J. S. Jones and Associates, Inc.

Type 4 Watercourse Buffer Enhancement Plan and Justification for Buffer Reduction

of the

15404 40th Avenue South Property
King County Tax ID No.: 004300-0266

Prepared for:
FLS Development, LLC
155 SW 152nd Street, #A
Seattle, Washington 98166
206-423-8425

Dated:
May 14, 2010

Prepared by:
Lance Erickson, Environmental Designer

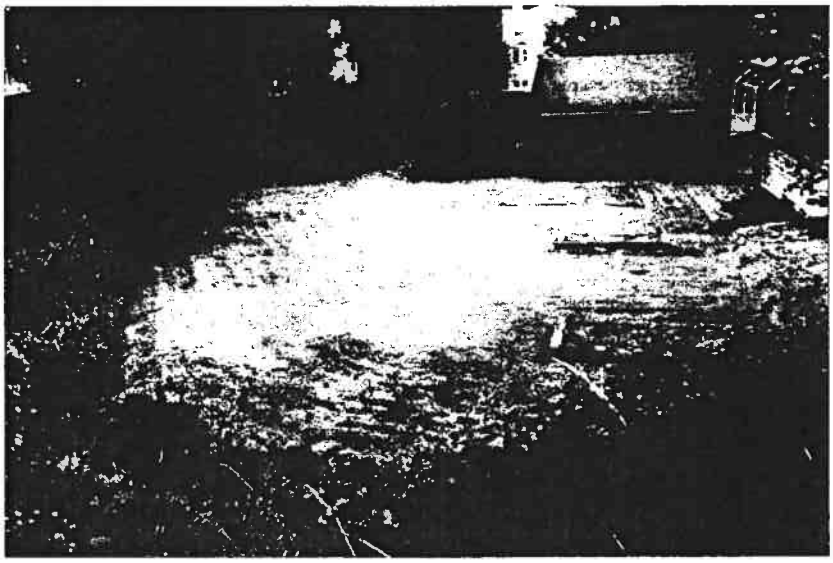
402 EAST MAIN STREET, SUITE 110
AUBURN, WASHINGTON 98002
253-804-2645 / FAX 253-333-8584

Executive Summary

The subject property is located at 15404 40th Avenue South, in Tukwila, Washington. A Type 4 watercourse is located between the north property line and South 154th Street. Type 4 watercourses are required to have a 50-foot buffer in the City of Tukwila. The applicant proposes to reduce the buffer by 50% and enhance the remaining buffer area. No evidence of additional sensitive areas are present south of the Type 4 watercourse. The remainder of the property is dominated by invasive vegetation which include Himalayan blackberry and non-native grasses. The applicant proposes to remove the invasive vegetation within the proposed enhancement area and install native trees and shrubs. The total area of enhancement is 3,057 square feet. The enhancement area will be planted with plant materials native to the Puget Sound lowlands. Native plant species will increase plant diversity, wildlife habitat and prevent the establishment of invasive species. In addition to the proposed enhancement, the reduced buffer will be fenced with split rail fencing and stream buffer signs will be posted. Detailed plans documenting the proposed enhancement are shown on the attached mitigation plan.

Figure 1.0

Proposed buffer reduction and enhancement area (existing lawn located in the northwest corner of the subject property)



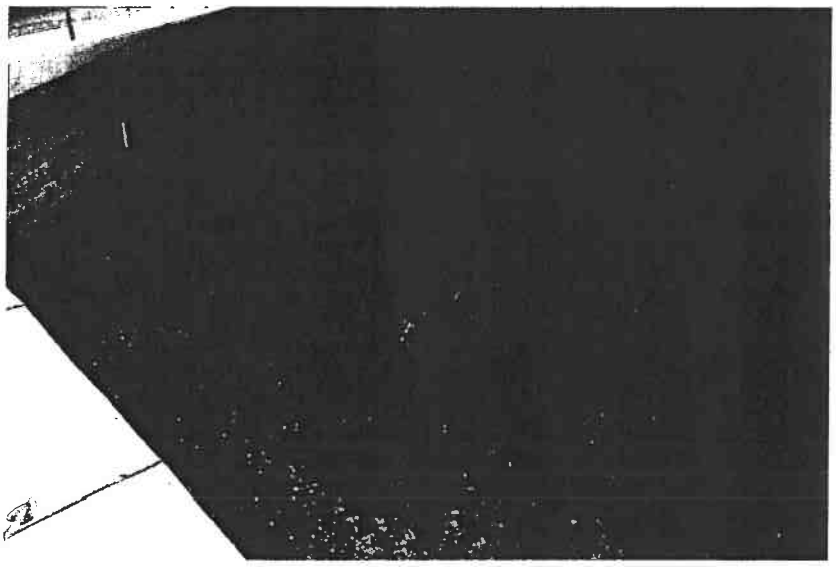
Baseline Information

The subject property is located at 15404 40th Avenue South, in Tukwila, Washington. The tax parcel number is 00430-0266. The property is located in the southwest quarter of Section 22, Township 23, Range 04 East of the Willamette Meridian.

A watercourse flows from a culvert under 40th Avenue South and runs parallel to the north property line. The watercourse is located in the vacated Right of Way for South 154th Street. The stream is rated as a Type 4 Watercourse. Section *18.45.100.A.4* of the Tukwila Municipal Code (TMC) defines Type 4 Watercourses as "those watercourses that have intermittent flows and are not used by salmonid fish." Type 4 Watercourses are required to have a 50-foot wide buffer. No evidence of additional sensitive areas are present south of the Type 4 watercourse. The remainder of the property is dominated invasive vegetation which include Himalayan blackberry and non-native grasses. Most of the eastern portion of the property is being used as residential lawn. The property slopes approximately 5% to the east. A residence and four associated out buildings (a detached garage and three sheds) are present. Multi-family residences are present to the south and east.

Figure 2.0

Type 4 Watercourse (view from side walk at northeast corner of property)



The TMC allows for buffer width variations. Section *18.45.10.F.1* of the TMC states "The Director may reduce the standard watercourse buffers on a case-by-case basis, provided the buffer does not contain slopes 15% or greater. The approved buffer width shall not result in greater than a 50% reduction in width. Any buffer reduction proposal must demonstrate to the satisfaction of the Director that it will not result in direct, indirect or long-term adverse impacts to watercourses." The applicable sections of the TMC are attached.

Justification for Buffer Reduction

This action is permitted in the TMC in Section 18.45.100.F.1a which states: "The Director may reduce the standard watercourse buffer on a case-by-case basis, provided the buffer does not contain slopes 15% or greater. The approved buffer width shall not result in greater than a 50% reduction in width. Any buffer reduction proposal must demonstrate to the satisfaction of the Director that it will not result in direct, indirect or long-term adverse impacts to watercourses, and that b), if there is no significant vegetation in the buffer, a buffer may be reduced only if an enhancement plan is provided. The plan must include using a variety of native vegetation that improves the functional attributes of the buffer and provides additional protection for the watercourses functions and values."

The proposed buffer reduction meets the required conditions as follows:

- The buffer is less than 15% slope
- The proposed reduction is not greater than 50%
- The existing buffer is mowed and maintained lawn, invasive Himalayan blackberry, and un-maintained grasses. In is current state the buffer provides little to no function or values to the Type 4 Watercourse. Enhancement will increase the functions and values of the buffer.
- Enhancement with native trees and shrubs will increase both the function and the value of the buffer area. Native trees and shrubs will increase will increase plant diversity, wildlife habitat and prevent the establishment of invasive species.

Environmental Goals and Objectives

The goal of mitigation is to increase the functions and values of the existing Type 4 Watercourse buffer through enhancement. The area of stream buffer which is proposed to be reduced is currently maintained lawn, invasive Himalayan blackberry, un-maintained grasses and weeds. Enhancement will provide a greater functions and values by improving plant diversity, wildlife habitat, and protection for the off-site watercourse. The objectives necessary to meet the above stated goal area as follows:

- Remove invasive vegetation from the stream buffer
- Remove trash and debris from the stream buffer
- Install native vegetation within the stream buffer
- Install split rail fencing and stream buffer signs at the limits of the proposed buffer deter future intrusions into the sensitive area
- Maintain and monitor the enhancement area for a period of three years or until the site meets the specified performance standards
- Record the sensitive area in a "Notice on Title"
- If the enhancement area fails to meet performance standards provide a contingency plan to rectify the situation.

Buffer Reduction and Mitigation

The area of the existing 50-foot buffer is 8,009 square feet. The applicant proposes a 50% reduction for enhancement. The remaining buffer area to be enhanced is 3,057 square feet. Section 18.45.10.F.1.B of the TMC, allows for reduction of a watercourse buffer by up to 50% if there is no significant vegetation present and an enhancement plan is provided. The western portion of the on-site buffer area is dominated by mowed and maintained lawn. The eastern portion is dominated by invasive Himalayan blackberry and un-maintained grass and weeds (see Figure 1.0 and Figure 3.0). The applicant proposes to remove the weeds and invasive vegetation and replant the area with native trees and shrubs. Native plant species will increase plant diversity, wildlife habitat and prevent the further establishment of invasive species. One existing maple tree will remain in the buffer area. No impacts to the Type 4 watercourse are proposed.

Plant quantities were calculated on a 9'x 9' spacing for trees and 5'x 5'spacing for shrubs. 40 trees and 120 shrubs are proposed for installation within the enhancement area. The enhanced buffer will be fenced with split rail fencing. Two stream buffer signs will be posted on the split rail fence. Details for split rail fencing and stream buffer signs are shown on the attached planting plans.

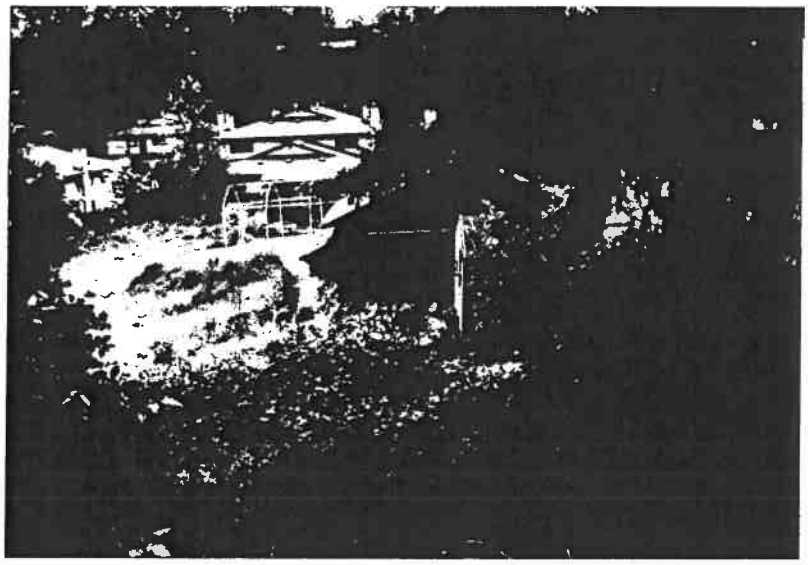


Figure 3.0

Invasive plant material and existing landscape trees in the mitigation area.

Performance Standards

The plant survival and cover standards established to measure the success of the mitigation area are as follows:

	Year 1	Year 2	Year 3
Shrub and Sapling Tree Cover*	>10%	>15%	>20%
Shrub and Sapling Tree Survival	100%	>85%	>80%

**Includes beneficial native plants in that category that are naturally recruiting volunteers*

- Less than 10% invasive vegetation during any monitoring event.
- The establishment of 3 species of native trees and 4 species of native shrubs at the end the monitoring period.

Monitoring Program

The applicant's environmental consultant will perform a three-year monitoring program. A monitoring report will be submitted to the City of Tukwila by December 31st of each year beginning the first fall after enhancement installation. Sample points or transects will be established for vegetation monitoring. Photo-points will be established from which photos will be taken throughout the monitoring period. Linear transects are the preferred method for vegetation monitoring for this site. No less than one (1) 50 foot transect will be established in the mitigation area. Permanent transect location(s) must be identified on the approved mitigation plans in the first monitoring report (they may be drawn on approved mitigation plans by hand). Plots located at the end of each transect shall detail herb, shrub, and tree aerial cover at radii of 1m, 5m, and 10m respectively, using the Braun-Blanquet releve method or other acceptable field method. Monitoring of vegetation transects shall occur annually between August 1 and September 30, prior to leaf drop, unless otherwise specified.

As applicable, the monitoring reports must include description/data for:

- Project reference number
- Site plan and location map
- Historic description of the project, including date of installation, current year of monitoring, restatement of enhancement goals, and performance standards
- Plant survival, vigor, and aerial coverage from every plant community and an explanation of monitoring methodology in the context of assessing performance standards
- Hydrologic data from wells, hand-ball test, and visual observations, and an explanation of monitoring methodology
- Buffer conditions, e.g. surrounding land use, use by humans, wild and domestic creatures
- Observed wildlife, including amphibians, avians and others
- Assessment of nuisance/exotic biota and recommendations for management
- Receipts for off-site disposal of any dumping, weeds or invasive plants
- Receipts for structural repairs or replacement
- Color photographs taken from permanent photo-points as shown on enhancement plan
- Summary of maintenance and contingency measures proposed for next season and completed last season

Maintenance Plan

In order to achieve performance standards, the applicant shall have the mitigation area maintained for the duration of the monitoring period. Maintenance shall be required in accordance with City of Tukwila guidelines and approved plans. Maintenance activities will be conducted a minimum of twice per year (April and September) for the duration of the monitoring period, three years. Maintenance will include:

- Watering
- Weeding around base of installed plants
- pruning
- Replacement
- Restaking
- Removal of all classes of noxious weeds (see Washington State Noxious Weeds List, WAC 16-7150-005) as well as Himalayan blackberry
- Any other measures needed to insure plant survival
- General maintenance activities which include the replacement of any vandalized or damaged signs, habitat features, fences or other structural component of the mitigation site.

Chemical controls shall not be used in the mitigation area. However, limited use of herbicides may be approved depending on site specific conditions, only if approved by City of Tukwila staff. All invasive material and debris is to be disposed of off-site in a legal manner. The Permittee shall be responsible for the health of 100% of all newly installed plants for one growing season after installation has been accepted by City of Tukwila staff. A growing season for these purposes is defined as occurring from spring to spring (March 15 to March 15, following year). The Permittee shall replace any plants that are failing, weak, defective in a manner of growth, or dead during this growing season, as directed by the Landscape Designer, Wetland Biologist, and/or City of Tukwila staff. Water shall be provided during the dry season (July 1-October 15) for the first two years after installation to ensure plant survival and establishment. Water should be provided by a temporary above ground irrigation system. Water should be applied at a rate of 1" of water two times a week for Year 1 and 1" of water one time a week during Year 2.

Contingency Plan

Should any monitoring report reveal the enhancement has failed in whole or in part, and should that failure be beyond the scope of routine maintenance, a contingency plan will be submitted. Once approved, it may be installed, and will replace the approved enhancement plan. If failure is substantial, the City of Tukwila may extend the monitoring period for the enhancement.

Performance Bonds

Prior to beginning any work, the Permittee must provide a mitigation bond or assignment of funds per City of Tukwila procedures. A bond quantity worksheet has been completed based on all elements of the mitigation plan. The total cost, plus contingency fees has been determined to be $ **13,894.37** , which will be the amount of the mitigation bond the Permittee is required to provide.

Critical Areas Mitigation
Bond Quantity Worksheet

Project Name: Tukwila Property | Date: 5/14/10 | Prepared by: J. S. Jones and Associates, Inc.

Location: 15404 40th Avenue South | Applicant: FLS Development, LLC | Phone: 206-423-8425

PLANT MATERIALS*

Type	Unit Price	Unit	Quantity	Description	Cost
PLANTS: Container, 1 gallon, medium soil	$11.50	Each	105		$ 1,207.50
PLANTS: Container, 2 gallon, medium soil	$20.00	Each	15		$ 300.00
PLANTS: Container, 5 gallon, medium soil	$36.00	Each	40		$ 1,440.00
* All costs include installation				TOTAL	$ 2,947.50

INSTALLATION COSTS (LABOR, EQUIPMENT, & OVERHEAD)

Type	Unit Price	Unit			Cost
Labor, general (landscaping)	$40.00	HR	24		$ 960.00
Hauling and disposal	$20.00	CY	10		$ 200.00
Mulch, delivered and spread	$35.73	CY	5		$ 178.65
				TOTAL	$ 1,338.65

GENERAL ITEMS

ITEMS	Unit Cost	Unit			Cost
Fencing, split rail, 3' high (2-rail)	$10.54	LF	185		$ 1,949.90
Signs, sensitive area boundary (inc. backing, post, install)	$28.50	Each	2		$ 57.00
				TOTAL	$ 2,006.90

OTHER				(Construction Cost Subtotal)	$ 6,293.05
ITEMS	Percentage of Construction	Unit			Cost
Mobilization	10%				$ 629.31
Contingency	30%				$ 1,887.92
				TOTAL	$ 2,517.22

MAINTENANCE AND MONITORING — NOTE: Projects with multiple permit requirements may be required to have longer monitoring and maintenance terms. This will be evaluated on a case-by-case basis for development applications. Monitoring and maintance ranges may be assessed anywhere from

Maintenance, Twice Annual					
Larger than 1,000 sq. ft. but less than 5,000 sq.ft. of buffer mitigation	$ 180.00	EACH	9	(4hr @$45/hr)	$ 1,620.00
Monitoring, annual					
Larger than 1,000 sq.ft. but less than 5,000 -buffer mitigation only	$ 720.00	EACH	3	(8 hrs @ 90/hr)	$ 2,160.00
Maintenance and Monitoring Inspection (City), annual	$362.25	EACH	2	(2.5 hrs @ $144.90/hr)	$ 724.50
Maintenance and Monitoring Inspection (City), final	$579.60	EACH	1	(4 hrs @ $144.90/hr)	$ 579.60
				TOTAL	$ 5,084.10

Total	**$13,894.37**

TUKWILA PROPERTY - BUFFER ENHANCEMENT PLAN

SW 1/4 OF SEC. 22, TWP. 23 N, RGE. 04 E, W.M.

TAX PARCEL ID NO.: 004300-0266

NORTH

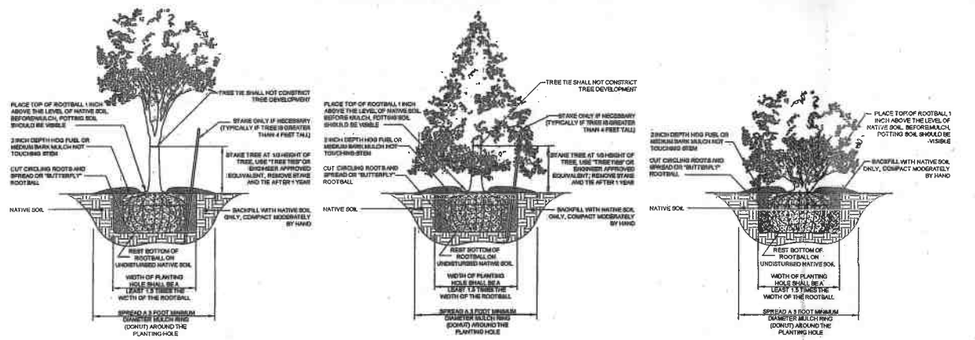
0 5 10 20 30

SCALE: 1" = 10'

SOIL PREP NOTES:
FOLLOWING INVASIVE REMOVAL 2"-3" OF TOPSOIL OR COMPOST WILL BE INSTALLED IN THE INVASIVE REMOVAL AREA. TOPSOIL OR COMPOST WILL BE INCORPORATED BY HAND PRIOR TO PLANT INSTALLATIONS.

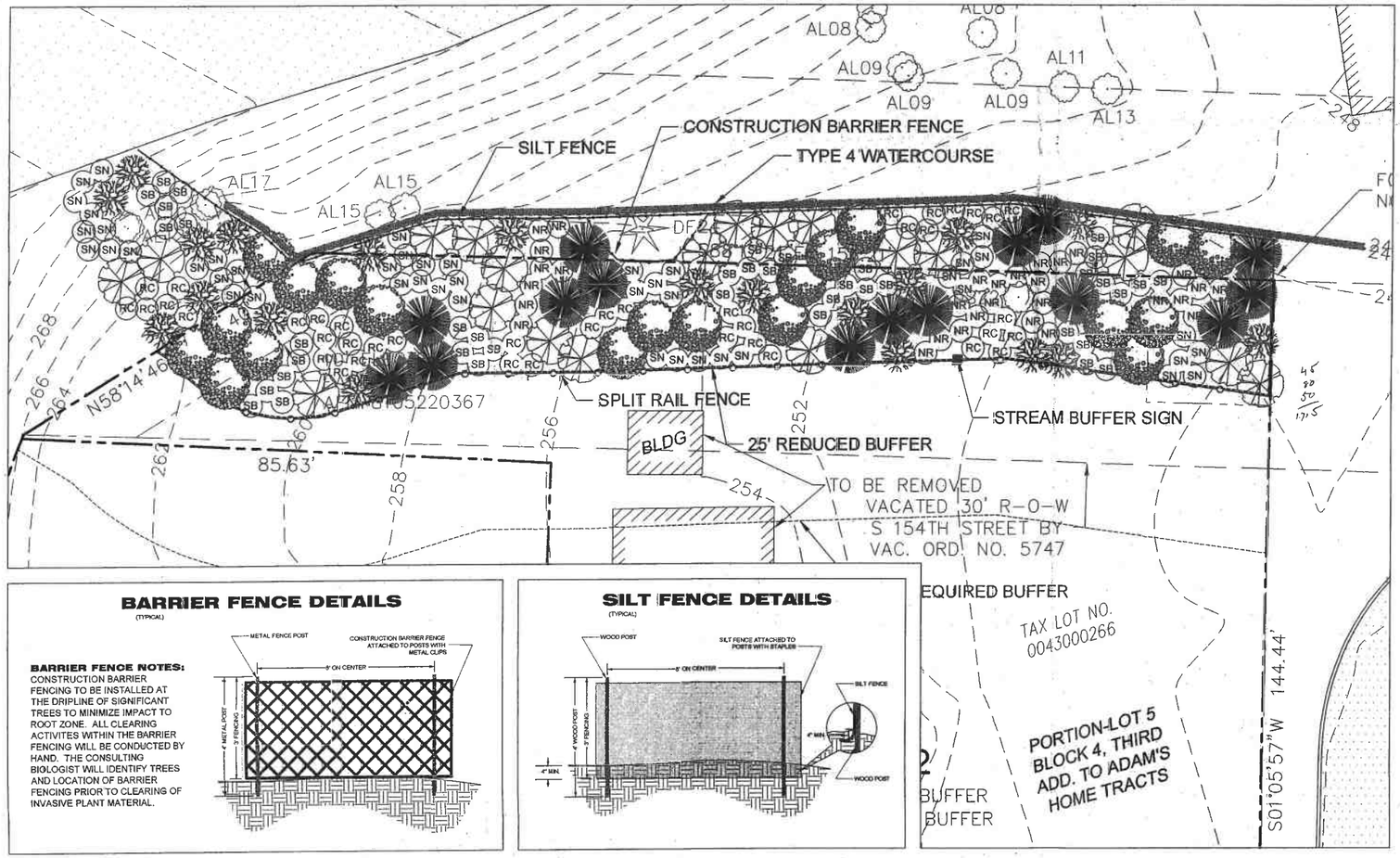
TEMPORARY IRRIGATION SYSTEM NOTES:
IF MITIGATION PLANTS ARE INSTALLED IN THE FALL OR SPRING A TEMPORARY IRRIGATION SYSTEM SHALL BE INSTALLED PRIOR TO THE FOLLOWING JUNE 1ST AFTER PLANT INSTALLATION. IF MITIGATION IS INSTALLED DURING THE DRY SEASON (JUNE-AUGUST) A TEMPORARY IRRIGATION SYSTEM WILL BE INSTALLED AT THE TIME OF PLANT INSTALLATION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO HAVE THE IRRIGATION SYSTEM DESIGNED, INSTALLED, AND MAINTAINED. WATER SHALL BE PROVIDED BY HOSE BIB FROM THE EXISTING RESIDENCE.

TREE AND SHRUB PLANTING AND STAKING DETAIL



PLANT SCHEDULE

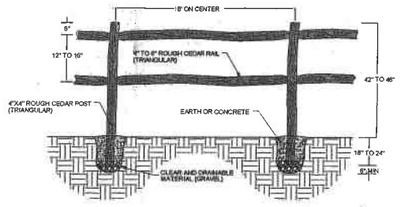
SYMBOL	COMMON NAME	SCIENTIFIC NAME	QTY.	SIZE
	BIG-LEAF MAPLE	ACER MACROPHYLLUM	20	5 GAL
	RED ALDER	ALNUS RUBRA	20	5 GAL
	DOUGLAS FIR	PSEUDOTSUGA MENZIESII	15	5 GAL
	VINE MARLE	ACER CIRCINATUM	20	2 GAL
RC	RED-FLOWERING CURRANT	RIBES SANGUINEUM	40	1 GAL
NR	NOOTKA ROSE	ROSA NUTKANA	30	1 GAL
SB	SALMONBERRY	RUBUS SPECTABILIS	40	1 GAL
SN	SNOWBERRY	SYMPHORICARPOS ALBUS	45	1 GAL



INVASIVE REMOVAL NOTES:
NON NATIVE INVASIVE PLANT MATERIAL SHALL BE GRUBBED OUT OF THE MITIGATION AREA BY MECHANICAL METHODS (I.E EXCAVATOR OR BACKHOE). CONSULTING BIOLOGIST SHALL BE PRESENT ON-SITE DURING INVASIVE REMOVAL TO SUPERVISE CLEARING ACTIVITIES. ORANGE CONSTRUCTION BARRIER FENCING SHALL BE INSTALLED AT THE DRIPLINE OF THE LARGE DOUGLAS FIR TREE TO MINIMIZE DISTURBANCE TO ROOT SYSTEM (SEE DETAIL). ALL INVASIVE REMOVAL WITHIN THE DRIPLINE OF NATIVE VEGETATION TO REMAIN WILL BE DONE BY HAND.

MULCHING NOTES:
FOLLOWING PLANT INSTALLATION 2"-4" OF HOG FUEL OR MEDIUM BARK MULCH SHALL BE INSTALLED IN THE ENTIRE MIGITATION AREA. HOG FUEL OR MEDIUM BARK MULCH WILL HELP MAINTAIN SOIL MOISTURE AND SUPRESS WEEDS.

SPLIT RAIL FENCE DETAIL



BARRIER FENCE DETAILS

(TYPICAL)

BARRIER FENCE NOTES:
CONSTRUCTION BARRIER FENCING TO BE INSTALLED AT THE DRIPLINE OF SIGNIFICANT TREES TO MINIMIZE IMPACT TO ROOT ZONE. ALL CLEARING ACTIVITES WITHIN THE BARRIER FENCING WILL BE CONDUCTED BY HAND. THE CONSULTING BIOLOGIST WILL IDENTIFY TREES AND LOCATION OF BARRIER FENCING PRIOR TO CLEARING OF INVASIVE PLANT MATERIAL.

SILT FENCE DETAILS

(TYPICAL)

STREAM SIGN DETAIL

(TYPICAL)

STREAM SIGN NOTES:
STREAM SIGN SHOWN IS TYPICAL OF CRITICAL AREA SIGNS USED IN THE PUGET SOUND REGION. PER THE REQUIREMENTS OF CITY OF TUKWILA SENSITIVE AREA ORDINANCE TMC. 18.45.060.6 WORDING SHALL BE AS FOLLOWS: *" PROTECTION OF THIS NATURAL AREA IS IN YOUR CARE. ALTERATION OR DISTURBANCE IS PROHIBITED PURSUANT TO TMC CHAPTER 18.45. PLEASE CALL THE CITY OF TUKWILA FOR MORE INFORMATION ."*

APPROVED
DEC 05 2013
City of Tukwila
PUBLIC Works

RECEIVED
NOV 04 2013
TUKWILA
PUBLIC WORKS

NO.	DATE	BY	REVISION
1	10/1/10	LRE	CITY COMMENTS 9/22/10

CONSULTANT:
J. S. Jones and Associates, Inc.
Environmental Consultants
Wetlands, Streams, and Wildlife
402 EAST MAIN STREET, SUITE 110 AUBURN, WASHINGTON 98002 253-804-2645

CLIENT:
FLS DEVELOPMENT, LLC
155 SW 152ND STREET, #A SEATTLE, WASHINGTON 98166
206-423-8425

PROJECT:
TUKWILA PROPERTY
STREAM BUFFER ENHANCEMENT PLAN
TAX PARCEL ID NO.: 004300-0266

DESIGNED BY:	CHECKED BY:	SCALE
L. Erickson	Jeff Jones	1"=10'
DRAWN BY:	APPROVED BY:	SHEET
L. Erickson		2 of 3
	DATE: 8/14/10	

PW13-0946

L10-056

TUKWILA PROPERTY - BUFFER ENHANCEMENT PLAN

SW 1/4 OF SEC. 22, TWP. 23 N, RGE. 04 E, W.M.

TAX PARCEL ID NO.: 004300-0266

1.0 Executive Summary
The applicant proposes to short plat the property into two lots. A Type 4 Watercourse is present to the north of the subject property. The buffer from the Type 4 Watercourse extends onto the subject property. As part the the short plat the applicant proposes to reduce the required watercourse buffer from 50 to 25 feet. As part of the reduction, the applicant proposes to enhance the on-site portion of the watercourse buffer with native trees and shrubs. Native plant species will increase plant diversity, wildlife habitat and prevent the establishment of invasive species.

1.1 Project Description
The applicant proposes to remove invasive vegetation within the proposed enhancement area and install native trees and shrubs. The total area of enhancement is 5,016 square feet. In addition to the proposed enhancement, the reduced buffer will be fenced with split rail fencing and stream buffer signs will be posted.

1.2 Goals and Objectives
The goal of mitigation is to increase the functions and values of the existing Type 4 Watercourse buffer through enhancement. The area of stream buffer which is proposed to be reduced is currently lawn and ornimental landscaping. Enhancement will provide a greater protection for the off-site watercourse. The objectives necessary to meet the above stated goal area as follows:

- Remove invasive vegetation from the stream buffer
- Remove trash and debris from the stream buffer
- Install native vegetation within the stream buffer
- Install split rail fencing and stream buffer signs at the limits of the proposed buffer deter future intrusions into the sensitive area
- Maintain and monitor the enhancement area for a period of five years or until the site meets the specified performance standards
- Record the sensitive area in a "Notice on Title"
- If the enhancement area fails to meet performance standards provide a contingency plan to rectify the situation.

2.0 Project Location
The property is located at 15404 40th Avenue South, in Tukwila, Washington.

3.0 Responsible Parties
Applicant
FLS Development, LLC
Attn: Lee Stenson
155 SW 152nd Street, #A
Seattle, Washington 98166
(206) 423-8425

Environmental Consultant
J. S. Jones and Associates, Inc.
Attn: Jeffery S. Jones, PWS
402 East Main Street, Suite 110
Auburn, Washington 98002
(253) 804-2645

4.0 Standards
All work and materials shall conform to City of Tukwila standards and specifications, and to the specifications and details shown on these plans.

5.0 City of TukwilaContact
Certain actions within this mitigation/restoration plan require inspection or approval by City of Tukwila staff. Requests for inspection/approval shall be coordinated through City of Tukwila Department of Community Development, (206) 431-3670.

6.0 Contractor Information
When it is available, contact information shall be provided to the City of Tukwilathat includes names, addresses and phone numbers of persons/firms that will be responsible for grading the mitigation/restoration area, installing required plants, and performing required maintenance and monitoring.

7.0 Contractor's Qualifications
Contractor/Landscape Installer must be experienced in mitigation and restoration work. The Permittee shall provide that there is one person on the site at all times during work and installation who is thoroughly familiar with the type of materials being installed and the best methods for their installation, and who shall direct all work being performed under these specifications. This person shall be experienced in installing native plant materials for wetland mitigation or restoration projects, unless otherwise allowed by the Landscape Designer, Wetland Biologist and/or City of Tukwila staff.

8.0 Site Conditions
The Contractor shall immediately notify the Landscape Designer and/or Wetland Biologist of drainage or soil conditions likely to be deterimental to the growth or survival of plants. Locations shall be as depicted in the approved plan set. The Landscape Designer and/or Wetland Biologist may adjust the locations of plantings shown on plans based on field conditions. Planting operations shall not be conducted under the following conditions: freezing weather, when the ground is frozen, excessively wet weather, excessively windy weather, or in excessive heat. Changes should be documented and as-built drawings submitted to the City of Tukwila upon request for formal construction approval.

9.0 Plants
9.1 Origin: Plant materials shall be Northwest native plants, nursery grown in the Puget Sound region of Washington. Dug plants may only be used upon approval of City of Tukwila staff.

9.2 Plant Names: Plant names shall comply with those generally accepted in the native plant nursery trade. Any questions regarding plant species or variety shall be referred to the Landscape Designer, Wetland Biologist or City of Tukwila staff. All plant materials shall be true to species and variety.
9.3 Plant Substitutions: Plant substitutions are not permitted without the permission of the Landscape Designer, Wetland Biologist and/or City of Tukwila staff. Same species substitutions of larger size do not require special permission. However, small plants often experience less transplant shock and adapt more quickly to site conditions, resulting in a higher success rate. As such, smaller plants will be approved as substitutions based on certain site-specific conditions (trees not less than 1 gallon size however).
9.4 Quality and Condition: Plants shall be normal in pattern of growth, healthy, well-branched, vigorous, with well-developed root systems, and free of pests and diseases. Damaged, diseased, pest-infested, scraped, bruised, dried-out, burned, broken, or defective plants will be rejected.
9.5 Intermediate Inspections: All plants shall be inspected and approved by the Landscape Designer and/or Wetland Biologist prior to installation. Condition of roots of a random sample of plants will be inspected, as well as all aboveground growth on all plants. Roots of any bare root plants, if permitted for use, will be inspected. Plant material may be approved at the source, at the discretion of the Landscape Designer and/or Wetland Biologist, but all material must be re-inspected and approved on the site prior to installation.
9.6 Handling: Plants shall be handled so as to avoid all damage, including breaking, bruising, root damage, sunburn, drying, freezing or other injury. Plants must be covered during transport. Plants shall not be bound with wire or rope in a manner that could damage branches. Protect plant roots with shade and wet soil in the time period between delivery and installation. Do not lift container stock by trunks, stems, or tops. Do not remove from containers until ready to plant. Water all plants as necessary to keep moisture levels appropriate to the species horticultural requirements. Plants shall not be allowed to dry out. All plants shall be watered thoroughly immediately upon installation. Soak all containerized plants thoroughly prior to installation. Bare root plants are subject to the following special requirements, and shall not be used unless planted between November 1 and March 1, and only with the permission of the Landscape Designer and City of Tukwila staff. Bare root plants must have enough fibrous root to insure plant survival. Roots must be covered at all times with mud and/or wet straw, moss, or other suitable packing material until time of installation. Plants whose roots have dried out from exposure will not be accepted at installation inspection.
9.7 Damaged Plants: Damaged, dried out, or otherwise mishandled plants will be rejected at installation inspection. All rejected plants shall be immediately removed from the site.
9.8 Roots: All plants shall be balled and burlapped or containerized, unless explicity authorized by the Landscape Designer and/or Wetland Biologist. Root bound plants or B&B plants with damaged, cracked or loose rootballs (major damage) will be rejected. Immediately before installation, plants with minor root damage (some broken and/or twisted) must be root-pruned. Matted or circling roots of containerized plantings must be pruned or straightened and the sides of the root ball must be roughened from top to bottom to a depth of approximately half and inch in two to four places. Bare root plantings of woody material is allowed only with permission from the Landscape Designer, Wetland Biologist, and/or City of Tukwila staff.
9.9 Sizes: Plant sizes shall be the size indicated in the plant schedule. Larger stock may be acceptable provided that it has not been cut back to size specified, and that the root ball is proportionate to the size of the plant. Smaller stock may be acceptable, and under some circumstances perferable, based on site-specific conditions. Measurements, caliper, branching and balling and burlapping shall conform to the American Standard of Nursery Stock by the American Assoiciation of Nurserymen (latest edition).
9.10 Form: Evergreen trees, if used, shall have single trunks and symmetrical, well-developed form. Deciduous trees shall be single trunked unless specified as multi-stem in the plant schedule. Shrubs shall have multiple stems, and be well-branched.
9.11 Planting: Planting shall be done in accordance with illustrated details in the mitigation/restoration plan set and accepted industry standards. Plant locations shall also be inspected and approved prior to planting.
9.12 Timing of Planting: Unless otherwise approved by City of Tukwila staff, all planting shall occur between September 1 and March 31.
9.13 Planting in Pits: Planting pits shall be circular or square with vertical sides, and shall be 6" larger in diameter than the root ball of the plant. Break up the sides of the pit in compacted soils. Set plants upright in pits, as illustrated in planting detail. Burlap shall be removed from the planting pit. Backfill shall be worked back into holes such that air pockets are removed without adversely compacting soils.
9.14 Soil Amendments: Unless otherwise specified and approved by City of Tukwila, native soil will be incorporated into the planting pits.
9.15 Mulch: The entire mitgation area shall receive no less than 2"-4" of hog fuel or medium bark mulch after planting. Hog fuel or mulch shall be kept well away (at least 2") from the trunks and stems of woody plants.
9.16 Fertilizer: Slow release fertilizer may be used if pre-approved by City of Tukwila staff. Fertilizers shall be applied only at the base of plantings underneath the required covering of mulch (that does not make contact with stems of the plants). No fertilizers will be placed in planting holes.
9.17 Water: Plants shall be watered upon completion of backfilling. For spring plantings (if approved), a rim of earth shall be mounded around the base of the tree or shrub no closer than the drip line, or no less than 30" in diameter, except on steep slopes or in hollows. Plants shall be watered a second time within 24-48 hours after installation. The earthen rim/dam should be leveled prior to the second growing season.
9.18 Staking: Most shrubs and many trees do not require any staking. If the plant can stand alone without staking in a moderate wind, do not use a stake. If the plant needs support, then strapping or webbing should be used as low as possible on the trunk to loosely brace the tree with one stake (see Planting Detail). Do not brace the tree tightly or too high on the trunk. If the tree is unable to sway, it will further lose the ability to support itself. As soon as supporting the plant becomes unnecessary, remove the stakes. All stakes must be removed within two (2) years of installation.
9.19 Weeding: Existing and exotic vegetation in the mitigation and buffer areas will be hand weeded from around all newly installed plants at the time of installation and on routine basis through monitoring period. No chemical control of vegetation on any portion of the site is allowed without the written permission of City of Tukwila staff.

10.0 Maintenance
Maintenance shall be required in accordance with City of Tukwila guidelines and approved plans.
10.1 Duration and Extent: In order to achieve performance standards, the Permittee shall have the mitigation/restoration area maintained for the duration of the monitoring period, 5 years. All maintenance shall be directed by the Landscape Designer and/or Wetland Biologist. Maintenance will include:

- watering (see 10.7 for details)
- weeding around base of installed plants
- pruning
- replacement (see 10.5 for details)
- restaking
- removal of all classes of noxious weeds (see Washington State Noxious Weeds List, WAC 16-750-005) as well as Himalayan blackberry
- any other measures needed to insure plant survival (see 10.6 for details)
- general maintenance activities which include the replacement of any vandalized or damaged signs, habitat features, fences or other structural component of the mitigation site.

10.2 Survival: The Permittee shall be responsible for the health of 100% of all newly installed plants for one growing season after installation has been accepted by City of Tukwila staff (see Performance Standards). A growing season for these purposes is defined as occurring from spring to spring (March 15 to March 15, following year). For fall installation (often required), the growing season will begin the following spring. The Permittee shall replace any plants that are failing, weak, defective in a manner of growth, or dead during this growing season, as directed by the Landscape Designer, Wetland Biologist, and/or City of Tukwila staff.
10.3 Installation Timing for Replacement Plants: Replacement plants shall be installed between September 1 and March 31, unless otherwise determined by the Landscape Designer, Wetland Biologist, and/or City of Tukwila staff.
10.4 Standards for Replacement Plants: Replacement plants shall meet the same standards for size and type as those specified for original installation unless otherwise directed by the Landscape Designer, Wetland Biologist, and/or City of Tukwila staff. Replacement plants shall be inspected as described above for the original installation.
10.5 Replanting: Plants that have settled in their planting pits too deep, too shallow, loose, or crooked shall be replanted as directed by the Landscape Designer, Wetland Biologist, and/or City of Tukwila staff.
10.6 Herbicides/Pesticides: Chemical controls shall not be used in the mitigation/restoration area, sensitive areas or their buffers. However, limited use of herbicides may be approved depending on site specific conditions, only if approved by City of Tukwila staff.
10.7 Irrigation/Watering: Water shall be provided during the dry season (July 1-October 15) for the first two years after installation to ensure plant survival and establishment. Water should be provided by a temporary above ground irrigation system. It is the responsibility of the applicant to have the temporary irrigation designed, installed and maintained so that the necessary water amounts are provided. Water should be applied at a rate of 1" of water two times a week for Year 1 and 1" of water one time a week during Year 2.

11.0 Performance Standards - Plant Cover and Survival

- Plant survival and cover standards are established to measure mitigation success as follows:

	Year 1	Year 2	Year 3
Shrub and Sapling Tree Cover*	>10%	>15%	>20%
Shrub and Sapling Tree Survival	100%	>85%	>80%

*Includes beneficial native plants in that category that are naturally recruiting volunteers

- Less than 10% invasive vegetation during any monitoring event.
- The establishment of 3 species of native trees and 4 species of native shrubs at the end the the monitoring period.

12.0 Monitoring
Monitoring shall be conducted annually for 5 years in accordance with the approved mitigation/restoration monitoring plan.
12.1 Vegetation Monitoring: Sample points or transects will be established for vegetation monitoring, and photo-points established from which photos will be taken throughout the monitoring period. Linear transects are the preferred method for vegetation monitoring for this site. No less than one (1) 100-foot transect per 10,000 square feet of area will be established in the mitigation/restoration area. Permanent transect location(s) must be identified on mitigation/restoration site plans in the first monitoring report (they may be drawn on approved mitigation/restoration plans by hand). Plots located at the end of each transect shall detail herb, shrub, and tree aerial cover at radii of 1m, 5m, and 10m respectively, using the Braun-Blanquet releve method or other acceptable field method. Monitoring of vegetation transects shall occur annually between August 1 and September 30 (prior to leaf drop), unless otherwise specified.
12.2 Photopoints: No less than one (1) permanent photo point per 10,000 square feet of mitigation/restoration area will be established within the mitigation/restoration area. Photographs will be taken from these points to visually record the condition of the mitigation/restoration area. Photos shall be taken annually between August 1 and September 30 (prior to leaf drop), unless otherwise specified.
12.3 Reports: Monitoring reports shall be submitted by December 31 of each year during the monitoring period. As applicable, monitoring reports must include description/data for:

- Site plan and location map
- Historic description of project, including date of installation, current year of monitoring, restatement of mitigation/restoration goals, and performance standards
- Plant survival, vigor, and aerial coverage from every plant community (transect data), and explanation of monitoring methodology in the context of assessing performance standards
- Site hydrology, including extent of inundation, saturation, depth to groundwater, function of any hydrologic structures, piezometer or staff guage if available, inputs, outlets, etc.
- Slope condition, site stability, any structures or special features
- Buffer conditions, e.g. surrounding land use, use by humans, wild and domestic creatures
- Observed wildlife, including amphibians, avians and others
- Assessment of nuisance/exotic biota and recommendations for management
- Soils, including texture, Munsell color, rooting and oxidized rhizoshperes
- Receipts for off-site disposal of any dumping, weeds, or invasive plants
- Receipts for any structural repair or replacement
- 4"x6" color photograph taken from permanent photo-points as shown on Monitoring/Restoration plan.
- Summary of maintenance and contingency measures proposed for next season and completed for past season

12.4 Deficiences: Any deficiency discovered during any monitoring or inspection visit must be corrected within 60 days of approval by City of Tukwila.
12.5 Contingency Plan: Should any monitoring report reveal the mitigation has failed in whole or in part, and should that failure be beyond the scope of routine maintenance, a Contingency Plan will be submitted. The Contingency Plan may range in complexity from a list of plants substituted, to cross-sections of proposed engineered structures. Once approved, it may be installed, and will replace the approved mitigation/restoration plan. If the failure is substantial, the City of Tukwila may extend the monitoring period for that mitigation.

13.0 Bond
Prior to beginning any work, the Permittee must provide a mitigation/restoration bond or assignment of funds per City of Tukwila procedures. A bond quantity worksheet has been completed based on all elements of the mitigation/restoration plan. The total cost, plus contingency fees has been determined to be $ 20,013.20 , which will be the amount of the mitigation/restoration bond the Permittee is required to provide.

APPROVED
DEC 05 2013
City of Tukwila
PUBLIC Works

CONSULTANT:
J. S. Jones and Associates, Inc.
Environmental Consultants
Wetlands, Streams, and Wildlife
402 EAST MAIN STREET, SUITE 110 AUBURN, WASHINGTON 98002 253-804-2645

NO.	DATE	BY	REVISION
1	10/11/10	LRE	CITY COMMENTS 9/22/10

CLIENT:
FLS DEVELOPMENT, LLC
155 SW 152ND STREET, #A SEATTLE, WASHINGTON 98108
206-423-8425

PROJECT:
TUKWILA PROPERTY
STREAM BUFFER ENHANCEMENT PLAN
TAX PARCEL ID NO.: 004300-0266

RECEIVED
NOV 04 2013
TUKWILA
PUBLIC WORKS

DESIGNED BY:	L. Erickson
DRAWN BY:	L. Erickson
CHECKED BY:	Jeff Jones
APPROVED BY:	
DATE:	5/14/10

SCALE
NONE

SHEET
3 of 3

REVISED FINAL WETLAND MITIGATION PLAN
TUKWILA POND
Tukwila, Washington

Prepared for:

Wig Properties LLC-SS
4811 SE 134th Place SE
Bellevue, Washington 98006

Prepared by:

Chad Armour LLC
6500 126th Avenue SE
Bellevue, Washington 98006
(425) 641-9743

August 2006

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U.S. Army Corps of Engineer Jurisdictional Determination of Wetlands on the Penney site
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Wetland Rating for the Penney site
Wetland Rating for the Tukwila Pond site
Wetland Rating for the Mitigation site – Existing Conditions
Wetland Rating for the Mitigation site – Projected Conditions

1. EXECUTIVE SUMMARY

Wig Properties LLC-SS (Wig) plans to construct the Southcenter Shopping center on the 18.77-acre Penney warehouse distribution site in Tukwila, Washington (Figure 1). To do so, Wig proposes to fill 1.16 acres of wetlands that developed on fill soil placed on the Penney site in the late 1960s (Figure 2).

Based on the City of Tukwila's (Tukwila) wetland rules, four of the six Penney site wetlands meet the criteria for Type 3 wetlands. The other two are unregulated. The U. S. Army Corps of Engineers (Corp) determined that only one of the six wetlands on the Penney site is jurisdictional and therefore regulated by the Corps (Appendix A). All six of the Penney site wetlands are regulated by the Washington Department of Ecology (Ecology).

As a whole the wetlands on the Penney site exhibit low wetland functions because they are small and support immature plant communities that developed on imported fill soils (Table 1). Upon closer inspection, the Penney site wetlands exhibit high water quality functions and low hydrologic and habitat functions. The road ruts that support wetlands store water that would otherwise be released quickly to the lower Green River. They also provide limited water quality improvement and biological support.

To mitigate for filling the Penney site wetlands, Wig proposes to create and enhance a total of 3.48 acres of lacustrine emergent and open water wetland dominated by reed canarygrass (*Phalaris arundinacea*). The mitigation site is located in the southeast quadrant of the 24-acre Tukwila Pond site. It is surrounded by open water, scrub-shrub and forested wetland, forested upland, and upland shrubs.

The Tukwila Pond site as a whole, rates at the low end of Category II wetlands (Appendix B). Its water quality functions rate high and it's hydrologic and habitat functions are rated as moderate. The mitigation site currently rates as a solid Category III wetland. It has a moderate rating for water quality and hydrologic functions and a low habitat function. Following completion of mitigation and at the end of the 10-year monitoring and maintenance effort, the Mitigation site is projected to function as a high end Category II wetland. The Tukwila Pond site is located about 1,000 feet northeast of the Penney site.

The Tukwila Pond was selected for mitigation for the following reasons:

- The quality of the existing wetland at the Tukwila Pond site can be substantially improved (Table1);
- Both Ecology and the Corps prefer that mitigation occur off site (Appendix A);
- The sensitive areas regulations allow for off site mitigation;
- Tukwila's long-term plans include enhancing degraded portions of the Tukwila Pond site;
- The mitigation site is located in the same drainage basin as the Penney site; and
- The mitigation site is bounded by existing open water and forested wetlands as well as upland forest and shrub plant communities.

In addition to providing compensation for wetland loss, the benefits of the wetland mitigation plan include:

- Increasing the complexity of the Tukwila Pond site; and
- Increasing the detention capacity of the Tukwila Pond.

In addition to providing these benefits, the wetland mitigation plan is designed to more than replace the wetland functions that will be lost on the Penney site. Filling the Penney site wetlands will have minimal impact on the hydrological support function because their contribution to base flow is very small. Conversely it will have a positive effect on floodwater abatement and water quality improvement. The shopping center's stormwater management system together with the new detention capacity on the Mitigation site represents a 574 percent increase over existing conditions (Table 2). Similarly, the shopping center's water quality system and landscaping together represents a 1,345 percent increase in water quality treatment capacity. Replacing the immature forest and meadow habitat present on the Penney site with four wetland classes, including open water, will more than offset the lost habitat functions (Table 1).

Wig recognizes that it is likely that some of the plants installed on the Mitigation site will not survive the seasonal flooding typical of the Tukwila pond. Wig also recognizes that seasonal flooding tends to favor reed canarygrass. To reduce these potentials Wig will:

- Install plants that tolerate seasonal flooding;
- Monitor the Mitigation site for 10 years – annually for the first 5 years;
- Install new plants annually to replace those that are lost; and
- Post a bond sufficient to cover the cost of replanting the Mitigation site.

2. PROJECT DESCRIPTION

This plan presents information about the proposed Southcenter Square Shopping Center project (Proposed Development), the wetlands that are present on the Penney site, the land present in the southeast quadrant of the Tukwila Pond site, and the mitigation plan designed to compensate for lost wetland functions due to the Proposed Development.

2.1 Project Location

The Proposed Development is located in Tukwila, Washington (King County) in Sections 26, Township 23 North, Range 4 East (Willamette Meridian) (Figure 1). It is bounded by Southcenter Parkway to the west, Minkler Boulevard to the south, the Bon distribution warehouse to the north, and a business park to the east. The Mitigation site is located within a larger parcel typically referred to as the Tukwila Pond. The Mitigation site is located west of Andover Parkway West (Andover).

2.2 Responsible Parties

The following key people are responsible for this project:

Ms. Leshya Wig, Project Manager
Wig Properties LLC-SS
4811 134th Place SE
Bellevue, Washington 98006
(425) 957-4774

Ms. Moira Bradshaw, Sr. Planner
City of Tukwila Department of Community Development
6300 Southcenter Boulevard
Tukwila, Washington 98188-2544
(206) 431-3651

Mr. Chad Armour, Principal
Chad Armour LLC
6500 126th Avenue SE
Bellevue, Washington 98006
(425) 641-6743

Mr. Armour prepared this wetland mitigation plan and delineated the wetlands on the Penney site and the central uplands on the Mitigation site (Figure 3).

2.3 Description of the Overall Project

Wig plans to construct a commercial shopping center on the 18.77-acre Penney site. There are currently two buildings on the western 13.55 acres of the Penney site. The eastern 5.22 acres is the location of immature deciduous forest and meadow plant communities that developed on fill soils. These soils were placed on the site some 35 years ago (Armour, 2004). To build the shopping center, Wig proposes to fill 1.16 acres of low quality emergent and forested wetlands.

To mitigate for filling these wetlands, Wig proposes to enhance and/or create 3.48 acres of existing upland and wetland present on the Tukwila Pond site. This includes creating wetland at a ratio of 1.5:1, enhancing degraded wetland at a ratio of 3:1, and enhancing degraded wetland at a ratio of 1:1. At the end of the 10-year monitoring the functional value of the created and

enhanced wetlands on the Mitigation site will be considerably greater than the functions of the existing wetlands on both the Penney and Tukwila Pond sites (Tables 1 and 2).

3. BASELINE INFORMATION

Chad Armour LLC (Armour) delineated the wetlands on the Penney site in April 2004. Armour installed and measured the water levels in 14 shallow groundwater monitoring wells on the Mitigation site from October 2004 to the present.

Bush, Roed & Hitchings, Inc. (BRH) is Wig's civil engineering consultant. BRH surveyed the delineated wetland boundaries on the Penney site, calculated pre- and post-development stormwater runoff on the same, and prepared the grading plan for the Mitigation site.

3.1 Wetlands on the Penney Site

There are six wetlands located on the Penney site (Figure 2).

3.1.1 Wetland A

Wetland A is an isolated Type 3 wetland that covers 13,718 square feet (0.32 acre). Its most notable feature is a rutted road. Grasses and herbs dominate most of Wetland A, including the road. Trees dominate a small portion of this wetland. The forested portion of Wetland A occupies 2,698 square feet; almost 20 percent of the wetland. During the rainy season standing water about 6 inches deep is present on about 75 percent of the wetland.

3.1.2 Wetland B

Wetland B is an isolated Type 3 wetland that covers 24,461 square feet (0.57 acre). Trees dominate the western half of Wetland B. Emergent herbs typically growing in a deeply rutted road dominate the remaining wetland. During the rainy season standing water averages about 6 inches deep; however, can be up to 1.5 feet deep in places.

3.1.3 Wetland C

Wetland C is an isolated Type 3 wetland that covers a total of 6,305 square feet (0.15 acre). It includes a forested area that covers 40 percent of the wetland and a rutted road. The road contains standing water during the rainy season and supports emergent vegetation. The understory of the forested area is generally devoid of vegetation, presumably as a result of standing water. During the rainy season 100 percent of this wetland is covered with about 6 inches of standing water.

3.1.4 Wetland D

Wetland D is a Type 3 wetland that covers 3,943 square feet (0.09 acre). Himalayan blackberry (*Rubus discolor*) shrubs, grasses, and herbs dominate it. Surface water accumulates in this wetland during the rainy season. This water discharges west to the asphalt apron and associated stormwater drain located on the developed portion of the distribution center. After the water enters the catch basin, it flows into a series of pipes (sizes range from about 6 inches to 66 inches in diameter) and swales before being discharged into a King County regional stormwater detention pond. This water is then pumped into the Green River (Clark, 2004). Wetland D is the only wetland considered jurisdictional by the Corps (Appendix A).

3.1.5 Wetland E

Wetland E covers 179 square feet (<0.01 acre) and is dominated by soft rush (*Juncus effusus*). The slight grade of this wetland precludes standing water during the rainy season. This isolated wetland is too small to be regulated by Tukwila, but is regulated by Ecology.

3.1.6 Wetland F

Wetland F is an isolated wetland that covers 1,971 square feet (0.05 acre). Trees dominate the central 40 percent of this wetland. The remainder of Wetland F is dominated by emergent plant species. Like all of the other Penney site wetlands, a rutted road represents a significant portion of this wetland. During the rainy season standing water about 6 inches deep is present on about 50 percent of the wetland. As with Wetland E, this isolated wetland is too small to be regulated by Tukwila, but is regulated by Ecology.

3.1.7 Wetland Ratings

Based on Tukwila's criteria (Tukwila, 2005), the wetlands individually and collectively are rated as Type 3 wetlands. The wetlands are classified as a Category III wetland using Ecology's wetland rating system (Appendix B).

3.1.8 Wetland Functions

Based on the revised Washington State Wetland Rating System for Western Washington (Hruby, 2004), the Penney site wetlands are rated at the low end of Category III wetlands (Table 1). As a whole the wetlands on the Penney site exhibit low functions because they are small and support immature plant communities that developed on imported fill soils. When the wetland functions are partitioned, the Penney site wetlands exhibit moderate water quality and habitat functions and low hydrologic functions. They rated high for water quality because very little surface water flows off of the site and the wetlands are surrounded by urban development. The road ruts on the site that are wetlands store water that would otherwise be released quickly to the lower Green River. We assume that this stored water infiltrates into the soil and contributes to the regional groundwater system. These open water areas also provide some habitat for waterfowl, and the trees and shrubs provide some nesting opportunities for small birds.

3.1.9 Fauna Associated with the Penney Wetlands

During one of our site visits we recall observing mallard (*Anas platyrhycos*) and American crow (*Corvus brachyrhyncos*). The Penney site likely attracts and supports a number of bird species typically attracted to western Washington's urban and suburban habitats. Small mammals could also be present.

There are three listed threatened species reported to be located in the vicinity of the Penney site. They are Chinook salmon (*Oncorhynchus tshawytscha*), bull trout (*Salvelinus confluentus*), and bald eagle (*Haliaeetus leucocephalus*). The salmonids are present in the Green River. An abandoned bald eagle nest was reported about 2 miles southwest of the Penney site (WDFW, 2004).

3.2 Tukwila Pond Site

The Tukwila Pond site is located about 1,000 feet north northeast of the Penney site (Figure 1). It occupies approximately 24 acres, more than 19 acres of which are open water. The Tukwila Pond site is bounded by uplands and urban development. Its buffers are narrow, confined to short steep slopes, and support trees and shrubs. Relatively tall (~75 foot) black cottonwood

(*Populus balsamifera*) trees are rooted in the buffer along the east side of the Tukwila Pond site. The southeast corner of the Tukwila Pond site is the location of the Mitigation site. This area covers a total of 3.48 acres.

3.2.1 Existing Vegetation

There are five plant communities in the southeast corner of the Tukwila Pond site.

A forest dominated by black cottonwood is located along the eastern perimeter of the Tukwila Pond site. The southern boundary is dominated by Himalayan blackberry. Both of these plant communities function as uplands. Most of the Tukwila Pond site is dominated by a monoculture of reed canarygrass (meadow). A portion of this meadow functions as upland (Figure 3). A Himalayan blackberry thicket is present at the south end of this upland. A forest composed of Pacific willow (*Salix lasiandra*) and red-osier dogwood (*Cornus stolonifera*) separate the meadow from the pond proper. The steep slopes of the railroad grade along the southern site boundary are covered with a tangle of blackberry and the flats with red-osier dogwood in two places. A depression near the southeast corner of the Mitigation site supports rooted floating vegetation.

3.2.2 Existing Soils

A 1986 geotechnical engineering report on the Mitigation site described the near-surface soils as silty fine sand and sandy silt (Dames and Moore, 1986). When Tukwila delineated the wetlands on the Tukwila Pond site, they described the near-surface soils as silt loam.

3.2.3 Existing Hydrology

Permanent open water is present in the Tukwila Pond site throughout the year. We understand that the pond is groundwater fed and know that there are seasonal inputs from precipitation and runoff from adjacent built up areas. On occasion Green River flood water is routed to the pond.

We understand that the pond is relatively shallow, averaging about 2 to 3 feet deep, with the deepest point about 6 feet below the surface (Partee, 2004). A 1988 construction drawing for a site to the north indicated a static pond water level of ±13.0 feet (Barghausen, 1988). The same drawings indicate that the flood elevation is 25.8 feet. In 2005 and 2006 we found the pond elevation to range from 19.2 to 19.3 feet in April (Table 3).

The elevation of the water in the pond is controlled by a 15 inch corrugated metal culvert (CMP) fitted with a flap gate located on the east side of the Mitigation site adjacent to Andover. When the lower Green River is in flood, Tukwila opens the flap gate to allow flood water to enter the pond for temporary storage. This stored water is released back into the river after the flood crest has passed (Howat, 2004). The invert elevation of this CMP is18.8 feet (BRH, 2004).

We have observed that a significant portion of the Mitigation site can be flooded during the rainy season (Figure 3). The southeast corner of the Mitigation site is flooded with water as much as 5 feet deep. Standing water in this depression extends from the area southeast of the upland to the flap gate CMP (Figure 3). The pond proper floods the western edge of the Mitigation site. In April 2005 and 2006 we measured the elevation of the pond to be about 19.2 feet (Table 3). During the same month the elevation of the standing water in the southeast corner of the Mitigation site was about 18.1 feet in 2005 and 18.4 feet in 2006. Apparently the flap gate CMP allows the smaller body of water to drain quickly, and retards pond drainage. When the mitigation area is flooded the surface of the water is covered with pieces of reed canarygrass. We assume that this flotsam includes reed canarygrass seed.

3.2.4 Wetland Ratings

There are several lacustrine wetland classes present on the Tukwila Pond site. A portion of the proposed Mitigation site is emergent and open water seasonally flooded wetland. To the west is a forested wetland and beyond that is open water (Cowardin et al., 1979). Based on Ecology's wetland rating system for western Washington, the wetland present on the Tukwila Pond site is classified as a Category II wetland (Appendix B).

3.2.5 Wetland Functions

The Tukwila Pond site wetland as a whole, rates at the low end of Category II wetlands (Table 1). It is completely surrounded by impervious surfaces associated with retail and commercial development. The Tukwila Pond wetland has a good mixture of open water, emergent, scrub-shrub, and forested wetland habitat, as well as unmanaged upland buffers. Its water quality functions rate high because it temporarily stores untreated stormwater prior to discharge to the Green River. It's hydrologic and habitat functions are rated as moderate (Appendix B).

Because the pond is not regularly flushed, is shallow, has a limited outflow, and during the dry season the size of the pond shrinks, the quality of the water is poor. This is particularly so in the summer when algal blooms rob the water of oxygen. The pond can be flushed during the rainy season.

When viewed independently of the Tukwila Pond site, the Mitigation site rates as a Category III wetland (Table 1). The thick mat of reed canarygrass prevents other species of plants – including woody shrubs and trees – from becoming established. This persistent monoculture is unattractive to most animals. It has a moderate rating for water quality because it is covered solely with herbaceous vegetation. It exhibits moderate hydrologic functionality because it temporarily stores untreated stormwater during the rainy season. It provides low habitat functions because of the predominance of the reed canarygrass monoculture.

3.2.6 Tukwila Pond Fauna

Many different animal species have been reported on the Tukwila Pond site. Waterfowl are attracted to the Tukwila Pond in an otherwise highly urbanized area. It is reported to be used as permanent habitat for some animals and as a migratory stopover for others (Watershed Dynamics, 1994). During periods of low water in the fall and winter, mudflats form on the southern end of the pond. These mudflats provide foraging opportunities for waterfowl. And the pond provides foraging opportunities for diving birds such as pied-billed grebe (*Podylimbus podiceps*) and double-breasted cormorant (*Phalocrocorax auritus*). During the summer the limited diversity afforded by thick vegetation limits the value to waterfowl and marsh birds. Brown bullhead (*Ictalurus nebulosus*) is present in the pond. Few mammals are reported for the Tukwila Pond site. Muskrat (*Onodantra zibethica*) haul-out sign was reported in the southeast corner of the Tukwila Pond site. Bull frog (*Rana catesbeiana*) is found near the edge of open water. The only reported priority species on the site is the great blue heron (*Ardea herodias*).

A report prepared by the WDFW for the Penney site also covers the Tukwila Pond and Mitigation sites. The WDFW report indicates that no priority species are present on or near the Tukwila Pond site.

3.3 PRECIPITATION ANALYSIS

As indicated in Section 3.3.2, the surface water elevation of the Tukwila Pond is affected by groundwater, runoff from surrounding areas, and on occasion flood water from the Green River. All of these factors are related to precipitation. As shown on Figure 4 the 2004/2005 water

years was somewhat drier than normal for the first 5 months (October through February), normal in March and June, and somewhat wetter than normal in April and May (Table 4). The 2005/2006 water year began normally (October and November) but quickly became wetter than normal in December and January, particularly in January when nearly twice the amount of expected rain fell on the region (Seattle Times, 2004, 2005, & 2006). The following two months of the 2005/2006 water year (February and March) were drier than normal and April exhibited a near normal amount of precipitation.

4. PROBABLE IMPACTS OF THE PROPOSED DEVELOPEMENT

Wetlands have several physical, chemical, and biological processes or attributes that are important to the ecosystem. These wetland functions include shoreline protection, hydrologic support, storm/flood water abatement, groundwater exchange, water quality improvement, and biological support. Each of these functions and the probable impact of site development are discussed in detail in the following subsections.

4.1 Shoreline Protection

Wetlands provide shorelines protection from erosion caused by tidal action along coasts, currents in rivers and streams during flooding, and wind or wake generated erosion along coastlines. Wetlands reduce shoreline erosion by absorbing or dissipating wave energy, by binding and stabilizing shoreline substrates, and by enhancing suspended sediment deposition (Hammer, 1992).

None of the wetlands on the Penney site are located adjacent to shorelines. Therefore, filling these wetlands will have no impact on shoreline functions. We anticipate that limited areas of soil adjacent to the Tukwila Pond shoreline will be exposed as part of mitigation. As such, a limited amount of erosion from wave action will likely occur the first couple of years following construction.

4.2 Hydrologic Support

Hydrology is the single most important factor for establishing and maintaining wetlands and wetland processes. Hydrologic inputs include precipitation, surface water runoff, groundwater, tides, and flooding. Water inputs are almost always the major source of nutrients to wetlands. Water outflows often remove biotic and abiotic material from wetlands. These physiochemical modifications of the environment have a direct impact on the biotic response in wetlands (Mitsch and Grosselink, 1986).

During the winter rainy season surface water from Wetland D (one of the Penney site wetlands) flows into a nearby catch basin. From this parking lot catch basin, water flows through a man-made storm water conveyance system into a detention pond where it is pumped into the Green River. The other five wetlands at the Penney site are isolated depressions with no direct connection to nearby streams. We assume that the water that accumulates in these depressional wetlands percolates through the soil profile and contributes to the base flow of the Green River.

Filling the Penney site wetlands will have a minimal impact on the hydrological support function because the contribution to Green River base flow is extremely small.

4.3 Storm/Flood Water Abatement

Wetlands can have an effect on the peak flows of floodwaters in streams and on their base flows during dry periods. Floodwater modification is most often identified with bottomland hardwood swamps. Forested wetlands in river floodplains can reduce the height of downstream floodwater peaks by acting as natural reservoirs and directly obstructing and slowing flows. By retaining stormwater and releasing them at a controlled rate, wetlands augment base flows (Hammer, 1992).

Tukwila's stormwater management strategy is to release stormwater into the Green River before flood flow reaches Tukwila. This strategy limits the potential for high water in the river from blocking runoff generated in the city and reduces the potential for flooding beyond the river's levees. In support of this strategy, Tukwila will require no detention for the existing impervious surfaces on the Penney warehouse distribution site, but will require Wig to detain runoff from the pervious surfaces currently present on this site. The development plan has these pervious surfaces – which cover 5.8 acres of the Penney distribution site – being converted to impervious surfaces.

Based on visual observations over a period of two winters, we estimate that the wetlands on the Penney site provide approximately 16,875 cubic feet (cf) of detention capacity (Table 2). This capacity assumes that all but one of the wetlands stores water averaging 6 inches deep throughout the rainy season. It also assumes that standing water represents 100 percent of the surface area of Wetlands C and D, 75 percent of Wetland A, and 50 percent of Wetlands B and F. Wetland E is located on a slight slope and retains no surface water.

The wetland mitigation plan includes removing a significant quantity of soil from the Mitigation site (Figure 5). This action will increase the detention capacity of the Tukwila Pond site by about 46,900 cf (BRH, 2006).

Using the King County Runoff Time Series (KCRTS) method for estimating runoff, Tukwila will require 26,200 cf of storage for the additional 5.8 acres of impervious surfaces that will be created by the Planned Development (BRH, 2004). This is a conservative estimate because the model assumes that the impervious surfaces are occupied by a mature Douglas-fir (*Pseudotsuga menziesii*) forest. The impervious surfaces are actually represented by 0.6 acre of mowed lawn and 5.22 acres of immature forest and meadow.

The volume of water to be detained on the Planned Development is somewhat less than three times the stormwater holding capacity of the Penney site wetlands (50,000cf/16,875cf). When the added capacity on the Mitigation site is also factored into the equation, the increase stormwater holding capacity of the Planned Development represents nearly a 575 percent increase over existing conditions (Table 2). Thus the mitigation plan compensates for the lost stormwater holding capacity of the Penney site wetlands many times over.

4.4 Groundwater Exchange

Groundwater recharge has been shown to occur in isolated wetlands such as prairie potholes, cypress domes, and floodplain forests. A few wetlands in Wisconsin, North Dakota, and Florida were shown to have direct connections and contributed significantly to groundwater. But other wetlands have been shown to have little influence on groundwater or, in some cases, the wetland is present because of surfacing groundwater (Hammer, 1992).

It is likely that the Penney site wetlands do not owe their existence to surfacing groundwater. Rather the precipitation that accumulates in these wetlands seasonally likely contributes to the regional groundwater system. This phenomenon is thought to be largely due to the original soil being covered some 35 years ago with up to 10 feet of imported fill soil (Armour, 2004).

4.5 Water Quality Improvement

Wetlands have the ability to remove pollutants from water, through a variety of physical, chemical, and biological processes. Water purification functions of wetlands are dependent on four principal components – vegetation, water column, substrates, and microbial populations. With respect to water quality improvement, the principal function of vegetation in wetlands is to provide environments for microbial populations. Not only do plants in the water column obstruct flow and facilitate sedimentation they also provide habitat for microbes. In addition to attachment surfaces for microbes, substrates provide physical support for plants, and surfaces for chemical reactions. The water column transports substances and gasses to microbial populations, carries off by-products, and provides matrix for biochemical processes (Hammer, 1992).

No surface water flows onto the eastern 5.22 acres of the Penney warehouse distribution site. Only surface water from Wetland D flows off of this area. As such, sediment retention is limited and most of the water quality improvement capacity of Penney site wetlands is provided by microbes attached to vegetation and to soil particles. The water flowing from Wetland D receives some water quality treatment when it flows through grass-lined ditches and is detained in the regional stormwater pond adjacent to the Green River. The water quality treatment capacity of the Penney wetlands is 1.16 acres.

The Planned Development specifies treating approximately 14 acres of pollution-generating surfaces (i.e., asphalt). Surface water runoff from the asphalt will be directed to a water quality treatment system. The water quality treatment system will be designed and maintained in accordance with Tukwila engineering standards. The Penney site currently has 7.1 acres of untreated pollution-generating surfaces (BRH, 2006).

In addition to the water quality treatment system, the Planned Development will have about 1.5 acres of landscaping. Most of the landscaping will be located around the perimeter of the shopping center. This landscaping represents pervious surface directly connected to the regional groundwater system. The microbes attached to soil particles in the landscaped areas will treat water that falls on these areas.

Wig will provide water quality treatment far in excess of that provided by the Penney site wetlands (Table 2). The water quality treatment system, together with the landscaped areas, represents about a 1345 percent increase in water quality treatment capacity relative to these wetlands. The total increase is even larger when the relatively clean water entering the Penney site wetlands is compared to the water entering the treatment system, which contain petroleum hydrocarbons and metals.

4.6 Biological Support

Wetlands produce many diverse forms of life and provide habitat for countless others. Wetlands are dynamic, transitional, and dependent on disturbance. Wetlands receive, hold, and recycle nutrients continually washed from upland regions. The combined interactions of abiotic and biotic factors create a diversity and abundance of habitats that make wetlands the most

important wildlife habitat. Basic productivity of many wetlands far exceeds the most fertile farm fields (Hammer, 1992).

The Penney site wetlands offer limited biological support functions because they are small and support immature or simple plant communities. Ducks use the wetlands seasonally during periods of prolonged precipitation. Other animals likely utilize the wetlands when they are dry.

Filling the Penney site wetlands will have very little impact on the biological support function of these wetlands. Listed salmonids cannot access the wetlands and bald eagles are not known to be present on the Penney site. The immature black cottonwood trees on the Penney warehouse distribution site are too small (<12 inches in diameter and 70 feet tall) to support nesting and/or roosting bald eagles.

5. MITIGATION APPROACH

After carefully evaluating several scenarios, Wig concludes that filling 1.16 acres of wetlands on the Penney site is unavoidable. With the exception of the Tukwila Pond site, options for mitigating for lost wetland functions are limited. In exchange for filling the Penney site wetlands, Wig proposes to create and/or enhance 3.48 acres of degraded upland and wetland located at the Tukwila Pond site.

Off-site mitigation makes the most sense in this case because:

- The quality of the existing wetland at the Tukwila Pond site can be substantially improved (Table1);
- Both Ecology and the Corps prefer that mitigation occur off site (Appendix A);
- Tukwila's rules allows for off site mitigation;
- Tukwila's long-term plans include enhancing degraded portions of the Tukwila Pond site;
- The Mitigation site is located in the same drainage basin as the Penney site; and
- The Mitigation site is bounded by existing open water and forested wetlands as well as upland forest and shrub plant communities.

5.1 Code Compliance

5.1.1 Permitted Alterations

Per Tukwila's sensitive area regulations, any use or development of wetlands requires the review and approval of the Director of Community Development (TMC 18.45.090). Requests may be approved if the alteration does not adversely affect water quality; fish, wildlife, or their habitat; drainage or stormwater detention capabilities; lead to unstable earth conditions or create an erosion hazard; be materially detrimental to any other property; and have an adverse effect on any other sensitive areas (TMC 18.45.090.B.1). Isolated wetlands exhibiting low functions that formed on fill material in highly disturbed environmental conditions may be altered (TMC 18.45.090.B.6). Per these requirements, the Penney wetlands clearly qualify as wetlands that may be altered (Tukwila, 2005).

5.1.2 Mitigation Sequencing

Tukwila requires that development proposals demonstrate a reasonable effort to avoid and minimize impacts to wetlands and their buffers. If avoidance and minimization are not possible, the preferred order of compensation is:

- Restoring wetlands on upland sites that were formerly wetlands;
- Enhancing significantly degraded wetlands;
- Creating wetlands on disturbed upland sites (TMC 18.45.090.C).

Wig cannot avoid or minimize filling the wetlands on the Penney site because Wig's tenant-driven key criteria are that the land be at least 18 acres in size and be located on the main strip of Southcenter Parkway. There are no other properties that meet these criteria.

Wig evaluated off site options including the Macadam site, River Bend site, and a site off of Strander Boulevard. The Macadam site was too steep and not large enough to be considered a viable option. The River Bend site was too small and as much as 15 feet of soil would need to be removed to create wetlands. The Strander site is owned by the Boeing Corporation and is not readily available for sale. None of these three options represented upland sites that were formerly wetlands.

The Mitigation site is a significantly degraded wetland with the potential to be enhanced. Enhancing this degraded wetland is supported by the Corps, Ecology, and Tukwila staff. Here Wig can create four wetland classes where only one wetland class now exists. Enhancement will significantly increase the functional value of the degraded wetland.

There is no opportunity to create wetlands on disturbed upland sites in Tukwila.

After evaluating the attributes of four potential mitigation sites, Wig concluded that enhancing the degraded wetland present on the Tukwila Pond site was the only reasonable available option. Further, on site mitigation has been discouraged by both the Corps and Ecology (Appendix A).

5.1.3 Mitigation Plans

Per section 18.45.090.D of the wetland regulations, "wetland and/or buffer relocation may be allowed only when a mitigation plan clearly demonstrates that the changes would be an improvement of wetland and buffer quantitative and qualitative functions." Further, the plan shall "show how water quality, wildlife and fish habitat, and general wetland quality would be improved."

The close proximity of available degraded upland and wetland adjacent to a large expanse of open water, scrub-shrub and forested wetland, and upland in an urban environment provide a unique opportunity to mitigate for impacts to wetlands. The enhanced wetland area will improve the habitat function of the existing wetland (Table 1) and be composed of four wetland classes – open water, forested, scrub-shrub, and emergent wetland (Figure 6). The existing Mitigation site wetland is composed of two wetland classes. The enhanced wetland will be bordered on the east by upland forest, on the south by wetland and upland shrubs, and on the northwest by a combination of existing open water and forested wetland. The resultant plant communities in conjunction with open water will provide excellent habitat for wildlife (Table 5).

5.1.4 Mitigation Location

According to Section 18.45.090.E of the wetland regulations, on-site mitigation shall be provided, except where the application can demonstrate that:

a) On-site mitigation is not scientifically feasible due to problems with hydrology, soils, waves, or other factors; or

b) Mitigation is not practical due to potentially adverse impact from surrounding land uses; or

c) Existing functional values created at the site of proposed restoration are significantly greater than lost wetland functional values; or

d) That established regional goals for flood storage, flood conveyance, habitat or other wetland functions have been established and strongly justify location of mitigation at another site.

On-site mitigation is not preferred because the Penney site wetlands are very small, surrounded by asphalt and concrete, and generally isolated from the closest wetland – the Tukwila Pond. Wig qualifies for off-site mitigation under provisions b) and c). Table 1 demonstrates that the functional values of the Tukwila Pond site are significantly greater than the function values of the Penney site wetlands. Further, the Penney site wetland functions can be more than compensated for by converting degraded upland to wetland and enhancing degraded wetland on the Tukwila Pond site. Wetland functions currently present on the Mitigation site are projected to increase from the current rating of a Category III wetland to a Category II wetland by 2015. When considering wildlife habitat functions in isolation, the created and enhanced wetland (score = 70) is projected to out perform the existing wetland (score = 15) as well as the Penney site wetlands (score = 42) (Table 5).

Tukwila requires that off-site mitigation shall occur within the same watershed where the loss occurred. The Tukwila Pond site is located in the same basin as the Penney site and therefore meets this requirement.

Finally, the regulation lists an order of preference for off site mitigation. The Tukwila Pond site contains existing degraded upland and wetland. Degraded upland areas are listed as the second and degraded wetlands the fourth preference for off site mitigation. All of the other sites considered but the unavailable Strander site fall into the third preference. These sites were deemed unsuitable because they were either too small or contained excess overburden.

5.2 Rationale for Choice

The 24-acre Tukwila Pond site was selected because it is the only suitable area available in the drainage basin. Also, the degraded area of the Tukwila Pond site has been identified by Tukwila as an area suitable for enhancement.

Tukwila owns the site.

5.2.1 Case Study

A 6.3-acre monoculture of reed canarygrass in Auburn was converted to a wetland complex possessing open water, emergent, scrub-shrub, and forested wetland classes (Raedeke Associates, 2002). This wetland was identified by Ecology as an example of a successful reed canarygrass conversion project.

5.2.2 Projected Conditions of the Mitigation Site

At the end of the 10-year monitoring period the monoculture of reed canarygrass currently present on the Tukwila Pond site is projected to have been transformed into a wetland complex composed of open water, emergent, scrub-shrub, and forested habitats. All three wetland functions will improve relative to existing conditions (Table 1). Similarly Wig projects that they will exceed the functions exhibited by the Tukwila Pond site as a whole (Appendix B). The improved Mitigation site is projected to enhance water quality and habitat functions largely by adding complexity and structure where little previously existed. The Mitigation site ten years after it is improved would rate at the high end of the Category II wetlands.

As shown on Table 1 the restored wetland (Projected Mitigation site) scored higher than the Tukwila Pond site for habitat largely because of added complexity. The Projected Mitigation site will have more plant communities and habitat amenities as well as fewer weeds than the existing Tukwila Pond site.

5.3 Constraints

It appears that potential constraints can be adequately mitigated. The 3.48 acre wetland will be designed so that seasonal flooding and near-surface groundwater will support and maintain wetland plant communities. It will be vegetated with native plants that typically tolerate temporary seasonal flooding during the dormant season.

The plan includes removing reed canarygrass. If the grass were not treated it would create a maintenance challenge during the monitoring and maintenance period. Its seed will be distributed throughout much if not all of the Mitigation site during flood events. As such Wig will remove the reed canarygrass, including its stolon mat, at the time of site grading. The resultant bare soil will be revegetated with native plants.

A robust monitoring and maintenance plan will limit invading weeds, including reed canarygrass. Tukwila will protect the Mitigation site in perpetuity. In the event Tukwila alters other parts of the Tukwila Pond site to enhance its water quality or to increase its capacity to store stormwater, a deed restriction or some other site development-limiting instrument will protect the enhanced wetland.

5.4 Goals and Objectives of the Mitigation Plan

To meet Tukwila's no net loss of wetland functions requirement, Wig proposes to improve the functions of 3.48 acres of degraded wetland and upland on the Tukwila Pond site.

5.4.1 Goals

The goal of the mitigation plan is to create 0.88 acre and enhance 2.6 acres of degraded lacustrine emergent and open water wetland habitat by converting it to a diverse wetland complex composed of four wetland classes. This action will considerably improve the habitat for indigenous and migratory wildlife. It will also increase the stormwater detention capacity of the Tukwila Pond.

5.4.2 Objectives

<u>Hydrology</u>

- Open Water Wetland – water at least 2 feet deep into the late growing season;

- Existing Degraded Wetland – seasonally flooded with saturated soil within 12 inches of the ground surface into the late growing season;
- Emergent Wetland – seasonally flooded with saturated soil within 12 inches of the ground surface into the late growing season;
- Scrub-shrub Wetland – seasonally flooded with saturated soil within 12 inches of the ground surface into the middle of the growing season; and
- Forested Wetland – saturated soils within 12 inches of the ground surface in the early growing season.

Wetland Classes

- Open Water – occupy approximately 0.92 acre;
- Existing Degraded Wetland – occupy approximately 0.88 acre and contain at least 3 native plant species (Table 6);
- Emergent – occupy approximately 0.52 acre and contain at least 3 native plant species;
- Scrub-shrub – occupy approximately 0.51 acres and contain at least 2 native plant species; and
- Forested – occupy approximately 0.65 acre and contain at least 2 native plant species.

Habitat Attributes

- 6 hardwood snags ranging from 10 to 30 feet tall and 6 to 12 inches in diameter; and
- 12 hardwood logs ranging from 10 to 30 feet long and 6 to 12 inches in diameter.

5.5 Performance Standards

Performance standards provide a basis for measuring the success of the mitigation plan. The target for meeting the performance standards is within 10 years of installation. Comparing actual results of the interim monitoring events (i.e., Years 1, 2, 3, 4, 5, 7, and 9) with the performance standards will determine whether contingency actions are warranted. The following standards will apply.

5.5.1 Hydrology

- Open Water Wetland – 0.92 acre of open water from 0 to more than 7 feet deep (constructed bottom 15.2 feet elevation) November through May;
- Existing Degraded Wetland – 0.88 acre of emergent wetland with saturated soil between 17.7 and 20.0 feet elevation November through June;
- Emergent Wetland – 0.52 acre of emergent wetland with saturated soil between 17.2 and 17.7 feet elevation November through June;
- Scrub-shrub Wetland – 0.51 acres of scrub-shrub wetland with saturated soil between 17.7 and 18.2 feet elevation November through May; and
- Forested Wetland – 0.65 acre of forested wetland with saturated soil between18.2 and 19.2 feet elevation November through April.

5.5.2 Soil

At final grade, the upper 6 inches of soil will contain 20 to 25 percent organic matter, as validated by an approved agricultural testing laboratory. This requirement will be reflected in final plan specifications.

5.5.3 Vegetation

- Emergent Wetland – 0.52 acre of emergent wetland that contains at least 3 or more native emergent plant species each consisting of at least 20 percent of total native emergent plant cover. The total native emergent plant cover will be at least:
  - 5 % in Year 1,
  - 25% in Year 2,
  - 30% in Year 3,
  - 40% in Year 4,
  - 50% in Year 5,
  - 70% in Year 7,
  - 80% in Year 9, and
  - 90% in Year 10.
- Existing Degraded Wetland – 0.88 acre of emergent wetland that contains at least 3 or more native emergent plant species each consisting of at least 20 percent of total native emergent plant cover. The total native emergent plant cover will be at least:
  - 5 % in Year 1,
  - 25% in Year 2,
  - 30% in Year 3,
  - 40% in Year 4,
  - 50% in Year 5,
  - 70% in Year 7,
  - 80% in Year 9, and
  - 90% in Year 10.
- Scrub-shrub Wetland – 0.51 acres of scrub-shrub wetland that contains at least 2 or more native shrub plant species each consisting of at least 20 percent of total native shrub plant cover. The total native shrub plant cover will be at least:
  - 5 % in Year 1,
  - 20% in Year 2,
  - 30% in Year 3,
  - 40% in Year 4,
  - 50% in Year 5,
  - 70% in Year 7,

- 80% in Year 9, and
- 90% in Year 10.

- Forested Wetland – 0.65 acre of forested wetland that contains at least 2 or more native tree plant species each consisting of at least 20 percent of total native tree plant cover. The total native tree plant cover will be at least:
  - 5 % in Year 1,
  - 10% in Year 2,
  - 15% in Year 3,
  - 20% in Year 4,
  - 30% in Year 5,
  - 70% in Year 7,
  - 80% in Year 9, and
  - 90% in Year 10; and
- No more than 20 percent of the vegetation will consist of non-native invasive plant species at any time during the monitoring period. This includes Himalayan blackberry, reed canarygrass, purple loosestrife (*Lythrum salicaria*), and all other Class A, B, and C weeds on the state noxious weed list.

5.5.4 Structure

- Emergent Wetland – vegetation ranging from 1 to 4 feet tall by Year 3;
- Existing Degraded Wetland – vegetation ranging from 1 to 2 feet tall by Year 3;
- Scrub-shrub Wetland – vegetation ranging from 4 to 8 feet tall by Year 5; and
- Forested Wetland – vegetation ranging from 8 to 20 feet tall by Year 7.

6. CONSTRUCTION PLAN

This section of the plan describes the strategies that will be used to achieve the objectives described in Section 5.4.2.

The plan is to remove all of the reed canarygrass and replace it with native trees, shrubs, and herbs adapted to seasonally flooded and saturated soil conditions. We reviewed the file, visited the site, and interviewed the designer of what appears to be a successful reed canarygrass conversion project in the City of Auburn. As indicated in Section 5.2.1, the 6+-acre Goedeke wetland enhancement project was transformed from a monoculture of reed canarygrass to a diverse wetland composed of four wetland classes. To achieve this result, the reed canarygrass was mowed and the stolon mat was excavated, buried and covered with fabric and soil. In 2004 this precipitation driven wetland contained a wide variety of native trees, shrubs, and herbs, with very little reed canarygrass. Based on results of the Goedeke project, it appears that the reed canarygrass can successfully be converted to a wetland complex possessing increased water quality, hydrologic, and habitat values.

6.1 Hydrology

Wig installed 14 shallow groundwater monitoring wells and 2 staff gauges in late 2004 to characterize the hydrology of the Mitigation site. Based on April measurements the central ridge of the Mitigation site is upland covering 0.88 acre (Figure 3). A significant portion of the area surrounding the upland is flooded in the winter and spring. The flooded area west of the upland drains slowly, presumably because the flap gate CMP is small relative the volume of water in the pond proper. We believe that the flooded area east of the upland drains more quickly because it represents a much smaller volume of water.

6.2 Soils

Wig will grade the finished elevation of the Mitigation site according to the grading plan prepared by BRH (Figure 5). The grading plan is based on the results of the groundwater monitoring program during April 2005 & 2006. At a minimum, the upper ±6 inches of soil will be excavated and exported. Exporting the upper layer of soil removes the canarygrass' subsurface reproductive parts. More than a 6-inch-deep scoop will be required to eliminate reed canarygrass' subsurface reproductive parts on occasion.

Wig will take every precaution to avoid or minimize impacts to existing stormwater control structures, including the flap gate CMP. If the flap gate and/or the associated berm are disturbed, Wig will repair these structures to Tukwila standards. We understand that the Tukwila Pond is considered a jurisdictional wetland by the Corps. As such a permit to export soil from the Mitigation site and if necessary import topsoil onto the same will require a permit from the Corps (Whiting, 2006). With respect to Wetland D on the Penney site, Wig must notify the Corps within 30 days after it is filled (Appendix A).

Wig will match grades along the edge of the existing forested and scrub-shrub wetlands, the edge of the pond, and/or the upland buffers to the south and east. The slopes of the excavated channel will be nearly vertical. The intent is to encourage fish and wildlife that are attracted to open water to utilize these habitats and discourage emergent vegetation. Our hope is that the channel will promote water circulation from the Tukwila pond. The flow and the resultant mixing action could help improve the quality of the water in the Tukwila pond. To facilitate this flow, Wig will excavate the edge of the Tukwila pond at the entrance to the channels to match the bottom elevation of the channel.

To augment the organic content of soils subject to excavation, Wig will rotovate three inches of fertile mulch (organic compost) into the upper 8 inches of the subgrade as necessary.

6.3 Vegetation

As shown on Figure 6, at least four wetlands classes are proposed – open water, forested, scrub-shrub, and emergent. These new wetland classes will be juxtaposed with three existing wetland classes and two upland classes. The existing open water, scrub-shrub, and forested wetland classes and upland plant communities have been incorporated in the design to compliment the created/enhanced wetland area.

Wig will vegetate the Mitigation site as indicated in Table 6. Several of the herbaceous plant species will be broadcast seeded throughout the emergent, scrub-shrub, and forested habitats. Larger herbs will be installed in the emergent wetland between 17.2 and 17.7 feet elevation. Selected herbs and the indicated shrubs will be installed in the scrub-shrub wetland between 17.7 and 18.2 feet elevation. The forested wetland will be vegetated with herbs, shrubs, and trees between 18.2 and 19.2 feet elevation. A mixture of grass species will be broadcast

seeded throughout the Existing Degraded Wetland. The seed will be covered with about ½ inch of soil to minimize the potential for the seed to float away during subsequent flood events. Mulch will be placed around the base of all installed trees and shrubs for weed control and moisture retention in the spring after the threat of flood has past.

Wig will install a temporary irrigation system designed to deliver up to 1 inch of water per week in the mitigation area for at least one growing season after the plants are installed.

6.4 Habitat Structures

Wig will place 12 medium-sized (6 to 12 inches in diameter and 10 to 30 feet long) hardwood logs on the Mitigation site as habitat amenities. To reduce the potential for these logs to float away during anticipated periods of high water, Wig will anchor the logs to the ground. Wig will also install 6 hardwood snags – ranging from 10 to 30 feet tall and 6 to 12 inches in diameter on the Mitigation site.

6.5 Installation Sequence

During a pre-construction meeting, the grading contractor, Wig, the project biologist, and appropriate regulatory agency staff will review the grading plan and best management practices (BMP), including stormwater pollution prevention plans (SWPPP), temporary erosion and sediment control plans (TESC), and spill control and prevention plans. In addition, components of the mitigation plan will be reviewed with the landscaping contractor at this meeting.

Based on the outcome of the pre-construction meeting, the grading contractor will flag the construction limits consistent with the grading plan and BMPs, and will install temporary filter fabric fences as necessary. A temporary fence will also be installed between the construction area and the Sitka willow trees along the northwest boundary of the Mitigation site. Temporary fence will also be placed around existing clumps of red-osier dogwood shrubs along the southern Mitigation site boundary.

Track hoe excavators, dump trucks, and/or dozers will be used to grade the Mitigation site. Machines will enter and leave the site via temporary construction entrances off Andover Parkway West. Because road drainage may contain soil and mud from construction vehicles and since the associated catch basins ultimately discharge to the Green River, filter fabric sediment traps will be installed and maintained at each catch basin. In addition, Andover will be swept as dirt or mud accumulates. Dust abatement measures, such as site watering during grading, will be instituted as necessary.

As indicated previously, prior to site grading the reed canarygrass will be mowed and the cuttings will be disposed off site. Following mowing the reed canarygrass mat will be excavated and exported. If the results of the soil chemical analysis indicate that organic augmentation is warranted, approximately three inches of fertile organic mulch will be rotovated into the upper top 8 inches of soil.

Next the contractors will install the habitat amenities, the temporary irrigation system, fence, sign, etc.

In the spring after floodwaters have subsided, seed from residual weedy plants that likely are distributed over most of the Mitigation site will sprout. As such the landscaping contractor will likely have to treat the Mitigation site for weeds prior to planting. After the weeds are treated the landscaping contractor will broadcast seed the Mitigation site that is not designated open water

habitat. About ½ inch of soil will be raked over the seed. Landscapers walking all over the site will also help "set" the seed. Following seeding the landscaping contractor will install the plants specified on Table 6.

Following construction and plant installation, the project biologist and landscaping contractor's representative will meet with Tukwila staff to develop a punch list of deficiencies. After the punch list items are addressed by Wig, Wig will seek approval for concluding the construction phase of the mitigation plan and seek Tukwila's approval to initiate the start of the ten-year monitoring period. Wig will develop an as-built plan that will be used as a basis for evaluating future results.

7. MONITORING PLAN

The purpose of the monitoring plan is to assess the existing Mitigation site and the results of the mitigation measures. Monitoring the water regime prior to final design and construction increases the probability of success. Post-construction monitoring provides an index for measuring the performance of the mitigation plan, the extent and timing of remedial actions (if necessary), and ultimately the length of the monitoring period. The monitoring plan consists of three separate but equally important steps; pre-construction monitoring, construction monitoring, and post-construction monitoring.

7.1 Pre-Construction Monitoring

Wig has been monitoring the hydrology of the Mitigation site since October 2004.

7.2 Construction Monitoring

Wig will maintain quality assurance by monitoring grading and landscaping contractors during construction. This aspect of the monitoring plan is particularly important because the final design elevation of the wetland is critical to establish and maintain the appropriate wetland hydrology. Similarly the methods and techniques used to install the plants are important because in many cases survival is dependent on the quality of the installation.

Tukwila will be responsible for final approval of construction. Wig will consult with Tukwila to assess deviations from the approved plan. After construction is completed, Tukwila will evaluate the installation and develop a punch list as necessary. Wig will address punch list items and prepare a post-installation report for review and approval by Tukwila. The post-installation report will be the basis for comparing future monitoring reports.

7.3 Post-Construction Monitoring

Hydrology monitoring will commence immediately following construction to characterize the modified hydrologic conditions. The pre-construction shallow groundwater monitoring wells and staff gauges will be replaced and incorporated as part of the post-construction monitoring plan. Their position will be located by survey and shown on the As-Built Plan.

Wig will monitor the mitigation area for 10 years following installation. A qualified biologist will be engaged for this effort. To document the results of the mitigation measures and to ensure that reed canarygrass and other incompatible weeds do not invade and take over the Mitigation site, Wig will monitor the Mitigation site annually for the first 5 years following installation as well as in Years 7, 9, and 10. Post-construction monitoring will include hydrology monitoring as well as vegetation monitoring. Wig will submit a detailed report comparing actual versus expected

performance standards to Tukwila for review and approval by December 31 each year the Mitigation site is monitored.

7.3.1 Hydrology

Wig will measure the water levels at least four times a year (April, May, June, and August) during the growing season with an electronic water level meter.

7.3.2 Soils

Wig will not monitor soils after post-installation sampling, provided that the performance standard is met at that time.

7.3.3 Vegetation

To measure the success of the vegetation effort, Wig will install permanent photographic and vegetation monitoring points in the Mitigation site. The monitoring points will be established by installing a permanent structure such as rebar, wood, fence post, plastic pipe, etc. Wig will characterize the vegetation in August in 1/100-acre circular plots. The monitoring biologist will also informally assess the vegetation when on site to monitor hydrology. The intent of informal vegetation monitoring is to identify areas where undesirable weeds (e.g., reed canarygrass, purple loosestrife, etc.) are present. These observations will be relayed to the maintenance contractor for timely removal action. Photographs will be taken facing a predetermined direction for consistency to provide a visual record of the Mitigation site throughout the monitoring period. The vegetation monitoring will assess:

- Species composition;
- Percent cover of each plant stratum and species;
- Stand height; and
- The health of the vegetation.

7.3.4 Fauna

Wig will record site observations of fish and wildlife during vegetation and groundwater monitoring activities.

7.3.5 Habitat Structures

After the habitat amenities are installed and their location noted on the As-Built Plan, it will not likely be necessary to monitor them again. However, as indicated in Section 5.4.4, Wig will characterize the average height of the plants present in the emergent, scrub-shrub, and forested habitat types. Wildlife habitat is determined by the interspersion of plant communities, by the structure of the plant communities, and by the mixture of species within a community. Although all of these are important, most species of wildlife respond more to structure of the plant community than to the plant species making up a community (Hall, et al., 1985).

7.3.6 Water Quality

Wig will not monitor water quality.

7.3.7 Buffers

Wig will not monitor the buffers.

8. SITE PROTECTION

To discourage human intrusion, a permanent post-and-rail fence at least 4 feet tall will be installed along the eastern boundary of the Mitigation site adjacent to Andover Parkway West. The eastern and southern perimeter of the Mitigation site will be posted with Habitat Conservation Area signs (Figure 6).

Tukwila will be responsible for protecting the Mitigation site. In accordance with Section 18.48.090.C of the sensitive areas regulations, the Mitigation site shall remain undeveloped and be protected from development in perpetuity. As such, Tukwila shall protect the Mitigation site via deed restriction, conservation easement, or other legally binding instrument. After Wig's monitoring and maintenance obligation is completed, the installed vegetation should be protected against any impacts from mowing, cutting, dredging, or other adverse activities to the Mitigation site.

9. MAINTENANCE PLAN

Wig will maintain the Mitigation site during the 10-year monitoring period. Maintenance includes irrigating recently installed plants to promote their establishment and survival. One inch of water per week shall be applied to the Mitigation site from the time the plants are installed to mid-September the first year of plant installation. Irrigation is not required in subsequent years.

Maintaining the Mitigation site is paramount to prevent unwanted plant species – particularly reed canarygrass and purple loosestrife – from expressing dominance during the 10-year monitoring period. Maintenance measures beyond the required monitoring period will become the responsibility of Tukwila.

In addition to collecting hydrologic and vegetative data as specified in Section 7.3, the monitoring biologist will also note physical and biological features on the Mitigation site that need attention, are of note, or reflect the ecological health of the mitigation area. These features include, but are not necessarily limited to, wildlife use, trash, plant mortality, weeds, and predation by herbivores, etc.

When reed canarygrass, purple loosestrife, or another aggressive undesirable weed is observed, Wig will instruct the maintenance contractor to treat the offending plants within 14 days. Manual weeding is the preferred method for removing the plants. However, on occasion it may be necessary to spot spray clumps with an approved herbicide. Rodeo is an herbicide approve for use in aquatic environments

10. CONTINGENCY PLAN

Wig recognizes that there is a chance that some of the installed plants will not survive the seasonal flooding typical of the Tukwila pond. Wig also recognizes that seasonal flooding tends to favor reed canarygrass. To reduce these potentials Wig will:

- Post a bond sufficient to cover the cost of replanting the Mitigation site;
- Install plants that tolerate seasonal flooding during the dormant season;
- Monitor the installed plants annually for the first 5 years;
- Remove all reed canarygrass and purple loosestrife plants present on the Mitigation site; and
- Install new plants annually to replace those that expired.

10.1 Post a Bond

As indicated in Section 12, Wig will provide Tukwila with a surety instrument in the amount of 150 percent of the estimated cost to install plants on the mitigation site.

10.2 Install Plants Suited to Seasonal Flooding

Wig will install plants native to Western Washington that are adapted to seasonal inundation during the winter rainy season. Many wetland plants survive seasonal inundation during the winter rainy season because these plants are dormant at the time of flooding. As indicated on Table 6 these plants include:

- Trees - black cottonwood and Oregon ash (*Fraxinus latifolia*), and to a limited extent red alder (*Alnus rubra*);
- Shrubs - Pacific willow, Piper's willow (*Salix hookeriana*), Sitka willow (*Salix sitchensis*), black twinberry (*Lonicera involucrata*), Pacific ninebark (*Physocarpus capitatus*), and red-osier dogwood; and
- Herbs such as slough sedge (*Carex obnupta*), tufted hairgrass (*Deschampsia cespitosa*), common spike-rush (*Eleocharis palustris*), wool-grass (*Scirpus cyperinus*), and reed mannagrass (*Glyceria grandis*).

The Mitigation site can be subject to flooding events during the rainy season. We observed inundation in both 2005 and 2006. The duration of these events can be as long as 4 months. The plants selected to replace reed canarygrass typically survive short-duration inundation during the winter rainy season when plants are typically dormant.

10.3 Annual Monitoring for the First 5 Years

Plant succession on bare ground is fairly predictable. A number of weeds, including reed canarygrass, are expected to invade the bare areas initially. Bare areas are common on mitigation sites the first couple of years following plant installation. That is, bare soil is typical between installed trees and shrubs as well as locally where seeded grasses and herbs are removed by herbivory, flowing water, etc. To minimize the potential for reed canarygrass to become established in these bare areas, Wig will monitor the mitigation site several times a year (April, May, June, and August) during the first 5 years following plant installation.

10.4 Remove All Reed Canarygrass

If reed canarygrass (and purple loosestrife) is observed during monitoring visits by the project biologist, its location will be marked in the field by the biologist. Initially, the biologist will accompany the maintenance contractor when they treat the offending plants to ensure that all of these plants are treated. Once the biologist feels comfortable with the maintenance contractor's ability to identify and treat offending weeds, it will no longer be necessary to accompany the maintenance contractor when weeds are observed. Wig will make every attempt to treat volunteer reed canarygrass plants before they go to seed. The entire plant, including stolons will be treated. This action will increase the potential that reed canarygrass plants represent a small fraction of the plant community.

10.5 Install Additional Plants as Necessary

Typically 80 percent of the installed trees and shrubs survive installation. As such, Wig assumes that installing additional trees and shrubs and quite possibly herbs will be necessary near the end of the first growing season. If during subsequent years the monitoring biologist

concludes that additional plantings are required, Wig will install additional plants as necessary. The selected replacement plants will include the most robust plant species growing on the site at the time of site evaluation.

11. SCHEDULE

Wig anticipates executing the construction plan in 2007 and upon receipt of permits and/or approvals from Tukwila and/or Ecology. Site grading will be limited to the drier months when groundwater elevations are at their lowest. Wig anticipates installing the plant material the following spring after flood waters have subsided. It is important that the surface soil (i.e., upper 12 inches) is moist at the time of plant installation. Monitoring will commence immediately following acceptance of plant installation by Tukwila.

12. PERFORMANCE BOND

Wig will post a bond or other surety in the amount of 150 percent of the value of the expected cost to install plants on the Mitigation site.

13. LIMITATIONS

Work for this project was performed, and this plan prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Wig Properties LLC-SS and its assigns for specific application to the referenced property. This plan is not meant to represent a legal opinion. No other warranty, express or implied, is made.

It should be noted that Chad Armour, LLC relied on information provided by others indicated previously. Chad Armour can only relay this information and cannot be responsible for its accuracy or completeness. Also note that wetland mitigation planning is an inexact science. Biological professionals may disagree on the nature and extent of mitigation plans. Final acceptance of this wetland mitigation plan is the responsibility of the permitting authority. Accordingly, this wetland mitigation plan should be reviewed by the appropriate permitting authority prior to committing to detailed planning and design activities.

Chad Armour, LLC

August 25, 2006

Moira Bradshaw, Senior Planner
City of Tukwila Department of Community Development
6300 Southcenter Boulevard, Suite 100
Tukwila, Washington 98188-2544

Subject: Mitigation Plan Bond
Southcenter Square
Tukwila, Washington

Dear Ms. Bradshaw:

In your August 22, 2006 email you asked us to estimate the cost to construct and restore the wetland in the Tukwila Pond and to monitor and maintain it for 10 years.

We trust that this information meets your needs. If you have any questions about the spreadsheet, please let us know.

Sincerely,
Chad Armour, LLC

Chad Armour
Principal

Attachments:
Attachment A – Bond Quantity Worksheet for the Tukwila Pond Wetland Restoration

6500 126th Avenue SE
Bellevue, Washington 98006
www.chadarmour.com

(425) 641-9743
(425) 643-3499 (Fax)
chad@chadarmour.com

PW06-121

Bond Quantity Worksheet for Sensitive Area Mitigations

Project Name: Southcenter Square **Project Address:** Tukwila Pond Wetland Restoration **Wetland File No.**

Date: 23-Aug-06 **Contact Person/Phone:** Chad Armour (425.641.9743)

Trees (includes delivery, installation, and materials)

Scientific Name	Common Name	Qty	Unit Price 1 gallon	1 gal Total	Qty	Unit Price 2 gallon	2 gal Total	Qty	Unit Price 1.5" cal	1.5" cap Total	Total Cost
				$0.00			$0.00	47	$ 55.00	$2,585	$2,585
Alnus rubra	red alder			$0.00			$0.00	47	$ 55.00	$2,585	$2,585
Fraxinus latifolia	Oregon ash			$0.00			$0.00	31	$ 55.00	$1,705	$1,705
Populus trichocarpa	black cottonwood										
			Total	$0.00		Total	$0.00		Total	$6,875	$6,875

Shrubs (includes delivery, installation, and materials)

Scientific Name	Common Name	Qty	Unit Price 1 gallon	1 gal Total	Qty	Unit Price 2 gallon	2 gal Total	Qty	Unit Price 5 gallon	5 gal Total	Total Cost
				$0.00	338	$ 30.00	$10,140.00			$0.00	$10,140.00
Cornus stolonifera	red-osier dogwood			$0.00	30	$ 30.00	$900.00			$0.00	$900.00
Lonicera involucrata	black twinberry			$0.00	30	$ 30.00	$900.00			$0.00	$900.00
Physocarpus capitatus	Pacific ninebark										
			Total	$0.00		Total	$11,940.00		Total	$0.00	$11,940.00

Live Stakes / Cuttings

Scientific Name	Common Name	Qty	Unit Price	Unit	Total Cost
					$0.00
Populus trichocarpa	Black cottonwood	440	$2.00		$880.00
Salix lasiandra	Pacific willow	124	$2.00		$248.00
Salix piperi	Piper's willow	123	$2.00		$246.00
Salix sitchensis	Sitka willow				
				Sub Total	$1,374.00

Earthwork/Organics (labor, equipment, overhead and profit)

Specific Name	Unit Price	Unit	Amount	Total Cost
Soil Export	$14.00	4000	4,000	$56,000.00
Soil Grading	$3.00	4000	4,000	$12,000.00
Topsoil - delivered & spread	$12.95	1400	1,400	$18,130.00
Mulch	$20.00	681	681	$13,620.00
			Sub Total	$99,750.00

Grasses/Emergents (includes delivery, installation, and materials)

Name	Seeding Rate	Acre	Unit Price	Pounds	Total Cost
Wetland Seed Mix, including:	20 to 40 lb./acre	0.88	$3,100.00	26.25	$2,728.00
Beckmannia syzigachne	American sloughgrass				
Deschampsia cespitosa	tufted hairgrass				
Elymus glaucus	blue wildrye				
Glyseria occidentalis	western mannagrass				
Hordeum brachyantherum	meadow barley				
Deschampsia cespitosa	tufted hairgrass	1.68	$50.00	0.55	$27.50
Geum macrophyllum	large-leaved avens	1.68	$120.00	1	$120.00
Glyseria grandis	reed mannagrass	1.68	$100.00	5.9	$590.00
				Sub Total	$3,465.50

Specific Name		Qty	Unit Price	br	Total Cost
Carex obnupta	slough sedge	7039	$1.65		$11,614.35
Carex stipata	sawbeak sedge	7436	$1.65		$12,269.40
Eleochris palustris	common spike-rush	1898	$1.65		$3,131.70
Scirpus cyperinus	wool-grass	950	$1.65		$1,567.50
Scirpus tabernaemontani	softstem bulrush	950	$1.65		$1,567.50
					$0.00
				Sub Total	$30,150.45

Habitat Structures (includes delivery, installation, and materials)

Specific Name	Unit Price	Units	Total Cost
Wood debris, large	$350.00	12	$4,200.00
Snags	$500.00	6	$3,000.00
		Sub Total	$7,200.00

General Items (includes delivery, installation, and materials)

Specific Name	Unit Cost	Units	Total Cost
Fencing, Split Rail, 4' High (3-rail) or 3' High (2-rail) **	$10.00	600	$6,000.00
Signs, Sensitive Area Boundary	$20.00	12	$240.00
Irrigation, Temporary	$9,500.00	1	$9,500.00
		Sub Total	$15,740.00

** may be included in construction bond instead of wetland bond with City approval

Monitoring and Maintenance Costs

Item	Qty	Unit Price	Unit	Total Cost
Maintenance - 1st 2 yrs	2	13,183.00		$26,366.00
Maintenance - next 8 years	8	5,650.00		$45,200.00
Monitoring annual - 1st 5 years	5	2,500.00		$12,500.00
Monitoring annual - Year 7	1	3,000.00		$3,000.00
Monitoring annual - Years 9 & 10	2	3,500.00		$7,000.00
			Sub Total	$94,066.00
				$269,186.95
Total Construction/Maintenance/Monitoring Costs				
Total Bond Amount		Agency Multiplier	150%	$403,780.43

CHAD ARMOUR, LLC

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chad@chadarmour.com

August 13, 2010
Job No. 08-002

Ms. Anjali Wig
Wig Properties LLC-SS
4811 – 134th Place SE
Bellevue, Washington 98006

Subject: Third Year Wetland Mitigation Monitoring Report
Tukwila Pond Mitigation Area (Fed Ref No. 200601027; St Ref No. 3815)
Tukwila, Washington

Dear Ms. Wig:

We are pleased to present the results of our wetland mitigation monitoring report the third year after installing plants on the above-referenced property. This is the third of several monitoring reports to assess the condition of the mitigation area relative to the performance standards. The purpose of the work is to satisfy federal, state, and local wetland permit requirements.

The report is organized in sections and includes:

SUMMARY OF FINDINGS that presents the results of the third year of monitoring and recommendations for additional work;

BACKGROUND INFORMATION that explains the purpose for the mitigation and how the mitigation area came to be;

MONITORING METHODS that describes how we collected the data, and presents the goals and performance standards of the mitigation plan;

MITIGATION AREA OBSERVATIONS that presents the results of our current hydrological and vegetative observations;

CONCLUSIONS that summarize the results of wetland mitigation to date relative to the performance standards; and

LIMITATIONS of this project.

Tables, figures, and representative photographs follow the text of the report. Table 1 shows the precipitation that fell on the region in the 2009/2010 water year. Table 2 presents the hydrological data for the mitigation area. Table 3 presents the vegetative data for the various wetland classes. And finally Table 4 summarizes the current vegetative data relative to the performance standards. Figure 1 is a vicinity map that shows the location of the mitigation area. Figure 2 shows the location of the vegetation classes, monitoring wells, and other pertinent features, as well as the size of the wetland classes and the plants that were installed on the mitigation area. Representative photographs follow the figures.

SUMMARY OF FINDINGS

Wig Properties, LLC-SS (Wig) converted the area east of the Tukwila Pond from a wetland and upland plant community dominated by reed canarygrass to a wetland plant community containing four wetland classes – open water, emergent, scrub-shrub, and forested. During the grading operation Wig was able to retain a significant portion of the mature trees and shrubs present in and adjacent to the mitigation area (site). Soon after the site was graded Wig installed several thousand native trees, shrubs, and herbaceous plants. Wig also applied the seed of several different grasses and herbs to the site.

Chad Armour, LLC (Armour) collected groundwater data from several shallow groundwater monitoring wells several times in the spring and summer and collected vegetative data in the summer of 2010.

The results of the third year of monitoring indicate that the site is in the process of complying with the performance standards. It appears that wetland hydrology is present throughout most of the site. The monitoring well measurements that are out of compliance appear to be related to excess ground elevation. Most of the vegetative performance standards are in compliance at this time. Currently the dominant plant species include Pacific willow, Sitka willow, red-osier dogwood, and tufted hairgrass. We observed less than 1% cover of non-native invasive plant species.

Recommendations

We recommend that Wig continue to aggressively treat non-native invasive plant species, particularly reed canarygrass and purple loosestrife. The reed canarygrass and purple loosestrife should be removed from the ground, roots and all and disposed off of the site. However; the reed canarygrass is prevalent enough that the clumps can be sprayed with an approved herbicide.

Install up to 25 Oregon ash trees in the forested wetland near where red alder and/or black cottonwood trees have died. Installing 'large' trees is not beneficial. Rather the new trees should be of the 5-gallon variety.

Fit the existing 'large' trees and the 25 trees to be installed with tree trunk protectors. The tree trunk protectors will make it difficult for rodents to access the bark of these trees. It will be necessary to remove the grass before the protectors are installed.

Remove the wooden stakes that were installed to support the 'large' trees. These trees no longer need the support.

Remove any remaining irrigation pipe on the site.

BACKGROUND INFORMATION

Wig constructed a wetland and enhanced degraded wetland in 2007 to compensate for filling slightly less than 1.16 acres (ac) of wetland on their Tukwila Southcenter shopping center. The 3.48ac site is a part of a larger 24-ac Tukwila Pond property that includes the pond and what was once a field of reed canarygrass, both with fringes of willow and/or black cottonwood trees. The site is located west of Andover Parkway West about 600 feet (ft) south of the intersection of Strander Boulevard and Andover Parkway West in Tukwila Washington (Figure 1 – Tukwila Pond Site).

Upland was transformed to wetland and degraded wetland was improved by replacing non-native invasives with a native plant assemblage. First Wig mowed the reed canarygrass then removed its rhizome mat before hauling it from the site. Then they removed some soil from the site, bringing the surface closer to the seasonal water table. To boost post-grading soil productivity, Wig mixed 3 inches (in) of Steergrow, a top soil substitute, into the upper layer of soil. They then installed several snags and added several pieces of large woody debris (LWD) to the finished surface prior to installing the plants.

At the time the mitigation area was graded, Wig made every effort to avoid cutting down existing mature trees and shrubs. The net result is more forested wetland and less emergent wetland that planned. The City of Tukwila (City) was concerned that the Steergrow (50% steer manure and 50% sawdust) would negatively impact the water quality of the Tukwila Pond. For this reason the City asked Wig to bridge the open water channel to prevent the water in the channel from mixing with the water in the pond. The sand dike at the south end of the channel has been breached and water from the pond has been comingling with water in the channel for the last two rainy seasons. Wig also added a berm adjacent to the northwest edge of the mitigation area.

Following grading, Wig installed several thousand trees and shrubs. Wig also installed several thousand sedge, rush, and spike-rush plugs as well as a mixture of emergent plant seeds to the bare soil. The plan was to install plugs and seeds differentially among wetland classes. During installation the plugs and seeds were installed across the entire wetland mitigation area.

Prior to construction Armour installed 17 shallow groundwater monitoring wells (wells) made from plastic PVC pipe across the site to model the groundwater elevation (Figure 2). Ten of these wells survived site grading. The seven new wells replace those lost during site grading. Together they completely cover the site.

The wells serve as the centers of 13 circular 1/100 acre vegetation assessment plots. After the first years monitoring we noticed that some wells yielded plots that straddled vegetative classes (i.e., emergent and forested). In other areas large branches of willows fell into plots, causing an emergent class to look like a forested class. For these reasons we moved five of the vegetative plots about 20 to 75ft from the similarly numbered well.

For the past two years Wig has maintained the site by removing non-native noxious weeds. Weeds removed and/or treated include Himalayan blackberry, reed canarygrass, and purple loose-strife.

In 2008 Wig installed about 80 additional willow live stakes on the site to replace those that had died.

MONITORING METHODS

Armour used an electronic water level indicator to detect ground and/or surface water in each of the 17 wells five times (March, April, May, June, and August). These measurements allow us to calculate the elevation of the groundwater or surface water. Groundwater elevation can be used as a surrogate to infer surface soil saturation. In this instance we assume that wetland hydrology is present if groundwater is within 1ft of

the surface or the surface soil is saturated. We record the data in the field and transfer it to a spreadsheet that calculated the ground and/or surface water elevation.

In each vegetative plot we note the health, estimated the cover of the trees, shrubs, herbs, and undesirable plants by species, and estimated the height of the vegetation. We designed the performance standards to evaluate short-, mid-, and long-term vegetation targets. Armour assessed the vegetation on August 11, 2010; recording the data in the field and transferring the data to an electronic spreadsheet for analysis.

Goal

The goal of the mitigation plan is to create 0.88ac and enhance 2.6ac of degraded lacustrine emergent and open water wetland habitat by converting it to a diverse wetland complex composed of four wetland classes. This action will considerably improve the habitat for indigenous and migratory wildlife. It will also increase the stormwater detention capacity of the Tukwila Pond.

Performance Standards

Hydrology Performance Standards

The design performance standards used to assess wetland hydrology include:

- Open water wetland – water from 0 to more than 7ft deep November through May;
- Emergent wetland – saturated soil between 17.2 and 17.7ft elevation November through June (the hydrology performance standard for the existing degraded wetland [now folded into the emergent wetland] ranged from 17.7 to 20.0ft);
- Scrub-shrub wetland – saturated soil between 17.7 and 18.2ft elevation November through May; and
- Forested wetland – saturated soil between 18.2 and 19.2ft elevation November through April.

Vegetation Performance Standards

The vegetation performance standards include:

- Emergent wetland – at least 3 or more native emergent plant species each consisting of at least 20% of total native emergent plant cover and ranging from 1 to 4 ft tall at the end of the 1-year monitoring effort;
- Scrub-shrub wetland – at least 2 or more native shrub plant species each consisting of at least 20% of total native shrub plant cover and ranging from 4 to 8 ft tall at the end of the 1-year monitoring effort;
- Forested wetland – at least 2 or more native tree plant species each consisting of at least 20% of total native tree plant cover and ranging from 8 to 20ft tall at the end of the 1-year monitoring effort;
- The total native plant cover for each wetland class in Year 3 will be at least:
  - Emergent – 30%,
  - Scrub-Shrub – 30%,

- Forested – 15%, and
- No more than 20% of the vegetation will consist of non-native invasive plant species at any time during the monitoring period.

MITIGATION AREA OBSERVATIONS

The 2009/2010 water year was wetter than normal. Excess precipitation for the 6 'wet' months ranged from 21% to 73% of normal. The two 'dry' months – November and February – were 51% and 16% drier than normal. A normal amount of precipitation fell in March (Table 1).

Much of the wetland was flooded for a significant period. The open water channel was flooded a month longer than it was in 2009. Water was somewhat more than a foot deep in mid-August (Table 2). Parts of the emergent, scrub-shrub, and forested wetland classes were flooded though the end of June. Other areas were flooded though May. Wetland hydrology was consistently present through the target date for the existing forested and open water wetlands. Depending on the elevation of the ground, wetland hydrology was either present or absent through the target date in parts of the scrub-shrub and emergent wetlands.

The total cover of installed, volunteer and non-native plant species ranged from 3 to 197% (Table 3). As expected plant cover in the open water wetland was negligible, although in some areas grasses and herbs adapted to prolonged flooding in shallow water are colonizing the channel. About half of the plant cover in the emergent wetland is represented by tree seedlings. Similarly, nearly half the cover in the scrub-shrub wetland is represented by tree seedlings. Willow is aggressively colonizing that part of the mitigation area that is regularly flooded. Trees represent nearly half of the cover in the forested wetland. As expected, trees represent most of the cover in the existing forest. Table 4 shows the vegetative results relative to the performance standards. To date Wig has met all but two of the vegetative standards. Only one dominant is present in the emergent wetland (three are required) and the average height of the vegetation on the forested wetland is less than the 20ft requirement.

The following paragraphs summarize our observations based on the data collected in 2010 by wetland class.

Emergent Wetland

Based on the 2010 hydrology data for the emergent wetland it would appear that wetland hydrology met the performance target in three of the four wells (Table 2). Two of the areas as represented by wells G-103 & G-7 were flooded through the end of June. The groundwater in the area represented by well G-106 was below or at the target elevation through the end of June; however, we never observe surface soil saturation at this location. Well G-101 missed the target significantly. Here groundwater ranged from 1.1 to 1.5ft below the target elevation from the end of March through the end of June. The area represented by well G-101 does not meet the regulatory wetland hydrology requirement of being inundated or saturated to the surface for more than 30 consecutive days.

The emergent wetland in the northeast corner of the site is dominated by herbs and tree seedlings, including tufted hairgrass, creeping buttercup, and black cottonwood. Other

common plant species include bulrush, soft rush, and Pacific willow (Attachment A – Photograph 1). The emergent wetland in the southwest corner of the site is dominated by creeping buttercup, black cottonwood, and Pacific willow. Soft rush and western yellowcress are common (Photograph 2). Branches of willow trees have fallen into the emergent wetland from the adjacent willow forest at a number of spots. The black cottonwood and willow seedling that form a virtual carpet in areas of prolonged flooding suggest that these parts of the emergent wetland will eventually become forested wetland.

There are a total of 25 different plant species in the emergent wetland. The native plant species cover 96% of the emergent wetland; far more than the 30% Year 3 cover standard (Table 4). The dominant plant species – black cottonwood and Pacific willow seedlings – represent more than half of the total vegetative cover. Less than 1% of the cover is attributable to non-native invasive plant species (Table 3).

Scrub-Shrub Wetland

Two of the three wells in the scrub-shrub wetland met the hydrology performance target (Table 2). One area was flooded through the end of June; the other area was flooded through the beginning of June. From a regulatory perspective the areas represented by all three wells exhibited wetland hydrology because the soil was saturated to the surface for at least 30 consecutive days during the growing season. From the performance standard perspective the area in the vicinity of well G-105 missed the hydrology target.

We counted a total of 17 plant species in the scrub-shrub wetland (Table 3). The total native plant cover (110%) far exceeds the 30% Year 3 cover standard (Table 4). The areas that are regularly flooded (G-8 & G-109) are dominated by Sitka willow saplings, Pacific willow seedlings, and soft rush. Black cottonwood saplings and spotted ladysthumb are common (Photographs 3 & 4). The non-flooded shrub-shrub wetland is dominated by red-osier dogwood and tufted hairgrass. Hooker willow saplings are common (Photograph 5). We observed only a trace of non-native invasive plants in this wetland class.

Forested Wetland

Both of the wells in the forested wetland met the hydrology performance target (Table 2). They also met the regulatory hydrology requirement.

The forested wetland is covered with a thick blanket of vegetation (Photograph 6). We counted 14 different plant species (Table 3). The 102% cover of native plants far exceeds the 15% Year 3 cover standard (Table 4). Pacific willow, red-osier dogwood, American sloughgrass, tufted hairgrass, and creeping buttercup dominate. Climbing nightshade is common in the forested wetland. We observed only a trace of non-native invasive plants in this wetland class.

In late April we observe that several of the installed trees appear to be dying. On closer inspection we saw that several black cottonwood and red alder trees are rooted in standing water during the early growing season. Both of these tree species are adapted to mesic (i.e., moderate) water regimes, but not hydric (i.e., flooded are prolonged surface soil saturation) water regimes. In August we counted 11 dead red alder trees and 9 black cottonwood trees. It is entirely possible that additional red alder trees will expire in the next year or so due to prolonged flooding during the early growing season.

Although the outer bark of the Oregon ash trees has been gnawed by small rodents, none of these threes are dead. They are adapted to wetter soil conditions than are the alder and cottonwood.

Open Water Wetland

The hydrology performance standard for the open water wetland was achieved in 2010. This wetland class was flooded through the middle of August with nearly 1.5ft of water (Table 2).

Near the end of the second growing season the open water wetland continues to be sparsely vegetated. The presence of standing water limits the vegetation in this wetland class. We observed 2 different plant species that cover 3% of the area (Table 3). Although not rooted in the open water wetland willow branches overhang the channel in places (Photograph 7). In other places aquatic vegetation is beginning to colonize the more protected areas (Photograph 8). We observed no non-native invasive plant species in the open water wetland.

Existing Forested Wetland

Wetland hydrology for the existing forested wetland was present through the end of June (Table 2).

Three of our original wells are located in existing forested areas dominated by Pacific willow trees ranging from 45 to 50ft tall. The total vegetative cover for the existing forested wetland is 197%, with trees representing 130%, shrubs 3%, and herbs 33% of the cover, respectively (Table 3). In addition to Pacific willow, dominant plant species include Sitka willow, creeping buttercup, and Watson willow-herb. Grasses are common volunteers. We observed only a trace of non-native invasive plants in this wetland class.

CONCLUSIONS

The wetland mitigation plan for the Tukwila Pond site currently appears to be on track.

Hydrology

With a few possible exceptions it appears that wetland hydrology in the created and enhanced wetlands is present. After three years of monitoring it appears that one area – the area represented by well G-101 – may not meet the hydrology performance standard. This area has consistently been 'dry' since the wetland was created/enhanced. A hydrological snapshot of this area in early April 2005 and mid-April 2006 prior to creation/enhancement indicates that this area functioned as upland prior to grading. At that time depth to groundwater ranged from 2.3 to 4.1ft below the ground surface.

Other areas not a part of the open water wetland is wetter than planned. These areas are subject to prolonged seasonal flooding and are represented by wells G-103 & G-7 (emergent wetland), G-8 & G-109 (scrub-shrub wetland), and G-113 (forested wetland). All of these areas are adjacent to the open water wetland and are in the process of being dominated by Pacific willow.

Vegetation

Wig is on track to meet the vegetative performance standards. Many of the cover and height requirements have been met (Table 4). Although the data does not show it, we observe considerably more non-native invasives on the site, particularly reed canarygrass and purple loosestrife. What were once small clumps are now small patches of reed canarygrass. Purple loosestrife has spread beyond the western edge of the Pacific willow forest. It is now also present along the edge of the open water wetland in the northeastern sector of the wetland.

LIMITATIONS

Work for this project was performed, and this letter report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Wig Properties LLC-SS and their assigns for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

Any questions regarding our work and this report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned.

Sincerely,
Chad Armour, LLC

Chad Armour
Principal

Table 1 – Precipitation measured at SeaTac from October 2009 through June 2010
Table 2 – Third Year (2010) subsurface hydrologic characteristics on the mitigation site
Table 3 – Third Year (2010) vegetation characteristics on the mitigation site
Table 4 – Third Year (2010) performance standard assessment for the mitigation site
Figure 1 – Vicinity Map
Figure 2 – Post-Construction Plan
Attachment A – Representative Photographs

cc: Sandra Whiting, City of Tukwila
Amy Klein, U.S. Army Corps of Engineers
Patrick McGraner, Department of Ecology

TABLES

Table 1 - Precipitation measure at SeaTac from October 2008 through June 2009

Month	Measured	Normal	Departure	Cumulative Departure
October	5.54	3.19	2.35	2.35
November	8.96	5.9	3.06	5.41
December	2.75	5.62	-2.87	2.54
January	6.17	5.13	1.04	3.58
February	3.52	4.18	-0.66	2.92
March	3.76	3.75	0.01	2.93
April	3.49	2.59	0.90	3.83
May	2.83	1.78	1.05	4.88
June	2.49	1.49	1.00	5.88

Table 2 - Third Year (2010) hydrologic characteristics on the Tukwila Pond mitigation site

Groundwater Monitoring Well	Habitat Type	Ground Elev (ft)	Target Elev (ft)	Groundwater Elevation (ft)[a]				
				3/31/10	4/27/10	6/1/10	6/30/10	8/11/210
G-2[b]	Forested Wetland (ex)	18.7	NA (17.7)[c]	18.88[f]	18.75[f]	18.55[g]	18.44[g]	16.6
G-4[b]	Forested Wetland (ex)	18.5	NA (17.5)[c]	18.83[f]	18.68[f]	18.51[g]	18.42[g]	17.2
G-11[b]	Forested Wetland (ex)	13.5	NA (12.5)[c]	18.82[ef]	18.71[ef]	18.54[ef]	18.5[ef]	16.48[ef]
G-7	Emergent Wetland	17.6	16.6[c]	18.79[f]	18.76[f]	18.52[f]	18.42[f]	17.38[g]
G-101	Emergent Wetland	19.4	18.4[c]	17.3	17.0	17.2	16.9	14.3
G-103	Emergent Wetland	18.0	17.0[c]	18.51[f]	18.69[f]	18.49[f]	18.41[f]	14.4
G-106	Emergent Wetland	19.2	18.2[c]	18.7	18.7	18.4	18.2	16.3
G-8	Scrub-Shrub Wetland	18.5	17.5[c]	18.82[f]	18.68[f]	18.52[f]	18.4	16.4
G-105	Scrub-Shrub Wetland	18.9	17.9[c]	17.92[g]	17.2	16.6	16.5	14.4
G-109	Scrub-Shrub Wetland	17.8	16.8[c]	18.77[f]	18.67[f]	18.49[f]	18.39[f]	15.7
G-113	Forested Wetland	18.0	17.0[c]	18.84[f]	18.73[f]	18.54[f]	18.47[f]	14.8
G-115	Forested Wetland	18.9	17.9[c]	18.79[g]	18.72[g]	18.5[g]	17.4	15.0
G-10	Open Water Wetland	15.0	15.2[d]	18.8[f]	18.74[f]	18.56[f]	18.49[f]	16.49[f]
G-12	Open Water Wetland	15.0	15.2[d]	18.83[ef]	18.71[ef]	18.54[ef]	18.5[ef]	17.13[f]
G-14	Open Water Wetland	15.0	15.2[d]	18.92[f]	18.75[f]	18.55[f]	18.5[f]	16.52[f]
S-1	Open Water Wetland	15.1	15.2[d]	18.87[f]	18.74[f]	18.56[f]	18.47[f]	16.48[f]
S-2[h]	Open Water Wetland	18.7	15.2[d]	18.84[f]	18.73[f]	18.5	18.45[g]	15.7

[a] Emergent target through June; Scrub-Shrub target through May; Forested target through April; & Open Water target through May
[b] control - for comparison only; [c] 1 ft below the ground elevation [d] the design elevation
[e] estimated elevation based on elevations from nearby monitoring wells
[f] flooded; [g] soil saturated to the surface; [h] located on the northern dike
shaded numbers indicate that the target elevation was not met and wetland hydrology is not present

Table 3 - Third Year (2010) vegetation characteristics on the Tukwila Pond mitigation site

		Open Water Wetland[a]		Emergent Wetland[b]		Scrub-Shrub Wetland[a]		Forested Wetland[c]		Forested Wetland (Ex)[a]	
		Cover	Freq	Cover	Freq	Cover	Freq	Cover	Freq	Cover	Freq
Trees											
black cottonwood	*Populus balsamifera*	--	--	18%	50%	6%	100%	--	--	--	--
Pacific willow	*Salix lasiandra*	--	--	37%	75%	16%	100%	52%	100%	90%	100%
red alder	*Alnus rubra*	--	--	--	--	--	--	8%	50%	--	--
Sitka willow	*Salix sitchensis*	--	--	4%	50%	28%	67%	--	--	40%	67%
Total Trees		**0%**		**55%**		**50%**		**60%**		**130%**	
Shrubs											
Hooker's willow	*Salix hookeriana*	--	--	--	--	5%	33%	3%	50%	--	--
red elderberry	*Sambucus racemosa*	--	--	T	25%	--	--	--	--	--	--
red-osier dogwood	*Cornus stolonifera*	--	--	T	50%	10%	100%	20%	100%	3%	67%
thimbleberry	*Rubus parviflorus*	--	--	T	25%	--	--	--	--	--	--
Native Shrub Subtotal		**0%**	--	**T**	--	**10%**	--	**23%**	--	**3%**	--
Himalayan blackberry	*Rubus discolor*	--	--	T	50%	--	--	--	--	T	33%
Non-Native Invasive Shrub Subtotal		**0%**		**T**	--	**0%**		**0%**		**%**	
Total Shrubs		**0%**		**T**		**10%**		**23%**		**3%**	
Herbs											
American sloughgrass	*Beckmannia syzigachne*	--	--	T	25%	--	--	10%	50%	--	--
American waterplantain	*Alisma plantago-aquatica*	T	33%	--	--	--	--	--	--	--	--

Table 3 - Third Year (2010) vegetation characteristics on the Tukwila Pond mitigation site

bulrush	*Scirpus acutus*	--	--	4%	25%	--	--	--	--	--	--
climbing nightshade[d]	*Solanum dulcamara*	--	--	3%	50%	--	--	8%	50%	T	67%
common spike-rush	*Eleocharis palustris*	--	--	--	--	T	33%	--	--	--	--
common cattail	*Typha latifolia*	--	--	T	25%	--	--	--	--	--	--
creeping buttercup[d]	*Ranunculus repens*	--	--	11%	50%	T	33%	--	--	27%	67%
unidentified grasses		--	--	--	--	T	33%	10%	50%	5%	33%
large-leaved avens	*Geum macrophyllum*	--	--	2%	50%	--	--	T	50%	--	--
mint	*Mentha* sp.	--	--	--	--	T	33%	--	--	--	--
prostrate knotweed	*Polygonum aviculare*	3%	33%	1%	25%	--	--	--	--	--	--
slough sedge	*Carex obnupta*	--	--	T	25%	--	--	T	100%	--	--
soft rush	*Juncus effusus*	--	--	6%	75%	7%	33%	4%	100%	2%	33%
spatter-dock	*Nuphar lutem*	--	--	--	--	--	--	--	--	10%	33%
spotted ladysthumb	*Polygonum persicaria*	--	--	1%	25%	3%	33%	--	--	--	--
thick-headed sedge	*Carex pachystachya*	--	--	T	25%	2%	33%	T	50%	--	--
three-square bulrush	*Scirpus americana*	--	T	T	25%	--	--	--	--	--	--
tufted hairgrass	*Deschampsia cespitosa*	--	--	16%	75%	33%	33%	10%	100%	--	--
Watson willowherb	*Epilobium watsonii*	--	--	2%	50%	T	33%	3%	50%	20%	67%
western yellowcress	*Rorippa curvisiliqua*	--	--	3%	25%	2%	67%	--	--	--	--
white clover[d]	*Trifolium repens*	--	--	--	--	T	33%	--	--	--	--

Table 3 - Third Year (2010) vegetation characteristics on the Tukwila Pond mitigation site

wool-grass	*Scirpus cyperinus*	--	--	2%	25%	--	--	--	--	--	--
yellow iris	*Iris pseudacorus*	--	--	--	--	T	33%	--	--	--	--
Native Herbs Subtotal		**3%**	--	**51%**	--	**47%**	--	**45%**	--	**64%**	--
purple loosestrife	*Lythrum salicaria*	--	--	T	25%	--	--	--	--	T	33%
reed canarygrass	*Phalaris arundinacea*	--	--	T	25%	T	33%	T	50%	T	33%
Non-Native Invasive Herbs Subtotal		**0%**	--	**T**	--	**T**	--	**T**	--	**T**	--
Total Herbs		**3%**		**51%**		**53%**		**45%**		**64%**	
Total Cover		**3%**		**106%**		**113%**		**128%**		**197%**	

[a] 3 plots; [b] 4 plots; [c] 2 plots; [d] non-native; T trace

Table 4 - Third Year (2010) performance standard assessment for the Tukwila Pond mitigation site

Performance Standard	Dominant Plant Species	Plant Association		
		Emergent	Scrub-Shrub	Forested
Cover of native dominants[a]	Pacific willow	37%	16%	52%
	Sitka willow	4%	28%	--
	red-osier dogwood	T	10%	20%
	tufted hairgrass	16%	33%	10%
Total native plant cover[b]		96%	110%	102%
Non-native invasive cover[c]		T	T	T
Average plant height[d]		3.6ft	6.1ft	4.6ft

[a] Year 10 standard - 20% cover for 3 species (Emergent) & 20% cover for 2 species (Scrub-shrub & Forested)

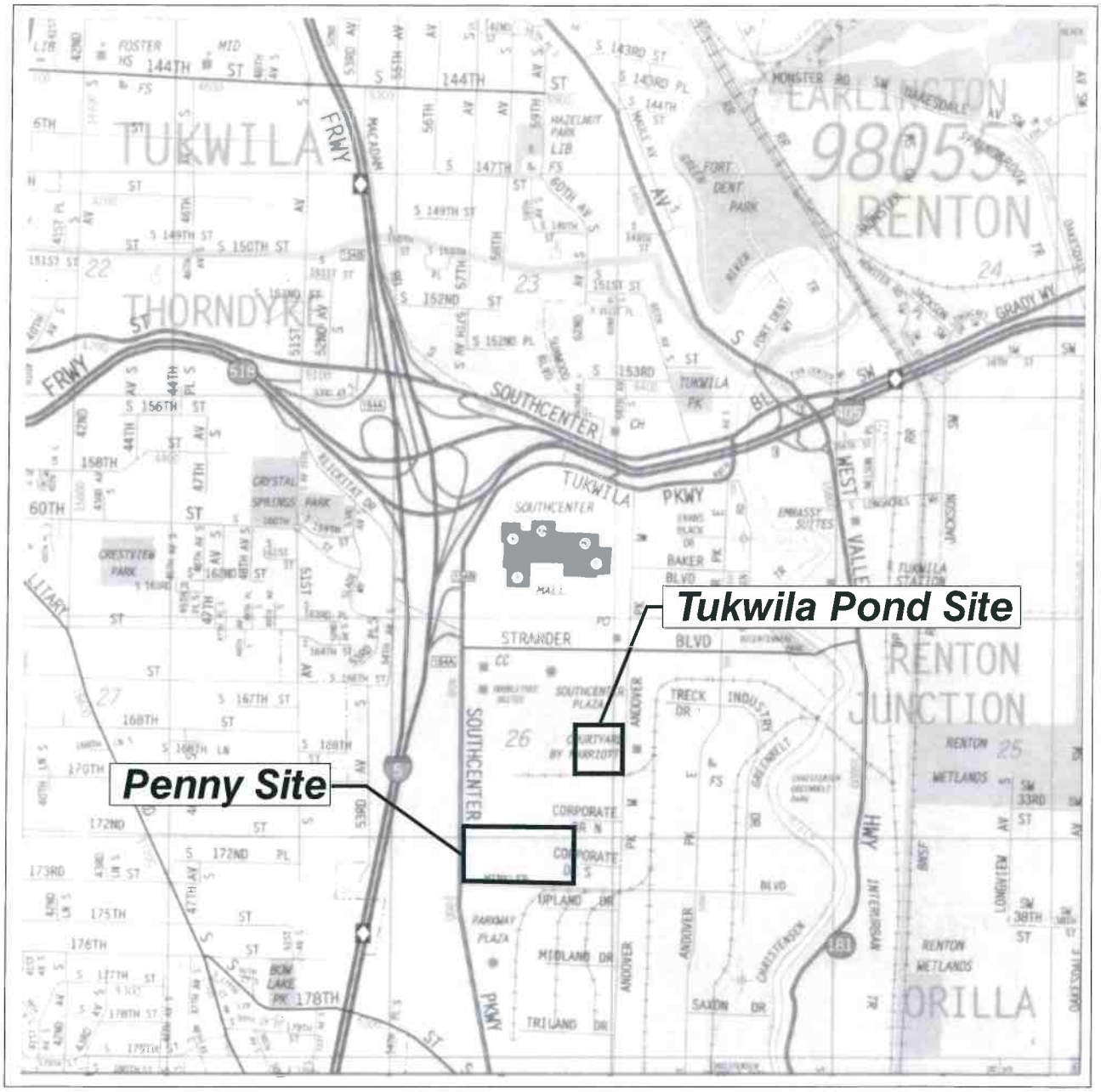
[b] Year 3 standard - Emergent 30%, Scrub-shrub 30%, Forested 15%

[c] Standard <20%

[d] 1-4 ft (EM) Year 3 Standard, 4-8 ft (SS) Year 5 Standard, & 8-20 ft (FO) Year 7 Standard

shaded species are dominants

FIGURES



Source: The Thomas Guide, 2002, King/Pierce/Snohomish Counties; Page 655.

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FIGURE 1: VICINITY MAP	Chad Armour, LLC
Wig Properties LLC-SS Tukwila, Washington	6500 126th Avenue SE Bellevue, Washington 98006

Plants installed on the Tukwila Pond Mitigation site

Scientific Name	Common Name	Emergent Wetland[a]	Scrub-shrub Wetland	Forested Wetland	Spacing	Size
		Trees				
Alnus rubra	red alder			47	15' OC	1.5" caliper
Fraxinus latifolia	Oregon ash			47	15' OC	1.5" caliper
Populus balsamifera	black cottonwood			31	30' OC	1.5" caliper
Salix lasiandra	Pacific willow			440	8' OC	cuttings
		Shrubs				
Cornus stolonifera	red-osier dogwood		338	50	6' OC	2-gallon
Cornus stolonifera	red-osier dogwood		338	145	6' OC	bare root
Lonicera involucrata	black twinberry		30		6' OC	2-gallon
Physocarpos capitatus	Pacific ninebark		30		6' OC	2-gallon
Salix piperi	Piper's willow		124		6' OC	cuttings
Salix sitchensis	Sitka willow		123		6' OC	cuttings
		Herbs				
Beckmannia syzigachne	American sloughgrass	2.67lb	2.67lb	2.67lb	broadcast	seed
Carex obnupta	slough sedge	2253	1336	3,450	24"OC	bare root
Carex stipata	sawbeak sedge	2,380	1,413	3644	24"OC	bare root
Deschampsia cespitosa	tufted hairgrass	3.05lb	3.05lb	3.05lb	broadcast	seed
Eleochris palustris	common spike-rush	607	361	930	24"OC	bare root
Elymus glaucus	blue wildrye	2.67lb	2.67lb	2.67lb	broadcast	seed
Geum macrophyllum	large-leaved avens	0.5lb	0.5lb	0.5lb	broadcast	seed
Glyseria elata	tall mannagrass	0.42lb	0.42lb	0.42lb	broadcast	seed
Glyseria grandis	reed mannagrass	0.03lb	0.03lb	0.03lb	broadcast	seed
Glyseria occidentalis	western mannagrass	3.58lb	3.58lb	3.58lb	broadcast	seed
Hordeum brachyantherum	meadow barley	2.67lb	2.67lb	2.67lb	broadcast	seed

[a] including Existing Degraded Wetland

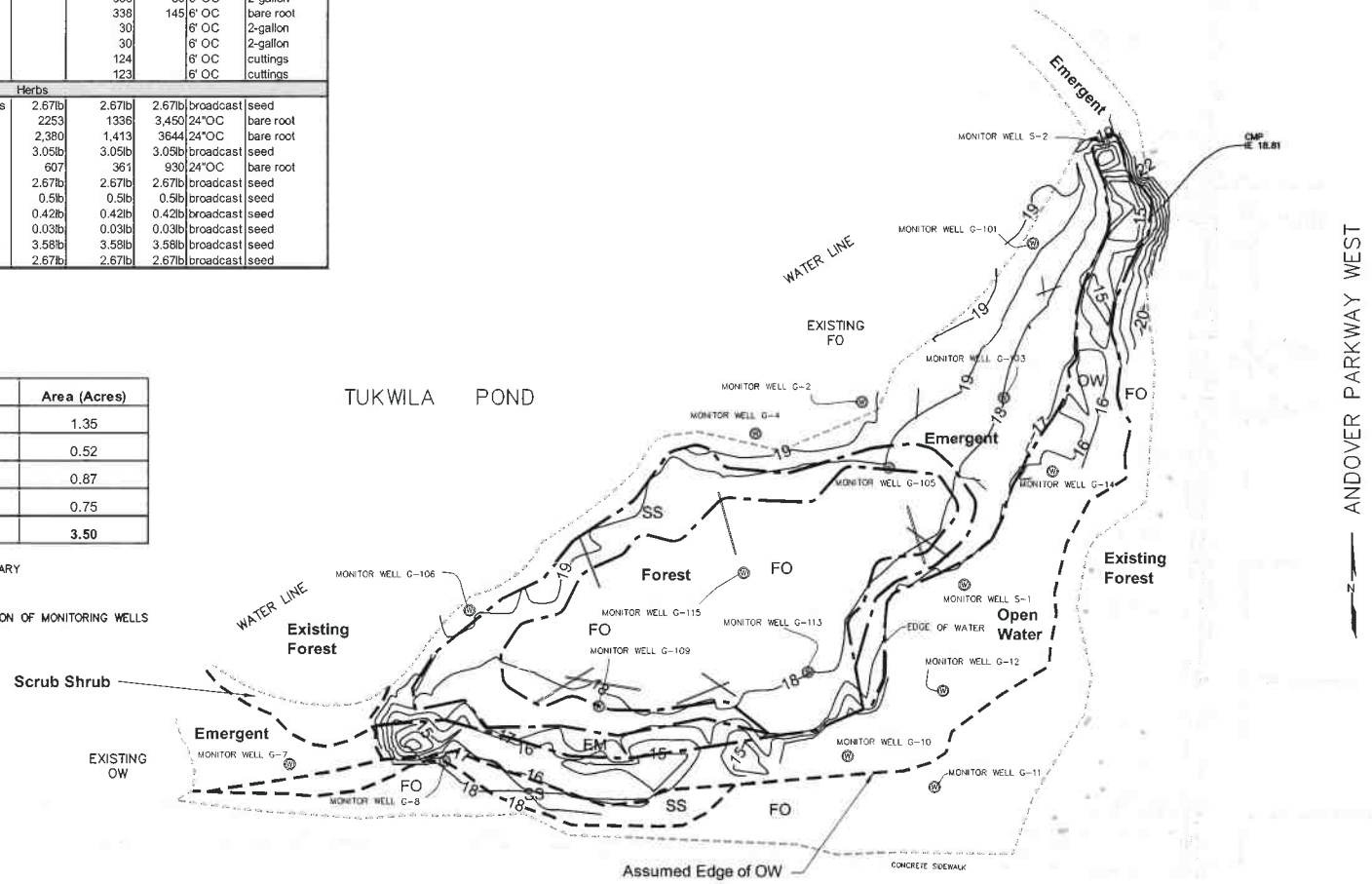
LEGEND

Wetland Class	Area (SF)	Area (Acres)
Forested (FO)	58,866	1.35
Scrub-Shrub (SS)	22,868	0.52
Emergent (EM)	37,778	0.87
Open Water (OW)	32,849	0.75
	152,361	**3.50**

MITIGATION BOUNDARY

LWD

G-1 NUMBER & LOCATION OF MONITORING WELLS



POST-CONSTRUCTION PLAN

0 40 80
Scale in Feet

Source: Bush, Roed & Hitchings, Inc.

DWG NAME: G:\project\Clients\armour\Wig Properties\wig012.dwg
DATE: 12/23/08 09:34am

FIGURE 2: POST-CONSTRUCTION PLAN (REVISED)
Wig Properties LLC-SS
Tukwila, Washington

Chad Armour, LLC
6500 128th Avenue SE
Bellevue, Washington 98006

ATTACHMENT A
Representative Photographs

Photograph 1. View of the Emergent Wetland from Plot G-101 looking southeast.

Photograph 2. View of the Emergent Wetland from Plot G-7 looking east.

Photograph 3. View of the Scrub-Shrub Wetland from Plot G-109 looking west.

Photograph 4. View of the Scrub-Shrub Wetland from Plot G-8 looking east.

Photograph 5. View of the Scrub-Shrub Wetland from Plot G-115 looking northeast.

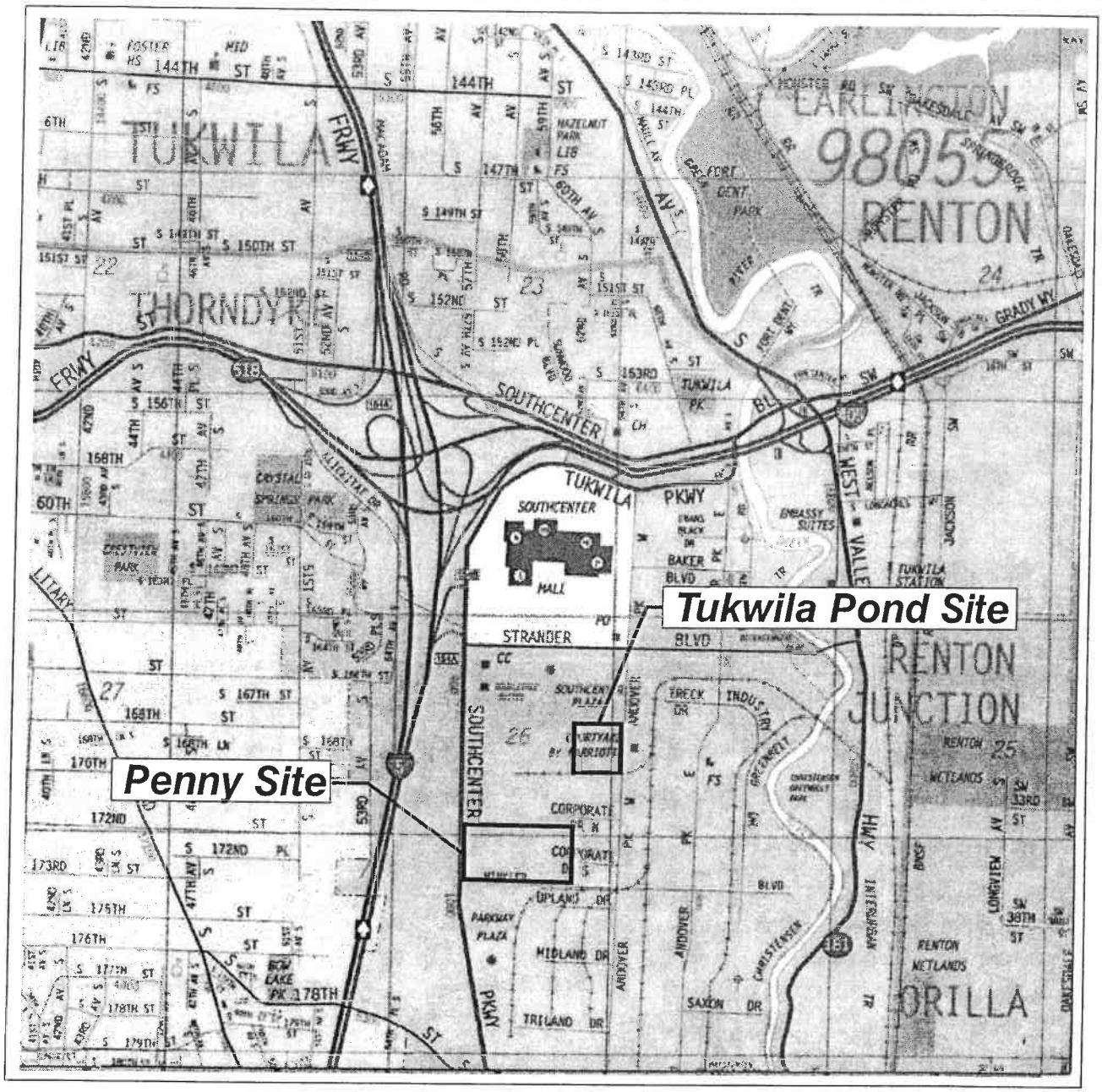
Photograph 6. View of the Forested Wetland from Plot G-105 looking southwest.

Photograph 7. View of the Open Water Wetland from Plot G-10 looking west.

Photograph 8. View of the Open Water Wetland from Plot G-12 looking southwest.

Photograph 10. View of the Existing Forested Wetland from Plot G-2 looking southwest.

Photograph 10. View of the Existing Forested Wetland from Plot G-4 looking northwest.



Source: The Thomas Guide, 2002, King/Pierce/Snohomish Counties; Page 655.

NOT TO SCALE

N

FIGURE 1: VICINITY MAP Wig Properties LLC-SS Tukwila, Washington	**Chad Armour, LLC** 6500 126th Avenue SE Bellevue, Washington 98006

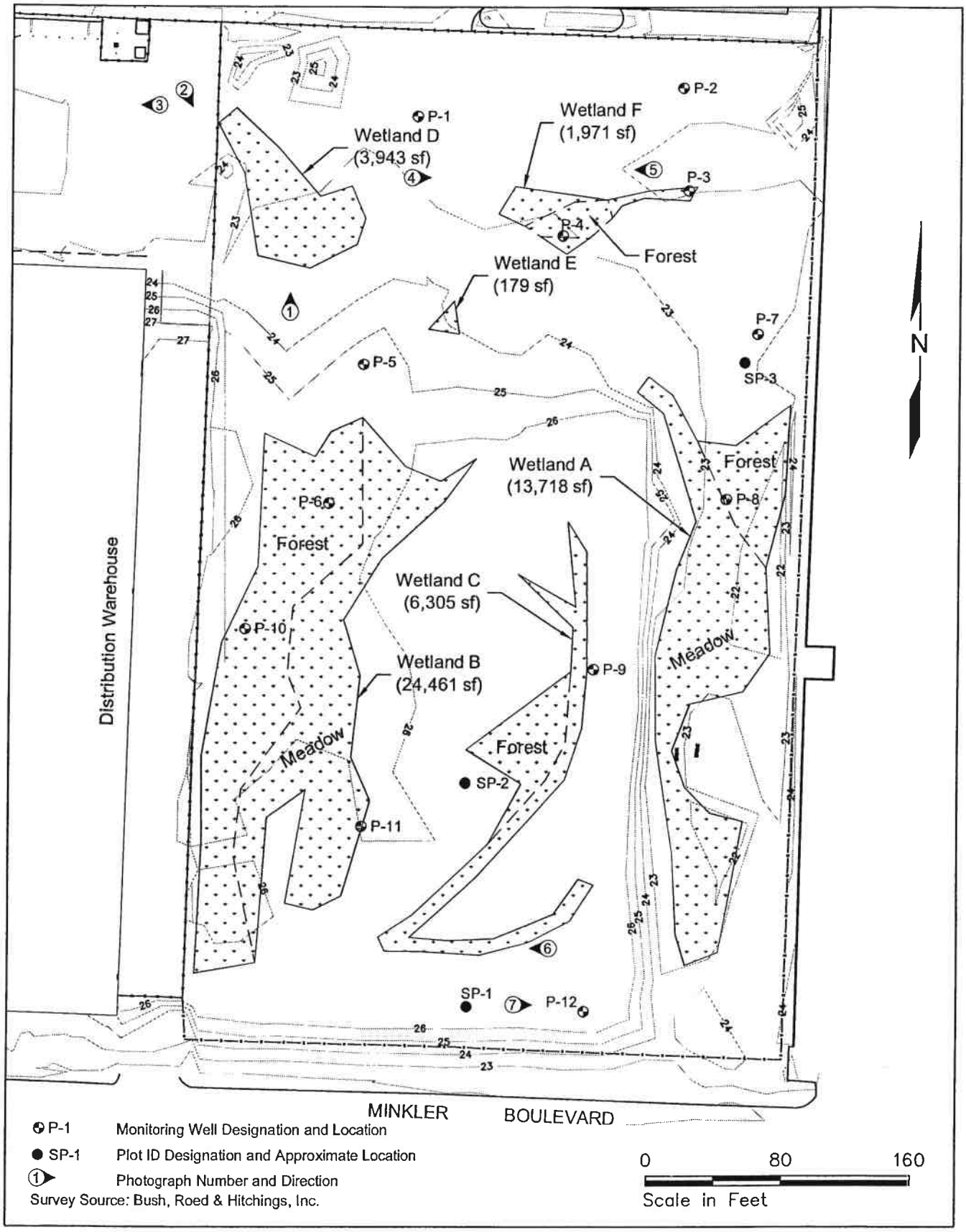


FIGURE 2: SITE PLAN (REVISED)

Wig Properties
Tukwila, Washington

Chad Armour, LLC
6500 126th Avenue SE
Bellevue, Washington 98006

DATE: 07/06/06 11:03am
DWG NAME: G:\project\Clients\armour\Wig Properties\wig002.dwg

DECIDUOUS TREE PLANTING DETAIL (6' TO 8' HEIGHT)

SCALE: NONE

GROUND COVER PLANTING DETAIL

SCALE: NONE

Scientific Name	Common Name	Emergent Wetland	Scrub-shrub Wetland	Forested Wetland	Spacing	Size	Comments
Trees							
Alnus rubra	red alder			47	15' OC	1.5" cal.; b&b	in clumps of 15
Fraxinus latifolia	Oregon ash			47	15' OC	1.5" cal.; b&b	in clumps of 15
Populus balsamifera	black cottonwood			31	30' OC	1.5" cal.; b&b	
Salix lasiandra	Pacific willow			440	8' OC	3' - 4' cuttings	50% stem burial
Shrubs							
Cornus stolonifera	red-osier dogwood		338	195	5' OC	br & 3-gallon	25% 3-gallon, clustered
Lonicera involucrata	black twinberry		30		5' OC	2-gallon	in clumps of 15
Physocarpus capitatus	Pacific ninebark		30		5' OC	2-gallon	in clumps of 15
Salix piperi	Piper's willow		124		5' OC	3' - 4' cuttings	50% stem burial; 2 rows/bed
Salix sitchensis	Sitka willow		123		8' OC	3' - 4' cuttings	50% stem burial; 2 rows/bed
Herbs							
Carex obnupta	slough sedge			7,000	24" OC	br	
Carex stipata	sawbeak sedge	1,898	5,538		24" OC	br	
Deschampsia cespitosa	tufted hairgrass	0.15	0.2	0.2		seed	broadcast seed; cover with 1/2" of soil
Eleocharis palustris	common spike-rush	1,898			24" OC	br	adjacent to open water
Geum macrophyllum	large-leaved avens	0.3	0.3	0.4		seed	broadcast seed; cover with 1/2" of soil
Glyceria grandis	reed mannagrass	1.8	1.8	2.3		seed	broadcast seed; cover with 1/2" of soil
Scirpus cyperinus	wool-grass	950			24" OC	br	
Scirpus tabernaemontani	softstem bulrush	950			24" OC	br	
Existing Degraded Wetland							
Beckmannia syzigachne	American sloughgrass	0.88 acre Degraded Wetland				seed mixture	broadcast seed; 20 to 40 lbs/ac
Deschampsia cespitosa	tufted hairgrass	0.88 acre Degraded Wetland				seed mixture	broadcast seed; 20 to 40 lbs/ac
Elymus glaucus	blue wildrye	0.88 acre Degraded Wetland				seed mixture	broadcast seed; 20 to 40 lbs/ac
Glyceria occidentalis	western mannagrass	0.88 acre Degraded Wetland				seed mixture	broadcast seed; 20 to 40 lbs/ac
Hordeum brachyantherum	meadow barley	0.88 acre Degraded Wetland				seed mixture	broadcast seed; 20 to 40 lbs/ac

SIGN DETAIL

SCALE: NONE

LOG DETAIL

SCALE: NONE

FENCE DETAIL

SCALE: NONE

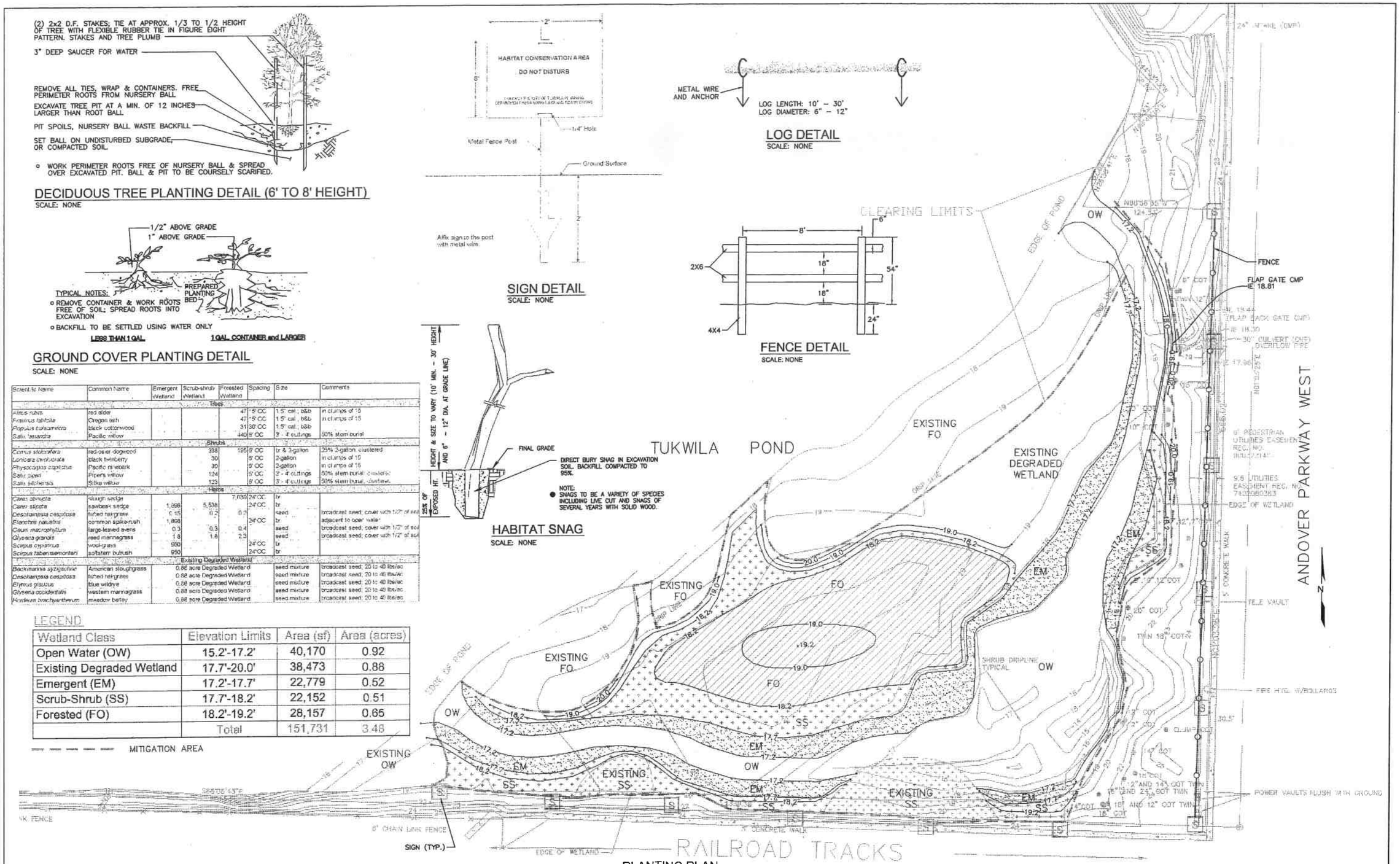
HABITAT SNAG

SCALE: NONE

LEGEND

Wetland Class	Elevation Limits	Area (sf)	Area (acres)
Open Water (OW)	15.2'-17.2'	40,170	0.92
Existing Degraded Wetland	17.7'-20.0'	38,473	0.88
Emergent (EM)	17.2'-17.7'	22,779	0.52
Scrub-Shrub (SS)	17.7'-18.2'	22,152	0.51
Forested (FO)	18.2'-19.2'	28,157	0.65
	Total	151,731	3.48

MITIGATION AREA



PLANTING PLAN

0 40 80
Scale in Feet

FIGURE 6: PLANTING PLAN
Wig Properties LLC–SS
Tukwila, Washington

Chad Armour, LLC
6500 126th Avenue SE
Bellevue, Washington 98006

Source: Bush, Roed & Hitchings, Inc.

DWG NAME: G:\project\Clients\armour\Wig Properties\wig009.dwg
DATE: 07/06/06 10:37am

Tukwila Wetlands

- 1,000 square feet or less
- 1,001-4,000 square feet
- 4,000 square feet or larger

S 120th Pl
East Marginal Way S
42nd Ave S
Martin L King Jr Way S
Tukwila International Blvd
S 124th St
599
50th Pl S
S 129th St
Gateway Dr
S 130th St
48th Ave S
40th Ave S
S 133rd St
Interurban Ave S
Military Rd S
37th Ave S
Tukwila Intl Blvd
S 140th St
5
53rd Ave S
34th Ave S
S 144th St
48th Pl S
51st Ave S
42nd Ave S
S 150th St
S 152nd St
518
International Blvd
Macadam Rd S
65th Ave S
S 156th St
Klickitat Dr
Southcenter Blvd
405
S 158th St
Tukwila Pkwy
Southcenter Mall
Longacres Way
S 160th St
Baker Blvd
Strander Blvd
Southcenter Pkwy
Andover Park W
Minkler Blvd
West Valley Hwy
S 184th Pl
99

SR 599 Ramp
Tukwila International Blvd
SR 99 Ramp
S 120th Pl

I-5 Fwy
51st Ave S
S 151st St
I-5 Ramp
52nd Ave S

S 159th St
53rd Ave S
Klickitat Dr
S 160th St
51st Ave S
Slade Way

West Valley Hwy

N
W
E
S

CHAPTER 18.70

NONCONFORMING LOTS, STRUCTURES AND USES

Sections:

18.70.010 Purpose
18.70.020 Construction Approved Prior to Adoption of Title
18.70.030 Substandard Lots
18.70.040 Nonconforming Uses
18.70.050 Nonconforming Structures
18.70.060 Repairs and Maintenance
18.70.070 Building Safety
18.70.080 Nonconforming Parking Lots
18.70.090 Nonconforming Landscape Areas
18.70.100 Conditional and Unclassified Uses
18.70.110 Nonconforming Adult Entertainment Establishment
18.70.120 Sidewalk Dedication
18.70.130 Cargo Containers

18.70.010 Purpose

It is the purpose of this chapter to establish limitations on the expansion and extension of nonconforming uses and structures which adversely affect the development and perpetuation of desirable residential, commercial, and industrial areas with appropriate groupings of compatible and related uses.

(Ord. 1819 §1 (part), 1997)

18.70.020 Construction Approved Prior to Adoption of Title

To avoid undue hardship, nothing in this title shall be deemed to require a change in plans, construction or designated use of any building on which actual construction was lawfully begun prior to adoption of this title and upon which actual building construction has been carried on in a diligent manner. Actual construction shall consist of materials in permanent positions and fastened in a permanent manner, and demolition, elimination and removal of one or more existing structures in connection with such construction; providing, that actual construction work shall be diligently carried on until the completion of the structure involved.

(Ord. 1819 §1 (part), 1997)

18.70.030 Substandard Lots

A. A lot, as defined in TMC 18.06.500, which does not meet the minimum standard for average lot width for the zone in which it is located, may still be developed as a separate lot if the proposed use is one which is permitted in the zone, and the proposed development can comply with the remaining requirements of this title regarding basic development standards for the applicable zone and other applicable land use and environmental requirements.

B. A lot, as defined in TMC 18.06.500, which cannot meet the basic development standards (other than lot width) for the applicable zone and other applicable land use and environmental requirements, may be developed only if it is combined with adjacent lot(s) in a manner which allows the combined lots to be developed in a manner which does comply with the basic development standards for the applicable zone and other applicable land use and environmental requirements. In the event lots are combined in order to comply with the requirements of this subsection, a boundary line adjustment shall occur so that the combined lots are henceforth considered a single lot.

C. Nothing in this subsection shall be deemed to prevent the owner of a sub-standard lot from applying for or receiving approval of variances pursuant to TMC Chapter 18.72.

(Ord. 2153 §1, 2007; Ord. 2097 §21, 2005)

18.70.040 Nonconforming Uses

Any preexisting lawful use of land made nonconforming under the terms of this title may be continued as a nonconforming use, defined in TMC Chapter 18.06, so long as that use remains lawful, subject to the following:

1. No such nonconforming use shall be enlarged, intensified, increased or extended to occupy a greater use of the land, structure or combination of the two, than was occupied at the effective date of adoption of this title.

2. No nonconforming use shall be moved or extended in whole or in part to any other portion of the lot or parcel occupied by such use at the effective date of adoption or amendment of this title.

3. If any such nonconforming use ceases for any reason for a period of more than six consecutive months, or a total of 365 days in a three-year time period, whichever occurs first, any subsequent use shall conform to the regulations specified by this title for the district in which such use is located.

4. No existing structure devoted to a use not permitted by this title in the zone in which it is located shall be structurally altered, except in changing the use of the structure to a use permitted in the zone in which it is located; except where minor alterations are made, pursuant to TMC Section 18.70.050(1), TMC Section 18.70.060, or any other pertinent section, herein.

5. If a change of use is proposed to a use determined to be nonconforming by application of provisions in this title, the proposed new use must be a permitted use in its zone or a use approved under a Conditional Use or Unclassified Use Permit process, subject to review and approval by the Hearing Examiner and/or the City Council. For purposes of implementing this section, a change of use constitutes a change from one Permitted, Conditional or Unclassified Use category to another such use category as listed within the Zoning Code.

6. Any structure, or structure and land in combination, in or on which a nonconforming use is superseded by a permitted use, shall thereafter conform to the regulations for the zone in which such structure is located, and the nonconforming use may not thereafter be resumed.

(Ord. 2500 §31, 2016; Ord. 1819 §1 (part), 1997)

18.70.050 Nonconforming Structures

Where a lawful structure exists at the effective date of adoption of this title that could not be built under the terms of this title by reason of restrictions on area, development area, height, yards or other characteristics of the structure, it may be continued so long as the structure remains otherwise lawful subject to the following provisions:

1. No such structure may be enlarged or altered in such a way that increases its degree of nonconformity. Ordinary maintenance of a nonconforming structure is permitted, pursuant to TMC Section 18.70.060, including but not limited to painting, roof repair and replacement, plumbing, wiring, mechanical equipment repair/replacement and weatherization. These and other alterations, additions or enlargements may be allowed as long as the work done does not extend further into any required yard or violate any other portion of this title. Complete plans shall be required of all work contemplated under this section.

2. Should such structure be destroyed by any means to an extent of more than 50% of its replacement cost at time of destruction, in the judgment of the City's Building Official, it shall not be reconstructed except in conformity with provisions of this title, except that in the LDR zone, structures that are nonconforming in regard to yard setbacks or sensitive area buffers, but were in conformance at the time of construction may be reconstructed to their original dimensions and location on the lot.

3. Should such structure be moved for any reason or any distance whatsoever, it shall thereafter conform to the regulations for the zone in which it is located after it is moved.

4. When a nonconforming structure, or structure and premises in combination, is vacated or abandoned for 24 consecutive months, the structure, or structure and premises in combination, shall thereafter be required to be in conformance with the regulations of the zone in which it is located. Upon request of the owner, the City Council may grant an extension of time beyond the 24 consecutive months.

5. Residential structures and uses located in any single-family or multiple-family residential zoning district and in existence at the time of adoption of this title shall not be deemed nonconforming in terms of bulk, use, or density provisions of this title. Such buildings may be rebuilt after a fire or other natural disaster to their original dimensions and bulk, but may not be changed except as provided in the non-conforming uses section of this chapter.

6. Single-family structures in single- or multiple-family residential zone districts that have legally nonconforming building setbacks, shall be allowed to expand the ground floor only along the existing building line(s), so long as the existing distance from the nearest point of the structure to the property line is not reduced, and the square footage of new intrusion into the setback does not exceed 50% of the square footage of the current intrusion.

7. In wetlands, watercourses and their buffers, existing structures that do not meet the requirements of the Sensitive Areas Overlay District chapter of this title may be remodeled, reconstructed or replaced, provided that:

a. The new construction does not further intrude into or adversely impact an undeveloped sensitive area or the required buffer;

b. The new construction does not threaten the public health, safety or welfare; and

c. The structure otherwise meets the requirements of this chapter.

8. In areas of potential geologic instability, coal mine hazard areas, and buffers, as defined in the Sensitive Areas Overlay District chapter of this title, existing structures may be remodeled, reconstructed or replaced, provided that:

a. The new construction is subject to the geotechnical report requirements and standards of TMC Sections 18.45.120B and 18.45.120C;

b. The new construction does not threaten the public health, safety or welfare;

c. The new construction does not increase the potential for soil erosion or result in unacceptable risk or damage to existing or potential development or to neighboring properties; and

d. The structure otherwise meets the requirements of this chapter.

9. A nonconforming use, within a nonconforming structure, shall not be allowed to expand into any other portion of the nonconforming structure.

(Ord. 2518 §15, 2016; Ord. 2175 §1, 2007; Ord. 2077 §1, 2004; Ord. 1819 §1 (part), 1997)

18.70.060 Repairs and Maintenance

If any building is devoted in whole or in part to any nonconforming use, work may be done in any period of twelve consecutive months on ordinary repairs, or on repair or replacement of nonbearing walls, fixtures, wiring or plumbing to an extent not exceeding 25% of the current replacement value of the building.

(Ord. 1819 §1 (part), 1997)

18.70.070 Building Safety

A. Nothing in this title shall be deemed to prevent the strengthening or restoring to a safe condition of any nonconforming building or part thereof declared to be unsafe by order of any City official charged with protecting the public safety.

B. Alterations or expansion of a nonconforming use which are required by law or a public agency in order to comply with public health or safety regulations are the only alterations or expansions allowed.

(Ord. 1819 §1 (part), 1997)

18.70.080 Nonconforming Parking Lots

A. Nothing contained in the Off-street Parking and Loading Regulations chapter of this title shall be construed to require a change in any aspect of a structure or facility covered thereunder including, without limitation, parking lot layout, loading space

Non-conforming regulations for critical areas					
Alterations allowed according to code:	Lateral expansion	Vertical expansion	Repairs/Maintenence	Reconstruction	Incentives.
Redmond	May be enlarged or expanded if the level of conformity isn't increased, and the impact to the critical area isn't increased.	Nothing mentioned	Allowed if conformity and proximity to critical area isn't altered.	Allowed if 50% or more of its value has been destroyed. Can't increase footprint or harm critical area further.	Groundwater protection incentive program: level of nonconformity may be increased if this mitigates the potential stormwater impacts to groundwater.
Bellevue	Prohibited if it further encroaches on the critical area	Nothing mentioned	Minor, nonstructural, and repairs of mechanical systems within or supporting the accessory structure allowed	If destroyed by an unforseen circumstance, the structure can be rebuilt in the same footprint, if commenced within one year of destruction. Temporary distrubance of surrounding areas from this construction will be restored afterwards.	Nothing mentioned
Issaquah	Building expansion over existing impervious surface area within the buffer is allowed provided the building expansion does not encroach closer toward a wetland or stream.	Existing buildings may expand vertically to add upper stories.	Nothing mentioned	If destroyed by an unforseen circumstance, the structure can be rebuilt in the same footprint.	Nothing mentioned
SEATAC	Nothing mentioned	Nothing mentioned	Repair and maintenance of non-conforming uses or structures is permitted provided they do not increase the degree of nonconformity	Nothing mentioned	
Kent	Reconstruction or additions to existing structures that intrude into critical areas or their buffers shall not increase the amount of such intrusion				Nothing mentioned
Des Moines	Where a legally established, nonconforming use of the buffer exists (e.g., a road or structure that lies within the width of buffer recommended for that wetland), proposed actions in the buffer may be permitted as long as they do not increase the degree of nonconformity, or if no reasonable alternative exists. This means no increase in the impacts to the wetland from activities in the buffer.				Nothing mentioned
Tukwila	Nothing mentioned	Nothing mentioned	Allowed if it doesn't affect the critical area or buffer	Allowed if the reconstruction doesn't intrude further into or impact the sensitive area or buffer	
Renton	Only permitted if it doesn't infringe further into the critical area or increases the level of nonconformity		Nothing mentioned	Can only be reconstructed if the new structure or use is in conformity with the code, except for ongoing a¯gricultural use.	Nothing mentioned
Kirkland	If it doesn't increase the level of nonconformity, expansion is allowed if it doesn't encroach further into the critical area or buffer. If it does increase the level of nonconformity, very specific guidelines must be followed (see code).	Upper floor additions are allowed above the ground floor of an existing nonconforming building if they do not encroach closer to the critical area buffer or structure setback from the buffer beyond the existing exterior walls	Allowed provided that the work does not increase the previously approved structure footprint or impervious area.	Can be reconstructed if the new construction doesn't increase the footprint. Existing buffer fencing, native buffer vegetation and dedication of the critical area must be retained.	Nothing explicitly mentioned

Kirkland Zoning Code:

90.185 Nonconformances in Critical Areas

6. Expansion of Nonconforming Building that Increases the Nonconformance – An existing, legally established nonconforming building may be expanded into a critical area buffer or the building setback under the following standards and limitations:

a. General Standards for Any Expansion

1) Expansion is only permitted for those buildings that have not received City approval for a critical area or buffer modification allowed under this or a previous code or not received approval for a reasonable use exception pursuant to KZC 90.180;

2) A one (1) time expansion of each option found in subsections (6)(b) through (e) of this section is permitted on a subject property. No more than one expansion is permitted for each option. See vegetative buffer standards in KZC 90.130;

3) No expansion is permitted in a critical area buffer that is a fish and wildlife conservation area without an approved management plan pursuant to KZC 90.95;

4) The following nonconforming improvements are allowed without going through review under subsections (6)(b) through (e) of this section if a new or replacement foundation is not required:

a) Upper floor additions are allowed above the ground floor of an existing nonconforming building if they do not encroach closer to the critical area buffer or structure setback from the buffer beyond the existing exterior walls;

b) Existing carports and decks with roofs may be enclosed if the new exterior walls do not extend beyond the existing foundation or corner supports of the structure; and

c) An interior open courtyard of an existing building may be enclosed if the courtyard is covered entirely with impervious material. See subsection (6)(d) of this section if the material is not entirely impervious;

5) Covering an existing deck with a roof or an existing pathway with a breezeway or similar improvements may be proposed using subsections (6)(b) through (e) of this section;

6) Any commercial parking required for additions shall not be located in the critical area buffer;

7) A critical area determination, report and a survey pursuant to KZC 90.105 and 90.110 are required if the wetland has not been rated and delineated pursuant to KZC 90.55 within the past five (5) years or the stream has not been classified or delineated pursuant to KZC 90.65;

8) Compensatory mitigation through buffer restoration shall be provided as follows:

a) A native vegetative buffer at a minimum ratio of 1:1 (new footprint area is equal to or less than vegetative buffer area) shall be provided;

b) If the new or expanded building footprint results in removal of a significant tree in a buffer, the tree shall be replaced with two (2) native trees in the buffer. The replacement tree shall be six (6) feet tall for a conifer and 2-inch caliper for deciduous or broadleaf. For a removed significant tree in a buffer that is 24 inches in diameter, the tree shall be replaced with three (3) native trees;

c) The vegetative buffer shall be located along the edge of the critical area or as close to the critical area as possible if the critical area is located off-site;

d) The vegetative buffer shall be 10 feet in depth and located across from the building expansion area;

e) The buffer vegetative standards pursuant to KZC 90.130 shall be used as a guideline for the mitigation area; and

f) The mitigation is in addition to revegetation of any disturbed area;

9) A mitigation planting plan, prepared by a qualified critical area professional approved by the City, shall be submitted for approval as part of the building permit. Prior to final inspection, replanting of any disturbed area and the mitigation planting shall be installed by the applicant and inspected by the City;

10) A performance and three-year maintenance and monitoring security shall be submitted with the building permit pursuant to KZC 90.165 for the mitigation plan;

11) Permanent critical area fencing and signage is required. Prior to issuance of a building permit, the Planning Official shall determine the location of the required critical area fencing and signage to be installed pursuant to KZC 90.190.

a) The fencing shall be located at the edge of the buffer. However, if all or portions of the buffer is covered by legally established lawn, nonnative vegetation and/or improvements, then the fencing shall be located at the boundary of that maintained area;

b) If the critical area is off site and that maintained area extends to the property line, then the fencing shall be located at the property line; and

c) Existing buffer fencing may need to be relocated to meet this provision;

12) A critical area covenant on a form approved by the City shall be recorded along with an as-built site plan showing the location of the approved expansion and mitigation vegetation in the buffer to protect the vegetated portion of the buffer in perpetuity. A critical area dedication pursuant to KZC 90.210 is not required for the vegetated portion of the buffer.

b. Expansion into Critical Area Buffer on Side of the Building Opposite of Critical Area

1) The footprint of an existing building may be expanded into the critical area buffer on the side of the building opposite of the critical area buffer up to a maximum of 1,000 square feet. The existing building must be between the addition and the critical area (see Chapter 180 KZC, Plate 26);

2) Only a one (1) time expansion of this option is permitted for the subject property. See subsection (6)(a)(2) of this section; and

3) See general standards in subsection (6)(a) of this section for an expansion.

c. Expansion into Structure Setback from the Buffer

1) The footprint of an existing building may be expanded into the structure setback up to a maximum of 500 square feet;

2) If an addition is located at the edge of the buffer, the portion of the buffer next to the side of the addition abutting the buffer is considered a structure setback from the buffer. Only necessary maintenance and repair of the addition are permitted in this portion of the structure setback. No improvements pursuant to KZC 90.140 are permitted in this portion of the structure setback;

3) Only a one (1) time expansion of this option is permitted for the subject property. See subsections (6)(a)(2) of this section; and

4) See general standards in subsection (6)(a) of this section for a building expansion.

d. Expansion into Critical Area Buffer but No Closer than the Existing Building

1) The footprint of an existing building may be expanded into the critical area buffer, but no closer than the edge of the existing building nearest to the critical area, up to a maximum of 500 square feet (see Chapter 180 KZC, Plate 26);

2) An interior open courtyard of an existing building may be enclosed up to 500 square feet if the courtyard is covered partially or entirely with pervious material. This improvement can be done in conjunction with subsection (6)(d)(1) of this section if the total new impervious area of the expanded building does not exceed 500 square feet;

3) The minimum buffer width for the addition shall be 60 percent of the required buffer width standard pursuant to KZC 90.55 for wetlands and KZC 90.65 for streams;

4) Only a one (1) time expansion of this option is permitted for the subject property. See subsections (6)(a)(2) of this section; and

5) See general standards in subsection (6)(a) of this section for a building expansion.

e. Expansion into Critical Area Buffer between the Building and the Critical Area

1) The footprint of a building may be expanded into the critical area buffer between the building and the critical area up to a maximum of 250 square feet (see Chapter 180 KZC, Plate 26);

2) The new footprint must be attached to the original building and not to any subsequent footprint addition under subsection (6) of this section;

3) The minimum buffer width for the addition shall be 60 percent of the required buffer width standard pursuant to KZC 90.55 for wetlands and KZC 90.65 for streams;

4) Only a one (1) time expansion of this option is permitted for the subject property. See subsection (6)(a)(2) of this section; and

5) See general standards in subsection (6)(a) of this section for a building expansion.