

ITEM 9
MANAGER'S REPORT NO. 49
COUNCIL MEETING 87/08/10

RE: CAPITOL HILL CONSERVATION AREA

ACTING MUNICIPAL MANAGER'S RECOMMENDATION:

1. THAT the recommendations of the Director Planning & Building Inspection be adopted.

* * * * *

TO: MUNICIPAL MANAGER 1987 August 05
FROM: DIRECTOR PLANNING & BUILDING INSPECTION Our File: 10.250
"Capitol Hill"
SUBJECT: CAPITOL HILL CONSERVATION AREA

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RECOMMENDATIONS:

1. THAT Council approve the revised boundaries for the Capitol Hill Conservation Area as outlined on Map 6.
2. THAT the private properties shown on Map 6 and included within the proposed Capitol Hill Conservation Area, be acquired by the Municipality as they become available, with such acquisitions financed from the Tax Sale Reserve and the Corporate Land Reserve Fund.
3. THAT Council approve the establishment of the proposed Geotechnical Review Area, as shown on Map 6 and described in Section 5.2
4. THAT within the Geotechnical Review Area, renovations, replacements or additions to existing structures be subject to the Chief Building Inspector being satisfied, as is provided for in Section 734 (2) of the Municipal Act, that the stability of the soil is sufficient to support such improvements and that the proposed developments will not be detrimental to the soil stability of other properties in the vicinity.
5. THAT the Municipality undertake remedial works to ensure that concentrated storm water flows are properly discharged from the ends of the following roads:
 - (i) In the Bessborough Drive/Ellesmere Avenue area, the western extremity of Bessborough Drive.
 - (ii) The intersection of North Hythe Avenue and Bessborough Drive.
6. THAT a copy of this report be forwarded to those property owners within the revised Capitol Hill Conservation Area, the Geotechnical Review Area and as well as to those that are no longer within the conservation area boundaries.

SUMMARY

124

This report reviews the existing Capitol Hill Conservation Area boundary based upon considerations of existing development, extent of servicing and the findings of a 1987 May 12 report on topography and ground conditions by a Geotechnical Engineering consultant. A revised Conservation Area boundary is recommended as the basis for guiding further subdivision and new development in the area. The intent of the Conservation Area is to set aside an area of undeveloped land in its natural environment and to control development on or close to an area of steep land recognized as having sensitive or unstable slopes. This report proposes the acquisition of 8 private properties within the recommended Capitol Hill Conservation area, as well as the designation of a "Geotechnical Review Area" in the Highfield Drive area where recommendations from a geotechnical engineer may be a prerequisite to development. Proposals for storm water drainage improvements in the Capitol Hill area are also presented.

R E P O R T

1.0 BACKGROUND

A chronological summary of actions relating to the Capitol Hill Conservation Area is as follows:

- (1) In 1972 Council adopted a recommendation that the north side of the Capitol Hill Area be reserved for conservation purposes, and that the Municipality acquire private lands therein as they become available. A line delineating the Capitol Hill Conservation Area was established as shown on Map 1.
- (2) In 1976 Council reaffirmed this policy and designated the municipal areas zoned P3 within the Conservation Area for inclusion within the Municipal Parks System.
- (3) In 1984 a further report re-examined the Conservation Area designation and proposed revisions to the boundary based upon considerations of existing services and dwellings, while using the criterion of a maximum 25 percent slope. This proposed adjustment to the Conservation Area boundary is also shown on Map 1.
- (4) The 1984 report was not adopted but arising from it, Council adopted the following motion on 1984 March 26:

"THAT this matter be referred to the Municipal Manager for a report indicating the lands which would be recommended for purchase, together with the methods of financing, which could be utilized for the acquisition of these properties and that the report contain as much pertinent information relative to the stability of soil in the area, and further, that the previously Council adopted land acquisition program for the area also be included."

2.0 CURRENT DEVELOPMENT AND SERVICES

Map 2 shows the existing ownership and development patterns in the area, together with the improved road locations. The majority of the Conservation Area is in municipal ownership but there are some privately owned parcels which would, as they become available, be appropriately consolidated with the municipal conservation holdings. The existing conservation boundary, established in 1972, frequently runs across property boundaries rather than preferably following property lines and road allowances.

Map 3 shows the location of services and utilities. Most of the houses in the Capitol Hill Area are served by either sanitary and storm sewers, combined systems or sanitary sewers only. There are, however, a number of dwellings in the Bessborough Drive-Harbour View Road area that are dependent on septic tanks.

Since 1978, 13 applications for the construction of houses within the Conservation Area have been dealt with by Council on a lot specific basis. In general, approval has been given to construct houses in those instances where it would represent an infill situation adjacent to other existing dwellings. One municipal acquisition of property within the Capitol Hill Conservation Area has occurred since 1978.

Two current enquiries have been made involving property in the existing Conservation Area. One relates to the proposed construction of a house on the vacant lot at 4958 Bessborough Drive, while the other is in regard to the proposed subdivision of 407 Hythe Avenue, in order to allow the construction of a second house on the lot. Both of these have been retained on file pending the completion of this policy review. The owners have been so informed.

3.0 GEOTECHNICAL ASSISTANCE

During the establishment of the 1972 Conservation Area boundary, the location of services and utilities were considered, as well as topographical conditions and ownership patterns, but technical data on soil stability was not available at that time. In order to respond to Council's directive to also review the Conservation Area boundary from a soils stability viewpoint, Geopacific Consultants Ltd. was retained in 1987 January to conduct a survey.

The Terms of Reference included assistance in establishing a new Conservation Area boundary, and related to this, a study of issues concerning lot servicing south of the Conservation Area.

Methodology employed by the consultant to gauge soil stability included slope measurement, drilling of test holes in the Conservation Area, measurement of the ratio of the height of water to thickness of soil for different degrees of slope, survey monument movement monitoring data supplied by the Municipal Survey Division, and site observations.

4.0 TOPOGRAPHY AND SOIL CONDITIONS

The following generalized comments on topography and soil stability as related to the general area, four sub-regions and 44 sub-areas shown on Map 5 are based on the contents of the report "Geotechnical Study of the Capitol Hill Conservation Area" by Geopacific Consultants Ltd. dated 1987 May 12. This document is available for viewing within the Planning & Building Inspection Department. For a full description of the reasoning and findings on soil stability, together with detailed data and a description of methodology, direct reference should be made to the report.

The Capitol Hill neighbourhood is bounded on the north by the steep escarpment sloping down to Burrard Inlet. The high point in the area is located immediately north of Cambridge Street in the sector between Ranelagh and Howard Avenues. From this plateau, which is relatively level in comparison with the surrounding area, the land slopes away in all directions with the most pronounced grades extending to the north and northeast. Slope conditions tend to be more variable to the west of this high plateau formation. Grades of between 10 to 15 percent occur in some sectors, although slopes in a 25 percent to 30 percent range are most common when proceeding in a northwesterly direction.

From Harbourview Park the land slopes precipitously to the north towards Scenic Park and Penzance Drive with grades of 30 to 50 percent and more being quite common. To the east, although the topography is less steep, grades are generally in a 22 percent to 25 percent range. However, these increase down slope from Highfield Drive to Stratford Park where the grades are entirely over 25 percent.

A steep escarpment runs approximately parallel to the shore of Burrard Inlet from a point north-west of the summit of Capitol Hill to the eastern boundary of the existing Conservation Area boundary. The escarpment ranges in height from about 80 to 160 feet at a slope angle of about 45-55 degrees, though some slopes reach 70 degrees. The location of the escarpment is shown on Map 4.

The area north of the escarpment is a major prehistoric landslide area within which the ground is still active and where there is evidence of both ancient and recent ground movement. It is conceivable that should future instability of the escarpment occur, it could possibly result in some degree of instability in the area to the south.

4.1 SUB-REGION DESCRIPTIONS (As related to Map 5)

4.1.1 Region 1

Below an elevation of 350 feet down to Penzance Drive, the soil underlying the ground surface consists of glacial till, which is underlain by conglomerate bedrock. Above this elevation the till is absent and the bedrock is near the surface beneath a thin layer of sand and gravel soil formed from the weathering of the underlying rock.

Slopes range up to about 20 percent in Areas 24-29 (shown on Map 5), which is primarily under private ownership, to about 40 percent in Areas 14-18. As a result of a layer of sand and gravel which blankets much of the slope, surface water infiltrates into the ground very rapidly.

With the exception of cracked and leaning retaining walls and settled driveway fills, no evidence of serious slope failure was observed in this region. Some minor infilling of the existing residential development area within Region 1 could occur without concern from a geotechnical viewpoint.

4.1.2 Region 2

The slopes in Region 2 are moderate to steep, ranging from about 31 percent to 40 percent, with local steep areas up to 58 percent.

The sub-surface conditions in this region are similar to Region 1, consisting of a mantle of sand or sand and gravel between 3 to 5 feet thick overlying either glacial till or conglomerate bedrock. Glacial till overlies the conglomerate on the lower portions of the north slope of Capitol Hill up to about elevation 350 feet. Above this elevation, the bedrock is close to the ground surface.

Surface water infiltrates rapidly into the surficial sandy soil and percolates along the top of the bedrock or till. A few streams occur on the slopes as a result of the infiltration.

Houses have been constructed only in Areas 10 and 11. The houses in Area 10 have been constructed on a narrow strip of land with a slope of about 33 percent within a larger area with a slope which averages between 40 to 49 percent. As a result of the relatively steep slopes, there have been difficulties related to the development of these lots. The houses are generally very close to the lane south of Scenic Highway and driveways and parking areas are at a premium. Other than the poor construction of retaining walls and building foundations of some of the houses in Area 10, there were no signs of slope instability within this region.

The consultant has advised that as a result of the steep slopes in this area, there are strict constraints on the type of development which could occur in this area and that normal subdivision development practices would not be suitable.

4.1.1.3 Region 3

Region 3 is underlain by conglomerate bedrock covered by a thin mantle of sand and gravel between 3 to 6 feet thick. The sand and gravel is clean and has a high percolation rate. Consequently, surface water infiltrates rapidly into the surface soil.

Slopes range from nearly flat lying at the summit of Capitol Hill in Areas 40 and 41 to steep (44 to 67 percent) north of Highfield Drive in Areas 21 and 22.

Development has occurred in all of the areas within this region with the exception of Area 22 which is located north of Highfield Drive. Most of the development consists of standard residential development with structures erected by excavating on the uphill side and placing fill on the downhill side. The fill is either supported by retaining walls or, on the more gentle grades, it is sloped or terraced.

The lots in Areas 20 and 21 are very steep and development of these lots has required multiple terraced retaining walls or single high retaining walls.

Though there have been difficulties associated with development on these steep lots in Areas 20 and 21, no serious sign of slope instability was observed. The evidence of fill settlement and cracked retaining walls can likely be attributed to poor construction practices.

Despite this observation, there is some evidence that subsidiary faulting or fracturing parallel to the east-west escarpment previously referred to exists in the area south of and above it. Consequently there is the possibility of retrogression of the landslide area. Thus, with respect to Area 21 (Highfield Drive), although there is no evidence of instability, it is conceivable that future instability of the escarpment, should it occur, could threaten this area. For this reason we believe it is prudent to exercise particular caution in approving further development applications in this area.

4.1.1.4 Region 4

The region north of the major escarpment located on the north slope of Capitol Hill to Penzance Drive and the CPR railway easement, represents an area of both recent and prehistoric landsliding.

Region 4 consists of "The Escarpment Area" and "The Slide Bowl Area".

(a) The Escarpment Area

Areas at the crest of or within the escarpment area include part of Area 1, part of 6, Areas 12, 13 and 23, and part of 22. Both the crest and toe of the escarpment area are shown on Map 4. At the base of the escarpment, soil has deposited in the form of a steep apron at a slope angle of between 30 and 35 degrees. This soil is derived from erosion of the conglomerate bedrock on the escarpment and therefore consists predominantly of very permeable sand and gravel.

Sub-surface water on the conglomerate bedrock in the overlying sand and gravel soil washes over the crest of the escarpment, keeping the surface of the escarpment perpetually moist.

(b) The Slide Bowl Area

The slide bowl area consists of sub-areas 1 to 4 and sub-area 7, which are located north of the escarpment. The general slope is toward the north and north-east. The slope is interrupted by closed depressions, reversed slopes and linear escarpments which are characteristic of landslide topography.

The majority of the slide bowl area is underlain by large blocks of tilted and disturbed sandstone and siltstone. Numerous springs occur. Evidence shows that the ground in the slide bowl area is still active.

As documented in a report prepared for the District of Burnaby by Dames & Moore, a landslide occurred on 1975 December 02, on the Goodwin Johnson Limited property. Horizontal and vertical movements of more than 10 feet occurred across the CPR tracks. Damage to existing structures included loss of support to the north-west corner of the building located in sub-area 4 and loss of a portion of the dock located north of sub-area 3 and outside the Conservation Area.

The consultant has confirmed that this region is not suitable in its present condition for development. The cost of stabilizing all or portions of this area would be "very large" due to the estimated depth and extent of the ancient slide.

5.0 THE CONCLUSIONS

5.1 THE REVISED CONSERVATION BOUNDARY

The results of the study by Geopacific Consultants Ltd. have verified that a from the standpoint of ground stability, the southern boundary of the Conservation Area can be adjusted northward to avoid all of the built up areas with the exception of properties within sub-areas 10 and 11 (Scenic Highway), which are scheduled for eventual acquisition. The proposed revised Capitol Hill Conservation Area boundary as shown on Map 6 is consistent with the findings of the geotechnical review of the area and the objective of minimizing damage to public and private property by preventing development within the Conservation Area on, or adjacent to land where there is a risk of ground instability.

The proposed revised boundary also reflects the objective of preserving the area within the Conservation Area in its natural wooded state and under eventual total municipal ownership. The Scenic Drive trail which runs through the area is a major component of the 1986 September report "Burnaby Trail Inventory and Development Program". This primary trail offers an opportunity for hiking through a natural setting of mixed forest, with intermittent glimpses of Burrard Inlet. This heavily treed, steep sloped area also provides a permanent, substantial buffer between the upland Capitol Hill residential properties and the industrial area on Burrard Inlet.

5.2 THE GEOTECHNICAL REVIEW AREA

The Consultant's geotechnical report indicates that with respect to sub-area 21 (Highfield Drive), there should be an awareness of certain geotechnical factors whenever any further development is under consideration. In view of this and the fact that this built up area is not proposed for acquisition and inclusion within the Capitol Hill Conservation Area, it is proposed to designate it as a "Geotechnical Review Area". The extent of the area included is shown on Map 6.

The geotechnical report points out the proximity of the escarpment to this area and states that "Although there is no evidence of instability in sub-area 21 (Highfield Drive) it is conceivable that future instability of the escarpment, should it occur, could threaten this area".

It is proposed that development on Highfield Drive would continue to be allowed, including replacements and additions, provided that the Chief Building Inspector is satisfied that ground conditions would not present a problem.

If the Chief Building Inspector considers that construction would be on land subject to erosion, land slip, or subsidence, he is empowered under the terms of the Municipal Act 734(2) to request the owner making application for a permit to provide him with a report certified by a professional geotechnical engineer that the land may be used safely for the use intended. Depending upon the result of the geotechnical engineer's report, the Chief Building Inspector can then issue the building permit, refuse the permit, or issue the permit on condition that the owner of the land covenants with the Municipality that the recommendations of the geotechnical engineer with respect to the proposed development are followed.

130

In addition, when the Chief Building Inspector considers it necessary to ensure that safe foundation construction methods are employed he is empowered under existing Municipal Building regulations to require that the owner obtain and follow the advice of a qualified structural engineer.

It is intended that these two discretionary powers be exercised to ensure protection of the interests of property owners in the Geotechnical Review Area. To protect the position of the Municipality, each owner making application for a building permit would be required to sign a waiver to absolve the Corporation from claims, and to acknowledge that he/she has been provided with an opportunity to read the report "Geotechnical Study of the Capitol Hill Conservation Area" dated 1987 May 12 and prepared for The Corporation of the District of Burnaby.

5.3 PROPOSED ACQUISITIONS

The intent is for the whole of the Capitol Hill Conservation Area to eventually be under total municipal ownership to eliminate pockets of development incongruous to the Conservation Area and to consolidate municipal holdings. No change is proposed to the existing policy of acquiring the remaining private properties as they become available. Under the proposed revision to the Conservation Area boundary the number of remaining private properties is reduced to 8. These are listed in Table 1. These acquisitions would be financed from the Tax Sale Reserve and the Corporate Land Reserve Fund.

TABLE 1 PRIVATE PROPERTIES PROPOSED FOR MUNICIPAL ACQUISITION,
CAPITOL HILL CONSERVATION AREA

Property Identification	Existing Use	Approx. Lot Size (sq.ft.)
5106 Scenic Highway (0328)	Residence	6,100
5110 Scenic Highway (0328)	Residence	6,100
5116 Scenic Highway (0328)	Residence	9,470
5122 Scenic Highway (0328)	Residence	6,494
5128 Scenic Highway (0328)	Residence	62,814

5740 Penzance Drive (0478)	Vacant	89,167
5741 Penzance Drive (0478)	Storage Building	222,592
5790 Penzance Drive (0478)	Vacant	35,719
TOTAL		438,456

(10.06 ac.)

5.4 SANITARY SEWERAGE

The geotechnical consultant has indicated that discharge from the absorption field of septic tanks can be detrimental to the stability of the surface layer of soil overlying the bedrock in Regions 1, 2 and 3, by contributing to the volume of ground water which is perched in the sand and gravel on the bedrock surface. Under the terms of the Subdivision Control Bylaw 1971, no subdivision of property can occur without the provision of sanitary sewerage, therefore this concern as related to septic tanks only pertains to the replacement or repair of existing tanks as approved by the Environmental Health Department. Further, there are no existing, privately held undeveloped lots that would now be available for development without subdivision under the revised boundary and require new septic tank service.

5.5 STORM WATER

The consultant has indicated that, from the geotechnical standpoint, there would be no significant benefit to providing storm water services to any of the sub-areas within the Conservation Area. It is pointed out that there are however three local areas which require some limited attention. It is proposed that the Municipality undertake remedial works to ensure that concentrated storm water flows from the ends of the following roads be made to discharge into coarse rock soak pits, to help prevent erosion:

- (i) In the Bessborough Drive/Ellesmere Avenue area, the western extremity of Bessborough Drive.
- (ii) The intersection of North Hythe Avenue and Bessborough Drive.

5.6 CONSOLIDATION OF MUNICIPAL PROPERTY

Existing municipal holdings within the Capitol Hill Conservation Area reflect a very fragmented subdivision pattern. In addition there are a number of unimproved street

rights-of-way not required for access. A consolidation of existing municipal lots and redundant rights-of-way should be undertaken in recognition of the Municipality's intention to retain the area in its natural, undeveloped state.

132

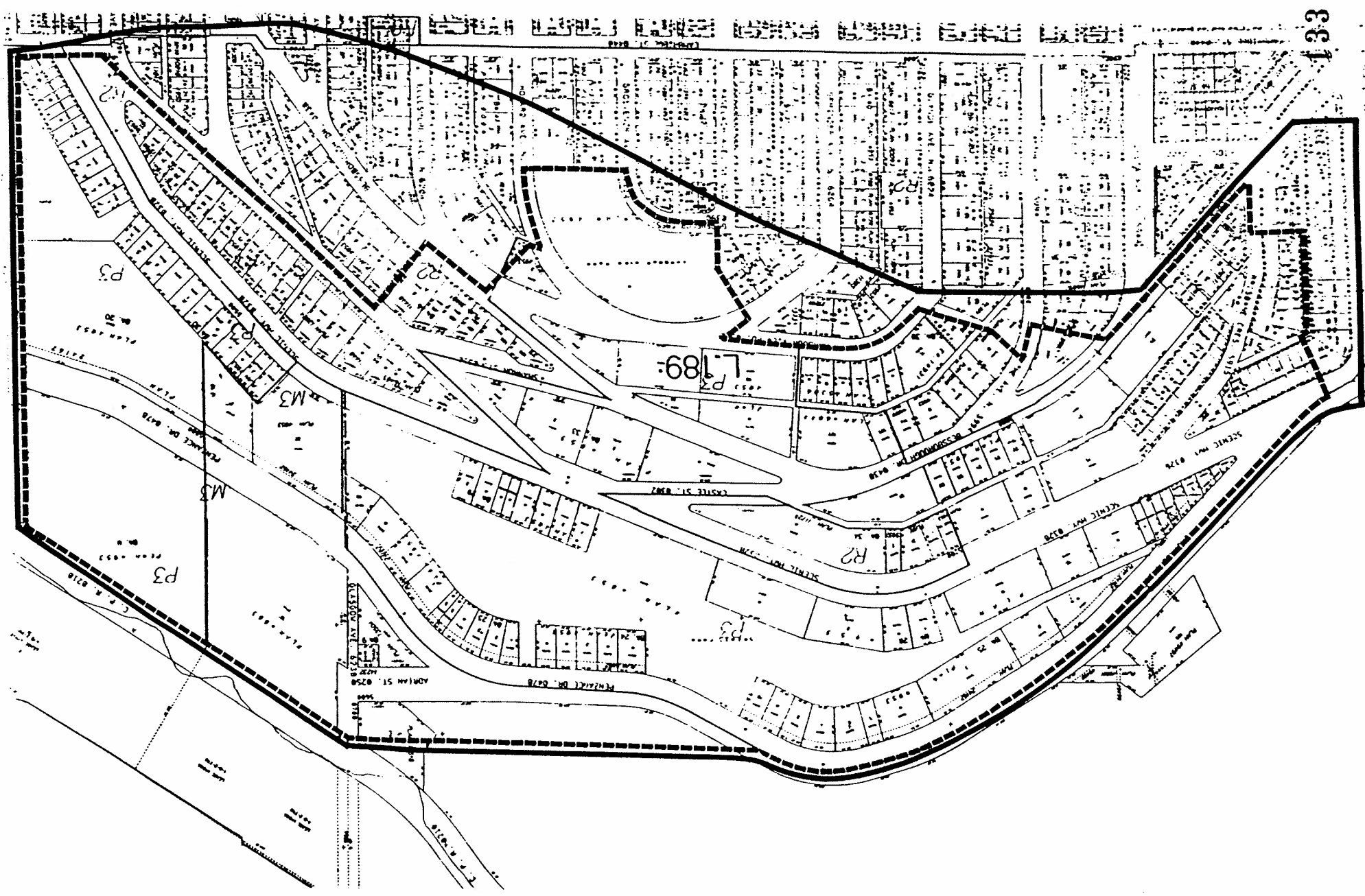


A.L. Parr
DIRECTOR PLANNING &
BUILDING INSPECTION



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cc: Chief Building Inspector
Director Engineering
Director Recreation & Cultural Services
Municipal Solicitor
Chief Public Health Inspector
Assistant Director - Long Range Planning
C.R. Lowther, Planner II

CAPITOL HILL CONSERVATION AREA



Legend

-  1972 Conservation Boundary
-  Proposed 1984 Conservation Boundary (not approved)

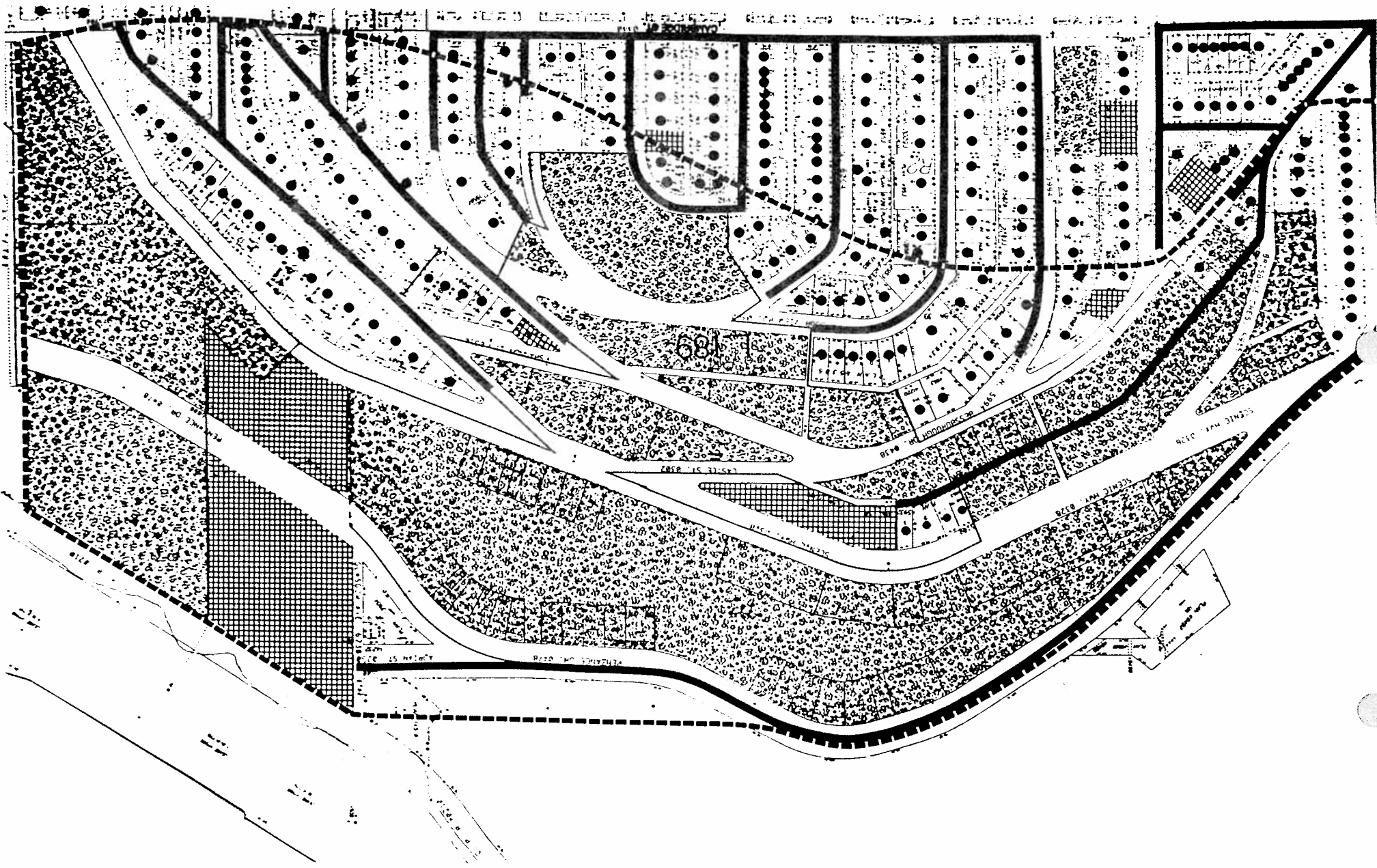
ITEM 9
MANAGER'S REPORT NO. 49
COUNCIL MEETING 87/08/10

Map 1








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CAPITOL HILL CONSERVATION AREA OWNERSHIP & IMPROVED ROADS



134

Legend

-  1972 Conservation Boundary
-  Improved Roads
-  Existing Park and/or Municipal Property
-  Privately Owned Undeveloped Property
-  Private Dwelling

ITEM 9
MANAGER'S REPORT NO. 49
COUNCIL MEETING 87/08/10

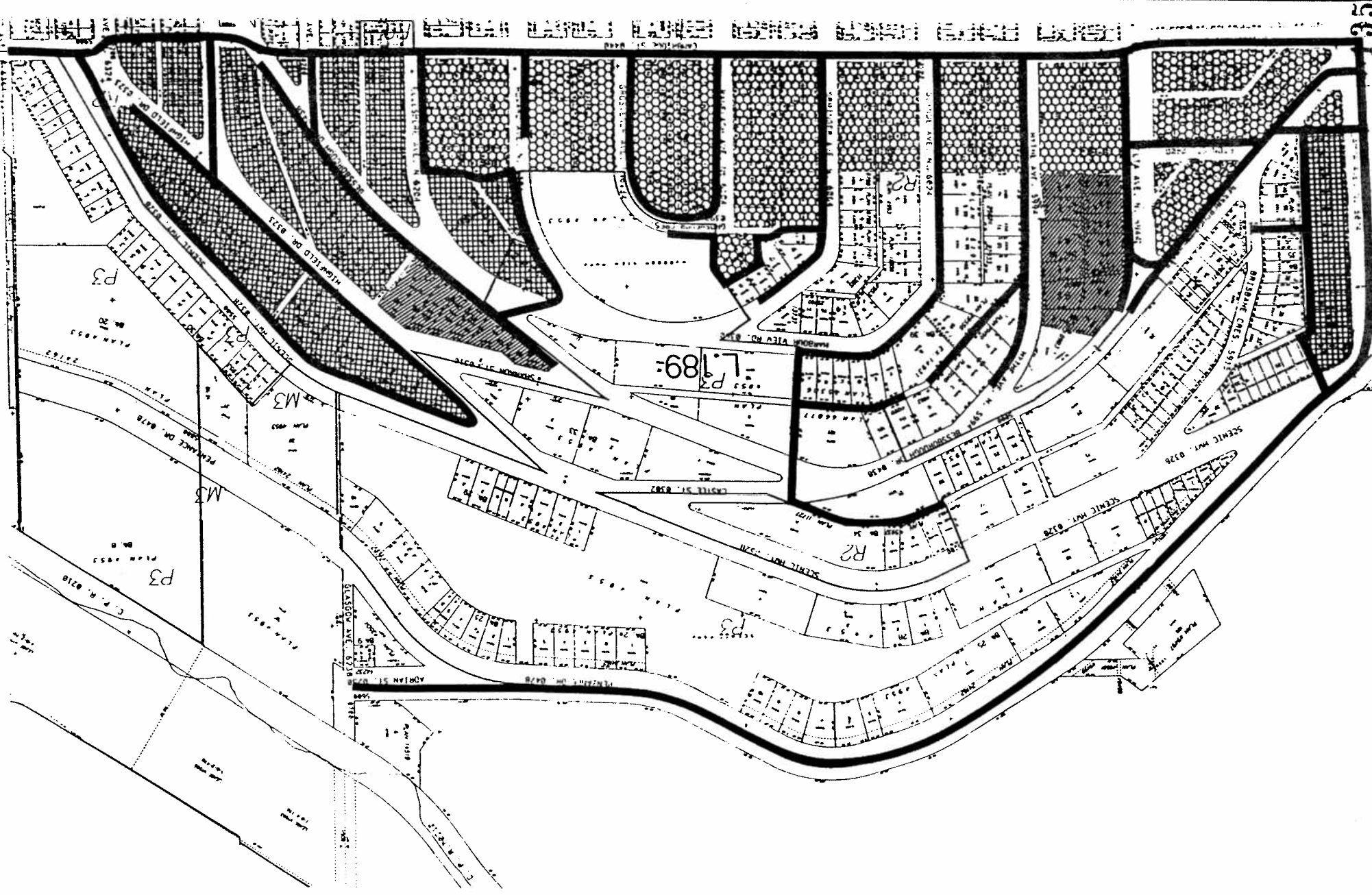
Map 2







Not to Scale

CAPITOL HILL CONSERVATION AREA

EXISTING SERVICES & UTILITIES



- Legend**
- SEWERS
 - Combined 
 - Sanitary & Storm 
 - Sanitary Only 
 - WATERMAINS 

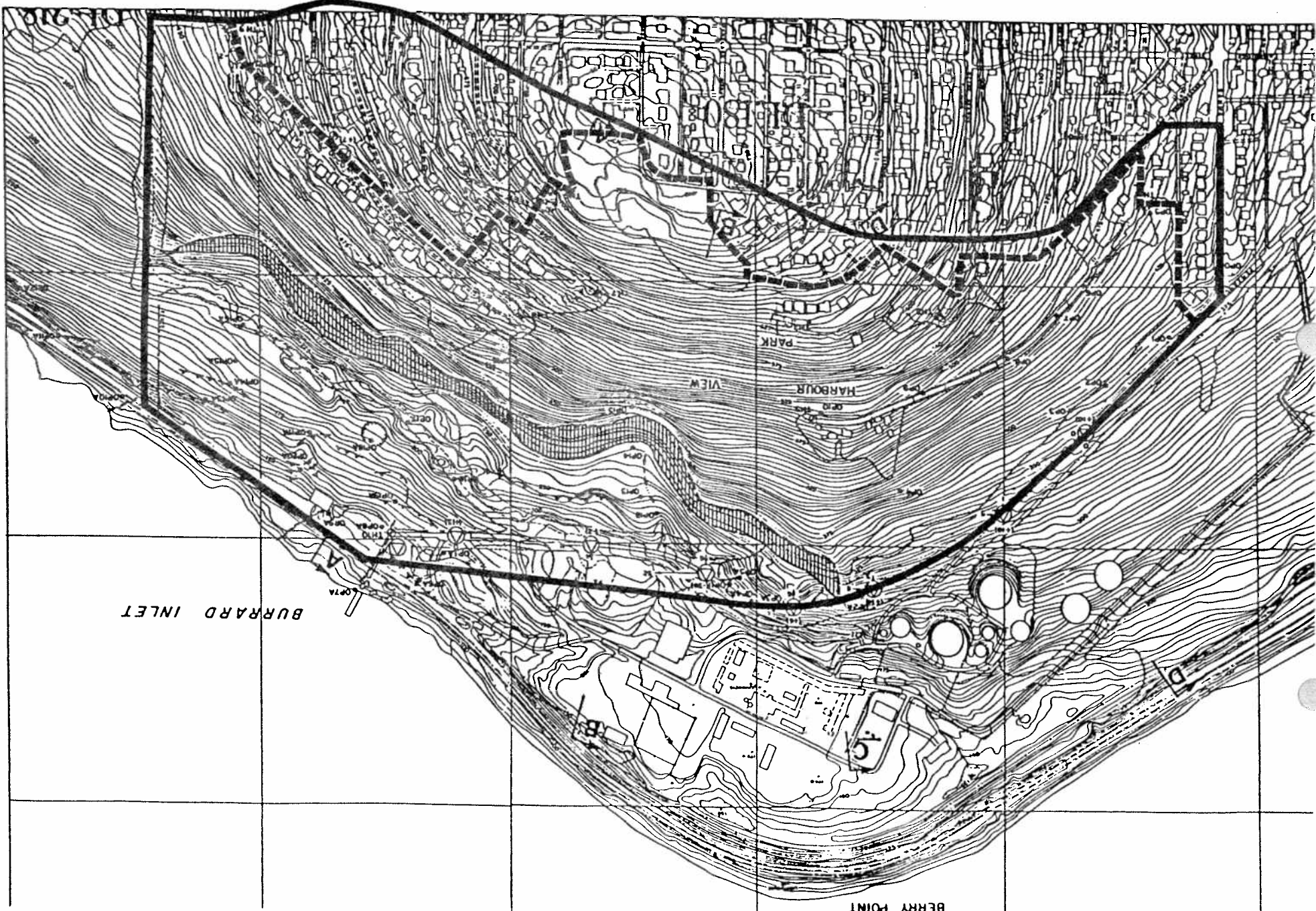
ITEM 9
 MANAGER'S REPORT NO. 49
 COUNCIL MEETING 87/08/10

Map 3
 NORTH

Not to Scale

CAPITOL HILL CONSERVATION AREA

BERRY POINT



TOPOGRAPHY

Legend

- 1984 Revised Boundary (not approved)
- 1972 Boundary

Escarpment Area

Slide Scarp or
Tension Crack

Shear Crack

Map 4

NORTH

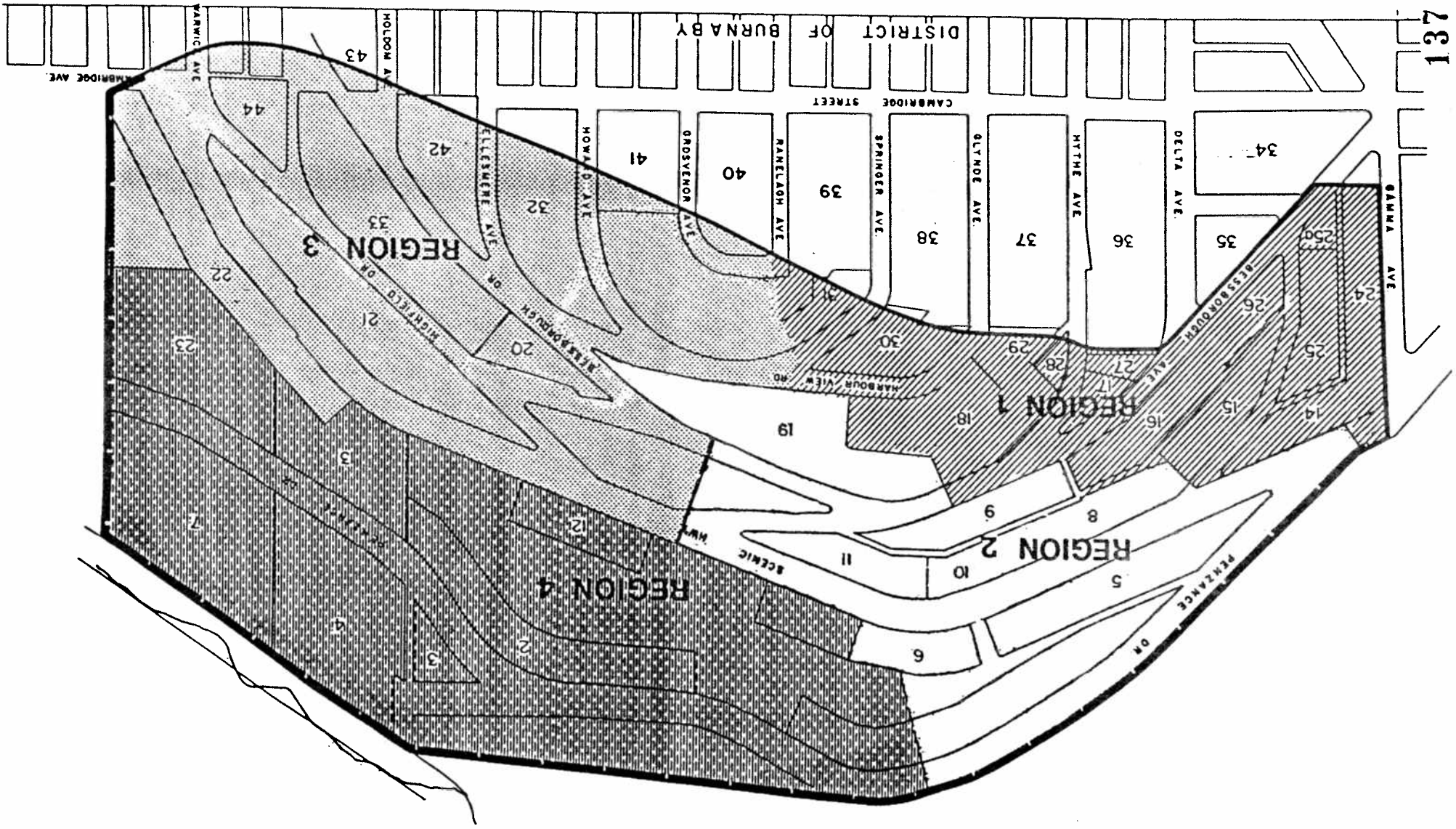
ITEM 9
MANAGER'S REPORT NO. 49
COUNCIL MEETING 87/08/10

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136

CAPITOL HILL CONSERVATION AREA

REGIONS & SUB-AREAS REVIEWED



137

Legend

1972 Approved Boundary

ITEM 9
 MANAGER'S REPORT NO. 49
 COUNCIL MEETING 87/08/10

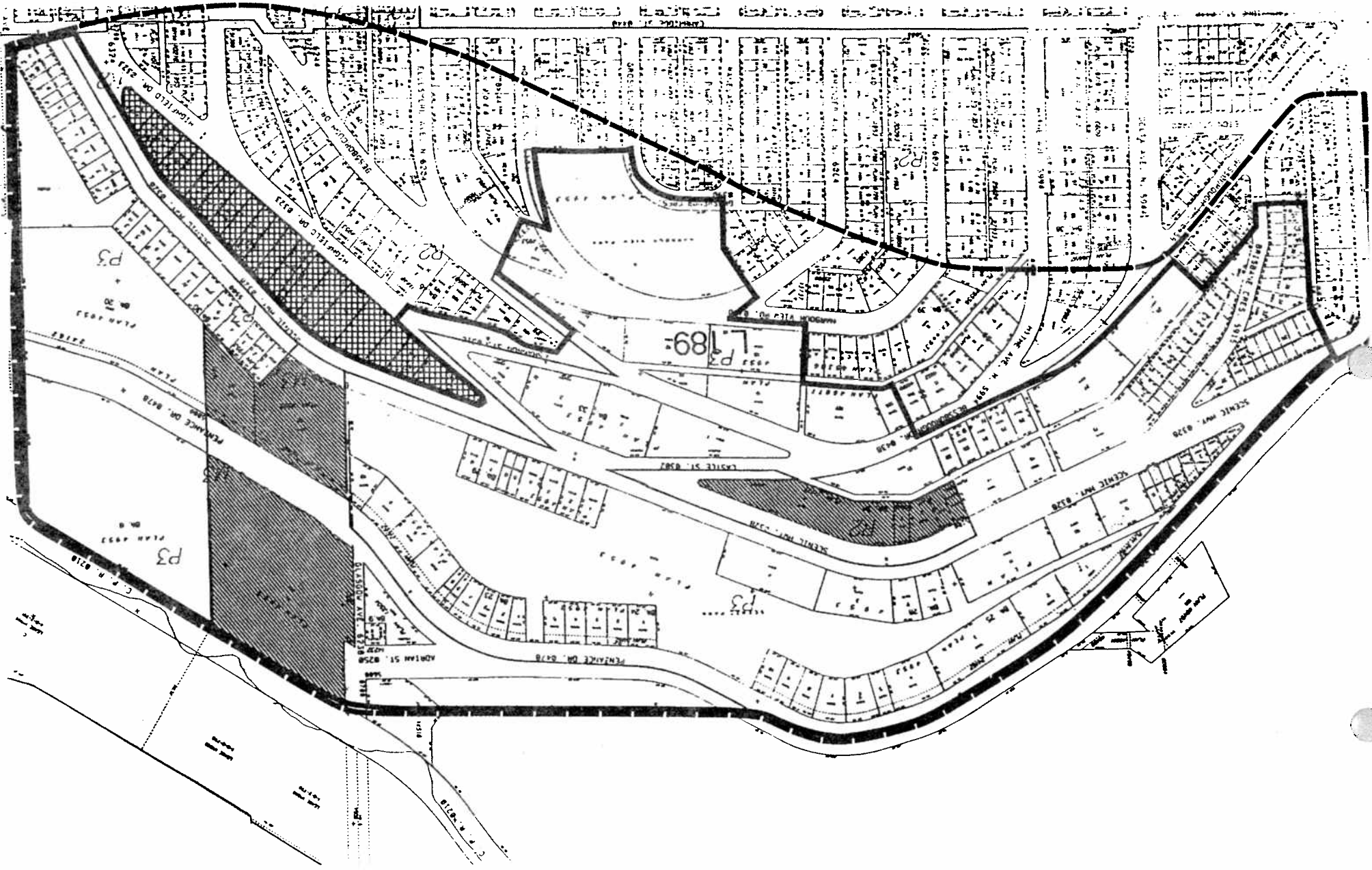
Map 5







NORTH

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CAPITOL HILL CONSERVATION AREA REVISED CONSERVATION BOUNDARY, GEOTECHNICAL REVIEW AREA & PROPERTY ACQUISITION PROPOSALS



- Legend**
-  1972 Conservation Area Boundary
 -  Proposed Revised Conservation Area Boundary
 -  Geotechnical Review Area
 -  To Be Acquired

Map 6

 NORTH

Not to Scale

138

ITEM 9
 MANAGER'S REPORT NO. 49
 COUNCIL MEETING 87/08/10