BIG FINN HILL PARK

REVISED MASTER PLAN

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TECHNIC[illegible]ENT AND RESEARCH CENTER
[illegible]TY DEPARTMENT OF
NATURAL RESOURCES AND PARKS

August 1, 1994

ADOPTED

BIG FINN HILL PARK

REVISED MASTER PLAN

King County
Facilities Management Division

and

King County Parks Division

Prepared by the Berger Partnership
August 1, 1994

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REPORT

APPENDIX

The Big Finn Hill Park Citizens Advisory Committee began working together on May 11, 1992 to discuss revising the Master Plan of the 85 acre tract designated as a regional recreation area. The following members represent the user associations, local schools, neighborhood, King County Parks, and The Berger Partnership:

BIG FINN HILL PARK CITIZENS ADVISORY COMMITTEE

Roy Abbett
Greater Kirkland Softball

Jeff Girvin
The Berger Partnership

Steve Palevich
Northshore Youth Soccer Association

Rick Parker
Thoreau Elementary

Tom Pendergrass
Kirkland National Little League
Northshore Community Planning Committee

Mike Rice
King County Parks

Greg Schindler
North Community

Ray Wheeler
South Community

Dixie Johansen
Facilitator

BACKGROUND

In 1968, voters approved a Forward Thrust Bond Issue which included $249,000 for the acquisition of Big Finn Hill (220 acres) to be developed as a "major urban park." A Master Plan for 85 acres of Big Finn Hill Park was adopted by the King County Design Commission in 1981, designating its use as a regional sports and recreation area. The Master Plan was revised and adopted again in 1988 in response to requests for more baseball fields.

The previously semi-rural area surrounding the Park developed into a residential area and the region's population growth placed new demands on two groups: organized recreation groups and neighborhoods. The past few years have been difficult as nearby neighborhoods began to resist the the removal of trees and the intrusion of noise generated by sports activities. By 1988, development of Phases I-III had been completed. A public meeting was held on March 26, 1990 to explain implementation of Phase IV. Following that meeting, a Big Finn Hill Park Neighborhood Committee submitted an alternative plan and requested involvement in revising the Master Plan so that the "beautiful regional park will be used by people from all over the county who have a wide variety of recreational interests." The King County Council Open Space, Parks and Natural Resources Committee responded to the public meeting and the Big Finn Hill Park Neighborhood Committee by requesting a Master Plan revision, approval of the Northeast 138th street vacation, and the formation of a Citizens Advisory Committee to include members of the Neighborhood Committee. Rules were also issued on the use of loudspeakers.

Ivary and Associates were selected by the King County Design Commission to site and design a Regional/District shop facility at Big Finn Hill Park on March 16, 1991. The Berger Partnership was contracted on October 8,1991 to revise the Big Finn Hill Master Plan. In early 1992, a Citizens Advisory Committee was appointed. The Berger Partnership hired a consultant and professional facilitator, Dixie Johansen, to assist the committee.

With the mutual agreement of the Neighborhood Committee, the Kirkland National Little League, King County Parks Division, and King County's elected officials, it was determined that the revised Master Plan of the 85 acre parcel would consider the inclusion of additional park amenities identified by the neighborhood and would attempt to increase the buffering between the athletic fields and the adjacent residential development, buffering for the north athletic field/park boundary and re-siting of planned future athletic fields. The Big Finn Hill Park Citizen Advisory Committee was formed by King County Parks for the specific purpose of responding to concerns of nearby neighbors about the projected increase in activity if additional sports fields were built and sited as proposed in the 1981 Master Plan and 1988 Revision.

CITIZENS ADVISORY COMMITTEE ROLES AND RESPONSIBILITIES

King County is adopting a standard public process for planning efforts by Citizens Advisory Committees. The process was explained and summarized for this report by Linda Dougherty, Acting Manager of King County Parks Division.

> For each plan, the Division appoints an advisory committee to assist the Division by providing a diverse citizen perspective throughout the planning process. These Citizen Advisory Committees are generally comprised of individuals who have varied parks and recreation interests and experiences and who will be able to assist the Division in addressing the planning issues at any given park from a broader perspective. After an Advisory Committee has made their recommendations and a conceptual plan or design has been developed, a series of public meetings are held to inform the general public of their recommendations, process, rationale, and to receive public comments. These are education/information sessions. Following the public meetings, the Advisory Committee and the Parks Division carefully consider public comments and concerns and incorporate the desirable and feasible recommendations in the proposed master plan which is first presented for approval by the Division Manager and Management Team and, as approved, forwarded to the Parks, Open Space and Natural Resources Committee of the King County Council for their review and comment.
>
> King County Parks has made a commitment to keep the BFHP Advisory Committee apprised of meetings which will address their issues. An Advisory Committee member may be asked to participate in the presentations. Or, as a citizen, any member of the Advisory Committee may speak at any public hearing.

The specific purpose for the Big Finn Hill Park Citizens Advisory Committee was described at the May 11, 1992 meeting and summarized for this report by Linda Dougherty.

> The original Master Plan focused on 85 acres of Big Finn Hill Park earmarked for active recreation, including soccer and ball fields, as well as passive amenities like picnic shelters and play areas. This Master Plan will be open to discussion and recommendations by the Big Finn Hill Park Advisory Committee regarding issues of:
>
> - sport field siting with no reduction in number of fields
> - amenities to serve the surrounding neighborhood (including children's playground, picnic shelters, and tennis courts)
> - noise buffering
>
> The Advisory Committee's responsibilities will include:
>
> - Recommendations to the King County Parks Division
> - Informing the local community and representative park users on the process, progress, and points of mutual agreement as they are reached

The Citizens Advisory Committee was specifically interested in whether the scope of this work could be expanded to include considerations of siting future field and/or shop development on the west side of Juanita Drive. The King County Parks Division considered this request and responded as follows:

> The entire 250 acres of Big Finn Hill Park will be discussed only in the context of identifying potential future options. There is currently no funding, nor is it the Parks Division's charge from the Council Committee, to develop a detailed master plan of the entire park. However, the Parks Division has agreed to provide any information it has regarding the western area of the park which would preclude locating fields and/or other built facilities there.

INITIAL INTERVIEWS AND MEETINGS:

Interviews were conducted with all members of the Big Finn Hill Citizens Advisory Committee prior to the first session to discover needs and concerns. Information from initial meetings and interviews were used to design the May 11th first committee meeting.

The following questions were asked at that initial interview:

> How does your group use the park at the present time?
>
> What do you perceive will be the needs of your group in the future?
> Next 1-2 years? Future needs?
>
> Describe any past incidents between your group and other user groups? Neighborhood groups? King County Parks? King County? Berger Partnership?
>
> Are there any current problems with the use of Finn Hill Park and your group?
>
> Do you perceive any future problems?
>
> Does your group have a working relationship with King County Parks?
> Describe this relationship.
>
> What kind of a working relationship would improve your use of Finn Hill Park?
> What changes would you suggest?
>
> Does your group have a working relationship with The Berger Partnership?
> Describe this relationship.
>
> What kind of working relationships with King County and The Berger Partnership would improve your use of Finn Hill Park? What changes would you suggest?
>
> What ideas do you have for the best way this Committee can achieve results.

THE FIRST MEETING:

The May 11, 1992 meeting was designed to focus on three areas:

Clarify the roles and responsibilities of the Big Finn Hill Park Citizens Advisory Committee

Make decisions about Committee structure and group process to increase effectiveness

Acknowledge each other as individuals with strengths, skills, and experiences that can contribute to the Citizens Advisory Committee's effectiveness

Identifying agreements/differences and trusting each other to act as advocates of Big Finn Hill Park as an important regional and local resource was critical.

All members of the Citizens Advisory Committee stated a belief in collaborative decision-making and agreed to work toward consensus as the most effective method of making decisions. Consensus stresses cooperation and meant that group members worked together rather than competing; consensus meant being flexible and avoiding the urge to "win". Recognizing that total satisfaction for every constituency or individual is rare, the Citizens Advisory Committee group wanted to ensure all concerns were considered and no one single group or individual's interest has been at the expense of others. Everyone recognized that "giving and receiving" would be a necessary step in reaching decisions. A Master Plan based on these principles will present strong, unified recommendations to King County.

Public sector actions do not function in isolation. The following organizations and groups (not represented on the Citizens Advisory Committee) were identified as being critical to the development of a successful revised Master Plan for Big Finn Hill Park. These organizations were notified of the Citizens Advisory Committee efforts and were contacted if any decision affected their organization.

Bothell City Council
Kirkland City Council
Senior Service Centers and Associations
King County Police
King County Fire
N.E. Lake Washington Water and Sewer
Local Realtors
Washington State Parks (St. Edwards)

DILEMMAS, DECISIONS and RECOMMENDATIONS:

Meeting every three weeks from May 11, 1992 through October 12, 1992, the Citizens Advisory Committee struggled to understand and respect all points of view and reach consensus on the following critical questions and concerns:

How can the Master Plan balance the "past, present, and future" needs of the citizens?

How can the Master Plan realize the impact of any development on the quality of life (regional, local, and individual)?

How can the Master Plan address the issues of regional growth and development?

How can the Master Plan address recreation needs, neighborhood needs, and Park capacity?

The Citizens Advisory Committee agreed that primary decisions regarding recommendations for a revised Master Plan would focus on three issues:

1. Form of use (what types of activities)
2. Level of use (how many, when)
3. Siting of use (location and buffers)

In order to begin planning, the members wanted information regarding sensitive area criteria, specific community concerns, and any formalized agreements with organized sports organizations, King County Parks, and the King County Council. Recommendations will also include identification of priorities and suggest phases for completion. These needs include consideration of:

- Definitions of regional and local communities
- Growth, Development, and Environmental issues
- Regulatory issues
- Safety and Security issues
- Noise buffering
- Educational opportunities
- Regional recreation needs
- Resource capabilities
- Traffic flow and Parking
- Equal access (male, female, disabled, seniors, etc.)
- Balanced development for a variety of users
- Open, unstructured natural space; passive areas
- Play area and structures for small children
- Protection of existing conifers

Jeff Girvin, The Berger Partnership, distributed large maps and graphics with common dimensions of ball fields, soccer fields, basketball, volleyball, etc. for use in exploring options with their respective constituents. On August 17, 1992, the Big Finn Hill Citizens Advisory Committee met to discuss presentations made by each constituent group.

ACTIVITY SITING CRITERIA

Activity	Area Requirements	Existing Topo Requirements	Special Considerations
Softball	325' radius'	0-5%	Noise, parking
Soccer	225' X 360"	0-5%	Noise, parking
Youth Baseball	385' radius	0-5%	Noise , parking
Little League Baseball	225' radius	0-5%	Noise, parking
Informal Recreation	Variable	0-5%	Open grass
Parking	Variable	0-5%	Road access, safety, drainage, 300sf / car
Maintenance Facility	200' X 210'	0-5%	Noise, road access, safety, security, drainage
Volleyball	30' X 60"	0-5%	Variable surfaces
Children's Play	Variable	0-5%	Visibility, safety
Tennis	60' X 120'	0-15%	Noise, $/user, drainage, subgrade
Basketball	40' X40"	0-15%	Half court, x2 full court
Picnic	Variable	0-15%	Single, group, shelter, access from cars
Walking, jogging	Variable	0-15%	Variable surfaces, loop destination, erosion

General Considerations:
All activities will incorporate access for people with disabilities. Setbacks to be added to area requirements.

Consensus was reached on the following areas of concern:

1. Preliminary Stream and Wetland classifications for Big Finn Hill Park were prepared for The Berger Partnership and the Citizens Advisory Committee by Scott Luchessa, Herrera Environmental Consultants. Federal and state environmental regulations regarding wetlands and streams have created new boundaries of development in this 85 acre parcel. Everyone on the Committee respects these restrictions.

2. After several attempts to incorporate a King County facility maintenance building on this site as well as additional community amenities, environmental restrictions, and the need for regional ball fields, the Citizens Advisory Committee will not support a maintenance facility on this 85 acres.

   After further study, the Parks Division has withdrawn its interest in the Big Finn Hill site as a location for a maintenance facility, preferring a location east of the site due to future annexations and incorporations.

3. The following community amenities will be incorporated in the master plan:

   - children's play area with play structures
   - picnic areas and shelters
   - open games area
   - jogging and hiking trails
   - basketball courts
   - tennis courts
   - volleyball courts
   - interpretive facility

4. The siting of sport fields and community amenities will consider NOISE as the #1 factor affecting neighborhoods. An acoustical environmental consultant (Eric Hansen, TRC Environmental Corporation) researched and advised the Citizens Advisory Committee and, as a result, acoustical factors will be a major criteria in the Master Plan revision and will be reviewed during implementation.

5. Removal of evergreen trees will be avoided when possible without compromising regional needs. Safety and security issues will also be a primary design factor. Other criteria discussed by the Citizens Advisory Committee included education opportunities, public access, parking, convenience, balance of activities, and balance of priorities.

6. Environmental education and experiences will be incorporated in the Master Plan for use of schools, groups, and individuals. Interpretive facilities will be located in the southeast corner of the 85 acre site. Renewal of the original salmon stream is viewed as an exciting opportunity. A shelter placed adjacent to informal open space offers opportunities for day camps, learning groups, etc.

7. A large shelter or "lodge" was supported by the Committee. The Citizens Advisory Committee is aware of the King County Park Department's reluctance to commit support and maintenance of large public use structures. However, the committee members see a need for such a structure. The reasons for supporting such development were listed:

   - Used from dawn to dusk, the shelter is viewed as a link with the natural areas; an open-air shelter from the Pacific Northwest weather.
   - Many organized non-profit groups (Scouts, Camp Fire, etc.) have difficulty finding a facility for their programs.
   - Other community groups and programs need meeting facilities for 50-74 people.

- Larger group picnics, family reunions, and celebrations find it difficult to find open natural surroundings.
- A small stage will encourage children's theater, puppet shows, and other celebration events.
- Day camps during school vacations and after-school youth programs are needed for working parents and single parent households; this need will increase.
- Adults and Senior citizens need more facilities for recreation and health activities, such as aerobics, yoga, dancing, etc.

A majority opinion (not consensus) made the following recommendations for revision to the 1981/1988 Master Plan:

8. There will be one less ball field than approved in 1988 to reduce impact on the neighborhood. The Kirkland Little League and Greater Kirkland Softball have agreed to share one ball field.

9. There will be one half-size soccer field and one full-size soccer field rather than the four soccer fields approved in the 1981 Master Plan. This reduction has been negotiated to spare part of the conifer forest and reduce impact on the neighborhood.

FINAL PHASE

These recommendations were given to Jeff Girvin, Partner and project lead from The Berger Partnership to draft the revised Big Finn Hill Park Master Plan. Following review by the Citizens Advisory Committee, the second draft was presented to King County Parks Division prior to the open public review process.

SITE ANALYSIS

The site was re-analyzed looking at a number of existing environmental and regulatory factors:

1. Existing development was noted both within and adjacent to the park. Residential neighborhoods occur at both the north and southwest boundaries. Thoreau Elementary is located at the northeast corner and Finn Hill Junior High is located at the southeast corner. The site is bounded by Juanita Drive on the west and 84th Avenue Northeast on the east. Northeast 138th bisects the site in an east / west direction.

2. Existing slopes were divided into three categories of relative steepness: the flatter portions of the site being easier to develop for active recreational purposes such as baseball, soccer and parking. The moderately flat portions of the site are more suited for passive recreation: picnicking and limited forms of active recreation such as hiking, children's play area, tennis, volleyball, and basketball. The steeper areas are to remain undeveloped.

3. Existing vegetation was reviewed and recorded. Conifers such as Douglas Fir, Hemlock, and Western Red Cedar were felt to be the most desirable because of their appearance and longevity. Mixed deciduous trees such as Alder and Maple were felt to be less desirable because most were high branching and susceptible to wind damage. However, wetland vegetation within this category was to be protected. Open areas noted were those cleared previously for active recreation or prior to purchase of the property by the County.

4. Wetlands and streams are significant features on the site. A preliminary stream and wetlands assessment was prepared by Herrera Associates. The locations of streams and the boundaries of significant wetlands were plotted and the associated setbacks were noted.

5. Activity setbacks from the park boundary were proposed to help mitigate visual and noise impacts. A 200 foot setback was noted adjacent to residential areas and 100 foot setback was noted adjacent to roadways.

All these factors were combined to form a composite suitability plan. The most suitable locations for recreational development tend to be toward the center of the site adjacent to areas that have previously been developed for recreation. In addition, the central portion of the site, north of Northeast 138th and west of the stream, is very suitable. The southeast portion of the site is significantly restricted by the large wetlands area, while the northwest portion of the site, although it contains some usable areas, is isolated from other activities.

REVISED MASTER PLAN

The Revised Master Plan is a response to the program developed by the Citizens Advisory Committee, operational requirements of King County, and the natural conditions and regulations affecting the site. The Revised Master Plan for Big Finn Hill Park will accommodate a diversity of active and passive recreational activities. The park is designed to serve the needs of the local neighborhood as well as the surrounding community. At the same time, the majority of the site will remain undeveloped, in its existing natural state. Significant trees and vegetation will be preserved; wetlands and streams will be protected and in many cases enhanced. The developed components that will make up Big Finn Hill Park are described as follows:

It is the continued intent of the Revised Master Plan that Northeast 138th be vacated and dedicated to park use. The park will be accessed by automobiles from the east and from the west, but no through traffic will be accommodated except for emergency and service vehicles. Large parking lots for approximately 120 to 150 cars each will occur in the eastern and western areas of the park and allow for pedestrian access to all portions of the site. A smaller parking area for approximately 35 cars will serve activities in the southeastern portion of the site and be able to serve as an overflow lot for the eastern athletic fields.

One additional baseball field will be added to the three existing fields. The field to be added is a multipurpose baseball / softball field similar in size to the existing field in the south portion of the site. The field will be located on the west side of the existing two-field complex near the existing restroom, concession, and parking area. The field will be oriented toward the southwest and will be on grade with the existing complex. The fourth field originally proposed for this area will not be developed. This area will instead be an informal play meadow and contain three sand volleyball courts. A buffer of evergreen trees will be added along the north property line between the existing Little League Field and the residences. The existing parking lot will be increased from 50 to approximately 120 cars and will be the terminus for the east portion of Northeast 138th. Basketball courts will be located near the west side of this parking lot.

One full sized soccer field will be added to the southwest area of the site, west of the existing baseball field. In order to construct the soccer field, a small Class 3 wetland area will be displaced and either reconstructed on the site or incorporated into a stream mitigation and improvement program. Service access and pedestrian access will be shared between the proposed soccer field and existing baseball field. The soccer field will be set back 200' from the park boundary with a buffer strip of evergreen trees added to the area south of the proposed soccer and existing baseball field. A practice or youth soccer field will be sited north of Northeast 138th. The smaller size field was preferred due to the desire to have a significant stand of conifer trees. All soccer and baseball fields will be natural turf and unlighted. A parking lot for approximately 150 cars will be constructed partially within the existing street right-of-way and curve to the north to serve the picnic area, children's play area, and meadow. The picnic area will incorporate open and wooded areas and contain one large open air shelter to accommodate group activities. A turnaround at the end of the parking lot will serve as the terminus for the west park entrance. The picnic area and the parking lot will be connected to the informal play meadow and the northeast area of the park by two bridges over the existing stream. Two tennis courts will be constructed at a level between the soccer field and the parking lot. A restroom will be added to serve the western portion of the park.

The northwest corner of the park will remain undeveloped except for a loop trail. Walking and jogging trails will connect activities within the entire site and will connect the park with the adjacent neighborhoods. Activities throughout the park will be accessible to people with disabilities. Many existing trails will be "formalized" to become part of the park trail system. Some trails will be wide enough to accommodate service and emergency access vehicles within the park boundaries. Pedestrian access will be encouraged throughout the park to eliminate isolated areas where undesirable activities could take place.

Members of the Citizens Advisory Committee expressed and demonstrated respect for each other and truly looked at the "big picture" trying to balance the individual and group needs, regional needs, and future needs. They believe, by collaborating, a "richness" was added to Big Finn Hill Park that no one individual could have done. They believe that compromising is not losing. The representatives collectively regret that their constituents could not experience the past year of deliberations and increased understanding.

APPENDIX

If play field areas are to be used during the wetter months of the year, we recommend that underdrains be installed. The underdrains are typically installed by placing a perforated pipe in a trench and surrounding it with pea gravel. The pipe is sloped to drain to an appropriate discharge area or tightline connected to the storm drain system The surrounding area is sloped to drain to the pipe. A free-draining sandy fill is used above the drainpipe. The play fields should be capped with a topsoil/sod layer containing at least 50 percent sand to promote drainage.

We recommend that footing drains be installed along the outside of the planned exterior wall footings. Footing drains should be installed at least 1 foot below planned finished slab. Footing drains should be constructed the same as the wall drains described earlier in this report.

Pavements

We recommend that areas to be paved be prepared as outline in our Site Preparation and Grading sub-section. Prior to paving, these areas should be proofrolled using a loaded dump truck or a piece of construction equipment with high axle loads. Areas observed to weave under proofrolling should be repaired prior to paving. We recommend that pavement areas be underlain by a minimum thickness of 6 inches of free-draining sand and gravel for frost protection.

USE OF THIS REPORT AND WARRANTY

We have prepared this report for The Berger Partnership P.S. and their agents, for use in planning and design of this project. The data and report should be provided to prospective contractors for their bidding and estimating purposes, but our report conclusions and interpretations should not be construed as a warranty of subgrade conditions. At the time of this report, the finished plans were not available. We recommend that we be allowed to review the final plans and provide additional design input, as necessary, prior to construction.

The scope of our work does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractors' methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design. There are possible variations in subsurface conditions. We recommend that project planning include contingencies in budget and schedule, should areas be found with conditions that vary from those described in this report. We recommend that we be retained during construction to evaluate the soils exposed during earthwork and to provide recommendations as appropriate, should conditions be different that those described in this report. As part

of our services, we would monitor site excavations, cut-off drain installation, road fill placement and utility trench backfill. We would expect that these services would be performed on a part-time, as needed, basis.

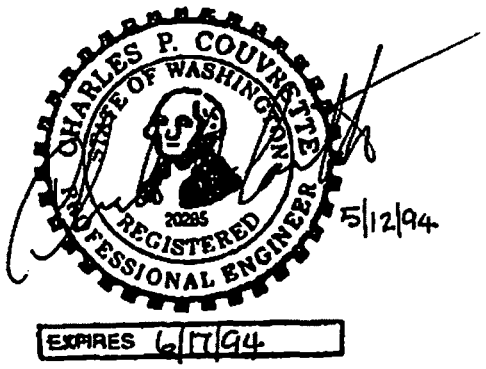
Within the limitations of scope, schedule and budget for our work, we have strived to take care that our work has been done in accordance with generally accepted practices followed in this area at the time this report was prepared. No other conditions, expressed or implied, should be understood.

We appreciate the opportunity to be of service to you. If there are any questions concerning this report or if we can provide additional services, please call.

Sincerely,
NELSON-COUVRETTE & ASSOCIATES, INC.

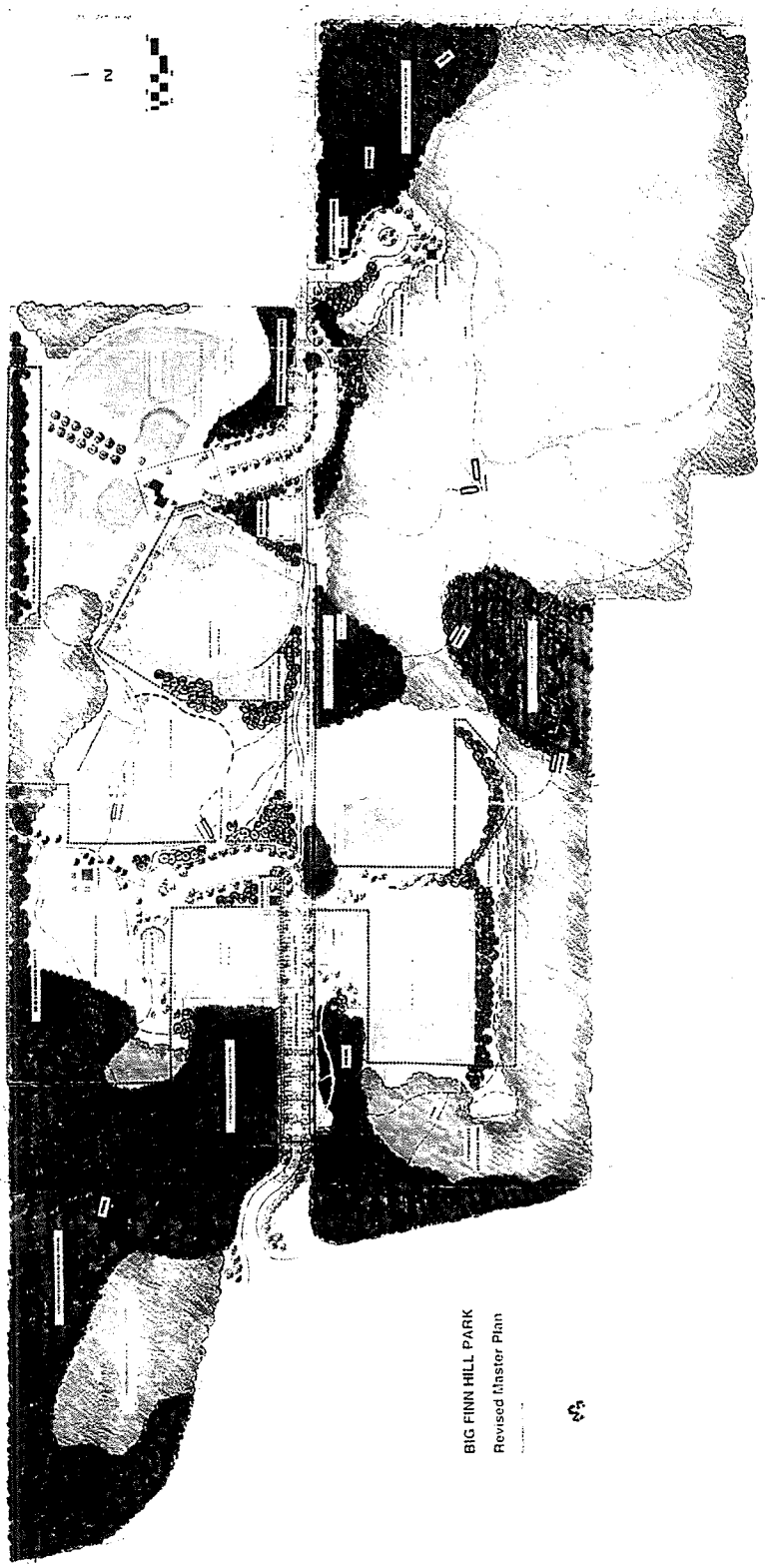
William B. Benzer
Project Engineer

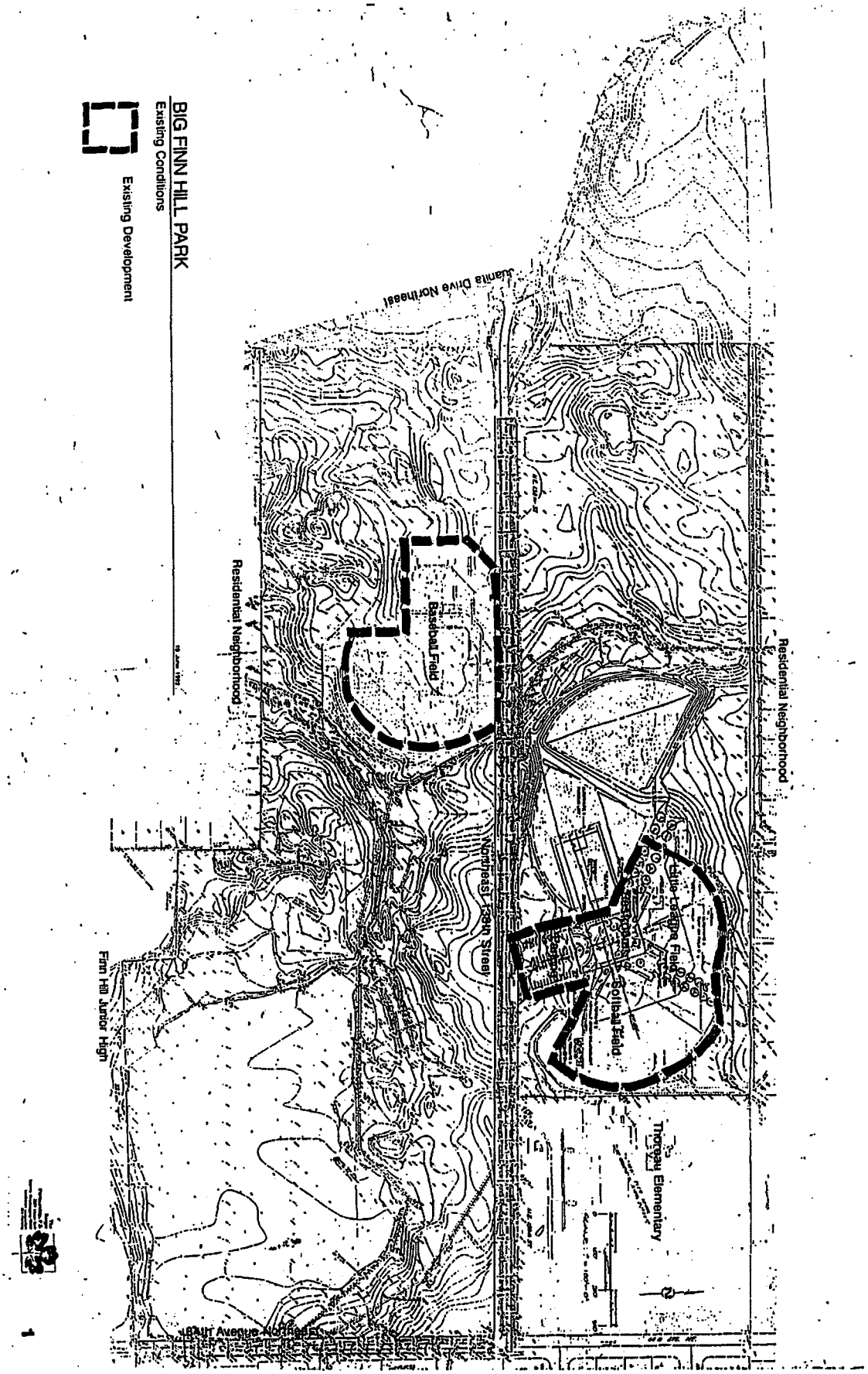
David L. Nelson, PG
Professional Engineering Geologist

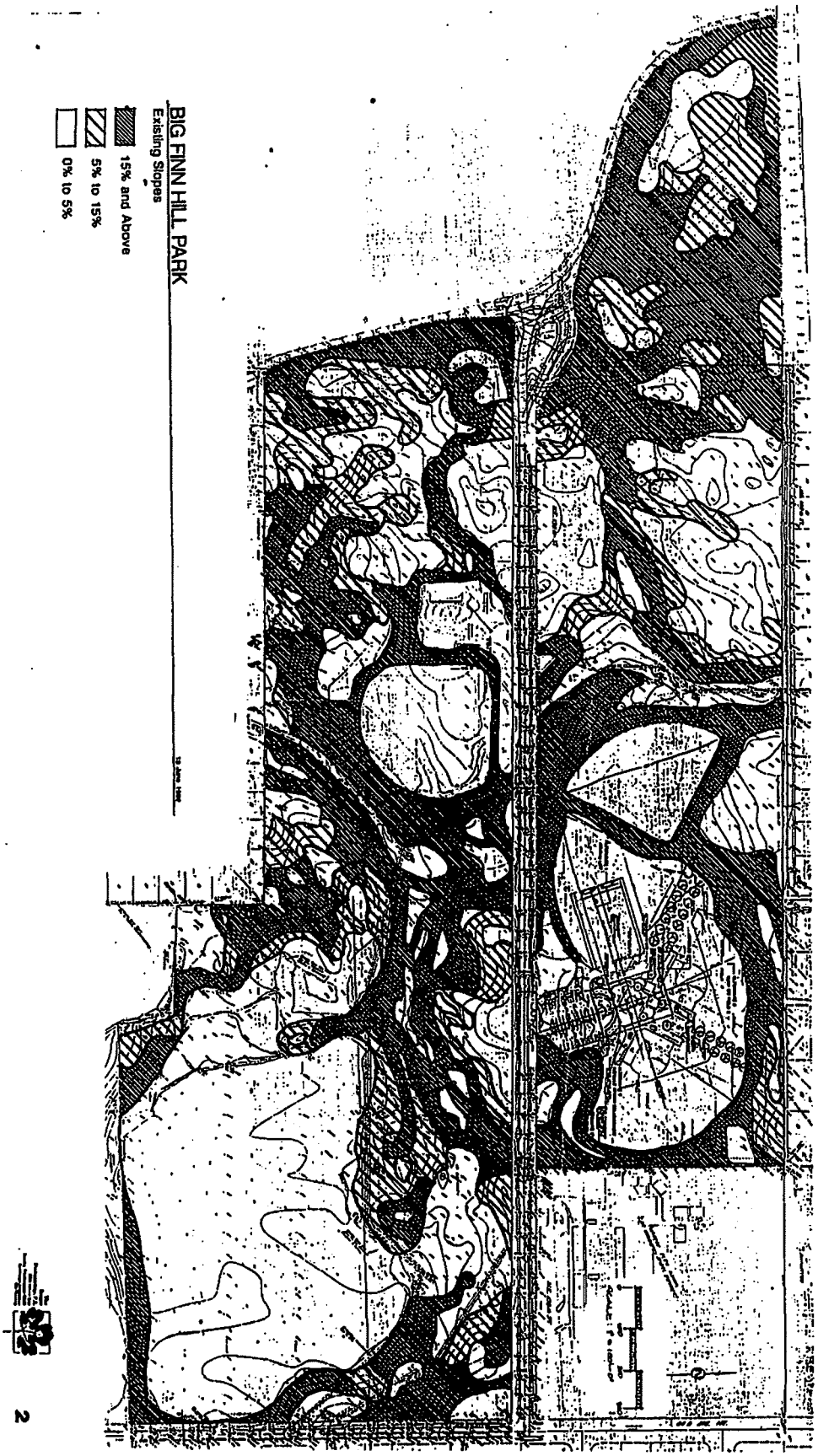


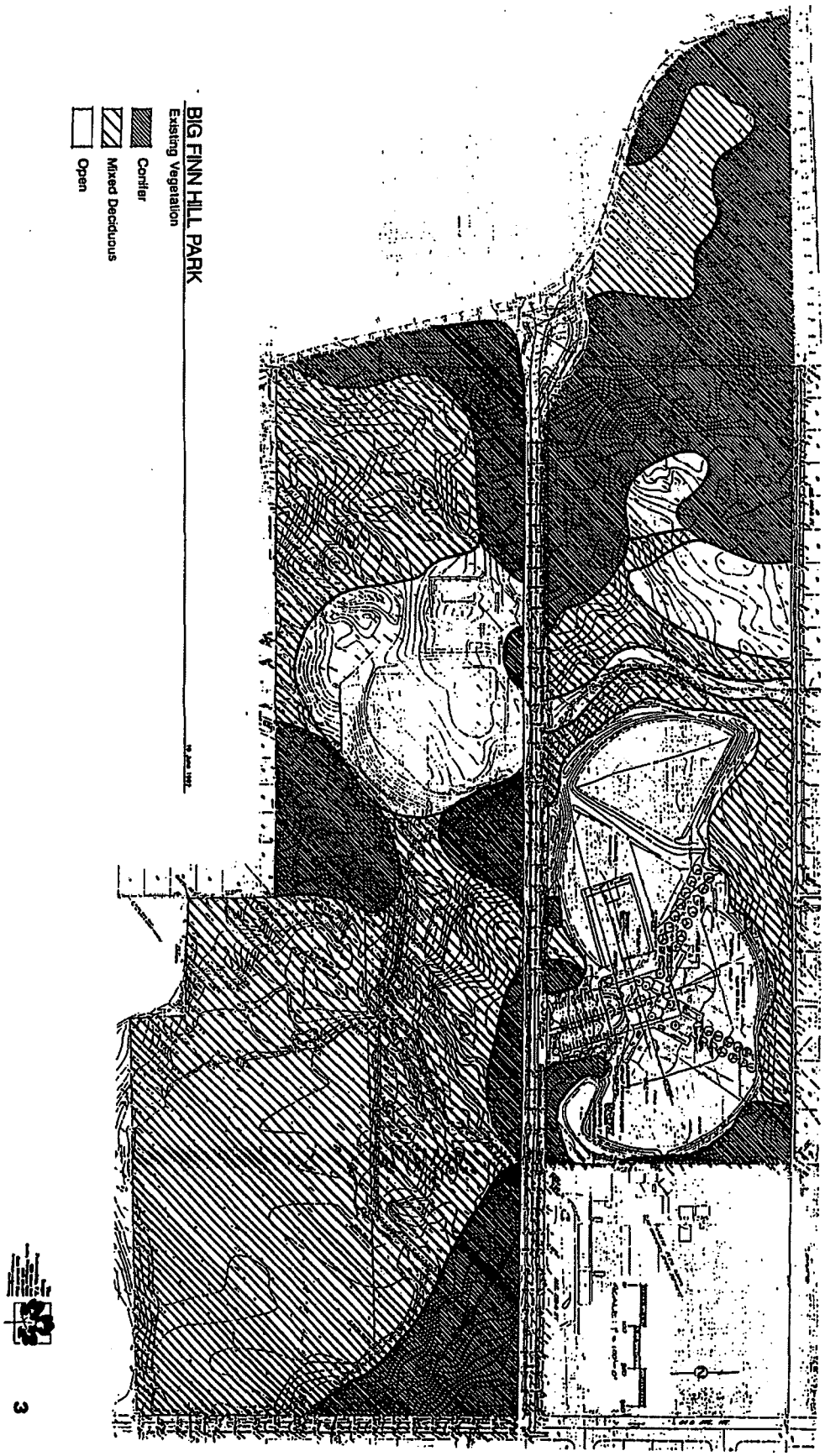
Charles P. Couvrette, PE
Geotechnical Engineer

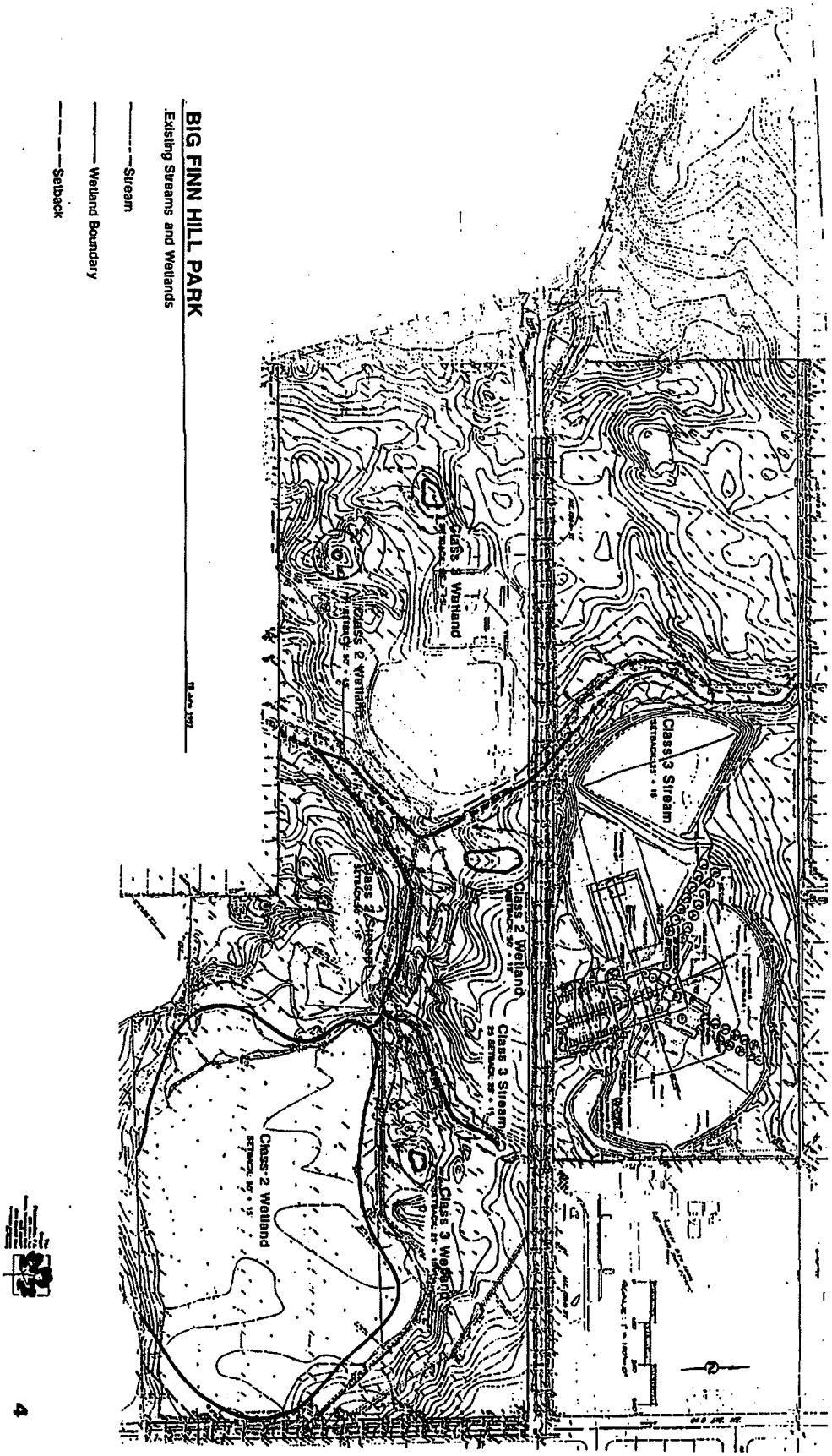
Three Copies Submitted
Fourteen Figures

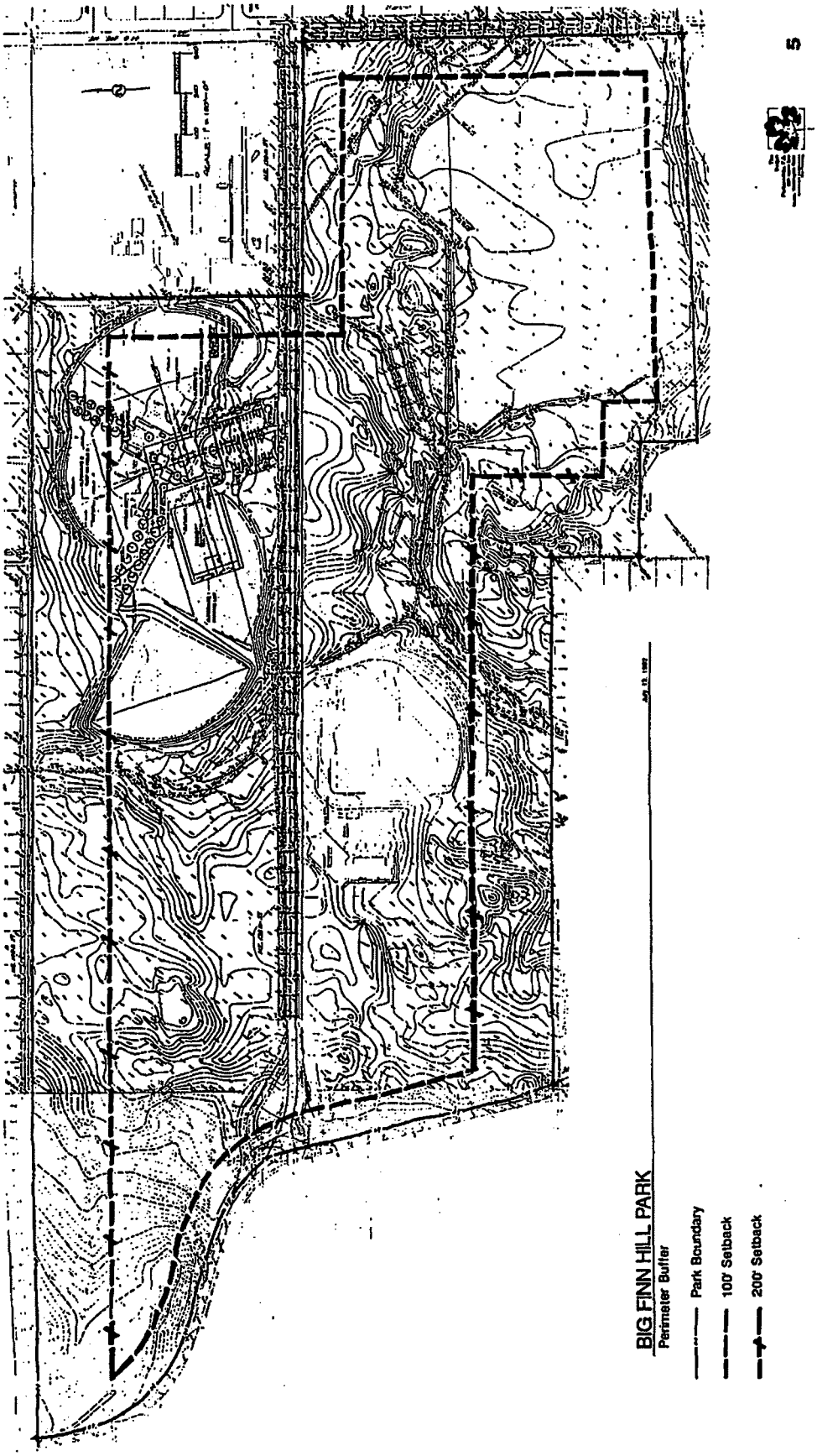

BIG FINN HILL PARK
Revised Master Plan

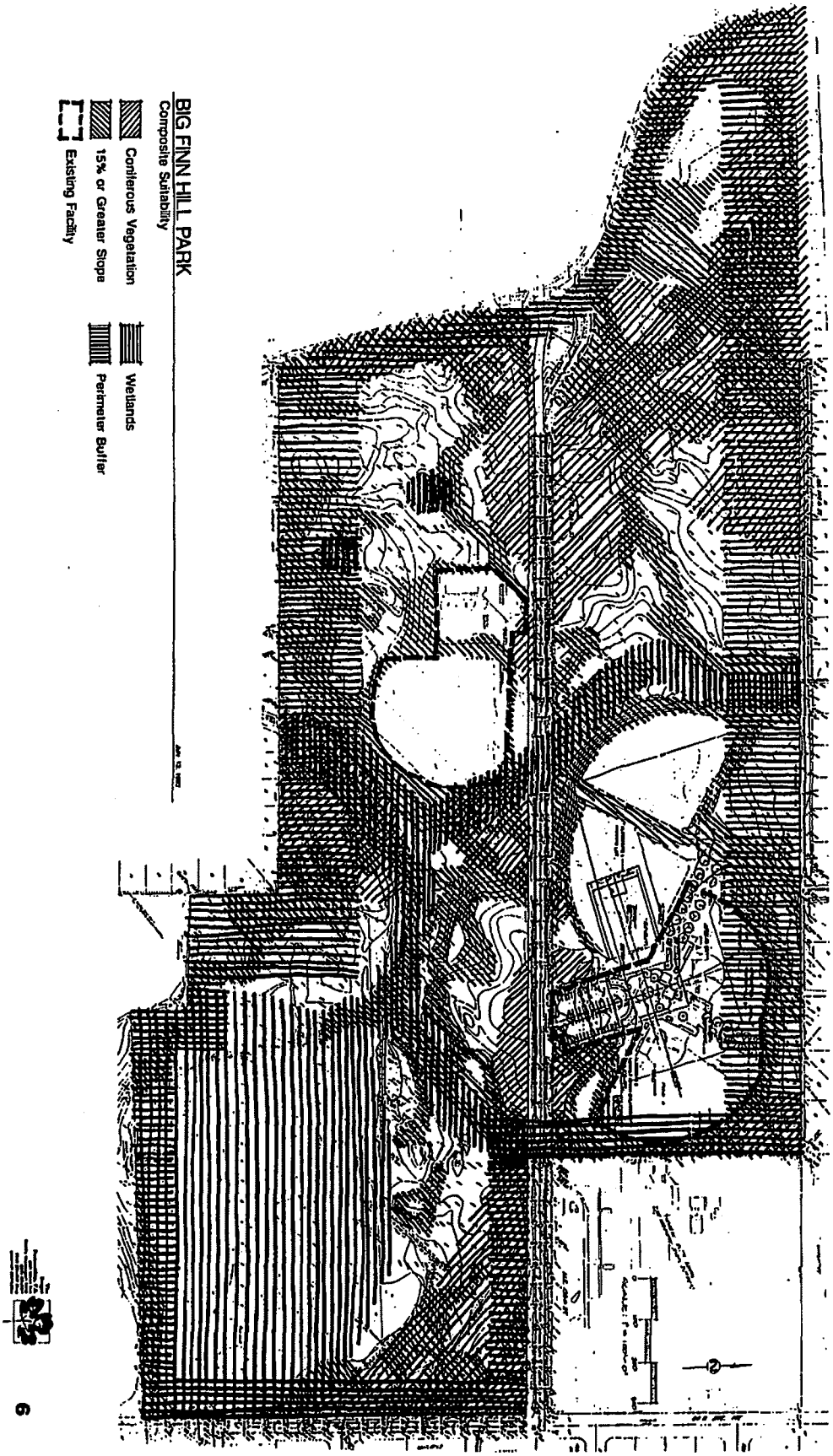

BIG FINN HILL PARK
Existing Conditions
Existing Development
Residential Neighborhood
Juanita Drive Northeast
Baseball Field
Residential Neighborhood
Northeast 120th Street
Little League Field
Softball Field
Thoreau Elementary
Finn Hill Junior High
132nd Avenue Northeast


BIG FINN HILL PARK
Existing Slopes
15% and Above
5% to 15%
0% to 5%
2


BIG FINN HILL PARK
Existing Vegetation
Conifer
Mixed Deciduous
Open
3


BIG FINN HILL PARK
Existing Streams and Wetlands
Stream
Wetland Boundary
Setback
Class 3 Stream
Class 2 Wetland
Class 3 Stream
Class 2 Wetland
Class 2 Wetland
Class 3 Stream
Class 2 Wetland
Class 3 Wetland


BIG FINN HILL PARK
Perimeter Buffer
Park Boundary
100' Setback
200' Setback


BIG FINN HILL PARK
Composite Suitability
Coniferous Vegetation
15% or Greater Slope
Existing Facility
Wetlands
Perimeter Buffer

PRELIMINARY STREAM AND WETLAND CLASSIFICATIONS

Big Finn Hill Park

Prepared for:

The Berger Partnership
2021 Minor East
Seattle, Washington 98102

Prepared by:

Herrera Environmental Consultants, Inc.
1414 Dexter Avenue, North, Suite 200
Seattle, Washington 98109

Phone: (206) 281-7604
Fax: (206) 281-7651

August 1992

INTRODUCTION

Herrera Environmental Consultants, Inc. has conducted a wetlands and stream assessment of the Big Finn Hill Park to determine preliminary classifications according to the King County Sensitive Areas Ordinance (SAO), to identify potential development restrictions, and to guide master plan development of the park. This report presents a preliminary classification of the streams and wetlands on site and describes wetland areas and functional values. Development issues, permit requirements, and conceptual mitigation alternatives also are identified.

PRELIMINARY STREAM AND WETLAND CLASSIFICATIONS

Herrera Environmental Consultants, Inc. has preliminarily identified the stream and wetland classes in the portion of Big Finn Hill Park east of Juanita Drive (Figure 1). Stream and wetland classifications have been preliminarily determined for the purpose of guiding development of the park master plan and to identify potential environmental issues and constraints. Preliminary classifications are based on the field reconnaissance conducted by HEC on July 7-8 and August 5, correspondence with agency personnel, and the best available existing information. Because it was beyond the scope of this study, these wetlands have not been delineated according to the federal interagency manual. Stream and wetland classes correspond to those classifications identified in the King County SAO.

Onsite Streams

Two streams, identified by the county as stream 0228 and 0228A, occur within the study area (Figure 1). The mouth of stream number 0228 is located in Denny Park on the east side of Lake Washington. The mainstem of 0228 proceeds up a steep hillslope in a north by northwest direction beneath Juanita Drive into the proposed project area where it is joined by tributary 0228A. Stream number 0228 has been identified by King County (1990) as a class 2 salmonid stream. Stream number 0228A is unclassified.

Fish usage on stream 0228 has been described by King County (1987). During the site reconnaissance, HEC confirmed that anadromous fish usage is restricted to below river mile 0.45, which is the location of a barrier to fish passage. In addition to anadromous fish, resident salmonids usage above the river mile 0.45 barrier was confirmed up to a pool on the downstream end of the culvert beneath Juanita Dr. By contrast to the county's earlier findings, no resident

salmonids were observed upstream of Juanita Dr. in the park. It is uncertain whether the Juanita Dr. culvert is partially plugged or presented a barrier to fish passage.

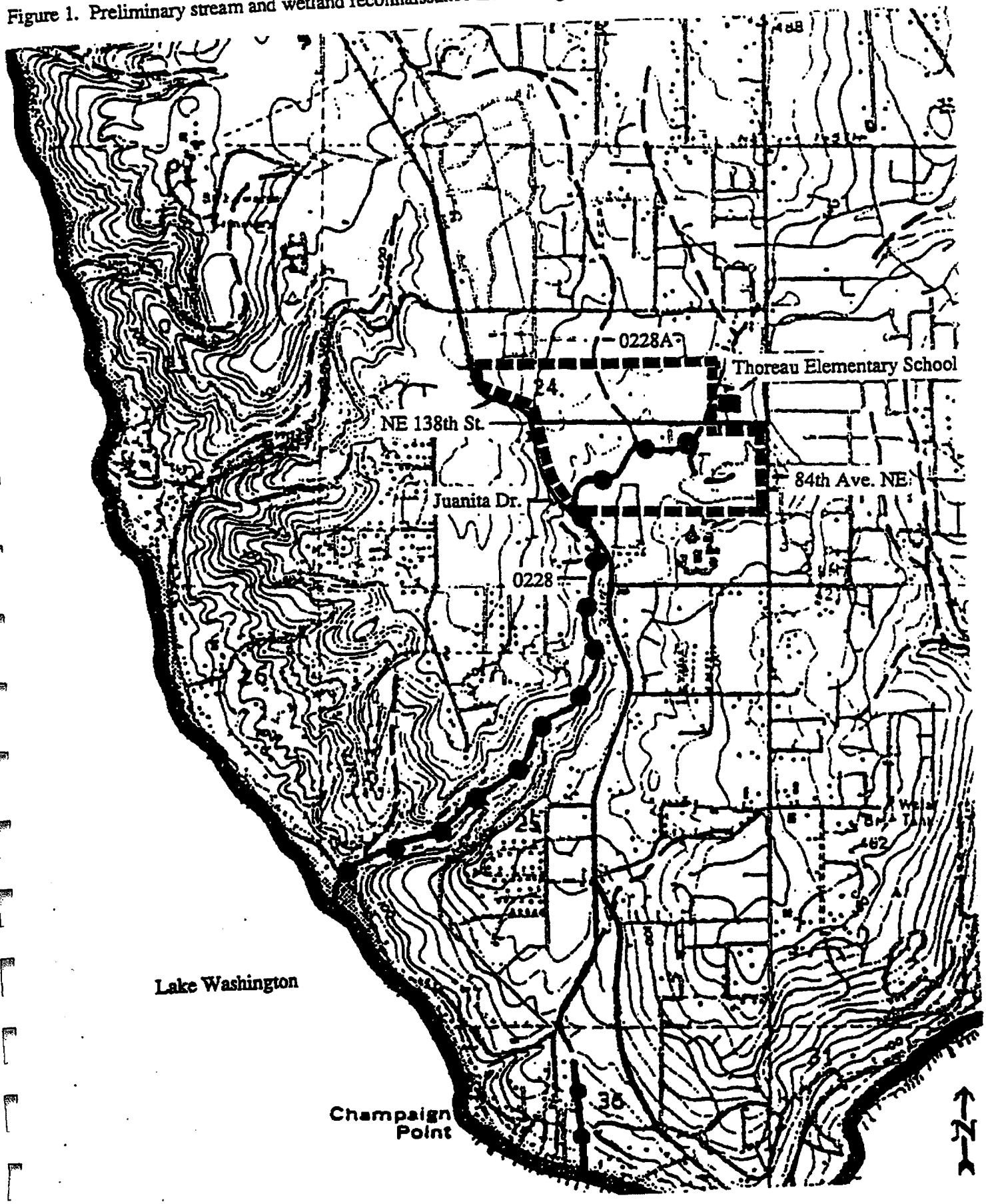
Because stream 0228 was flowing at the time of the primary site reconnaissance in early July, it was initially assumed that both tributaries were perennial. However, On a subsequent site visit on August 5, stream 0228 was dry above the confluence with the outlet channel from wetland W2. Therefore it is intermittent from wetland W2 to the culvert beneath NE 138th St. Although the stream has been classified as a class 2 salmonid stream up to NE 138th St.(King County 1990), HEC's recent reconnaissance observations appear to indicate that the easternmost portion of the stream within the study area is intermittent and unlikely to support salmonids. Furthermore, this intermittent portion of the stream is a class 3.

The western tributary of the stream (0228A) crosses NE 138th St in a culvert to the east of the west ballfield (Figure 2). This tributary appears to be intermittent and is therefore also a class 3 stream. The two tributaries unite to the south of the westernmost ballfield near the southern park boundary. No barriers exist on the 0228 stream reach that would prevent fish passage into the western tributary (0228A). However because it is intermittent, stream 0228A is unlikely a salmonid producing stream.

Fish habitat in both reaches of the stream within the park east of Juanita Dr. is marginal. In general, fine sediments stored instream limit salmonid food prey items and contribute to unsuitable spawning habitat. Clean spawning gravels, although rare, do occur in some places. In addition, there is little instream cover and generally poor rearing habitat. Both stream channels consist predominantly of shallow riffle habitat, which is at least partially attributable to lack of large organic debris. However, the forest canopy provides good thermal insulation and shallow groundwater discharges, which are the primary source of instream flows. Generally, urbanization has resulted in increased flows, which have increased erosion and sedimentation processes, resulted in reduced habitat diversity and generally degraded habitat within the stream reaches in the park. These findings are supported by previous studies, which also indicated that erosion, sedimentation and habitat degradation are problems in this area (Williams et al. 1975; King County 1987).

By contrast to previous studies, this reconnaissance study did not confirm the presencee of salmonids within the park east of Juanita Dr. Hence, it is uncertain whether the stream continues to support salmonids upstream of Juanita Dr. Neither the Washington Department of Wildlife (Opperman personal communication 1992), the Washington Department of Fisheries

Figure 1. Preliminary stream and wetland reconnaissance area of Big Finn Hill Park.



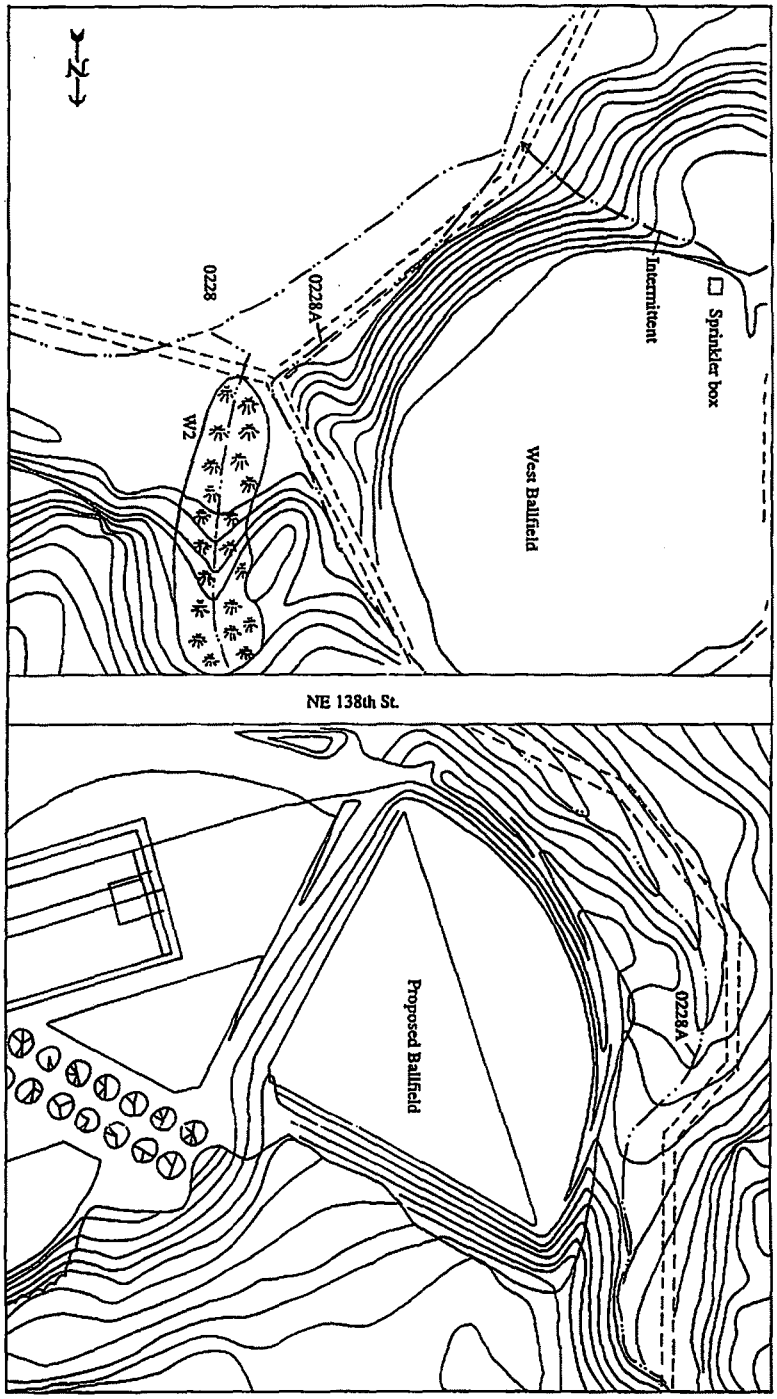


Figure 2. Streams and wetlands near the west ballfield.

(Fisher personal communication 1992), nor King County Surface Water Management (Wood personal communication 1992) have conducted any recent stream surveys confirming salmonid use above Juanita Dr. In addition, intermittent and seasonally low flows in stream 0228 are unlikely to support salmonids. Considering the absence of evidence indicating that salmonids are present in 0228 east of Juanita Dr., the perenially flowing section of this stream below wetland W2 is likely a class 2 non-salmonid stream.

The SAO buffer is 50 feet for class 2 (i.e, perennial) streams without salmonids and 100 feet for a class 2 streams with salmonids. Intermittent stream segments are rated class 3, which require a 25 foot buffer. In addition to the buffer, a 15 foot building setback is required for all stream classes. Therefore the total buffer plus setback for the perenial segment of stream 0228 below wetland W2 is either 65 (no salmonids) or 115 feet (with salmonids). The buffer and setback for the intermittent section of stream 0228 above wetland W2 is 40 feet. Stream 0228A, which also appears to be intermittent, must have a 40 foot buffer plus setback. The stream reaches within the park did not appear to support resident salmonids and are likely of limited importance because of habitat and instream flow limitations. As stated previously, none were observed during the field reconnaissance, and none of the resource management agencies have conducted any recent inventories in these reaches. In determining stream buffer requirements, the county may consider reducing buffers if the applicant demonstrates that proposed development will not adversely affect associated stream resources.

Besides the perennial stream channels 0228 and 0228A, other intermittent or ephemeral stream channels occur in the park. An ephemeral channel associated with shallow groundwater discharge or possibly a leaking sprinkler line is located near the right field line of the west ballfield (See Figure 2). This channel is best described as a grass-lined swale. However, it does not appear to be a constructed swale. Two other intermittent channels are located near isolated wetland W1 (Figure 3). These generally shallow channels are approximately 4 to 5 feet wide composed of partially decomposed and undecomposed forest floor litter (e.g., twigs, branches, and leaves). These channels likely receive shallow groundwater discharges or surface water runoff only during the wet part of the year (October to May) and during heavy, sustained rainfall events. They may have been disconnected from stream 0228 when the sewer line utility that traverses this area was installed. No surface water outlet from these channels was observed, but they are likely hydraulically connected with stream 0228 and the East Lake Washington 2 wetland. All these areas are class 3 streams that would require a 40 foot buffer plus setback.

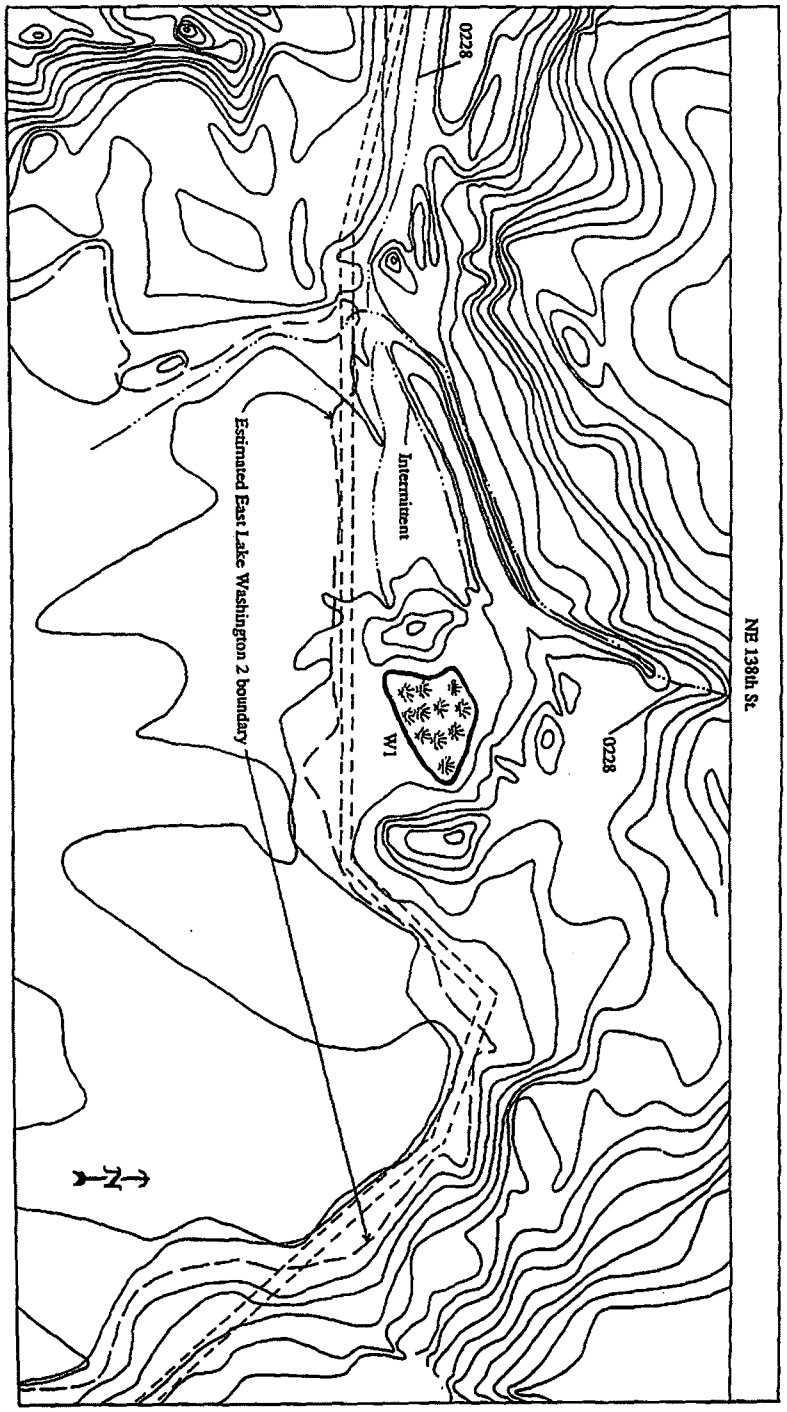


Figure 3. Streams and wetlands in the SE portion of the site.

Related King County Drainage Projects within the park

Because the culvert beneath Juanita Dr. is undersized, King County Surface Water Management has proposed to develop a capital improvement project in the park. Capital improvement project no. 1604 would replace the existing undersized cross culvert at Juanita Dr. to prevent flooding on the upstream side of the culvert. This project has not been completed at this time but may be pursued in the future (O'Neil personal communication 1992).

Onsite wetlands

Preliminary SAO wetland classifications and approximate boundaries were determined for those wetlands in area of the park bounded by Juanita Dr to the west, NE 140th St. to the north, 84th Ave NE to the east, and the high school access road to the south. Several wetlands exist within this portion of Big Finn Hill Park. In addition to the 16 acre East Lake Washington 2 wetland four small (less than one acre) wetlands were observed during the site reconnaissance. The locations, estimated size, and characteristics of these wetlands are described in the following section.

East Lake Washington 2

Big Finn Hill Park contains a large wetland identified as East Lake Washington 2 (King County 1991). The East Lake Washington 2 wetland is located in the southeast corner of the park and is bounded by NE 138th St. to the north, 84th Ave NE to the east and the high school access road to the south. Based on field observations, the north boundary of the East Lake Washington 2 wetland and the total area appear to be slightly different than those identified by King County (1991). The estimated north boundary and surface water inputs are shown in Figure 3. This wetland is hydraulically connected to stream 0228 and two unnamed intermittent channels located on the northwest side of the wetland. Stream 0228 likely contributes surface water inflows to the wetland during high flow events.

Because this wetland is relatively large, approximately 16 acres, and consists of a diverse assemblage of scrub-shrub and forest vegetation, it has moderate to high habitat and other functional values . Observed plant and animal species in this wetland are described in the wetland inventory (King County 1991).

According to the SAO, wetlands with forest vegetation communities are considered class 2 wetlands. King County requires a total buffer and setback of 65 feet for a class 2 wetland (50 foot buffer plus 15 setback).

Wetland W1

A small isolated wetland located in a depression occurs northwest of the East Lake Washington 2 wetland (see Figure 3). This wetland is designated W1. The estimated total area of this isolated wetland is 400 square meters (approximately 0.1 acre). Approximate wetland boundaries based on vegetational communities were flagged with pink survey tape labeled W1 HEC 7/7/92. Wetland hydrology is maintained by shallow groundwater table level fluctuations. Although there are no surface inlets or outlets to this wetland, two intermittent channels occur to the northwest and southwest of this wetland. These may be linked to the East Lake Washington 2 wetland by shallow subsurface groundwater flow.

Wetland vegetation consists of discrete aggregations of emergent and scrub-shrub species in the ponding area, which covers about 200 square meters. Scrub-shrub vegetation borders the pond area to the west, north and east, and by grassy meadow to the south. Dominant emergent plant species are smartweed (*Polygonum* sp.), pale bulrush (Scirpus pallidus), and small-fruited bulrush (*Scirpus microcarpus*). The dominant scrub-shrub plants include willow (*Salix* sp.), hardhack (*Spirea douglasii*), salmonberry (*Rubus spectabilis*), and alder saplings (*Alnus rubra*). This wetland provides excellent habitat for amphibians, and good habitat for small mammals and birds. Many frogs and tadpoles were observed in the pond during the field reconnaissance. Surrounding upland areas are composed of mixed coniferous/deciduous second growth forest species that are typical of western Washington.

Because it has two or fewer vegetation classes and is less than one acre, this is a class 3 wetland. King County requires a 40 foot buffer and setback (25 foot buffer plus 15 foot setback) around class 3 wetlands.

Wetland W2

Another wetland (W2) occurs in a low lying area approximately 0.2 mile west of Thoreau Elementary School. Estimated area of this wetland is 900 square meters (approximately 0.2 acre). The approximate boundaries of this wetland also were flagged with pink survey tape (Figure 4). Wetland hydrology consists predominantly of shallow groundwater discharge and

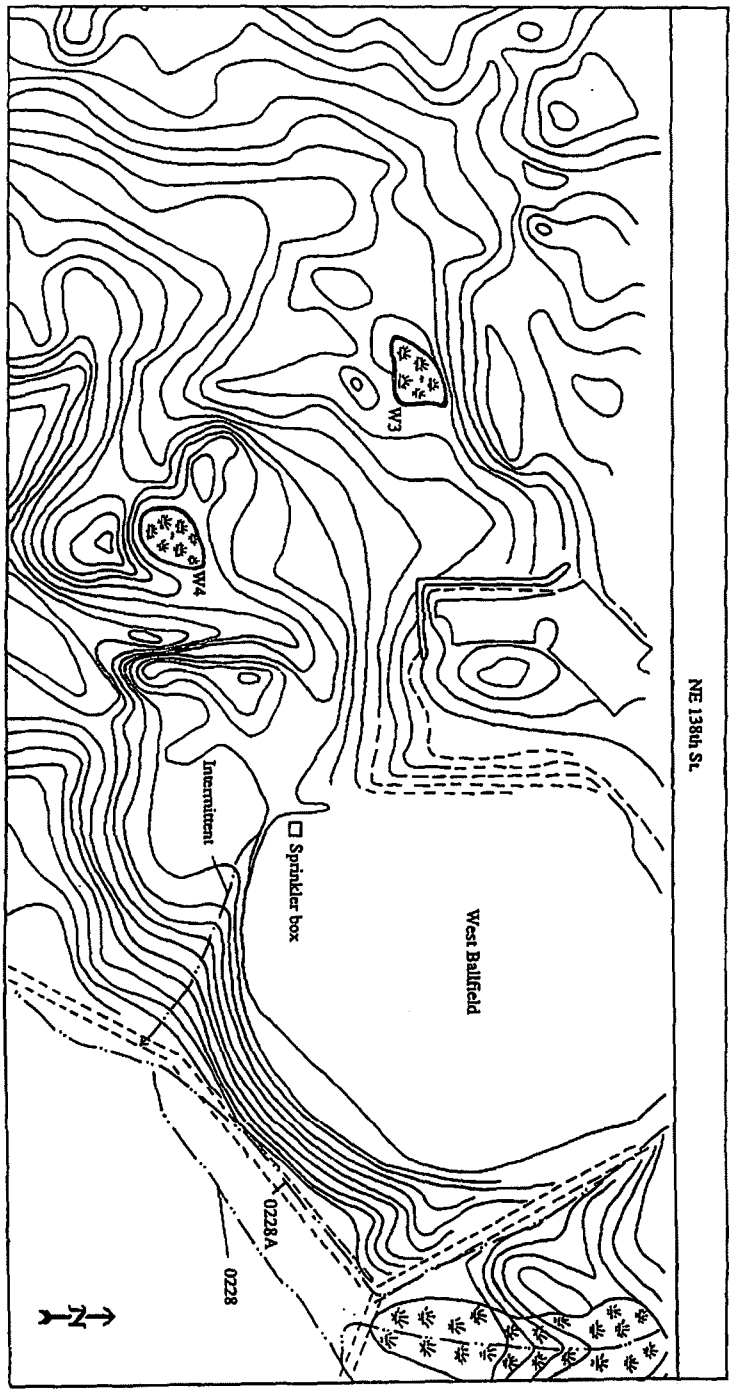


Figure 4. Streams and wetlands in the SW portion of the site.

some surface water runoff from a wetpond on the north side of NE 138th St. Water from the wetpond, which consists primarily of shallow groundwater discharge during the dry months (April to September), spreads out as sheetflow in this low-lying depressed area. Although water was flowing into the wetland at the time of the reconnaissance, no water was flowing into the outlet channel located approximately 70 meters (approximately 210 feet) south by southwest from the wetpond culvert inflow. The outlet channel is connected to stream 0228. Therefore it is thought that this wetland probably contributes to both groundwater recharge and instream flows at various times of the year.

Shallow groundwater levels have contributed to development of saturated muck soils and associated wetland vegetation. Wetland vegetation is composed of emergent and scrub-shrub species, which are bordered by upland forest. Dominant understory plant species in this wetland are pig-a-back (*Tolmeia menziesii*), skunk cabbage (*Lysichitum americanum*), stinging nettle (*Urtica dioica*), lady fern (*Athyrium felix-femina*), and creeping buttercup (*Ranunculus repens*). Dominant scrub-shrub overstory plants include salmonberry (*Rubus spectabilis*), Indian plum (*Oemleria cerasiformis*), red elderberry (*Sambucus racemosa*), and alder saplings (*Alnus rubra*). The mixed deciduous/coniferous upland forest canopy composed of western red cedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), madrona (*Arbutus menziesii*), black cottonwood (*Populus trichocarpa*), cascade mountain ash (*Sorbus scopulina*) and alder (*Alnus rubra*) extends partially over the wetland. Although these trees do not appear to be part of the wetland, their roots may extend into the wetland and therefore King County may consider this a forested wetland (Casey personal communication 1992).

Assuming the county classifies this as a class 2 wetland because of the presence of the forest overstory, the required buffer plus setback is 65 feet.

Wetland W3

Another isolated wetland (W3) exists near the parking lot of the west ballfield. This wetland covers an area of 500 square meters (0.1 acre). As with the previous wetlands, the approximate boundaries of the wetland are flagged with pink survey tape. Shallow groundwater discharge forms a seasonal pond in this small surface depression. As with other isolated wetlands on the site, this area contributes to shallow groundwater aquifer recharge and instream flows during parts of the year. There are no well defined surface water channel inlets or outlets to this wetland.

Seasonally ponded water and associated soil conditions contribute to the existing emergent and scrub-shrub vegetation. Soils in these wetlands may be saturated much of the growing season depending on annual rainfall and groundwater table level fluctuation. The seasonally ponded area, which constitutes approximately two thirds of the total wetland, is covered by a dense mat of water parsely (*Oenanthe sarmentosa*). The remaining third is a narrow band of scrub-shrub vegetation comprised predominantly of salmonberry and Indian plum. Vegetational structure and community composition create moderately good habitat for birds, small mammals, and amphibians.

Wetland W3 also has been assigned a preliminary designation of class 3. Although the SAO regulations clearly stipulate that class 3 wetlands require an undisturbed buffer and setback of 40 feet, the county may permit the alteration of up to 7,500 square feet of isolated wetlands if specific conditions and suitable mitigation are performed (refer to regulatory authorities, issues and permit requirements section).

Wetland W4

Another small, isolated wetland (W4) estimated to be 120 square meters (approximately 0.03 acre) is located in a surface depression near the west ballfield (see Figure 4). Approximate wetland boundaries were flagged. This area seasonally ponds and has no well defined surface water channel inlets or outlets. Wetland hydrology therefore is likely dependent on shallow groundwater.

Although it is uncertain whether this generally barren seasonally ponding depression satisfies the federal interagency wetland hydrophytic vegetation criterion (FICWD 1989), the county may consider this a forested wetland because the roots of nearby trees may extend into the ponding area (Casey personal communication 1992). Because it has less than 30 percent vegetative cover, the area may be best described as a unconsolidated shore palustrine wetland as defined by (Cowardin et al. 1979). There are some emergent and scrub-shrub wetland plants present including skunk cabbage, hardhack, and lady fern, these cover less than 30 percent of the seasonally ponded area. The bed of the ponded area consists of partially decomposed forest floor litter (e.g., leaves, twigs, and other organic matter).

This wetland has been assigned a preliminary rating of class 2. Because class 2 wetlands have significant environmental and public values, the county has determined that a 65 foot buffer plus

setback is necessary to protect these resources. The preliminary SAO stream and wetland classifications are summarized in Table 1.

REGULATORY AUTHORITIES, ISSUES AND PERMIT REQUIREMENTS

Several agencies at the and federal, state, and local levels are responsible for regulating wetland development and protecting water quality or aquatic resources. The responsibilities, roles, and statutory authority of these regulators are described briefly in the following section. In addition, agency contacts, addresses, and telephone numbers are listed.

Federal Regulations

The U.S. Army Corps of Engineers has the primary responsibility for regulating development in waters of the United States, which include wetlands. Authority to regulate wetland development is provided by federal Clean Water Act section 404. Under the expanded authority of the amended statute (33 USC 1251 et seq.), the Corps has the responsibility to protect, restore, and to maintain the physical and biological integrity of the nation's waters through control of grading, filling, and dredging of wetlands.

The Corps regulates wetland development through nationwide and individual project permits. Proposed filling activities that will result in the loss or substantial adverse modification of less than one acre of isolated wetlands may be permitted under nationwide permit 26 (33 CFR 330.5 (a)(26)), provided certain conditions are met. Though project developers are not required to notify the Corps of fills of less than one acre, notification of proposed activities is recommended.

Although nationwide permit 26 stipulates that fill activities that result in the loss of between 1 and 10 acres may also be permitted, fills which result in the loss of more than 2 acres are not permitted in this region (U.S. COE 1992). For fills that alter greater than 2 acres of wetlands, an individual permit is required. Discharge of dredge or fill material which would cause the loss of 1 to 2 acres of wetlands is permitted under this nationwide permit, but the applicant must submit a predischarge notification to the Corps District Engineer and receive approval prior to proceeding with the proposed activity. The predischarge notification submittal includes:

- Description of the proposed activity
- Location of the proposed activity, and delineation of affected special aquatic sites (e.g., wetlands)

Table 1. Summary of preliminary SAO stream and wetland classes within the study area.

Preliminary Stream/ Wetland Classification	Size	Location	Description	SAO Buffer/Setback
Stream 0228 - Class 2	NA	Juanita Dr. east to wetland W2	Perenial, riffle dominated.	115 feet (Class 2 salmonid) or 65 feet (Class 2 non-salmonid)
		Wetland W2 to Thoreau Elementary	Intermittent, riffle dominated.	40 feet (Class 3).
Stream 0228A - Class 3	NA	Behind west ballfield north across NE 138th St	Intermittent, riffle dominated.	40 feet
All Unnamed Intermittent Channels - Class 3	NA	Draining wetland W2;	Tributary to 0228.	Wetland buffer applies (65 feet)
		Two channels near W1 and East Lake Washington 2	Ephemeral, no outlet.	40 feet
East Lake Washington 2 Class 2	16 acres	SE corner of the site	scrub-shrub, forested wetland.	65 feet
W1 - Class 3	0.1 acre	North and west of East Lake	Isolated wetland with emergent and scrub-shrub vegetation.	40 feet
W2 - Class 2	0.2 acre	Abuts NE 138th across from wetpond below proposed field	Emergent, scrub-shrub, and forested wetland.	65 feet
W3 - Class 3	0.1 acre	Near parking area of west ballfield.	Isolated wetland with emergent and scrub-shrub vegetation.	40 feet
W4 - Class 2	0.03 acre	South of W3 in SW portion of site near west ballfield.	Unconsolidated shore, forested wetland.	65 feet

- Purpose of the project
- Evaluation of the potential impacts of the proposed project.
- A statement that the applicant has contacted other applicable agencies including the U.S. Fish and Wildlife Service, the National Marine Fisheries Service (if applicable), and the state Office of Archaeology and Historic Preservation.

In the predischarge notification process, the Corps notifies the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the Washington state Department of Ecology (Ecology) of the proposed project. These agencies review the proposed project and may submit comments to the Corps. The Corps considers these comments in determining whether or not to authorize the project under nationwide permit 26. The Corps has the discretion to permit an activity, providing specific conditions are met by the applicant, such as providing compensatory mitigation.

If the project is not authorized under a nationwide permit, and the project developer can apply for an individual permit. Individual permit applications go through an extensive public interest review process that can take over a year to complete. During this process the Corps considers the potential environmental impacts of the proposed project, whether practicable, less environmentally damaging alternatives exist, and decides whether the applicant must consider mitigating measures. Mitigating measures in the Section 404 regulations in order of preference, as follows:

1. Avoiding the wetland fill
2. Reducing the wetland fill
3. Compensating for unavoidable adverse wetland impacts by creating, restoring, or enhancing other wetlands.

The U.S. Fish and Wildlife Service and the National Marine Fisheries Service have consultation authority in this process, and the U.S. EPA has oversight and veto authority. An individual permit may be denied if the Corps finds that the proposed project is contrary to the public interest, if any other state or local permit for the project has been denied, or for other specified reasons.

Dredge and fill activities often require other permits in addition to a Corps Section 404 permit, such as, a shoreline permit, hydraulic project approval permit, water quality certification, and

short-term water quality modification, and coastal zone management certification. For filling less than one acre of isolated wetland, only a water quality certification may be required.

Contact:

U.S. Army Corps of Engineers
Seattle District
Regulatory Branch
Attn: Mr. Jim Green
P.O. Box C-3755
Seattle, WA 98124
(206) 764-3495

State Regulations

Washington state agencies that govern development activities affecting water quality and aquatic resources include Ecology, the Department of Fisheries, and the Department of Wildlife. These agencies protect water quality, natural resources through the State Environmental Policy Act (SEPA) review process and associated permits. In addition, the Washington Department of Natural Resources regulates forest practices.

Ecology is the state agency primarily responsible for water quality protection in accordance with the federal Clean Water Act, the state Water Pollution Control Act (RCW 90.48), and the state Water Resources Act (RCW 90.54). Ecology coordinates the state permitting process in conjunction with any Corps 404 permitting and administers water quality certifications and short-term water quality modification permits for dredge and fill activities. Section 401 of the Clean Water Act authorizes Ecology to regulate any discharges (such as filling) to surface waters, including wetlands. The 401 certification process is concurrent with the Corps 404 public interest review process. For those discharge activities that may temporarily result in unavoidable violations of state water quality standards, particularly the turbidity standard, a short-term water quality modification permit must be obtained from Ecology. Discharge of fill material in isolated wetlands may require a water quality certification from Ecology. Other permits that are sometimes required from Ecology for activities that may affect water quality include point source discharge permits and a coastal zone certification. Neither of these permits is likely to be required for a project involving the filling of isolated wetlands at Big Finn Hill Park.

The fisheries and wildlife departments are responsible for protecting aquatic resources through implementation of the state hydraulic code (RCW 75.20). A hydraulic project approval (HPA) permit is required for any project below the ordinary high water mark (OHWM) in state waters, including some wetlands. The Department of Fisheries has jurisdiction over projects in saltwater and in freshwaters used by anadromous fish species. Projects in state waters not used by anadromous fish are in the domain of the Department of Wildlife. Because isolated wetlands are not part of nor adjacent to state waters, an HPA permit is not required for their development.

Timber harvesting or removal, road building or development in forested areas requires a forest practices approval from the Department of Natural Resources in accordance with the state Forest Practices Act (RCW 76.09). In areas adjacent to streams, riparian management zones are established to protect fish, wildlife, and stream resources. These areas vary in width and habitat protection requirements depending on the existing water types, which are defined in the forest practices regulations. An applicant must submit information on the location and extent of harvesting and describe the proposed development, stream crossings, drainage plans, location of water bodies, construction equipment, and related activities.

Forest practices administrative regulations have recently been amended. It is uncertain whether these revisions could significantly affect the permitting of the proposed project. Forest practice approval permit applications take up to 30 days to process (Bannon personal communication 1992).

Contacts:

(Water Quality Certification)
Washington Department of Ecology
Central Programs
Environmental Review Section
Attn: Barbara Ritchie
Mail Stop PV-11
Olympia, WA 98504-8711
(206) 459-6025

(Water Quality Modification)
Washington Department of Ecology
Northwest Regional Office
Water Quality Program
Attn: John Glynn
3190 160th Ave SE
Bellevue, WA 98008-5452
(206) 649-7033

Washington Department of Fisheries
Regional Habitat Manager
Attn: Larry Fisher
22516 SE 64th Place Suite 240 Bldg E.
Issaquah, WA 98027
(206) 392-9159

Washington Department of Wildlife
Regional Habitat Manager
Attn: Ted Muller
16018 Mill Creek Blvd.
Mill Creek, WA 98012
(206) 775-1311

Department of Natural Resources
Attn: Joanne Bannon
28329 SE 448th St.
P.O. Box 68
Enumclaw, WA 98022
(206) 825-1672

Local Regulations

Big Finn Hill Park is under the local jurisdiction of King County. In response to the Washington state Growth Management Act, King County has developed and adopted the SAO to assist in growth management and to protect environmental and public health. The ordinance establishes specific development standards and measures to protect wetlands, streams, and other sensitive areas. The ordinance identifies buffer zones and building setback limits for each of the three classes of streams and wetlands to protect these sensitive areas from adverse impacts of development. Class 1 streams and wetlands have the greatest public and ecological value; therefore the buffer requirements for class 1 streams and wetlands are more stringent than those for classes 2 and 3. The preliminary classifications for the streams and wetlands in Big Finn Hill Park and there associated buffer requirements are identified in the preliminary findings section of this report.

King County conducts a sensitive-areas review of all proposed development projects that require any county permit, such as a clearing and grading permit. The applicant for a county permit must include a description of the site, professionally certified development plans and specifications, and identification of all sensitive areas on or adjacent to the site. In addition, a sensitive area study, which characterizes and delineates sensitive areas, assesses the potential impacts of the development on sensitive areas, may be required if the proposed project could adversely affect onsite or offsite sensitive areas. If sensitive areas would be adversely affected by the proposed development the applicant also must identify, develop, and implement mitigation, maintenance, and monitoring plans. In addition, a performance bond is required to insure that these proposed plans are successfully implemented.

Compensatory wetland mitigation (e.g., replacement, restoration or enhancement of other wetlands) is generally considered only if there are no feasible alternatives, including avoiding potential adverse impacts by selecting an alternative site. However, up to 7,500 square feet of isolated wetlands may be altered or filled per 20 acres if the county determines that these wetlands are hydrologically isolated from other wetlands and streams, and the applicant develops an acceptable compensatory mitigation plan. Although the ordinance clearly stipulates that

avoidance and minimization are preferable to compensatory mitigation, compensatory mitigation may be acceptable if the applicant demonstrates that the mitigation meets established requirements. The county requires a 1:1 replacement for class 3 wetlands, and 2:1 replacement for class 2 wetlands. Wetlands constructed for surface water runoff control and treatment (e.g., wetponds) cannot be applied towards wetland mitigation. Wetland replacement, restoration or enhancement must conform to SAO mitigation standards. In addition, a performance bond and post-mitigation monitoring are required.

In addition to administering the provisions of the SAO, King County is responsible for administering the State Environmental Policy Act (SEPA). Unless potential significant environmental impacts may occur as a result of the proposed project, only a SEPA checklist is likely to be required by the county.

Contact:

King County Building and Land Development
Technical Services Section
Attn: Laura Casey
3600 - 136th Place SE
Bellevue, WA 98006-1400
(206) 296-6600

CONCEPTUAL MITIGATION ALTERNATIVES

In recognition of the important ecological and public values of wetlands, federal, state, and local wetland regulators have developed a list of mitigating measures for protecting wetlands and aquatic resources. In order of preference, these potential mitigating measures are avoidance, minimization, and lastly compensation. For the proposed county maintenance facility in the park, avoiding potential adverse impacts to wetland and stream resources can be best achieved by locating the facility in a suitable upland area away from these resources. A potential suitable upland site for the proposed maintenance facility may be the northwest corner of the site west of tributary 0228A (see Figure 2). Much of this area is composed of invasive vegetation, which has lower habitat value than native vegetation, and has been used as a dumping area for yard waste and other refuse.

Another conceptual alternative is to locate the facility in the area of isolated wetland W3. This activity would require filling wetland W3, which may be permitted by the county (refer to local regulations section) if suitable compensatory mitigation and other requirements are satisfied. Enhancing the East Lake Washington 2 wetland or wetland W1 may fulfill these compensatory mitigation requirements.

Avoiding or minimizing potential adverse impacts by selecting a suitable upland site for the proposed development is significantly less complex in terms of regulatory requirements. Compensatory mitigation would require development of mitigation, monitoring, and maintenance plans, conducting wetland delineations, and involving more state and possibly federal wetland regulators. Negotiating and developing compensatory mitigation plan with these regulators could delay project completion and cost considerably more.

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GEOTECHNICAL ENGINEERING REPORT
PHASE IV DEVELOPMENT
BIG FINN HILL PARK
KING COUNTY, WASHINGTON
FOR
THE BERGER PARTNERSHIP, P.S.

NELSON-COUVRETTE & ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

17311-135th Ave. NE, A-500
Woodinville, WA 98072
(206) 486-1669 • FAX 481-2510

Snohomish County (206) 794-4332
Wenatchee/Chelan (509) 784-2756

May 12, 1994

Mr. Jeff Girvin
The Berger Partnership, P.S.
2021 Minor East
Seattle, WA 98102

Geotechnical Engineering Report
Phase IV Development
Big Finn Hill Park
King County, Washington
NCA File No. 125494

Dear Mr. Girvin:

INTRODUCTION

This report presents the results of our geotechnical engineering investigation for the planned Phase IV improvements to Big Finn Hill Park. The site is located between 84th Avenue NE and Juanita Drive NE, and NE 140th Street and NE 136th Street in King County, as shown on the Site Vicinity Map in Figure 1. For our use in preparing this report an untitled composite site plan and a preliminary site plan, showing planned Phase IV improvements by The Berger Partnership, P.S., dated June 19, 1992 and November 1, 1993 respectively, and utility plans dated July 21, 1987 and January 3, 1986 were supplied to us by you.

Project Description

General: The site is located within Big Finn Hill Park, west of the existing baseball fields, on the north and south sides of NE 138th Street in King County. The Phase IV development includes new baseball and soccer fields (play fields), tennis and volleyball courts (sports courts), outbuildings and parking areas. You desire geotechnical information relative to soil bearing pressures, structural fill parameters, and other geotechnical opinions and recommendations which may become evident during our evaluation.

The site has undulating topography, with an overall elevation loss to the southeast. Local areas within the park have been previously cleared and partially graded. Planned improvements are referenced by intended use and our test pit locations. We understand that reinforced earth fills are planned for portions of two of the play fields and one parking area. The current plan is that we will design these walls at a later date.

Parking: We understand that NE 138th Street will be abandoned and that additional paved parking will be created at the west and east ends of the alignment. A trail is planned connecting the two parking areas. Three areas of parking are in the areas of Test Pits 21, 28 and 29 (west end of NE 138th Street), Test Pits 13 through 17 (north of NE 138th Street) and Test Pits 11 and 12 (south of the existing ball fields). In the vicinity of Test Pits 13 through 17 we anticipate that up to 5 feet of fill will be placed to create a level parking area. A reinforced earth fill will be used to retain the fill placed in this area. The planned parking in the vicinity of Test Pits 21, 28 and 29 is anticipated to be a cut. Parking south of the existing ballfields will most likely be a cut and fill.

Play Fields: A new baseball field is planned in the area of Test Pits 1 through 5 and 10. This area has been previously graded. Additional fill is planned for the south side of the ballfield, adjacent to NE 138th Street. A reinforced fill approximately 4 to 6 feet high will be used to retain the additional fill.

A soccer field is planned south of NE 138th Street at the west end of the park (Test Pits 22 through 27). It is anticipated that up to 10 feet of fill will be placed to create a level play area. A reinforced earth fill wall, on the order of 10 feet in height, will be used to retain this fill at the south end of the play field (Test Pits 24 through 27).

Other play fields such as basketball (between Test Pits 4 and 12), volley ball (Test Pit 9) and tennis (Test Pits 21 and 22) are also planned. It is anticipated that these play fields will be constructed on previously graded areas or the existing surface will be cut to grade.

Structures: We anticipate that some light structures such as restrooms and shelters will be constructed along with the other planned improvements. We anticipate that these structures will be of slab-on-grade construction and be lightly loaded.

SCOPE

The purpose of this study is to explore and characterize the subsurface conditions, and present geotechnical recommendations for site development. Our report is intended to identify foundation soil types for structures, earthwork parameters for the baseball and soccer fields, and sports courts and pavement areas. Specifically, our scope of services include the following:

1. Review available geologic and soils data for the site, based on published geologic maps.
2. Explore the subsurface conditions at the site with backhoe test pits to determine subsurface soils and hydrologic conditions.
3. Identify foundation conditions and appropriate building support options.
4. Provide recommendations for site preparation, grading and structural fill.
5. Provide general information for on-site drainage considerations.
6. Prepare a written report to document our findings and recommendations.

SITE CONDITIONS

Surface

The site extends west from 84th Avenue NE between NE 140th Street and NE 136th Street to Juanita Drive NE in King County. The park is bisected into north and south halves by NE 138th Street. The site has undulating topography, with local areas which have been previously cleared and partially graded. The overall slope is from northwest to southeast with a total elevation loss on the order of 60 feet. The site is vegetated with grassy areas, brush and deciduous and fir trees. Two isolated wetland areas exist in the southwest corner of the site. Two small streams trend north to south and east to southwest in the center of the site. Existing ball fields are located in the northeast and mid-south portion of the site.

Geology

Most of the Puget Sound region was affected by past intrusion of continental glaciation. The last period of glaciation, the Vashon Stade, ended approximately 10,000 to 12,000 years ago. Many of the geographic features seen today are a result of scouring and overriding by glacial ice. During the Vashon Stade, the Puget Sound region was overridden by over 3,000 feet of ice. Soil layers overridden by the ice sheet were compacted to a much greater extent than those that were not. A typical sequence includes glacial till mantling advance outwash sand. Glacial till is an unsorted mixture of sand, silt and gravel that is deposited at the bottom of the glacier. The advance outwash sand is a water-sorted fine to coarse sand with varying

gravel content. It may contain finer grained layers. The geologic units mapped for this site are shown on the Geologic Map of the Kirkland Quadrangle, Washington by James P. Minard (U.S.G.S. 1983) as glacial till (Qvt). The till has been overridden by the continental glaciers. The glacial till exhibits both high strength and low permeability. Our explorations encountered glacial till and glacial drift (QvDr). Glacial drift is a till that has experienced some sorting by fluvial action and typically is less dense.

Explorations

Subsurface conditions were explored at the site by excavating 32 test pits, using a rubber-tired tractor-mounted backhoe. The test pits were located in the field by an engineering geologist, representing this firm, who maintained logs of the conditions encountered. The location of the test pits are shown on the Site Plan in Figure 2. The soils were classified in general accordance with the Unified Soil Classification system, a copy of which is presented on Figure 3. The test pit logs, edited to reflect examination of soil samples in our laboratory, are presented as Figures 4 through 14.

Subsurface

Our test pits revealed a surficial topsoil layer approximately 0.2 to 1.0 feet thick, consisting of loose to medium dense dark brown silty fine sand with gravel and roots. In Test Pit 17, we observed this topsoil layer to be approximately 2.0 feet thick. The topsoil was generally underlain by approximately 0.5 to 3.25 feet of loose to dense orange-brown and brown silty fine sand with gravel interpreted to be weathered till (weathered Qvt). In Test Pits 1A and 8, the weathered till was underlain by approximately 2.0 to 3.0 feet of medium dense brown fine to coarse gravel with sand, silt and cobbles, interpreted to be glacial drift (QvDr). The weathered till and drift were underlain by dense silty fine to medium sand with variable amounts of gravel. This soil horizon was interpreted to be glacial till (Qvt). In Test Pits 1A, 2, 4, 5, 6, 22, and 24 a suficial layer of fill approximately 1 to 7 feet thick was encountered. In Test Pits 7 and 8, fill approximately 1.5 to 2.6 feet thick was encountered under a surficial topsoil layer. The fill consisted of loose to medium dense brown and gray silty fine to medium sand with gravel and roots. The fill appears to be associated with past grading operations to create level play fields and parking areas.

Hydrologic Conditions

Slow to slight seepage was encountered at depths of 1 and 6 feet below grade in Test Pits 1A, 2, 8, 14, 19, 22, 23, 25, and 27. We interpret this to be perched water flowing through the more permeable fill, weathered till and drift horizons, on top of the less permeable till. Ground water seepage of this type is

typically dependent on the amount of rainfall. Perched ground water may increase during the wetter winter months and all but disappear during the drier summer months.

Slight seepage was encountered in Test Pits 13, 15 through 17, and 25 at depths of 4 to 8 feet. We interpret this as ground water flowing through the more permeable zones in the glacial till. Theses zones are typically discontinuous and do not contain large volumes of water.

CONCLUSIONS AND RECOMMENDATIONS

General

The underlying drift, weathered till, and till soils will provide good support of foundation elements, play fields, sports courts, and parking areas. The existing fills may need some partial reworking in play field areas and total reworking in the parking lot and roadway areas. We did not find significant fill depths in the areas to be paved.

The soils likely to be exposed during construction are moderately to highly moisture sensitive. We recommend that earthwork take place during extended periods of dry weather. We recommend that traffic be diverted around prepared subgrade during periods of rainfall, to prevent disturbance. Wet weather construction should include placing rock spalls on the construction access roads.

The soils observed on site exhibit poor drainage characteristics and evidence of surface and near surface water was observed. The site should be sloped to drain where possible. Even with proper surface drainage, it is our experience that some future wet areas may exist during the wet seasons. These wet areas can be drained by a combination of cut-off drains and surface swales. We recommend that the surface storm water system be designed such that these types of cut off drains or swales can be installed after the park is completed with minimal disturbance to the landscaping. This would include placing storm water catch basins in strategic locations such that they could be easily accessed by future drains.

A properly designed underdrain system should be used under the grass fields. We would expect poor performance of grass fields placed directly on the native soils because of the poor drainage characteristics of these soils. Typically the underdrain systems are designed by the landscape architects and therefore are not considered within the scope of this study. We can provide recommendations for these drains at a future date, if desired.

Erosion Control Measures

Erosion control methods should be undertaken to prevent surface runoff from flowing uncontrolled down graded slopes. We recommend that concentrated surface runoff be diverted away from slopes, or into a system that will prevent erosion of the slope. We also recommend that a silt fence be erected between the site clearing area and wetland areas to be preserved. Hay bales may be substituted for a silt fence, provided that they form a continuous line. Erosion control measures should conform to local and state guidelines.

Site Preparation and Grading

Roadways and Parking Areas: These areas should be stripped of vegetation and cut to grade. Any fill, topsoil or soils with high organic content should be removed from the exposed subgrade. The till or drift soils likely to be exposed are considered moderately to highly moisture sensitive and will disturb when wet. We recommend that earthwork be conducted during periods of dry weather. If earthwork is to be accomplished during the wet weather months, we recommend that prepared subgrades be sloped to drain and a blanket of rock spalls be placed for the planned access roadway. The thickness of the spalls should be based on soil conditions exposed in the roadway at the time that the site is developed and the performance under heavy equipment. We recommend using a minimum of 1 foot thickness of spalls in traffic areas for estimating purposes.

Following stripping to depth and removal of unsuitable soils, the exposed subgrade should be compacted to a dense non-yielding condition with a large self-propelled vibratory roller. If the subgrade appears wet, it should not be exposed to the compaction procedures. If pumping or weaving are observed during compaction, some repairs to the exposed subgrade may be required. These repairs could consist of overexcavation of wet (or over optimum) soils and replacement with compacted structural fill.

Reinforced Earth Fills: The subgrade for the reinforced earth fills should be prepared as outlined above for roadways. If wet subgrade conditions are encountered during construction of the reinforced earth walls, we recommend that the subgrade be covered with a blanket of crushed rock a minimum of 6 inches thick to separate the fill to be placed from the wet subgrade.

Play Fields: Play fields should be prepared as outlined above. Due to the moisture sensitivity of the soils likely to be exposed, we recommend that the subgrade and resulting surface after grading be sloped to drain. To provide a play field that may be usable during the wetter portion of the year, we recommend that

the topsoil layer consist of at least 50 percent sand and be a minimum of 6 inches thick to promote drainage. This topsoil layer should be sloped to drain.

Temporary and Permanent Cut Slopes

Temporary cut slope stability is a function of many factors such as the type and consistency of soils, depth of the cut, surcharge loads adjacent to the excavation, length of time a cut remains open, and the presence of surface or ground water. It is difficult under these variable conditions to pre-establish a "safe and maintenance-free" temporary cut slope angle. Therefore it should be the responsibility of the contractor to maintain safe slope configurations since he is continuously at the job site, able to observe the nature and condition of the cut slopes, and able to monitor the subsurface materials and ground water conditions encountered.

A cut or cuts are anticipated for roadway and parking areas. For planning purposes, it is our opinion that the till, likely to be exposed, will stand at a temporary cut of 1 Horizontal to 1 Vertical inclination (1H to 1V) or steeper. If ground water is encountered, we would expect that flatter inclinations would be necessary. We recommend that cut slopes be protected from erosion. Measures taken may include covering cut slopes with plastic sheeting and diverting surface runoff away from the top of cut slopes. We do not recommend vertical slopes or trench cuts deeper than 4 feet, if worker access is necessary. We recommend that cut slope heights and inclinations conform to appropriate local, state and federal regulations.

Final slope inclinations for structural fill and the native soils should be no steeper than a 2H:1V. Lightly compacted fills, or common fills, should be no steeper than 3H:1V. Common fills are defined as fill material with potentially some organics that are "track-rolled" into place. They would not meet the compaction specification of structural fill. The face of fill slopes should be thoroughly compacted. Final slopes should be vegetated and covered with straw or jute netting. The vegetation should be maintained until it has been established.

Structural Fill

General: All fill placed beneath buildings, pavements or other settlement sensitive features, should be placed as structural fill. Structural fill, by definition, is placed in accordance with prescribed methods and standards, and is monitored by an experienced geotechnical professional or soils technician. Field monitoring procedures would include the performance of a representative number of in-place density tests

to document the attainment of the desired degree of relative compaction. The area to receive the fill should be prepared as outlined in the **Site Preparation and Grading** sub-section. Slopes with greater than 20 percent inclination that will receive fill should be benched to key the new fill into the slope. The keys typically have a nominal dozer width (approximately 8 feet) with about 3 feet vertical between benches.

Materials: Imported structural fill should consist of a good quality free-draining granular soil, free of organics and other deleterious material, and be well graded to a maximum size of about 3 inches. Imported, all weather fill should contain no more than about five percent fines (soil finer than a U.S. No. 200 sieve, based on that fraction passing the U.S. No. 4 sieve).

The till soils contain a significant percentage of fine-grained particles and are moderately to highly moisture sensitive. The use of weathered till and till soils as fill should be limited to extended periods of dry weather. Even during periods of dry weather, some discing for drying and watering may be necessary to achieve the desired moisture content. We recommend that these soils be considered for fill only if construction takes place during the drier summer months.

Fill Placement: Following subgrade preparation, placement of the structural fill may proceed. All backfilling should be accomplished in 8 to 10 inch thick uniform lifts. Each lift should be spread evenly and be thoroughly compacted prior to placement of subsequent lifts. All structural fill underlying building areas, should be compacted to a minimum of 95 percent of its maximum dry density as determined by the ASTM D 1557 test procedure. Fill placed within 2 feet of pavement subgrade should be compacted to a minimum of 95 percent of its maximum dry density as determined by the ASTM D 698 test procedure (in accordance with King County road standards). Fills more than 2 feet beneath sidewalks, and pavement subgrades should be compacted to 90 percent of their maximum dry density as determined by ASTM D 698. The moisture content of the soils to be compacted should be within about 2 percent of optimum so that a readily compactable condition exists. It may be necessary to overexcavate and remove wet soils in cases where drying to a compactable condition is not feasible. All compaction should be accomplished by equipment of a type and size sufficient to attain the desired degree of compaction.

Foundations

In our opinion, the use of shallow spread footings founded on the weathered till, till and drift soils, should provide suitable support of the proposed light structures. We anticipate that bearing soil should be encountered at normal foundation depths for most of the site. In the vicinity of Test Pits 1, 2, 5, 6, and 24

we encountered up to 8 feet of fill. The fill appears to be localized in the vicinity of past grading for the play fields. We recommend that foundations for these areas should be placed through any fill and surficial soils, to bear on the medium dense to dense glacial soils.

Footings should be excavated and poured in a timely manner. During footing excavation, the upper 6 to 8 inches of footing subgrade is likely to become disturbed. We recommend that the resulting footing subgrade be compacted to a firm and non-yielding surface or the loose material removed prior to pouring footings. For planning purposes, an allowable soil bearing pressure of 2000 pounds per square foot (psf) should be used for design of shallow footings founded into the undisturbed glacial soil.

The above allowable soil bearing capacities provided are based on the following:

1. All footings should be founded into the native site soils, as described above. Specific care should be taken to ensure that foundations extend through any existing fill and into native soils.

2. All footing excavations should be prepared such that a dense, non-yielding, uniform soil condition has been established prior to placement of concrete.

3. All footings should extend through any existing non-structural fill or modified zones, and be placed to bear a minimum of 18 inches below finished adjacent grade for frost protection.

4. All footings should be sized according to the anticipated wall or column loads, and the above soil bearing values. Minimum footing widths of 14 and 20 inches are recommended for all continuous and isolated footings, respectively.

5. All footing areas should be free of ponded water and sloughed or water loosened soils prior to placement of footing concrete.

Retaining Walls

Plans for the proposed Phase IV development include cut and fill for the roadway north of 138th Street NE, and fill for the soccer and ball fields. Embankment fills for these areas, exceeding a 2H to 1V slope, will need to be retained. We expect that reinforced soil walls will be the best option. For road cut areas, in the glacial till, rockeries may be appropriate if a near vertical slope is desired. A brief description of these two options are presented below. We are available to provide design input for other wall types, if requested.

Reinforced Soil Walls are best suited to supporting fill embankments. Soil reinforcing typically uses geogrids or geotextiles to reinforce the soil mass. The grids typically extend into the slope from 0.5 to 0.8 times the wall height, depending on the geometry and anticipated loads. Reinforced soil walls offer the advantages of nearly unrestricted height, settlement tolerance and a variety of architectural facades, including rockeries and block wall facings. The relative cost of these walls range from low to high depending on the wall height and the particular system used.

We recommend that a phi angle of 36 degrees be used for design, if the on-site glacial till is to be used to construct the reinforced earth fills. It should be noted that the till soils are moisture sensitive and may be difficult to compact to project specifications except during the drier summer months. The design of a reinforced earth fill for the roadway is beyond the scope of this report and will be presented under separate cover.

Rockeries may be used to face stable cuts in the glacial till soils. We recommend that we review planned rockeries exceeding 4 feet in height and/or with a backslope. We recommend that rockeries be constructed to Associated Rockery Contractors (ARC) guidelines and appropriate local standards.

Slabs-On-Grade

The subgrade for slabs should be stripped of topsoil to reveal the weathered and unweathered glacial soils. The resulting subgrade should be compacted to a firm and non-yielding condition. Areas that are observed to weave during compaction should be overexcavated and replaced with structural fill. Where moisture control is important, we recommend that at least 6 inches of free draining material be placed under slabs-on-grade to act as a capillary break. The capillary break material should be separated from slabs by a vapor barrier such as plastic sheeting. A 2 inch thick sand blanket may be used to cover the vapor barrier. The capillary break material should be connected to the footing drains to provide positive drainage.

Drainage

The soils likely to be encountered on site exhibit poor drainage characteristics. We recommend that the storm drainage system be designed to accommodate future additions. Runoff from impervious surfaces such as roofs, access roadways and parking areas, should be collected and routed to an appropriate storm water discharge system. The roof drains should be tightlined separate of the footing drains, until the tightline is a minimum of 1 foot vertically down gradient from the footing drains.