Do it:
Gather all the information in conjunction with consultant team.

Synthesize, Analyze, Optimize:
Consider how sensitive, important, is this item to development.

Avoid Analysis Paralysis:
Don't get overwhelmed with details; think big picture.

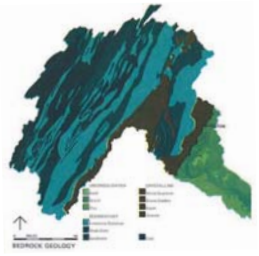
Use it:
The most salient items will guide your planning.

SITE ANALYSIS: DO IT. USE IT.

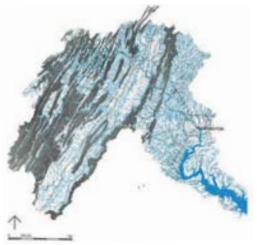
- Topography
- Soils — Geotech
- Hydrology
- Habitat — Flora
- Fauna
- Climate
- Views
- Recreation Potential
- Urban Form
- Visual and Aesthetic Values
- Historical Uses
- Transportation
- Zoning and Land Uses
- Other items as determined by your site

Best Reference—First Published in 1969

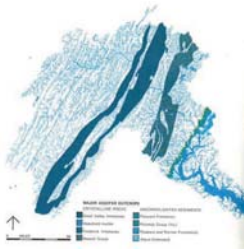
GEOLOGY



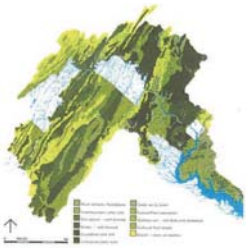
PHYSIOLOGY



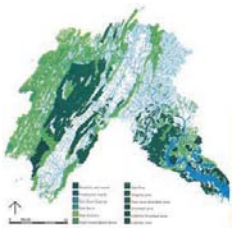
HYDROLOGY



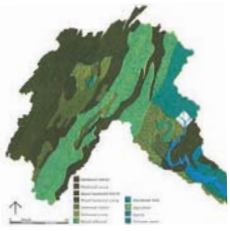
SOILS



PLANT ASSOCIATIONS

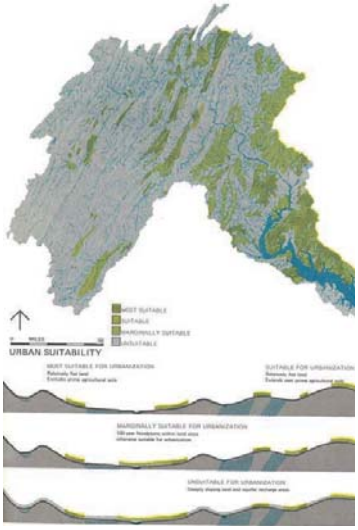


WILDLIFE

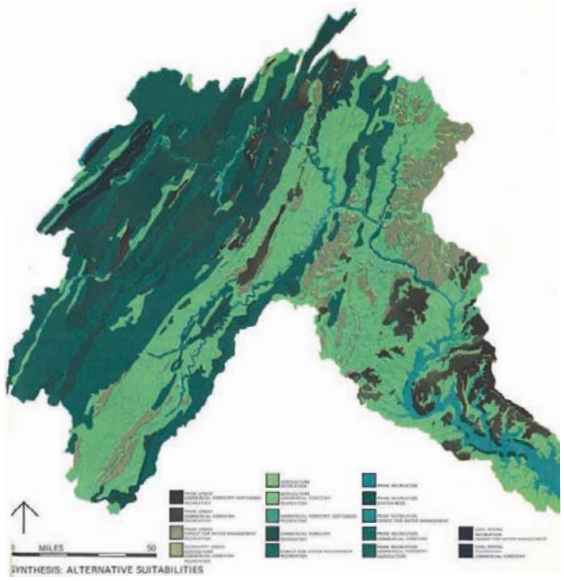


SLOPE

AGRICULTURE



URBAN SUITABILITY



SYNTHESIS

WEBER THOMPSON

Ronald T. Jepson & Associates

THE WATERSHED COMPANY

An Evolving Plan

FAIRHAVEN HIGHLANDS
BELLINGHAM, WA

EIS Scoping Meeting
January 16, 2008

EXAMPLES OF USING THE SITE TO DESIGN

SITE LOCATION

EXISTING CONDITIONS

VIEW SOUTH ON CHUCKANUT DRIVE

VIEW NORTH ON CHUCKANUT DRIVE

VIEW ACROSS STREET

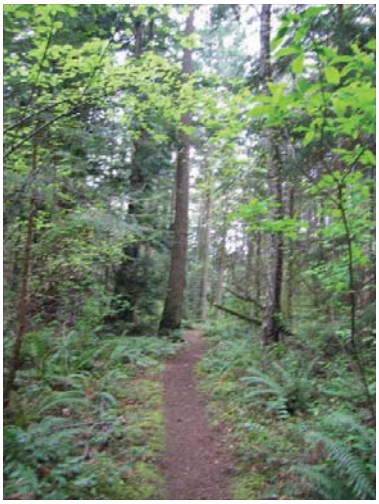
VIEW SOUTH OF DEVELOPMENT

NEW COMMUNITIES WEST OF SITE

SINGLE FAMILY WEST OF SITE

VIEW WEST

NORTH OF SITE



SITE—TRAILS

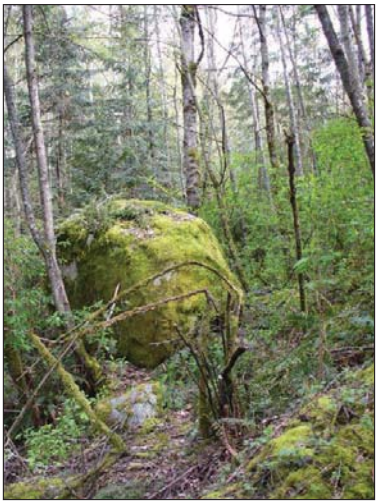
SITE—FORMER GRAVEL PIT

SITE

SITE — TRAILS THROUGH WETLAND

SITE

SITE



SITE

WETLAND

WETLAND

TRAILS

AERIAL PHOTO

AN INTEGRATED DESIGN APPROACH

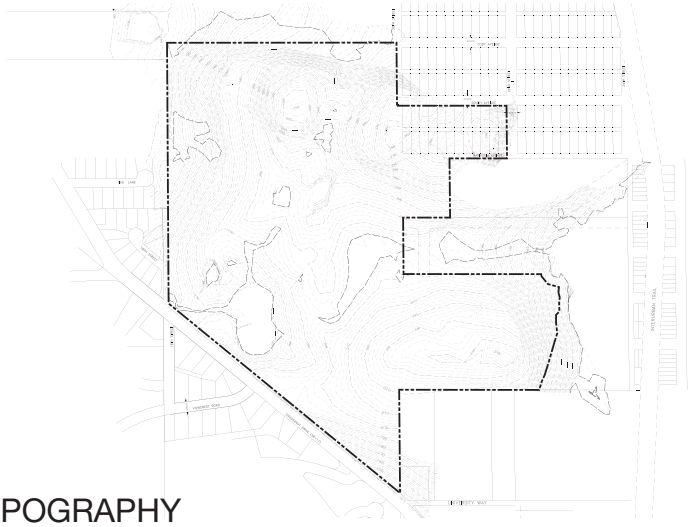
Geotechnical Engineering
- Sub-surface Flows
- Steep Slopes
- infiltration Testing
- Grading Considerations

Wetland Studies
- biological Assessment
- wetland delineation
- water Level monitoring
- Flora and Fauna

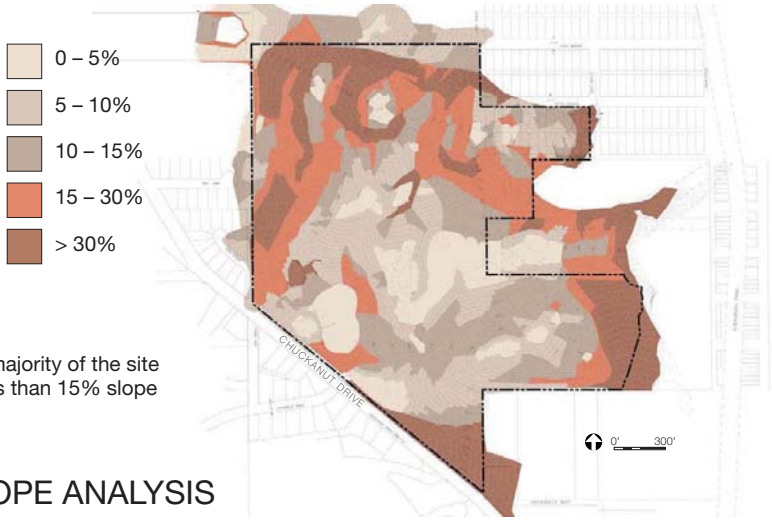
Civil Engineering
- Stormwater management
- Road Grading and design
- Utility design

Architecture/ Planning
- Site Planning
- Site design
- building and Unit design
- Open Space and Community Planning

Landscape Architecture
- Low impact Landscape design
- Planting for wetland enhancement, Mitigation
- Parks, Greens, Streetscape Landscape

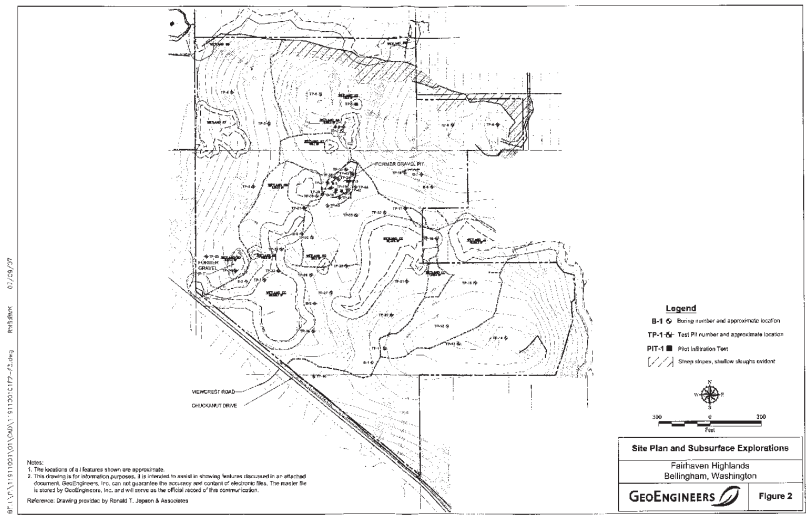


TOPOGRAPHY

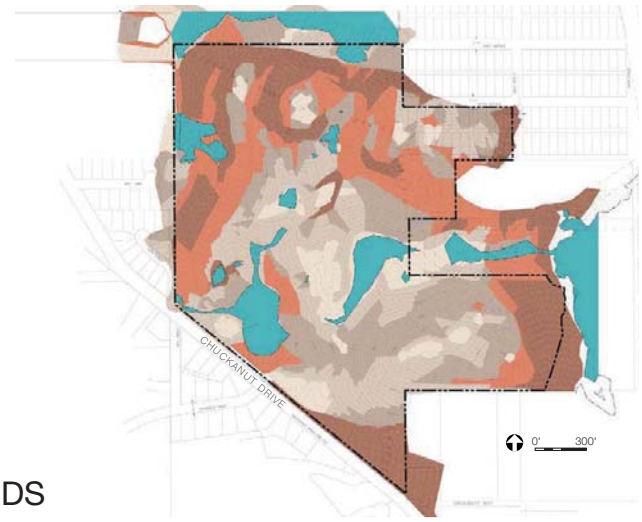


The majority of the site is less than 15% slope

SLOPE ANALYSIS

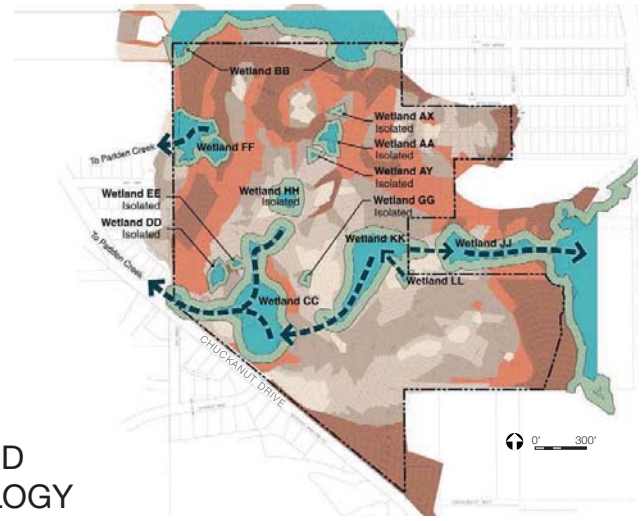


GEOTECHNICAL REPORT

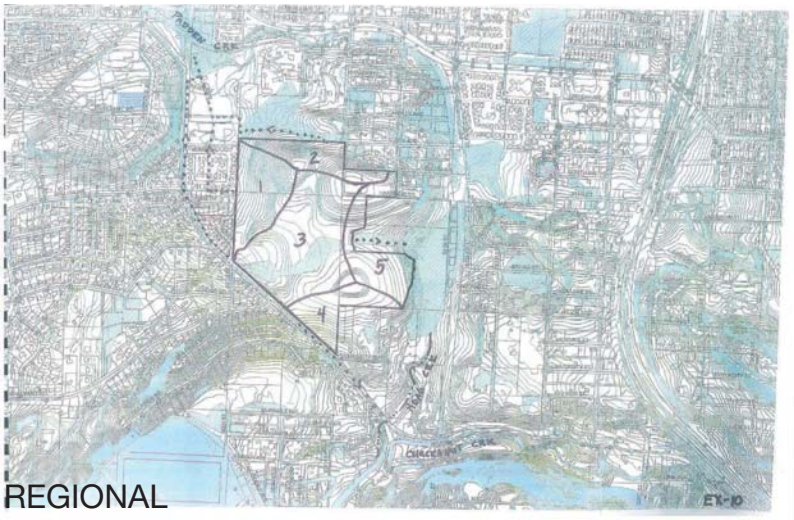


WETLANDS

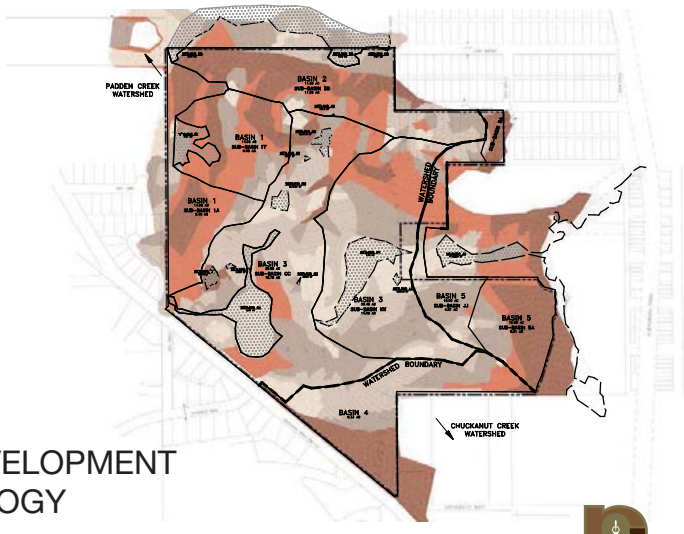
REQUIRED BUFFERS



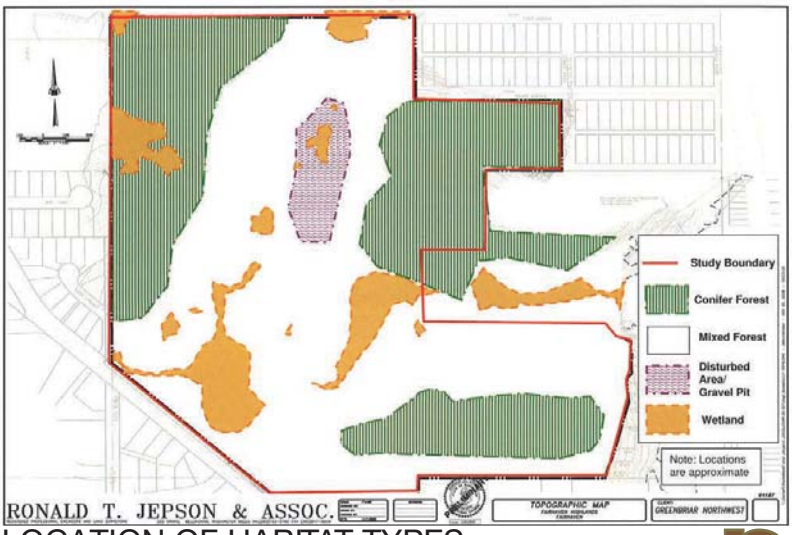
WETLAND HYDROLOGY



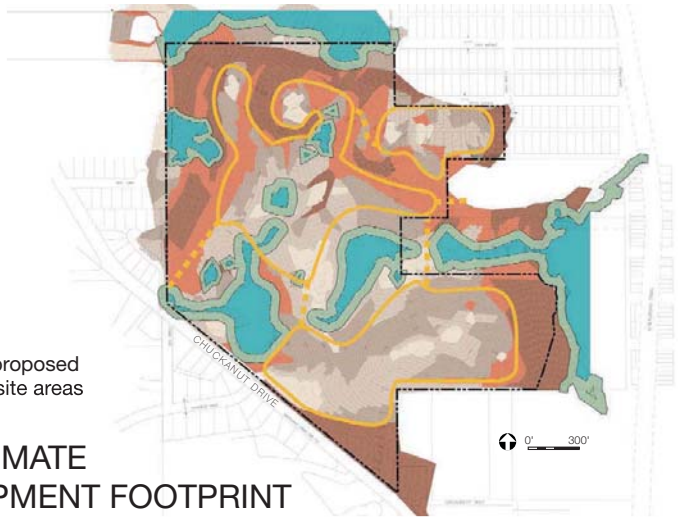
REGIONAL HYDROLOGY



PRE-DEVELOPMENT HYDROLOGY

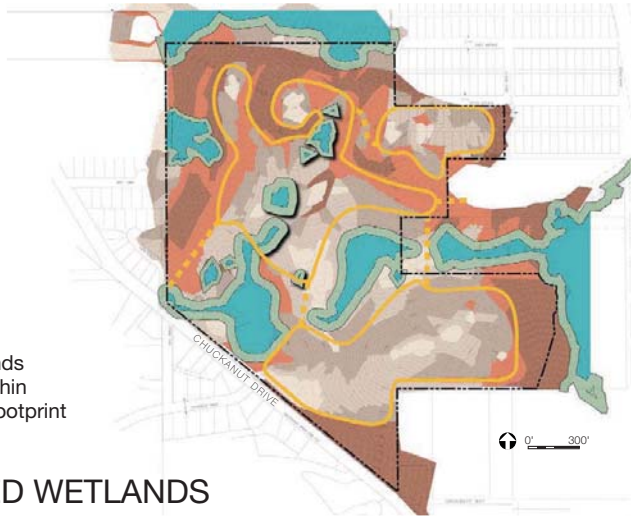


LOCATION OF HABITAT TYPES



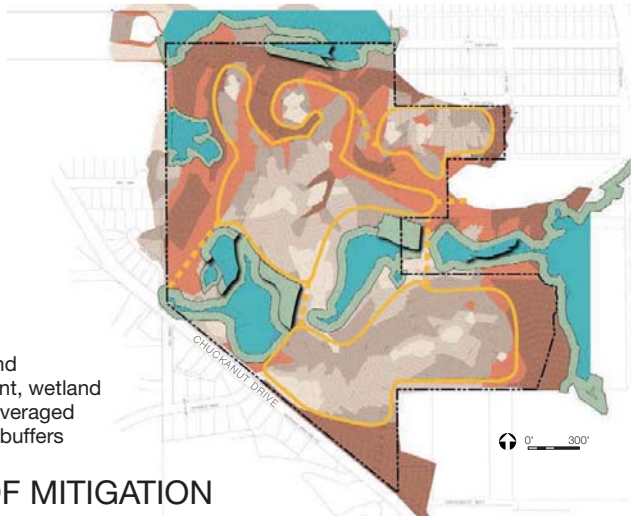
Development proposed on the flattest site areas

APPROXIMATE DEVELOPMENT FOOTPRINT



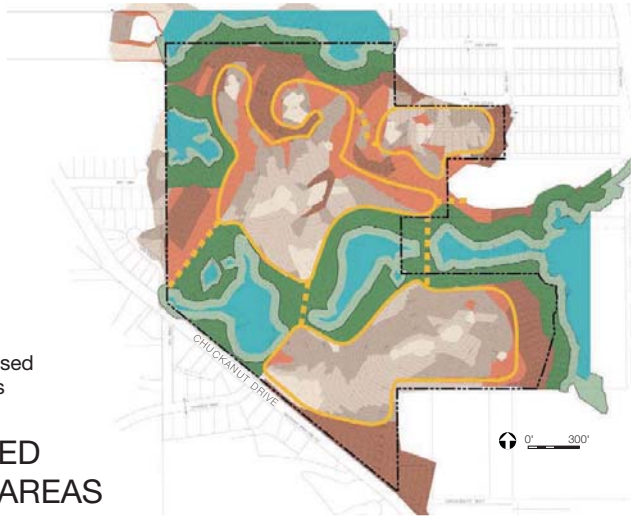
Isolated wetlands and buffers within development footprint

IMPACTED WETLANDS



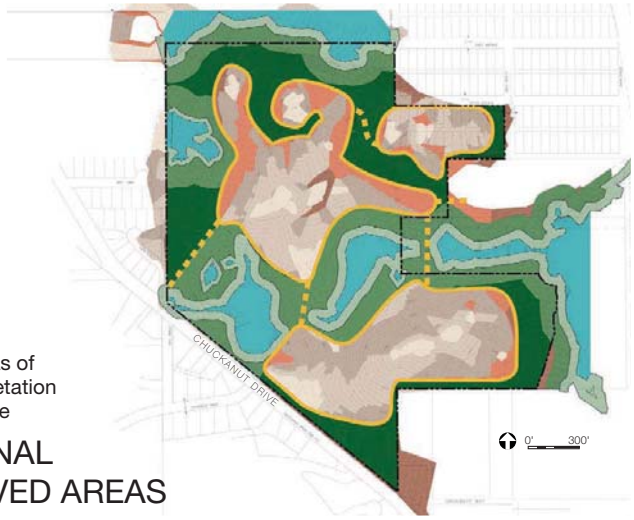
Areas of wetland re-establishment, wetland creation, and averaged and enhanced buffers

AREAS OF MITIGATION



Areas of increased wetland buffers

ENHANCED BUFFER AREAS



Additional areas of preserved vegetation and steep slope

ADDITIONAL PRESERVED AREAS

Over 40 acres of
preserved natural areas

TOTAL PRESERVED NATURAL AREA

COmmUni Ty bUiLdin G

SinGLe FAmiLy deTACHed
17 UNITS

SinGLe FAmiLy ATTACHed
112 UNITS

LOw RiSe mULTi FAmiLy
TOwn HOme S OVeR FLATS
166 UNITS

LOw RiSe mULTi FAmiLy
bACk TO bACk TOwn HOme S
74 UNITS

LOw RiSe mULTi FAmiLy
3 FLOORS STACKed FLATS
60 UNITS

4 FLOOR mULTi FAmiLy
STACKed FLATS
210 UNITS

5 FLOOR mULTi FAmiLy
STACKed FLATS
100 UNITS

739 UNITS

January 16, 2008

SITE PLAN

An INTEGRATED DESIGN APPROACH

Geotechnical Engineering
- Sub-surface Flows
- Steep Slopes
- infiltration Testing
- Grading Considerations

Wetland Studies
- biological Assessment
- wetland delineation
- water Level monitoring
- Flora and Fauna

Civil Engineering
- Stormwater management
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- Site Planning
- Site design
- building and Unit design
- Open Space and Community Planning

Landscape Architecture
- Low impact Landscape design
- Planting for wetland enhancement, Mitigation
- Parks, Greens, Streetscape Landscape

STORMWATER MANAGEMENT

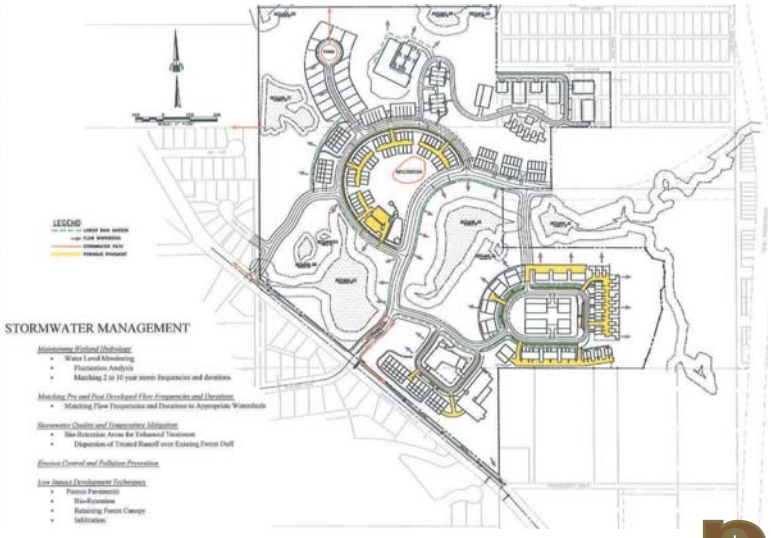
Maintaining Wetland Hydrology
- water Level m onitoring
- Fluctuation Analysis
- matching 2 to 10 year storm frequencies and durations

Matching Pre and Post Developed Flow Frequencies and Durations
- matching Flow Frequencies and durations to Appropriate Watersheds

Stormwater Quality and Temperature Mitigation
- bio-Retention Areas for enhanced Treatment
- dispersion of Treated Runoff over existing Forest duff

Erosion Control and Pollution Prevention

Low Impact Development Techniques
- Porous Pavements
- bio-Retention
- Retaining Forest Canopy
- infiltration



WSU LID TECHNICAL WORKSHOP | FAIRHAVEN HIGHLANDS

COPYRIGHT 2008 WEBER THOMPSON | WEBER THOMPSON

SITE PLAN—SOUTH SIDE

WSU LID TECHNICAL WORKSHOP | FAIRHAVEN HIGHLANDS

WEBER THOMPSON

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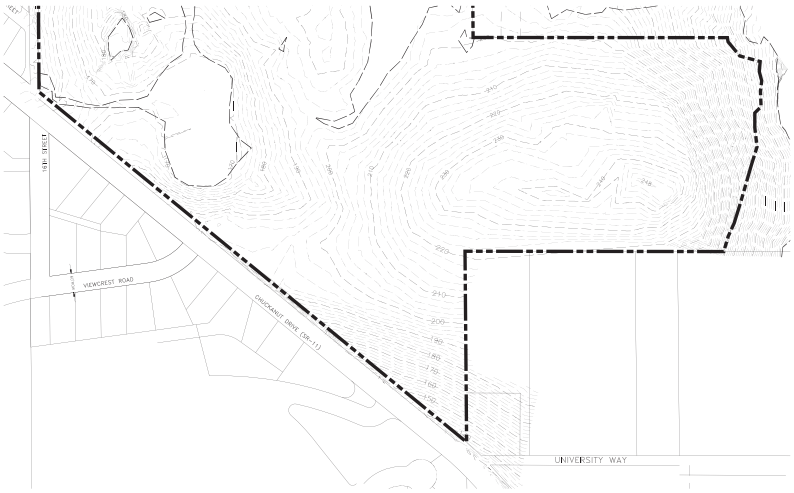


DETAIL OF TOPOGRAPHY

SITE PLAN—SOUTH SIDE

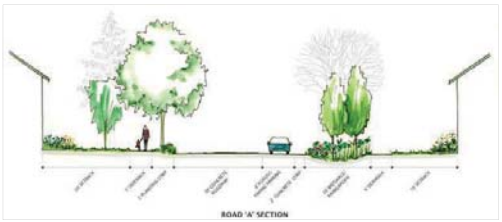
Low-impact storm water methods protect wetland hydrology

Photo Source: Urban Land Institute

examples of
GREEN INFRASTRUCTURE

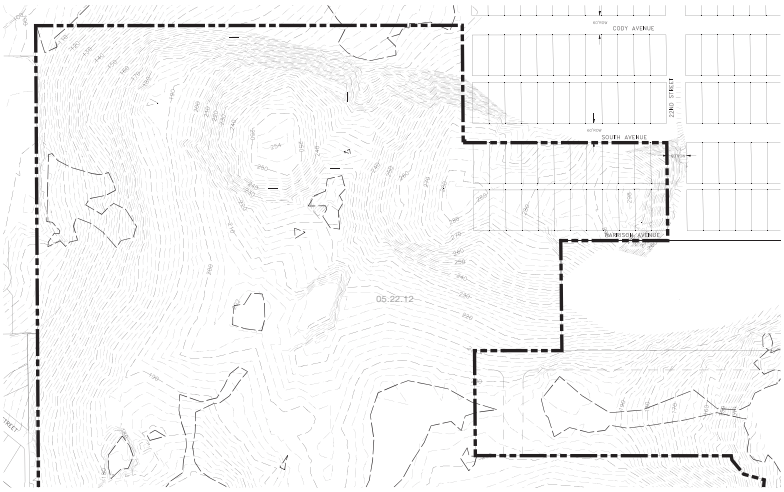
Photo Source: Rain Garden Handbook / Washington State University except where noted.

Proposed linear rain gardens along road clean and slow storm water runoff



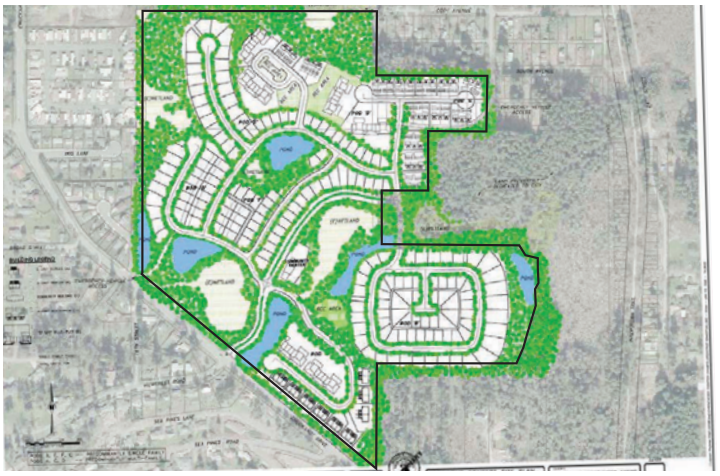
GREEN INFRASTRUCTURE

SITE PLAN—NORTH SIDE



DETAIL OF TOPOGRAPHY

SITE PLAN—NORTH SIDE



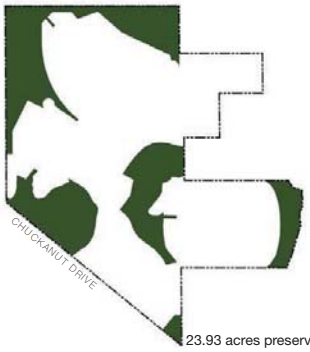
SITE PLAN APRIL 2005

April 2005 Plan

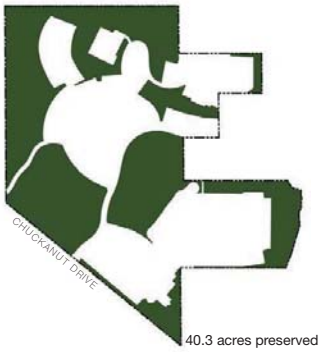
2008 enhanced buffer Plan

Comparison of the
TWO PLANS

April 2005 Plan

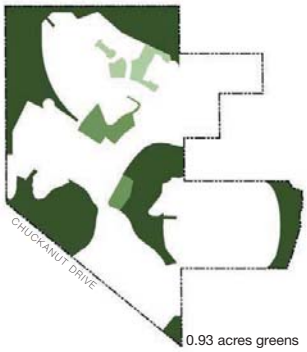


2008 enhanced buffer Plan



Comparison of
PRESERVED AREAS

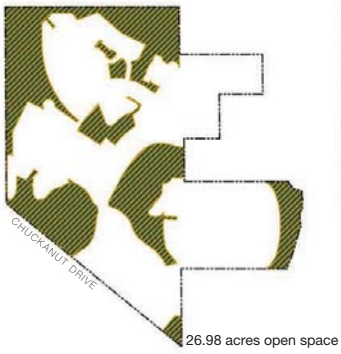
April 2005 Plan



2008 enhanced buffer Plan

Comparison of
GREENS + COURTYARDS

April 2005 Plan

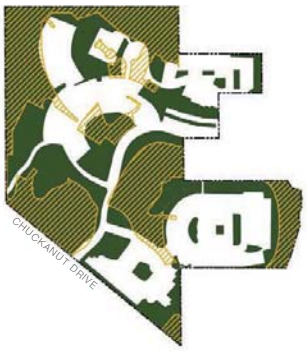


2008 enhanced buffer Plan

Comparison of
TOTAL OPEN SPACE

April 2005 Plan

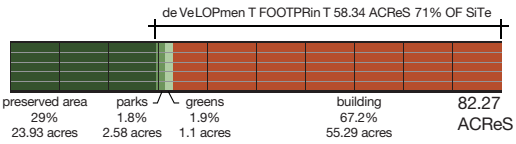
2008 enhanced buffer Plan



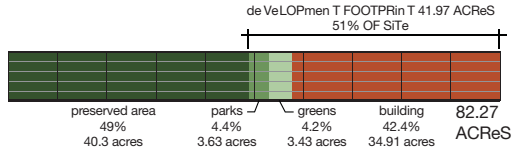
An additional 20.38 acres open space — almost 25%

Comparison of
TOTAL OPEN SPACE

April 2005 Plan

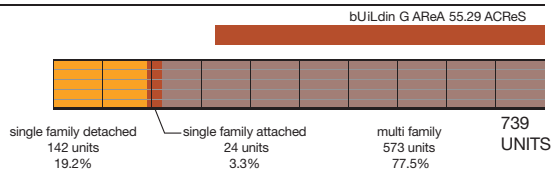


2008 enhanced buffer Plan

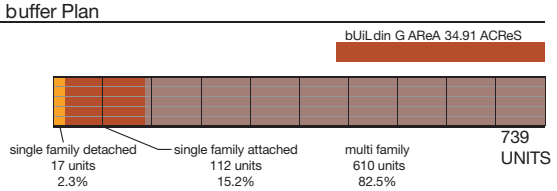


Comparison of
OPEN SPACE VS. BUILDING AREA

April 2005 Plan

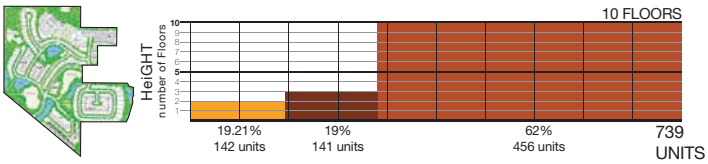


2008 enhanced buffer Plan

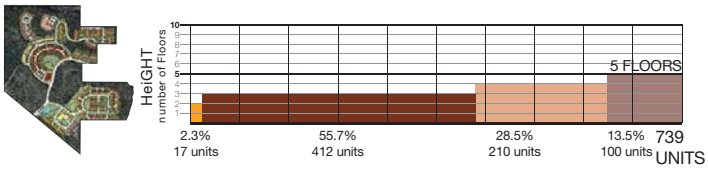


Comparison of
HOUSING MIX

April 2005 Plan



2008 enhanced buffer Plan



Comparison of
bUILDING HEIGHT

examples of
SINGLE FAMILY ATTACHED / DETACHED

examples of
LOW RISE MULTI FAMILY



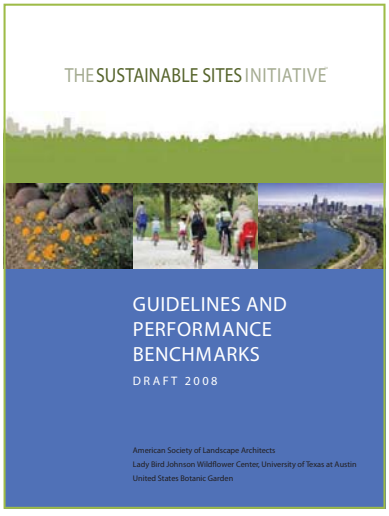


examples of
MIDRISE MULTIFAMILY

THE 2008 ENHANCED BUFFER PLAN PROVIDES:

1. Over 40 acres of preserved natural areas
2. Much greater wetland buffers and enhancements
3. Low-impact storm water management and protected wetland hydrology
4. Approximately seven acres of park areas and green space
5. Lower height of buildings

SUMMARY




2

Ecosystem Services

Ecosystem services are goods and services of direct or indirect benefit to humans that are produced by ecosystem processes involving the interaction of living elements, such as vegetation and soil organisms, and non-living elements, such as bedrock, water, and air.

Various researchers have come up with a number of lists of these benefits, each with slightly different wording, some lists slightly longer than others. For the purpose of developing performance criteria for practices that will protect or regenerate these benefits, the members of the Su stainable Sites Technical Subcommittees and staff have reviewed and consolidated the research into the list below of services provided by natural ecosystems. The goal of a sustainable site is to protect, restore, and enhance such ecosystem services wherever possible through sustainable land development and management practices.

1. Global climate regulation
   Maintaining balance of atmospheric gases at historic levels, creating breathable air, and sequestering greenhouse gases
2. Local climate regulation
   Regulating local temperature, precipitation, and humidity through shading, evapotranspiration, and windbreaks
3. Air and water cleansing
   Removing and reducing pollutants in air and water
4. Water supply and regulation
   Storing and providing water within watersheds and aquifers
5. Erosion and sediment control
   Retaining soil within an ecosystem, preventing damage from erosion and siltation
6. Hazard mitigation
   Reducing vulnerability to damage from flooding, storm surge, wildfire, and drought
7. Pollination
   Providing pollinator species for reproduction of crops or other plants
8. Habitat functions
   Providing refuge and reproduction habitat to plants and animals, thereby contributing to conservation of biological and genetic diversity and evolutionary processes
9. Waste decomposition and treatment
   Breaking down waste and cycling nutrients
10. Human health and well-being benefits
    Enhancing physical, mental, and social well-being as a result of interaction with nature
11. Food and renewable non-food products
    Producing food, fuel, energy, medicine, or other products for human use
12. Cultural benefits
    Enhancing cultural, educational, aesthetic, and spiritual experiences as a result of interaction with nature

respective flowers and promote the growth of myriad plants and crops. Healthy wetlands protect against floods. Soils and vegetation purify stormwater seeping through to groundwater and underground aquifers.

All of these services take place in functioning ecosystems whether anyone is paying attention or not. And because these services occur largely in the background, governments and businesses don't include them in their conventional cost

12

COMMUNITY BUILDING

SINGLE FAMILY DETACHED
17 UNITS

SINGLE FAMILY ATTACHED
112 UNITS

LOW RISE MULTI FAMILY
TOWN HOMES OVER FLATS
166 UNITS

LOW RISE MULTI FAMILY
BACK TO BACK TOWN HOMES
74 UNITS

LOW RISE MULTI FAMILY
3 FLOORS STACKED FLATS
60 UNITS

4 FLOOR MULTI FAMILY
STACKED FLATS
210 UNITS

5 FLOOR MULTI FAMILY
STACKED FLATS
100 UNITS

739 UNITS

QUESTIONS?