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GEORGIAN HEIGHTS PHASE 4 WETLAND AND STREAM MITIGATION PLAN

Prepared For:
Lakewood Construction
PO Box 12648
Mill Creek, Washington
98082

March 2005

RECEIVED
MAR 11 2005
CITY OF WOODINVILLE
PLANNING DEPARTMENT

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1.0 INTRODUCTION

Adolfson Associates, Inc. (Adolfson) performed wetland delineations and prepared this technical report for the Georgian Heights Phase 4 site, located in the City of Woodinville, Washington (Appendix A, Figure 1). This report includes a description of wetlands and streams, a functional assessment, project impacts, and mitigation measures, all summarized in this technical report. Raedeke Associates previously identified wetlands and streams on this site and reported their findings in 1988 (Raedeke, 1988).

2.0 PROJECT DESCRIPTION

Georgian Heights Phase 4 is a proposed 51-lot residential subdivision located immediately south of NE 205th Street, north of the Woodinville High School, and one lot west of 136th Avenue NE. Other project elements include a public road and cul-de-sac, a private access road, and utilities. Site drawings are provided in Appendix C, Sheet 1 of 1.

3.0 SITE DESCRIPTION

The Georgian Heights Phase 4 site is a 19.22-acre parcel. The site is mostly forested, with some areas dominated by shrubs (Appendix A, Figure 2)(Appendix B, Photo 1). Aerial photographs from 1936 and 1974 indicate vegetation clearing and a road on the north portion of the site (Appendix A, Figures 3 and 4). The presence of large stumps shows evidence of past logging on the site. Two unnamed streams and two wetlands are located on the site (Appendix C, Sheet 1 of 1).

3.1 Landscape Setting

The site is located within the Little Bear Creek sub-basin within the Sammamish River-Lake Washington watershed (WRIA 8). The site receives surface water from the west and slopes down to the east. Surface water flows from the site eventually enter Little Bear Creek east of the site.

The native forest cover in surrounding areas has changed dramatically in recent years altering site hydrology (Appendix A, Figures 2 through 4). Portions of the site and areas surrounding the site have been cleared for agriculture during the past century (Appendix A, Figures 3 and 4). In recent years residential development has resulted in the removal of native forest cover and increased impervious surfaces in the surrounding areas (Appendix A, Figure 2).

3.2 Onsite Wetlands and Streams

Adolfson scientists delineated wetlands and identified streams on the site on March 22, 25, and 30, 2004. Wetlands were delineated using the methods described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997).

3.2.1 Wetlands

Two wetlands are centrally located across most of the site (Appendix C, Sheet 1 of 1). These wetlands have similar hydrology, soils, and vegetation and are described together in this report. The hydrogeomorphic classification of these wetlands is depressional flow-through because they are located within topographic depressions and surface water flows through them to the east (Brinson, 1993). Each wetland has a stream flowing through from west to east. Both are considered to be palustrine forested wetlands, though their forest canopies are open (Cowardin et al., 1979)(Appendix B, Photo 1). Wetland data sheets are provided in Appendix G.

Hydrology. The two main sources of wetland hydrology include groundwater seepage from upslope areas and surface water from two small streams flowing through each of the two wetlands. Soils were saturated to the surface with areas of surface inundation during the March site visits.

New point sources of wetland hydrology include stormwater from upslope urban developments, some of which has been redirected to flow onto the site. Two new residential subdivisions, Creekside II and Leckner located adjacent to the site to the west have redirected surface water flows that used to be retained and infiltrated by native forest into new storm drainage systems that direct surface water flows onto the site (Appendix A, Figure 2)(Appendix B, Photos 2 through 4)(Appendix D). In addition, surface water from the Leckner plat that would normally have flowed onto the Woodinville High School site as indicated by existing contours on the Leckner drawing in Appendix D was rerouted into a stormwater system that directs surface water flows onto the Georgian Heights Phase 4 site.

Soils. As noted in Raedeke (1988) soils varied in wetlands from organic muck and peat in lower areas to silt and sand loams in areas at slightly higher elevations. A typical wetland soil profile consists of organic muck from the surface to 7 inches in depth, black (10YR 2/1) gravelly silt loam from 7 to 10 inches in depth, and gravel from 10 to 16 inches in depth.

Vegetation. Wetlands are forested with an open canopy with some areas dominated by shrubs (Appendix B, Photos 1 and 6). Dominant trees include red alder and western red cedar. Douglas fir and western hemlock, normally upland species, are scattered throughout the wetlands on small hummocks. Dominant shrubs include salmonberry, vine maple (on hummocks), and Himalayan blackberry near the wetland boundaries. The dominance of Himalayan blackberry on the site throughout the upland buffer and wetland areas near the wetland boundary was not noted in the 1988 Raedeke report, this species has likely spread on the site since 1988. Dominant herbs include skunk cabbage, lady fern, and youth-on-age.

Wetland Functions and Values. Wetland functions and values were evaluated using the Washington State Department of Transportation (WSDOT) methods for assessing wetland functions for linear projects (Null et al., 2000). The results of the functions and values assessment for the wetland areas are presented in Appendix E. The importance of different wetland functions has likely changed in recent years due to urban development. At this time the principal wetland functions on this site include flood flow alteration and water quality treatment because of the influx of stormwater from upslope areas due to recent urban development and the capacity of these wetlands to contain and treat stormwater (Appendix B, Photos 1 through 4).

Surface water moves slowly through wetland soils and vegetation, and high micro relief in the wetlands provides ample surfaces for the deposition of sediments and nutrient uptake to occur. Though not specified in Null et al. (2000), groundwater and stream baseflow support are important functions provided by onsite wetlands.

Other important wetland functions include organic export, native plant richness, habitat for invertebrates, amphibians, birds, and mammals, and erosion control. Deciduous trees, shrubs, and herbs enrich the wetland soils with organic matter and organic material is exported downstream to Little Bear Creek by two small streams flowing through the wetlands. The wetlands are composed of a relatively diverse native plant community typical of the region. Habitat features include deciduous snags, large woody debris, seasonal and perennially inundated areas, dense shrub thickets, large conifer and deciduous trees, leaf litter, berries, nuts, and seeds. Stream channels appear to be stabile. Mature trees within the wetlands provide some heritage value.

Human activities are negatively affecting wetland functions and values on the site. The vegetation in buffer and wetland areas is disturbed in some areas and evidence of human habitation and children's play activities is apparent (Appendix B, Photo 5). Wetland functions are also negatively affected by the recent spread of non-native invasive species, mostly in wetland buffer areas and near the wetland boundaries (Appendix B, Photos 7 and 8).

3.2.2 Streams

Two streams flow through the site. They enter the site from the slopes to the west and flow generally east to Little Bear Creek. One stream flows through Wetland A, the other flows through Wetlands B. They are seasonal streams with unconsolidated silt and sand substrates. The streams are not accessible to migrating fish and they do not appear to provide suitable fish habitat for resident fish either.

4.0 REGULATORY IMPLICATIONS

Wetlands and streams are regulated by the City of Woodinville in accordance with the Woodinville Municipal Code (WMC) Chapter 21.24 Development Standards – Critical Areas. Wetlands A and B are considered to be Class II wetlands because they are more than one acre in size (WMC 21.24.320). According to WMC 21.24.330 Class II wetlands are required to have a 100-foot buffer, or the buffer may be reduced to 50 feet with enhancement. Class II wetlands impacted by development must be replaced on-site on a 2:1 basis with equivalent or greater biologic functions (WMC 21.24.350).

The streams on-site would most likely be considered Type 4 streams, which are intermittent or ephemeral during years of normal rainfall and which are not used by fish (WMC 21.24.370). *A Catalog of Washington Streams and Salmon Utilization* (1975) does not show that the on-site streams support salmon species although they are tributaries to Little Bear Creek which does have salmonids present. Based on WMC 21.24.380, Class 4 streams shall have 50-foot buffers or reduced 35-foot buffers with enhancement.

According to WMC 21.24.340(8), road crossings may be allowed to impact wetlands if the following conditions are met:

(a) The Planning Director determines that no alternative access is practical;

(b) All crossings minimize impact to the wetland and provide mitigation for unavoidable impacts through restoration, enhancement or replacement of disturbed areas;

(c) Crossings do not change the overall wetland hydrology;

(d) Crossings do not diminish the flood storage capacity of the wetland; and

(e) All crossings are constructed during summer low water periods.

According to WMC 21.24.390(6) stream crossings may be allowed as long as the following conditions are met:

(a) All crossings use bridges or other construction techniques in accordance with best management proactices, which do not disturb the stream bed or bank, except that bottomless culverts or other appropriate methods demonstrated to provide fisheries protection may be used for Type 2 or 3 streams if the applicant demonstrates that such methods and their implementation will pose no harm to the stream or inhibit migration of fish;

(b) All crossings are constructed during the summer low flow and are timed to avoid stream disturbance during periods when use is critical to salmonids;

(c) Crossings do not occur over salmonid spawning areas unless the Planning Director determines that no other possible crossing site exists;

(d) Bridge piers or abutments are not placed within the FEMA floodway or the ordinary high water mark;

(e) Crossings do not diminish the flood-carrying capacity of the stream;

(f) Underground utility crossings are laterally drilled and located at a depth of four feet below the maximum depth of scour for the base flood predicted by a civil engineer licensed by the State of Washington; and

(g) Crossings are minimized and serve multiple purposes and properties whenever possible.

Utilities may be allowed in wetland or stream buffers provided that the conditions outlined in WMC 21.24.340(3) and 21.24.390(3) are met. Utility corridors in buffers must be revegetated with native vegetation.

5.0 PROJECT IMPACTS

Project elements that will affect wetlands, streams, and buffers include roads, utilities, and lot development (Appendix C, Sheet 1 of 1). New roads will cross the unnamed stream on the north portion of the site at two locations, a narrow band of wetland area associated with the stream will also be crossed at these two locations. A road cul-de-sac will cross a narrow finger of wetland dominated by shrubs in the southwest portion of the site (Appendix B, Photo 6). The total wetland fill resulting from these road crossings is estimated to be 0.08 acre in size. Underground utilities including water and sewer lines will be installed in wetland and stream buffer areas near the south site boundary. Utilities will be installed by boring beneath wetland areas to avoid wetland impacts.

Buffer reduction of the standard 100-foot wetland buffer to 50 feet will be used throughout the site to allow for the development of 51 residential lots. Mitigation for buffer reduction will include wetland and buffer enhancement in areas currently dominated by non-native invasive species. The total enhancement area is estimated to be 38,244 square feet in size. A variance has been requested from the City for reducing the buffer to less than 50 feet in a few locations.

6.0 MITIGATION MEASURES

The complete mitigation plan drawings are provided in Appendix F. This section of the report discusses mitigation sequencing, the type of wetland and buffer mitigation to be provided, and a functional analysis of post development wetland and stream conditions and how they will compare with existing conditions. Goals and objectives, performance standards, monitoring, and maintenance requirements for the wetland and buffer enhancement areas are provided in Appendix F, Sheet 3 of 3.

6.1 Mitigation Sequencing

The use of mitigation sequencing is generally required for limiting and reducing impacts to sensitive areas such as wetlands and streams. Mitigation sequencing has been followed for this project and includes the sequence of avoidance, minimization, restoration, and compensatory mitigation.

Avoidance. All residential lots have been located outside of wetland and stream areas. Utilities will be installed by boring beneath wetland areas to avoid wetland impacts.

Minimization. Direct wetlands and stream impacts are limited to road crossings required for access to new lots. Wetland and stream road crossings are designed to meet the requirements of WMC 21.24.320 and WMC 21.24.360. Minimum lot sizes and the clustering of lots are used to avoid impacts to the wetlands, streams, and buffers that encompass most of this site.

Restoration. All buffer areas temporarily disturbed by construction such as the utility line corridor and any areas disturbed adjacent to new lots or roads will be revegetated with native vegetation once construction is complete in these areas.

Compensatory Mitigation. Mitigation plans are provided in Appendix F, Sheets 1 through 3 of 3. Compensatory mitigation calculations are shown in Appendix C, Sheet 1 of 1. To compensate for 0.08 acre (approximately 3,600 square feet) of wetland impact, new wetlands will be created at a 2:1 ratio. Approximately 7,226 square feet of wetland will be created near NE 205th Street adjacent to the existing wetland boundary. New wetland hydrology will be accomplished using surface water that has been treated by onsite stormwater treatment facilities and limited grading to spread surface water across the surface. Only a few trees currently exist in the wetland creation area, these trees will be retained to the extent possible while clearing and grading to create wetland conditions.

Mitigation for wetland and stream buffer reduction includes wetland and buffer enhancement of areas currently dominated by Himalayan blackberry and reed canarygrass. Wetland and buffer areas will be enhanced by the removal of non-native, invasive plant species and replanting with native vegetation. The area of wetland enhancement is estimated to be 19,861 square feet and the area of buffer enhancement is estimated to be 18,383 square feet.

In summary, wetland and buffer areas identified in Appendix C, Sheet 1 of 1 will be created and enhanced by the following means:

- Removal of non-native invasive plants including Himalayan blackberry and reed canarygrass;
- Some clearing and grading in wetland creation areas;
- Mulching disturbed ground and replanting with native shrub and tree species;
- Installing chain link fence at the buffer boundaries to prevent human intrusions. The fence will be modified to include turn style type openings for deer and other large mammal movement and smaller ground level openings for ground dwelling animals; and
- Large woody debris, brush piles, and rock piles may be added to wetland or buffer areas to provide additional habitat features.

6.2 Functions and Values

The small amount of impacts proposed to existing wetland and stream areas are not expected to affect the greater functions and values of these systems. Wetland and stream functions and values are expected to increase in wetland and buffer enhancement areas with the increase in native plant diversity and the removal of the dominating non-native plant species that exist in these areas today. Other wetland and buffer areas to be protected by new fencing should continue to provide the functions and values described above in Section 3.2.1 Wetlands. The protected wetlands and streams and the reduced buffer will continue to provide forested habitat, flood control support, and water quality functions post construction.

6.3 Monitoring

Enhancement areas will be monitored on an annual basis for a period of five years to determine if the performance standards outlined in Appendix F, Sheet 3 of 3 are being met. Annual monitoring reports will be sent to the City, the contractor, and the owner.

6.4 Contingency

If any portion of the mitigation is not successful, a contingency plan will be implemented. Such plans are prepared on a case-by-case basis to remedy any aspect of the mitigation that does not meet the performance standards. The development of a contingency plan would be triggered if site monitoring demonstrates that performance standards are not being met during a given monitoring period. The contingency plan will identify specific maintenance, replanting, or other management techniques that need to be employed in order to meet the performance standards in following monitoring years. Contingency plans will be submitted to the City of Woodinville for review before implementation, unless urgent action is required to address safety or resource protection (e.g., severe erosion) in a timely manner. Contingency plans may be included as part of the regular monitoring report.

7.0 REFERENCES

Brinson, MM. 1993. *A Hydrogeomorphic Classification for Wetlands.* Technical Report WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service. Publ. # FWS/OBS-79/31. 131 p.

Ecology (Washington State Department of Ecology). 1997. *Washington State Wetlands Identification and Delineation Manual*. Washington State Department of Ecology, Publication No. 96-94.

Null, W.S., G. Skinner, and W. Leonard. 2000. *Wetland Functions Characterization Tool for Linear Projects*. Washington State Department of Transportation, Environmental Affairs Office. Olympia, Washington.

Raedeke Associates. 1988. *Assessment of the Wetlands on the Woodinville High School Annex Property, King County, Washington.*

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APPENDIX A: FIGURES

APPENDIX B: PHOTOGRAPHS

APPENDIX C: SITE DRAWINGS

APPENDIX D: OFFSITE DRAWINGS SHOWING DRAINAGE PLANS

APPENDIX E: WETLAND FUNCTIONS AND VALUES FORMS

APPENDIX F: MITIGATION PLAN DRAWINGS

APPENDIX G: WETLAND FIELD DATA SHEETS

DAVID G. WEST
STATE OF WASHINGTON
20442
REGISTERED
PROFESSIONAL LAND SURVEYOR
3/19/04
EXPIRES 9/25/04

Textual Site Data:

EXISTING ZONING:	R-6
PROPOSED ZONING:	R-6
PROPOSED LAND USE:	SINGLE FAMILY RESIDENCE
GROSS SUBDIVISION AREA:	837,223 S.F.
SENSITIVE AREA:	551,034 S.F.
EFFECTIVE SENSITIVE AREA:	220,414 S.F.
RIGHT-OF-WAY & STORM TRACT:	60,854 S.F.
NET SITE AREA:	445,749 S.F.
DENSITY UNITS ALLOWED	61.38 ROUND DOWN TO 61
DENSITY UNITS:	61 UNITS
AVERAGE LOT SIZE/SMALLEST LOT:	15,464 S.F./9,026 S.F.
DENSITY CREDITS TO BE RETAINED	10 DENSITY CREDITS RETAINED
WATER SUPPLY:	WOODINVILLE WATER DIST.
SEWAGE DISPOSAL:	WOODINVILLE WATER DIST.
FIRE DISTRICT:	WOODINVILLE FIRE DIST.
SCHOOL DISTRICT:	NORTHSHORE

Section D-D
Private Road
N.T.S.

Section C-C
Private Road
N.T.S.

Section A-A (Std. Dwg #104B)
Interior Plat Road (135th Ave. N.E.)
N.T.S.

Section B-B
N.E. 205th St.~ Frontage
N.T.S.

Owners/Applicant

LAKEWOOD CONSTRUCTION
P.O. BOX 12648
MILL CREEK, WA. 98082
PH: 425-481-7949

Engineer

G.R. (BOB) PARROTT
P.O. BOX 2715
WOODINVILLE, WA. 98072
PH: 425-481-3027

Surveyor

THE WEST GROUP, INC.
2120-HEWITT AVE
EVERETT, WA. 98201
PH: 425-252-7088/FAX: 425-252-7403

Legal Description:

THE WEST 38 RODS OF THE EAST 60 RODS OF GOVERNMENT LOT 4, SECTION 3, TOWNSHIP 26 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON; EXCEPT ROADS.

Vicinity Map
SCALE: 1"=1000'

Basis of Bearing:

K.C.A.S.

EXHIBIT 3D
PAGE 1 OF 3D

REVISIONS:	
DATE:	4/15/2004
JOB NUMBER:	2003-13
D.W.	
CHECKED BY:	
DRAWN BY:	D.W.

The West Group, Inc.
Professional Land Surveyors & Planners
2120-Hewitt Ave. 425-252-7088 Office
Everett, Wa. 98201 425-252-7403 Fax

Preliminary Plat

Georgian Heights
Phase 4

SHEET: 1 OF 4

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Basis of Bearing:
K.C.A.S.

NE 205TH ST

1318.88'93" (meas)

MITIGATION AREA–D
8,325 S.F.

MITIGATION AREA–B
6087 S.F.

DISPERSAL TRENCH
BIO–SWALE (TYP.)

DET. POND

50' WETLAND BUFFER (TYP.)

8,605 S.F.

PRIVATE ROAD

260 SF
WETLAND FILL

URBAN STREAM
CLASS 'N' (NON-FISH BEARING)

MITIGATION AREA–A
4457 S.F.

WETLAND–A
95,327 S.F.

WETLAND REPLACEMENT
7,838 S.F.

MITIGATION AREA–C
18,945 S.F.

WETLAND–B
228,887 S.F.

GOV'T LOT 4

WETLAND FILL
1,040 S.F.

WETLAND FILL
2,313 S.F.

Private Road

61 62 63 64 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 5 6

IE=211.80
IE=214.48

Georgian Heights Phase 4
Enhancement Table

Buffer Enhancement		Wetland Enhancement
0 s.f.	Mitigation area A	4,457 s.f.
4,363 s.f.	Mitigation area B	2,154 s.f.
7,849 s.f.	Mitigation area C	11,096 s.f.
6,171 s.f.	Mitigation area D	2,154 s.f.
18,383 s.f. total		19,861 s.f.

Total Enhancement Area 38,244 s.f.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

Class 2 Wetland Replacement Table

Create 7,838 s.f. Class 2 Wetland w/ 5 year Monitoring Plan
Fill 2,313 s.f. Cul de Sac area at SW corner
Fill 260 s.f. creek crossing at private road in NE corner
Fill 1,040 s.f. creek crossing at public road in NW corner

3,613 s.f. Total Wetland Fill area; min. 2:1 Ratio = 7,226 s.f.

TOTALS: **CREATE 7838 s.f. Class 2 Wetland**
FILL 3613 s.f. Class 2 Wetland
~~Minimum~~ 2:1 RATIO REPLACEMENT 7226 s.f.

REVISIONS:
1. REVISED FOR NEW CAO 3-01-05

DATE: 4/16/2004
CHECKED BY: B.L.
DRAWN BY: B.G.

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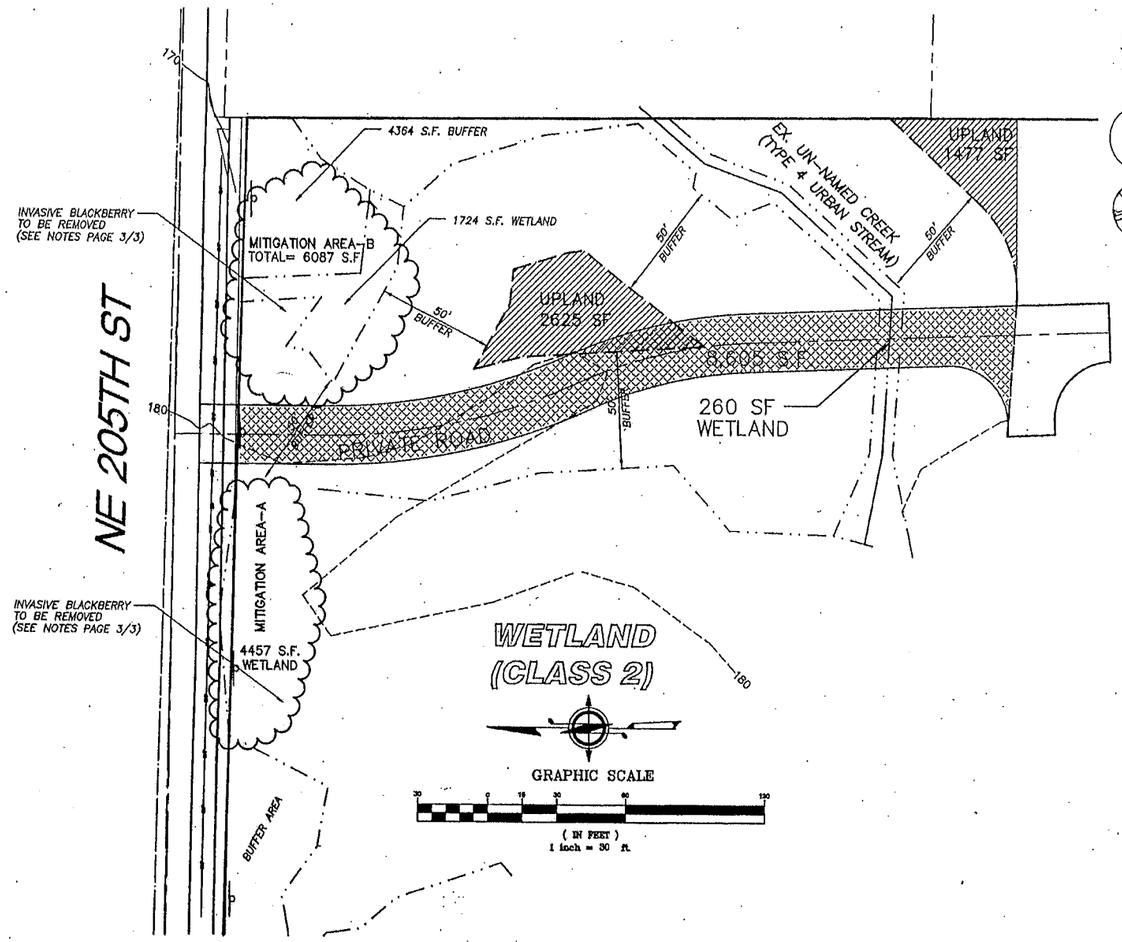
BUFFER/WETLAND ENHANCEMENT/REPLACEMENT PLAN

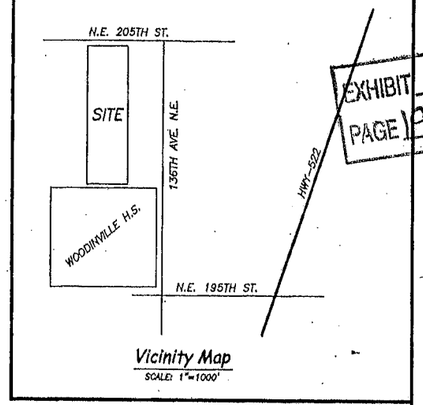
Georgian Heights
Phase 4

SHEET: 1 OF 1



LANDSCAPE PLANTING SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY
	Crataegus Douglasii	Douglas Hawthorn	1 GAL.	12
	Picea Sitchensis	Sitka Spruce	1 GAL.	12
	Populus Tremuloides	Quaking Aspen	1 GAL.	12
	Populus Trichocarpa	Black Cottonwood	1 GAL.	14
	Pseudotsuga Menzeisii	Douglas Fir	1 GAL.	9
	Thuja Plicata	Western Red Cedar	1 GAL.	9
	Lonicera Involucrata	Black Twinberry	1 GAL.	74
	Mahonia Aquifolium	Tall Oregon grape	1 GAL.	56
	Rosa Pisocarpa	Clustered Rose	1 GAL.	140
	Salix Sitchensis	Sitka Willow	1 GAL.	114
	Symphoricarpos Albus	Snow Berry	1 GAL.	96
	Vaccinium ovatum	Evergreen Huckleberry	1 GAL.	86



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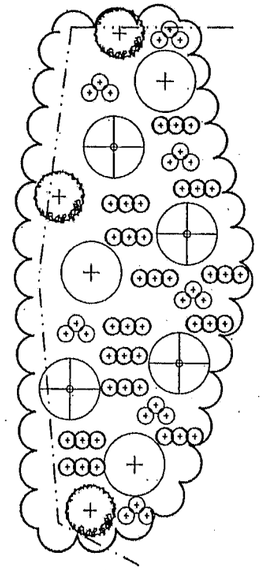
DECIDUOUS TREE PLANTING DETAIL
NO SCALE

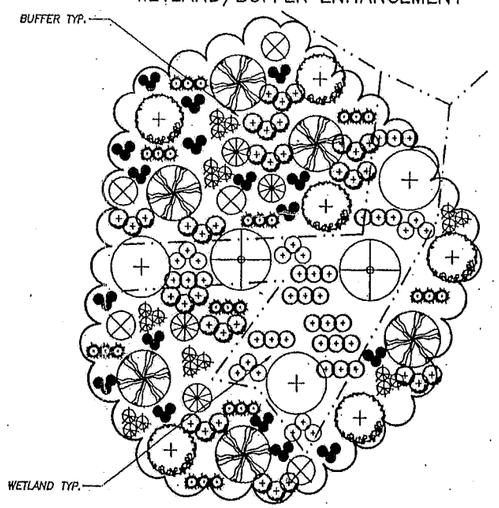
CONIFEROUS TREE PLANTING DETAIL
NO SCALE

WETLAND ENHANCEMENT

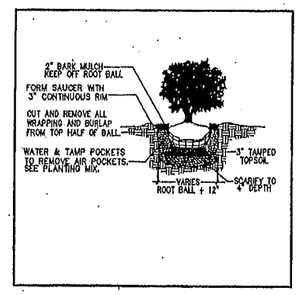


MITIGATION AREA-A
SCALE 1"=15'
4457 S.F.

WETLAND/BUFFER ENHANCEMENT



MITIGATION AREA-B
WETLAND AREA= 1741 S.F.
BUFFER AREA= 4346 S.F.
SCALE 1"=15'



SHRUB PLANTING
NO SCALE

REVISIONS:

DATE: 9-15-2004

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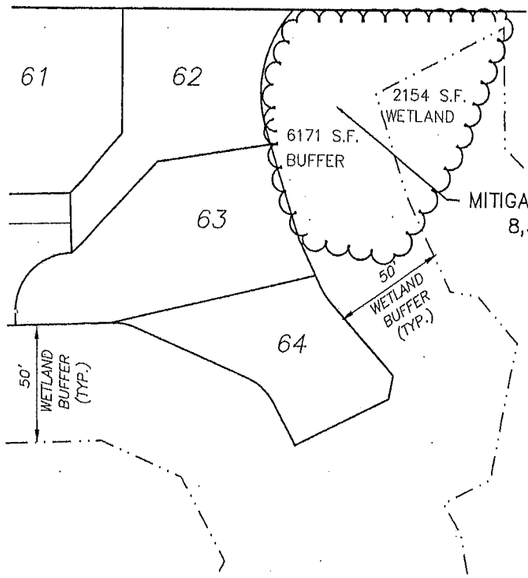
Everett, Wa. 98201 425-252-7403 Fax

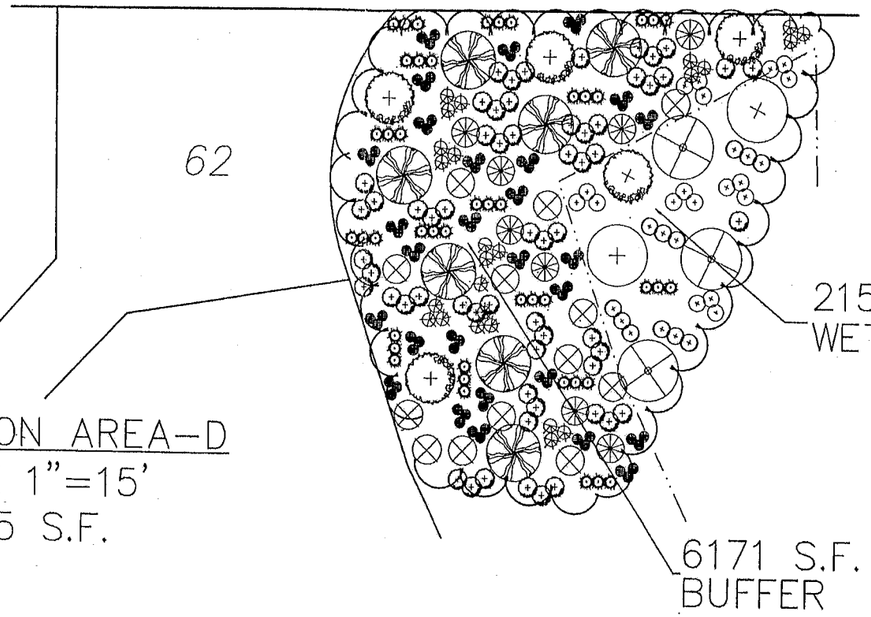
DRAWN BY: B.G. CHECKED BY: B.L.

MITIGATION PLAN

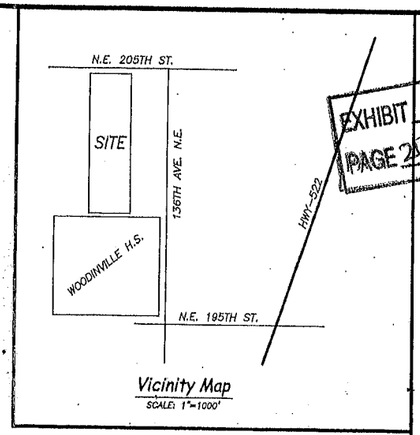
Georgian Heights
Phase 4

SHEET: 1 OF: 3





MITIGATION AREA-D
SCALE 1"=15'
8,325 S.F.



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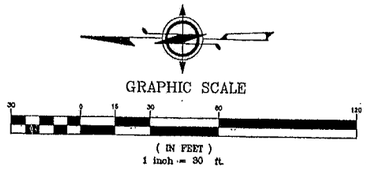
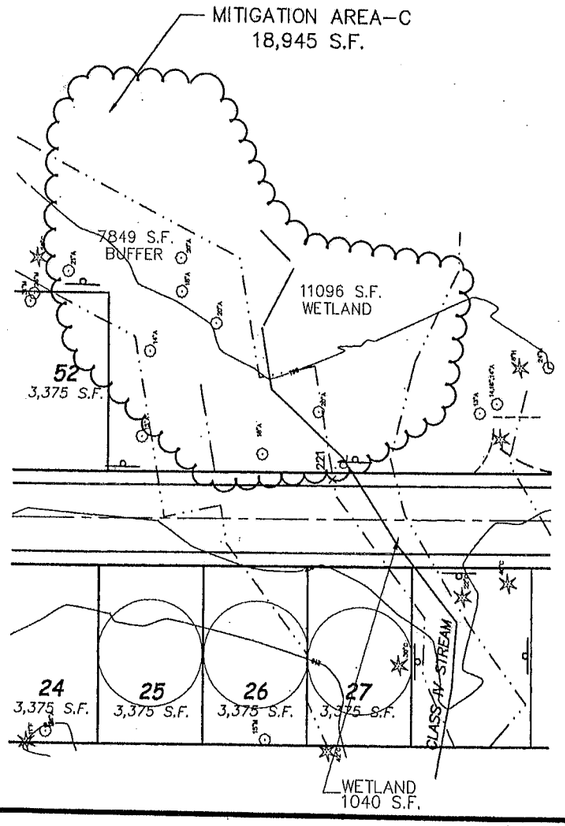
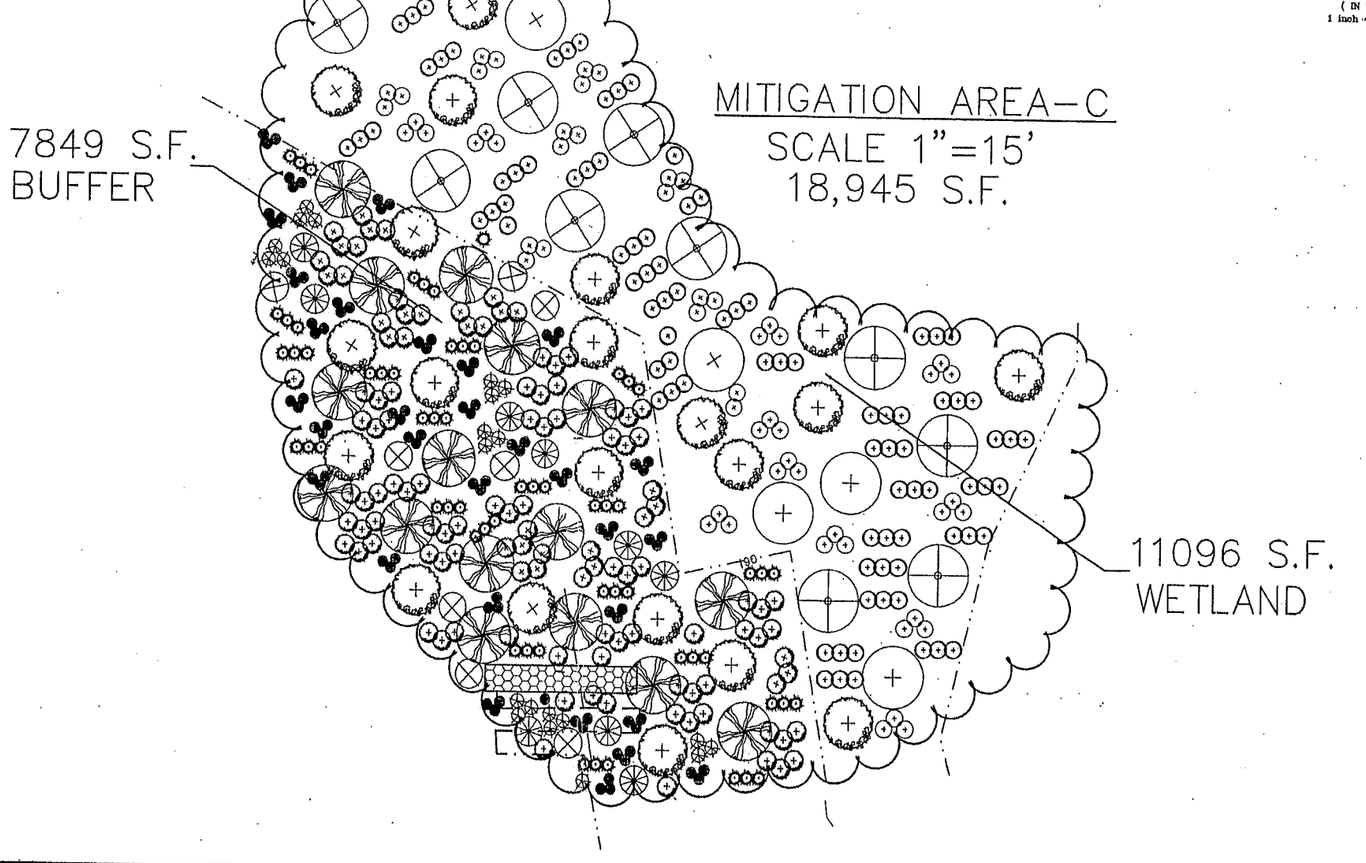


WETLAND-A
95,327 S.F.





MITIGATION AREA-C
SCALE 1"=15'
18,945 S.F.

REVISIONS:

DATE: 9-15-2004

DRAWN BY: B.G. CHECKED BY: B.L.

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MITIGATION PLAN
Georgian Heights
Phase 4

SHEET: 2 OF 3

WETLAND/BUFFER ENHANCEMENT

1. PERMITS

Construction will be performed in accordance with the City of Woodinville standards, codes, permit conditions, and other applicable ordinances and policies. The applicant is responsible for obtaining any other related or required permits prior to the start of construction.

A copy of the approved plans, specifications, permits, and City of Woodinville approvals must be kept onsite until project completion.

A qualified wetland consultant shall be onsite, as necessary, to monitor construction and approve minor revisions to the plan. Contractor shall provide the wetland consultant ten days notice prior to start of construction activities.

2. CLEARING

Existing native trees, shrubs, and herbs within the Enhancement area shall be retained. Non-native invasive plants shall be cleared from Enhancement areas by hand or other non-mechanical means. Prior to clearing the clearing limits shall be marked with orange construction fencing. No clearing shall occur outside of these limits.

3. MULCHING

Arborist of wood chip mulch, 6" deep shall be spread onto disturbed soil areas.

4. IRRIGATION

A temporary above-ground irrigation system shall be designed and installed by the Contractor upon completion of finish grading and prior to installation of plantings in the Enhancement areas.

The irrigation system shall provide for ½" of watering two times per week between June 15th and October 31st of the first year after planting. For the second year (and third year if necessary) after planting, the Contractor shall adjust the irrigation system to provide for ½" of watering once weekly between July 1st and October 1st. If planting occurs between May and October, then irrigation of the plantings shall be extended to three growing seasons.

The Contractor shall ensure that the irrigation system functions properly on a regular basis. Contractor shall inspect and test the system at a minimum twice per year, with written reports sent to the City, Wetland Consultant and/or other regulatory agency overseeing this project.

Upon successful plant establishment and Wetland Consultant approval, Contractor shall permanently cap and remove the irrigation system from within the Enhancement areas.

5. PLANTING SCHEDULE

Planting should occur between October 1st and March 31st.

Contractor shall locate, stake, and verify planting areas and configurations prior to planting. Planting locations shown on planting plans are approximate and actual planting locations may vary from those shown due to final site conditions and locations of installed utility lines and/or required structures. Any variations from the planting plan shall be approved by the Wetland Consultant.

The Wetland Consultant shall inspect planting locations and spacing after plant installation.

6. PLANT MATERIALS

The Wetland Consultant shall inspect plant material prior to planting. Any plant material not meeting the specifications shall be immediately removed from the site and replaced with plant material that meets the specifications. Plant material shall meet the requirements of State and Federal laws with respect to plant disease and infestation. Plant materials shall be nursery grown, well-rooted or normal growth and habit, and free from disease or infestation.

Inspection certificates, required by Law, shall be submitted to the Wetland Consultant upon receipt by the Contractor. The Wetland Consultant shall approve of any substitution of plant materials prior to ordering substitutions.

Plant materials shall be grown in western Washington state, western Oregon state and/or western British Columbia, Canada. Said plant materials shall be healthy, bushy, and true to size, name and variety. If replacement of plant materials is necessary due to plant material failure or construction damage (within 1 year of installation) the size, specie and quantity of plant materials shall be equal to the failed or damaged plant materials.

Trees shall have uniform branching, single straight trunks (unless required as multi-stemmed) and the central leader intact and undamaged. Container trees and shrubs shall be fully rooted but not root bound. Plant material with damaged root zones or broken root balls shall be rejected. Conifer trees shall be nursery grown, full and bushy, with uniform branching and a non-sheared form. Original central leader must be healthy and undamaged. Maximum gap between branching shall not exceed 9" and length of top leader shall not exceed 12". Shrubs shall be a minimum heights or 18" with 3 canes minimum, or as otherwise specified.

Native plant cuttings shall be grown and collected in the maritime Pacific Northwest. Cuttings shall be of one to two year old wood, ½" minimum diameter and be minimum 4 foot length with 4 lateral buds exposed above ground level after planting. The tops of each cutting shall be a minimum of 1" above a leaf bud; the bottom cut 2" below a bud. The basal ends of the cuttings shall be cut at a 45 degree angle and marked clearly so that the rooting end is planted in the soil. Cuttings must be kept covered and wet during storage and transport, and no cuttings shall be stored for more than three days from the date of cutting.
Cuttings shall only be used if planting occurs between December 1st and April 1st. For planting of cuttings between April 1st and December 1st, rooted cuttings or saplings shall be used. Substitutions of plant species or sizes may be permitted based on plant availability, but only with approval from the Wetland Consultant.

7. PLANT INSTALLATION

All plants and trees shall be pit planted or as otherwise shown on these Wetland/Buffer Enhancement drawings. Mulch shall be cleared away from the planting hole by 1 ft.
Planting holes should be twice as wide as deep as the rootball.

The Contractor shall install City-approved signage at 100' spacing along the buffer boundary. Signs shall be attached to a 4x4 wood post prior to installation. The post shall be anchored a minimum of 18" deep, with a minimum of 6 feet of the post above the ground level.

The Contractor shall ensure the removal and clean-up of construction materials and debris on the site following installation of plant materials and sign/post installation.

8. ONE-YEAR WARRANTY

The Contractor warrants the replacement of plant materials with similar plant materials that prove either to be dislocated or unsuitable as to plant materials standards. Except for loss due to severe climatological conditions substantiated by 10-year recorded weather charts, installed plant materials are required to be guaranteed for one year against defects and unsatisfactory growth, except for cases of neglect by Owner or abuse/damage by others. Plant materials replaced shall be guaranteed for one year against defects and unsatisfactory growth, except for cases of neglect by Owner or abuse/damage by others.

9. FINAL ACCEPTANCE

The Wetland Consultant shall approve planting locations and if necessary, a punch list shall be prepared and provided to the Contractor prior to final acceptance. Upon punch list approval, the Contractor shall provide as-built drawings to the Wetland Consultant. The date of final

acceptance shall constitute the beginning of the One Year Warranty.

10. MAINTENANCE STANDARDS

The Contractor shall maintain trees and shrubs as required to maintain healthy growth and habitat diversity for a period of one year following Final Acceptance; including but not limited to the following: (1) resetting plants to proper grade and upright position, (2) grass and invasive control, and (3) corrective drainage as required.

The Contractor shall be responsible for consistent and adequate water application throughout the growing season and shall winterize and restart the irrigation system in spring time including any repairs necessary during the One Year Warranty period.

Irrigation is required within the Wetland/Buffer restoration area for at least 2 growing seasons following plant material installation to ensure adequate establishment and then the Contractor shall remove the irrigation system. Final approval will not occur until the irrigation system is satisfactorily removed.

11. MONITORING AND PERFORMANCE STANDARDS

The goal of the Wetland/Buffer Enhancement is to mitigate for the filling of 3613 s.f. of class 2 Wetland. Enhancement of wetlands and buffers is required by the City of Woodinville (WMC 21.24.340). In meeting this goal the following apply:

A. Increase the structural diversity of the plant community within the enhanced wetland and its buffer by providing for a combination of native and woody vegetation covering at least 15% of the enhancement area following the 1st year after planting, at least 25% of the enhanced area following the 2nd year after planting and at least 35% of the enhacement area following the 3rd, 4th and 5th years after planting.
B. Increase the plant species diversity within the enhanced wetland and its buffer by providing for a combination of at least six native plant species with at least 100% survival after the 1st year after planting, 85% survival after the 2nd year after planting and 85% survival after the 3rd year of planting.
C. Limit the amount of invasive and exotic species within the enhanced wetland and its buffer by providing for a 5-year monitoring program, maintaining below 20% exotic and invasive plant species in the enhancement area; except for the reed canary grass.

D. Construction limits will be staked and any existing native vegetation shall be saved as field-marked. A pre-construction meeting will be held at the site to review and discuss all aspects of the project with the selected Contractor.
E. A Wetland Consultant will supervise plan implementation during construction to ensure that specifications of the enhancement plan are met.
F. The monitoring program will be conducted once during each growing season, for a period of five years, with annual reports submitted to the City of Woodinville, the Contractor and the Owner.
G. Vegetation sampling points shall be established within the enhancement area for representation of the plant communities. These sampling points shall be re-visited each year with records kept of all plant species found. All monitoring shall be conducted by a qualified consultant and vegetation will be recorded with a focus on relative percent cover of the dominant species within the vegetative strata. Photo-points shall be established for the monitoring program annual reports. Review of the photos taken each year will provide a semi-quantitative representation of the planting plan.
H. Readily observable wildlife species will be identified and recorded in the restoration area.
I. An assessment of the water quality/hydrology within the enhancement area shall be completed for the monitoring program annual report. General observations will be made by the Wetland Consultant regarding extent and depth of soil saturation and/or inundation. Water quality will be assessed qualitatively; unless it is evident there are serious concerns. In such case of serious concerns, water quality samples will be taken and reviewed for oil sheen, abnormal water color and odor, stressed or dead vegetation and turbidity.
J. Mulch shall be added (3-4") in depth where needed at the beginning of monitoring year 2.

12. MAINTENANCE PLAN

Maintenance shall be conducted on a routine, year round basis according to the schedule below. Additional maintenance needs will be identified and addressed following the monitoring program annual report.

Maintenance Item	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Weed control	1	1	1	1	1	1	1	1	1	1	1	1
Irrigation 1st year						4	8	8	8	4		
Irrigation 2nd year						2	4	4	4	2		
General Maintenance	1	1	1	1	1	1	1	1	1	1	1	1

***1-8 denotes number of times task shall be performed per month.

Weed control shall include removal and control of non-native and invasive plants, performed by hand grubbing whenever possible. Undesirable and weedy exotic plant species shall be maintained at levels below 20% total cover at all times during the 5-year monitoring period.

3'x 3'Areas or less with reed canarygrass shall be hand-grubbed. Areas larger than 3' x 3' shall be weed-whacked and staked with cuttings. Scouler Willow (Salix scouleriana) and black twinberry (Lonicera involucrate) cuttings shall be used in the wetter areas and black cottonwood (Populus trichocarpa) cuttings shall used in drier areas. During April 1 through November 30, one-gallon plants (minimum 18") shall be used in place of cuttings. Cuttings shall be installed at 1' OC spacing over and extending 2' in each direction, unless otherwise specified. Cuttings shall be 2-year old wood, 4' length, ½" diameter, with all side branches removed and installed to a minimum depth of 12".

13. IRRIGATION

The Contractor shall ensure proper functioning of the temporary above-ground irrigation system from June 1 through October 31. During the 1st year after installation, irrigation should be applied at a rate of ½" water twice per week. During the 2nd year after installation, irrigation should be applied at a rate of ½" water once per week. However, if more than 10% of plant replacement occurs, watering rates shall be maintained at ½" water twice per week.
The Contractor shall ensure adequate coverage and function of the entire system, including but not limited to repairs, resetting of heads and adjustments, and winterization by October 31 to prevent winter freeze damage.

14. GENERAL MAINTENANCE

The Contractor shall remove all trash and other debris on a regular basis. Contractor shall leave all dead plant material and other organic debris (leaf matter, fallen branches, etc) except pest-infested vegetation.
The Contractor shall regularly maintain the trees including but not limited to resetting plants with mulch rings, or selective weed-whacking. If weed-whacking is performed, great care shall be taken to prevent damage to desired native species either planted or recolonized.
Weed control should be performed by hand removal, installation of weed barrier cloth to proper grades and upright positions, and weeding around bases.
Woody plants shall be pruned at the direction of the Wetland Consultant or to remove pest infestations (i.e tent caterpillar).

The Contractor shall replant areas after reason for failure has been identified (i.e. moisture problems, poor planting, bad stock, disease, shade/sun, etc). The Contractor shall replace dead plants with the same species or an approved substitute species that meets the goal of the enhancement plan. The Contractor shall notify the Wetland Consultant or species, quantity, size and replacement material prior to installation. The Wetland Consultant shall review staked locations prior to installation. Replaced plant material shall meet the same specifications as originally installed material. The Contractor will complete one-year warranty replacement.
The Contractor shall correct any erosion and drainage problems and will notify the Wetland Consultant, the City of Woodinville and the Owner.

15. MAINTENANCE BOND

At the discretion of the City of Woodinville, a performance bond or other financial guarantee will be posted with the City of Woodinville for the cost of implementing and monitoring the enhancement plan. At the discretion of the City of Woodinville, the performance bond may be released in partial amounts in proportion to work successfully completed over the 5-year monitoring period as the Owner demonstrates performance for implementing the conditions of the enhancement plan.

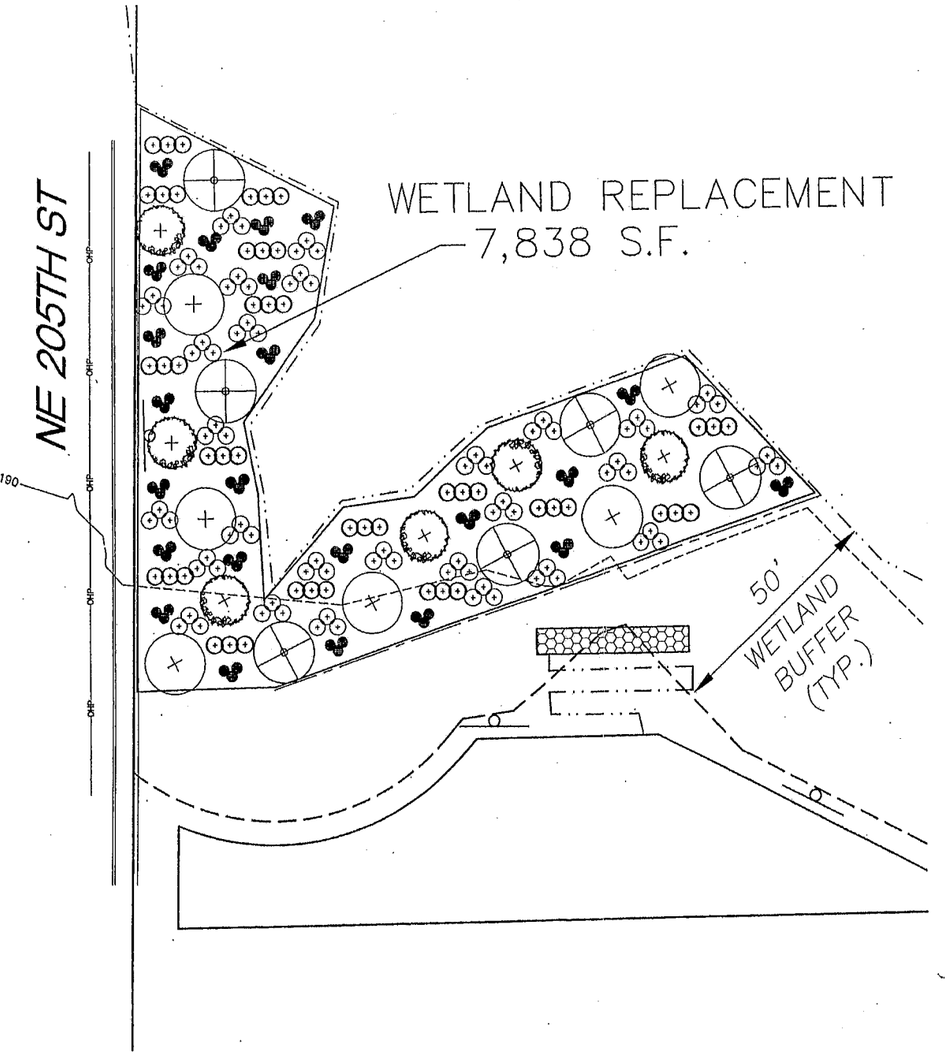


EXHIBIT 30
PAGE 21 OF 30

REVISIONS: | DATE: 9-15-2004

The West Group, Inc.
Professional Land Surveyors & Planners
2120-Everett Ave. Everett, Wa. 98201
425-252-7088 Office
425-252-7403 Fax

DRAWN BY: B.G. | CHECKED BY: B.L.

MITIGATION PLAN NOTES

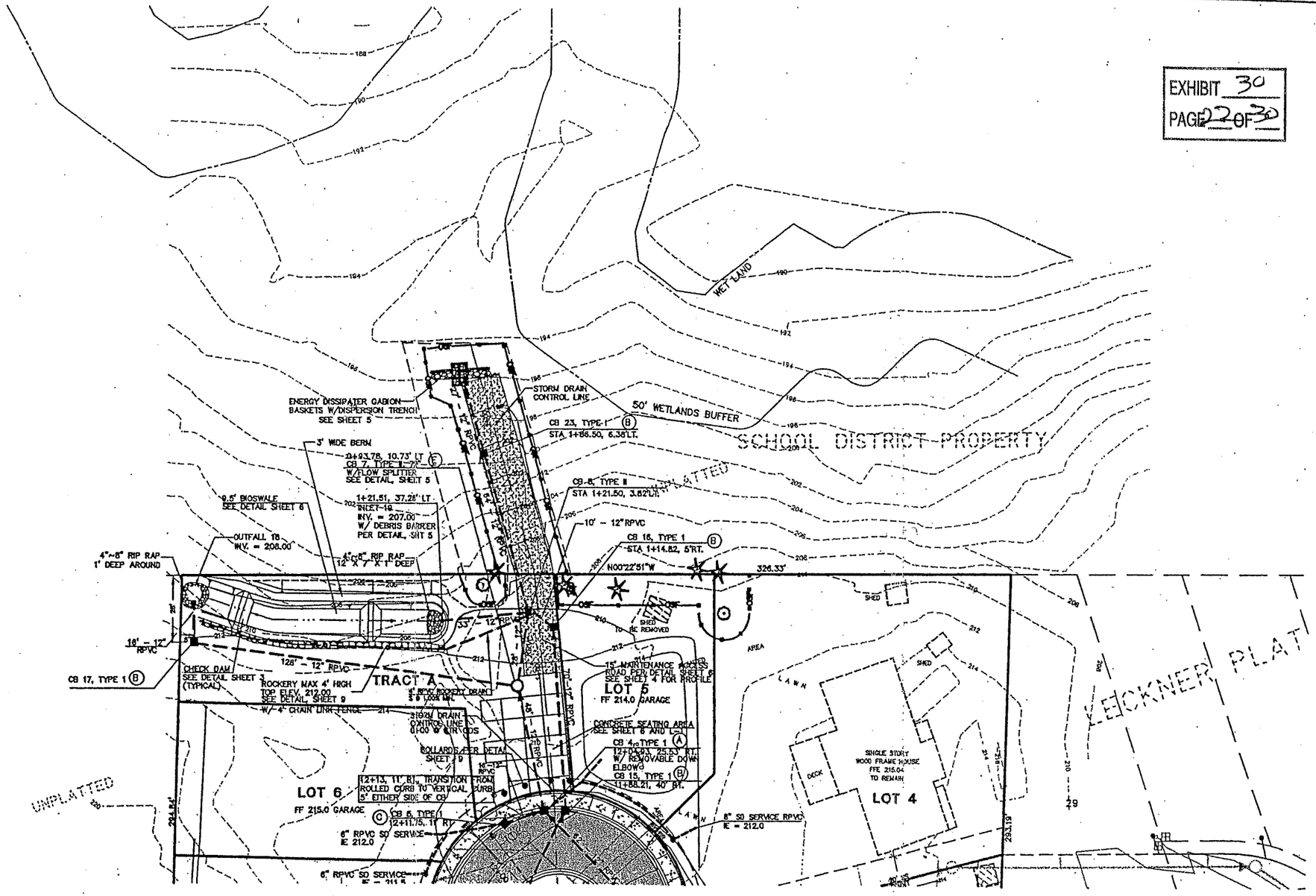
Georgian Heights
Phase 4

SHEET: 3 OF: 3

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

EXHIBIT 30
PAGE 22 OF 30



SEE SHEET 2

APPROVED FOR CONSTRUCTION

Director of Public Services
City of Woodinville

Date: _____

Plan Chk Engr
For Sheets _____ through _____
Util Engr _____
Trans Engr _____
Fire Dept _____
Planning Dept _____

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CLIFFORD N. WILLIAMS — STATE OF WASHINGTON — 37804 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 6/28/01

DESIGNED CD					
DRAWN CD/ALK/JPO	2	REVISED PER CITY REVIEW	CD	CNW	5/1/00
CHECKED CNW	SYMBOL	REVISION	BY	APPROVED	DATE

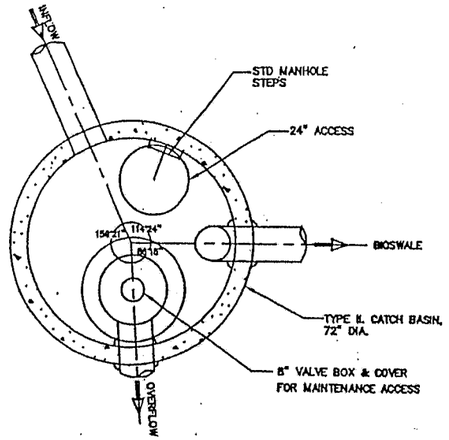
HDA — Horton Dennis & Associates, Inc.
Consulting Engineers, Planners, and Surveyors
KIRKLAND, WASHINGTON • 822-2525

Belmont Homes, Inc.
Robert P. Wenzl
P.O. Box 2401
Kirkland, WA 98083-2401
(425) 823-4713

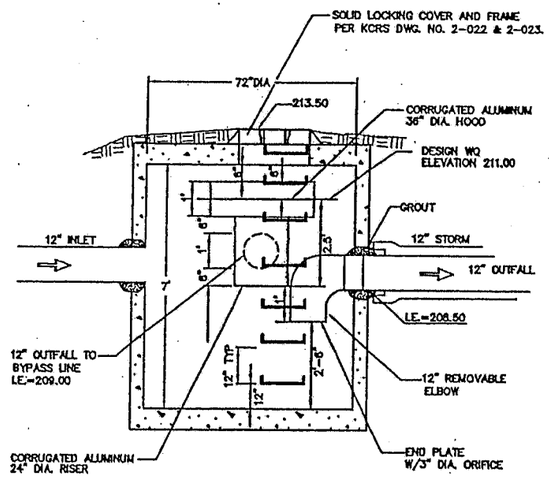
APPROVED: _____
DATE 12-29-99
SCALE NOTED
FB NO. _____

CREEKSIDE
GRADING AND STORM PLAN

ACAD FILE: 9832GRDPLN
JOB NO. 9832.01
SHEET NO. 2A OF 10

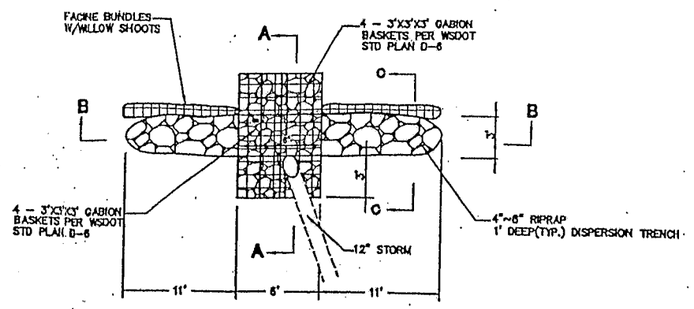


PLAN VIEW
1"=2'

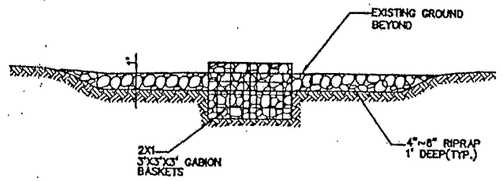


SECTION VIEW
1"=2'

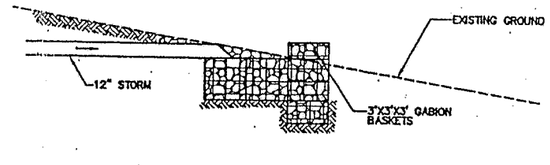
FLOW SPLITTER CB 7



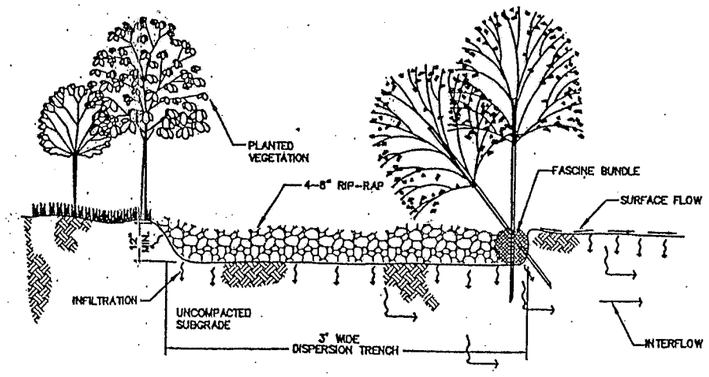
PLAN
NTS



SECTION B
NTS

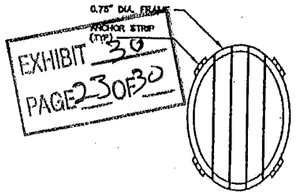


SECTION A
NTS

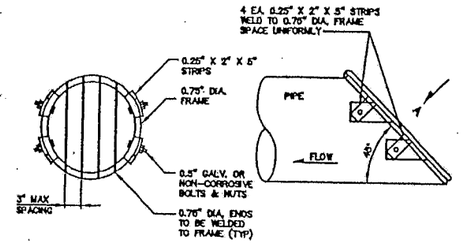


SECTION C
NTS

ENERGY DISSIPATER GABION BASKETS WITH DISPERSION TRENCH



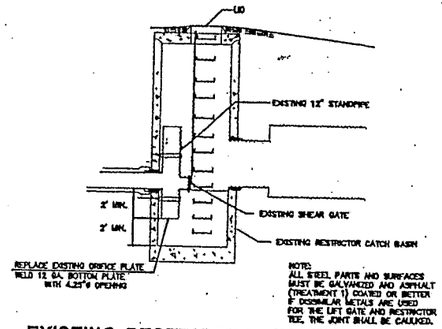
VIEW A



END VIEW

NOTES
1. REQUIRED FOR ANY PIPE 12" OR LARGER.
2. ALL STEEL PARTS MUST BE GALVANIZED AND ASPHALT COATED (TREATMENT 1 OR BETTER).

DEBRIS BARRIER
NTS



EXISTING RESTRICTOR MH, TYPE II - 54" LOCATED IN PLAT OF CEDAR PARK NORTH
ORIFICE MODIFICATION

EXHIBIT 30
PAGE 23 OF 30

APPROVED FOR CONSTRUCTION

Director of Public Services
City of Woodinville

Date: _____

Plan Chk Engr
For Sheets _____ through _____
Util Engr _____
Trans Engr _____
Fire Dept _____
Planning Dept _____

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CLIFFORD N. WILLIAMS — STATE OF WASHINGTON — 27606 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 6/28/01

DESIGNED CD					
DRAWN CD/ALK/APO	2	REVISED PER CITY REVIEW	CD	CNW	5/1/00
CHECKED CNW	SYMBOL	REVISION	BY	APPROVED	DATE

HDA — Horton Dennis & Associates, Inc.
Consulting Engineers, Planners, and Surveyors
KIRKLAND, WASHINGTON • 822-2525

Belmont Homes, Inc.
Robert P. Wenzl
P.O. Box 2401
Kirkland, WA 98083-2401
(425) 823-4713

APPROVED

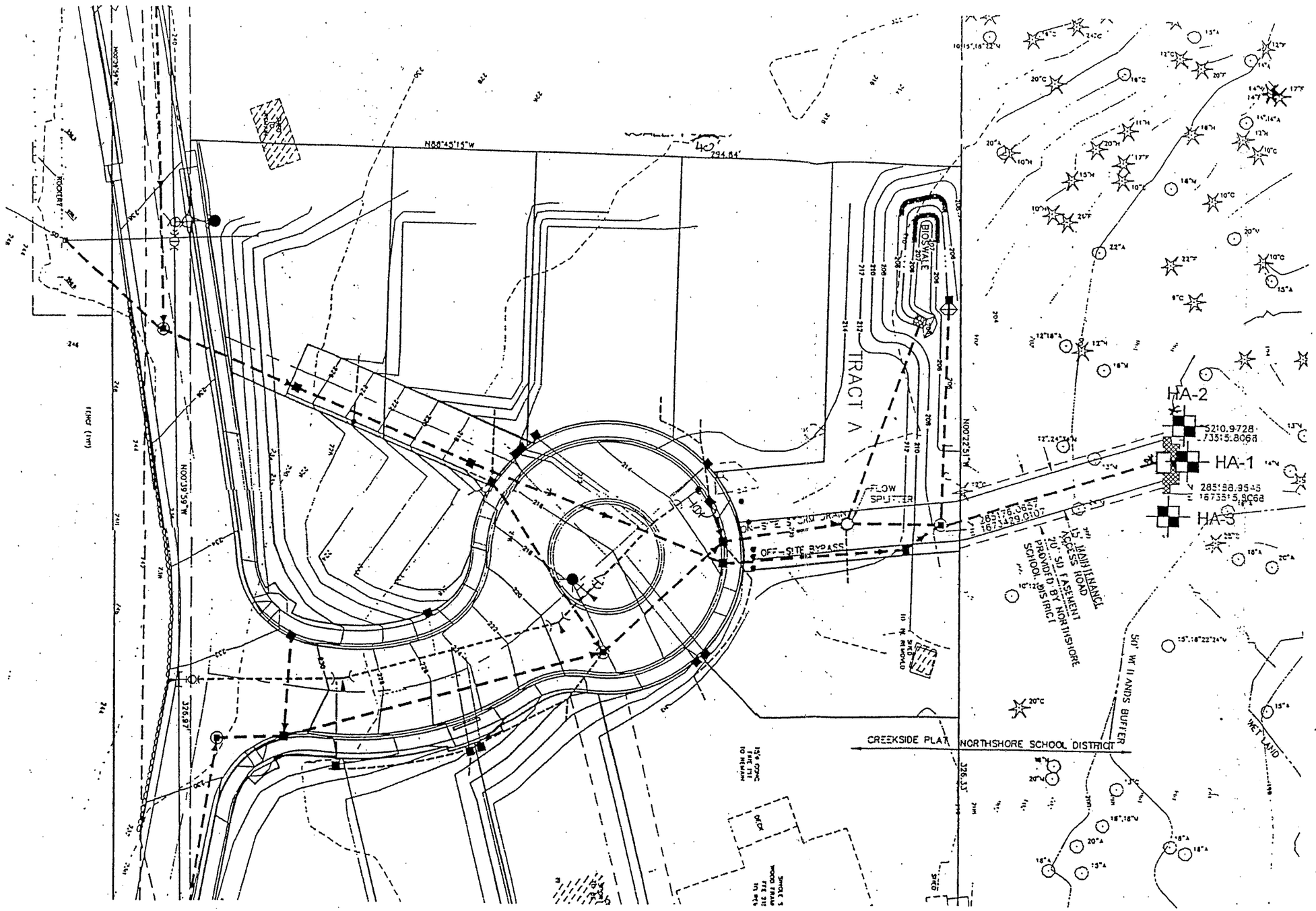
DATE 12-28-99
SCALE NOTED
FB NO. _____

CREEKSIDE
STORM DRAIN DETAILS

ACAD FILE: DRAINDET.DWG
JOB NO. 9832.01
SHEET NO. 5 OF 10

Site Plan

EXHIBIT 3U
PAGE 29 OF 30



LEGEND

HA-1 — NUMBER AND APPROXIMATE LOCATION OF HAND AUGER

0 40 80

Scale 1" = 40'

Reference: Site Plan created from original site plan provided by Horton Dennis & Associates, INC. dated November 11,1999.

NELSON-COUVRETTE & ASSOCIATES, INC. CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS	Smith Plat	FIGURE 2
	FILE NO. 2370B99	DATE December 1999

company\NCADrafting1999\coreldraw\siteplan\sp17.cd

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

CATCH BASIN GRATE & FRAME LEGEND

Designation	Type of Frame & Grate
(A)	Rolled curb vaned grate & frame, per KCRS 2-019, 2-020, 2-021.
(B)	Solid cover & frame per KCRS 2-014, 2-015
(C)	Through curb frame and vaned grate per KCRS 2-016, 2-017
(D)	Standard frame & grate per KCRS 2-013, 2-104.
(E)	Round locking manhole covers & frame per KCRS 2-022, 2-023.
(F)	Vaned grate & frame per KCRS 2-014, 2-018

NOTES:

1. A separate building permit must be obtained from the City Building Department for any retaining wall or rockery greater than 4 feet high prior to the start of construction.
2. See Sheet 6 for Roadway Standard sections.
3. Use min. 1% slope on all roof drain connector systems pipes and stubouts.
4. For Storm Drainage Pipe Standard Trench section, see Sheet 9.
5. Drought tolerant plants shall be installed by landscape contractor in cul de sac island. See landscape Architect plan.

NOTE:
SEE TREE RETENTION PLAN, SHEET 7 FOR TREES TO BE SAVED.
THE CONTRACTOR IS RESPONSIBLE TO RETAIN ALL TREES SHOWN.

SEE SHEET 2A

EXHIBIT B
PAGE 2 OF 3

SIGN SCHEDULE

[1] STREET NAME SIGN (NE 202ND CT.)
DEADEND – (W14-1P)
STREET NAME SIGN (132ND AVE NE)

[2] NO PARKING SIGN (R7-1)
(8 REQUIRED)

LEGEND (EXISTING)

- WATER METER
- FIRE HYDRANT
- ROCKERY
- MAILBOX
- TELEPHONE RISER
- 10' CONTOURS
- 2' CONTOURS
- FENCE
- POWER POLE
- WATER VALVE
- SANITARY SEWER MANHOLE
- CATCH BASIN
- POST INDICATOR VALVE
- POWER TRANSFORMER

CONSTRUCT ROCKERY PER DESIGN BY NELSON–COUVRETTE AND ASSOCIATES, DATED JULY, 1998

ROCKERY TABLE

STATION	BOTTOM ELEV.	TOP ELEV.
11+75	237.6	237.6
12+00	236.9	244.2
12+25	236.3	242.8
12+50	235.5	240.0
12+75	234.3	237.5
13+00	233.1	235.2
13+25	231.9	234.2
13+50	230.9	233.5
13+75	230.1	232.5
13+80	229.9	229.9

NOTE: OFFSITE CONSTRUCTION
1. PROJECT WORK INCLUDES MODIFYING SIZE OF FLOW RESTRICTOR ORIFICE IN UPSTREAM CATCH BASIN ON CEDAR PARK NORTH PLAT, SEE DETAIL, SHEET 5. COORDINATE WORK WITH CITY OF WOODINVILLE PUBLIC WORKS DEPARTMENT.

LEGEND PROPOSED STORM DRAINAGE

- STORM DRAIN PIPE
- ROOF AND FOOTING DRAIN
- BOUNDARY
- LOT LINE
- RIGHT-OF-WAY
- GUTTER, FLOW, & CURB LINE
- CENTER LINE
- EASEMENT
- 10' CONTOURS
- 2' CONTOURS
- ROCKERY
- TREE PROTECTION FENCE
- CHECK DAM
- PROPOSED SANITARY SEWER
- PROPOSED WATER
- CATCH BASIN, TYPE 1
- CATCH BASIN, TYPE 2
- CLEANOUT
- YARD DRAIN
- CURB RAMP
- MAILBOX
- SIGN
- MONUMENT AND CASE (SEE DETAIL SHT. 9)
- RPVC ULTRA-RIB PVC PIPE
- SIGN PER SCHEDULE
- RIP RAP 2'-6" QUARRY SPALLS
- PROPOSED WATER METER

APPROVED FOR CONSTRUCTION
Director of Public Services
City of Woodinville
Date:
Plan Chk Engr
For Sheets ____ through ____
Util Engr
Trans Engr
Fire Dept
Planning Dept

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CLIFFORD K. WILLIAMS — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 6/28/01

NO.	REVISION	BY	APPROVED	DATE
2	REVISED PER CITY REVIEW	CD	CHW	5/1/00
1	REVISED PER CITY REVIEW	CD	CHW	1/2/00

DES. (ENG.) CD
DRAWN CD/ALK/JPC
CHECKED CHW

HDA
Horton Dennis & Associates, Inc.
Consulting Engineers, Planners, and Surveyors
KIRKLAND, WASHINGTON • 822-2525

Belmont Homes, Inc.
Robert P. Wenzl
P.O. Box 2401
Kirkland, WA 98083-2401
(425) 823-4713

DATE 12-29-99
SCALE NOTED
FB NO.

CREEKSIDE
GRADING AND STORM PLAN

ACAD FILE: 9832GR
JOB NO. 9832.01
SHEET NO. 2 OF 11

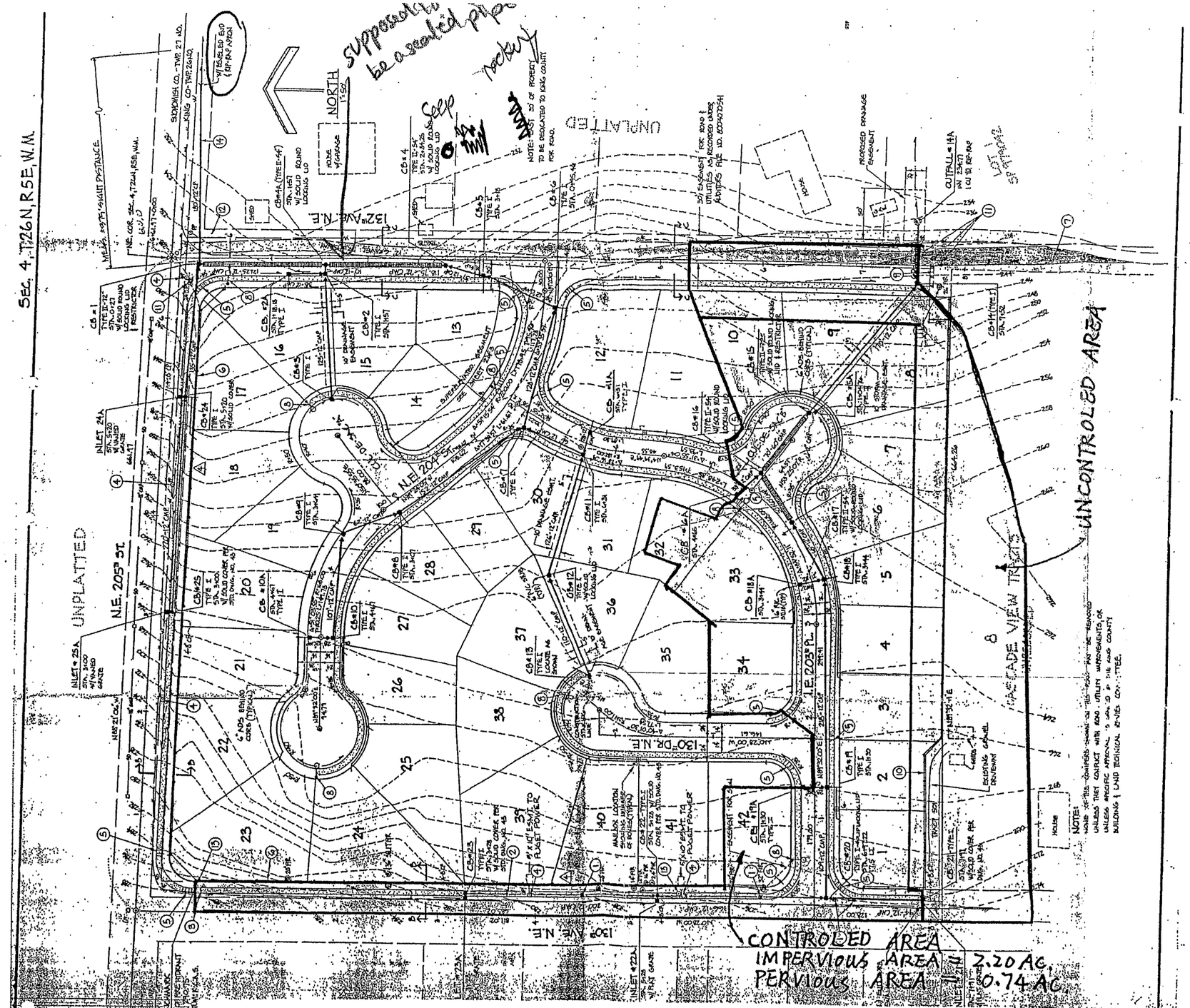
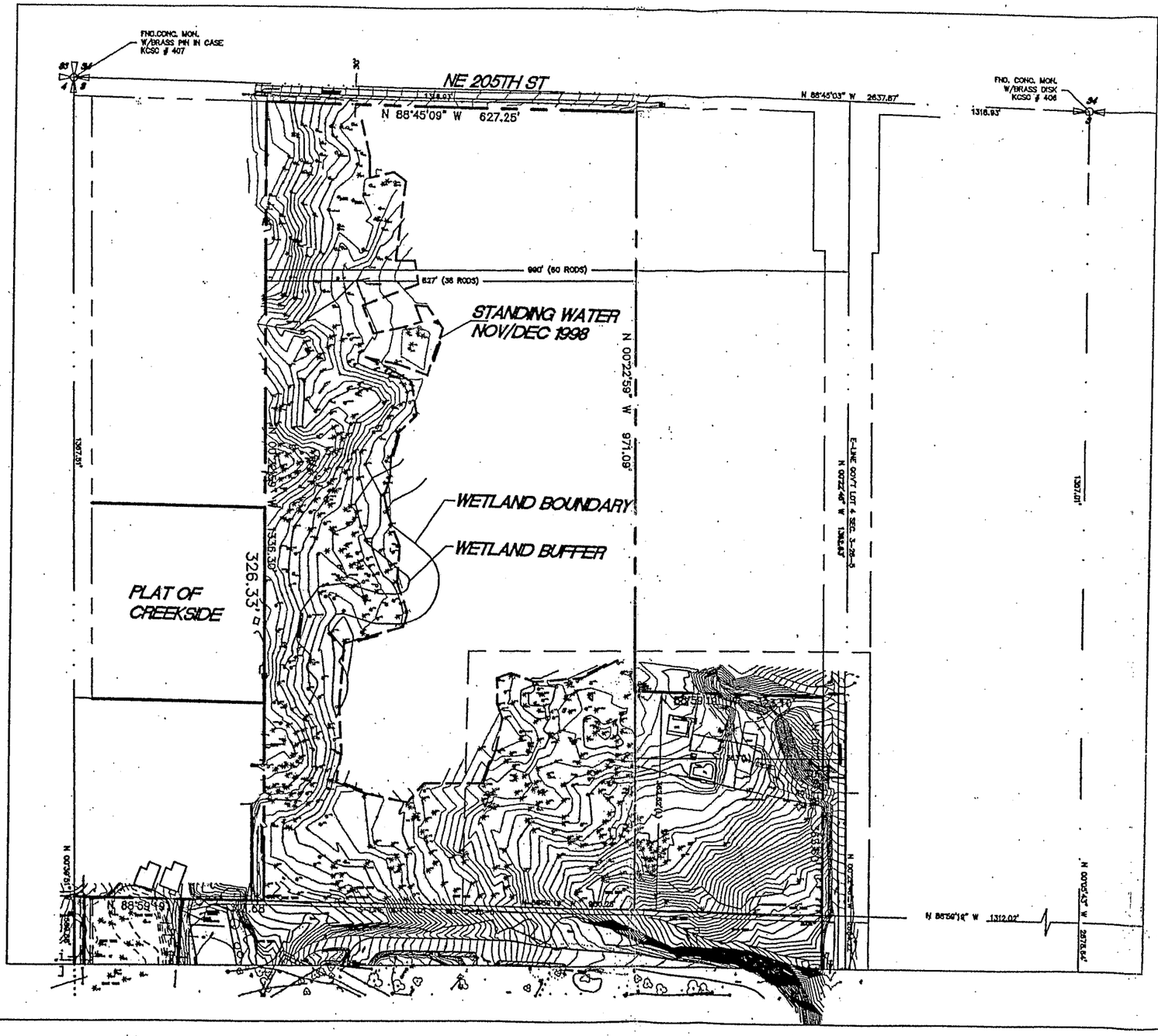


Figure 1 **Cedar Park North Drainage Basin Map**

EXHIBIT 30
PAGE 27 OF 30



GRAPHIC SCALE

200 100 0 200

(IN FEET)
1 inch = 200 ft.

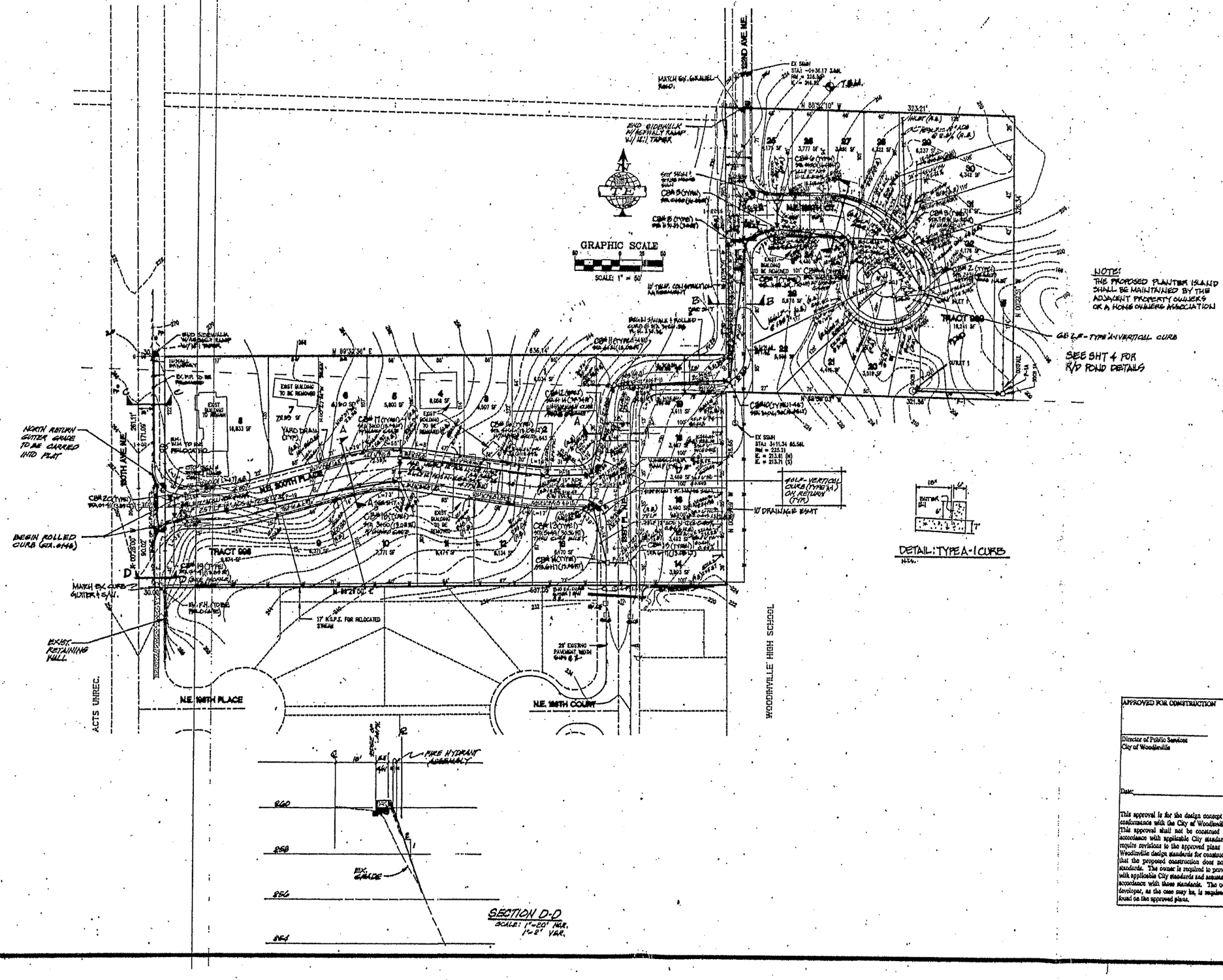
TOPOGRAPHY FURNISHED BY THE NORTHSHORE SCHOOL DISTRICT FROM A SURVEY BY CONCEPT ENGINEERS, INC.

DRAWING NO. 9832EX6.DWG

DESIGNED						HORTON DENNIS & ASSOCIATES, INC. CONSULTING ENGINEERS 320 SECOND AVE. SOUTH KIRKLAND, WA 98033-6687 (425)-822-2525	BELMONT HOMES	DATE 12/23/99	NORTHSHORE SCHOOL DISTRICT WETLANDS	JOB NO. 9832.01
DRAWN CD								SCALE 1" = 200'		SHEET NO. 1 OF 1
CHECKED CNW	SYMBOL	REVISION	BY	APP'D	DATE			FB NO. LL		

PORTION OF NE 1/4, SEC. 4, + NW 1/4 SEC. 3, TWP. 26N, RGE. 5E, W.M.

EXHIBIT 3
PAGE 21 OF 34



APPROVED FOR CONSTRUCTION	Final City Engr:
	For Sheets ____ Through ____
Director of Public Services City of Woodinville	Util Engineer:
	Trans Engineer:
	Fire Dept:
Date:	Planning Dept:

This approval is for the design concept only. These plans appear to be in conformance with the City of Woodinville design standards for construction. This approval shall not be construed as authorizing construction not in accordance with applicable City standards. The City reserves the right to require revisions to the approved plans to assure conformance with City of Woodinville design standards for construction at any time that it is discovered that the proposed construction does not meet the applicable construction standards. The owner is required to provide design and plans in accordance with applicable City standards and assures that construction is accomplished in accordance with those standards. The owner and/or design engineer and/or developer, as the case may be, is required to correct any errors or omissions found on the approved plans.

(AS) AS-BUILT DRAWING

REVISIONS:
- 1 REV. PER CITY OF WOODINVILLE REVIEW 6-15-95
- 2 REV. PER CITY OF WOODINVILLE REVIEW, ADDED SECTION D-D PROFILE, 8-10-95
- 3 REV. PER CITY OF WOODINVILLE REVIEW, 8-29-95
- 4 AS-BUILTED, 7-10-96
- 5 REVISED LOTLINE BETWEEN LOT 6 & 7, 7-17-96

DRAWN BY: R.H.B.
CHECKED BY: T.T.
JOB NO.: 95029
DATE: 6-6-95

TREPANIER ENGINEERING
PROFESSIONAL CIVIL ENGINEERING
1420 HEWITT AVE.
EVERETT, WA. 98201
PHONE: (206)259-5556
FAX: (206)259-5558

ROAD AND DRAINAGE PLAN

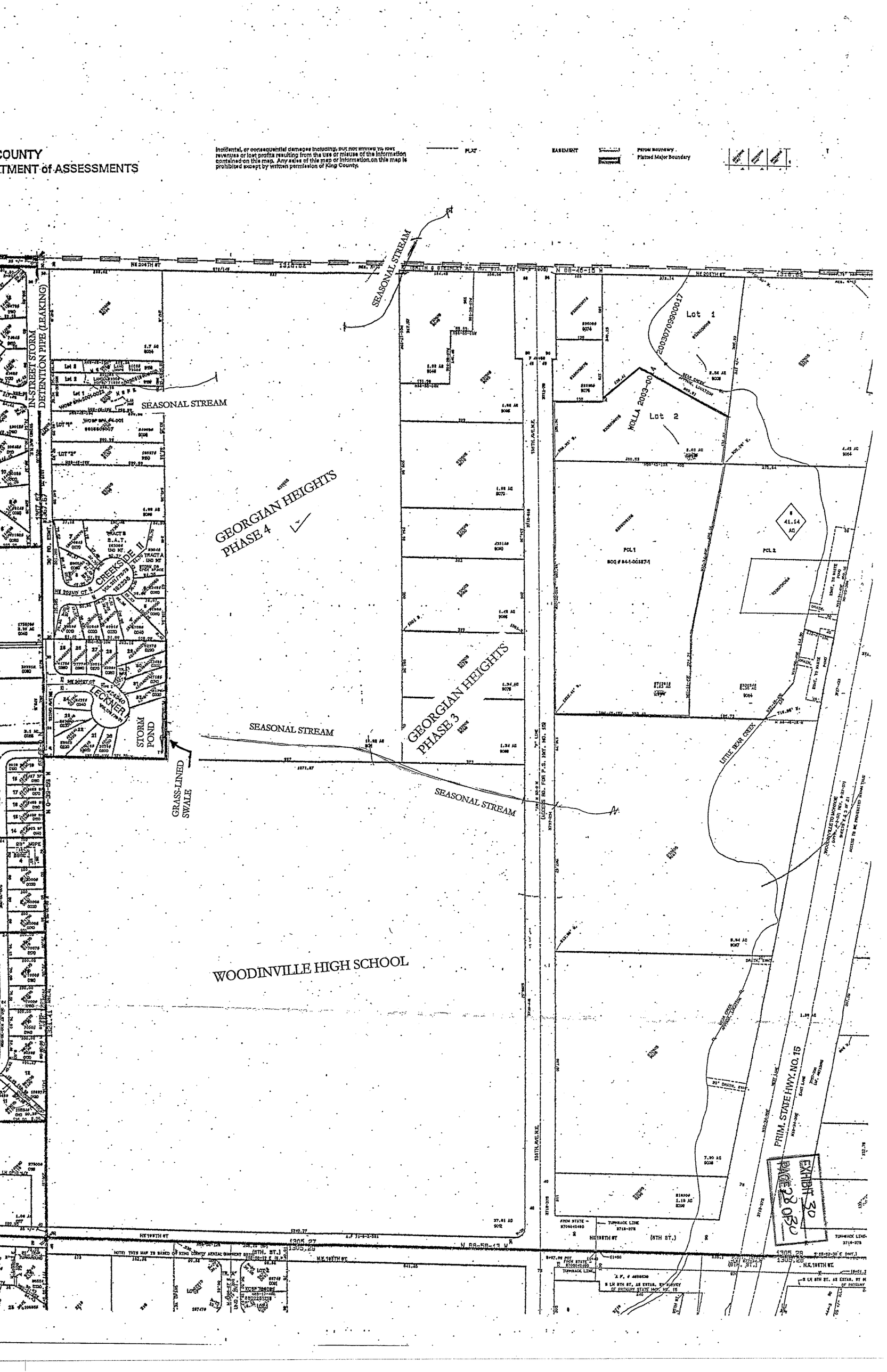
LECKNER

SHEET: 6 OF: REV:

COUNTY
TMENT of ASSESSMENTS

Incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sales of this map or information on this map is prohibited except by written permission of King County.

PLAT — EASEMENT — Parcel Boundary — Platted Major Boundary



MULCHING NOTES

GUIDE TO MULCH MATERIALS, RATES AND USES

Mulch Material	Quality Standards	Application Rates: per 1000 sq. ft.	per Acre	Depth of Application	Remarks[1]
Gravel, Crushed Stone or Slag	Washed; ¾ - 1½" size	8 cy. yds.		3"	Excellent mulch for short slope and around woody plants and ornamentals. Use where subject to foot traffic. (Approx. 2000 lbs. per cu. yd.)
Hay or Straw	Air-dried; free from undesirable seed & coarse material	75-100 lbs., 2-3 bales (Approx. 2" thick)	1.5 - 2.5T 90-100 bales		Lightly cover entire surface (min. 2") Use straw where mulch effect is to be maintained for more than 3 months. Subject to wind blowing unless kept moist or tied down. Most common and widely used mulching material. Good for erosion control in critical areas.
Wood Fiber Cellulose (partly digested wood fibers)	Dyed green. No growth organism inhibiting factors	25-30 lbs.	1000 1500 lbs.		When used for erosion control on critical areas double application rate. Apply with hydromulcher. No tiedown required. Packaged in 100lb. bags.

[1] All mulches will provide some degree of (1) erosion control, (2) moisture conservation, (3) weed control, and (4) reduction of soil crusting.

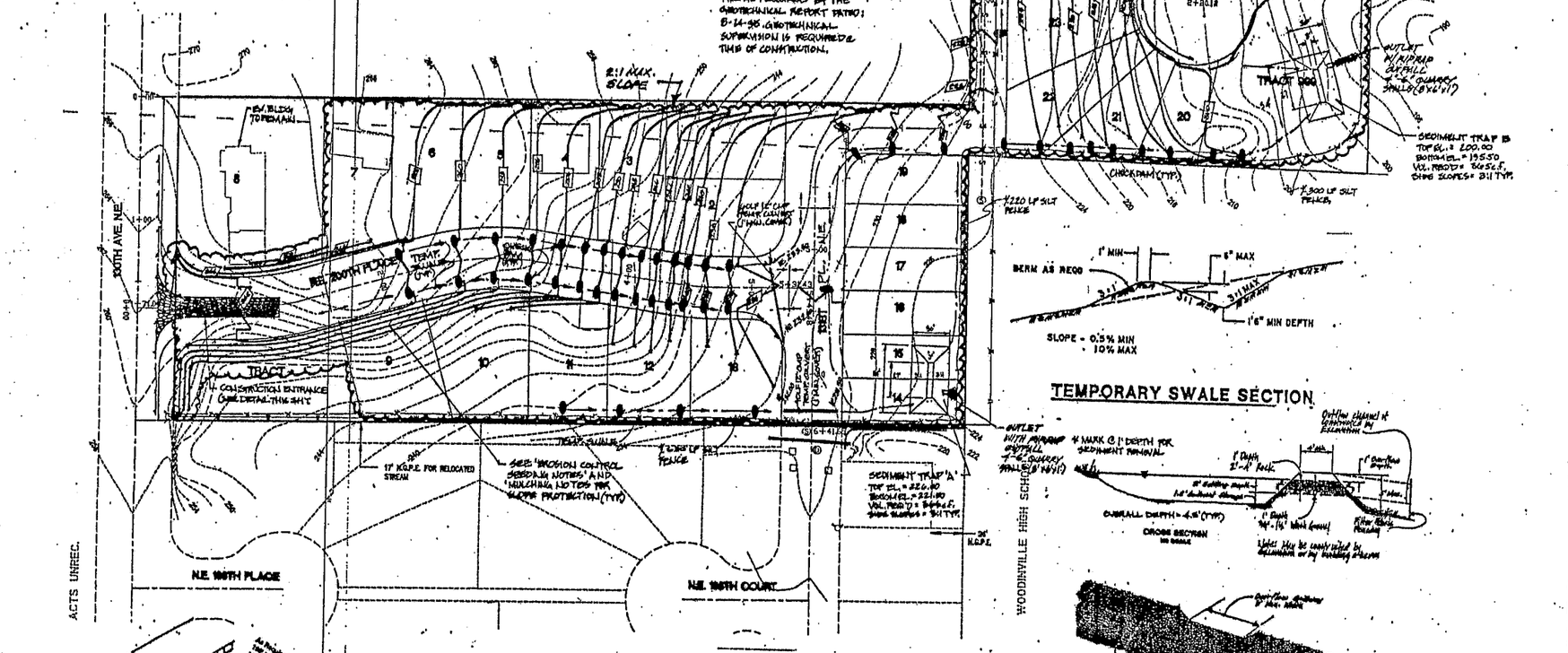
EROSION CONTROL SEEDING NOTES

Name	Proportions by Weight	Percent Purity	Percent Germination
Redtop (Agrostis Alba)	10%	92	90
Annual rye (Lolium Multiflorum)	40%	98	90
Chewings fescue (Festuca Rubra Commutata) (Jamestown, Banner, Shadow or Koket)	40%	97	90
White dutch clover (Trifolium Repens)	10%	98	90

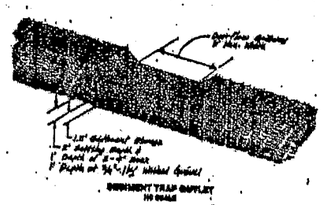
For other seed mixtures, use local supplier recommendations with approval from BALD.

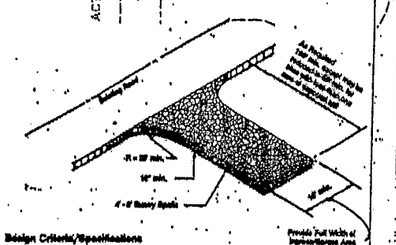
a "Hydroseeding" applications with approved seed-mulch-fertilizer mixtures may also be used.

b Maintenance - Seeding should be supplied with adequate moisture. Supply water as needed, especially in abnormally hot or dry weather, or on adverse sites. Water application rates should be controlled to prevent runoff. Inadequate amounts of water may be more harmful than no water.



TEMPORARY SWALE SECTION

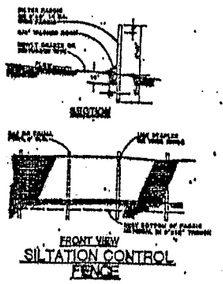




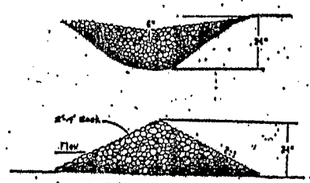
Design Criteria/Specifications

- Minimize the period of soil exposure through use of temporary ground cover and other temporary stabilization practices (See Section 5.5, Cover Measures).
- Site is sprinkled with water until surface is wet. Repeat as needed. To prevent carryout of mud onto street, refer to Stabilized Construction Entrance. (See Section 5.4.1.2)
- Spray exposed soil areas with the ' ' approved dust palliative (list of approved palliatives will be available at preconstruction meeting). Note, used oil is prohibited for use as a palliative.

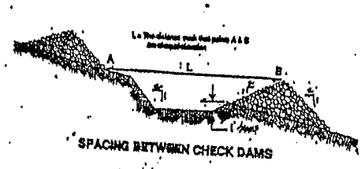
DETAIL: CONSTRUCTION ENTRANCE



SILTATION CONTROL FENCE



ROCK CHECK DAM
NO SCALE



SPACING BETWEEN CHECK DAMS

TYP. CHECK DAM
NO SCALE

EROSION/SEDIMENTATION CONTROL NOTES

EXHIBIT 30.
PAGE 30 OF 30

(1) Approval of this erosion/sedimentation control (ESC) plan does not constitute an approval of permanent road or drainage design (e.g. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).

(2) The implementation of these ESC plans and the construction, maintenance, replacement, and upgrading of these ESC facilities is the responsibility of the applicant/contractor until all construction is approved.

(3) The boundaries of the clearing limits shown on this plan shall be clearly flagged in the field prior to construction. During the construction period, no disturbance beyond the flagged clearing limits shall be permitted. The flagging shall be maintained by the applicant/contractor for the duration of construction.

(4) The ESC facilities shown on this plan must be constructed in conjunction with all clearing and grading activities, and in such a manner as to insure that sediment laden water does not enter the drainage system or violate applicable water standards.

(5) The ESC facilities shown on this plan are the minimum requirements for anticipated site conditions. During the construction period, these ESC facilities shall be upgraded (e.g. additional sumps, relocation of ditches and silt fences, etc.) as needed for unexpected storm events.

(6) The ESC facilities shall be inspected daily by the applicant/contractor and maintained as necessary to ensure their continued functioning.

(7) Any area stripped of vegetation, including roadway embankments, where no further work is anticipated for a period of 15 days, shall be immediately stabilized with the approved ESC methods (e.g. seeding, mulching, netting, erosion blankets, etc.).

(8) Any area needing ESC measure, not requiring immediate attention, shall be addressed within fifteen (15) days.

(9) The ESC facilities on inactive sites shall be inspected and maintained a minimum of once a month or within the 48 hours following a storm event.

(10) At no time shall more than one foot of sediment be allowed to accumulate within a catch basin. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment laden water into the downstream system.

(11) Stabilized construction entrances and wash pads shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures may be required to insure that all paved areas are kept clean for the duration of the project. (RCW 46.61.655).

(12) During the time period of November 1 through March 31, all project disturbed areas greater than 5,000 square feet that are to be left unworked for more than 12 hours shall be covered by one of the following cover measures: mulch, sodding or plastic covering.

(13) Any permanent retention/detention facility used as a temporary settling basin shall be modified with the necessary erosion control measures and shall provide adequate storage capacity. If the permanent facility is to function ultimately as an infiltration or dispersion system, the facility shall not be used as a temporary settling basin. No underground detention tanks or vaults shall be used as a temporary settling basin.

(14) Where seeding for temporary erosion control is required, fast germinating grasses shall be applied at an appropriate rate (e.g. annual or perennial rye applied at approximately 80 pounds per acre).

(15) Where straw mulch for temporary erosion control is required, it shall be applied at a minimum thickness of two inches.

CONSTRUCTION SEQUENCE

1. ATTEND PRE-CONSTRUCTION MEETING
2. FLAG CLEARING LIMITS
3. INSTALL FILTER FENCE
4. PROVIDE C.B. PROTECTION ON ALL EX. C.B. UPSTREAM IN IMMEDIATE AREA
5. INSTALL ROCKED CONSTRUCTION ENTRANCE
6. CLEAR FOR AND INSTALL TEMP. SED. POND AND APPURTENANCES
7. INSTALL INTERCEPTOR SWALES
8. CLEAR AREA SHOWN (GROSSLY) ROUGH GRADING)
9. INSTALL UTILITIES (STORM, SANITARY, WATER, ECT)
10. PROVIDE C.B. PROTECTION
11. FINAL GRADE/PAVE, MAINTAIN MINIMAL C.B. PROTECTION
12. HYDROSEED/MULCH ALL DISTURBED AREAS
13. FLUSH STORM DRAINAGE SYSTEM
14. REMOVE T.E.S.C. FACILITIES ONLY WHEN FACILITIES SITE IS STABILIZED

APPROVED FOR CONSTRUCTION	Plan Cite Engr. _____
	For Sheets ____ Through ____
Director of Public Services City of Woodinville	Util Engineer _____
	Trans Engineer _____
	Fire Dept _____
Date: _____	Planning Dept _____

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REVISIONS:
1. PER CITY OF WOODINVILLE REVIEW 8-1-95
2. PER CITY OF WOODINVILLE REVIEW 8-10-95
3. PER CITY OF WOODINVILLE REVIEW 8-29-95
4. REV. LAYOUT BETWEEN LOTS 4, 5 9-7-95

DRAWN BY: SB.
CHECKED BY: T.T.
JOB NO.: 95029
DATE: - - -

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1420 HEWITT AVE.
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TES.C. AND GRADING PLAN

LECKNER

SHEET: 2
REV:
OF: 6