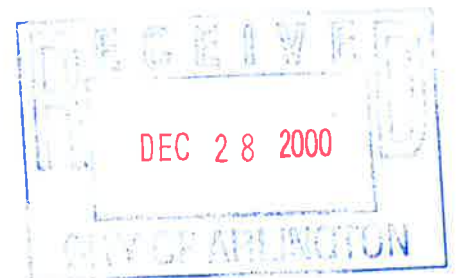

CITY OF ARLINGTON ENVIRONMENTAL CHECKLIST

Stoneway

Prepared by
SHOCKEY/BRENT, INC.



Project
Stoneway

Applicant

Darling Investments, LLC
Scott Darling
P.O. Box 1887
Marysville, Washington 98270
Phone: (425) 239-9925

Project Representative

Shockey/Brent, Inc.
Rick McArdle
2716 Colby Avenue
Everett, Washington 98201
Phone: (425) 258-9308

December 2000

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Appendices

- Appendix A – Legal Description
- Appendix B – Preliminary Geotechnical Evaluation

ENVIRONMENTAL CHECKLIST

A. BACKGROUND

- 1. Name of proposed project, if applicable: **Stoneway**
- 2. Name of applicant: **Darling Investments, LLC**
- 3. Address and phone number of applicant and contact person:

Applicant Contact: **Scott Darling**
P.O. Box 1887
Marysville, WA 98270
Phone: (425) 239-9925

Representative: **Shockey/Brent, Inc.**
Attn.: Rick McArdle
2716 Colby Avenue
Everett, WA 98201
Phone: (425) 258-9308

- 2. Date checklist prepared: December 27, 2000
- 3. Agency requesting checklist: City of Arlington
- 4. Proposed timing or schedule (including phasing, if applicable):

Construction of roads and other site improvements would begin immediately on receipt of construction plan approvals, anticipated to be summer/fall of 2001.

- 5. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

There are no plans for any future activity related to this proposal.

- 6. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Preliminary Geotechnical Evaluation Terra Associates, Inc.
Traffic Analysis..... PEAK Engineering
Preliminary Drainage and Utilities Plan and Report..... PEAK Engineering

- 7. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No applications are pending.

- 8. List any government approvals or permits that will be needed for your proposal, if known.

Preliminary and Final Plat Approval	City of Arlington
SEPA Determination.....	City of Arlington
Grading Permit.....	City of Arlington
DPDES Permit	Washington State Dept. of Ecology
HPA Permit.....	Washington State Dept. of Fish and Wildlife
Detailed Road and Storm Drainage Plan Approvals.....	City of Arlington
Water and Sewer Extensions	City of Marysville
Building Permits	City of Arlington

9. Give brief, complete description of your proposal, including the proposed uses and size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

This application proposes 32 single-family residence lots, one commercial tract and a storm drainage/park tract on the 17.14-acre site. The residential lots comprise approximately 7.8 acres of the total parcel. The plan provides stormwater management facilities. The proposed lots would be served with public roads, water and sewer. See *Figure 1 – Preliminary Plat/Landscaping Plan*

10. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is located in the southwest quarter of Section 21, Township 31 North, Range 5 East. Snohomish County tax parcel number 213105-3-047-0002. Points of access to the property are from 175th Place NE and 39th Drive NE. See *Figure 2 – Vicinity Map, Figure 3 – Parcel Map and Appendix A – Legal Description.*

EVALUATION FOR
AGENCY USE ONLY

B. ENVIRONMENTAL ELEMENTS

1. EARTH

a. **General description of the site (circle one):** Flat, rolling, hilly, steep slopes, mountains, other.

b. **What is the steepest slope on the site (approximate percent slope)?**

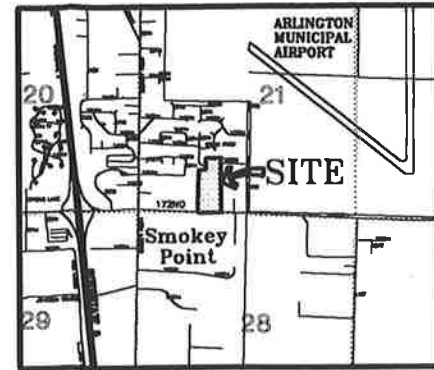
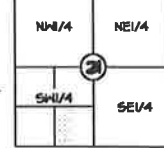
The steepest slope on the site is 3 percent.

c. **What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.**

Lynnwood loamy sand, 0 to 3 percent slopes, is the soil found on the site. It is very deep, excessively drained. Permeability of the soil is rapid and available water capacity is low. For site-specific soils information, see *Appendix B – Preliminary Geotechnical Evaluation.*

PORTION OF SW 1/4, SECTION 21, TOWNSHIP 31 N, RANGE 5 E, WM.
 PLAT OF STONEWAY SUBDIVISION
 CITY OF ARLINGTON

INDEX MAP



PROJECT ANALYSIS

APPLICANT: DARLINS INVESTMENTS, LLC
 SCOTT DARLINS
 P.O. BOX 987
 HARRYSVILLE, WA 98719
 (425) 295-1925

SURVEYOR: NETRON AND ASSOCIATES INC.
 TACHEAS BARRY
 3071 N. OLYMPIC AVENUE, SUITE 203
 ARLINGTON, WA 98223
 (360) 438-3771

OWNER: AUGUST 4 HELEN BAUER FAMILY LIMITED PARTNERSHIP
 C/O JOE BAUER
 3589 TRUDY PL. NE
 ARLINGTON, WA 98223
 (360) 698-3521

CONTRACTOR: SHOCKEY/BRENT, INC.
 RICK HANDE
 716 COLBY AVE.
 EVERETT, WA 98201
 (425) 298-2388

DESIGNER: PEAK ENGINEERING
 C. SCOTT STEWART
 P.O. BOX 987
 HARRYSVILLE, WA 98719
 (360) 698-6986

SITE AREA: TOTAL SITE AREA 146,676 SF (3.34 ACRES)
 AREA ZONED R-10D 84,946 SF (1.93 ACRES)
 AREA ZONED HC 61,730 SF (1.41 ACRES)

EXISTING ZONING: R-10D 1 HC
TAX ACCOUNT #: 20108-3-047-0000
PROPOSED LOTS: 33 (41 LOTS/ACRE)
AVERAGE LOT SIZE: 4,445 SF
SMALLEST LOT SIZE: 1,372 SF
PARK AREA REQUIRED (200 SPANITS): 6,400 SF
PARK AREA PROPOSED: 7,795 SF
OPEN SPACE REQUIRED (200 SPANITS): 6,000 SF
OPEN SPACE PROPOSED: 6,000 SF

WATER: CITY OF HARRYSVILLE
SEWER: CITY OF HARRYSVILLE
SCHOOL DISTRICT: ARLINGTON
FIRE DISTRICT: 040 CO FFD #2
ROAD LINES: 1,276 LF / 1/4 ACRES (84')

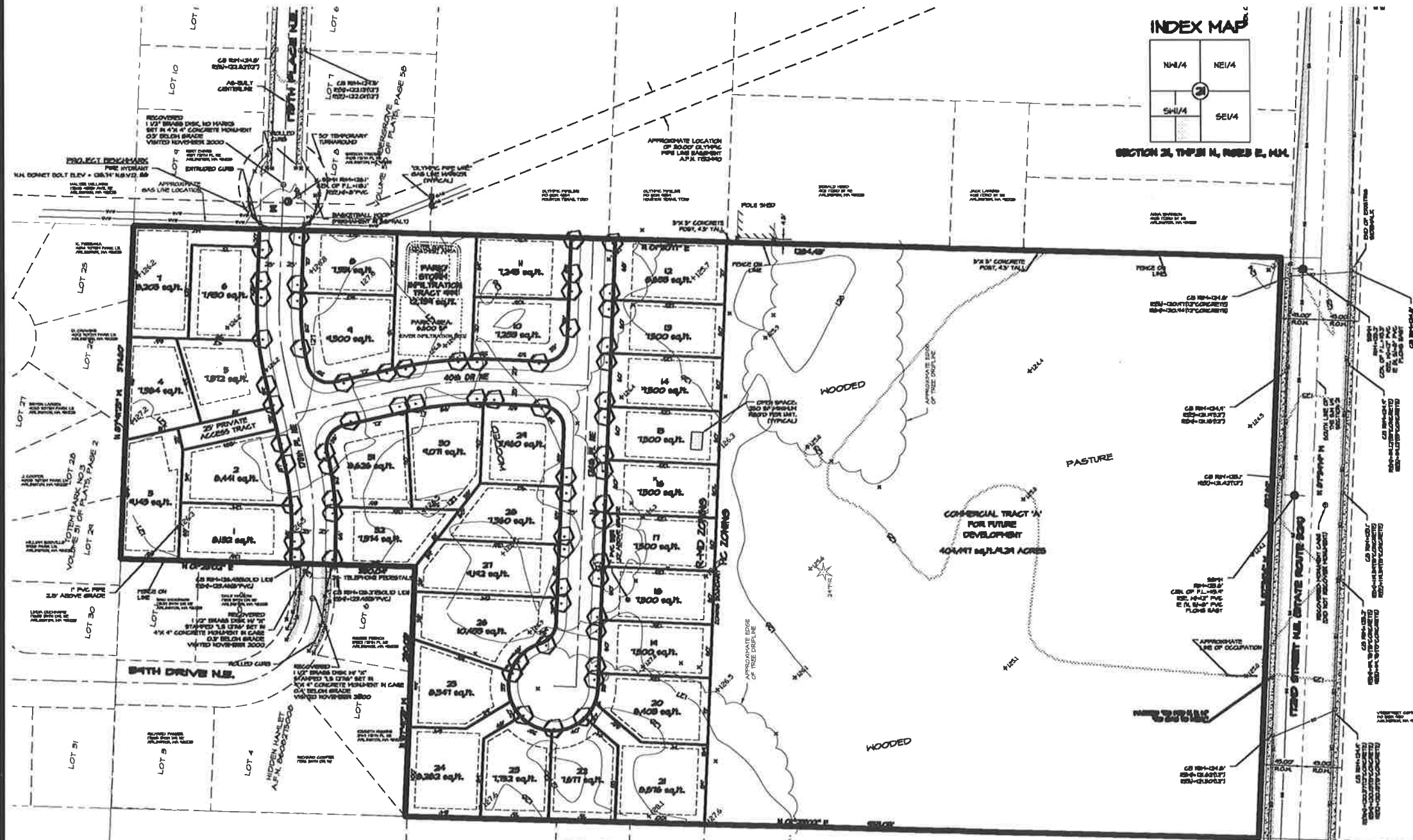
DENSITY CALCULATIONS FOR AREA ZONED R-10D:
GROSS AREA: 34,946 SF
LESS TRACTS: 7,795 SF
LESS ROADS: 6,000 SF
LESS DEDICATIONS: N/A
NET SITE AREA: 21,151 SF / 0.48 AC
MAX UNITS ALLOWED: 6 X 0.36 = 2.16
TOTAL UNITS PROPOSED: 33 (8.3 DU/AC)

LEGAL DESCRIPTION

THE WEST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 21, TOWNSHIP 31 NORTH, RANGE 5 EAST, WM., RECORDS OF SNOHOMISH COUNTY, WASHINGTON, EXCEPT THE NORTH 300 FEET OF THE WEST 200 FEET THEREOF, ALSO EXCEPT THE SOUTH 45 FEET THEREOF FOR SMOKEY POINT-EDGECROFT ROAD, SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON. (LEGAL DESCRIPTION PER STEWART TITLE GUARANTY COMPANY ORDER NUMBER 36271 DATED OCTOBER 29, 2000.)

VERTICAL DATUM - N.A.S.D. 86

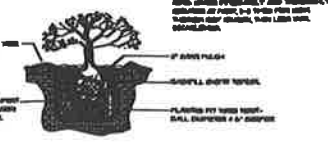
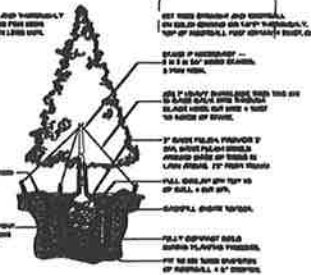
PROJECT BENCHMARK - AS SHOWN HEREON
 N.M. TOP BONNET BOLT ELEVATION = 130.74 FEET N.A.S.D. 86
 VERTICAL DATUM BASED ON A G.P.S. TIE TO SNOHOMISH COUNTY SURVEY CONTROL #166.
 N.A.S.D. 86 = 3.70 FEET = N.G.S.D. 29



PLANT KEY

SYMBOL	QTY.	LATIN NAME/ COMMON NAME	SIZE/COMMENTS
	65	PRUNUS CERASIFERA 'THUNDERCLOUD' THUNDERCLOUD PLUMS	1 1/2" CALIBER

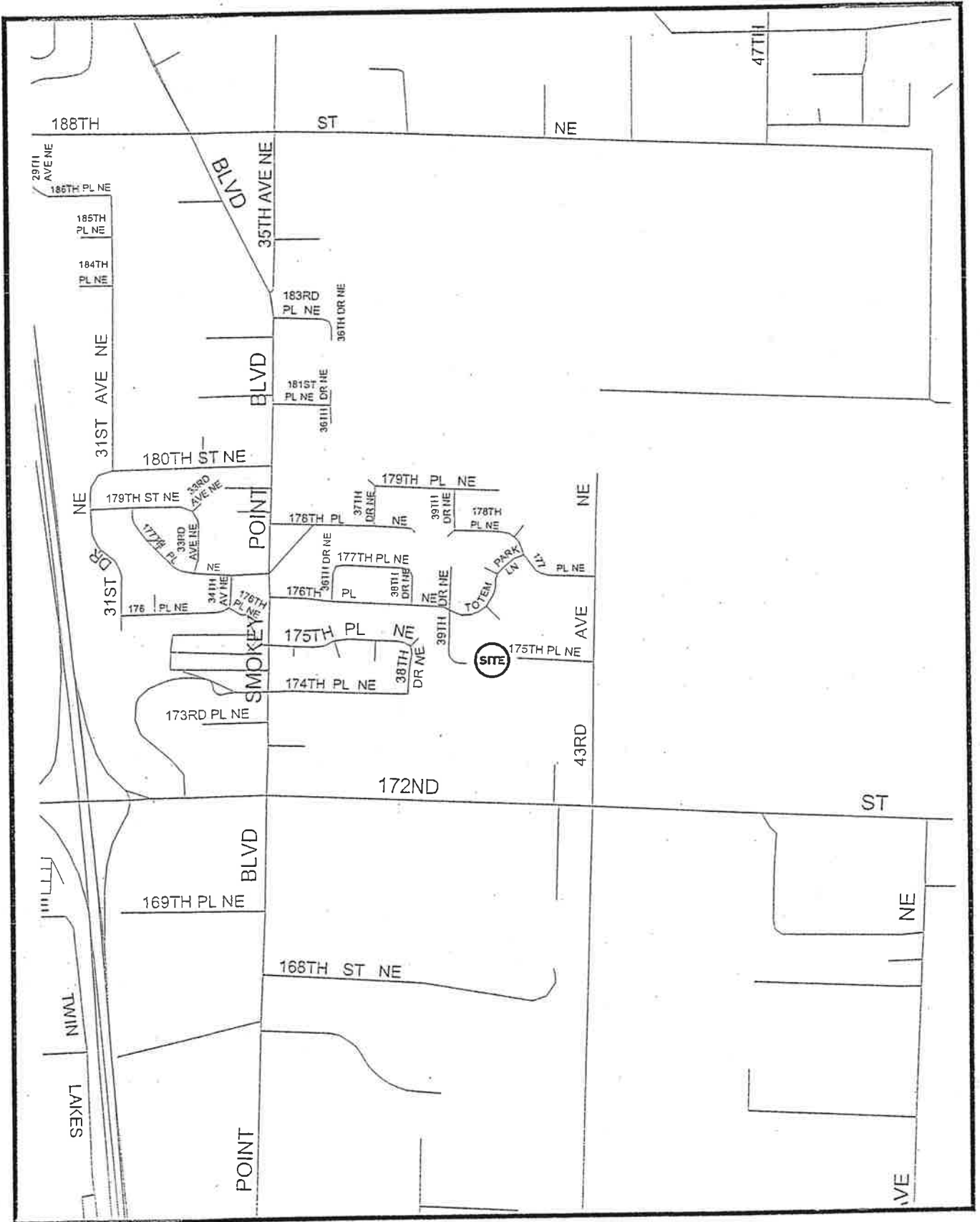
- PLANTING NOTES**
- THESE NOTES ARE PROVIDED TO CLARIFY SCOPE OF WORK, PROCEDURES AND QUALITY FOR LANDSCAPE CONTRACTOR. REVISIONS MAY BE NECESSARY PRIOR TO CONSTRUCTION.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL OTHER SITE IMPROVEMENTS PRIOR TO STARTING LANDSCAPE WORK.
 - CONTRACTOR SHALL NOTIFY UTILITY LOCATIONS PRIOR TO EXCAVATION. CONTRACTOR SHALL USE CAUTION WHILE EXCAVATING TO AVOID DISTURBING ANY EXISTING UNDERGROUND UTILITIES. IF ACTIVE UTILITIES ARE ENCOUNTERED, CONTRACTOR IS TO PROMPTLY ADVISE GENERAL CONTRACTOR AND OWNER.
 - CONTRACTOR SHALL MAINTAIN AND WATER PLANT MATERIAL UNTIL OWNER'S FINAL ACCEPTANCE IS RECEIVED IN WRITING.
 - TREE LOCATIONS SHALL BE STAKED AND APPROVED BY OWNER AND CITY PRIOR TO PLANTING.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE QUANTITY OF PLANTS THAT ARE REPRESENTED BY SYMBOLS ON THE DRAWING.
 - ALL PLANT MATERIAL SHALL EXPOSED TO AAN STANDARD FOR MANSORY STOCK, LATEST EDITION.
 - CONTRACTOR SHALL MAINTAIN SITE UNTIL FINAL INSPECTION AND ACCEPTANCE, INCLUDING WATERING. ONE YEAR MONITORING PROGRAM FOR ALL TREES TO BEGAN AT THIS TIME.
 - ROOT BARRIERS SHALL BE INSTALLED WITHIN PLANTER BUMP.



SHOCKEY BRENT, INC.
 Land Use • Environmental Analysis
 Civil Engineering • Public Policy
 2711 City Avenue, Everett, WA 98201 • 425.232.0322 • info@shockeybrent.com

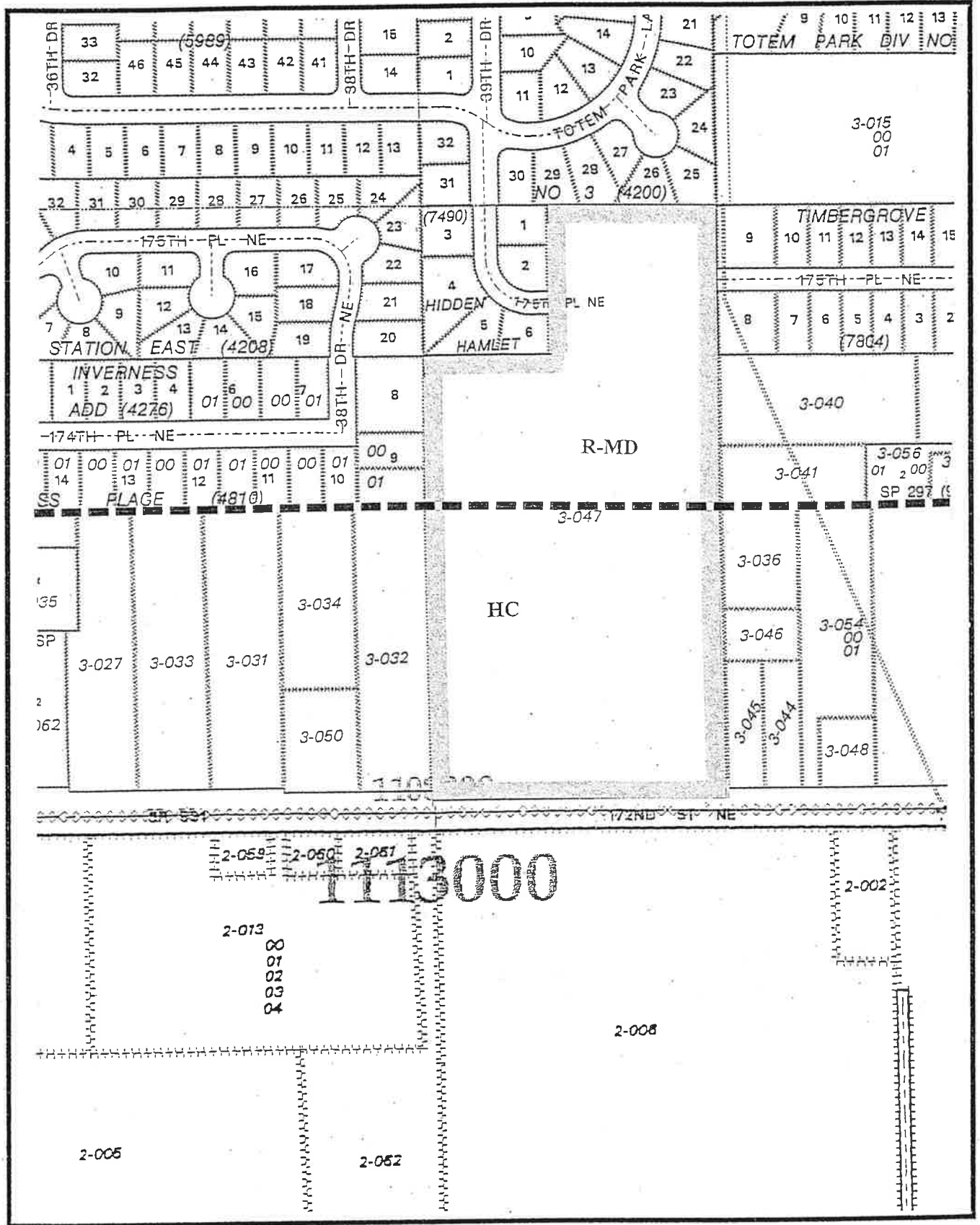
PRELIMINARY PLAT/LANDSCAPE PLAN
 CITY OF ARLINGTON
STONEWAY

Figure 1 - Preliminary Plat and Landscaping Plan



Land Use • Environmental Analysis • Civil Engineering • Public Policy

Source: Snohomish County, Department of Information Services: GIS Division



Land Use • Environmental Analysis • Civil Engineering • Public Policy

Source: Snohomish County Assessors

- b. **Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.**

There are no surface indications or history of unstable soils in the immediate vicinity.

- c. **Describe the purpose, type and approximate quantities of any filling or grading proposed. Indicate source of fill.**

Grading would occur for construction of roads, utilities and home-sites on individual lots. Cut and fill quantities would be balanced on site; approximately 1,200 cubic yards of cut and an equal amount of fill. Gravel would be imported from an approved off-site source as required for road base and trench backfill.

- d. **Could erosion occur as a result of clearing, construction, or use? If so, generally describe.**

There could be a short-term increase in potential for on-site erosion where soils are exposed during site preparation and construction.

- e. **About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?**

Approximately 22% of the total site would be covered with roads, rooftops and other impervious surfaces.

- f. **Proposed measures to reduce or control erosion, or other impacts to the earth, if any:**

T.E.S.C. measures per City of Arlington requirements would be implemented per the approved temporary erosion control plan. Construction phase erosion control typically includes the use of hay bales, siltation fences, geotextile barriers (silt barriers), and controlled surface grading. See *Figure 4 – Preliminary Drainage and Utilities Plan*.

2. AIR

- a. **What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.**

Short-term emissions, dust and odors would occur from mechanized construction equipment and site preparation. These impacts should be minimal.

Long-term changes would result from the increased vehicle traffic to the site. Automobile emissions include mainly carbon monoxide, nitrogen oxides, hydrocarbons and photochemical oxidants. Domestically produced pollutants would be generated after the single-family development is constructed. These impacts are not expected to be significant.

**PLAT OF STONEMAY SUBDIVISION
PORTION OF SW 1/4, SECTION 21, TOWNSHIP 31 NORTH, RANGE 5 EAST, W.M., SPOKANE COUNTY, WA
CITY OF ARLINGTON**



GRAPHIC SCALE
1 INCH = 80 FT
(IN FEET)

DATUM: NAVD 83
BENCH: EX FINE HYDRANT IN 175th PL NE (LOCATED AT SOUTHWEST CORNER LOT 8, TONBERG GROVE) ELEV. = 128.74 M.A.S.L. (BY BOMMET 5821)
VERTICAL BENCHMARK ON A G.P.S. TIE TO SPOKANE COUNTY SURVEY CONTROL #1198. M.A.S.L. IS - 3.70 FEET - 86.13.29

DRAINAGE NOTES:

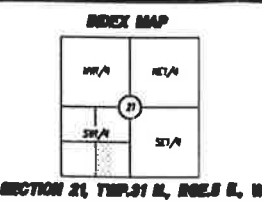
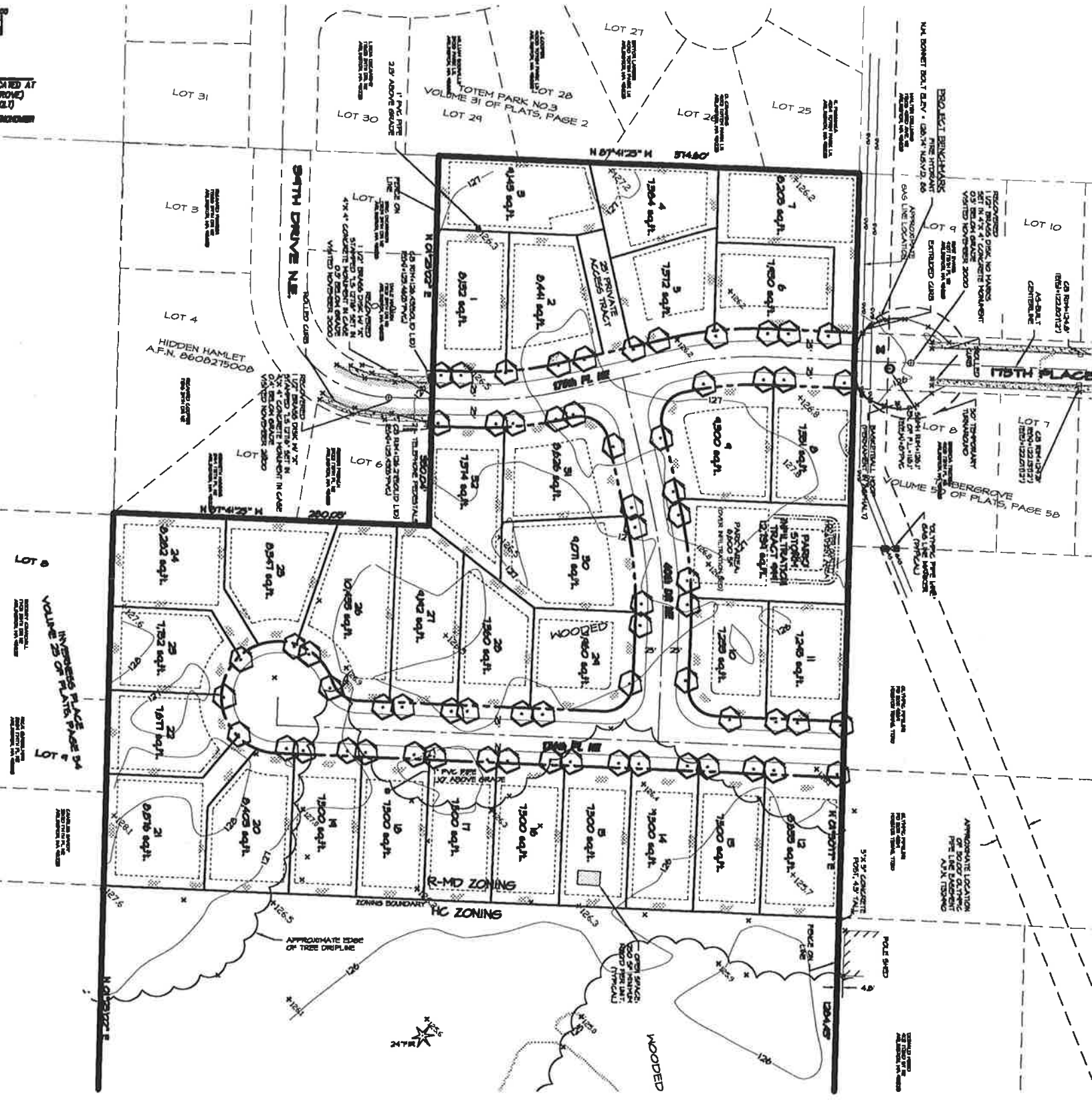
1. READY TO BE CONSTRUCTED AND INSTALLED INTO THE GROUND. THE SITE SLOPE IS LESS THAN 1% TO THE SOUTH.
2. SOILS ON SITE ARE CLASSIFIED AS RAINIER FINE SANDY LOAM (HYDROLOGIC SOIL GROUP A). DRAINAGE IS BEST PRACTICE - SAND.
3. EXISTING COVER: 8.8K ACRES WOODS; 7.48K ACRES PASTURE/GRASS.
4. DEVELOPED CONDITION: 2.9K ACRES UNDISTURBED WOODS; 8.8K ACRES UNDISTURBED PASTURE; 3.1K ACRES IMPROVED (T/A, D/W, S, & RESOURCES); 6.5K ACRES LANDSCAPING/IMPROVEMENTS.
5. READY FROM ALL IMPROVED SURFACES WILL BE COLLECTED AND IMPROVED ON SITE.
6. SEE "PRELIMINARY DRAINAGE REPORT AND DRAINAGE ANALYSIS" PREPARED BY PEAK ENGINEERING, INC. AND DATED 12/24/2020.

LEGEND

EXISTING	DESCRIPTION	PROPOSED
---	BLDG SETBACK LINE (SBL)	---
---	BLDG FOOTPRINT	---
---	CATCH BASIN (1'-1')	---
---	CATCH BASIN (1'-2')	---
---	CASE MONUMENT	---
---	CONCRETE HIGH	---
---	CONCRETE LOW	---
---	CURBS (2'-0" ONLY)	---
---	DRAINAGE DITCH/CHANNEL	---
---	DRAINAGE FLOW PATTERNS	---
---	E/W CURBOUT	---
---	EASEMENTS (E/W)	---
---	EDGE FINISHMENT (E/W)	---
---	FIRE HYDRANT (FH)	---
---	LOT LINE (L/L)	---
---	MAILBOXES (M/B)	---
---	PROPERTY LINE (P/L)	---
---	RIGHT OF WAY (R/W)	---
---	ROAD CENTER (C/R) LINE	---
---	SEWER SERVICE MAINS	---
---	SEWER CORNER	---
---	SEWER STRAIGHT	---
---	STORM PIPE (S/P)	---
---	STORM STRAIGHT	---
---	UTILITY POLE (P/P, U/P)	---
---	WATER LINE	---
---	WATER SERVICE (W/S)	---
---	WATER MAIN (W/M)	---
---	WHEEL CHAIR RAMP (W/C)	---
---	WOOD BASH (W/B)	---

ABBREVIATIONS TABLE

---	BOTTOM OF CURB-T/A	---	OR WATER SEPARATOR
---	BOTTOM OF DRAIN	---	POINT OF CURBLINE
---	BREAK/BREAK BREAK	---	POWER/UTILITY POLE
---	CATCH BASIN	---	POINT OF TANGENCY
---	COLLECTION BOX UNITS	---	PAVEMENT
---	CONCRETE FIN	---	STORM DRAIN
---	CURBOUT	---	SOLID LINE LEG
---	OK SURF'S BASE COURSE	---	SEMI-TRUCK
---	OK SURF'S TOP COURSE	---	SEWER MANHOLE
---	CURB	---	SUBGRADE
---	DRAINAGE	---	TOP OF CURB
---	EDGE OF ASPHALT	---	TRUCK CURB RILET
---	EDGE OF DRIVEWAY	---	TOP OF DRIVE
---	EASEMENT	---	TOP OF DRIVE
---	EASEMENT	---	TYPICAL
---	OUTLET LINE OF CURB	---	FINISHED DRIVE
---	OR	---	THIRD GRADE
---	OR	---	WHEEL CHAIR RAMP
---	OR	---	WATER SERVICE MAIN
---	OR	---	WHEEL CHAIR RAMP
---	OR	---	WATER MAIN
---	OR	---	WATER SERVICE
---	OR	---	WHEEL CHAIR RAMP
---	OR	---	WOOD BASH



MINIMUM BUILDING SETBACKS

FRONT	30'
REAR	10'
SIDE (R/W)	5'

NOTED ON PLAN AS BSL (BUILDING SETBACK LINE)



APPLICANT: MALING INVESTMENTS, LLC
3001 172ND PL NE
MARYSVILLE, WA 98270
(509) 228-2823

CONTACT: SHERRY/SHERRY, INC.
27th COLBY AVE.
CROFTON, WA 98612
(425) 258-9300

OWNER: MALING & HELLEN BROTHER
FAMILY LIMITED PARTNERSHIP
C/O JEE BROTHER
3005 172ND PL NE
MARYSVILLE, WA 98273
(509) 228-2823

GEOTECHNICAL ENGINEER: BOWEN ASSOCIATES, INC.
JOHN C. BOWEN, P.E.
13235 WILLOW ROAD,
SUITE 100
BUNKER HILL, WA 98244
(425) 871-7777

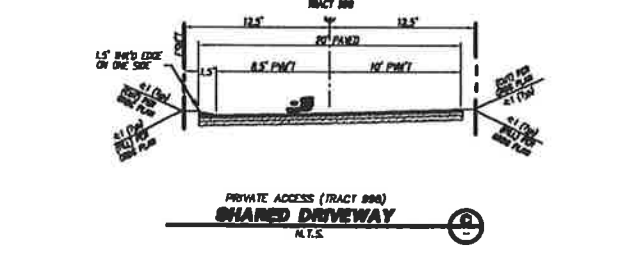
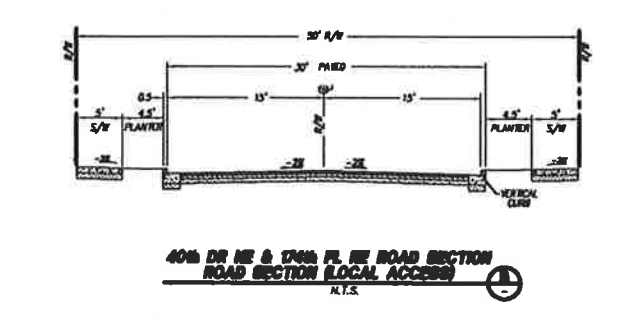
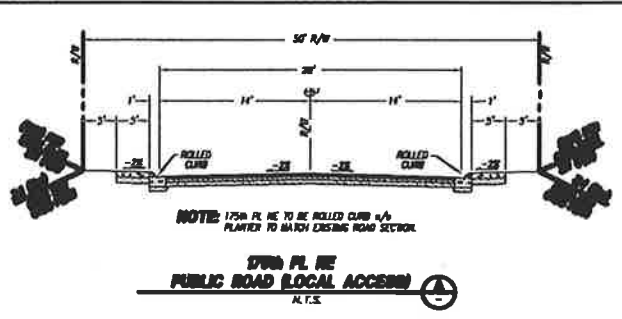
SITE AREA: TOTAL SITE AREA: 79.68 ACRES
AREA ZONED R-MD: 34.19 ACRES
AREA ZONED HC: 45.49 ACRES

EXISTING ZONING: R-MD & HC
TAX ACCOUNT NO.: 21305-3-041-0000

LEGAL DESCRIPTION: THE WEST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 21, TOWNSHIP 31 NORTH, RANGE 5 EAST, W.M., RECORDS OF SPOKANE COUNTY, WASHINGTON.

EXCEPT THE NORTH 330 FEET OF THE WEST 380 FEET THEREOF; ALSO EXCEPT THE SOUTH 45 FEET THEREOF FOR SHERRY POINT-EDGECOMER ROAD.

SITING IN THE COUNTY OF SPOKANE, STATE OF WASHINGTON.
(LEGAL DESCRIPTION PER STATEMENT FILE GUARANTY COMPANY ORDER NUMBER 36371 DATED OCTOBER 25, 2008).



PEAK ENGINEERING

1730 GROVE STREET, MARYSVILLE, WASHINGTON 98270
(509) 698-6999 FAX: (509) 698-7926



SURVEY & TOPOGRAPHIC INFORMATION PROVIDED BY:

SHERRY & SHERRY, INC.
LAND SURVEYS, MAPS & PLANNING
207 N. CLAYTON, SUITE 300
ARLINGTON, WASHINGTON 98222
(509) 228-2823
SHERRY AND BIL. 07/20

APPLICANT: MALING INVESTMENTS, LLC
P.O. BOX 889
MARYSVILLE, WA 98270
(509) 228-2823

GRADING QUANTITIES:
28' 0" CUT
25' 0" FILL

DATE: 12/27/20

REVISION/ISSUE:

DATE	REVISION/ISSUE

**STONEMAY
PRELIMINARY GRADING,
DRAINAGE, & UTILITY
PLAN**

PROJECT NO. 00323
DWG C1
OF 2

Figure 4 – Preliminary Drainage Plan

- b. **Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.**

The primary sources of visible particulate matter are vehicle emissions and smoke from wood stoves/fireplaces and open burning. Automobile emissions include mainly carbon monoxide, nitrogen oxides, hydrocarbons and photochemical oxidants. Air quality within the site vicinity is good and is expected to remain good.

- c. **Proposed measures to reduce or control emissions or other impacts to air, if any:**

The Washington Clean Air Act requires the use of all known, available and reasonable means of controlling air pollution, including dust. Construction impacts would not be significant and could be controlled by measures such as washing truck wheels before exiting the site and maintaining gravel construction entrances. In addition, dirt-driving surfaces would be watered during extended dry periods to control dust.

3. WATER

a. Surface

- 1) **Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

There are no surface bodies of water in or near the immediate vicinity of the site.

- 2) **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

Not applicable.

- 3) **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.**

No fill and dredge material would be placed in or removed from surface water or wetlands.

- 4) **Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.**

The proposal would not require surface water withdrawals or diversions.

- 5) **Does the proposal lie within a 100-year floodplain? If so, note location on site plan.**

The project does not lie within a 100-year floodplain.

- 6) **Does the proposal involve any discharge of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

No waste material would be discharged or withdrawn to or from surface waters. A public sanitary sewer system would be installed to serve the individual houses.

b. Ground

- 1) **Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.**

Stormwater runoff from the completed project would be directed to a subsurface infiltration bed for release. Public water and sanitary sewer mains would be installed as part of the site development.

- 2) **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

No waste material is proposed to be discharged into the ground.

c. Water Runoff (including storm water)

- 1) **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

Storm drainage from roads and rooftops would be directed to catchbasins and underground pipe and conveyed to a stormwater infiltration facility at the east edge of the project site. Prior to infiltration, stormwater would pass through an open bioswale for water quality treatment. No release to surface waters is proposed.

- 2) **Could waste materials enter ground or surface waters? If so, generally describe.**

Any development of the area would cause a potential increase in pollutants from stormwater runoff due to homesites, roads, lawn fertilization and other human factors. Oils, grease, and other pollutants from the additional paved areas could potentially enter the ground or downstream surface waters through surface water runoff. The proposed plans for control of water quality are expected to

minimize or eliminate entry of waste materials or pollutants to ground water and surface waters.

3) Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

The proposed drainage system would satisfy City and Washington State Department of Ecology standards. Temporary and permanent drainage facilities would provide protection of water quality of surface runoff during construction and after development. Infiltration of stormwater to the underlying water table is the preferred method of stormwater disposal when conditions are favorable for that type system.

4. PLANTS

a. Check or circle types of vegetation found on the site:

- deciduous tree: alder, maple, aspen, other: plum, cherry, holly and sumac
- evergreen tree: fir, cedar, pine, other: hemlock
- shrubs
- grass, pasture, crop or grain
- wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other: _____
- water plants: water lily, eelgrass, milfoil, other: _____
- other types of vegetation: _____

b. What kind and amount of vegetation will be removed or altered?

Approximately 56% of the existing wooded areas and 44% of the existing pasture on-site would be removed with development of the site.

c. List threatened or endangered species known to be on or near the site, if any:

There are no known endangered species of vegetation known to be on or near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site if any:

Individual and groups of existing conifers would be retained through site development where practical and where they would pose no wind blow danger. Street trees would be planted along all interior plat streets. Homeowners would provide landscaping on each individual lot.

5. ANIMALS

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

- birds: hawk, heron, eagle, songbirds, other:
- mammals: deer, bear, elk, beaver, other: small mammals
- fish: bass, salmon, trout, herring, shellfish, other:

- b. **List any threatened or endangered species known to be on or near the site.**

There are no known threatened or endangered species to be on or near the site.

- c. **Is the site part of a migration route? If so, explain.**

Western Snohomish County, as well as the rest of Western Washington, is in the migration path of a wide variety of neotropical songbirds, waterfowl and other species of birds. The specific level of use of this site by migrants is undetermined.

- d. **Proposed measures to preserve or enhance wildlife, if any:**

Habitat would be provided by retained vegetation and introduced ornamental plantings.

6. ENERGY AND NATURAL RESOURCES

- a. **What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.**

Electricity and natural gas are the primary energy source for residential heating and cooking within this area. Wood stoves, solar and alternative energy sources could also be utilized to supplement individual homeowners energy needs. All wood stoves incorporated into the new housing units would comply with local and State regulations.

- b. **Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.**

No.

- c. **What kinds of energy conservation features are included in the plans of this proposal? List of other proposed measures to reduce or control energy impacts, if any:**

The requirements of the Washington State Energy Code and the Uniform Building Code would be satisfied in the construction of the houses. Energy conserving materials are encouraged in all new construction.

7. ENVIRONMENTAL HEALTH

- a. **Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.**

There are no onsite environmental health hazards known to exist today, nor anticipated to be generated as a direct result of this project.

1) Describe special emergency services that might be required.

No special emergency services would be required.

2) Proposed measures to reduce or control environmental health hazards, if any:

There are no known health hazards that would be associated with development of this site, therefore, no measures for the reduction or control of environmental health hazards are proposed.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, aircraft, other)?

Traffic and aircraft noises exist in the vicinity, but neither would pose a significant adverse impact to the project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Short-term impacts would result from the use of construction equipment during site development. Construction would occur primarily during the daylight hours, and always in compliance with the Noise Code. Heavy equipment, hand tools and the transporting of construction equipment generate construction noise. At 200 feet from the construction, Leq would be approximately the following:

<u>Activity</u>	<u>Leq (in decibels)</u>
Clearing	71-72
Excavation	59-77
Foundations	65
Building Erection	60-72
Finishing	62-77

Long-term impacts would be those associated with the increase in site users. Additional traffic would be generated by future uses. The increase in noise would be typical of a single-family residential development of this size and would be considered minimal. Sound levels for various noise sources include:

<u>Noise Sources</u>	<u>Sound Level at 100 feet (dBA)</u>
Automobile Starting	50-55
Closing Car Door	50-55
Loud Voices	50
Automobile/Truck Traffic	50

3) Proposed measures to reduce or control noise impacts, if any:

Construction activities would be performed during normal daytime working hours, and would comply with noise regulations contained in Chapter 10.01 SCC. The proposed use is expected to generate typical residential noise levels.

8. LAND AND SHORELINE USE

a. What is the current use of the site and adjacent properties?

The project site has a single-family residence on the southern portion of the parcel. The proposed residential development would occur on the northern portion of the parcel. To the north, east and west are existing residential neighborhoods, to the south, 172nd Street NE.

b. Has the site been used for agriculture? If so, describe.

No.

c. Describe any structures on the site.

One single-family residence is located on Tract A, the commercial zoned portion of the property.

d. Will any structures be demolished? If so, what?

No structures would be demolished.

e. What is the current zoning classification of the site?

The current zoning classification of the north end of the site is Residential Moderate Density (R-MD). The southern end is Highway Commercial (HC). For single-family dwellings, R-MD zoning permits up to six units per acre.

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation is Medium High Density Residential for the portion of the parcel that is proposed for development. For the southern portion, which is not being developed at this time, the designation is Highway Commercial.

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No portion of the site has been classified as environmentally sensitive.

i. Approximately how many people would reside or work in the completed project?

Based on an average of three persons per residence, the completed project would house approximately 96 people.

j. Approximately how many people would the completed project displace?

No people would be displaced by the completed project.

k. Proposed measures to avoid or reduce displacement impacts, if any:

None.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project would comply with the City of Arlington comprehensive plan, zoning and development regulations.

9. HOUSING

a. Approximately how many units would be provided, if any?

There would be 32 single-family lots in the finished subdivision.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

None proposed.

10. AESTHETICS

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The proposed development would meet the bulk regulations of the R-MD zone. The maximum height permitted within this zone is 35 feet, although it is anticipated that no residences would exceed two stories, or approximately 25 feet. House exteriors would be principally wood and masonry.

b. What views in the immediate vicinity would be altered or obstructed.

The new houses would be visible from adjacent properties. No views would be obstructed.

c. Proposed measures to reduce or control aesthetic impacts, if any:

None proposed.

11. LIGHT AND GLARE

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Exterior and interior residential lighting during evening hours, as well as vehicle headlights would produce light and glare.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Light from the finished project would not interfere with views or cause hazards. Exterior lighting would be typical of a residential neighborhood.

c. What existing off-site sources of light or glare may affect your proposal?

The primary off-site source of light would be from vehicles traveling along roads in the vicinity.

d. Proposed measures to reduce or control light and glare impacts, if any:

No specific mitigation is proposed. The impacts would be typical of a single-family neighborhood.

12. RECREATION

a. What designated and informal recreational opportunities are in the immediate vicinity?

There is one High School, one Middle School and two elementary schools to the west along SR 531. Each has playfields and gymnasiums, and the elementary schools have play equipment on those campuses.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The proposed project would not displace any existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including opportunities to be provided by the project or applicant, if any:

A park of 6,600-sq. ft. (approximately 206-sq. ft. per lot) is proposed at the east edge of the site. In addition, park impact mitigation fees would be provided in the amount of \$100 per lot, for a total of \$3,200.

13. HISTORIC AND CULTURAL PRESERVATION

- a. Are there any places or objects listed on, or proposed for, natural, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No.

- b. Generally describe any landmarks or evidence of historic, archeological, scientific, or cultural importance known to be on or next to the site?

None.

- c. Proposed measures to reduce or impacts, if any:

If any archeological artifacts were discovered during construction, activity in that area would be halted and the State Historic Preservation Officer would be contacted.

14. TRANSPORTATION

- a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

Access to the site is from 175th Place NE and Totem Park. 175th Place NE would be extended to connect through the proposed subdivision.

- b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

Community Transit serves the area. A Park and Ride lot with bus services is located on Smokey Point Boulevard and 177th Place NE, which is about a half-mile from the proposed subdivision.

- c. How many parking spaces would the completed project have? How many would the project eliminate?

A minimum of two off-street parking stalls would be provided on each lot.

- d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

All new streets would be constructed to City standards for public streets, with the exception of one short private street providing access to three lots in the northwest corner of the development.

- e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project would occur in the vicinity of air transportation. The Arlington Airport is located just to the west of the proposed subdivision.

- f. **How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.**

Approximately 306 ADT would be generated, with 32 p.m. peak hour trips. Peak volumes would occur between 4-6 p.m. weekdays.

- g. **Proposed measures to reduce or control transportation impacts, if any:**

Traffic mitigation would be provided for impacts to City, County, and WSDOT road systems in accordance with City requirements and interlocal agreements. Adequate off-street parking would be provided on-site, and road connections would be provided for future development on adjacent undeveloped property. See submitted Traffic Analysis.

15. PUBLIC SERVICES

- a. **Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe:**

The project would result in an increased need for public services (fire, police, schools, etc.) typical of a residential development of this nature. Lakewood School District #306 serves the area. Fire service is provided by Marysville Fire District #12; the nearest station is located at 14716 Smokey Point Blvd. The City of Arlington Police Department, as of January 1, 2001, will provide police service; their estimated response time to the site is four minutes or less.

- b. **Proposed measures to reduce or control direct impacts on public services, if any:**

In addition to payment of yearly property taxes by each homeowner, direct impacts of the proposal would be mitigated in accordance with adopted City regulations. The City of Arlington requires payment of \$1,797 per lot school mitigation fees to the Lakewood School District.

16. UTILITIES

- a. **Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:**

- b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.**

Water..... City of Marysville
Sewer City of Marysville
Telephone..... Verizon Northwest

Electricity Snohomish County PUD
Natural Gas Puget Sound Energy

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Applicant Representative Signature:  _____
Rick McArdle, Shockey/Brent, Inc.

Date submitted: 2-28-00

Appendix A

Legal Description

THE NORTH HALF OF THE WEST HALF OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 21, TOWNSHIP 31 NORTH, RANGE 5 EAST, W.M., RECORDS OF SNOHOMISH COUNTY, WASHINGTON;

EXCEPT THE NORTH 330 FEET OF THE WEST 280 FEET THEREOF;

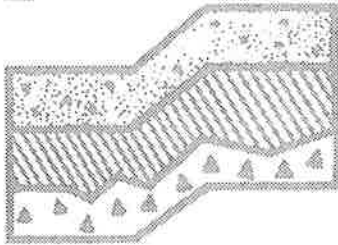
SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON.

Appendix B
Preliminary Geotechnical Evaluation

PRELIMINARY GEOTECHNICAL REPORT

**Biwer Property
4000 Block of 175th Place NE
Arlington, Washington**

Project No. T-4806



Terra Associates, Inc.

Prepared for:

**Darling Investment
Marysville, Washington**

November 17, 2000

TERRA ASSOCIATES, Inc.

Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

November 17, 2000
Project No. T-4806

Mr. Scott Darling
Darling Investment
P.O. Box 1887
Marysville, Washington 98270

Subject: Preliminary Geotechnical Report
Biwer Property
4000 Block of 175th Place NE
Arlington, Washington

Dear Mr. Darling:

As requested, we have conducted a preliminary geotechnical engineering study for the subject project. The attached report presents our findings and recommendations for the geotechnical aspects of project design and construction.

Our field exploration indicates the site is generally underlain by medium dense sands. We encountered moderate groundwater seepage in 2 of the 5 test pits below a depth of approximately 10.5 feet. We expect groundwater levels will rise during the winter and spring months.

In our opinion, the site conditions encountered are suitable for the planned development. The undisturbed native soils are suitable for supporting the proposed structures and pavements, provided the recommendations presented in this report are incorporated into project design and construction.

The native sandy soils are favorable for infiltration of site stormwater. However, seasonal high groundwater levels can impact the design and function of the system. Therefore, we recommend monitoring groundwater levels at the site through the winter and spring.

Mr. Scott Darling
November 17, 2000

We appreciate the opportunity to be of service during this phase of the subject project and look forward to working with you during the final design and construction phases. We trust the information presented is sufficient for your current needs. If you have any questions or require additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

John C. Sadler

John C. Sadler, R.P.G.
Project Engineering Geologist

Theodore F. Schepper 11/17/00

Theodore F. Schepper, P.E.
Principal Engineer 26742

JCS/TJS:dvp

EXPIRES 6/18/01

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**Preliminary Geotechnical Report
Biver Property
4000 Block of 175th Place NE
Arlington, Washington**

1.0 PROJECT DESCRIPTION

The proposed project will be a residential development. Detailed building and development plans were not available at the time of our study. Site stormwater will be collected and routed to an on-site detention pond or infiltration facility. Design information for the detention pond/infiltration facility is currently not available; however, we understand that it will likely be located in either the northwestern or southeastern portion of the site.

The recommendations contained in the following sections of this report are based on limited site development information. Therefore, our recommendations should be considered preliminary. We should review final design drawings and specifications to verify that our recommendations have been properly interpreted and incorporated into project design.

2.0 Scope of Work

On November 2, 2000, we excavated 5 test pits to a maximum depth of 11 feet below existing surface grades. Using the information obtained from the subsurface exploration, we performed analyses to develop preliminary geotechnical recommendations for project design and construction. Specifically, this report addresses the following:

- Soil and groundwater conditions
- Suitability of native soils for use as fill
- Site preparation and grading
- Excavations
- Stormwater detention/infiltration
- Foundations
- Slabs-on-grade
- Drainage
- Utilities
- Pavements

3.0 SITE CONDITIONS

3.1 Surface

The site is an undeveloped, approximately eight-acre parcel located west of 43rd Avenue NE and north of 172nd Street NE in the Smokey Point area of Arlington, Washington. The approximate location of the site is shown on Figure 1.

The site is relatively flat and is vegetated primarily with mature coniferous trees and low brush. The site is bordered by residential and undeveloped properties.

3.2 Soils

The soils encountered in the test pits generally consist of four to ten inches of duff/sod and topsoil overlying two to four feet of medium dense, fine-grained sand with silt to silty sand. These soils are, in turn, underlain by predominantly fine-grained sands containing occasional gravel. The sand is generally dry to moist to depths of about ten feet, then becomes moist to wet.

We encountered wet to water-bearing, fine- to coarse-grained gravelly sand to sandy gravel below a depth of ten feet in Test Pits TP-2 and TP-4, located in the northeastern and southeastern portions of the site, respectively. Both of these test pits were terminated in the gravelly sand/sandy gravel at a depth of 11 feet below the existing surface grade.

The *Geologic Map of the Arlington West 7.5 Minute Quadrangle, Snohomish County, Washington*, by James P. Minard (1985), shows the soils in the vicinity of the site belonging to the Marysville sand member of the Vashon recessional outwash. These soils are classified as well-drained sand with fine gravel overlying till. The soils we observed in our test pits are generally consistent with the classification of well-drained sand with fine gravel.

Figures A-2 through A-4 in Appendix A present detailed descriptions of the subsurface conditions encountered in the test pits. The approximate test pit locations are shown on Figure 2.

3.3 Groundwater

We encountered moderate groundwater seepage in Test Pits TP-2 and TP-4 below a depth of approximately 10.5 feet. The seepage at these locations occurred from fine- to coarse-grained gravelly sand to sandy gravel.

Fluctuations in the groundwater levels will occur on a seasonal basis. Given the time of year our exploration was performed, it is our opinion that the groundwater levels observed have not yet reached their seasonal high levels. Based on our experience in the vicinity of the site, the seasonal fluctuations in groundwater levels can be several feet.

We installed slotted PVC standpipes in Test Pits TP-1, TP-4, and TP-5 to allow future measurements of groundwater levels at those locations. Test Pits TP-1 and TP-4 are located in possible locations of stormwater infiltration facilities.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 General

The proposed project is feasible from a geotechnical standpoint. The primary geotechnical issue is the potential impacts groundwater could have on site excavations and the stormwater detention/infiltration facility.

The soil conditions encountered below the upper two to four feet are favorable for on-site infiltration. However, the groundwater table will limit the maximum depth and the infiltration capability of the system. The groundwater level we encountered at the site is currently about 10.5 feet below existing surface grades. We expect that the groundwater table will rise during the winter and spring. Potential groundwater impacts to the development should be evaluated by monitoring groundwater levels at the site through the winter and spring months.

Residences can be supported on conventional spread footing foundations bearing on competent native soils below the upper 6 to 12 inches of surficial soils. Alternatively, if required by desired final building elevations, structural fill placed and compacted above these native soils can be used to support the building foundations. Floor slabs and pavements can be similarly supported.

The following sections provide detailed recommendations regarding these issues and other geotechnical design considerations. These recommendations should be incorporated into the final design drawings and construction specifications.

4.2 Site Preparation and Grading

To prepare the site for construction, all vegetation, organic surface soils, and other unsuitable materials should be stripped and removed from the site. Surface stripping depths of about 6 to 12 inches should be expected to remove organic topsoil. Organic topsoil will not be suitable for use as structural fill, but may be used for limited depths in non-structural areas or for landscaping purposes.

Once clearing and grubbing operations are complete, cut and fill operations to establish desired grades can be initiated. Prior to placing fill, we recommend proofrolling all exposed surfaces to determine if any isolated soft and yielding areas are present. Proofrolling should also be performed in cut areas that will provide direct support for new construction. A representative of Terra Associates, Inc., should observe all proofrolling operations. We also recommend field evaluations at the time of construction to verify stable subgrades.

If excessively yielding areas are observed and they cannot be stabilized in place by compaction, they should be cut to a firm subgrade and filled to grade with structural fill. If the depth of excavation to remove unstable soils is excessive, use of a geotextile fabric, such as Mirafi 500X or equivalent, in conjunction with structural fill can be considered in order to limit the depth of removal. In general, a minimum of 18 inches of a clean, granular structural fill over the geotextile fabric should establish a stable bearing surface.

In general, the on-site soils appear suitable for use as structural fill. The upper two to four feet of the site soils contain as much as 13 percent fines (silt and clay size particles) and will be difficult to compact as structural fill when too wet. The ability to use these soils from site excavations as structural fill will depend on their moisture content and the prevailing weather conditions at the time of construction. Additionally, the relatively clean sands found beneath the site may be difficult to adequately compact if the fill soil is not confined, and if the soil is excavated from beneath the water table.

If grading activities must take place during wet weather or on a wet subgrade, the owner should be prepared to use wet weather structural fill. For this purpose, we recommend using a granular soil that meets the following grading requirements:

U.S. Sieve Size	Percent Passing
6 inches	100
No. 4	75 maximum
No. 200	5 maximum*

*Based on the 3/4 inch fraction.

Our grain-size analysis indicates that the fine-grained sands encountered beneath the silty surficial soils generally do not meet the above-recommended gradation. However, when excavated, they should be suitable for reuse as structural fill. Prior to use, Terra Associates, Inc., should examine and test all on-site or imported materials proposed for use as structural fill.

Structural fill should be placed in uniform loose layers not exceeding 12 inches and then compacted to a minimum of 95 percent of the soil's maximum dry density, as determined by ASTM Test Designation D-698 (Standard Proctor). The moisture content of the soil at the time of compaction should be within two percent of its optimum, as determined by this same standard. In non-structural areas or for backfill in utility trenches below a depth of 4 feet, the degree of compaction could be reduced to 90 percent.

4.3 Excavations

All excavations at the site associated with confined spaces, such as utility trenches, must be completed in accordance with local, state, or federal requirements. Based on current Occupational Safety and Health Administration (OSHA) regulations, the on-site soils would generally be classified as Group C soils.

Based on existing information, we expect excavations to encounter moderate to heavy groundwater seepage below a depth of approximately 10.5 feet, depending on the site location. Dewatering should be anticipated if excavations will approach these depths, or if work must proceed during the winter or spring. During the winter and spring, we expect the depths to groundwater will be shallower. For excavations above the water table or for those adequately dewatered, side slopes should be laid back at a minimum gradient of 1.5:1 (Horizontal:Vertical).

this information is provided solely for the benefit of the owner and other design consultants, and should not be construed to imply that Terra Associates, Inc. assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

4.4 Stormwater Detention/Infiltration

4.4.1 Detention Pond

Design information regarding stormwater detention is currently not available. It will be necessary to determine seasonal high groundwater levels in order to address potential impacts to the design volume capacity of the pond and pond side slope stability due to groundwater seepage.

If pond berms will be constructed, the berm locations should be stripped of topsoil, duff, and soils containing organic material prior to the placement of fill. Berm fill should be placed and compacted as structural fill, as described in Section 4.2 of this report. Soils to be used as berm fill should consist of an inorganic soil with at least 20 percent fines passing the No. 200 sieve. We did not encounter any on-site soils meeting this criterion. Terra Associates, Inc. should examine and test all materials (on-site or imported) proposed for use as berm fill.

Exterior berm slopes should be graded to a finished inclination no steeper than 2:1. Due to exposure to fluctuating stored water levels, the medium dense outwash sands exposed on the interior side slopes of the ponds may be subject to some risk of periodic shallow instability or sloughing. Establishing interior slopes at a 3:1 gradient will significantly reduce or eliminate this potential. Finished slope faces should be thoroughly compacted and vegetated to guard against erosion.

4.4.2 Infiltration

As previously discussed, soils observed in the proposed infiltration areas consist primarily of outwash sands with varying amounts of gravel. In our opinion, these soil conditions will support discharge of stormwater by infiltration. However, the design and function of the infiltration facility will depend on its depth and the seasonal high groundwater table. The seasonal high groundwater table should be determined by monitoring groundwater levels through the winter and spring. For preliminary design purposes, we recommend using an infiltration rate of four inches per hour.

4.5 Foundations

Spread Footings

Residential structures may be supported on conventional spread footing foundations bearing on competent soils or on structural fills placed above competent soils. Foundation subgrades should be prepared as recommended in Section 4.2 of this report. Perimeter foundations exposed to the weather should bear at a minimum depth of 1.5 feet below final exterior grades for frost protection. Interior foundations can be constructed at any convenient depth below the floor slab.

We recommend designing foundations for a net allowable bearing capacity of 2,500 pounds per square foot (psf). For short-term loads, such as wind and seismic, a one-third increase in this allowable capacity can be used. With the anticipated loads and this bearing stress applied, building settlements should be less than one-half inch.

For designing foundations to resist lateral loads, a base friction coefficient of 0.4 can be used. Passive earth pressures acting on the sides of the footings and buried portions of the foundation stem walls can also be considered. We recommend calculating this lateral resistance using an equivalent fluid weight of 300 pounds per cubic foot (pcf). We recommend not including the upper 12 inches of soil in this computation because it can be affected by weather or disturbed by future grading activity. This value assumes the foundation will be constructed neat against competent soil or backfilled with structural fill, as described in Section 4.2 of this report. The passive value recommended includes a safety factor of 1.5.

4.6 Slabs-on-Grade

Slabs-on-grade may be supported on the subgrade prepared as recommended in Section 4.2 of this report. Immediately below the floor slab, we recommend placing a four-inch thick capillary break layer of clean, free-draining sand or gravel that has less than three percent passing the No. 200 sieve. This material will reduce the potential for upward capillary movement of water through the underlying soil and subsequent wetting of the floor slab. The capillary break material will not be necessary where native subslab soils consist of clean sand. Additional testing will be required to verify the suitability of the native sands for this purpose.

Where moisture by vapor transmission is undesirable, a durable plastic membrane should be placed below the slab, on top of the capillary break, if used. The membrane should be covered with one to two inches of clean, moist sand to guard against damage during construction and to aid in curing of the concrete.

4.7 Drainage

Surface

Final exterior grades should promote free and positive drainage away from the building areas at all times. Water must not be allowed to pond or collect adjacent to foundations or within the immediate building area. We recommend providing a gradient of at least three percent for a minimum distance of ten feet from the building perimeter, except in paved locations. In paved locations, a minimum gradient of one percent should be provided, unless provisions are included for collection and disposal of surface water adjacent to structures.

Subsurface

We recommend installing a continuous drain along the outside lower edge of the perimeter building foundations. Subsurface drains must be laid with a gradient sufficient to promote positive flow to the discharge point. The foundation drains and roof downspouts should be tightlined separately to an approved point of controlled discharge.

4.8 Utilities

Utility pipes should be bedded and backfilled in accordance with American Public Works Association (APWA) or City of Arlington specifications. As a minimum, trench backfill should be placed and compacted as structural fill, as described in Section 4.2 of this report.

Soils excavated on-site should be suitable for use as backfill material if they are above the water table. Based on existing information, the groundwater table will be encountered in utility excavations extending to and below a depth of approximately 10.5 feet. If construction takes place during the winter or spring, the depth to groundwater will likely be shallower. If proposed elevations of buried utilities will extend beneath the water table, dewatering will be necessary, and excavations may need to be provided with temporary shoring support. It may also be necessary to provide measures for uplift resistance of buried utilities if located below the groundwater table.

4.9 Pavements

Pavements should be constructed on subgrades prepared as described in Section 4.2 of this report. Regardless of the degree of relative compaction achieved, the subgrade must be firm and relatively unyielding before paving. Proofrolling the subgrade with heavy construction equipment should be completed to verify this condition.

The pavement design section is dependent upon the supporting capability of the subgrade soils and the traffic conditions to which it will be subjected. Traffic at the residential development will mainly consist of light passenger and commercial vehicles with only occasional heavy traffic in the form of moving trucks and trash removal vehicles. Based on this information, with a stable subgrade prepared as recommended, we recommend the following pavement sections:

- Two inches of asphalt concrete (AC) over four inches of crushed rock base (CRB)
- Two inches of AC over three inches of asphalt-treated base (ATB)

The paving materials used should conform to the Washington State Department of Transportation (WSDOT) specifications for AC, ATB, and CRB.

Long-term pavement performance will depend on surface drainage. A poorly-drained pavement section will be subject to premature failure as a result of surface water infiltrating into the subgrade soils and reducing their supporting capability. For optimum performance, we recommend surface drainage gradients of at least two percent. Some degree of longitudinal and transverse cracking of the pavement surface should be expected over time. Regular maintenance should be planned to seal cracks when they occur.

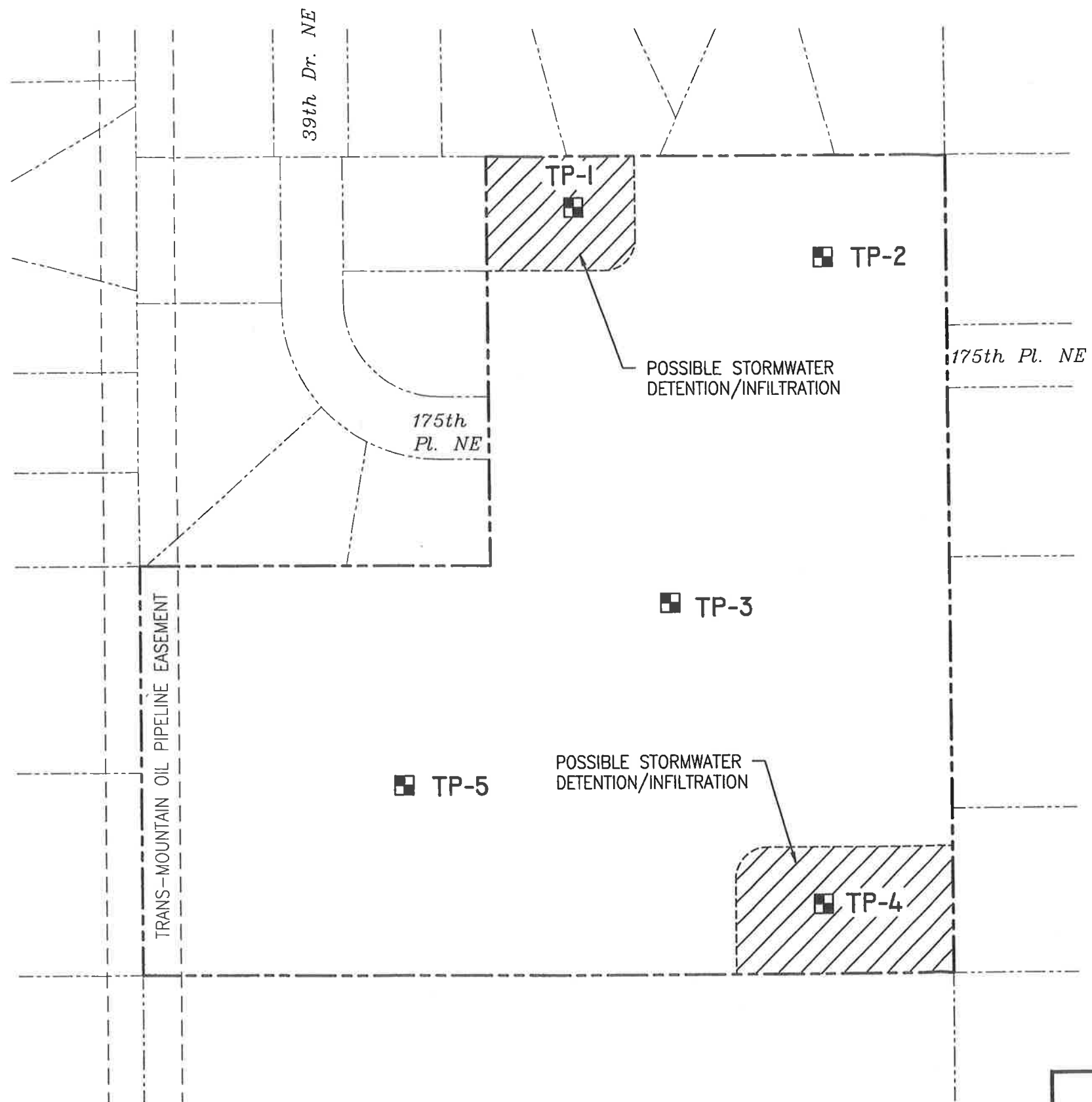
5.0 ADDITIONAL SERVICES

Terra Associates, Inc. should review the final design and specifications in order to verify that earthwork and foundation recommendations have been properly interpreted and incorporated into the project design. We should also provide geotechnical services during construction in order to observe compliance with the design concepts, specifications, and recommendations. This will allow for design changes if subsurface conditions differ from those anticipated prior to the start of construction.

6.0 LIMITATIONS

We prepared this report in accordance with generally accepted geotechnical engineering practices. This report is the property of Terra Associates, Inc., and is intended for specific application to the Biwer Property project. This report is for the exclusive use of Darling Investment and their authorized representatives. No other warranty, expressed or implied, is made.

The analyses and recommendations presented in this report are based upon data obtained from the test pits excavated on-site. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, Terra Associates, Inc. should be requested to re-evaluate the recommendations in this report prior to proceeding with construction.



LEGEND:

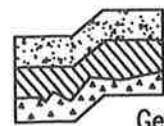
■ APPROXIMATE TEST PIT LOCATION

REFERENCE:

UNDATED PLAT SKETCH PREPARED BY STEWART TITLE COMPANY.

NOTE:

THIS SITE PLAN WAS CREATED USING DIMENSIONS AND LOCATIONS FOUND ON A FACSIMILE OF THE REFERENCED SITE PLAN. DUE TO DISTORTION COMMON WITH THIS PROCESS, ALL LOCATIONS AND DIMENSIONS SHOWN ARE TO BE CONSIDERED APPROXIMATE.



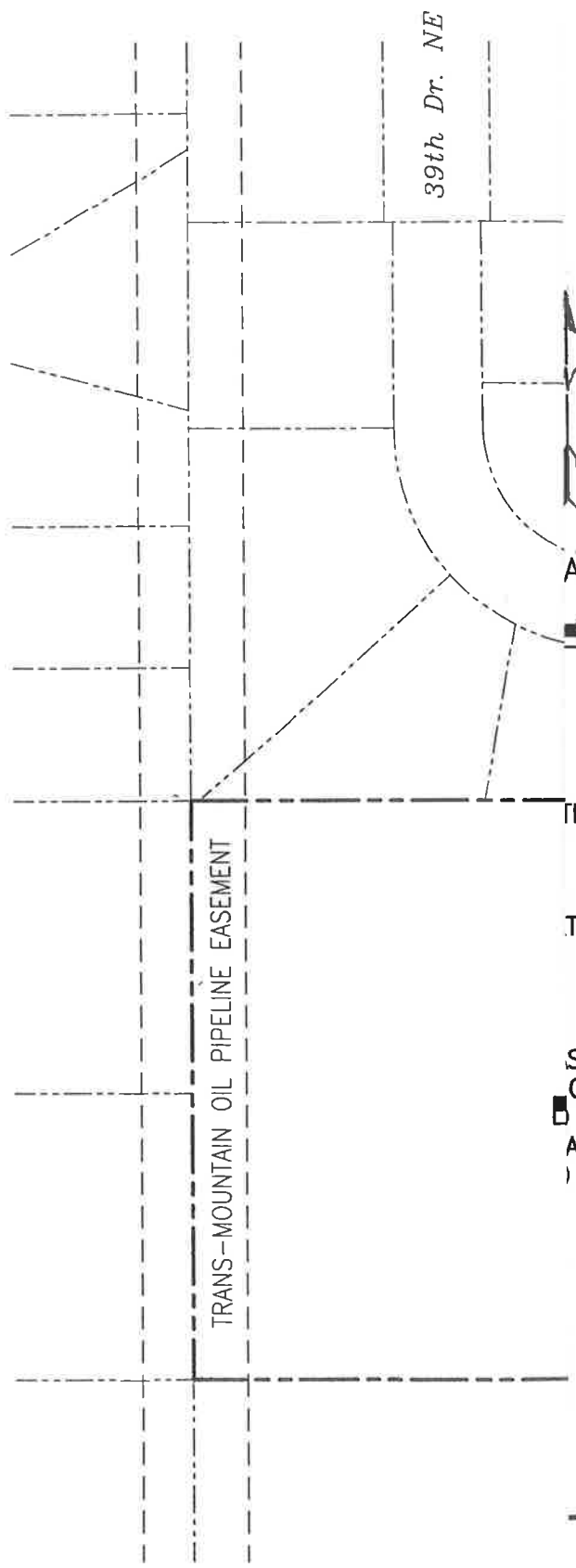
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EXPLORATION LOCATION PLAN
BIWER PROPERTY
ARLINGTON, WASHINGTON

Proj.No. 4806

Date NOV. 2000

Figure 2



ATE SCALE
100 200 feet

TEST PIT LOCATION

DRAWN BY STEWART

THIS PLAN WAS CREATED USING DIMENSIONS AND
 ON A FACSIMILE OF THE REFERENCED
 DISTORTION COMMON WITH THIS
 MAP. DIMENSIONS AND DIMENSIONS SHOWN ARE
 APPROXIMATE.

EXPLORATION LOCATION PLAN BIWER PROPERTY ARLINGTON, WASHINGTON		
Proj.No. 4806	Date NOV. 2000	Figure 2

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

Biwer Property
Arlington, Washington

On November 2, 2000, we performed our field exploration using a rubber-tired backhoe. We explored subsurface soil and groundwater conditions at the site by excavating 5 test pits to a maximum depth of 11 feet below existing surface grades. The test pit locations are shown on Figure 2. The test pit locations were approximately determined by pacing from known landmarks. The test pit logs are presented as Figures A-2 through A-4.

An engineering geologist from our office maintained a log of each test pit as it was excavated, classified the soil conditions encountered, and obtained representative soil samples. All soil samples were visually classified in accordance with the Unified Soil Classification System. A copy of this classification is presented as Figure A-1.

Representative soil samples obtained from the test pits were placed in sealed plastic bags and taken to our laboratory for further examination and testing. The moisture content of each sample was measured and is reported on the test pit logs. Grain size analyses were performed on nine of the samples. The results of the grain size analyses are presented as Figures A-5 through A-9.

A three-fourths inch diameter slotted PVC pipe was placed vertically in Test Pits TP-1, TP-4, and TP-5 prior to backfilling. These pipes were installed to provide a means for future measurements of groundwater levels at those locations.

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS More than 50% material larger than No. 200 sieve size	GRAVELS More than 50% of coarse fraction is larger than No. 4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS More than 50% of coarse fraction is smaller than No. 4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines.
			SP	Poorly-graded sands or gravelly sands, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS More than 50% material smaller than No. 200 sieve size	SILTS AND CLAYS Liquid limit is less than 50%		ML	Inorganic silts, rock flour, clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, (lean clay).
			OL	Organic silts and organic clays of low plasticity.
	SILTS AND CLAYS Liquid limit is greater than 50%		MH	Inorganic silts, elastic.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat.

DEFINITION OF TERMS AND SYMBOLS

SAND or GRAVEL	<u>Density</u>	<u>Standard Penetration Resistance in Blows/Foot</u>	I 2" OUTSIDE DIAMETER SPLIT SPOON SAMPLER II 2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER ▼ WATER LEVEL (DATE) Tr TORVANE READINGS, tsf Pp PENETROMETER READING, tsf DD DRY DENSITY, pounds per cubic foot LL LIQUID LIMIT, percent PI PLASTIC INDEX N STANDARD PENETRATION, blows per foot
	Very loose	0-4	
Loose	4-10		
Medium dense	10-30		
Dense	30-50		
Very dense	>50		
SILT or CLAY	<u>Consistency</u>	<u>Standard Penetration Resistance in Blows/Foot</u>	
	Very soft	0-2	
	Soft	2-4	
	Medium stiff	4-8	
	Stiff	8-16	
	Very stiff	16-32	
Hard	>32		



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**UNIFIED SOIL CLASSIFICATION SYSTEM
BIWER PROPERTY
ARLINGTON, WASHINGTON**

Proj. No. T-4806

Date NOV 2000

Figure A-1

Test Pit No. TP-1

Logged by: JCS

Date: 11/2/00

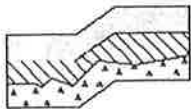
Depth (ft.)	Soil Description	Moisture Content (%)	
0	4 inches DUFF and TOPSOIL. Rusty brown SAND with silt to silty SAND, fine grained, medium dense, moist. (SW-SM/SM) With roots and occasional fine gravel.	11	
	Light grayish-brown SAND with silt to silty SAND, fine grained, medium dense, dry to moist. (SP-SM/SM) Slightly mottled.	4	
5	Light gray SAND, fine grained, medium dense, dry to moist. (SP) With a few fine gravel. Grain size appears to increase with depth.	4	
10	Test pit terminated at approximately 9 feet. No groundwater seepage. Installed 3/4-inch diameter PVC standpipe.		
15			

Test Pit No. TP-2

Logged by: JCS

Date: 11/2/00

Depth (ft.)	Soil Description	Moisture Content (%)	
0	4 inches DUFF and TOPSOIL. Rusty brown SAND with silt to silty SAND, fine grained, medium dense, moist. (SP-SM/SM) With roots and occasional fine gravel.		
	Gray SAND, fine to medium grained, medium dense, moist. (SP) With a few fine gravel. Grain size appears to increase with depth.	8	
5			
10	Gray gravelly SAND, fine to coarse sand, fine to coarse gravel, medium dense, wet. (SP)	18 6	▼
15	Test pit terminated at approximately 11 feet. Moderate groundwater seepage at approximately 10.5 feet.		



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**TEST PIT LOGS
BIWER PROPERTY
ARLINGTON, WASHINGTON**

Proj. No. T-4806

Date NOV 2000

Figure A-2

Test Pit No. TP-3

Logged by: JCS

Date: 11/2/00

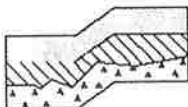
Depth (ft.)	Soil Description	Moisture Content (%)	
0	6 inches DUFF and TOPSOIL. Rusty brown SAND with silt to silty SAND, fine grained, medium dense, moist. (SP-SM/SM) With roots and occasional fine gravel.		
5	Light gray SAND, fine grained, medium dense, dry to moist. (SP) With a few fine gravel.		
10	Test pit terminated at 10 feet. No groundwater seepage.		
15			

Test Pit No. TP-4

Logged by: JCS

Date: 11/2/00

Depth (ft.)	Soil Description	Moisture Content (%)	
0	6 inches SOD and TOPSOIL. Rusty brown SAND with silt to silty SAND, fine grained, medium dense, moist. (SP-SM/SM) With roots and occasional fine gravel.		
5	Light gray SAND, fine grained, medium dense, dry to moist. (SP) With a few fine gravel.	4	
10	Gray gravelly SAND to sandy GRAVEL, fine to coarse sand, fine to coarse gravel, medium dense, wet. (SW/GW)	10	▼
15	Test pit terminated at approximately 11 feet. Moderate groundwater seepage at approximately 10.5 feet. Installed 3/4-inch diameter PVC standpipe.		



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**TEST PIT LOGS
BIWER PROPERTY
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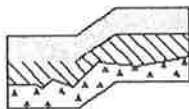
Proj. No. T-4806	Date NOV 2000	Figure A-3
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Test Pit No. TP-5

Logged by: JCS

Date: 11/2/00

Depth (ft.)	Soil Description	Moisture Content (%)	
0	10 inches SOD and TOPSOIL. Rusty-brown SAND with silt to silty SAND, fine grained, medium dense, moist. (SP-SM/SM) With roots and occasional fine gravel.		
5	Gray SAND, fine grained, medium dense, dry to moist. (SP) With a few fine gravel.	4	
10	Test pit terminated at approximately 10 feet. No groundwater seepage. Installed 3/4-inch diameter PVC standpipe.		
15			



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**TEST PIT LOGS
BIWER PROPERTY
ARLINGTON, WASHINGTON**

Proj. No. T-4806

Date NOV 2000

Figure A-4

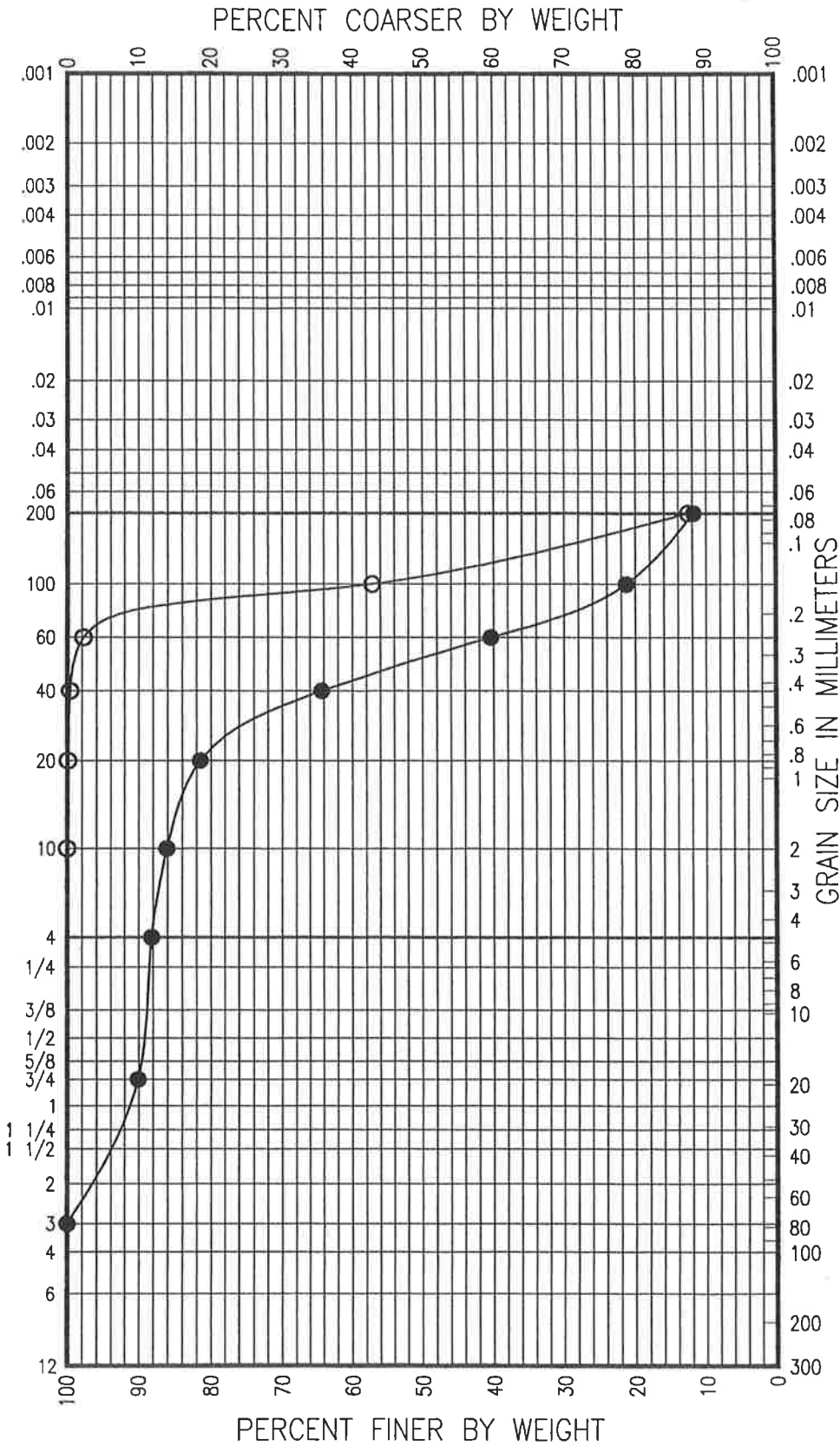
HYDROMETER ANALYSIS

GRAIN SIZE IN MM

SIEVE ANALYSIS

NUMBER OF MESH PER INCH, US STANDARD

SIZE OF OPENING IN INCHES



FINES

FINE

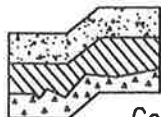
MEDIUM SAND

COARSE SAND

GRAVEL

COBBLES

Key	Test Pit Number	Depth (ft.)	USCS	Description	Moisture Content (%)	LL	PL
●	TP-1	1.0	SW-SM	SAND with silt and gravel			
○	TP-1	3.0	SM	silty SAND			



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GRAIN SIZE ANALYSIS
BIWER PROPERTY
ARLINGTON, WASHINGTON

Proj.No. 4806

Date NOV. 2000

Figure A-5

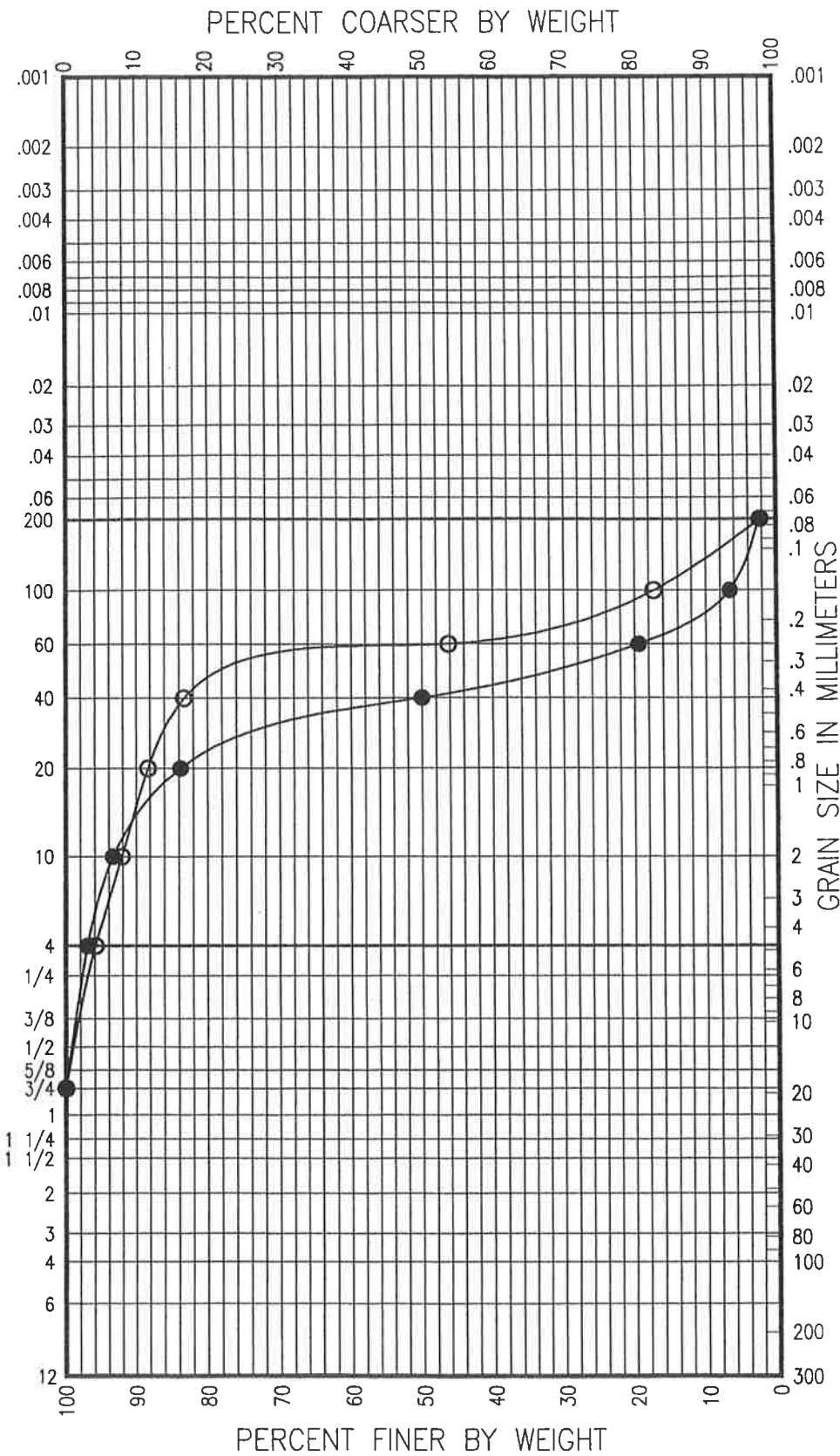
HYDROMETER ANALYSIS

GRAIN SIZE IN MM

SIEVE ANALYSIS

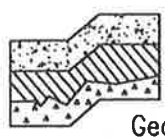
NUMBER OF MESH PER INCH, US STANDARD

SIZE OF OPENING IN INCHES



COBBLES | COARSE GRAVEL | FINE GRAVEL | SAND | FINE SAND

Key	Test Pit Number	Depth (ft.)	USCS	Description	Moisture Content (%)	LL	PL
●	TP-1	6.0	SP	SAND			
○	TP-2	3.0	SP	SAND			



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GRAIN SIZE ANALYSIS
BIWER PROPERTY
ARLINGTON, WASHINGTON

Proj.No. 4806

Date NOV. 2000

Figure A-6

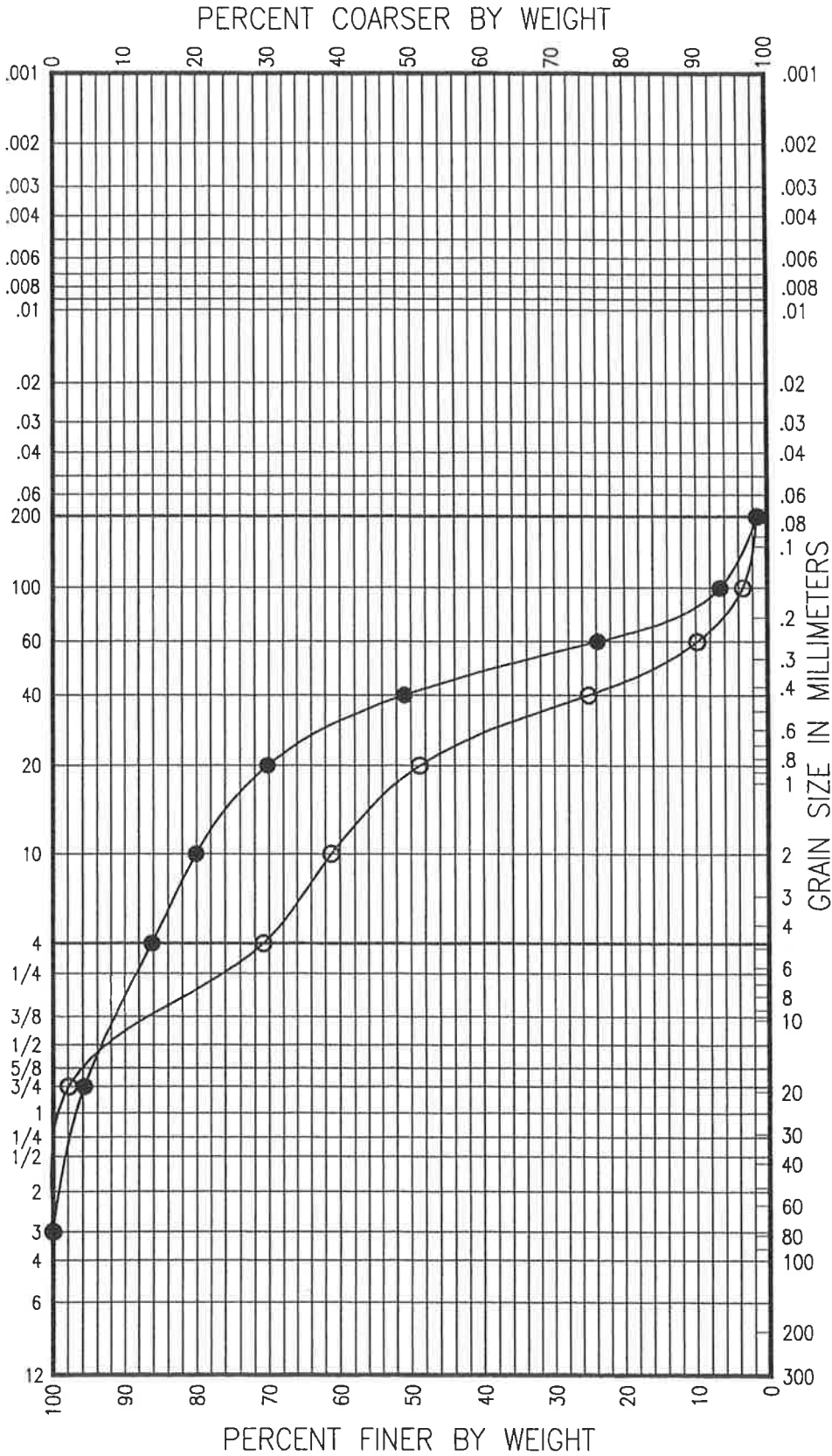
HYDROMETER ANALYSIS

GRAIN SIZE IN MM

SIEVE ANALYSIS

NUMBER OF MESH PER INCH, US STANDARD

SIZE OF OPENING IN INCHES



FINES

FINE

MEDIUM SAND

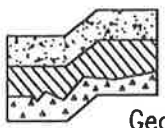
COARSE SAND

FINE GRAVEL

COARSE GRAVEL

COBBLES

Key	Test Pit Number	Depth (ft.)	USCS	Description	Moisture Content (%)	LL	PL
●	TP-2	10.0	SP	SAND with gravel			
○	TP-2	11.0	SP	gravelly SAND			



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GRAIN SIZE ANALYSIS
BIWER PROPERTY
ARLINGTON, WASHINGTON

Proj.No. 4806

Date NOV. 2000

Figure A-7

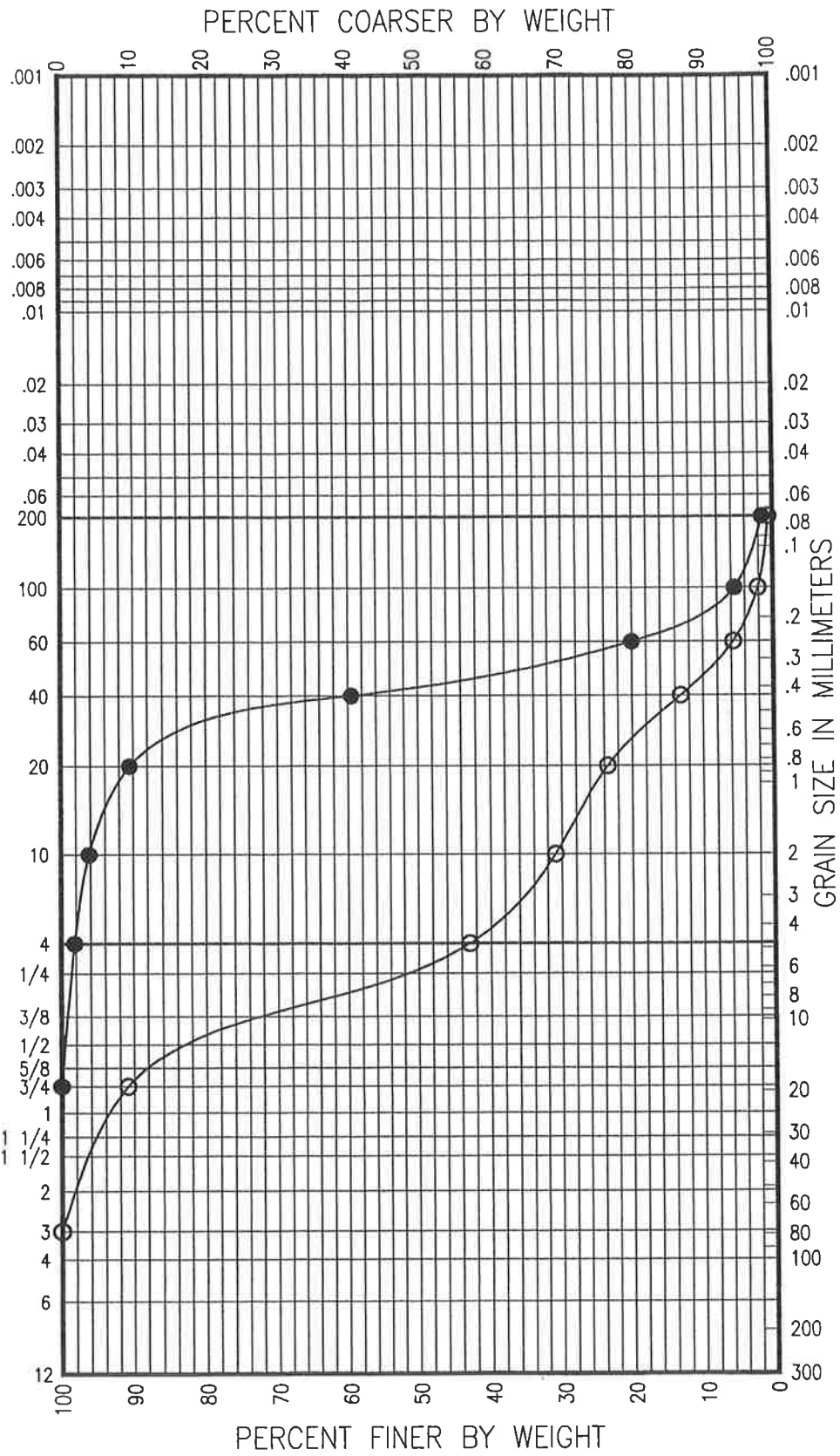
HYDROMETER ANALYSIS

SIEVE ANALYSIS

GRAIN SIZE IN MM

NUMBER OF MESH PER INCH, US STANDARD

SIZE OF OPENING IN INCHES



FINES

FINE

MEDIUM SAND

COARSE SAND

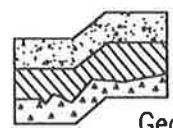
GRAVEL

GRAVEL

COARSE GRAVEL

COBBLES

Key	Test Pit Number	Depth (ft.)	USCS	Description	Moisture Content (%)	LL	PL
●	TP-4	6.0	SP	SAND			
○	TP-4	11.0	GW	sandy GRAVEL			



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GRAIN SIZE ANALYSIS
BIWER PROPERTY
ARLINGTON, WASHINGTON

Proj.No. 4806

Date NOV. 2000

Figure A-8

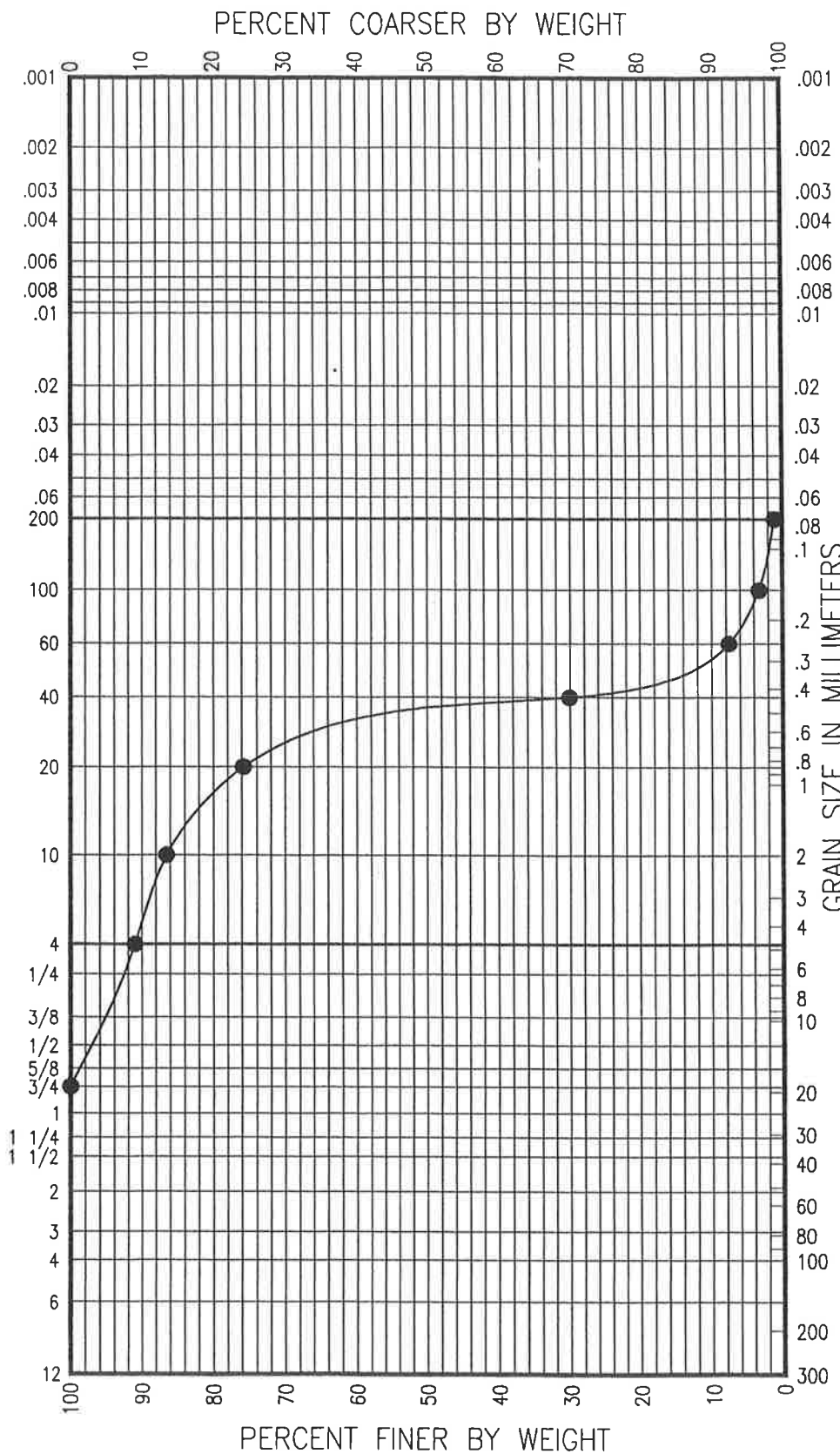
HYDROMETER ANALYSIS

SIEVE ANALYSIS

GRAIN SIZE IN MM

NUMBER OF MESH PER INCH, US STANDARD

SIZE OF OPENING IN INCHES



FINES

FINE

MEDIUM SAND

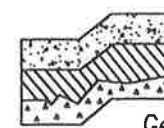
COARSE SAND

GRAVEL

COARSE GRAVEL

COBBLES

Key	●	Test Pit Number	TP-5	Depth (ft.)	7.0	USCS	SP	Description	SAND	Moisture Content (%)		LL		PL	
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GRAIN SIZE ANALYSIS
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