RESOLUTION NO. 5179-14

RESOLUTION APPROVING WITH CONDITIONS A PUBLIC UTILITIES APPLICATION FOR THE NYBERG RIVERS SHOPPING CENTER DEVELOPMENT LOCATED AT 7455-7925 SW NYBERG STREET (TAX MAP 2S1 24 A, TAX LOTS 1601, 1602, 1900, 2502, 2506, 2507, 2508, AND 2700; TAX MAP 2S1 24B, TAX LOTS 2000, 2001, AND 2100)

WHEREAS, Center Cal Properties LLC submitted a Public Utilities application for the Nyberg Rivers Shopping Center; and

WHEREAS, the City Engineer issued a Public Utilities decision on December 20, 2013; and

WHEREAS, a request for review of the City Engineer's Public Utilities decision was filed; and

WHEREAS, a public hearing was held before the City Council of the City of Tualatin on January 27, 2014, to consider the request for review; and

WHEREAS, notice of public hearing was given as required by Tualatin Development Code 1.031; and

WHEREAS, the City Council heard and considered the testimony and information presented by City staff, the applicant, the appellant, and those appearing at the public hearing; and

WHEREAS, after conclusion of the public hearing, the Council voted unanimously to approve the application with conditions.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUALATIN, OREGON, that:

Section 1. The application for Public Utilities for the Nyberg Rivers Shopping Center, which is attached as "Exhibit 1" and incorporated by reference, is approved with the following conditions:

PRIOR TO ISSUANCE OF A WATER QUALITY PERMIT:

PFR-1 The applicant shall grant a public stormwater facility easement for the public stormwater facility.

PFR-2 The applicant shall submit revised plans that show all private stormwater treatment facilities and lines; including the filter vault at the intersection of the private access easement acting as the Loop Road is shown within SW Nyberg Street to be located on private property, for review and approval.

PFR-3 The applicant shall submit final plans that show three LIDA planters within parking landscaping south of building 1030 and east of building 1040, for review and approval.

PFR-4 The applicant shall submit revised plans that do not show the LIDA rain garden over public easements, for review and approval.

PFR-5 The applicant shall submit revised plans that show access easements to the public stormwater facility and manholes, for review and approval.

PFR-6 The applicant shall grant a public access easement to the public stormwater facility and manholes.

PFR-7 The applicant shall submit revised plans that include a complete and connected stormwater treatment and conveyance system for the parking lot north of the City offices, for review and approval.

PFR-8 The applicant shall submit final plans that show mechanical filters treating the public Street "A" and future SW Seneca Street, for review and approval.

PFR-9 The applicant shall submit final plans that comply with the Service Provider Letter conditions and Clean Water Services Memorandum comments, for review and approval.

PFR-10 The applicant shall obtain a Stormwater Connection Permit.

PRIOR TO ISSUANCE OF A PUBLIC WORKS PERMIT:

PFR-11 The applicant shall submit revised plans that show the existing public fire hydrant at the northwest corner of building D-130 labeled as public.

PFR-12 The applicant shall submit revised plans of SW Boones Ferry Road that include a median on the north side of the eastbound travel lane in order to restrict Street "A" to right-in/right-out movement, for review and approval.

PFR-13 The applicant shall submit revised plans that show a crosswalk at the intersection of SW Boones Ferry Road and Street "A" that includes material that is visually different and possibly raised, for review and approval.

PFR-14 The applicant shall submit revised plans that show SW Seneca Street from SW Martinazzi Avenue connecting to the Nyberg Rivers site for construction up to the requirements stated in Resolution 5163-13, without on-street parking, with signalization at SW Seneca Street & SW Martinazzi Avenue, for review and approval.

PFR-15 The applicant shall submit a copy of the ODOT Permit and Washington County Facility Permit for construction of SW Nyberg Street from I-5 to SW Tualatin Sherwood Road to add a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip and a retaining wall with a hand rail on top and close SW 75th Avenue's access.

PFR-16 The applicant shall submit final plans for SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road that include two 11-foot westbound travel lanes, a 6-foot bike lane, a varied width 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with Resolution 5163-13, for review and approval.

PFR-17 The applicant shall grant a public sidewalk easement from right-of-way to back of sidewalk adjacent to SW Nyberg Street.

PFR-18 The applicant shall submit revised plans for the Loop Road from the SW Nyberg Street main intersection north to the south side of building 1010 that includes the City's standard 5'x5' tree wells within the 14-foot wide shared path, for review and approval.

PFR-19 The applicant shall submit final plans from the south side of building 1010 west to the south side of building D-120 that include two 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side, for review and approval.

PFR-20 The applicant shall submit final plans that show along the west side of buildings D-120, D-125, and D-130 two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side, trees planted in the parking buffers, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side, for review and approval.

PFR-21 The applicant shall submit final plans that show two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road that will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side.

PFR-22 The applicant shall submit revised plans that show a raised crosswalk at the intersection of the greenway trail and Street "A", for review and approval.

PFR-23 The applicant shall grant a maintenance agreement to City standards for all cross-sections of the Loop Road.

PFR-24 The applicant shall grant a public access easement over all cross-sections of the Loop Road.

PFR-25 The applicant shall submit revised plans that show an approved street name in place of Street "A", for review and approval.

PFR-26 The applicant shall submit revised plans that show a 32-foot wide access to the City's back parking lot approximately 140 feet south of SW Boones Ferry Road without requiring relocation of existing structures, for review and approval.

PFR-27 The applicant shall submit revised plans that show the Heron's Landing Apartments driveway cut to be a minimum of 32-feet wide with associated 40-foot private access easement and located opposite the City parking lot access approximately 140 feet south of SW Boones Ferry Road, for review and approval.

PFR-28 The applicant shall submit a copy of the private access easement allowing Heron's Landing Apartments access to Street "A", for review and approval.

PFR-29 The applicant shall submit revised plans that show private access easements for the lots with buildings E-100, F-100, G-100, and H-100 to allow circulation from the intersection of the public access easement acting as the Loop Road from SW Nyberg Street through the east parking area to south of building 1010, for review and approval.

PFR-30 The applicant shall submit copies of the recorded documents that show private access easements for the lots with buildings E-100, F-100, G-100, and H-100 to allow circulation from the intersection of the public access easement acting as the Loop Road from SW Nyberg Street through the east parking area to south of building 1010, for review and approval.

PFR-31 The applicant shall submit a copy of the private access easement from TLID 2S124B002000 through TLID 2S124B001602 to a public right-of-way, for review and approval.

PFR-32 The applicant shall submit final water system plans, for review and approval.

PFR-33 The applicant shall grant a 15-foot wide public water line easement over proposed public water lines.

PFR-34 The applicant shall submit revised plans that show access easements to public water lines, for review and approval.

PFR-35 The applicant shall grant an access easement to public water lines.

PFR-36 The applicant shall submit copies of private water line easements.

PFR-37 The applicant shall submit revised plans that minimize private water lines crossing public utility easements and only cross perpendicular to the public lines, for review and approval.

PFR-38 The applicant shall submit revised plans that show trees located outside public water line easements, for review and approval.

PFR-39 The applicant shall submit revised plans that show the public water line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

PFR-40 The applicant shall construct a public irrigation line to the irrigation system serving the City maintained plantings along I-5 and in the median of SW Tualatin-Sherwood with associated water meter and backflow prevention.

PFR-41 The applicant shall submit sanitary sewer system plans, for review and approval.

PFR-42 The applicant shall grant a 15-foot wide public sanitary sewer line easement over proposed public water lines.

PFR-43 The applicant shall submit revised plans that show access easements to public sanitary sewer manholes, for review and approval.

PFR-44 The applicant shall grant an access easement to public sanitary sewer manholes.

PFR-45 The applicant shall submit revised plans that minimize private sanitary sewer lines crossing public utility easements and only cross perpendicular to the public lines, for review and approval.

PFR-46 The applicant shall submit revised plans that show trees located outside public sanitary sewer line easements, for review and approval.

PFR-47 The applicant shall submit revised plans that show the public sanitary sewer line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

PFR-48 The applicant shall submit revised stormwater system plans that include the public stormwater treatment facility within a public stormwater easement outside of the public water line easement, for review and approval.

PFR-49 The applicant shall submit revised plans that minimize private stormwater lines crossing public utility easements and only cross perpendicular to the public lines and private facilities and structures located outside of public easements, for review and approval.

PFR-50 The applicant shall submit revised plans that show trees located outside public stormwater line easements, for review and approval.

PFR-51 The applicant shall submit revised plans that show access easements to public stormwater manholes, for review and approval.

PFR-52 The applicant shall grant an access easement to public stormwater manholes.

PFR-53 The applicant shall submit revised plans that show the public stormwater line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

PRIOR TO ISSUANCE OF A BUILDING PERMIT:

PFR-54 The applicant shall submit plans that comply with fire protection requirements as determined through the Building Division and Tualatin Valley Fire & Rescue (TVF&R).

PFR-55 The applicant shall obtain all Public Works and Water Quality Permits needed for this development.

PFR-56 The applicant shall obtain a Public Works Permit for all cross-sections of the Loop Road.

PFR-57 The applicant shall obtain a City of Tualatin erosion control permit that includes the entire site area to be disturbed.

PFR-58 The applicant shall submit an amended 1200-C for the remainder of the site, for review and approval.

PFR-59 The applicant shall submit a completed FHADP application with a plan showing the balanced cut and fill and a 1st survey.

PFR-60 The applicant shall submit revised plans that show a trail connection from the development north of building 1040 that includes a 16-foot wide greenway trail easement that that allow for future construction of a cross section of a 12-foot wide path with additional 2-feet on either side for LIDA water quality treatment, for review and approval.

PFR-61 The applicant shall submit revised plans that show the greenway trail connection to the west along the Tualatin River within 40-feet of the top of bank, for review and approval.

PFR-62 The applicant shall submit revised plans that show a greenway trail connection on the west side of I-5 at the Tualatin River to access future north (south of shared pathway at locations shown on Exhibit M (Transportation Plant) in the Master Plan set, for review and approval.

PFR-63 The applicant shall submit revised plans that show a greenway trail easement over the three future viewing areas north of building 1040 and N-100, for review and approval.

PFR-64 The applicant shall grant an easement to allow for the trail to be located either within the area south of Heron's Landing Apartments and the Tualatin River and north of the development or for a specific approved location as shown with an associated Clean Water Services Service Provider Letter.

PFR-65 The applicant shall submit final plans that show a 14-foot public shared pathway from the greenway trail between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road, for review and approval.

PFR-66 The applicant shall grant a 14-foot easement for a public shared pathway from the greenway trail between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road.

PRIOR TO A FRAMING INSPECTION:

PFR-67 The applicant shall submit a 2nd survey for the Flood Hazard Area Development Permit.

PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY:

PFR-68 The applicant shall construct SW Boones Ferry Road that include a median on the north side of the eastbound travel lane in order to restrict Street "A" to right-in/right-out movement as part of the Public Works Permit.

PFR-69 The applicant shall construct a crosswalk at the intersection of SW Boones Ferry Road and Street "A" that includes material that is visually different and possibly raised.

PFR-70 If the applicant obtains the right-of-way for the Seneca Street extension and traffic signal by April 1, 2014, the applicant will design and construct the Seneca Street extension along with a new signal at the SW Martinazzi Avenue/SW Seneca Street intersection per the Public Works Construction Code under a public works permit or if the applicant is unable to obtain the right-of-way by April 1, 2014, the applicant will provide a fee in lieu of the Seneca Street construction to the City in the amount of $360,000, which accounts for the applicant's share of the improvements.

PFR-71 If the east extension of SW Seneca Street is constructed, the applicant will need to extinguish and close the private access easement, Washington County recorded document 8295, Book 773, Page 873, exists over City owned TLID 2S124B001900.

PFR-72 The applicant shall construct SW Nyberg Street from I-5 to SW Tualatin Sherwood Road to add a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip prior to a hand rail on top of a retaining wall and close SW 75th Avenue's access.

PFR-73 The applicant shall construct SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road that include two 11-foot westbound travel lanes, a 6-foot bike lane, a varied width 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with Resolution 5163-13.

PFR-74 The applicant shall construct Loop Road from the SW Nyberg Street main intersection north to the south side of building 1010 that includes the City's standard 5'x5' tree wells within the 14-foot wide shared path.

PFR-75 The applicant shall construct a cross-section from the south side of building 1010 west to the south side of building D-120 that include two 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side.

PFR-76 The applicant shall construct along the west side of buildings D-120, D-125, and D-130 two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side, trees planted in the parking buffers, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side.

PFR-77 The applicant shall construct two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side.

PFR-78 The applicant shall construct a raised crosswalk at the intersection of the greenway trail and Street "A.

PFR-79 The applicant shall complete all the public improvements and private water quality facilities and have them accepted by the City.

PFR-80 The applicant shall construct the public water system.

PFR-81 The applicant shall construct a public irrigation line to the irrigation system serving the City maintained plantings along I-5 and in the median of SW Tualatin-Sherwood with associated water meter and backflow prevention.

PFR-82 The applicant shall complete all the public water improvements and have them accepted by the City.

PFR-83 The applicant shall construct the public sanitary sewer system.

PFR-84 The applicant shall complete all the public sanitary sewer improvements and have them accepted by the City.

PFR-85 The applicant shall construct the public stormwater system.

PFR-86 The applicant shall complete all the public stormwater improvements and have them accepted by the City.

PFR-87 The applicant shall submit a 3rd survey for the Flood Hazard Area Development Permit.

Section 2. The City Council adopts as its Findings and Analysis the findings set forth in "Exhibit 2," which is attached and incorporated by reference.

Section 3. This Resolution is effective upon adoption.

Adopted by the City Council this 10 Day of February, 2014.

CITY OF TUALATIN, OREGON

BY ________________________
Mayor

APPROVED AS TO FORM

BY ________________________
City Attorney

ATTEST:

BY ________________________
City Recorder

Exhibits to Resolution No. 5179-14 are available upon request in the Administration Department.

18861 SW Martinazzi Ave, Suite 200

Tualatin, OR 97062

503.691.3011

MEMORANDUM

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www.cardno.com

To: Clare Fuchs, AICP

From: Michael Cerbone, AICP
Project Manager

Date: October 23, 2013

Project: Nyberg Rivers
Cardno#: 21198310
Re: Completeness Responses for Case File AR-13-07 Nyberg Rivers ARB

This memo will serve as a response to the Notice of Incomplete Application issued by the City of Tualatin on October 16, 2013. The project team has reviewed the incompleteness and preliminary review items and drafted responses and plan updates to reflect changes as requested by the City. The following items and responses are provided to address specific elements of both the plan set, the project narrative and the *Exhibit A—Report on Compliance with Master Plan Conditions of Approval*. Please find included within this submittal a revised plan set, an updated Compliance Report as well as excerpts from the narrative that were revised per the comments received. Please do not hesitate to contact me if there are any questions, comments or concerns.

ITEMS IDENTIFIED AS "INCOMPLETE"

1. *Civil Sheets—from Engineering*
   a. *Consistently show all public lines and easements on all plan sheets. Staff is unable to determine all concerns because public lines and easements are not shown on all sheets (PWCC 202.2.00). (All sheets)*

Response: All Civil and Landscaping Sheets have been updated to show all public lines and easements through the site. A full-size plan set has been submitted with this memo with those updates.

   b. *Utilities, trash enclosure, and buildings on adjacent City-owned property are missing on the plans. Staff needs these items shown to determine the feasibility with the proposal. Please show adjacent properties. Please identify slope easements and construction needed to support the Street A construction (PWCC 203.2.02). (ex: C1.1)*

Response: The plans have been updated to show utilities, trash enclosures and buildings on adjacent City-owned property. Also, slope easements and construction needed to support the Street "A" construction is shown on sheet C1.1.

   c. *Show abutting properties to determine how trail connections and future auto connections at Heron's Landing will work with the proposal. (PWCC 203 and TDC 75.120(8)(b)). (ex: C1.1)*

Exhibit 1
Attachment A-1

Response: Abutting properties to the north and west are shown on the plans. Trail and future auto connections are shown on the plans, with particular focus on the Heron's Landing residential complex.

d. *Show how all parking areas will be drained. (ex: C4.0)*

Response: Drainage through all parking areas is reflected in the Grading and Utility Plans included with this updated submittal. Specifically, the storm drainage basins and lines show how the parking areas will be drained.

2. *Civil Sheets—from Planning*
   a. *The greenway does not connect in three places to the Heron's Landing Apartments as conditioned in Resolution 5163-13. The connection points will need to be provided as public access easements (ex: sheet C1.0)*

Response: The Civil and Landscape Plan Sheets have been updated to reflect greenway connections in three places to the Heron's Landing Apartments. These connection points will be provided as public access easements.

3. *Architectural Sheets—from Planning*
   a. *The loading dock doors are difficult to decipher, especially for New Seasons and the Home Goods stores. Staff was unable to count and measure them to see if they meet TDC. (sheets A2.10 #3, A2.11 #3, and A2.12 #2).*

Response: Additional elevations have been provided to detail the loading areas for Home Goods and New Seasons.

b. *On elevation #4, staff was unable to determine what the 10-foot high structure is on the left side of the elevation. Please identify. It appears to be a trash compactor. If so, it needs to be screened (sheet A2.10)*

Response: Additional elevations have been provided which show screening for this area.

c. *Staff is unsure what the three roof top shapes are. Please identify either what architectural features these are or what roof equipment is being proposed. All roof top equipment must be screened from view (TDC 73.150(18)). (sheet A2.13 #2)*

Response: Elevation #4 has been detailed and labeled to provide information about the rooftop equipment and screen.

d. *The architectural features proposed at the July 23, 2013 City Council Hearing are missing. (sheet A2.11, A2.12, A2.13, A3.10)*

Response: The applicant has reviewed the elevations with City staff and has provided updated elevations that provide green screens flanking the Home Goods

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store. The Master Plan depicted an element above the existing Barbara Johnson store. The Barbara Johnson store will remain until their lease expires, at which time the elevation and interior space will be revised consistent with the Master Plan. The applicant has included a perspective with enhanced landscaping that shows the corner. The proposed improvements along with the building articulation provide for visual interest at the corner that is distinct.

e. *The applicant has separately proposed a parapet to screen the roof top equipment during this architectural review. Please show proposed roof top equipment on these elevations along with proposed screening. (sheet A3.10)*

Response: The applicant has revised the elevations to depict rooftop equipment.

f. *The plans are not to scale. Consequently, staff cannot determine if the elevations meet code or conditions of approval without a scale. Please include a scale on sheets A3.10, A4.10, A5.10, and A6.10.*

Response: The applicant has provided scales on the elevations.

g. *The plans show 147 overall bike parking spaces and 74 covered spaces. Please show your bike parking calculation on the plans or in the narrative. In staff's initial calculation 255 overall bike parking spaces and 139 covered bike parking spaces are required (TDC 73.360(2)(a)). (sheet A7.10)*

Response: The applicant has addressed this comment below under 5a.

h. *Add the architectural items in Condition L of Resolution 5163-13. (all A sheets)*

Response: The applicant has provided elevations within the submittal. The applicant understands the Architectural Review process may result in additional conditions being placed on the development.

NARRATIVE PACKAGE and EXHIBITS

4. Narrative—from Engineering

a. The top of page 14 indicates proposed connections from the shared pathway easement to Heron's Landing Apartments. These are not indicated clearly on the plans. Please revise the plan accordingly and show access as a public access easement (ex: p. 14)

Response: The Civil Sheets have been updated to reflect greenway connections in three places to the Heron's Landing Apartments. These connection points will be provided as public access easements. Page 14 within the project narrative has been updated to reflect the addition of the greenway connections.

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b. **State the three southbound lanes are either 11 or 12-feet. Plan sheet C1.1 indicates 12-foot wide lanes which matches requirements, but conflicts with this statement (Resolution 5163-13). (p. 20, #7)**

Response: Page 20, #7 within the project narrative has been updated to state that all three southbound lanes are each 12-feet wide.

5. **Narrative and Exhibit A—from Planning**

   a. **Please show bike parking compliance calculation. Staff calculates a significantly higher required covered and overall bike parking than shown. Please refer to Incomplete Item #1g. (p. 51 and Exhibit A)**

Response: Please find City calculations as well as the applicant's calculations below. The applicant is proposing to use the "shopping center" requirement. This is appropriate as the site is being developed as a shopping center and patrons are expected to visit one or more businesses when they visit the site.

BUILDING	SF	USE	BICYCLE PARKING RATIO	MINIMUM BICYCYLE PARKING	COVERED BIKE PARKING
1005	33,562	Retail Shop	0.5/1,000 SF	17	8.39
1010	21,750	Retail Shop	0.5/1,000 SF	11	5.44
1030	2,900	Restaurant	2/1,000 SF	6	1.45
1040	110,093	Shopping Center	0.5/1,000 SF Gross Floor Area	55	27.52
A	12,500	Retail Shop	0.5/1,000 SF	6	3.13
B	5,850	Retail Shop	0.5/1,000 SF	3	1.46
C	3,950	Bank	2 or 0.33/1,000 SF Whichever is greater	2	0.20
D	32,459	Retail Shop	0.5/1,000 SF	16	8.11
E	3,172	Bank	2 or 0.33/1,000 SF Whichever is greater	2	0.20
F	5,500	Drive Up Restaurant	2/1,000 SF	11	2.75
G-100	6,500	Restaurant	2/1,000 SF	13	3.25
H-100	4,526	Drive Up Restaurant	2/1,000 SF	9	2.26
J-100	5,797	Restaurant	2/1,000 SF	12	2.90
N-100	45,000	Health Club	2/1,000 SF Exercise Area	90	45.00
	293,559			**253**	**112**

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Total Area	293,559	Shopping Center	.5/1,000 SF	**147**	**74**

b. Narrative and plans do not discuss the conditions to be added to Street A as stated they were discussed in the Compliance Report. (p. 92 and Exhibit A)

Response: The applicant has revised page 21 to provide additional detail concerning Street A. The applicant has also revised the attached plan set to include a cross section for Street A as well as a slope easement.

6. **Exhibit A and Conditions of Approval Compliance Report—from Planning**
   a. **Conditions M and O relating to Cabela's architectural features and oversize vehicle parking are missing from the Compliance Report responses.**

Response: The applicant understands the conditions and has provided elevations for the proposed Cabela's within the attached plan set. The applicant is not proposing to construct oversized vehicle parking.

7. **Exhibit A – Bicycle and Pedestrian Plan—from Engineering**
   a. **Pedestrian and Bicycle Plan shows shared pathway easement connection to Heron's Landing on the east side, unlike the plans (C1.0). Plans do not show crosswalk at Boones Ferry Road crossing Street A.**

Response: Sheet C1.0 and the rest of the attached plan set have been revised to show the pedestrian and bicycle connections referenced above.

8. **Exhibit A – Cross-Section A-A—from Engineering**
   a. **The tree well width shown on the shared path is 2-feet wide, not the City standard 5' x 5' (Resolution 5163-13 and PWCC Drawing #514). Please revise.**

Response: The applicant is proposing an alternative standard which is detailed within the attached landscape plans. The 2' x 2' grate is provided and there is a 5' x 5' planting area provided.

9. **Exhibit A – Cross-Section C-C—from Engineering**
   a. **Show tree wells on the east side of the public-like street, but the plans (L1.2) do not.**

Response: Cross Section C-C has been revised to accurately reflect the landscape plan. Please see the revised cross section attached.

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10. Exhibit A – Bicycle and Pedestrian Plan—from Engineering

a. Pedestrian and Bicycle Plan shows shared pathway easement connection to Heron's Landing on the east side, unlike the plans (C1.0). Plans do not show crosswalk at Boones Ferry Road crossing Street A.

Response: The easements to Heron's Landing on have been provided within the revised plan set.

Nyberg Rivers

Tualatin, Oregon

An Application For:
Architectural Review Board

September 13, 2013
Completeness Responses October 23~~18~~, 2013

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Applicant:
Centercal Properties, LLC
7455 SW Bridgeport Road, Suite 205
Tigard, OR 97224
Phone: (503) 968-8940
Contact: Michael Kirk

Prepared by:
Cardno
5415 SW Westgate Drive, Suite 100
Portland, Oregon 97221
Phone: 503-419-2500
Fax: 503-419-2600

21198310

Exhibit 1
Attachment A-2

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TABLE OF CONTENTS

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Exhibit 1
Attachment A-2

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Exhibit 1
Attachment A-2

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Exhibit 1
Attachment A-2

EXHIBITS

Exhibit A	Master Plan and Conditional Use Findings
	Master Plan Cross-Sections
Exhibit B	ARB Application
Exhibit C	Affidavit of Posting
Exhibit D	Natural Resource Assessment
Exhibit E	CWS Service Provider Letter
Exhibit F	Neighborhood Developer Meeting Materials
Exhibit G	Legal Description of the Property
Exhibit H	Vicinity Map
Exhibit I	Mixed Solid Waste Plan
Exhibit J	Washington County Assessor's Maps
Exhibit K	Mailing Labels
Exhibit L	Traffic Impact Analysis
Exhibit M	Arborist Report
Exhibit N	Stormwater Report
Exhibit O	Plan Set
	Existing Conditions Plan
	Site Plan
	Grading Plan
	Tree Preservation Plan
	Public Facilities Plan
	Photometric Plan
	Landscape Plan
	Building Elevations
	Bicycle Parking & Trash Enclosures

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Exhibit 1
Attachment A-2

I. INTRODUCTION

GENERAL INFORMATION

Applicant:	Centercal Properties, LLC 7455 SW Bridgeport Road, Suite 205 Tigard, Oregon 97224 Phone: (503) 968-8940 Contact: Michael Kirk mkirk@centercal.com	
Applicant's Representative	Cardno 5415 SW Westgate Drive; Suite 100 Portland, Oregon 97221 (503) 419-2500 phone (503) 419-2600 fax Contact: Michael Cerbone, AICP michael.cerbone@cardno.com	
Tax Lot Information:	Map	Tax Lots
	2S124A & 2S124B	1601, 1602, 2000, 2001, 2100, 2502, 2506, 2507, 2508, 2700
	City of Tualatin, Oregon	
Location:	Generally bounded by SW Nyberg Rd to the south, Martinazzi Ave to the west, Interstate 5 to the east, and the Tualatin River to the north.	
Current Zoning Districts:	Office Commercial (CO) Central Commercial (CC) High Density Residential (RH)	
Project Site Area:	+/- 31.91 acres	

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SUMMARY OF PROPOSAL

The applicant is requesting Architectural Review approval for the all of the site improvements detailed within the plan set attached as Exhibit O. Existing buildings are proposed to be improved as detailed within the Architectural Elevations provided within Exhibit O. New buildings are proposed to be constructed consistent with the approved Nyberg Rivers Master Plan. Building pads G-100 and H-100 are proposed to be constructed as pads, with site improvements including landscaping and parking fields. The applicant understands that subsequent development of these pads (G-100 and H-100) will be subject to Architectural Review at a later date.

BACKGROUND

On August 26, 2013, the City Council voted unanimously to approve the Nyberg Rivers Master Plan and the associated Conditional Use Permit. The adopted findings for the unanimous master plan and conditional use approvals are attached as Exhibit A and incorporated herein by reference.

The Master Plan evaluated the proposed development under the Central Urban Renewal Plan Goals and Objectives including building location and size, transportation systems, pedestrian and bike networks, site plan improvements and the like. The Master Plan decision contains many conditions of approval, compliance with which is illustrated here in this ARB submittal. The Master Plan decision specifically notes those specific areas where the Master Plan did not provide a review or related conditions of approval. Those areas are found on page 3 of the Master Plan decision and are repeated here for ease of reference:

- Approve and permit retail uses within the Office Commercial (CO) designated portions of the property.
- Approve and permit outdoor sales within the Central Commercial designated portion of the property.
- Approve right-of-way vacation of the Oregon Department of Transportation property along Nyberg Road.
- Approval of any modification of land uses.
- Acceptance by the City of any easements or other land transactions for pedestrian or transportation facilities.
- A decision on whether to adopt a separate review procedure for the Master Plan
- Approve the Nyberg Rivers alternate sign program.

All of these elements were not approved by the Master Plan but were instead left for either the Conditional Use Permit or this ARB. The first two items have since been approved by the City Council in its final decision on the Conditional Use Permit attached as Exhibit A. The balance of these elements are addressed here in the ARB.

Because this site is located in an area of the City that requires Master Plan approval before ARB approval, many of the issues that would normally first arise in the ARB have already been addressed and decided by the City Council in the master plan proceeding. Thus, where these decisions have already been made and conditions of approval imposed, this application specifically lists those conditions and how the ARB proposal complies with those conditions.

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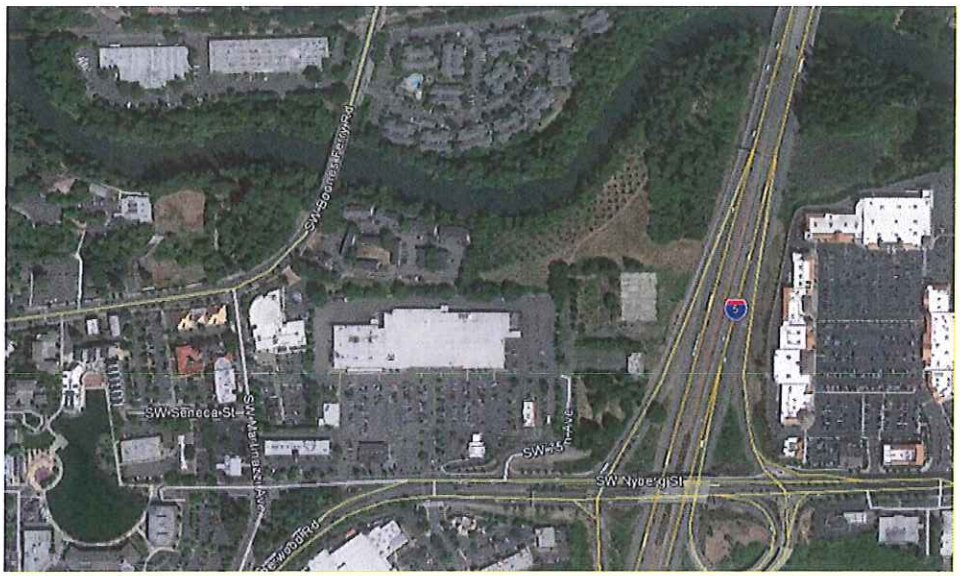
The approval criteria for this ARB are listed under TDC Chapter 73, Community Design Standards. This application addresses each of those applicable criteria, as well as the development standards in each base zone, and demonstrates that the proposal meets those criteria and complies with all of the conditions of approval imposed by the City in the final Master Plan and Conditional Use permit decisions.

Lastly, a Neighborhood Meeting was held August 8, 2013 at the Sylvan Learning Center located at 7809 SW Nyberg Street in Tualatin. Attendees were presented with general information about the redevelopment project including construction timelines and procedures. A copy of the noticing and meeting materials is included with this narrative under Exhibit F.



SURROUNDING USES

Table A: SURROUNDING LAND USE

Location	*Zoning Designation*	*Land Use*
North	High Density Residential (RH) General Commercial (CG)	Tualatin River & Heron's Landing Apartments
South	Central Commercial (CC)	SW Nyberg Street/ Fred Meyer
East	General Commercial (CG)	Interstate 5
West	General Commercial (CG)	SW Martinazzi Avenue/ Tualatin Central Downtown

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II. TUALATIN DEVELOPMENT CODE (TDC)

TDC 73.050 ARCHITECTURAL REVIEW

(1) In exercising or performing his or her powers, duties, or functions, the Community Development Director shall determine whether there is compliance with the following:

(a) The proposed site development, including the site plan, architecture, landscaping, parking and graphic design, is in conformance with the standards of this and other applicable City ordinances insofar as the location, height, and appearance of the proposed development are involved;

Response: The findings set forth below demonstrate that the proposal is in conformance with the approved Master Plan, as well as the standards of the TDC referenced above. The following sections demonstrate compliance with the Community Design Standards of this chapter, as well as the underlying standards of each of the applicable base zones.

(b) The proposed design of the development is compatible with the design of other developments in the general vicinity; and

Response: The approved Master Plan adopted the following findings regarding the proposed development, at page 4: "The site is located directly adjacent Interstate 5 to the east and just north of Nyberg Street, a regional roadway that provides a access to Tualatin as well as the City of Sherwood and the Highway 99w corridor. Nyberg Rivers is surrounded by a mix of compatible uses both to the west and south. To the south, the existing Fred Meyer's anchor and surrounding retail uses provide a variety of retail tenants to attract both local and regional shoppers, with more of a focus on vehicular access and vehicular trips. To the west, the Downtown Tualatin area is more focused on pedestrian scale commercial, office, and civic uses. Nyberg Rivers is situated as a regional shopping opportunity to promote both vehicle and pedestrian access into the site. The Nyberg Rivers center will serve to extend the existing downtown to the east through the network of pedestrian paths and landscape amenities that will tie into the surrounding urban fabric to create a complementary and compatible development. The vehicle access into the site will allow for safe and efficient circulation that is compatible with the Fred Meyer's development to the south.

"The Master Plan proposes to redevelop an underutilized shopping center with new construction and new tenants in an effort to enhance and reinvigorate this commercial area. The proposal features a strong commercial component including a new mix of upgraded tenants, a large retailer and an assortment of small and medium sized retail and restaurant uses. The now vacant K-Mart and the existing Jiggles restaurant are proposed to be demolished. In addition to the commercial aspect of the project, the Applicant is proposing an outdoor plaza space and amenities, pedestrian and bicycle paths, and new private roadway connections that resemble public streets with sidewalks or multiuse paths, planters and curbs. The demolition of the dated, empty buildings and

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construction of new, integrated buildings eliminates blight and prevents future blight. The construction of new buildings and the development of a new and revitalized shopping center will increase the overall property value of the site. The shopping center and outdoor areas, which are in close proximity to City offices and the Public Library, will encourage public and private land uses that are anticipated to result in activity throughout business hours and into the evening."

"The site serves as a gateway to the City and eastern extension of downtown. A redeveloped center will contribute to the social and economic development of central Tualatin by improving property values. By including a range of retail, restaurant, and other uses, the proposed Master Plan includes aspects that will encourage activity during business hours, evenings, nights and weekends. Plaza spaces and outdoor seating areas will encourage outdoor activity.

The proposed development within the Master Plan area presents an opportunity to redevelop the eastern extension of downtown in a way that meets the Plan goals. The City Council concluded that certain conditions of approval are required in order for the Master Plan to be consistent with the Plan Goals and Objectives. The City Council finds that the Master Plan proposal with the conditions imposed meets the Plan Goals and Objectives."

In adopting these findings the City Council concluded that the project would meet the primary goal of the Central Urban Renewal District Plan to "encourage and facilitate commercial development in the Urban Renewal Area with an emphasis on establishing a visible and viable central business district that encourages community and business activity on weekdays, evenings and weekends".

In this same manner, the development and its design is compatible with the surrounding development as further discussed below.

(c) The location, design, size, color and materials of the exterior of all structures are compatible with the proposed development and appropriate to the design character of other developments in the vicinity.

Response: The design elevations are included in Exhibit O. These elevations demonstrate that the designs of the structures within the development have been tastefully integrated with the new development in the same center as well as surrounding properties.

The property is bordered on the north and east with vegetated corridors either along I-5 or the Tualatin River. To the south is Nyberg Street and the Fred Meyer center and to the immediate west is City Hall and Martinazzi. The design environment for this proposal is largely created by the development itself. Because there are existing buildings to be retained on the site, the architecture of the new buildings is designed to create a coherent design environment. The palette of materials contain quality elements such as natural tone elements like a mohave blend (darker tan) brick veneer, an earth-finish stone veneer, and a Dakota Land (tan) plaster body finish. . The color palette is designed to soften

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and brighten the center against its natural backdrop and to work in tandem with the proposed mix of materials that includes wood, brick stone. Together with the trees to be preserved including the greenway corridor, the landscape plan brings the natural landscape through and around the site in a natural Oregon theme. The color palate and building materials are complemented by the proposed landscaping detailed within Exhibit O that includes a variety of Oregon native tree and shrub species. Trees species selected include Oregon White Oak, Douglas fir, Western Red Cedar, Vine Maple as well as Western Dogwood. Understory shrubs and ground cover include Oregon Grape, Nootka Rose, Snowberry, Bearberry, Mahonia and Juniper.

The master plan finding adopted by the City Council also found, as stated above and incorporated herein by reference, that the demolition of the dated, empty buildings and construction of new, integrated buildings eliminates blight and prevents future blight. "The construction of new buildings and the development of a new and revitalized shopping center will increase the overall property value of the site. The shopping center and outdoor areas, which are in close proximity to City offices and the Public Library, will encourage public and private land uses that are anticipated to result in activity throughout business hours and into the evening."

"The site serves as a gateway to the City and eastern extension of downtown. A redeveloped center will contribute to the social and economic development of central Tualatin by improving property values. By including a range of retail, restaurant, and other uses, the proposed Master Plan includes aspects that will encourage activity during business hours, evenings, nights and weekends. Plaza spaces and outdoor seating areas will encourage outdoor activity."

The design properly integrates the site with its surrounding uses through form and function in compliance with this criterion.

(2) In making his or her determination of compliance with the above requirements, the Community Development Director shall be guided by the objectives and standards set forth in this chapter. If the architectural review plan includes utility facilities or public utility facilities, then the City Engineer shall determine whether those aspects of the proposed plan comply with applicable standards.

Response: Again, the sections below demonstrate compliance with the Community Design Standards of this chapter, as well as address the public and private utility aspects of the project.

(3) In determining compliance with the requirements set forth, the Community Development Director shall consider the effect of his or her action on the availability and cost of needed housing. The Community Development Director shall not use the requirements of this section to exclude needed housing types. However, consideration of these factors shall not prevent the Community Development Director from imposing conditions of approval necessary to meet the requirements of this section. The costs of such conditions shall not unduly increase the cost of housing beyond the minimum necessary to achieve the purposes of this Code. As part of the Architectural Review

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process, the Community Development Director has no authority to reduce dwelling unit densities.

Response: The development is largely limited to CC and CO zoned lands which does not require residential development. Thus redevelopment of the center does not affect the availability or cost of needed housing.

(4) As part of Architectural Review, the property owner may apply for approval to remove trees, in addition to those exemptions allowed in TDC 34.200(3), by submitting information concerning proposed tree removal, pursuant to TDC 34.210(1). The granting or denial of a tree removal permit shall be based on the criteria in TDC 34.230.

Response: The applicant has submitted a tree removal plan with this application, attached as Exhibit O and detailed within the Arborist Report included as Exhibit M. Trees within the public utility corridor will be removed under the public utility permit prior to ARB. All other trees proposed for removal will either be removed prior to ARB under the tree removal plan based on the tree location within an approved building footprint under the master plan or will not be removed until the AR is in process or complete.

TDC 73: COMMUNITY DESIGN STANDARDS

SECTION 73.150 OBJECTIVES.

All commercial, industrial, public and semi-public projects should strive to meet the following objectives to the maximum extent practicable. Architects and developers should consider these elements in designing new projects. In the Central Design District, the Design Guidelines of TDC 73.610 shall be considered. In the case of conflicts between objectives, the proposal shall provide a desirable balance between the objectives. Site elements shall be placed and designed, to the maximum extent practicable, to:

(1) Provide convenient walkways and crosswalks which separate pedestrians from vehicles and link primary building entries to parking areas, other on-site buildings and the public right-of-way.

Response: Pedestrian access was one of the primary focuses of the master plan proceeding and review. To that end the master plan contains the following findings:

Excerpt from Master Plan findings page 6.

"The City Council finds that a well-designed commercial development that provides connections to and from nearby multi-family property meets the purposes of Goal 2. The Applicant designed the site to prove an attractive façade that faces the residential property to the north, with landscaping and screening envisioned that will provide a critical step in ensuring the resulting design will meet the City's pedestrian and design requirements.

The relationship of the Master Plan site design, building design, and pedestrian connectivity to residential uses in the downtown is discussed further in Central

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Urban Renewal District Goals 4, 5, 6 and 11. The Applicant has proposed connections from the Shared Pathway Easement to Heron's Landing Apartments to the north. These connections provide access to the proposed development including pedestrian and bicycle paths that connect to the City Hall and Library Campus. Additionally, the proposed "Street A" will provide connections from the residential development to the western portion of downtown via a 12-foot multi-use path that leads to Boones Ferry Road. These pedestrian and bicycle paths provide connectivity to existing and future residential development in the downtown area such as in the Tualatin Commons.

The City Council finds it necessary to condition the Master Plan to ensure adequate pedestrian connectivity to existing and future housing and comply with Goal 2.

The Master Plan area and Nyberg Rivers site shall provide attractive and pedestrian-oriented features including accessways and pathways that will connect to existing and future residential development in the downtown area and specifically to the adjoining Heron's Landing Apartments property.

The Master Plan with the condition that oriented features including accessways and pathways will connect to existing and future residential development in the downtown area such as in the Tualatin Commons and the adjoining Heron's Landing Apartments property supports the neighboring housing. Walking to the Master Plan area to shop for groceries and other items supports multi-family housing and the Plan's Goal 2. With the imposition of the condition of approval, the Master Plan meets Goal 2."

Excerpt from Master Plan findings pages 8-9.

Connections between Private and Civic Facilities. The Central Urban Renewal District Plan identifies the Nyberg Rivers site as part of the Tualatin Downtown and it is adjacent to the Tualatin Library and City Hall campus along Martinazzi Avenue. The Master Plan contains pedestrian and bicycle circulation that connects the Nyberg Rivers site to the City Hall campus and the western portion of downtown Tualatin. A shared pathway is shown on the west side of "Street A" continuing south and terminating at a pedestrian route just to the east City property. Two pedestrian routes are shown, one on the north side and one on the south side, of the continuation of Seneca Street. Bike lanes proposed by the developer are also show on the north and south sides of a future Seneca Street. These circulation routes demonstrate a connection between the proposed development and civic facilities

The Applicant originally proposed loading and services facilities on the north side of Buildings D1, D2, 1005, 1010, 1030 and 1040. The proposed loading and service truck route ("Primary Truck Circulation") showed trucks accessing SW Martinazzi and SW Boones Ferry Road through the Library/City Hall Campus. Trucks using these routes are a significant conflict for the Library and City Hall functions, public plazas and the public that use them. The Council finds it necessary to remove these routes as truck routes on the Master Plan.

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The Master Plan shows a plaza between Building 1030 and the west corner of Building 1040. This is the intersection of the north-south bicycle and pedestrian aisle/accessway that passes between the buildings and the east-west walkway that extends across the south-facing elevations (facing the parking lot/SW Nyberg Street) of the main building storefronts. The plaza contains seating, canopies, awnings, landscape planters, water, a mastodon statue, and statuary features. The width of the open portions of the plaza range from approximately 20 ft. to 30 ft. with 10 ft. to 12 ft. wide aisles within the plaza. The area of the plaza is approximately 6,400 sq. ft., including the outdoor dining area associated with Building 1030 (food & beverage), raised planters and sculpture/feature pads.

The Master Plan also includes the east-west building front walkway that extends across the building storefronts from Building D1/D2 on the west (Michaels store) to the east corner of Building 1040 as a plaza. The walkway area in front of Buildings 1030, 1010, 1005, D2 and D1 includes raised planters, seating, sculpture features, canopies and outdoor dining/outdoor sales areas associated with the grocer and retailer storefronts. The width of the east west walkway/plaza surface is approximately 12-16 ft. while the passage way for pedestrians ranges from 8 ft. to 16 ft. taking into account raised planters, trees, and space devoted to dining/ retail activities. The Master Plan provides and promotes civic facilities such as community gathering spaces and pedestrian amenities.

The dimensions and features of the plaza create potential conflicts with bicycles and pedestrians passing through the narrow sections of the proposed plaza and the walkway plaza. Adequately sized passages between objects and structures located in the plaza are necessary to allow circulation of bicycle and pedestrian users that are traveling through the plaza area between the stores or on the bicycle and pedestrian paths that connect to public areas and ways such as the Tualatin River Greenway, Civic Center and south of SW Nyberg Street.

The conditions of approval imposed reduce conflicts and expand public spaces. The Master Plan's public gathering places and pedestrian and bicycle connections to the nearby civic facilities will provide a public benefit consistent with Goal 4.

Council finds conditions of approval are needed to satisfy Goal 4. The conditions of approval are:

- Recreational equipment, apparel and sports outfitting sales are prohibited in areas identified as public gathering, multi-function open plaza and plaza seating with fire pit as identified in the Building Frontage landscape plan.

- A minimum of 12 feet of clear, unobstructed width for walkways or accessways through a plaza or along the building frontage between Building D1 and northeast corner of the public gathering, multi-function plaza seating with fire pit as identified in the Building Frontage landscape plan.

- The Truck Route designations from "Street A" and Seneca Street are removed.

- The Master Plan with the conditions of approval satisfies Goal 4."

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- The applicant has proposed a pedestrian network that complies with these findings and conditions of approval.

All buildings within the Nyberg Rivers project are served by sidewalks at their entrances. All new buildings provide pedestrian sidewalks and designated routes across driveways to other new buildings within the development. Specifically, there is a continuous sidewalk in front of new buildings D-110, D-120, D-125, D-130, 1005, 1010, 1030 and 1040. There is a continuous sidewalk and crosswalk network that links new buildings E-100, F-100, G-100, H-100, J-100 and N-100 that provides a protected pedestrian route. See Sheets L 1.7-A, 1.7-B, 1.8-A and L1.8-B to show the central plaza elements and pedestrian treatments along the central plaza. Specific pedestrian circulation patterns are illustrated on Exhibit O and in cross sections A-A through G-G approved in the Master Plan and incorporated here as sheets within Exhibit M. The site plan approved as a part of the Master Plan and submitted to the ARB includes an extensive pedestrian system that both links the buildings to parking and off-site areas and provides a convenient and safe on-site pedestrian system that provides separation from the public right-of-way.

(2) Avoid barriers to disabled individuals.

Response: The Site Plan included with this application shows ADA compliant parking stalls located in the central parking area nearest the primary entrances to the buildings. These stalls are adjacent to pedestrian crossing areas that provide safe access to the buildings consistent with the ADA requirements. As shown on the Site Plan (Sheets C1.0-1.2, Exhibit O) provided with this application and summarized in the Project Summary notes on the Site Plan, the ADA stalls are all 9-feet wide by 19-feet deep, with an associated off-loading area for van accessible spaces that is 8-feet wide. As shown on the Grading Plans (Sheets 3.0-3.2, Exhibit O), the general grades through the ADA areas vary from 2.1 to 2.8% resulting in a site and overall design that is easily navigated. The site grades coupled with the numerous pathways and sidewalks provide the opportunity for access from and to all areas proposed for development within the master plan area consistent with the intent of this criterion.

(3) Locate and design drive-through facilities in a manner which does not conflict with pedestrian routes or other vehicular circulation and minimizes adverse impacts on adjacent properties.

Response: The Master Plan originally showed a new building H-100 identified as a drive-thru restaurant, this building pad is no longer shown as a drive-thru. The Master Plan area currently has three drive-thru banks and one drive-thru restaurant (Wendy's). The Applicant submitted a supplemental site plan for the August 7, 2013 master plan hearing eliminating one of the drive-thru restaurants (H-100). The City found that eliminating an additional drive-thru restaurant was conducive to pedestrian friendly developments, reducing pedestrian crossing conflicts and would not discourage people from walking between buildings and connecting to public walkways. (Master Plan findings at page 5).

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Thus the City appropriately conditioned the Master Plan on the following:

- The City Council finds it necessary to condition the Master Plan to limit the number of drive-thru facilities in the Master Plan to no more than four and designing any new or re-located drive-thru facilities so the service windows and service aisles are screened from public streets.

The City further found that by limiting the total number of drive-thru facilities to four and screening service windows and aisles from public streets the Goal 1 objective is satisfied.

As shown on the Site Plan sheets L1.2 and 1.3 included with this ARB under Exhibit O, all relocated drive-thru facilities are sited to negate any conflict with pedestrian routes or vehicular circulation accessways. The drive-through facilities are located between the building and the property line or right-of-way, away from the central parking area and pedestrian access paths. In compliance with the Master Plan condition of approval, the relocated drive through service window and service aisle at Building F-100 are screened from SW Nyberg Road with a combination of trees and shrubs. According to the planting plan and planting legend and notes on Sheet L1.0 within Exhibit M, the trees along SW Nyberg Road include Serviceberries, River Birch, Western Juniper, Red Pine, and Thornless Honeylocust within the landscape strip right-of-way. Shrubs and accents include Snowberry, Wood's Rose, Coralberry, and Fountain Grass.

(4) Break up parking areas with landscaping (trees, shrubs and walkways) and buildings to lessen the overall impact of large paved areas.

Response: As shown on Sheets L1.2 through L1.6 under Exhibit O, all proposed and existing parking lots within the site are broken up with landscaping that includes trees, shrubs, groundcovers and walkways. The main entryway is lined with street trees and includes a landscaped median to welcome customers and soften the edges of the driveway. All landscaping elements were approved under the Master Plan process.

(5) Utilize landscaping in parking areas to direct and control vehicular movement patterns, screen headlights from adjacent properties and streets, and lessen the visual dominance of pavement coverage.

Response: This objective was specifically addressed in the Master Plan findings at pages 23-24. There the findings state:

"The Master Plan proposes 6 ft. x 6 ft. (measured to outside of curb) "Parking Diamonds" as a form of required parking area interior landscaping as an alternative to planters that extend between rows of parking and separate groups of parking stalls. The Community Design Standards of the Tualatin Development Code (TDC 73.310, 73.320, 73.360) requires parking lot landscaping to provide shade within the parking lot for users and with required trees and other planted vegetation in parking lot planters to both physically and visually break up the extensive paved surfaces and the parked vehicles in the parking area.

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Community Design standards require 25 sq. ft. of parking area landscaping (both interior and perimeter to the parking area), a minimum of 1 deciduous shade tree per 4 parking stalls within a 5 foot wide (inside of curb) planter island. The proposed "diamonds" have limited surface area as a planter within a paved parking area. With limited planter area in the diamonds, there is more paved surface area in a parking lot and less landscaping to break up the scale of the pavement and the parked vehicles. This has an impact for people who using the parking lot and visually for the public from adjacent streets and public ways. Staff was concerned that the proposed "diamonds" do not serve the purposes of landscaped islands and do not provide adequate soil volume for the long term growth of the required shade trees."

The City was concerned about the adequacy of the 6 ft. x 6 ft. "diamond" planters and found:

"The Applicant submitted plans for the diamond planters that indicates that the proposed Nyberg Rivers "diamond planters" will be constructed differently and in a manner that will support adequate deciduous tree growth and be able to meet the standard of achieving a minimum 30 ft. mature height and a sufficient canopy required in TDC 73.360 Parking Lot Landscaping."

To ensure the success of the Applicant's proposed planters, the City imposed a condition of approval.

To ensure adequate tree growth and shade, Council finds the following conditions of approval necessary to meet Goal 11:

- Trees planted in "diamond planters" shall achieve a growth that is a minimum of 66 % (2/3) of the 30 ft. mature tree height standard in TDC 73.360(7)(a-e) within 5 years of planting.
- Trees planted in the "diamond planters" shall be monitored annually. The applicant, its successors or assigns, shall submit a report from a certified arborist that documents tree height, health of canopy, and size of trunk by November 1 of each year after planting.
- If the trees do not meet the performance requirement, then Applicant, its successors and assigns, must remedy the failure. Such remedy shall be up to and including rebuilding and expanding the planting area.

The proposed landscape planting plans included as Exhibit O – L1.2 through L1.6 shows how landscape islands, diamond and corridors direct and control vehicular movement patterns, screen headlights and soften the pavement coverage and will meet the master plan condition of approval. The mix of landscape islands interspersed with landscape diamonds uniformly throughout the parking field provides a variety of parking lot landscape treatments to achieve the intent of the code. Shade via a mix of native tree species is provided throughout the parking lot to reduce the heat island effect that can result from parking lots. A mix of evergreen and deciduous trees provides for a variety tree

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forms, leaf types and color that adds visual interest and complements the existing natural areas adjacent the site. Likewise the mix of shrubs and ground covers work together to provide for visual interest and assist with breaking up the parking fields within the site Parking lot islands and landscape strips are provided along the central driveway and at the end of parking aisles to control vehicular movement patterns and screen headlights. The landscape diamonds will soften the pavement coverage by providing a tree canopy to reduce the "heat-island effect" within Nyberg Rivers.

(6) Provide vehicular connections to adjoining sites.

Response: The City Council comprehensively reviewed the transportation system and the vehicle connections to adjoining sites in the Master Plan findings. There the City found that the proposed connections provide both adequate transportation facilities and connections to adjoining sites. To ensure these connections, the City imposed the following conditions of approval.

City Council finds the following transportation improvements are needed for the Master Plan to comply with Goal 5, and therefore imposes them as conditions of approval:

- The Seneca Street extension to the Nyberg Rivers site with a signal at SW Martinazzi Avenue constructed to the standards of a Minor Collector Street. The time of construction will be determined through the public facilities decision process and is not anticipated or required to occur prior to removal of the Council Chambers building.
- A westbound right turn lane on SW Nyberg Road.
- Two southbound left turn lanes and a shared through/right turn lane from the site's access onto SW Nyberg Road.
- Two inbound receiving lanes; and
- The associated signal improvements at the main entrance.

In addition, City Council finds the street cross-sections need to be modified to satisfy Goal 5 and are needed to serve the Master Plan area. The City Council approves the Master Plan cross sections with the following modifications:"

The City Council then listed several modifications to the cross sections at pages 14-16 of the Master Plan findings.

Exhibit M – Sheet C1.0 and the modified cross sections in compliance with the conditions are attached here within Exhibit A. The Exhibits show the vehicular connections through the site, with connections to adjoining sites and streets that support the local and regional traffic circulation pattern. Upon review of these same connections in the recent and unanimous approval by the City of the master plan, the City found that these connections with the modified cross sections provide vehicular connections to adjoining sites. Those same findings can be made here as the applicant has complied with the conditions of approval

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imposed by the City to ensure that these cross sections provide adequate access in compliance with this criterion.

(7) Emphasize entry drives into commercial complexes and industrial park developments with special design features, such as landscaped medians, water features and sculptures.

Response: The proposed design complies with this criterion. The Applicant has provided a main entry drive to the commercial center from Nyberg Street. Several exhibits demonstrate the entry character of this main entry: Cross section A-A: Nyberg Main Entry, the Nyberg Rivers Entry Landscaping exhibit and the Enlargement 'A' Plan View and Section were all submitted as a part of the Master Plan approval package. The Landscape Planting Plan submitted with this ARB package on Sheet L1.2, Exhibit O, does show the proposed trees, shrubs and groundcover proposed along the main entry aisle. The east side of the entry will reflect Coast Range plantings with Beach Plum, Cascara, Red Sunset Maples, and Urbanite Ash, while the west side will transition to Central Oregon plantings to include Quaking Aspen and Serviceberry. Sheet L1.7-B, shown on Sheet L1.7, does show the central entry as it transitions to the front of the central plaza, with enhanced concrete pavers at the pedestrian crossings, plaza amenities to include benches, entry icon elements, seating and patios, and columnar deciduous trees to buffer from the adjacent traffic.

Elements shown on the Landscape Planting Plan includes (2) 12-foot northbound travel or entry lanes; (3) southbound or egress lanes also at ~~either 11 or~~ 12-feet; a 1.5 foot median between the travel lanes; a varying 4 to 7-foot planter strip to the east; a 14-foot shared path with tree wells; and a 4-foot planter strip to the west side of the entry.

(8) Locate, within parking lots, pedestrian amenities and/or landscaping in areas which are not used for vehicle maneuvering and parking.

Response: As shown on the Landscape Planting Plan, Exhibit M – L1.0 through L1.6, all areas within the parking lot not used for parking stalls or drive isles are designated as landscape areas or walkways. Several pedestrian plazas as also incorporated into the site design and provide areas for patrons to rest and socialize. These areas enhance the aesthetics and pedestrian experience of the Nyberg Rivers redevelopment. The cross sections attached as Exhibit O show the width and character of the pedestrian amenities providing well landscaped and well lighted access throughout the site including within and around the parking areas in compliance with this objective.

(9) Encourage outdoor seating areas which provide shade during summer and sun during winter, trash receptacles and other features for pedestrian use. Plantings with a variety of textures and color are encouraged.

Response: Three primary outdoor seating areas have been incorporated into the design. A central pedestrian plaza is shown between Buildings 1010 and 1040 that will provide outdoor seating areas. Two additional pedestrian plazas and seating areas have been incorporated in the site design; one in the southwest corner of the site and one in between proposed buildings H-100 and J-100. As shown on

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the elevations submitted as Exhibit O – C1.0, plantings and pedestrian amenities will be featured along the building frontages to create a sense of place and scale suitable to a pedestrian environment. These amenities include dining patios, cove seating, bench seating, a pedestrian promenade, outdoor art, a water feature, a fire pit and enhanced paving at the central pedestrian plaza. Trees, shrubs, ground cover and raise planting areas are provided in and around the pedestrian areas to provide shade and a variety of plant forms and colors.

The location and design elements of each of these plazas was articulated as well in the City's final decision on the Master Plan. At pages 8-9, the Master Plan decision states:

The Master Plan shows a plaza between Building 1030 and the west corner of Building 1040. This is the intersection of the north-south bicycle and pedestrian aisle/accessway that passes between the buildings and the east-west walkway that extends across the south-facing elevations (facing the parking lot/SW Nyberg Street) of the main building storefronts. The plaza contains seating, canopies, awnings, landscape planters, water, a mastodon statue, and statuary features. The width of the open portions of the plaza range from approximately 20 ft. to 30 ft. with 10 ft. to 12 ft. wide aisles within the plaza. The area of the plaza is approximately 6,400 sq. ft., including the outdoor dining area associated with Building 1030 (food & beverage), raised planters and sculpture/feature pads.

The Master Plan also includes the east-west building front walkway that extends across the building storefronts from Building D1/D2 on the west (Michaels store) to the east corner of Building 1040 as a plaza. The walkway area in front of Buildings 1030, 1010, 1005, D2 and D1 includes raised planters, seating, sculpture features, canopies and outdoor dining/outdoor sales areas associated with the grocer and retailer storefronts. The width of the east west walkway/plaza surface is approximately 12-16 ft. while the passage way for pedestrians ranges from 8 ft. to 16 ft. taking into account raised planters, trees, and space devoted to dining/ retail activities. The Master Plan provides and promotes civic facilities such as community gathering spaces and pedestrian amenities.

The Master Plan conditions of approval require:

- Recreational equipment, apparel and sports outfitting sales are prohibited in areas identified as public gathering, multi-function open plaza and plaza seating with fire pit as identified in the Building Frontage landscape plan.
- A minimum of 12 feet of clear, unobstructed width for walkways or accessways through a plaza or along the building frontage between Building D1 and northeast corner of the public gathering, multi-function plaza seating with fire pit as identified in the Building Frontage landscape plan.
- The Truck Route designations from "Street A" and Seneca Street are removed.

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Exhibit O, Sheets L1.7 and 1.8 demonstrate that each of these conditions of approval have been satisfied. No outdoor sales area is designated within the plaza, a minimum of 12 foot clear is provided for an unobstructed walkway and the truck route designations have been removed from Street A

(10) Create opportunities for, or areas of, visual and aesthetic interest for occupants and visitors to the site.

Response: The approved Nyberg Rivers Master Plan document shows examples of landscaping and building elements and articulation that will create areas of visual and aesthetic interest for visitors to the site. The perspective plans included with the approved Master Plan portray a retail center with ample landscaping, pedestrian pathways, and visual amenities to draw the user interest into the site and central plaza area. The perspective plan is acted out in the Master Plan approved Landscape Plant Material Schedule and Building Frontage Landscape Plan, as well as the Pedestrian and Bicycle Plan. In particular, the on-site pedestrian system shown on the Master Plan Pedestrian and Bicycle Plan included within Exhibit A creates walking and biking opportunities throughout the site. The pedestrian system is complimented by an extensive landscaping plan. The Master Plan findings at pages 7-9 discuss the pedestrian system and how it and the overall design of the project provide areas of visual and aesthetic interest to occupants and visitors:

"The Master Plan contains pedestrian and bicycle circulation that connects the Nyberg Rivers site to the City Hall campus and the western portion of downtown Tualatin. A shared pathway is shown on the west side of "Street A" continuing south and terminating at a pedestrian route just to the east City property. Two pedestrian routes are shown, one on the north side and one on the south side, of the continuation of Seneca Street. Bike lanes proposed by the developer are also show on the north and south sides of a future Seneca Street. These circulation routes demonstrate a connection between the proposed development and civic facilities."

"The Master Plan shows a plaza between Building 1030 and the west corner of Building 1040. This is the intersection of the north-south bicycle and pedestrian aisle/accessway that passes between the buildings and the east-west walkway that extends across the south-facing elevations (facing the parking lot/SW Nyberg Street) of the main building storefronts. The plaza contains seating, canopies, awnings, landscape planters, water, a mastodon statue, and statuary features. The width of the open portions of the plaza range from approximately 20 ft. to 30 ft. with 10 ft. to 12 ft. wide aisles within the plaza. The area of the plaza is approximately 6,400 sq. ft., including the outdoor dining area associated with Building 1030 (food & beverage), raised planters and sculpture/feature pads.

The Master Plan also includes the east-west building front walkway that extends across the building storefronts from Building D1/D2 on the west (Michaels store) to the east corner of Building 1040 as a plaza. The walkway area in front of Buildings 1030, 1010, 1005, D2 and D1 includes raised planters, seating, sculpture features, canopies and outdoor dining/outdoor sales areas associated with the grocer and retailer storefronts. The width of the east west walkway/plaza surface is approximately 12-16 ft. while the passage way for pedestrians ranges

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from 8 ft. to 16 ft. taking into account raised planters, trees, and space devoted to dining/ retail activities. The Master Plan provides and promotes civic facilities such as community gathering spaces and pedestrian amenities." In addition, at page17 of the Master Plan findings, the City Council found that the Art Walk and Ice Age Discovery Trail would add important visual elements to the project:

"Connections are shown and/or described that would bring the ArtWalk - A Self-Guided Tour of Tualatin's Art, Cultural and Natural History, and the Ice Age Discovery Trail into the site. When combined with the proposed Mastodon sculpture, the ArtWalk and Ice Age Discovery Trail would bring a sense of place, local history, and interpretive opportunities to the development."

The approved Master Plan also includes a shared pathway easement through the natural area adjacent to the Tualatin River. The pathway is shown on Site Plan Sheet C1.2 under Exhibit O. The Applicant will provide an easement to the City for this pathway, but the Applicant does not propose to construct the pathway as a part of this application. Ultimately, the pathway will provide opportunities to retail customers and the public to view the Tualatin River and provides an excellent aesthetic element of the project.

(11) Conserve, protect and restore fish and wildlife habitat areas, and maintain or create visual and physical corridors to adjacent fish and wildlife habitat areas.

Response: Although there are no specifically identified fish or wildlife habitat areas on the project site itself, the Master Plan includes a large natural area adjacent to the Tualatin River Greenway. A shared pathway easement will go through the natural area and provide a link to the Tualatin River Greenway. To the extent that the natural area is considered a habitat area, by maintaining the area as a natural area, the project conserves and protects this habitat area. Additionally, both the natural area and the future pathway will provide visual and a physical corridor to the Tualatin River and the greenway. The City Council's Master Plan findings at pages 16 to 17 further described the natural area and pathway:

"The Tualatin River Greenway will provide connectivity and links with residential and commercial areas in east Tualatin when the trail crosses under I-5 and joins the existing segment of the Tualatin River Greenway Trail that runs through Brown's Ferry Park to Tualatin's eastern boundary. This Shared Pathway is especially important because it will serve as an alternative route that would be safer than using the Nyberg Street bridge over I-5 (at exit 289) where bicyclists and pedestrians are required to cross several freeway on-and-off ramps with high traffic volumes. The Nyberg Street bridge over I-5 (at exit 289) was identified as a high accident location in the recently adopted Transportation System Plan.

A future connection to the west along the Tualatin River that is located within the outer 40' from the top of bank is needed and so it will fit within the boundaries as defined for the Tualatin River Greenway."

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(12) Provide safe pathways for pedestrians to move from parking areas to building entrances.

Response: As demonstrated in the Master Plan and Site Plan (Exhibit O – C1.0 to 1.2) and the Landscape Planting Plan (Exhibit O – Sheets L1.2 through L1.6), separate pedestrian walkways and crosswalks are provided along the primary building entrances from the parking areas, between buildings, and to the adjacent public right-of-ways. Landscape islands and plantings along the walkways help distinguish the pedestrian circulation routes from the vehicular circulation routes. Every parking area is connected to an on-site pathway that connects the parking area to public streets and to building entrances. Pathways extend north and south, as well as east and west throughout the site and connect to adjacent properties or streets on all sides of the site.

(13) Design the location of buildings and the orientation of building entrances for commercial, public and semi-public uses such as churches, schools and hospitals to provide adequate pedestrian circulation between buildings and to provide preferential access for pedestrians to existing or planned transit stops and transit stations.

Response: As demonstrated in the Site Plan (Exhibit O – C1.0 to 1.2) and the Landscape Planting Plan (Exhibit O – Sheets L1.2 through L1.6), separate pedestrian walkways and crosswalks are provided along the primary building entrances from the parking areas, between buildings, and to the adjacent public right-of-ways. There is an existing bus transit stop located along SW Martinazzi Avenue, directly west of the site. Pedestrian and bicycle connectivity is provided to the bus stop. Goal 6 of the Central Urban Renewal Plan specifically addresses transit. The Council's findings regarding transit are set forth on page 19 of the findings:

"TriMet service is located nearby on SW Martinazzi (a stop at the City Library) and on SW Boones Ferry Road extending from the WES Commuter Rail station further west to the Tualatin Park & Ride located at I-5 Exit 290 to the north. The proposed "Street A" extension from the Nyberg Rivers site to SW Boones Ferry Road will be near an existing TriMet bus stop on SW Boones Ferry Road near the Tualatin River Bridge. In addition, this development is within the boundaries of the Southwest Corridor Plan which identifies the need for improved transit service. Current options being evaluated by the region show high capacity transit service potentially traveling along Boones Ferry Road, with a terminus at the WES station. The Master Plan, as currently proposed, would provide sufficient connections to the existing and proposed transit improvements near the site on Boones Ferry Road and Martinazzi Avenue.

The Master Plan supports the metropolitan transportation system and its goals to provide alternate modes of transportation for the residential and employment population of the Urban Renewal Area. The Master Plan complies with Goal 7."

As recognized by the City Council, the on-site pedestrian circulation plan provides a robust pedestrian circulation plan that provides direct access to existing and planned transit stops and stations.

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(14) Provide accessways between commercial, public and semi-public development and publicly-owned land intended for general public use; arterial and collector streets where a transit stop and/or a bike lane is provided or designated; and abutting residential, commercial and semi-public property.

Response: As demonstrated on the Site Plan (Exhibit O – C1.0 to 1.2) and the Landscape Planting Plan (Exhibit O – Sheets L1.2 through L1.6), separate pedestrian walkways and crosswalks are provided along the primary building entrances from the parking areas, between buildings, and to the adjacent public right-of-ways. There is an existing bus transit stop located along SW Martinazzi Avenue, directly west of the site. Pedestrian and bicycle connectivity is provided to the bus stop. The City Council's findings at page 19 demonstrate that the project provides more than adequate connections between the commercial elements of the project and the public and semi-public uses on adjacent and nearby property:

"The City Council finds that the purpose of Goal 6 is met with the Master Plan's pedestrian/bicycle system as well as the conditions of approval. The bicycle and pedestrian facilities serve the purposes outlined in the Transportation System Plan. The bicycle and pedestrian facilities provide on-and-off street connectivity in all directions to residential, commercial, and industrial areas with public parks, the library, and schools. The system of pedestrian and bicycle facilities contributes to and promotes linkage between the downtown project site and Community Park. In particular, the bicycle and pedestrian system provides a link between the Urban Renewal Area and residential area, parks, natural areas, as well as links to the business areas north and south h of SW Boones Ferry Road. Pedestrian and bikeways allow a direct connection through the site and in all directions. Pedestrian and bikeways will be lighted in accordance with City standards, and the buildings will incorporate awnings and other shade and rain protection forms. The overall site will include attractive pedestrian streetscapes. The City Council concludes the Master Plan with the conditions of approval complies with Goal 6."

(15) Not applicable

(16) Accessways should be designed and located in a manner which does not restrict or inhibit opportunities for developers of adjacent properties to connect with an accessway, and provide continuity from property to property for pedestrians and bicyclists to use the accessway.

Response: As demonstrated in the Site Plan (Exhibit O – C1.0 to 1.2) and the Landscape Planting Plan (Exhibit O – Sheets L1.2 through L1.6), separate pedestrian walkways and crosswalks are provided along the primary building entrances from the parking areas, between buildings, and to the adjacent public right-of-ways. These accessways and their locations do not restrict or inhibit opportunities for developers of adjacent properties to connect with an accessway. As discussed above, the City Council found the following with respect to connectivity to adjacent properties:

"The City Council finds that the purpose of Goal 6 is met with the Master Plan's pedestrian/bicycle system as well as the conditions of approval. The bicycle and pedestrian facilities serve the purposes outlined in the Transportation System

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Plan. The bicycle and pedestrian facilities provide on-and-off street connectivity in all directions to residential, commercial, and industrial areas with public parks, the library, and schools. The system of pedestrian and bicycle facilities contributes to and promotes linkage between the downtown project site and Community Park. In particular, the bicycle and pedestrian system provides a link between the Urban Renewal Area and residential area, parks, natural areas, as well as links to the business areas north and south h of SW Boones Ferry Road. Pedestrian and bikeways allow a direct connection through the site and in all directions. Pedestrian and bikeways will be lighted in accordance with City standards, and the buildings will incorporate awnings and other shade and rain protection forms. The overall site will include attractive pedestrian streetscapes. The City Council concludes the Master Plan with the conditions of approval complies with Goal 6."

(17) Provide preferential parking for carpool and vanpools to encourage employees to participate in carpools and vanpools.

Response: Carpool or vanpool designated spots have not been demarcated at this time. However, the applicant will work with the City to address carpool and vanpool parking if needed.

(18) Screen elements such as mechanical and electrical equipment, above ground sewer or water pump stations, pressure reading stations and water reservoirs from view.

Response: The buildings have been designed to screen mechanical and electrical equipment from view. There are no proposed above ground sewer or water pump stations within the project. Mechanical equipment has been located on top of the proposed buildings and is screened from view utilizing walls. The attached elevations included as part of Exhibit O provide more detail.

(19) Not applicable

(20) When a fish and wildlife habitat area abuts or is on the subject property the applicant and decision authority for a development application should consider locating buildings farther away from the fish and wildlife habitat area. [Ord. 635-84, § 36, 6/11/84; Ord. 649-84, §7, 11/26/84; Ord. 661-85, §10, 3/25/85; Ord. 827-91, §6 and 7, 3/25/91; Ord. 849-91, §38 and 39, 11/25/91; Ord. 862-92, §51, 3/23/92; Ord. 895-93, §8, 5/24/93; Ord. 904-93, §47, 9/13/93; Ord. 920-94, §17, 4/11/94; Ord. 965-96, §82, 12/9/96; Ord. 979-97, §52, 7/14/97; Ord. 1097-02, 2/11/02; Ord. 1224-06 §22, 11/13/06]

Response: While no specific fish and wildlife habitat area has been identified on the property, the applicant has elected to preserve a large natural area adjacent to the Tualatin River. This area will ultimately include a shared pathway easement and two overlook areas. The proposed alignment of the trail easement and overlooks was arrived at after close coordination with Clean Water Services and City staff. The proposed setbacks are further away from the Tualatin River and the Tualatin River Greenway than required by the TDC in order to preserve the natural area and views of the Tualatin River.

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SECTION 73.160 STANDARDS.

The following standards are minimum requirements for commercial, industrial, public and semi-public development, and it is expected that development proposals shall meet or exceed these minimum requirements.

(1) Pedestrian and Bicycle Circulation.

(a) For commercial, public and semi-public uses:

(i) a walkway shall be provided between the main entrance to the building and any abutting public right-of-way of an arterial or collector street where a transit stop is designated or provided. The walkway shall be a minimum of 6 feet wide and shall be constructed of concrete, asphalt, or a pervious surface such as pavers or grasscrete, but not gravel or woody material, and be ADA compliant, if applicable;

Response: As shown on the Site Plan (Exhibit O– Sheets C1.0-1.2), direct pedestrian connections are present from each building to every other building on the site, forming complete pedestrian connections throughout the site and to adjacent property. The pedestrian walkways also connect directly to public rights of way, adjacent property and the natural area adjacent to the Tualatin River. All walkways exceed 6 feet, are constructed of concrete or pavers and are ADA compliant.

(ii) walkways shall be provided between the main building entrances and other on-site buildings and accessways. The walkways shall be a minimum of 6 feet wide and shall be constructed of concrete, asphalt, or a pervious surface such as pavers or grasscrete, but not gravel or woody material, and be ADA compliant, if applicable;

Response: As shown on the Site Plan (Exhibit O– Sheets C1.0-1.2), direct pedestrian connections are present from each building to every other building on the site, forming complete pedestrian connections throughout the site and to adjacent property. The pedestrian walkways also connect directly to public rights of way, adjacent property and the natural area adjacent to the Tualatin River. All walkways exceed 6 feet, are constructed of concrete or pavers and are ADA compliant.

(iii) walkways through parking areas, drive aisles, and loading areas shall be visibly raised and of a different appearance than the adjacent paved vehicular areas;

Response: As shown on the Site Plan (Exhibit O– Sheets C1.0-1.2), all pedestrian walkways are raised above parking and loading areas, bordered by landscaping where possible and are significantly different in appearance from adjacent vehicular areas. Contrasting materials serve to set the walkway apart from the vehicle areas, where these connections cross vehicle areas, pavers and/or crosswalk striping is utilized to denote the presence of pedestrians.

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(iv) accessways shall be provided as a connection from the development's internal bikeways and walkways to all of the following locations that apply: abutting arterial or collector streets upon which transit stops or bike lanes are provided or designated; abutting undeveloped residential or commercial areas; adjacent undeveloped sites where an agreement to provide an accessway connection exists; and to abutting publicly-owned land intended for general public use, including schools;

Response: As shown on the Site Plan (Exhibit O – Sheets C1.0-1.2), there are direct pedestrian connections to public rights of way abutting the site. All walkways exceed 6 feet, are constructed of concrete and are ADA compliant. As the City Council's findings for the Master Plan provide, at page 19:

"The City Council finds that the purpose of Goal 6 is met with the Master Plan's pedestrian/bicycle system as well as the conditions of approval. The bicycle and pedestrian facilities serve the purposes outlined in the Transportation System Plan. The bicycle and pedestrian facilities provide on-and-off street connectivity in all directions to residential, commercial, and industrial areas with public parks, the library, and schools. The system of pedestrian and bicycle facilities contributes to and promotes linkage between the downtown project site and Community Park. In particular, the bicycle and pedestrian system provides a link between the Urban Renewal Area and residential area, parks, natural areas, as well as links to the business areas north and south h of SW Boones Ferry Road. Pedestrian and bikeways allow a direct connection through the site and in all directions. Pedestrian and bikeways will be lighted in accordance with City standards, and the buildings will incorporate awnings and other shade and rain protection forms. The overall site will include attractive pedestrian streetscapes. The City Council concludes the Master Plan with the conditions of approval complies with Goal 6."

The AR proposal continues to comply with this finding in compliance with this criterion.

(v) fences or gates which prevent pedestrian and bike access shall not be allowed at the entrance to or exit from any accessway.

Response: As shown on the Site Plan (Exhibit O – Sheets C1.0-1.2), no fences or gates which prevent pedestrian and bike access are proposed.

(vi) bikeways shall be provided which link building entrances and bike facilities on the site with the adjoining public right-of-way and accessways.

Response: As shown on the Site Plan (Exhibit O – Sheets C1.0-1.2), all bikeways linking the on-site buildings are directly connected to adjoining rights of way and accessways. The City Council's findings for the Master Plan provide, at page 19:

"The City Council finds that the purpose of Goal 6 is met with the Master Plan's pedestrian/bicycle system as well as the conditions of approval. The bicycle and pedestrian facilities serve the purposes outlined in the Transportation System

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Plan. The bicycle and pedestrian facilities provide on-and-off street connectivity in all directions to residential, commercial, and industrial areas with public parks, the library, and schools. The system of pedestrian and bicycle facilities contributes to and promotes linkage between the downtown project site and Community Park. In particular, the bicycle and pedestrian system provides a link between the Urban Renewal Area and residential area, parks, natural areas, as well as links to the business areas north and south h of SW Boones Ferry Road. Pedestrian and bikeways allow a direct connection through the site and in all directions. Pedestrian and bikeways will be lighted in accordance with City standards, and the buildings will incorporate awnings and other shade and rain protection forms. The overall site will include attractive pedestrian streetscapes. The City Council concludes the Master Plan with the conditions of approval complies with Goal 6."

(vii) Outdoor Recreation Access Routes shall be provided between the development's walkway and bikeway circulation system and parks, bikeways and greenways where a bike or pedestrian path is designated.

Response: As shown on the Site Plan (Exhibit O – Sheets C1.0-1.2), there is a direct connection between the commercial component of the project and the natural area adjacent to the Tualatin River. The shared pathway system on the site provides an east-west connection, as well as a direct connection to the south. As shown on Site Plan C1.0, the shared pathway from SW Nyberg Road will provide north-south access into the site from Nyberg Road and the Fred Meyer commercial complex to the south. The path extends along the central entry across a pedestrian crossing into the central pedestrian plaza. A shared pathway is also denoted along Street 'A' on the south/west side of the street. This pathway extends into the site before meeting up with the proposed Seneca Street sidewalk which then ties into the east-west pedestrian path along both the south side of the east-west drive aisle and the north side (the central plaza). Designated bicycle lanes are located along Nyberg Road and the Seneca Street extension.

(c) Curb ramps shall be provided wherever a walkway or accessway crosses a curb.

Response: Exhibit O demonstrates that curb ramps will be provided on-site wherever a walkway or accessway crosses a curb.

(d) Accessways shall be a minimum of 8 feet wide and constructed in accordance with the Public Works Construction Code if they are public accessways, and if they are private access-ways they shall be constructed of asphalt, concrete or a pervious surface such as pervious asphalt or concrete, pavers or grasscrete, but not gravel or woody material, and be ADA compliant, if applicable.

Response: Exhibit O, Sheets L1.7 and 1.8 __ demonstrate that all proposed accessways along the building frontages will be meet or exceed the minimum 8-foot standard. Where the accessways are public, they will be constructed to public works

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standards. Where private, they will be constructed of concrete or asphalt and, where applicable, be ADA compliant.

(e) **Accessways to undeveloped parcels or undeveloped transit facilities need not be constructed at the time the subject property is developed. In such cases the applicant for development of a parcel adjacent to an undeveloped parcel shall enter into a written agreement with the City guaranteeing future performance by the applicant and any successors in interest of the property being developed to construct an accessway when the adjacent undeveloped parcel is developed. The agreement shall be subject to the City's re-view and approval.**

Response: The Nyberg Rivers redevelopment project will be developed in whole, with no proposed undeveloped parcels. Therefore, this criterion does not apply. Pad G-100 and H-100 will be developed at a later date, however the applicant is proposing to construct the pedestrian connections at this time consistent with the intent of this requirement.

(g) **Accessways shall be constructed, owned and maintained by the property owner.**

Response: All accessways will be constructed, owned and maintained by the property owner with two clarifications. The construction of Street A requires the dedication of additional ROW by the City prior to construction. In addition, in compliance with the master plan conditions of approval, Seneca Street will not be constructed until such time as the City decides to relocate Council Chambers and make available sufficient right of way for the construction. The City Council specifically found that the Seneca Street extension was not required until such time as these conditions were satisfied.

(2) **Drive-up Uses.**

(a) **Drive-up uses shall provide a minimum stacking area clear of the public right-of-way and parking lot aisles from the window serving the vehicles as follows:**

(i) **Banks--each lane shall provide a minimum capacity for five automobiles.**

(ii) **Restaurants--each lane shall provide a minimum capacity for eight automobiles.**

(iii) **Other Drive-Up Uses--each lane shall provide a minimum capacity for two to eight automobiles, as determined through the architectural review process.**

(iv) **For purposes of this Section, an automobile shall be considered no less than twenty feet in length. The width and turning radius of drive-up aisles shall be approved through the architectural review process.**

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(b) **Parking maneuvers shall not occur in the stacking area. The stacking area shall not interfere with safe and efficient access to other parking areas on the property.**

(c) **Locate drive-up aisles and windows a minimum of 50 feet from residential planning districts to avoid adverse impacts. A wall or other visual or acoustic may be required through the architectural review process.**

Response: The Nyberg Rivers redevelopment project proposes one relocated drive-up restaurant in addition to the three existing bank drive-ups on site. The relocated drive-up restaurant will be housed in building F-100. The vehicle queuing lanes for building F-100 are shown on the Site Plan (Exhibit O – C1.1). The queuing length for building F-100 allows for 11 cars in the queue, well above the 8 automobile minimum. In approving the Master Plan, the City Council found that a total number of four drive-thru buildings would be permitted and imposed the following condition of approval:

"*The City Council finds it necessary to condition the Master Plan to limit the number of drive-thru facilities in the Master Plan to no more than four and designing any new or re-located drive-thru facilities so the service windows and service aisles are screened from public streets.*

The relocated drive-thru facility service windows are screened from public streets through a mix of landscape trees and shrubs. Therefore, the Applicant has addressed this standard and also met the requirements of the Master Plan. No drive-thru facilities are proposed within 50 feet of residential planning districts.

(3) **Safety and Security.**

(a) **Locate windows and provide lighting in a manner which enables tenants, employees and police to watch over pedestrian, parking and loading areas.**

(b) **In commercial, public and semi-public development and where possible in industrial development, locate windows and provide lighting in a manner which enables surveillance of interior activity from the public right-of-way.**

(c) **Locate, orient and select on-site lighting to facilitate surveillance of on-site activities from the public right-of-way without shining into public rights-of-way or fish and wildlife habitat areas.**

(d) **Provide an identification system which clearly locates buildings and their entries for patrons and emergency services.**

(e) **Shrubs in parking areas must not exceed 30 inches in height. Tree canopies must not extend below 8 feet measured from grade.**

(f) **Above ground sewer or water pumping stations, pressure reading stations, water reservoirs, electrical substations, and above ground natural gas pumping stations shall provide a minimum 6' tall security fence or wall.**

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Response: As shown on the building elevations submitted as part of Exhibit O, each of the buildings feature a large percentage of glazing along the building exterior, primarily along the front building façade, creating eyes to the public places. Also, lighting will be provided throughout the site, both in the internal parking area, as well as the pedestrian accessways and plazas throughout the site. Light locations and cover are provided as Exhibit L – E-1 through E-6. The Site Plan included with this application demonstrates safe and efficient access into and through the site, both for pedestrian and vehicle access. The central entry located at Nyberg Street provides a focal entry point to the major tenant spaces, with signage to direct visitors through the site. As shown on the Landscape Planting Plan (Exhibit O – Sheets L1.2 through L1.6), parking lot landscaping will not exceed 30 inches in shrub height and tree canopies will not extend below 8 feet measured from grade. Landscaping and pathways will also assist with directing pedestrians and provide safe visibility corridors throughout the site. The Landscape Planting Plan and the landscape elements outlined in the elevation exhibits (Exhibit O) display the landscape elements and amenities to be provided throughout the site. These elements will combine to provide a safe and secure site.

(4) Service, Delivery and Screening.

(a) On and above grade electrical and mechanical equipment such as transformers, heat pumps and air conditioners shall be screened with sight obscuring fences, walls or landscaping.

(b) Outdoor storage, excluding mixed solid waste and source separated recyclables storage areas listed under TDC 73.227, shall be screened with a sight obscuring fence, wall, berm or dense evergreen landscaping.

(c) Above ground pumping stations, pressure reading stations, water reservoirs; electrical substations, and above ground natural gas pumping stations shall be screened with sight-obscuring fences or walls and landscaping.

Response: Specific locations for mechanical equipment have not been determined at this time, however, consistent with this requirement, all above grade electrical and mechanical equipment will be screened with site-obscuring fences, walls and/or landscaping, fully consistent with other enclosures and storage areas. Any site obscuring landscaping will be consistent with the landscaping throughout the project site. Outdoor storage areas are shown on the attached Site Plan between buildings F-100 and G-100, buildings G-100 and H-100, and on the north side of J-100. Those areas will be screened with a site obscuring wall. There are no above-ground pumping stations or water reservoirs proposed on-site. The bicycle parking and trash enclosure exhibit included with the building elevations shows the combination trash enclosure and bike rack. This structure effectively screens the trash enclosure through a sight obscuring wood wall.

(5) The Federal Americans with Disabilities Act (ADA) applies to development in the City of Tualatin. Although TDC, Chapter 73 does not include the Oregon Structural Specialty Code' s (OSSC) accessibility standards as requirements to be reviewed during the Architectural Review process, compliance with the OSSC is a

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requirement at the Building Permit step. It is strongly recommended all materials submitted for Architectural Review show compliance with the OSSC.

Response: All development on the project site is designed to meet the applicable standards of the ADA. While specific building standards will be addressed at the building permit stage, the site plan demonstrates that the number and location of parking stalls meets ADA requirements, that all pedestrian walkways and building frontages meet ADA standards. Those ADA stalls are marked on the Site Plan (Exhibit O – Sheets C1.0 - 1.2).

(6) (a) All industrial, institutional, retail and office development on a transit street designated in TDC Chapter 11 (Figure 11-6) shall provide either a transit stop pad on-site, or an on-site or public sidewalk connection to a transit stop along the subject property's frontage on the transit street.

(b) In addition to (a) above, new retail, office and institutional uses abutting major transit stops as designated in TDC Chapter 11 (Figure 11-6) shall:

(i) locate any portion of a building within 20 feet of the major transit stop or provide a pedestrian plaza at the transit stop;

(ii) provide a reasonably direct pedestrian connection between the major transit stop and a building entrance on the site;

(iii) provide a transit passenger landing pad accessible to disabled persons;

(iv) provide an easement or dedication for a passenger shelter as determined by the City; and

(v) provide lighting at the major transit stop. [Ord. 862-92, §51, 3/23/92; Ord. 895-93, §9, 5/24/93; Ord. 898-93, §5, 6/14/93; Ord. 904-93, §48, 49 and 50, 9/13/93; Ord. 947-95, §8, 9, 10 and 11, 7/24/95; Ord. 965-96, §83 and 84, 12/9/96; Ord. 1008-98, §6, 7/13/98; Ord. 1046-00 §35, 2/14/00; Ord. 1103-02, , 3/25/02; Ord. 1224-06 §23, 11/13/06]

Response: Martinazzi Avenue is classified as a transit street, with a bus line and bus stop located near the City Library, just west of Nyberg Rivers. Pedestrian and bicycle accessways are provided from the site to the transit stop. The transit stop provides a covered bench and waiting area, trash receptacle and bicycle rack, which constitutes as pedestrian plaza. The connection to the transit stop is via a direct accessway to the larger project site, and is lighted in accordance with City standards.

SECTION 73.200 STRUCTURE DESIGN - COMMERCIAL, INDUSTRIAL, PUBLIC AND SEMI-PUBLIC USES.

Purpose.

The purpose of commercial, industrial, public and semi-public building design objectives and standards is to implement the purpose and objectives of TDC 73.020(2) and are intended to promote functional, safe, innovative and attractive buildings which are

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compatible with the surrounding environment. This concerns the building form including the articulation of walls and roof design, materials, colors, placement of elements such as windows, doors, mechanical equipment and identification features. [Ord. 705-86, §6, 9/8/86]

Response: This narrative, the attached Site Plan, and the building elevations and view perspectives provided with this submittal package and the approved Master Plan, demonstrate that the design and layout of the site and the buildings promote functional, safe, innovative and attractive buildings which are compatible with the surrounding environment. This is primarily achieved through building siting, articulation, materials, colors, and the placement of glazing, doors, and other identification features. Site design elements combine with the structure design to create a safe, innovative, and attractive redevelopment project that ties into the existing infrastructure and provides a transition to both the downtown area to the west and the natural area along the Tualatin River to the north of the site.

SECTION 73.210 OBJECTIVES.

All commercial, industrial, public and semi-public projects should strive to meet the following objectives to the maximum extent practicable. Architects and developers should consider these elements in designing new projects. In the Central Design District, the Design Guidelines of TDC 73.610 shall be considered. In case of conflicts between objectives, the proposal shall provide a desirable balance between the objectives. Buildings shall be designed, to the maximum extent practicable, to:

(1) Minimize disruption of natural site features such as topography, trees and water features.

Response: As the majority of the Nyberg Rivers site features existing development, there will be minimal disruption of the natural site features. Site topography will remain relatively unchanged, larger tree stands located to the east and north in the site will remain, and there is no proposed structural development within the conservation area or the Tualatin River riparian area. The only trees that will be removed from the site will be those necessary to facilitate construction of the approved Master Plan structures, uses, parking and utilities. The site plan does propose a walkway with outlook points providing pedestrian and bicycle circulation within the conservation area, however, it would be constructed at a later date, as only the easement is proposed as a part of this application.

(2) Provide a composition of building elements which is cohesive and responds to use needs, site context, land form, a sense of place and identity, safety, accessibility and climatic factors. Utilize functional building elements such as arcades, awnings, entries, windows, doors, lighting, reveals, accent features and roof forms, whenever possible, to accomplish these objectives.

Response: The composition of building elements is best displayed in the collection of elevations attached in Exhibit O, which shows a retail center with a sense of place, created through a mix of building articulation and roof forms, columns and glazing, and landscaping within the plaza. Patios, cove seating, awnings, entries, windows and lighting all work to create a cohesive development, while avoiding unnecessary uniformity that welcomes users into the site. New construction will included significant glazing, articulated facades, varied roof lines and other distinguishing features.

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The design proposed is consistent with the City's decision and direction in the master plan as shown in the following excerpt:

"The Master Plan includes design concepts for each elevation of the proposed buildings which demonstrate the high quality of the intended finishes as well as the architectural massing and articulation of each façade. Cross-sections demonstrate the attractive and functional streetscape and walkway lighting. Together with the integrated landscape plan evokes a sense of place. Each of the design elements enhance the overall appearance of the site, as well as public safety and convenient within the Urban Renewal Area. The Master Plan with the conditions imposed will result in an aesthetically pleasing development which will tend to promote the desirability of investment and occupancy of the Master Plan area.

The City did have some concerns about the design of certain buildings on the site as shown in this additional excerpt:

"To be consistent with Goal 11, the Nyberg Rivers Master Plan should incorporate more windows and architectural features on each of the four sides of Buildings 1040, G-100, H-100, J-100 and N-100. These include additional building articulation and variation in height, incorporate more windows on Building 1040 and other Buildings to provide a visual connection between the store interior and the exterior including walkways and parking areas, and to add distinguishing building design features and materials to achieve a stronger design relationship to Tualatin's downtown architectural style."

The City Council then imposed the following condition: There shall be additional windows and architectural features on each of the four sides of Buildings 1040, G-100, H-100, J-100 and N-100.

The applicant has revised the elevations for buildings 1040, G-100, J-100 and N-100 as provided within Exhibit O. Where feasible the applicant has provided additional windows, architectural features have been added to elevations to provide for visual interest and break up walls consistent with the intent of this condition.

(3) Where possible, locate loading and service areas so that impacts upon surrounding areas are minimized. In industrial development loading docks should be oriented inward to face other buildings or other loading docks. In commercial areas loading docks should face outward towards the public right-of-way or perimeter of the site or both.

<u>Response:</u> Loading and service areas for the central retail center of the site will all be located on the back side of the building, along the northern edge of the property and will face the perimeter of the site, consistent with this requirement. This portion of the site is configured to handle larger truck circulation and loading docks, while limiting conflict with shoppers and pedestrians accessing the shared

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pathway through the natural area. Loading for the individual tenant buildings will be conducted during non-business hours to minimize conflict with pedestrian and vehicle traffic and, to the extent practicable, have been located to minimize the impacts on surrounding areas.

(4) Enhance energy efficiency in commercial and industrial development through the use of landscape and architectural elements such as arcades, sunscreens, lattice, trellises, roof overhangs and window orientation.

Response: The Landscape Planting Plan submitted as Exhibit O – Sheets L1.2 through L1.6 features trees, shrubs, and groundcover that create natural canopies throughout the site to limit the heat-island effect. Proposed glazing along the building frontages will provide natural lighting into the tenant spaces, reducing the need for internal building lighting. Also, as the central retail center and plaza is south facing, solar exposure will be maximized. Many of the buildings include awnings, overhangs and other features that both enhance energy efficiency and provide protection from the elements.

(5) Locate and design entries and loading/service areas in consideration of climatic conditions such as prevailing winds, sun and driving rains.

Response: The primary entrances to the central retail buildings are oriented to the south, which will provide natural solar exposure. The loading areas are located to the back portion of the building to the north. The loading facilities are angled to "tuck" into the buildings, providing some level of screening and protection from the elements.

(6) Give consideration to organization, design and placement of windows as viewed on each elevation having windows. Surveillance over parking areas from the inside, as well as visual surveillance from the outside in, should be considered in window placement.

Response: Glazing on the buildings is located in the central portion of many buildings, providing visual corridors both into the tenant spaces and out to the surrounding pedestrian and parking areas. Where windows are not present on a particular elevation, the reason for such omission is due to the internal features and activities of the building at issue. For example, it is impractical to include windows on an elevation where the interior of the building contains storage or other features which are incompatible with windows.

(7) Select building materials which contribute to the project's identity, form and function, as well as to the surrounding environment.

Response: The building elements and materials selected for Nyberg Rivers provides a palette of colors, materials, and design elements that create a sense of place and identity for the site. The existing buildings (buildings A, B and C) have facades using stone facing around entrances and pillars and a beige/brown color palette with red accenting on the signage. The Applicant is proposing to continue this color palette and stone detailing throughout the entire site with slight variations in architectural form and accenting color to distinguish each building and tenant. For example, New Seasons would have lime green accent walls flanked by dark

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brown walls and a slanted roof line above the main entrance. Specific materials and architectural styles are presented in Exhibit O.

(8) Select colors in consideration of lighting conditions and the context under which the structure is viewed, the ability of the material to absorb, reflect or transmit light and the color's functional role (e.g., to identify and attract business, aesthetic reasons, image-building).

Response: The palette of colors maintains a lighter, softer color palette with brighter colors used as accents and highlights. While the background palate provides a cohesive and lighter design theme, the accents allow special identify for individual users. As an example, the existing buildings (buildings A, B and C) have facades using stone facing around entrances and pillars and a beige/brown color palette with red accenting on the signage. The Applicant is proposing to continue this color palette and stone detailing throughout the entire site with slight variations in architectural form and accenting color to distinguish each building and tenant. For example, New Seasons would have lime green accent walls flanked by dark brown walls and a slanted roof line above the main entrance. Specific materials and architectural styles are presented in Exhibit O.

(9) Where possible, locate windows and provide lighting in a manner which enables tenants, employees and police to watch over pedestrian, parking and loading areas.

Response: Glazing on the buildings is located in the central portion of many buildings, providing visual corridors both into the tenant spaces and out to the surrounding pedestrian and parking areas. As discussed above, where windows are not present on a particular elevation, the reason for such omission is due to the internal activities and uses of the building.

(10) Where practicable locate windows and provide lighting in a manner which enables surveillance of interior activity from the public right-of-way or other public areas. [Ord. 904-93, §51, 9/13/93; Ord. 1097-02, 2/11/02]

Response: Glazing on the buildings is located in the central portion of many buildings, providing visual corridors both into the tenant spaces and out to the surrounding pedestrian and parking areas, which enables surveillance of interior activity from the central plaza and parking areas.

SECTION 73.220 STANDARDS.

The following standards are minimum requirements for commercial, industrial, public and semi-public development and it is expected that development proposals shall meet or exceed these minimum requirements.

(1) Safety and Security.

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(a) **Locate, orient and select on-site lighting to facilitate surveillance of on-site activities from the public right-of-way or other public areas without shining into public rights-of-way or fish and wildlife habitat areas.**

(b) **Provide an identification system which clearly identifies and locates buildings and their entries.**

(c) **Shrubs in parking areas shall not exceed 30 inches in height, and tree canopies must not extend below 8 feet measured from grade, except for parking structures and underground parking where this provision shall not apply. [Ord. 904-93, §52, 9/13/93; Ord. 20-94, §18, 4/11/94; Ord. 1224-06 §24, 11/13/06]**

Response: Adequate lighting will be provided on-site, as is demonstrated in the site photometric plan provided with this application within Exhibit O. Adequate signage will be provided to guide users into the site, as well as directing them to the specific tenant areas within the different buildings. All parking lot landscaping will conform to the requirements listed above in order to ensure clear vision corridors. As shown on the site photometric plan, lighting will be consistent with City standards, will not shine into public rights-of-way and will not be directed to the natural area on the north edge of the site. All entries will be clearly identifiable through signage, windows and doors. Landscaping materials selected are consistent with the standards set forth above and will be maintained to meet these standards.

SECTION 73.226 OBJECTIVES.

All new or expanded multi-family, including townhouses, commercial, industrial, public and semi-public projects should strive to meet the following objectives to the maximum extent practicable. Architects and developers should consider these elements in designing new projects. In the Central Design District, the Design Guidelines of TDC 73.610 shall be considered. In the case of conflicts between objectives, the proposal shall provide a desirable balance between the objectives. Townhouses may necessitate a different balancing than multi-family developments such as apartments. Mixed solid waste and source separated recyclable storage areas shall be designed to the maximum extent practicable, to:

(1) **Screen elements such as garbage and recycling containers from view.**

(2) **Ensure storage areas are centrally located and easy to use.**

(3) **Meet dimensional and access requirements for haulers.**

(4) **Designed to mitigate the visual impacts of storage areas.**

(5) **Provide adequate storage for mixed solid waste and source separated recyclables.**

(6) **Improve the efficiency of collection of mixed solid waste and source separated recyclables. [Ord. 898-93, §7, 6/14/93. Ord. 1025-99, §40, 7/26/99; Ord. 1097-02, 2/11/02]**

Response: As described above, for the central buildings, mixed solid waste and source separated recyclables will be located within the buildings, while storage areas are

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shown between buildings F-100 and G-100, G-100 and H-100, and north of J-100. All garbage and recycling storage bins will be contained within enclosed structures. These structures will be approximately 18' L x 24' W. Proposed locations and structure details are provided as Exhibit O. The storage areas meet the dimensional and access requirements for haulers, while providing easy access for the tenant spaces. Landscaping will be provided to soften the edges of the structures and provide some additional screening. The location and design of the solid waste areas was coordinated with the local garbage hauler, Exhibit I includes a Mixed Solid Waste Plan and correspondence from the hauler that the location and design are acceptable.

LANDSCAPING

SECTION 73.240 LANDSCAPING GENERAL PROVISIONS.

(1) The following standards are minimum requirements.

(3) The minimum area requirement for landscaping for uses in CO, CR, CC, CG, ML and MG Planning Districts shall be fifteen (15) percent of the total land area to be developed, except within the Core Area Parking District, where the minimum area requirement for landscaping shall be 10 percent. When a dedication is granted in accordance with the planning district provisions on the subject property for a fish and wildlife habitat area, the minimum area requirement for landscaping may be reduced by 2.5 percent from the minimum area requirement as determined through the AR process.

Response: Nyberg Rivers is located within the CC, CO, and RH Districts. Therefore, the minimum landscape percentage is 15%. As shown on the Site Plan provided with this narrative, there are 5.6 acres or 21% of the net land area (not including the natural area) designated as landscape area. This also accounts for the central plaza and hardscape elements located throughout the site. The Applicant's landscaping plan exceeds the minimum requirement by 6 percent.

(9) Yards adjacent to public streets, except as described in the Hedges Creek Wetlands Mitigation Agreement, TDC 73.240(7), shall be planted to lawn or live groundcover and trees and shrubs and be perpetually maintained in a manner providing a park-like character to the property as approved through the Architectural Review process.

Response: The landscape setback along Nyberg Street could qualify as a yard adjacent to a public street. The setback area is shown on Exhibit O, Sheet C1.1 and is planted with deciduous trees and lawn and live groundcover that will be maintained in a manner providing a park-like character to the Nyberg Rivers property. The landscape area adjacent to Nyberg Street has an average width of 10 feet as proposed and approved in the master plan.

(10) Yards not adjacent to public streets or Low Density Residential (RL) or Manufacturing Park (MP) Planning Districts shall be planted with trees, shrubs, grass or other live groundcover, and maintained consistent with a landscape plan indicating areas of future expansion, as approved through the Architectural Review process.

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Response: The only qualifying area that may be considered as a yard not adjacent to a public street or RL or MP Planning District would be the area along the natural area. This portion of the site located to the north of the proposed commercial center is proposed to be planted with trees, shrubs and grass to be maintained in a park-like setting. No future expansion is proposed through this area. While not likely relevant to this approval criterion, this landscaped area is shown on Exhibit O, Sheets L 1.5 and 1.6 and is not modified from the plan submitted and approved is part of the master plan.

(11) Any required landscaped area shall be designed, constructed, installed, and maintained so that within three years the ground shall be covered by living grass or other plant materials. (The foliage crown of trees shall not be used to meet this requirement.) A maximum of 10% of the landscaped area may be covered with un-vegetated areas of bark chips, rock or stone. Disturbed soils are encouraged to be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity.

Response: The proposed landscape plan attached as Exhibit O, Sheets L 1.0 through L 1.10, demonstrates compliance with this standard. The proposed landscape materials have been selected, and will be planted and maintained, to achieve the coverage within 3 years. In addition, in adopting the Master Plan, the City Council imposed several conditions of approval relative to the parking lot diamond planters:

- Trees planted in "diamond planters" shall achieve a growth that is a minimum of 66 % (2/3) of the 30 ft. mature tree height standard in TDC 73.360(7)(a-e) within 5 years of planting.
- Trees planted in the "diamond planters" shall be monitored annually. The applicant, its successors or assigns, shall submit a report from a certified arborist that documents tree height, health of canopy, and size of trunk by November 1 of each year after planting.
- If the trees do not meet the performance requirement, then Applicant, its successors and assigns, must remedy the failure. Such remedy shall be up to and including rebuilding and expanding the planting area.

The proposed landscape diamond planters have been submitted and approved as a part of the Master Plan approval. In order to assure that the tree diamond landscape areas do achieve a viable size and performance level, the applicant is committing to the following measures:

- Prior to planting, all trees procured for the project will receive a rigorous and thorough review by the Landscape Architect prior to planting. This includes a coordinated selection process with regional nurseries as well as tree inspection after delivery and prior to installation.
- All tree planting topsoil will be imported and amended per topsoil analysis provided by a qualified soils lab. The applicant's landscape architect will review the subgrade preparation and, as shown on the Enlargement C exhibit submitted with the Master Plan, include an

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added layer of drain rock and perforated pipe. Once installed, the applicant's landscape architect will perform a review of the topsoil placement to ensure that the soil is compacted properly. An additional review will be done after trees are installed to ensure that the root balls are not damaged during handling and to confirm that the burlap and wire baskets are removed to the greatest extent possible.

- The applicant's landscape architect will perform a punch list walkthrough with the Landscape Contractor at the completion of planting operations to ensure that all trees are appropriately installed, staked, and irrigated.
- Within the first year from the date of substantial completion, the Landscape Contractor will be responsible for maintaining all new plantings. This will include but is not limited to--- selective pruning for shape, fertilization and ample seasonal irrigation. A maintenance agreement will also be contracted between the Owner and Landscape Contractor. At the completion of the one-year maintenance and warranty period, Cardno will perform a warranty walkthrough with the Landscape Contractor to ensure all trees are established. Trees that require special attention or replacement will be identified at that time and replacement trees will be installed by the Landscape Contractor and provided with a new one-year warranty from the date of replanting.
- After the first year, the applicant's qualified landscape architect shall complete the following quarterly site observations:
    - A visual inspection of the irrigation system for problems and to identify any required repairs.
    - Take soil samples and send to a testing lab. Soil will be tested in at least three (3) landscape diamonds across the site in the spring of each year.
    - Selective pruning of dead limbs or crossed branches.
    - Trees will be inspected for indications of pests or disease. If discovered, the appropriate herbicide or pesticide will be applied per the manufacturer's recommendations, in accordance with state and local codes.

(13) Landscape plans for required landscaped areas that include fences should carefully integrate any fencing into the plan to guide wild animals toward animal crossings under, over, or around transportation corridors. [Ord. 882-92 §15, 12/14/92; Ord. 890-93 §9, 4/12/93; Ord. 904-93 §53 and 54, 9/13/93; Ord. 993-94 §48, 11/28/94; Ord. 1025-99 §41, 7/26/99; Ord. 1035-99 §16, 11/8/99; Ord. 1070-01 §11, 4/9/01; Ord. 1070-01, 4/9/01; Ord. 1216-06, 7/24/06; Ord. 1224-06 §25, 11/13/06; Ord. 1321-11 §49, 4/25/11]

Response: No fences are proposed with this application.

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SECTION 73.250 TREE PRESERVATION.

(1) Trees and other plant materials to be retained shall be identified on the landscape plan and grading plan.

Response: Trees to be retained on-site are identified on Tree Preservation Site Plan submitted as Exhibit O – C 2.0 through C 2.2. The City has approved the removal of trees within the public utility corridor prior to this AR. Trees near and within the building footprints in the northeast corner of the site will be reviewed for removal under the Arborist Report submitted here as Exhibit M. The remaining trees while already reviewed for removal under the approved master plan will not be removed until this AR is complete.

(2) During the construction process:

(a) The owner or the owner's agents shall provide above and below ground protection for existing trees and plant materials identified to remain.

(b) Trees and plant materials identified for preservation shall be protected by chain link or other sturdy fencing placed around the tree at the drip line.

(c) If it is necessary to fence within the drip line, such fencing shall be specified by a qualified arborist as defined in TDC 31.060.

(d) Neither top soil storage nor construction material storage shall be located within the drip line of trees designated to be preserved.

(e) Where site conditions make necessary a grading, building, paving, trenching, boring, digging, or other similar encroachment upon a preserved tree's drip-line area, such grading, paving, trenching, boring, digging, or similar encroachment shall only be permitted under the direction of a qualified arborist. Such direction must assure that the health needs of trees within the preserved area can be met.

(f) Tree root ends shall not remain exposed.

Response: The applicant's representative will provide above and below ground protection for existing trees identified to remain. These trees will feature visible protection to avoid any impact from construction-related activities. If there is proposed work within a preserved tree's drip-line area, the work will be conducted under the direction of a qualified arborist and tree root ends will not be exposed in compliance with this criterion..

(2) Landscaping under preserved trees shall be compatible with the retention and health of said tree.

Response: All landscaping shown on the Landscape Plan will be installed in a manner that preserves and protects any preserved tree in compliance with this criterion.

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(4) When it is necessary for a preserved tree to be removed in accordance with TDC 34.210 the landscaped area surrounding the tree or trees shall be maintained and replanted with trees that relate to the present landscape plan, or if there is no landscape plan, then trees that are complementary with existing, nearby landscape materials. Native trees are encouraged

(5) Pruning for retained deciduous shade trees shall be in accordance with National Arborist Association "Pruning Standards For Shade Trees," revised 1979.

(6) Except for impervious surface areas, one hundred percent (100%) of the area preserved under any tree or group of trees retained in the landscape plan (as approved through the Architectural Review process) shall apply directly to the percentage of landscaping required for a development. [Ord. 904-93, §55, 9/13/93; Ord. 1224-06, §26, 11/13/06]

Response: The Landscape Plan and Tree Removal Plan show the trees to be retained and the trees to be removed. Where trees are removed, the area not approved for development is to be replanted in conformance with the Landscape Plan. During the construction process any trees identified for preservation will be protected with adequate fencing and root protection to ensure tree and root health.

SECTION 73.310 LANDSCAPE STANDARDS - COMMERCIAL, INDUSTRIAL, PUBLIC AND SEMI-PUBLIC USES.

(1) A minimum 5-foot-wide landscaped area must be located along all building perimeters which are viewable by the general public from parking lots or the public right-of-way, excluding loading areas, bicycle parking areas and pedestrian egress/ingress locations. Pedestrian amenities such as landscaped plazas and arcades may be substituted for this requirement. This requirement shall not apply where the distance along a wall between two vehicle or pedestrian access openings (such as entry doors, garage doors, carports and pedestrian corridors) is less than 8 feet.

(2) Areas exclusively for pedestrian use that are developed with pavers, bricks, etc., and contain pedestrian amenities, such as benches, tables with umbrellas, children's play areas, shade trees, canopies, etc., may be included as part of the site landscape area requirement.

(3) All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas or undisturbed natural areas shall be landscaped. [Ord. 882-92, §16, 12/14/92; Ord. 904-93, §58, 9/13/93]

Response: As noted in the Landscape Planting Plan (Exhibit O – Sheets L1.0 through L1.10), foundation and building landscaping will be installed with landscape qualifying material to complement the architectural style and soften building appearance within the overall Site Plan. A minimum of 5-foot wide landscaped area is located along the building perimeters that are viewable by the general public from the right of way or parking areas. In large part, this standard is satisfied through the pedestrian amenities such as landscaped plazas and arcades along the northern building frontages that qualify as landscape elements

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to meet the standard. Aside from loading areas and building entrances, 5-foot wide landscape areas are provided along all building sides. All landscaping meets or exceeds the numerical standards set forth above. Areas with predominate storefronts, multiple entryways, covered arcades, and/or outdoor seating areas provide landscaping between the drive aisle and pedestrian pathways to achieve a well vegetated urban environment.

OFF-STREET PARKING LOT LANDSCAPING

SECTION 73.320 OFF-STREET PARKING LOT LANDSCAPING STANDARDS.

SECTION 73.340 OFF-STREET PARKING LOT AND LOADING AREA LANDSCAPING - COMMERCIAL, INDUSTRIAL, PUBLIC AND SEMI-PUBLIC USES, AND RESIDENTIAL AND MIXED USE RESIDENTIAL USES WITHIN THE CENTRAL DESIGN DISTRICT.

(1) A clear zone shall be provided for the driver at ends of on-site drive aisles and at driveway entrances, vertically between a maximum of 30 inches and a minimum of 8 feet as measured from the ground level, except for parking structures and underground parking where this provision shall not apply.

(2) Perimeter site landscaping of at least 5 feet in width shall be provided in all off-street parking and vehicular circulation areas (including loading areas). For conditional uses in multifamily residential planning districts the landscape width shall be at least 10 feet except for uses allowed by TDC 40.030(3), 40.030(5)(j), 40.030(5)(m), 40.030(5)(n) and 41.030(2).

(a) The landscape area shall contain:

(i) Deciduous trees an average of not more than 30 feet on center. The trees shall meet the requirements of TDC 73.360(7).

(ii) Plantings which reach a mature height of 30 inches in three years which provide screening of vehicular headlights year round.

(iii) Shrubs or ground cover, planted so as to achieve 90 percent coverage within three years.

(iv) Native trees and shrubs are encouraged.

(b) Where off-street parking areas on separate lots are adjacent to one another and are connected by vehicular access, the landscaped strips required in subsection (2) of this section are not required. [Ord. 882-92, §18, 12/14/92; Ord. 904-93, § 61, 9/13/93; Ord. 920-94, §19, 4/11/94; Ord. 1224-06 §30, 11/13/06]

Response: A 5-foot wide landscape area is provided along the perimeter of all off-street parking and vehicular circulation areas. All landscape areas do contain deciduous trees at a spacing no more than 30-feet on center, with ground plantings that reach a mature height of 30-inches in three years. Shrubs or groundcover will achieve 90 percent coverage within three years. A landscape

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planting plan under Exhibit O, Sheets L 1.0 through L1.10 is included with this application demonstrating compliance with this criteria.

SECTION 73.360 OFF-STREET PARKING LOT LANDSCAPE ISLANDS - COMMERCIAL, INDUSTRIAL, PUBLIC, AND SEMI-PUBLIC USES.

(1) A minimum of 25 square feet per parking stall shall be improved with landscape island areas. They may be lower than the surrounding parking surface to allow them to receive stormwater run-off and function as water quality facilities as well as parking lot landscaping. They shall be protected from vehicles by curbs, but the curbs may have spaces to allow drainage into the islands. They shall be dispersed throughout the parking area [see TDC 73.380(3)]. They shall be planted with groundcover or shrubs that will completely cover the island area within 3 years. They shall be planted with deciduous shade trees when needed to meet the parking lot shade tree requirements. Native plant materials are encouraged. Landscape square footage requirements shall not apply to parking structures and underground parking.

Response: With 1,316 parking spaces located throughout Nyberg Rivers, a minimum of 32,900 SF of landscaping is required within landscape islands areas. The total amount of planted area landscaping provided within landscape islands is 53,404 SF, which is well above the 25 SF per stall requirement. As included with the Master plan, and as detailed above and incorporated herein by reference, several parking landscape islands have been approved as landscape diamonds, shown under[Exhibit O, included in this application.. The Landscape Planting Plan (Exhibit O – L1.0 through L1.10) shows a variety of deciduous shade trees located within those landscape islands. Sheet L1.0 outlines the Planting Legend and Notes, with specific reference to tree protection and tree planting installation requirements.

(2) Landscaped island areas with deciduous parking lot shade trees shall be a minimum of 5 feet in width (from inside of curb to curb).

Response: As shown in Exhibit O to this application, 6-foot landscape diamonds with drain rock and perforated pipe are proposed throughout the central vehicle landscape island areas. Traditional landscape islands are also scattered throughout the site, with a width of a minimum of five feet, measured from inside of curb to curb. Under the master plan conditions of approval, and as detailed above these islands will be constructed and maintained in a manner that ensures the targeted growth and canopy.

(3) A minimum of one deciduous shade tree shall be provided for every four (4) parking spaces to lessen the adverse impacts of glare, reduce heat from paved surfaces, and to emphasize circulation patterns. Required shade trees shall be uniformly distributed throughout the parking lot (see TDC 73.380(3)), except that within the Central Design District landscape islands and shade trees may be placed to frame views of the Tualatin Commons water feature or identified architectural focal elements. The trees shall meet the requirements of TDC 73.360(7). Parking lot shade tree requirements shall not apply to parking structures and underground parking.

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Response: With 1,316 parking spaces, there are a total of 329 deciduous trees required within the parking lot landscape islands. There are a total of 547 deciduous trees provided throughout the parking lot area. As shown on the Landscape Planting Plan, the parking lot trees are all deciduous trees and are uniformly distributed throughout the parking areas..

(4) **Landscape islands shall be utilized at aisle ends to protect parked vehicles from moving vehicles and emphasize vehicular circulation patterns. Landscape island location requirements shall not apply to parking structures and under-ground parking.**

Response: As shown on the Site Plan and Landscape Planting Plan, landscape islands are provided at parking area aisle ends. The minimum dimension of these islands is five feet, as dimensioned on the Site Plan.

(5) **Required plant material in landscape islands shall achieve 90 percent coverage within three years. Native shrubs and trees are encouraged.**

Response: The applicant is aware of this provision and will note on the Landscape Planting Plan the requirement to achieve 90 percent coverage within three years. The plants will be installed in a manner that facilitates reaching 90% coverage in 3 years,

(6)

(a) **Except as in (b) below, site access from the public street shall be defined with a landscape area not less than 5 feet in width on each side and extend 25 feet back from the property line for commercial, public, and semi-public development with 12 or more parking spaces and extend 30 feet back from the property line for industrial development, except for parking structures and under-ground parking which shall be determined through the Architectural Review process.**

(b) **In the Central Design District where driveway access is on local streets, not collectors or arterials, and the building(s) on the property is(are) less than 5,000 square feet in gross floor area, or parking is the only use on the property, site access from the public street shall be defined with a landscape area not less than 5 feet in width on each side and extend 5 feet back from the property line, except for parking structures and underground parking which shall be determined through the Architectural Review process.**

Response: As shown on the Site Plan attached as Exhibit O, Sheets C1.0 through C1.2 and the Cross Section A-A attached as Exhibit A for the site entry at Nyberg Street, the central entry includes tree lined planters on both sides of the travel lanes and a landscaped median. The west side of the street features a 14-foot shared path with tree wells and a 4-foot planter. The east side of the street features a planter that ranges from 4-feet to 7-feet. These landscape areas continue into the site before terminating in front of the central pedestrian plaza.

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Cross-Section D-D, included under Exhibit A with this application, shows the general configuration for Street 'A', which includes 4-foot landscape planters on both the east and west sides of the street, with a 12-foot multi-use path on the west side and a 5-foot sidewalk on the east side of the property. A 2-foot minimum landscape planter is located back of the pathways to provide additional buffering for pedestrians.

Based on the street configuration shown for SW Seneca Street on the Site Plan included under Exhibit O and Sheet C1.0, a 5 to 6-foot landscape planter is provided between the sidewalk and traffic and bicycle lanes.

(7) Deciduous shade trees shall meet the following criteria:

(a) Reach a mature height of 30 feet or more;

(b) Cast moderate to dense shade in summer;

(c) Long lived, i.e., over 60 years;

(d) Do well in an urban environment:

(i) Pollution tolerant.

(ii) Tolerant of direct and reflected heat.

(e) Require little maintenance:

(i) Mechanically strong.

(ii) Insect- and disease-resistant.

(iii) Require little pruning.

(f) Be resistant to drought conditions;

(g) Be barren of fruit production. [Ord. 882-92, §20, 12/14/92; Ord. 904-93, §64, 9/13/93; Ord. 920-94, §20, 4/11/94; Ord. 945-95, §1, 5/8/95; Ord. 1224-06 §32, 11/13/06]

Response: The proposed deciduous shade trees shown on the Landscape Planting Plan have been selected to achieve the minimum criteria outlined above. The deciduous trees include: oaks, maples, honey locust and ash, which have been selected due to their ability to cast a moderate to dense shade in the summer, live over 60 years, do well in an urban setting, require little maintenance, be resistant to drought conditions, and yield no fruit.

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SECTION 73.370 OFF-STREET PARKING AND LOADING.

(1) General Provisions.

(a) At the time of establishment of a new structure or use, or change in use, or change in use of an existing structure, within any planning district of the City, off-street parking spaces, off-street vanpool and carpool parking spaces for commercial, institutional and industrial uses, off-street bicycle parking, and off-street loading berths shall be as provided in this and following sections, unless greater requirements are otherwise established by the conditional use permit or the Architectural Review process, based upon clear findings that a greater number of spaces are necessary at that location for protection of public health, safety and welfare or that a lesser number of vehicle parking spaces will be sufficient to carry out the objectives of this section. In the Central Design District, the Design Guidelines of TDC 73.610 shall be considered. In case of conflicts between guidelines or objectives in TDC Chapter 73, the proposal shall provide a balance.

Response: As this project represents both a change in use and the establishment of new structures, the general provisions outlined in this section do apply.

(b) At the time of enlargement of an existing multi-family residential, commercial, institutional or industrial structure or use, TDC 73.370 shall apply to the existing and enlarged structure or use.

Response: As this project represents both a change in use and the establishment of new structures, the general provisions outlined in this section do apply.

(c) Except where otherwise specified, the floor area measured shall be the gross floor area of the building primary to the function of the particular use of the property other than space devoted to off-street parking or loading.

Response: All floor area measurements do use the gross floor area of the building, which is used to determine parking requirements by use, as well as transportation trip generation rates.

(d) Where employees are specified, the term shall apply to all persons, including proprietors, working on the premises during the peak shift.

Response: Specific employees by tenant are not identified with this ARB application.

(e) Calculations to determine the number of required parking spaces and loading berths shall be rounded to the nearest whole number.

Response: All calculations are rounded to the nearest whole number.

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(f) **If the use of a property changes, thereby increasing off-street parking or loading requirements, the increased parking/loading area shall be provided prior to commencement of the new use.**

Response: The applicant is aware of this provision. All parking/loading area requirements are calculated based on the proposed new uses.

(g) **Parking and loading requirements for structures not specifically listed herein shall be determined by the Community Development Director, based upon requirements of comparable uses listed.**

Response: All proposed structures generally fall within a defined land use designation category as defined by the Tualatin Development Code.

(h) **When several uses occupy a single structure, the total requirements for off-street parking may be the sum of the requirements of the several uses computed separately or be computed in accordance with TDC 73.370(1)(m), Joint Use Parking.**

Response: The total requirements for off-street parking do include the sum of all uses within Nyberg Rivers. These uses were calculated both on a separate and combined shopping center use designation. Off-street parking spaces provided exceed both the individual uses and combined shopping center parking requirements.

(i) **Off-street parking spaces for dwellings shall be located on the same lot with the dwelling. Other required parking spaces may be located on a separate parcel, provided the parcel is not greater than five hundred (500) feet from the entrance to the building to be served, measured along the shortest pedestrian route to the building. The applicant must prove that the parking located on another parcel is functionally located and that there is safe vehicular and pedestrian access to and from the site. The parcel upon which parking facilities are located shall be in the same ownership as the structure.**

Response: All off-street parking spaces are located on-site, within the Nyberg Rivers complex.

(j) **Required parking spaces shall be available for the parking of operable passenger automobiles of residents, customers, patrons and employees and shall not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business.**

Response: The applicant is aware of this provision. All parking spaces proposed on-site will be available for the customers, patrons, and employees at Nyberg Rivers.

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(k) **Institution of on-street parking, where none is previously provided, shall not be done solely for the purpose of relieving crowded parking lots in commercial or industrial planning districts.**

Response: There is no on-street parking proposed with this project.

(l) **Parking facilities may be shared by users on adjacent parcels if the following standards are met:**

(i) **One of the parcels has excess parking spaces, considering the present use of the property; the other parcel lacks sufficient area for required parking spaces.**

(ii) **The total number of parking spaces meets the standards for the sum of the number of spaces which would be separately required for each use.**

(iii) **Legal documentation, to the satisfaction of the City Attorney, shall be submitted verifying permanent use of the excess parking area on one lot by patrons of the uses deficient in required parking area.**

(iv) **Physical access between adjoining lots shall be such that functional and reasonable access is actually provided to uses on the parcel deficient in parking spaces.**

(v) **Adequate directional signs shall be installed specifying the joint parking arrangement.**

(vi) **Areas in the Natural Resource Protection Overlay District, Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan, or a Clean Water Services Vegetated Corridor would be better protected.**

Response: All parcels associated with Nyberg Rivers within the proposed development area will allow for general off-street parking for customers, patrons, and employees to the site.

(m) **Joint Use Parking. Joint use of parking spaces may occur where two or more separate developments or multiple uses in a development are able to jointly use some or all of the same required parking spaces because their parking demands occur at different times. Joint use of parking spaces may be allowed if the following standards are met:**

(i) **There shall be no substantial conflict in the principal operating hours of the buildings or uses for which the joint use parking is proposed. Future change of use, such as expansion of a building or establishment of hours of operation which conflict with or affect a joint use parking agreement are prohibited, unless approval is obtained through the Architectural Review process;**

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(ii) **The joint use parking spaces shall be located no more than 500 feet from a building or use to be served by the joint use parking;**

(iii) **The number and location of parking spaces, hours of use and changes in operating hours of uses subject to joint use shall be approved through the Architectural Review process;**

(iv) **Legal documentation, to the satisfaction of the City Attorney, shall be submitted verifying the joint use parking between the separate developments. Joint use parking agreements may include provisions covering maintenance, liability, hours of use and cross easements; and**

(v) **The City Attorney approved legal documentation shall be recorded by the applicant at the Washington or Clackamas County Recorder's Office and a copy of the recorded document submitted to the Planning Department prior to issuance of a building permit.**

(vi) **Areas in the Natural Resource Protection Overlay District, Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan, or a Clean Water Services Vegetated Corridor would be better protected.**

Response: All parcels associated with Nyberg Rivers within the proposed development area will allow for general off-street parking for customers, patrons, and employees to the site.

(n) **Bicycle parking facilities shall either be lockable enclosures in which the bicycle is stored, or secure stationary racks which accommodate a bicyclist's lock securing the frame and both wheels.**

Response: As shown on the Bicycle Parking and Trash Enclosure Plan included under Exhibit O, the proposed bicycle parking options will include a ground mounted bike rack (Type A), a trash enclosure with hanging bicycle racks (Type B), and a standalone bike enclosure (Type C). There are a total of (91) Type A, (36) Type B and (24) Type C bicycle parking options for a total of 151 bicycle parking spaces. Each of these options will allow for bicycle storage that will accommodate a bicyclist's lock.

(o) **Each bicycle parking space shall be at least 6 feet long and 2 feet wide, and overhead clearance in covered areas shall be at least 7 feet, unless a lower height is approved through the Architectural Review process.**

Response: An elevation of the Type A, B and C bicycle parking options are shown on the Bicycle Parking and Trash Enclosure Plan within Exhibit O. The Type B design features a 10-foot overhead clearance, with vertical spacing at least 2-feet wide. The Type C enclosure allows for 8-feet of overhead clearance, with 14-feet spacing to accommodate 8 bikes.

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(p) **A 5-foot-wide bicycle maneuvering area shall be provided beside or between each row of bicycle parking. It shall be constructed of concrete, asphalt or a pervious surface such as pavers or grasscrete, but not gravel or woody material, and be maintained.**

Response: All proposed bicycle parking areas will provide a 5-foot wide bicycle maneuvering area between each row of bicycle parking. This area will be constructed of concrete or concrete pavers.

(q) **Access to bicycle parking shall be provided by an area at least 3 feet in width. It shall be constructed of concrete, asphalt or a pervious surface such as pavers or grasscrete, but not gravel or woody material, and be maintained.**

Response: Access to the bicycle parking areas will be provided by an area at least 3-feet in width, constructed of concrete or concrete pavers.

(r) **Required bicycle parking shall be located in convenient, secure, and well-lighted locations approved through the Architectural Review process. Lighting, which may be provided, shall be deflected to not shine or create glare into street rights-of-way or fish and wildlife habitat areas.**

Response: The proposed bicycle parking locations are shown on the Bicycle Parking and Trash Enclosure Plan included under Exhibit O in this application. These areas are spaced across the site to allow for ample bicycle parking options for the multiple tenant spaces, with both covered and uncovered options. These areas will be well lit, with minimal candling onto adjacent properties.

(s) **Bicycle parking facilities may be provided inside a building in suitable secure and accessible locations.**

Response: All proposed bicycle parking is located outside any building. Specific tenants may desire to locate bicycle parking inside their space, although no interior parking is proposed at this time.

(t)

(u) **Bicycle parking areas and facilities shall be identified with appropriate signing as specified in the Manual on Uniform Traffic Control Devices (MUTCD) (latest edition). At a minimum, bicycle parking signs shall be**

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located at the main entrance and at the location of the bicycle parking facilities.

Response: Bicycle parking areas and facilities will be identified with the appropriate signing as specified by the above-noted manual. Bicycle parking signs will be located at the main entrance and at the specific location of the bike parking facilities.

(v) Required bicycle parking spaces shall be provided at no cost to the bicyclist, or with only a nominal charge for key deposits, etc. This shall not preclude the operation of private for-profit bicycle parking businesses.

Response: There will be no charge for required bicycle parking spaces.

(w) Parking on existing residential, commercial and industrial development may be redeveloped as a transit facility as a way to encourage the development of transit supportive facilities such as bus stops and pullouts, bus shelters and park and ride stations. Parking spaces converted to such uses in conjunction with the transit agency and approved through the Architectural Review process will not be required to be replaced.

Response: There are no transit facilities proposed with this redevelopment project. There is an existing Tri-Met bus stop located along Martinazzi Boulevard, just west of the site. Access to the bus stop is provided via the Seneca Street extension or Street 'A'.

(x) Required vanpool and carpool parking shall meet the 9-foot parking stall standards in Figure 73-1 and be identified with appropriate signage.

Response: There is no proposed vanpool or carpool parking.

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Bicycle Parking Diagram

LEGEND	TYPE OF BIKE RACK
(blue)	BIKE RACK A - FITS 7 BIKES PER MODULE
(orange)	TRASH ENCLOSURE B WITH HANGING BIKES - FITS 12 BIKES
(green)	BIKE ENCLOSURE C - FITS 24 BIKES

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	REQUIRED	PROVIDED	RACK TYPE/QTY
OVERALL BICYCLE PARKING	147 SPACES	151 SPACES	(84) TYPE A. (36) TYPE B. (24) TYPE C
COVERED BICYCLE PARKING	74 SPACES (50% OF OVERALL)	74 SPACES	(14) TYPE A. (36) TYPE B. (24) TYPE C
UNCOVERED BICYCLE PARKING	NO SPECIFIC REQUIREMENTS	77 SPACES	(77) TYPE A

BIKE PARKING REQUIRED : 0.50 space per 1.000 sq. ft. of gross floor area 50 % COVERED

293.919 SF / 1000 * 0.50 = 146.95 OR 147 REQ'D (147 * 0.5 = 74 REQ'D COVERED)

(2) Off-Street Parking Provisions.

(a) The following are the minimum and maximum requirements for off-street motor vehicle parking in the City, except for minimum parking requirements for the uses in TDC 73.370(2)(a) (Residential Uses: iii, iv, v, vi, vii; Places of Public Assembly: I, ii, iv; Commercial Amusements: I, ii; and Commercial: I, ii, xi, xii, xiv) within the Core Area Parking District (CAPD). Minimum standards for off-street motor vehicle parking for the uses in 73.370(2) (a) Residential Uses: iii, iv, v, vi, vii; Places of Public Assembly: I, ii, iv; Commercial Amusements: I, ii; and Commercial: I, ii, xi, xii, xiv in the CAPD are in TDC 73.370(2)(b). The maximum requirements are divided into Zone A and Zone B, as shown on the Tualatin Parking Zone Map, Figure 73-3. The following are exempt from calculation of maximum parking requirements: parking structures; fleet parking; parking for vehicles for sale, lease or rent; car/vanpool parking; dedicated valet parking; and user-paid parking.

USE	MINIMUM MOTOR VEHICLE PARKING REQUIREMENT	MAXIMUM MOTOR VEHICLE PARKING REQUIREMENT	BICYCLE PARKING REQUIREMENT	PERCENTAGE OF BICYCLE PARKING TO BE COVERED
(iii) Shopping center (over 100,000 sq. ft. of gross floor area)	**4.1 spaces per 1,000 sq. ft. of gross floor area**	**Zone A: 5.1 spaces per 1,000 sq. ft. gross floor area Zone B: 6.2 spaces per 1,000 sq. ft. gross floor area**	**0.50 space per 1,000 sq. ft. of gross floor area**	**50**

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Response: The Nyberg Rivers commercial area is classified as a shopping center with greater than 100,000 SF of gross floor area. Therefore, the parking requirement of 4.1 spaces per 1,000 SF of gross floor area is applied. With a maximum permissible building area of 307,000 SF, the minimum number of spaces required is 1,259, while the total parking stalls provided is 1,316 stalls. The City has also asked that we assess each tenant space based on the specific use for each space. Using this calculation as shown in the table below, there is 1 less stall required versus the general shopping center use designation. Therefore, the minimum parking stall requirement is met.

As shown in the second table provided below, ~~For~~ 147 bicycle parking ~~147~~ spaces are required on-site based on the overall shopping center designation. A breakout of specific uses would require a total of 253 parking spaces, with 112 of those stalls requiring a cover. The location of the bicycle parking stalls is shown on the Bicycle Parking Diagram above, as well as the Bicycle Parking and Trash Enclosure Plan included under Exhibit O.

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VEHICLE PARKING REQUIREMENTS

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BUILDING	SF	USE	MINIMUM PARKING RATIO	MINIMUM PARKING	MAXIMUM PARKING RATIO	MAXIMUM PARKING
1005	33,562	Retail Shop	4/1000	134	5.1/1000	171
1010	21,750	Retail Shop	4/1000	87	5.1/1000	111
1030	2,900	Restaurant	10/1000	29	19.1/1000	55
1040	110,093	Shopping Center	4.1/1000	451	5.1/1000	561
A	12,500	Retail Shop	4/1000	50	5.1/1000	64
B	5,850	Retail Shop	4/1000	23	5.1/1000	30
C	3,950	Bank	4.3/1000	17	5.4/1000	21
D	32,459	Retail Shop	4/1000	130	5.1/1000	166
E	3,172	Bank	4.3/1000	14	5.4/1000	17
F	5,500	Drive Up Restaurant	9.9/1000	54	12.4/1000	68
G-100	6,500	Restaurant	10/1000	65	19.1/1000	124
H-100	4,526	Drive Up Restaurant	9.9/1000	45	12.4/1000	56
J-100	5,797	Restaurant	10/1000	58	19.1/1000	111
N-100	45,000	Health Club	1/1000	45	1.3/1000	59
	293,559		**TOTAL**	**1,203**		**1,614**

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Total Area As Shopping Center	293,559	Shopping Center	4.1/1000	1,204	5.1/1000	1,497

BICYCLE PARKING REQUIREMENTS

BUILDING	SF	USE	BICYCLE PARKING RATIO	MINIMUM BICYCLE PARKING	COVERED BIKE PARKING
1005	33,562	Retail Shop	0.5/1,000 SF	17	8.39
1010	21,750	Retail Shop	0.5/1,000 SF	11	5.44
1030	2,900	Restaurant	2/1,000 SF	6	1.45
1040	110,093	Shopping Center	0.5/1,000 SF Gross Floor Area	55	27.52
A	12,500	Retail Shop	0.5/1,000 SF	6	3.13
B	5,850	Retail Shop	0.5/1,000 SF	3	1.46
C	3,950	Bank	2 or 0.33/1,000 SF Whichever is greater	2	0.20
D	32,459	Retail Shop	0.5/1,000 SF	16	8.11
E	3,172	Bank	2 or 0.33/1,000 SF Whichever is greater	2	0.20
F	5,500	Drive Up Restaurant	2/1,000 SF	11	2.75
G-100	6,500	Restaurant	2/1,000 SF	13	3.25
H-100	4,526	Drive Up Restaurant	2/1,000 SF	9	2.26
J-100	5,797	Restaurant	2/1,000 SF	12	2.90
N-100	45,000	Health Club	2/1,000 SF Exercise Area	90	45.00
	293,559			**253**	**112**
Total Area	293,559	Shopping Center		147	73.39

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SECTION 73.380 OFF-STREET PARKING LOTS.

A parking lot, whether an accessory or principal use, intended for the parking of automobiles or trucks, shall comply with the following:

(1) Off-street parking lot design shall comply with the dimensional standards set forth in Figure 73-1 of this section, except for parking structures and underground parking where stall length and width requirements for a standard size stall shall

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be reduced by .5 feet and vehicular access at the entrance if gated shall be a minimum of 18 feet in width.

Response: Figure 73-1 requires standard 90-degree parking stall dimensions of 9-feet wide by 18.5-feet deep, with a 24-foot aisle width between stall lines. Subcompact parking requires a stall width of 7.7-feet, stall depth of 15-feet, with a 20-foot aisle width. As shown on the Site Plan, Sheets C1.0 through C1.2, the proposed standard parking stall dimensions are 9-feet by 19-feet, with compact stalls measuring 7.7-feet by 16-feet. All drive aisles widths on-site are 24-feet or greater. These dimensions exceed the standard parking requirements.

(2) Parking stalls for sub-compact vehicles shall not exceed 35 percent of the total parking stalls required by TDC 73.370(2). Stalls in excess of the number required by TDC 73.370(2) can be sub-compact stalls.

Response: There are 1,316 total parking stalls located within the Nyberg Rivers site. 228, or approximately 17%, of those stalls are sub-compact parking stalls as shown on the attached Site Plan (Exhibit O – Sheets C1.0 through C1.2). Of these 22 of the total stalls are Handicap Accessible. The applicant provides sub-compact spaces throughout the site, but well below the 35-percent threshold

(3) Off-street parking stalls shall not exceed eight continuous spaces in a row without a landscape separation, except for parking structures and underground parking. For parking lots within the Central Design District that are designed to frame views of the central water feature or identified architectural focal elements as provided in TDC 73.350(3), this requirement shall not apply and the location of parking lot landscape islands shall be determined through the Architectural Review process.

Response: The Site Plans and Landscape Planting Plans included under Exhibit O demonstrate that off-street parking stalls do not exceed eight continuous spaces without a landscape island or diamond separation.

(4) Parking lot drive aisles shall be constructed of asphalt or concrete, including pervious concrete. Parking stalls shall be constructed of asphalt or concrete, or a pervious surface such as pavers or grasscrete, but not gravel or woody material. Drive aisles and parking stalls shall be maintained adequately for all-weather use and drained to avoid water flow across sidewalks. Pervious surfaces such as pervious concrete, pavers and grasscrete, but not gravel or woody material, are encouraged for parking stalls in or abutting the Natural Resource Protection Overlay District, Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan, or in a Clean Water Services Vegetated Corridor.

Response: Parking lot drive aisles will be constructed of asphalt, while parking stalls will also be constructed of asphalt. The maintenance of these areas will be conducted by the Nyberg Rivers maintenance staff.

(5) Artificial lighting, which may be provided, shall be deflected to not shine or create glare in a residential planning district, an adjacent dwelling, street right-of-way in such a manner as to impair the use of such way or a Natural Resource Protection

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Overlay District, Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan, or a Clean Water Services Vegetated Corridor.

Response: Artificial lighting will be deflected to avoid shining or creating glare into any residential planning district, street right-of-way or adjacent dwelling. A site Photometric Plan is provided with this ARB submittal package to address these requirements is included within Exhibit O. The lighting is deflected to reduce light trespass at the property lines. The northwest corner of the site that is adjacent to existing residential development does not exceed .1 foot candles at the property line.

(8) Service drives to off-street parking areas shall be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, and maximum safety of pedestrians and vehicular traffic on the site.

Response: As noted above and shown on the Site Plans, Sheets C1.0 through C1.2, all drive aisles are 24-feet or greater. These drive aisles provide both north-south and east-west circulation that connects with the central vehicle entry off Nyberg Street, with secondary access from Street 'A' and Seneca Street. Service drive aisles will be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, while promoting the maximum safety of pedestrians and vehicular traffic on the site.

(9) Parking bumpers or wheel stops or curbing shall be provided to prevent cars from encroaching on the street right-of-way, adjacent landscaped areas, or adjacent pedestrian walkways.

Response: Curbing will be provided to prevent cars from encroaching on to the street right-of-way, adjacent landscaped areas and adjacent pedestrian walkways. [All proposed curbing is shown on the Site Plans under Exhibit O, Sheet C1.0 through 1.2, with a specific "Proposed Curb Line" line type shown in the Site Plan legend.

(10) Disability parking spaces and accessibility shall be provided in accordance with applicable federal and state requirements.

Response: As shown on the Site Plans, Exhibit O—Sheets C1.0 through C1.2, a total of 22 ADA compliant parking spaces are provided nearest the building entrances in those parking areas closest to the primary entrances of the tenant spaces. These stalls are provided in accordance with federal and state requirements.

(11) On-site drive aisles without parking spaces, which provide access to parking areas with regular spaces or with a mix of regular and sub-compact spaces, shall have a minimum width of 22 feet for two-way traffic and 12 feet for one-way traffic. On-site drive aisles without parking spaces, which provide access to parking areas with only sub-compact spaces, shall have a minimum width of 20 feet for two-way traffic and 12 feet for one-way traffic. [Ord. 882-92, §22, 12/14/92; Ord. 904-93, §68, 69 and 70, 9/13/93; Ord. 920-94, §22, 4/11/94; Ord. 956-96, §38, 1/8/96; Ord. 1224-06 §34, 11/13/06]

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Response: As shown on the Site Plans, Exhibit O—Sheets C1.0 through C1.2, all proposed on-site drive aisles are dimensioned to be 24-feet or greater, surpassing the minimum width requirement of 22-feet.

SECTION 73.390 OFF-STREET LOADING FACILITIES.

(1) The minimum number of off-street loading berths for commercial, industrial, public and semi-public uses is as follows:

Square Feet of Floor Area	Number of Berths
Less than 5,000	0
5,000 - 25,000	1
25,000 - 60,000	2
60,000 and over	3

(2) Loading berths shall conform to the following minimum size specifications.

(a) Commercial, public and semi-public uses of 5,000 to 25,000 square feet shall be 12' x 25' and uses greater than 25,000 shall be 12' x 35'

(b) Industrial uses - 12' x 60'

(c) Berths shall have an unobstructed height of 14'

(d) Loading berths shall not use the public right-of-way as part of the required off-street loading area.

(3) Required loading areas shall be screened from public view from public streets and adjacent properties by means of sight-obscuring landscaping, walls or other means, as approved through the Architectural Review process.

(4) Required loading facilities shall be installed prior to final building inspection and shall be permanently maintained as a condition of use.

(6) The off-street loading facilities shall in all cases be on the same lot or parcel as the structure they are intended to serve. In no case shall the required off-street loading spaces be part of the area used to satisfy the off-street parking requirements.

(7) Subject to Architectural Review approval, the Community Development Director may allow the standards in this Section to be relaxed within the Central Design District, where a dense mix of uses is desirable in close proximity, pedestrian circulation is strongly emphasized, and the orientation of structures around a central water feature virtually eliminates the possibility of reserving any side of a

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building solely for truck access. Adjustments may include, but are not limited to, reduction in the number of loading berths required, adjustment of loading berth size specifications and right-of-way restrictions, shared loading berths and maneuvering areas for use by more than one building, alteration or elimination of screening requirements, and requirements for maintenance of berths in a clean and visually appealing condition. [Ord. 882-92, §23, 12/14/92; Ord. 956-96, §39, 1/8/96]

Response: As shown on the Site Plans, Exhibit O—Sheets C1.0 through C1.2, off-street loading facilities are located behind the central buildings, thereby screening these areas from public view. These on-site loading areas provide semi-truck access into and through the site, with truck turning radii to allow semi-trucks up to 62-feet in length. There are more than three (3) loading areas shown on the Site Plan surpassing the 3 space minimum required by code. All berths meet the 14-foot height requirement and are 68 feet long by 17.5 feet wide. Buildings 1005, 1030 and 1040 each have one loading space provided that is detailed on the attached site plan included as part of Exhibit O.

SECTION 73.400 ACCESS.

(1) The provision and maintenance of vehicular and pedestrian ingress and egress from private property to the public streets as stipulated in this Code are continuing requirements for the use of any structure or parcel of real property in the City of Tualatin. No building or other permit shall be issued until scale plans are presented that show how the ingress and egress requirement is to be fulfilled. If the owner or occupant of a lot or building changes the use to which the lot or building is put, thereby increasing ingress and egress requirements, it shall be unlawful and a violation of this code to begin or maintain such altered use until the required increase in ingress and egress is provided.

Response: As part of the Master Plan approval, the City Council approved the location of all access points to the project. As shown on the Site Plans (Exhibit O, Sheets C1.0 through C1.2), the access points proposed as part of this application conform to the approved Master Plan. Ingress and egress are provided at Nyberg Street, Street 'A' and Seneca Street. Scaled dimensions of these accessways are provided on the Site Plan included with this ARB package, with the Master Plan approved cross-sections included under Exhibit A for supporting evidence.

(2) Owners of two or more uses, structures, or parcels of land may agree to utilize jointly the same ingress and egress when the combined ingress and egress of both uses, structures, or parcels of land satisfies their combined requirements as designated in this code; provided that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases or contracts to establish joint use. Copies of said deeds, easements, leases or contracts shall be placed on permanent file with the City Recorder.

Response: An access easement will be established to allow for joint ingress and egress to serve both the properties owned by the Nyberg family, as well as the MacBale properties. A 15-foot access easement is shown from the main entrance off Nyberg Street to connect to the ODOT maintenance easement and the (6) tax

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lots that currently use the existing access road. The 15-foot access easement will be located within the proposed 62.50' access easement at the primary entry before tying into the 30-foot ODOT access easement along the east-west drive aisle just north of Building E. This 30-foot easement continues to the east before heading in a northeasterly direction. At this point the proposed 15-foot access easement swings southeast to connect to the 10-foot maintenance easement. See Sheets C1.0 and C1.1 under Exhibit O for reference.

(3) Joint and Cross Access.

(a) Adjacent commercial uses may be required to provide cross access drive and pedestrian access to allow circulation between sites.

(b) A system of joint use driveways and cross access easements may be required and may incorporate the following:

(i) a continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards.

(ii) a design speed of 10 mph and a maximum width of 24 feet to accommodate two-way travel aisles designated to accommodate automobiles, service vehicles, and loading vehicles;

(iii) stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross access via a service drive;

(iv) a unified access and circulation system plan for coordinated or shared parking areas.

(c) Pursuant to this section, property owners may be required to:

(i) Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive;

(ii) Record an agreement with the deed that remaining access rights along the roadway will be dedicated to the city and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;

(iii) Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners;

(iv) If (i-iii) above involve access to the state highway system or county road system, ODOT or the county shall be contacted and shall approve changes to (i-iii) above prior to any changes.

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Response: All commercial uses and properties on-site will be utilizing the network of drive aisles, accessways, and driveways into and through the site. The entire site will operate as a single shopping center, with each tenant having the right to utilize the entire shopping center, all drives, aisles, parking and accessways. Per coordination with ODOT, a 10-foot wide maintenance access easement along the new Nyberg Street right-of-way is shown on the Site Plan, Sheet C1.1 under Exhibit O. Also, a 15-foot access easement is shown from the main entrance off Nyberg Street to connect to the ODOT maintenance easement and the (6) tax lots that currently use the existing access road.

(4) Requirements for Development on Less than the Entire Site.

(a) To promote unified access and circulation systems, lots and parcels under the same ownership or consolidated for the purposes of development and comprised of more than one building site shall be reviewed as one unit in relation to the access standards. The number of access points permitted shall be the minimum number necessary to provide reasonable access to these properties, not the maximum available for that frontage. All necessary easements, agreements, and stipulations shall be met. This shall also apply to phased development plans. The owner and all lessees within the affected area shall comply with the access requirements.

(b) All access must be internalized using the shared circulation system of the principal commercial development or retail center. Driveways should be designed to avoid queuing across surrounding parking and driving aisles.

Response: The entire site is being developed as a cohesive shopping center, and no property is being omitted from the development. Pursuant to the master plan approval, the City Council approved all access points for the property. Those access points are shown on the Site Plan Sheets C1.0 through C1.2 under Exhibit O and are consistent with the approved Master Plan. There are five proposed access points into the site, with the primary access via Nyberg Street and secondary access points from Boones Ferry Road via Street 'A' and SW Seneca Street. Existing access points west of the primary entrance along Nyberg Street and just north on Martinazzi Avenue will be maintained with this redevelopment.

(5) Lots that front on more than one street may be required to locate motor vehicle accesses on the street with the lower functional classification as determined by the City Engineer.

Response: The City Council comprehensively reviewed the site access for the redeveloped project under the master plan proceedings. The Site Plan, attached as Exhibit O, Sheets C1.0- C1.2, is in compliance with the access plan approved by the City Council in the master plan decision. Specifically, the City adopted the location and design of the Loop Road as shown on the Site Plan. The master plan findings relative to the Loop Road are excerpted here and incorporated by reference:

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Attachment A-2

"The City Council finds that the applicant is providing a Loop Road in the location permitted by the TSP and has designed that road consistent with the terms of the Urban Renewal Plan. The City's TSP shows a "future minor collector" on the project site. The future minor collector is shown as a dashed green line that connects Boones Ferry with Seneca Street and SW Nyberg Street. No specific alignment is proposed in the TSP. Rather, Figure 1 expressly states: "Future roadway alignments are approximate and subject to additional engineering and design." The TSP further provides that the function of this minor collector is to "connect two major arterials, SW Boones Ferry Road and SW Nyberg Street." The TSP shows the additional task of connecting Seneca Street to Boones Ferry and SW Nyberg through the site. This location is in the same conceptual location shown in the 2013 TSP. ...The Loop Road is not in the parking lot drive aisles. Instead the Loop Road commences at Boones Ferry Road continues through the site connecting with the improved Seneca Street and continues with a through connection to SW Nyberg Street. This location is consistent with the TSP and fully meets the desired objective of the Loop Road which is to connect Seneca Street, Boones Ferry and SW Nyberg Street.

The Urban Renewal Plan also specifically addresses the design of the Loop Road under the section entitled, Public Improvements at page 19. There the Plan defines the Loop Road as a minor collector. It then states: "This entire street will be a special section, but will generally follow Street Section Cb and be modified as specific areas warrant."

Street cross-section Cb has been amended with the updated TSP and is now listed as a "Minor Collector" in TDC Chapter 74 Figures 74-2A through 74-2G which provides two travel lanes, bike lanes, a plant strip and a sidewalk. The standard is not prescriptive and like the Urban Renewal Plan can be a special section that is modified as specific areas warrant. Accordingly, not only is the Loop Road specifically called out as a special section in the Urban Renewal Plan with anticipated modifications to the minor collector standards, the standard referenced also provides a recommendation that can be modified by the City Engineer or, in the case of a master plan, by the City Council.

The Loop Road cross sections are consistent with the description of the Loop Road in the Urban Renewal Plan. The cross sections provide sidewalks and/or shared paths, bike facilities, at least 2 travel lanes, and landscaped planter areas. In some cases, these cross sections provide even greater ultimate width than is shown in Minor Collector."

The Loop Road cross sections are attached as Exhibit A.

(6) Except as provided in TDC 53.100, all ingress and egress shall connect directly with public streets. [Ord. 882-92, § 24,12/14/92]

Response: As shown on the Site Plan, Exhibit O, Sheets C1.0 through C1.2, all ingress and egress points connect directly with Nyberg Street, Boones Ferry Road and/or Martinazzi Avenue, all defined as public streets. The site is also served by a new minor collector, the Loop Road described above, in compliance with this criterion.

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(7) Vehicular access for residential uses shall be brought to within 50 feet of the ground floor entrances or the ground floor landing of a stairway, ramp or elevator leading to dwelling units.

Response: No residential uses are proposed within Nyberg Rivers. This provision does not apply.

(8) To afford safe pedestrian access and egress for properties within the City, a sidewalk shall be constructed along all street frontage, prior to use or occupancy of the building or structure proposed for said property. The sidewalks required by this section shall be constructed to City standards, except in the case of streets with inadequate right-of-way width or where the final street design and grade have not been established, in which case the sidewalks shall be constructed to a design and in a manner approved by the City Engineer. Sidewalks approved by the City Engineer may include temporary sidewalks and sidewalks constructed on private property; provided, however, that such sidewalks shall provide continuity with sidewalks of adjoining commercial developments existing or proposed. When a sidewalk is to adjoin a future street improvement, the sidewalk construction shall include construction of the curb and gutter section to grades and alignment established by the City Engineer.

Response: Sidewalks, pedestrian plazas, and general pedestrian access into and through the site were all approved in the master plan and are incorporated here as shown on the Site Plan under Exhibit O, Sheets C1.0 through C1.2. The Pedestrian and Bicycle Plan included with the Master Plan and incorporated here in Exhibit A includes the locations of all proposed sidewalks and pathways, while specific design elements are shown on the cross-sections provided with the approved Master Plan and attached here as Exhibit A. Each of these paths provides safe pedestrian access and egress along all street and building frontages and are proposed to City standards.

(14) Maximum Driveway Widths and Other Requirements.

(a) Unless otherwise provided in this chapter, maximum driveway widths shall not exceed 40 feet.

(b) Except for townhouse lots, no driveways shall be constructed within 5 feet of an adjacent property line, except when two adjacent property owners elect to provide joint access to their respective properties, as provided by Subsection (2).

(c) There shall be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Engineer.

Response: Although the existing entrance provided between Buildings A and B from Nyberg Street and the alley entrance behind Building A may be defined as a driveway, none of the proposed access points qualify as a driveway. The proposed central

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entry from Nyberg Street, as well as the secondary accesses from Seneca and Street 'A', is defined as a street with required easement dedication. Therefore, the minimum distance spacing requirements do not apply.

(15) Distance between Driveways and Intersections.

Except for single-family dwellings, the minimum distance between driveways and intersections shall be as provided below. Distances listed shall be measured from the stop bar at the intersection.

(a) At the intersection of collector or arterial streets, driveways shall be located a minimum of 150 feet from the intersection.

(b) At the intersection of two local streets, driveways shall be located a minimum of 30 feet from the intersection.

(c) If the subject property is not of sufficient width to allow for the separation between driveway and intersection as provided, the driveway shall be constructed as far from the intersection as possible, while still maintaining the 5-foot setback between the driveway and property line as required by TDC 73.400(14)(b).

(d) When considering a public facilities plan that has been submitted as part of an Architectural Review plan in accordance with TDC 31.071(6), the City Engineer may approve the location of a driveway closer than 150 feet from the intersection of collector or arterial streets, based on written findings of fact in support of the decision. The written approval shall be incorporated into the decision of the City Engineer for the utility facilities portion of the Architectural Review plan under the process set forth in TDC 31.071 through 31.077.

Response: The applicant is not proposing to construct any new driveway approaches. One driveway is proposed to remain southeast of Building A which is located over 200 feet from the intersection of Martinazzi and Nyberg. Although the existing entrance provided between Buildings A and B from Nyberg Street and the alley entrance behind Building A may be defined as a driveway, none of the proposed access points qualify as a driveway. The proposed central entry from Nyberg Street, as well as the secondary accesses from Seneca and Street 'A', are defined as a street with required easement dedication. Therefore, the minimum distance spacing requirements do not apply.

(16) Vision Clearance Area.

(a) Local Streets - A vision clearance area for all local street intersections, local street and driveway intersections, and local street or driveway and railroad intersections shall be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at

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points which are 10 feet from the intersection point of the right-of-way lines, as measured along such lines (see Figure 73-2 for illustration).

(b) Collector Streets - A vision clearance area for all collector/arterial street intersections, collector/arterial street and local street intersections, and collector/arterial street and railroad intersections shall be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at points which are 25 feet from the intersection point of the right-of-way lines, as measured along such lines. Where a driveway intersects with a collector/arterial street, the distance measured along the driveway line for the triangular area shall be 10 feet (see Figure 73-2 for illustration).

(c) Vertical Height Restriction - Except for items associated with utilities or publicly owned structures such as poles and signs and existing street trees, no vehicular parking, hedge, planting, fence, wall structure, or temporary or permanent physical obstruction shall be permitted between 30 inches and 8 feet above the established height of the curb in the clear vision area (see Figure 73-2 for illustration). [Ord. 895-93 §3, 5/24/93; Ord. 945-95, 5/8/95; Ord. 1025-99, §7, 7/26/99; Ord. 1026-99 §97, 8/9/99; Ord. 1103-02, 3/25/02; Ord. 1096-02, 1/28/02]

Response: Exhibit O, Sheets L1.2 and L1.4 show the vision clearance areas for local and collector streets, and demonstrate that the standards above are met or exceeded.

TDC 74: PUBLIC IMPROVEMENT REQUIREMENTS

IMPROVEMENTS

SECTION 74.110 PHASING OF IMPROVEMENTS.

The applicant may build the development in phases. If the development is to be phased the applicant shall submit a phasing plan to the City Engineer for approval with the development application. The timing and extent or scope of public improvements and the conditions of development shall be determined by the City Council on subdivision applications and by the City Engineer on other development applications.

Response: There is no proposed phasing planned for the Nyberg Rivers redevelopment project. However, within the conservation area in the northwest corner of the site, the Applicant proposes a "Shared Pathway Easement" that will allow for future development and the extension of the Tualatin River Trail at a later date. The pathway will be provided as an easement to the City, but construction of the pathway is not proposed as a part of this application.

SECTION 74.120 PUBLIC IMPROVEMENTS.

(1) Except as specially provided, all public improvements shall be installed at the expense of the applicant. All public improvements installed by the applicant shall be constructed and guaranteed as to workmanship and material as required by the Public Works Construction Code prior to acceptance by the City. No work

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shall be undertaken on any public improvement until after the construction plans have been approved by the City Engineer and a Public Works Permit issued and the required fees paid.

Response: The Applicant is aware that all public improvements shall be installed at the expense of the Applicant. And those public improvements will be constructed and guaranteed as to workmanship and material as required by the Public Works Construction Code prior to acceptance by the City. As stated above, Street A requires additional City owned property to commence construction and Seneca Street will be constructed at such time as the City decides to relocate Council Chambers and make sufficient right of way available for that use.

SECTION 74.130 PRIVATE IMPROVEMENTS.

All private improvements shall be in-stalled at the expense of the applicant. The property owner shall retain maintenance responsibilities over all private improvements.

Response: The Applicant is aware that all private improvements shall be installed at the expense of the Applicant and maintenance of those improvements will be under the responsibility of the Applicant.

SECTION 74.140 CONSTRUCTION TIMING.

(1) All the public improvements required under this chapter shall be completed and accepted by the City prior to the issuance of a Certificate of Occupancy; or, for subdivision and partition applications, in accordance with the requirements of the Subdivision regulations.

(2) All private improvements required under this chapter shall be approved by the City prior to the issuance of a Certificate of Occupancy; or for subdivision and partition applications, in accordance with the requirements of the Subdivision regulations.

Response: The Applicant is aware that the public and private improvements must be completed and accepted prior to the issuance of a Certificate of Occupancy. However, as articulated in the master plan, the Seneca Street extension will not be constructed until such time as the City determines it is necessary or desired to move City facilities to accommodate the extension. In particular, the master plan final decision concluded "the time of construction will be determined through the public facilities decision process and is not anticipated or required to occur prior to removal of the Council Chambers building." (Resolution 5163-13 at page 11). Thus, it is not likely nor required that Seneca Street is constructed prior to a Certificate of Occupancy as contemplated in the master plan approval.

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G. Parks

1. An additional crosswalk from east of Street A sidewalk to building D-130.
2. Access path to Tualatin River Greenway at Building 1040 needs to be the same width as the main path, 16-feet: a 12-foot path with a 2-foot shy, with a 2-foot shy on either side through the sensitive area.
3. Affirm that access path to Tualatin River Greenway from building N-100 has been eliminated (it is shown on Exhibit M).
4. The connection to the west along the Tualatin River shall be shown within the outer 40-feet from top of bank at the northwest corner of N-100.

H. Artwalk Signage

1. Create a sign plan that shows route to art and location of wayfinding and all other Artwalk signs.

AR-4 The following shall be performed for Washington County prior to the issuance of any City of Tualatin building permit for any and all buildings on the entirety of the subject site. Provide evidence/documentation to the City of Tualatin Planning Division that all items have been completed prior to Planning signing off on any building permit for building construction:

NOTE: Any work within County-maintained right-of-way requires a permit from the Washington County Operations Division (503.846.7623). No private infrastructure can be located within the right-of-way.

A. The following shall be recorded (contact appropriate jurisdiction for recordation of prepared documents):

1. All public improvements identified in Washington County's Traffic Staff report dated May 21, 2013 shall be located within public right-of-way and/or easements.

B. Submit to Washington County Public Assurance Staff, 503-846-3843:

1. Completed "Design Option" form (a form that states who will be building the improvements and submitting to the Washington County Road Standards).
2. **$15,000.00** Administration Deposit.

NOTE: *The Administration Deposit is a cost-recovery account used to pay for County services provided to the developer, including plan review and approval, field inspections, as-built approval, and project administration. The Administration Deposit amount noted above is an estimate of what it will cost to provide these services. If, during the course of the project, the Administration Deposit account is running low, additional funds will be requested to cover the estimated time left on the project (at then-current rates per the adopted Washington County Fee Schedule). If there are any unspent funds at project close out, they will be refunded to the applicant.* ***PLEASE NOTE: Any point of contact with County staff can be a chargeable cost. If project plans are not complete or do not comply with County standards and codes, costs will be higher. There is a charge to cover the cost of***

every field inspection. Costs for enforcement actions will also be charged to the applicant.

3. A copy of the City's Land Use Approval with Conditions, signed and dated.
4. Three (3) sets of complete engineering plans for construction of the following public improvements (refer to attached Traffic Staff Report dated May 21, 2013):

    a. A westbound right-turn lane on SW Nyberg Road.

    b. Two (2) southbound left-turn lanes and a shared through/right-turn lane from the site's access on SW Nyberg Road and two (2) inbound receiving lanes.

    c. Modify the traffic signal to accommodate the widening of the driveway and the westbound right turn movement.

C. Obtain a Washington County Facility Permit upon completion of the following:

1. Obtain Engineering Division approval and provide a financial assurance for the construction of the public improvements listed in condition **AR-3.B.4**.

NOTE: The Washington County Public Assurance staff (503-846-3843) will send the required forms to the applicant's representative **after** submittal and approval of items listed under **AR-3.B.4.**

__The Facility Permit__ allows construction work within County rights-of-way and permits site access only after the developer first submits plans and obtains Washington County Engineering approval, obtains required grading and erosion control permits, and satisfies various other requirements of Washington County's Assurances Section including but not limited to execution of financial and contractual agreements. This process ensures that the developer accepts responsibility for construction of public improvements, and that improvements are closely monitored, inspected, and built to standard in a timely manner. ***Access will only be permitted under the required Washington County Facility Permit, and only following submittal and County acceptance of all materials required under the facility permit process.***

D. Pay a lump sum of $10,000 to the County for field visit and retiming of the existing corridor signal system with the recommended traffic signal phasing change at main entrance intersection into the subject site.

AR-5 Prior to Occupancy of any building on the entirety of the subject site:

A. Obtain a finaled Washington County Facility Permit, contingent upon the following:

1. The road improvements required in condition **AR-3.B.4** above shall be completed and accepted by Washington County.

B. The applicant shall show evidence to City of Tualatin staff that the diamond planter trees were installed consistent with the approved AR planting specifications.

C. Provide a copy of the subject site's landscape and maintenance manual as required by Condition R of Resolution 5163-13.

D. Survey and stake area of easements in areas not to be constructed at this time. The City shall approve the location of the easement prior to its acceptance per 74.310(1). (Please see Public Facilities Report for more information)

E. Submit a tree maintenance plan as required by Condition R of Resolution 5163-13.

F. Provide an arborist's report that the trees in the diamond planters

have been planted properly and according to Condition Q of Resolution 5163-13.

AR-6 All conditions of approval, except where otherwise stated, shall be subject to field inspection prior to Certificate of Occupancy.

AR-7 No trees shall be removed associated with Seneca Street until the Seneca extension is approved.

AR-8 Trees along the shared pathways will be maintained to have an 8-foot vertical clearance per TMC 74.725(2).

AR-9 To meet the requirement of 73.100(2), all building exterior improvements approved through the Architectural Review Process shall be continually maintained including necessary painting and repair so as to remain substantially similar to original approval through the Architectural Review Process, unless subsequently altered with Community Development Director approval, as a condition of approval.

AR-10 To meet the requirement of 73.100(1), all landscaping approved through architectural review (AR) shall be continually maintained, including necessary watering, weeding, pruning and replacement, in a manner substantially similar to that originally approved by the AR decision, unless subsequently altered through AR.

AR-11 The applicant shall separately from this AR submit sign permit applications for any proposed signage. Pursuant to TDC 73.160(3)(d), provide an identification system which clearly locates buildings and their entries for patrons and emergency services.

AR -12 Encroachment upon any identified preserved trees must occur under the direction of a qualified arborist to assure the health needs of trees within the preserved area per TDC 73.250(2)(e).

AR-13 Except as allowed by Subsection (2), all landscaping and exterior improvements required as part of the Community Development Director's, Architectural Review Board's or City Council's approval shall be completed in addition to Fire and Life Safety, and Engineering/Building Department requirements prior to the issuance of any certificate of occupancy (TDC 73.095).

AR-14 The subject site shall comply with all ADA standards.

RIGHT-OF-WAY

SECTION 74.210 MINIMUM STREET RIGHT-OF-WAY WIDTHS.

The width of streets in feet shall not be less than the width required to accommodate a street improvement needed to mitigate the impact of a proposed development. In cases where a street is required to be improved according to the standards of the TDC, the width of the right-of-way shall not be less than the minimums indicated in TDC Chapter 11, Transportation Plan.

(2) For development applications other than subdivisions and partitions, wherever existing or future streets adjacent to property proposed for development are of inadequate right-of-way width, the additional right-of-way necessary to comply with the Transportation Element of the Tualatin Community Plan shall be dedicated to the City for use by the public prior to issuance of any building permit for the proposed development. This right-of-way dedication shall be for the full width of the property abutting the roadway and, if required by the City Engineer, additional dedications shall be provided for slope and utility easements if deemed necessary.

(4) If the City Engineer deems that it is impractical to acquire the additional right-of-way as required in subsections (1)-(3) of this section from both sides of the center-line in equal amounts, the City Engineer may require that the right-of-way be dedicated in a manner that would result in unequal dedication from each side of the road. This requirement will also apply to slope and utility easements as discussed in TDC 74.320 and 74.330. The City Engineer's recommendation shall be presented to the City Council in the preliminary plat approval for subdivisions and partitions, and in the recommended decision on all other development applications, prior to finalization of the right-of-way dedication requirements.

(5) Whenever a proposed development is bisected by an existing or future road or street that is of inadequate right-of-way width according to TDC Chapter 11, Transportation Plan, additional right-of-way shall be dedicated from both sides or from one side only as determined by the City Engineer to bring the road right-of-way in compliance with this section.

(6) When a proposed development is adjacent to or bisected by a street proposed in TDC Chapter 11, Transportation Plan and no street right-of-way exists at the time the development is proposed, the entire right-of-way as shown in TDC Chapter 11 shall be dedicated by the applicant. The dedication of right-of-way required in this subsection shall be along the route of the road as determined by the City.

Response: The Applicant is aware that additional right-of-way may need to be dedicated in order to facilitate street improvements along adjacent roadways that serve the Nyberg Rivers site. Based on discussion with City Transportation Engineers and coordination with ODOT, the Nyberg Street ROW is owned by ODOT and therefore no additional ROW dedication for improvements is needed. The Loop Road will also be a public road consistent with the terms of the final master plan decision. The cross sections for each road and the associated right of way widths are shown in Exhibit O. These cross sections and widths were specifically reviewed and approved under the master plan. Proposed improvements provide

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for all modes of travel consistent with the City's design standards located within the transportation system plan. All streets proposed for development have adequate right of way width or will maintain that width through a dedicated easement conveyance.

EASEMENTS AND TRACTS

SECTION 74.310 GREENWAY, NATURAL AREA, BIKE, AND PEDESTRIAN PATH DEDICATIONS AND EASEMENTS.

(1) Areas dedicated to the City for Greenway or Natural Area purposes or easements or dedications for bike and pedestrian facilities during the development application process shall be surveyed, staked and marked with a City approved boundary marker prior to acceptance by the City.

(2) For subdivision and partition applications, the Greenway, Natural Area, bike, and pedestrian path dedication and easement areas shall be shown to be dedicated to the City on the final subdivision or partition plat prior to approval of the plat by the City; or

(3) For all other development applications, Greenway, Natural Area, bike, and pedestrian path dedications and easements shall be submitted to the City Engineer; building permits shall not be issued for the development prior to acceptance of the dedication or easement by the City. [Ord. 933-94 §50, 11/28/94; Ord. 979-97 §52, 7/14/97; Ord. 1026-99 §98, 8/9/99].

Response: As shown on the attached Site Plan, Exhibit O, Sheets C1.0 through C1.2, the Applicant proposes a "Shared Pathway Easement" that will allow for future development and the extension of the Tualatin River Trail at a later date. This easement will be accepted by the City prior to issuance of building permits, but construction of the pathway is not proposed as a part of this review. The applicant is not proposing a land division at this time. The applicant will prepare easements and dedications for the City engineers review consistent with the requirements stated above.

SECTION 74.320 SLOPE EASEMENTS.

(1) The applicant shall obtain and convey to the City any slope easements determined by the City Engineer to be necessary adjacent to the proposed development site to support the street improvements in the public right-of-way or accessway or utility improvements required to be constructed by the applicant.

(2) For subdivision and partition applications, the slope easement dedication area shall be shown to be dedicated to the City on the final subdivision or partition plat prior to approval of the plat by the City; or

(3) For all other development applications, a slope easement dedication shall be submitted to the City Engineer; building permits shall not be issued for the development prior to acceptance of the easement by the City. [Ord. 933-94, § 51, 11/28/94]

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Response: The Applicant is aware that slope easements determined by the City Engineer may be necessary to support the street improvements in the public ROW. If the City Engineer so decides, slope easements will be provided by the applicant during the final engineering design and permitting process.

SECTION 74.330 UTILITY EASEMENTS.

(1) Utility easements for water, sanitary sewer and storm drainage facilities, telephone, television cable, gas, electric lines and other public utilities shall be granted to the City.

(4) For development applications other than subdivisions and partitions, and for both on-site and off-site easement areas, a utility easement shall be granted to the City; building permits shall not be issued for the development prior to acceptance of the easement by the City. The City may elect to exercise eminent domain and condemn necessary off-site public utility easements at the applicant's request and expense. The City Council shall determine when condemnation proceedings are to be used.

(5) The width of the public utility easement shall meet the requirements of the Public Works Construction Code. All subdivisions and partitions shall have a 6-foot public utility easement adjacent to the street and a 5-foot public utility easement adjacent to all side and rear lot lines. [Ord. 933-94, § 52, 11/28/94]

Response: The Applicant is aware that utility easements will be required for water, sanitary sewer and storm draining facilities. Existing easements are shown on the Existing Conditions Sheets C0.1 through C0.3 under Exhibit O, while proposed and existing easements are shown on the Site Plans, Sheets C1.0 through C1.2.

SECTION 74.340 WATERCOURSE EASEMENTS.

(1) Where a proposed development site is traversed by or adjacent to a watercourse, drainage way, channel or stream, the applicant shall provide a storm water easement, drainage right-of-way, or other means of preservation approved by the City Engineer, conforming substantially with the lines of the watercourse. The City Engineer shall determine the width of the easement, or other means of preservation, required to accommodate all the requirements of the Surface Water Management Ordinance, existing and future storm drainage needs and access for operation and maintenance.

(2) For subdivision and partition applications, any watercourse easement dedication area shall be shown to be dedicated to the City on the final subdivision or partition plat prior to approval of the plat by the City; or

(3) For all other development applications, any watercourse easement shall be executed on a dedication form submitted to the City Engineer; building permits shall not be issued for the development prior to acceptance of the easement by the City.

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(4) The storm water easement shall be sized to accommodate the existing water course and all future improvements in the drainage basin. There may be additional requirements as set forth in TDC Chapter 72, Greenway and Riverbank Protection District, and the Surface Water Management Ordinance. Water quality facilities may require additional easements as described in the Surface Water Management Ordinance. [Ord. 933-94, § 53, 11/28/94]

Response: The Applicant is not proposing a subdivision, nor is there any known watercourse or drainage way that is located on the property that would necessitate an easement per the standards set forth above.

SECTION 74.350 TRACTS.

A dedicated tract or easement will be required when access to public improvements for operation and maintenance is required, as determined by the City Engineer. Access for maintenance vehicles shall be constructed of an all-weather driving surface capable of carrying a 50,000-pound vehicle. The width of the tract or easement shall be 15-feet in order to accommodate City maintenance vehicles. In subdivisions and partitions, the tract shall be dedicated to the City on the final plat. In any other development, an access easement shall be granted to the City and recorded prior to issuance of a building permit. [Ord. 933-94, § 54, 11/28/94]

Response: The applicant will be dedicating proper easements with the Nyberg Rivers redevelopment project. These easements will include dedications for utilities and shared pathways as shown on the site plan included within Exhibit O. Based on input received from ODOT, a 10-foot wide maintenance access easement along the new Nyberg Street right-of-way is required and shown on the Site Plan, Sheet C1.1 under Exhibit O. Also, a 15-foot access easement is shown from the main entrance off Nyberg Street to connect to the ODOT maintenance easement and the (6) tax lots that currently use the existing access road. The 15-foot access easement will be located within the proposed 62.50' access easement at the primary entry before tying into the 30-foot ODOT access easement along the east-west drive aisle just north of Building E. This 30-foot easement continues to the east before heading in a northeasterly direction. At this point the proposed 15-foot access easement swings southeast to connect to the 10-foot maintenance easement. See Sheets C1.0 and C1.1 for reference. Access for maintenance vehicles shall be constructed of an all-weather driving surface capable of carrying a 50,000-pound vehicle consistent with city requirements.

TRANSPORTATION

SECTION 74.410 FUTURE STREET EXTENSIONS.

(1) Streets shall be extended to the proposed development site boundary where necessary to:

(a) give access to, or permit future development of adjoining land;

(b) provide additional access for emergency vehicles;

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(c) **provide for additional direct and convenient pedestrian, bicycle and vehicle circulation;**

(d) **eliminate the use of cul-de-sacs except where topography, barriers such as railroads or freeways, existing development, or environmental constraints such as major streams and rivers prevent street extension.**

(e) **eliminate circuitous routes. The resulting dead end streets may be approved without a turnaround. A reserve strip may be required to preserve the objectives of future street extensions.**

Response: Future street extensions proposed for the Nyberg Rivers redevelopment include the Street 'A' extension off Boones Ferry Road, the loop road system, as well as the SW Seneca Street extension across City-owned property. The applicant has provided a comprehensive Traffic Impact Analysis for the site that demonstrates that the site provides the necessary street extensions to provide access to the site. The TIA is attached as Exhibit L. The City found in its master plan decision that the streets proposed provide access to the commercial development, improve existing functions of transportation facilities in the area and provide direct and convenient pedestrian, vehicle and bicycle access in compliance with this criterion. This access plan is illustrated on Exhibit O and defined in the cross sections also attached under Exhibit A.

(2) **Proposed streets shall comply with the general location, orientation and spacing identified in the Local Streets Plan, TDC 11.630, Figure 11-1 and Figure 11-3.**

(b) **Streets proposed as part of new industrial or commercial development shall comply with TDC 11.630(2) and Figure 11-1.**

Response: The proposed streets do comply with the general location, orientation and spacing identified in Figure 11-1. Specifically, Figure 11-1 identifies the Loop Road extension that is achieved through the Street 'A',SW Seneca Street and main entry extensions.

The City Council comprehensively reviewed the site access for the redeveloped project under the master plan proceedings. The Site Plan, attached as Exhibit O, Sheets C1.0- C1.2. is in compliance with the access plan approved by the City Council in the master plan decision. Specifically, the City adopted the location and design of the Loop Road as shown on the Site Plan. The master plan findings relative to the Loop Road are excerpted here and incorporated by reference:

"The City Council finds that the applicant is providing a Loop Road in the location permitted by the TSP and has designed that road consistent with the terms of the Urban Renewal Plan. The City's TSP shows a "future minor collector" on the project site. The future minor collector is shown as a dashed green line that connects Boones Ferry with Seneca Street and SW Nyberg Street. No specific alignment is proposed in the TSP. Rather, Figure 1 expressly states: "Future roadway alignments are approximate and subject to additional engineering and

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design." The TSP further provides that the function of this minor collector is to "connect two major arterials, SW Boones Ferry Road and SW Nyberg Street." The TSP shows the additional task of connecting Seneca Street to Boones Ferry and SW Nyberg through the site. This location is in the same conceptual location shown in the 2013 TSP. The Loop Road is not in the parking lot drive aisles. Instead the Loop Road commences at Boones Ferry Road continues through the site connecting with the improved Seneca Street and continues with a through connection to SW Nyberg Street. This location is consistent with the TSP and fully meets the desired objective of the Loop Road which is to connect Seneca Street, Boones Ferry and SW Nyberg Street.

The Urban Renewal Plan also specifically addresses the design of the Loop Road under the section entitled, Public Improvements at page 19. There the Plan defines the Loop Road as a minor collector. It then states: "This *entire street will be a special section*, but will *generally* follow Street Section Cb and be modified as specific areas warrant."

Street cross-section Cb has been amended with the updated TSP and is now listed as a "Minor Collector" in TDC Chapter 74 Figures 74-2A through 74-2G which provides two travel lanes, bike lanes, a plant strip and a sidewalk. The standard is not prescriptive and like the Urban Renewal Plan can be a special section that is modified as specific areas warrant. Accordingly, not only is the Loop Road specifically called out as a special section in the Urban Renewal Plan with anticipated modifications to the minor collector standards, the standard referenced also provides a recommendation that can be modified by the City Engineer or, in the case of a master plan, by the City Council.

The Loop Road cross sections are consistent with the description of the Loop Road in the Urban Renewal Plan. The cross sections provide sidewalks and/or shared paths, bike facilities, at least 2 travel lanes, and landscaped planter areas. In some cases, these cross sections provide even greater ultimate width than is shown in Minor Collector."

The Loop Road cross sections are attached within Exhibit A.

(3) During the development application process, the location, width, and grade of streets shall be considered in relation to existing and planned streets, to topographical conditions, to public convenience and safety, and to the proposed use of the land to be served by the streets. The arrangement of streets in a subdivision shall either:

(a) provide for the continuation or appropriate projection of existing streets into surrounding areas; or

(b) conform to a street plan approved or adopted by the City to meet a particular situation where topographical or other conditions make continuance of or conformance to existing streets impractical.

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Response: The location, width, and grade of streets were reviewed and determined during the approved Master Plan process. The Master Plan included cross-sections showing the widths and back of curb pedestrian and landscaping elements for the proposed streets and driveways. The master plan findings on the street plan are incorporated herein by reference as well was the findings of the TIA attached as Exhibit L. The cross sections attached as Exhibit A show that the streets proposed meet the grade of existing streets protecting the public safety and convenience. The streets conform to the TSP in design and location and provide for continuation of streets through the project site in compliance with this criterion.

(4) The City Engineer may require the applicant to submit a street plan showing all existing, proposed, and future streets in the area of the proposed development.

Response: A plan of the street networks is shown within Exhibit O and conforms to the street plan and cross-sections approved by the City Council in the master plan proceedings. The street plan shows all proposed, existing and future (Seneca extension) streets in the area of the proposed development in compliance with this criterion.

(5) The City Engineer may require the applicant to participate in the funding of future off-site street extensions when the traffic impacts of the applicant's development warrant such a condition. [Ord. 933-94 §55, 11/28/94; Ord. 1026-99 §99, 8/9/99; Ord. 1103-02, 3/25/02]

Response: The traffic impacts of this development were exhaustively reviewed in the master plan proceedings. The transportation findings from the final master plan decision are incorporated herein by reference. The TIA demonstrates that all study intersections will continue to operate at acceptable levels of service and some intersections will improve over existing conditions. The applicant agreed in the master plan proceedings to fund a number of street improvements including: a signalized intersection at the SW Martinazzi Avenue and SW Seneca Street intersection; Street "A" on the Site Plan will be dedicated and extended from Boones Ferry Road into the site, connecting to Seneca and Nyberg Streets; Nyberg Street will be expanded with additional right turn lane;. An access easement will be dedicated with the Street "A" extension in order to provide future access to the Future Development Area 4. As shown on the Site Plan and in the findings above, the Site Plan provides direct and convenient pedestrian, bicycle and vehicle access through the site. New sidewalks and streets are planned through the site, connecting with the surrounding vehicle, pedestrian and bicycle network. These proposed streets and drive aisles meet the design standards identified by TDC 11.630, Figure 11-1 and Figure 11-3 and consider the context of existing, adjacent streets.

The Site Plan is sensitively designed to facilitate development of adjoining properties through the location of uses and street extensions.

The findings provided earlier in this narrative addressing the street, pedestrian and bike improvements are incorporated herein by reference.

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SECTION 74.420 STREET IMPROVEMENTS.

When an applicant proposes to develop land adjacent to an existing or proposed street, including land which has been excluded under TDC 74.220, the applicant should be responsible for the improvements to the adjacent existing or proposed street that will bring the improvement of the street into conformance with the Transportation Plan, and the City' s Public Works Construction Code, subject to the following provisions:

(1) For any development proposed within the City, roadway facilities within the right-of-way described in TDC 74.210 shall be improved to standards as set out in the Public Works Construction Code.

Response: Other than the future Seneca Street extension, the only proposed work within the existing ROW will occur on the north side of Nyberg Street, within the ODOT ROW. As ODOT already owns the ROW, for the proposed improvements along Nyberg, no additional dedication is needed. As mentioned above in detail, a new Loop Road will be constructed through the site to the design parameters of a minor collector as approved in the master plan. The Loop Road will be a public road throughout the site.

(2) The required improvements may include the rebuilding or the reconstruction of any existing facilities located within the right-of-way adjacent to the proposed development to bring the facilities into compliance with the Public Works Construction Code.

Response: The only proposed work within the existing ROW will occur on the north side of Nyberg Street, within the ODOT ROW. As ODOT already owns the ROW for the proposed improvements, no additional dedication is needed, Improvements will also occur at Street A and Lower Boones Ferry, at Martinazzi and Seneca (subject to ROW provided by the City) as well as the main entrance and Nyberg. These improvements will be in compliance with the Public Works Construction Code which will be assured during the permitting and construction process.

(3) The required improvements may include the construction or rebuilding of off-site improvements which are identified to mitigate the impact of the development.

Response: The applicant will construct all of the off-site improvements identified in the master plan:

- *The Seneca Street extension to the Nyberg Rivers site with a signal at SW Martinazzi Avenue constructed to the standards of a Minor Collector Street. The time of construction will be determined through the public facilities decision process and is not anticipated or required to occur prior to removal of the Council Chambers building.*
- *A westbound right turn lane on SW Nyberg Road.*
- *Two southbound left turn lanes and a shared through/right turn lane from the site's access onto SW Nyberg Road.*
- *Two inbound receiving lanes; and*
- *The associated signal improvements at the main entrance.*

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In addition, City Council finds the street cross-sections need to be modified to satisfy Goal 5 and are needed to serve the Master Plan area. The City Council approves the Master Plan cross sections with the following modifications:"

The applicant revised the cross sections to meet these modification requests and the findings and this record demonstrate that the applicable jurisdictions reviewed the proposal and found, with the conditions of approval, that the proposal met each of their standards.

(4) Where development abuts an existing street, the improvement required shall apply only to that portion of the street right-of-way located between the property line of the parcel proposed for development and the centerline of the right-of-way, plus any additional pavement beyond the centerline deemed necessary by the City Engineer to ensure a smooth transition between a new improvement and the existing roadway (half-street improvement). Additional right-of-way and street improvements and off-site right-of-way and street improvements may be required by the City to mitigate the impact of the development. The new pavement shall connect to the existing pavement at the ends of the section being improved by tapering in accordance with the Public Works Construction Code.

Response: The only proposed work within the existing ROW will occur on the north side of Nyberg Street, within the ODOT ROW. The improvement applies only to that portion of the street right-of-way located between the property line of the parcel proposed for development and the centerline of the right-of-way, plus any additional pavement beyond the centerline deemed necessary by the City Engineer to ensure a smooth transition between a new improvement and the existing roadway (half-street improvement).

(5) If additional improvements are required as part of the Access Management Plan of the City, TDC Chapter 75, the improvements shall be required in the same manner as the half-street improvement requirements.

Response: The Applicant is aware of this provision, although no additional improvements are foreseen within the proposed scope of work along Nyberg Street.

(6) All required street improvements shall include curbs, sidewalks with appropriate buffering, storm drainage, street lights, street signs, street trees, and, where designated, bikeways and transit facilities.

Response: The proposed half-street improvements along the north side of Nyberg Street includes a 15-foot right-hand turn lane, a 4-foot planter and a combined 12-foot shared pathway to accommodate both bicycle and pedestrian access. A cross-section of these improvements was summarized under cross-section G-G, submitted under the approved Master Plan and attached here under Exhibit A.

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The master plan decision at pages 14 through 16 adopted these cross sections as modified.

(7) For subdivision and partition applications, the street improvements required by TDC Chapter 74 shall be completed and accepted by the City prior to signing the final subdivision or partition plat, or prior to releasing the security provided by the applicant to assure completion of such improvements or as otherwise specified in the development application approval.

Response: No subdivision or partition applications have been submitted as part of the Nyberg Rivers redevelopment project.

(8) For development applications other than subdivisions and partitions, all street improvements required by this section shall be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.

Response: The applicant is aware of this provision and will complete the street improvements prior to issuance of a Certificate of Occupancy. The only exception to this criterion is the Seneca Street extension. That extension is not required as part of this development application but instead will occur if and when the City decides to relocate Council Chambers.

(10) Streets within, or partially within, a proposed development site shall be graded for the entire right-of-way width and constructed and surfaced in accordance with the Public Works Construction Code.

Response: All internal driveways and accessways within the proposed development will be graded, constructed, and surfaced for the entire portion of the site. The public streets dedicated with this project are the Street 'A' extension, the Loop Road and the expansion of Nyberg Street.

(11) Existing streets which abut the proposed development site shall be graded, constructed, reconstructed, surfaced or repaired as necessary in accordance with the Public Works Construction Code and TDC Chapter 11, Transportation Plan.

Response: Existing streets which abut Nyberg Rivers will be graded, constructed, reconstructed, surfaced, or repaired as necessary. The only proposed work within the existing public ROW is along the north side of Nyberg Street.

(12) Sidewalks with appropriate buffering shall be constructed along both sides of each internal street and at a minimum along the development side of each external street in accordance with the Public Works Construction Code.

Response: As shown on the Landscaping Planting Plan, Exhibit O – Sheets L1.0 through L1.10, sidewalks have been located to provide connectivity into and through the site along both north-south and east-west corridors. Landscape buffering or landscape islands are provided along all sidewalks.

(13) The applicant shall comply with the requirements of the Oregon Department of Transportation (ODOT), Tri-Met, Washington County and Clackamas County when

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a proposed development site is adjacent to a roadway under any of their jurisdictions, in addition to the requirements of this chapter.

Response: All applicable jurisdictions provided comments on this development as part of the master plan review. Each found that the development complied with their requirements subject to conditions of approval. Those conditions of approval were incorporated into the master plan and are incorporated herein by reference from pages 9-16 of the master plan final decision:

"ODOT reviewed the submitted information for their facilities (I-5 and Nyberg Street). Based on the analysis performed by ODOT, the Applicant's proposed improvements mitigate the impact of the development on ODOT facilities. Per coordination with ODOT, a 10-foot wide maintenance access easement along the new Nyberg Street right-of-way is shown on the Site Plan, Sheet C1.1 under Exhibit O. Also, a 15-foot access easement is shown from the main entrance off Nyberg Street to connect to the ODOT maintenance easement and the (6) tax lots that currently use the existing access road. Sufficient right-of-way exists; however, final design may indicate the need for refinements and adjustments to the site plan to accommodate public improvements. The ODOT required mitigation is a condition of approval.

Washington County also reviewed the information and they have provided a list of conditions and measures to mitigate impacts on Nyberg Street and Tualatin-Sherwood Road. Final design may indicate the need for additional right-of-way. The Washington County required mitigation is a condition of approval."

"The Tualatin Transportation System Plan and Tualatin Development Code chapters 11, 74, and 75 includes future Minor Collector streets within the project area including a Loop Road; a western extension of SW Seneca Street that would connect to a new street between the main site entrance as well as SW Boones Ferry Road plus SW Nyberg Road from the Kmart/Fred Meyer intersection to SW Martinazzi. SW Boones Ferry Road and SW Nyberg Road from I-5 to the Kmart/Fred Meyer intersection are classified as Major Arterials.

Private streets with public access over the locations of the Loop Road instead of public streets are supported by:

- The submitted traffic study shows public access will function adequately.
- The cross-sections for the locations of the public access have "street-like" qualities.
- Future arrangements for maintenance will assure the continued functionality of the public access to public standards.

The Loop Road collector is intended to provide public vehicular and pedestrian access through Urban Renewal Blocks 2 and 5 and the eastern portion of the City's downtown core. The cross-sections include characteristics of Minor Collectors like sidewalks and bike-lanes or multi use paths, planter strips or tree wells, streetlights, and through travel lanes. Parking is either available adjacent

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to planters and sidewalks within the cross-section or within adjacent parking lots."

"The City Council concludes that the Master Plan, with the proposed conditions, complies with Goal 5. Adequate transportation facilities providing connections and improvements consistent with the transportation system meets Goal 5.

City Council finds the following transportation improvements are needed for the Master Plan to comply with Goal 5, and therefore imposes them as conditions of approval:

- *The Seneca Street extension to the Nyberg Rivers site with a signal at SW Martinazzi Avenue constructed to the standards of a Minor Collector Street. The time of construction will be determined through the public facilities decision process and is not anticipated or required to occur prior to removal of the Council Chambers building.*
- *A westbound right turn lane on SW Nyberg Road.*
- *Two southbound left turn lanes and a shared through/right turn lane from the site's access onto SW Nyberg Road.*
- *Two inbound receiving lanes; and*
- *The associated signal improvements at the main entrance.*

In addition, City Council finds the street cross-sections need to be modified to satisfy Goal 5 and are needed to serve the Master Plan area. The City Council approves the Master Plan cross sections with the following modifications:"

The applicant revised the cross sections to meet these modification requests and the findings and this record demonstrate that the applicable jurisdictions reviewed the proposal and found, with the conditions of approval, that the proposal met each of their standards.

(14) The applicant shall construct any required street improvements adjacent to parcels excluded from development, as set forth in TDC 74.220 of this chapter.

Response: The Applicant is aware of the street improvements adjacent to parcels excluded from development provision. Both the Street 'A' and SW Seneca Street extension are considered street improvements adjacent to parcels excluded from development. As noted above the construction of Seneca is subject to the City providing right-of-way and is not needed to be constructed prior to occupancy.

(15) Except as provided in TDC 74.430, whenever an applicant proposes to develop land with frontage on certain arterial streets and, due to the access management provisions of TDC Chapter 75, is not allowed direct access onto the arterial, but instead must take access from another existing or future public street thereby providing an alternate to direct arterial access, the applicant shall be required to construct and place at a minimum street signage, a sidewalk, street trees and street lights along that portion of the arterial street adjacent to the applicant's

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property. The three certain arterial streets are S.W. Tualatin-Sherwood Road, S.W. Pacific Highway (99W) and S.W. 124th Avenue. In addition, the applicant may be required to construct and place on the arterial at the intersection of the arterial and an existing or future public non-arterial street warranted traffic control devices (in accordance with the Manual on Uniform Traffic Control Devices, latest edition), pavement markings, street tapers and turning lanes, in accordance with the Public Works Construction Code.

Response: The development has access to a new minor collector, the internal Loop Road. The Loop Road is the primary access for the entire site. The Loop Road connects at an intersection with Nyberg Street and Boones Ferry Road. Because the Loop Road will be a public minor collector road, this standard does not apply. The applicant is aware of the access management provisions of TDC Chapter 75, but based on conversation and input from the City, the proposed access points will not negatively impact or create access management issues within the region. This is supporting by the findings outlined in the TIA included under Exhibit L.

(16) The City Engineer may determine that, although concurrent construction and placement of the improvements in (14) and (15) of this section, either individually or collectively, are impractical at the time of development, the improvements will be necessary at some future date. In such a case, the applicant shall sign a written agreement guaranteeing future performance by the applicant and any successors in interest of the property being developed. The agreement shall be subject to the City's approval.

Response: The applicant is aware of this provision, but does not foresee that construction and street improvements will occur separately, with the exception of Seneca Street..

(17) Intersections should be improved to operate at a level of service of at least D and E for signalized and unsignalized intersections, respectively. [Ord. 933-94 §56, 11/28/94; Ord. 1026-99 §100, 8/9/99; Ord.1103-02, 3/25/02; Ord. 1224-06 §36, 11/13/06]

Response: The scope of the traffic report and required level of service analysis and street standards applicable in the TIA were reviewed and approved by all of the relevant jurisdictions prior to commencing the TIA analysis. The analysis demonstrates that all signalized and unsignalized intersections that are impacted at more than a de minimis level will continue to operate at LOS D or E, respectively consistent with this criterion.

The TIA Conclusions and Recommendations section found within the TIA on pages 53 to 56, demonstrate that all intersections will continue to operate at acceptable levels of service D and E and some intersections will experience improved service. The master plan final decision shares this conclusion with enumerated conditions of approval, as described above.

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SECTION 74.440 STREETS, TRAFFIC STUDY REQUIRED.

(1) The City Engineer may require a traffic study to be provided by the applicant and furnished to the City as part of the development approval process as provided by this Code, when the City Engineer determines that such a study is necessary in connection with a proposed development project in order to:

(a) Assure that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic that is expected to be generated by the proposed development, and/or

(b) Assure that the internal traffic circulation of the proposed development will not result in conflicts between on-site parking movements and/or on-site loading movements and/or on-site traffic movements, or impact traffic on the adjacent streets.

Response: A traffic study prepared by Kittelson and Associates, Inc. was drafted and included as a part of the Master Plan application. The TIA is attached here as Exhibit L and includes the original traffic study and all of the supplemental memorandum and analysis developed during the master plan proceedings. The traffic study demonstrates, and the master plan final decision concludes, that all study intersections will continue to operate at acceptable levels of service with the conditions of approval and all internal traffic circulation will not result in conflicts between on-site movements.

(2) The required traffic study shall be completed prior to the approval of the development application.

Response: The traffic study completed by Kittelson and Associates, Inc. is complete and attached as Exhibit L.

(3) The traffic study shall include, at a minimum:

(a) an analysis of the existing situation, including the level of service on adjacent and impacted facilities.

(b) an analysis of any existing safety deficiencies.

(c) proposed trip generation and distribution for the proposed development.

(d) projected levels of service on adjacent and impacted facilities.

(e) recommendation of necessary improvements to ensure an acceptable level of service for roadways and a level of service of at least D and E for signalized and unsignalized intersections respectively, after the future traffic impacts are considered.

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(f) **The City Engineer will determine which facilities are impacted and need to be included in the study.**

(g) **The study shall be conducted by a registered engineer.**

(4) **The applicant shall implement all or a portion of the improvements called for in the traffic study as determined by the City Engineer. [Ord. 1103-02, 3/25/02]**

Response: The required TIA was scoped with the City and County and was completed by Kittelson and Associates. That TIA is included as Exhibit L and addresses all of the above requirements while demonstrating that the proposed development will have no impact or will improve the existing transportation infrastructure. The mitigation to improve traffic efficiency is also noted in the TIA. Those improvements include:

- A new roadway connection to SW Boones Ferry Road (shown as "Street A" in Figure 2 of the TIA) that includes sidewalks.
- An enhanced site-access through development of the Loop Road that will better accommodate vehicular queuing and demand.
- A potential future (assuming the City desires to move forward) new site-access connection to SW Martinazzi Avenue that aligns across from SW Seneca Street. This connection would be the Seneca Street extension envisioned in the Town Center Plan. Prior to the City making a decision on any new SW Street Seneca alignment, the redevelopment site plan preserves this connection opportunity in the present or future.
- The preservation of east-west and north-south travel ways that will provide vehicular and pedestrian access between Street A, the Seneca Street alignment/extension, and enhanced access to SW Nyberg Street.
- New sidewalks along the enhanced site-access driveway to SW Nyberg Street that provide pedestrian connections to the integrated site circulation network.
- New bikeway connections along the perimeter of the site.
- Closure of the existing SW 75th Avenue site-access driveway to SW Nyberg Street to minimize turning movement conflicts, allow for construction of a westbound right-turn lane at SW Nyberg Street/signalized site driveway, and to improve the interchange access spacing conditions along SW Nyberg Street.
- A new 350-foot westbound right-turn lane constructed on SW Nyberg Street
- The site design also facilitates connections to surrounding properties and does not preclude the development of other transportation facilities consistent with the TSP. These commitments by the applicant will work to create a more

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efficient and coordinated transportation system within Nyberg Rivers and the City Center.

The transportation conditions of approval imposed by the master plan final decision are detailed above and not repeated here but incorporated by reference.

The TIA also contains all of the required components required above on page 56 within the TIA.

SECTION 74.450 BIKEWAYS AND PEDESTRIAN PATHS.

(1) Where proposed development abuts or contains an existing or proposed bikeway or pedestrian path, as set forth in TDC Chapter 11, Transportation Plan, the City may require that a bikeway or pedestrian path be constructed, and an easement or dedication provided to the City.

(2) Where required, bikeways and pedestrian paths shall be provided as follows:

(a) Bike and pedestrian paths shall be constructed and surfaced in accordance with the Public Works Construction Code.

(b) The applicant shall install the striping and signing of the bike lanes and shared roadway facilities, where designated. [Ord. 933-94, § 57, 11/28/94]

Response: As approved with the Master Plan, the Applicant is proposing to dedicate a shared pathway easement for the future build out of a pedestrian and bicycle path along the Tualatin River Trail network. That shared pathway easement is located at the northern end of Nyberg Rivers, within the conservation area along the south side of the Tualatin River. The Applicant is also proposing to construct two north-south connections through the site as detailed within the site plan included within Exhibit O; the first bisects the site running north from the main entrance off of Nyberg Street through the site, between proposed buildings 1030 and 1040 connecting in with the planned Tualatin River Trail. The second north-south connection is located within the western portions of the site and connects Seneca Street to proposed Street "A" and the planned Tualatin River Trail. All pathways will be constructed in accordance with the Public Works Construction Code. These pathways are shown within the Site Plan include within Exhibit O.

SECTION 74.470 STREET LIGHTS.

(1) Street light poles and luminaries shall be installed in accordance with the Public Works Construction Code.

(2) The applicant shall submit a street lighting plan for all interior and exterior streets on the proposed development site prior to issuance of a Public Works Permit.

Response: The Applicant is aware of the street lighting provision. Street lighting and a Photometric Plan is included with this ARB application as Exhibit O – E-1 through E-6.

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UTILITIES

SECTION 74.610 WATER SERVICE.

(1) Water lines shall be installed to serve each property in accordance with the Public Works Construction Code. Water line construction plans shall be submitted to the City Engineer for review and approval prior to construction.

(2) If there are undeveloped properties adjacent to the subject site, public water lines shall be extended by the applicant to the common boundary line of these properties. The lines shall be sized to provide service to future development, in accordance with the City's Water System Master Plan, TDC Chapter 12.

(3) As set forth is TDC Chapter 12, Water Service, the City has three water service levels. All development applicants shall be required to connect the proposed development site to the service level in which the development site is located. If the development site is located on a boundary line between two service levels the applicant shall be required to connect to the service level with the higher reservoir elevation. The applicant may also be required to install or provide pressure reducing valves to supply appropriate water pressure to the properties in the proposed development site. [Ord. 933-94, § 59, 11/28/94]

Response: The subject property is bounded by I-5 to the east, the Tualatin River to the north, Nyberg Street to the south and City owned property that fronts Martinazzi Avenue to the west. There are currently water lines in Martinazzi Avenue providing service to the adjacent City owned properties. Likewise the existing apartment development located north is connected to the water system in Boones Ferry Road. The Applicant has included a proposed water system plan, Exhibit O – Sheets C6.0-6.2, that provides access to water for domestic as well as fire protection for the site. All proposed and existing buildings will be served by the proposed water system. The proposed water system onsite will extend a portion of the public water line with a 15 foot easement to serve the proposed buildings F-100. At the property line the public water line will change to a private water line (proposed double check valve assembly to differentiate the private and public). This private portion of the water line will consist of private fire system loop extend around the site to provide service to proposed buildings G-100, H-100, J-100, N-100, 1040, 1010, and 1005. The public loop with have double check detector assemblies located at both looped connections to the public system. Fire hydrants and FDC's have been placed around the proposed buildings for fire protection. All new buildings have been proposed as with fire sprinkler systems.

The domestic water for F-100 and G-100 will be served from new public meters. The remainder to the proposed building will be served from the proposed public meter located north of the existing Michael's and a 4" domestic line extended through the site.

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SECTION 74.620 SANITARY SEWER SERVICE.

(1) Sanitary sewer lines shall be installed to serve each property in accordance with the Public Works Construction Code. Sanitary sewer construction plans and calculations shall be submitted to the City Engineer for review and approval prior to construction.

(2) If there are undeveloped properties adjacent to the proposed development site which can be served by the gravity sewer system on the proposed development site, the applicant shall extend public sanitary sewer lines to the common boundary line with these properties. The lines shall be sized to convey flows to include all future development from all up stream areas that can be expected to drain through the lines on the site, in accordance with the City's Sanitary Sewer System Master Plan, TDC Chapter 13. [Ord. 933-94, § 60, 11/28/94]

Response: All sanitary water will be conveyed through an on-site sanitary sewer system as shown in Exhibit O – Sheets C5.0 - 5.2. The proposed sanitary sewer system will reroute a portion of the public sewer line with a 15 foot easement to ensure sanitary service to the property in the southeast corner of the site and the acquired ODOT land (Proposed Building F-100, G-100, and H-100). A proposed main private sanitary line will serve proposed buildings J-100, N-100, 1005, 1010 and 1040 will run north of the proposed buildings and connect into the existing public sanitary sewer line. Grease interceptors will be located prior to the public sanitary sewer line connection for any proposed restaurant or building tenant requiring grease interceptors.

SECTION 74.630 STORM DRAINAGE SYSTEM.

(1) Storm drainage lines shall be installed to serve each property in accordance with City standards. Storm drainage construction plans and calculations shall be submitted to the City Engineer for review and approval prior to construction.

(2) The storm drainage calculations shall confirm that adequate capacity exists to serve the site. The discharge from the development shall be analyzed in accordance with the City's Storm and Surface Water Regulations.

(3) If there are undeveloped properties adjacent to the proposed development site which can be served by the storm drainage system on the proposed development site, the applicant shall extend storm drainage lines to the common boundary line with these properties. The lines shall be sized to convey expected flows to include all future development from all up stream areas that will drain through the lines on the site, in accordance with the Tualatin Drainage Plan in TDC Chapter 14. [Ord. 933-94, § 61, 11/28/94; Ord. 952-95, § 2, 10/23/95]

Response: The existing stormwater system onsite is comprised of a public storm sewer mainline and multiple private collection laterals feeding into that public line. The public line is encompassed within a 15 foot public easement running just north of the existing retail buildings and then heading south to serve the property in the southeast corner. Treatment for the site provided by several Contech stormfilter catch basins and vaults structures sized per CWS standards prior to discharging

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into the public lines. Additionally, Low Impact Development features have been added prior to the filter vaults for added pretreatment. Whereas these features are not required prior to stormfilter cartage treatment and will not be designed to the LIDA handbook standard, they will provide benefit by providing additional water quality and flow reduction.

The public line outfalls into the Tualatin River just north of the site. A Storm Layout is provided as Exhibit O – Sheets C4.0-4.2. The Applicant has also included a Stormwater Drainage Memo under Exhibit N that provides drainage calculations for water quality consistent with this requirement. As previously stated, the site is surrounded by public facilities, natural features or property already committed to development.

Low Impact Development (LID) stormwater facilities have been located throughout the site where feasible as detailed within sheets C4.0 through 4.2 of Exhibit O. Specifically these facilities have been located east and south of Building 1040. Site grading precludes the use of LID's within other landscape areas of the site. The proposed stormwater system is consistent with the Master Plan approval and conditions contained within.

SECTION 74.640 GRADING.

(1) Development sites shall be graded to minimize the impact of storm water runoff onto adjacent properties and to allow adjacent properties to drain as they did before the new development.

(2) A development applicant shall submit a grading plan showing that all lots in all portions of the development will be served by gravity drainage from the building crawl spaces; and that this development will not affect the drainage on adjacent properties. The City Engineer may require the applicant to remove all excess material from the development site.

Response: The Applicant has included a grading plan as part of this submittal (Exhibit O – C3.0- 3.2). The Applicant is proposing to re-grade the vast majority of the site in order to direct stormwater into appropriate basins for subsequent treatment. Proposed new grades on the site range from a low point of approximately 124 msl near the northwest corner of the site to a high point of approximately 137 msl near the eastern boundary of the site.

SECTION 74.650 WATER QUALITY, STORM WATER DETENTION AND EROSION CONTROL.

The applicant shall comply with the water quality, storm water detention and erosion control requirements in the Surface Water Management Ordinance. If required:

(1) On subdivision and partition development applications, prior to approval of the final plat, the applicant shall arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and

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calculations indicating that the requirements of the Surface Water Management Ordinance will be satisfied and obtain a Stormwater Connection Permit from Clean Water Services; or

(2) On all other development applications, prior to issuance of any building permit, the applicant shall arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from Clean Water Services.

(3) For on-site private and regional non-residential public facilities, the applicant shall submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the City, for the water quality facility for the City's review and approval. The applicant shall submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site shall occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City. [Ord. 952-95, § 3, 10/23/95; Ord. 1070-01, 4/9/01; Ord. 1327-11 §1; 6/27/11]

Response: The proposed project includes the construction of public and private storm sewer lines as shown in Exhibit O – Sheet C6.0. All on-site surface water will be captured, conveyed and treated through an on-site stormwater system before discharging into the public system. Public storm lines have been designed for the Street "A" and SW Seneca Street extension with treatment from Contech stormfilter structures. Additionally, a public storm line with a 15-foot easement has been proposed behind the proposed retail buildings (1005, 1010, and 1040). The public line then runs south to serve the property in the southeast corner of the site and the acquired ODOT land (Proposed building F-100). A private storm line will be extended to the north for connections to proposed buildings G-100, H-100, J-100 and N-100. The storm service for existing buildings "A", "B", and "C" will remain in place, but will be retrofit with Contech stormfilter structures to treat the existing impervious area.

The remainder of the site will be captured in sumped catch basins and conveyed to Contech stormfilter structures. Sumped catch basins and Contech stormfilter structures are an approved pretreatment and treatment device per the City of Tualatin and Clean Water Services. A Storm Drainage Plan and Drainage Report included as Exhibit N was submitted as a part of the approved Master Plan. Operation and maintenance of the storm drainage areas will be the responsibility of Nyberg Rivers property management. The City found in the master plan decision that the Master Plan area shall use vegetative treatment of stormwater where feasible.

Low Impact Development (LID) stormwater facilities have been located throughout the site where feasible as detailed within sheets C4.0 through 4.2 of Exhibit O. Specifically these facilities have been located east and south of Building 1040. Site grading precludes the use of LID's within other landscape areas of the site. The proposed stormwater system is consistent with the Master Plan approval and conditions contained within.

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SECTION 74.660 UNDERGROUND.

(1) All utility lines including, but not limited to, those required for gas, electric, communication, lighting and cable television services and related facilities shall be placed underground. Surface-mounted transformers, surface-mounted connection boxes and meter cabinets may be placed above ground. Temporary utility service facilities, high capacity electric and communication feeder lines, and utility transmission lines operating at 50,000 volts or above may be placed above ground. The applicant shall make all necessary arrangements with all utility companies to provide the underground services. The City reserves the right to approve the location of all surface-mounted transformers.

(2) Any existing overhead utilities may not be upgraded to serve any proposed development. If existing overhead utilities are not adequate to serve the proposed development, the applicant shall, at their own expense, provide an underground system. The applicant shall be responsible for obtaining any off-site deeds and/or easements necessary to provide utility service to this site; the deeds and/or easements shall be submitted to the City Engineer for acceptance by the City prior to issuance of the Public Works Permit.

Response: The Applicant is aware of this provision and will underground all utilities as required. Any surface mounted transformers or connection boxes will feature landscape or structural screening to limit visual impacts.

SECTION 74.670 EXISTING STRUCTURES.

(1) Any existing structures requested to be retained by the applicant on a proposed development site shall be connected to all available City utilities at the expense of the applicant.

(2) The applicant shall convert any existing overhead utilities serving existing structures to underground utilities, at the expense of the applicant.

(3) The applicant shall be responsible for continuing all required street improvements adjacent to the existing structure, within the boundaries of the proposed development site.

Response: Several existing structures are proposed to be retained as a part of the Nyberg Rivers redevelopment. The Applicant will ensure that those structures are connected to all City utilities and that those utilities are placed underground. Proposed structures to be retained include Buildings A through D.

SECTION 74.705 STREET TREE REMOVAL PERMIT.

(1) A person who desires to remove or destroy a tree, as defined in TDC 31.060, in or upon public right-of-way shall make application to the Operations Director on City forms.

(2) The applicant must provide:

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(a) the applicant's name and contact information and if applicable that of the applicant's contractor;

(b) the number and species of all street trees the applicant desires to remove;

(c) a clear description of the street trees' the applicant desires to remove;

(d) the date of removal;

(e) the reason(s) for removal; and

(f) other information as the Operations Director deems necessary.

(3) Upon the Operations Director approving the removal of a street tree, the applicant or designated contractor shall replace each removed tree on a one-for-one basis by fulfilling the following requirements:

(a) Remove both the tree and stump prior to planting a replacement tree, or request the City to remove the tree and stump and pay the applicable fee(s) established in TDC 74.706; and

(b) Replace the removed tree by planting a species of street tree permitted by Schedule A of the TDC Chapter 74 within the time period specified in writing by the Operations Director; or, the applicant may request within sixty (60) days of the permit approval date that the City replace the street tree and pay the applicable fee(s) established in TDC 74.706. If an applicant opts for the City to plant the replacement tree, the Operations Department may plant the tree on its usual tree-planting schedule. Planting done by the applicant or designated contractor shall comply with all applicable TDC sections and any additional requirements imposed by the Operations Director.

(c) The applicant shall comply with all applicable TDC sections and additional requirements imposed by the Operations Director. The Operations Director may:

(d) waive the one-for-one replacement requirement if he or she determines that the replacement would:

(i) conflict with public improvements or utility facilities, including but not limited to fire hydrants, water meters and pipes, lighting fixtures, traffic control signs; private improvements or utility facilities – including but not limited to driveways and power, gas, telephone, cable television lines; or, minimum vision clearance;

(ii) interfere with the existing canopy of adjacent trees, the maturation of the crown of the proposed replacement tree, or both;

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(A) cause a conflict by planting trees too close to each other, hurting their health;

(iii) limit the selection of species from Schedule A: and;

(iv) direct how to plant replacement tree(s).

(e) a person who fails to comply with TDC 74.705 shall pay an enforcement fee and a restoration fee to the City of Tualatin, as set forth in TDC 34.220(3), in addition to civil penalties in TDC 31.111. [Ord. 963-96, § 9, 6/24/96. Ord. 1079-01, § 2, 7/23/01; Ord. 1279-09 §3, 3/23/09]

Response: The Applicant has submitted Tree Removal Permit applications as necessary for the Nyberg Rivers redevelopment. Exhibit M and Exhibit O, Sheets – C2.0 through C2.5 identify all trees to remain and to be removed with the associated reason for removal if any additional street trees need to be removed in the future, the Applicant will comply with these standards. Proposed new street trees are included in the Landscape Planting Plan included with this application under Exhibit O – L1.0 through L1.10. Street trees are being removed to facilitate the extension of Street A to Lower Boones Ferry, the relocation of Seneca as well as the new right-turn lane that is proposed on Nyberg Street. A street tree at the corner of Martinazzi and Nyberg is proposed for removal as it interferes with the clear vision area.

SECTION 74.720 PROTECTION OF TREES DURING CONSTRUCTION.

(1) During the erection, repair, alteration or removal of a building or structure, it is unlawful for the person in charge of such erection, repair, alteration or removal to leave a tree in or upon a public right-of-way in the vicinity of the building or structure without a good and sufficient guard or protectors to prevent injury to the tree arising out of or by reason of such erection, repair, alteration or removal.

(2) Excavations and driveways shall not be placed within six feet of a tree in or upon a public right-of-way without written permission from the City Engineer. During excavation or construction, the person shall guard the tree within six feet and all building material or other debris shall be kept at least four feet from any tree. [Ord. 963-96, § 9, 6/24/96]

Response: The Applicant is aware of the requirements for tree protection during construction. Proper protection is shown on the Grading Plan submitted as Exhibit O – C3.0 through C3.2 with this ARB application.

SECTION 74.765 STREET TREE SPECIES AND PLANTING LOCATIONS.

All trees, plants or shrubs planted in the right-of-way of the City shall conform in species and location and in accordance with the street tree plan in Schedule A. If the Operations Director determines that none of the species in Schedule A is appropriate or finds appropriate a species not listed, the Director may substitute an unlisted species. [Ord. 963-96, § 9, 6/24/96; Ord. 1279-09 §7, 3/23/09]

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Response: The Applicant has presented a landscape plan that includes approved trees from the Schedule A: Street Tree Species list. As included under Exhibit O – Sheets L1.0 through L1.10, the proposed Landscape Planting Plan includes a wide variety of approved trees including Oak, Hawthorne, Cedar, and Ash throughout the street frontage and interior landscape areas.

TDC 75: ACCESS MANAGEMENT ON ARTERIAL STREETS

SECTION 75.050 APPROVAL PROCESS FOR ACCESS ONTO ARTERIALS, AND APPEAL PROVISIONS.

(1) All requests for access onto arterials shall be reviewed by the City Engineer and follow the process described in TDC 31.074 through TDC 31.078 unless it is processed in conjunction with an application requiring a public hearing by the City Council. Based on provisions of this chapter and of the procedure described in TDC 31.074 through TDC 31.078, the City Engineer shall approve, approve with conditions, or reject the request for access in writing, stating the reasons for his or her decision.

(2) Notice of the City Engineer's decision shall be distributed in accordance with TDC 31.074. The applicant shall be responsible for preparing the list of property owners within the notification area in the manner provided by TDC 31.071. The City Engineer's decision shall be final 14 calendar days after the date the notice of the decision is distributed unless within the 14 calendar the City Engineer receives a request for review of the decision. Requests for review shall be submitted in accordance with TDC 31.076 and a hearing conducted in accordance with TDC 31.077. [§75.05(3) Re-pealed by Ord. 743-88, §29 & 34, 3/28/88; Ord. 982-97, §6, 8/4/97; Ord. 96-07, 5/12/97; Ord. 1096-02 §38, 1/28/02]

Response: Although this section sets out only an approval process and not a criterion, the proposed Nyberg Rivers Site Plan utilizes an existing access point onto SW Nyberg Street. Based on input received from ODOT, a 10-foot wide maintenance access easement along the new Nyberg Street right-of-way is required and shown on the Site Plan, Sheet C1.1 under Exhibit O. Also, a 15-foot access easement is shown from the main entrance off Nyberg Street to connect to the ODOT maintenance easement and the (6) tax lots that currently use the existing access road. The Applicant is also proposing to remove an existing access point on Nyberg Street (75th Street) as well as two driveways that are located along Martinazzi. The Applicant is providing an easement for future connection to Street "A" to allow for future access management along Boones Ferry Road. The Applicant is also proposing that the connection from Street "A" to Boones Ferry Road be constructed as a right-in/right-out improvement consistent with these requirements. It should be noted that no curb extensions are proposed for Street "A", as no on-street parking is allowed along Street "A". As noted in the TIA provided as Exhibit L, several transportation improvements are proposed that will work to enhance access management and vehicle circulation and efficiency. Those findings are again incorporated herein by reference. Most notably, the primary access for the site is from a new minor collector, Loop Road that will serve all uses within the shopping center.

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SECTION 75.060 EXISTING DRIVEWAYS AND STREET INTERSECTIONS.

(1) Existing driveways with access onto arterials on the date this chapter was originally adopted shall be allowed to remain. If additional development occurs on proper-ties with existing driveways with access onto arterials then this chapter applies and the entire site shall be made to conform with the requirements of this chapter.

(2) The City Engineer may restrict existing driveways and street intersections to right-in and right-out by construction of raised median barriers or other means. [Ord. 635-84, §48, 6/11/84; Ord. 982-97, §7, 8/4/97]

Response: The master plan comprehensively reviewed the driveway access points to the site. There the City found: At the intersection of collector or arterial streets, driveways needs to be located a minimum of 150 feet from the intersection. Several accesses are within 150 feet from either SW Boones Ferry Road or SW Nyberg Road, both Major Arterials. Access to the City staff parking lot and the access easement to Heron's Landing Apartments are approximately 140 feet and 110-feet away from SW Boones Ferry Road, respectively. Locating the City staff parking lot access farther south would require relocation of the cement block trash enclosure, therefore the location is acceptable. The Heron's Landing Apartments access is too close to SW Boones Ferry Road; therefore, it will need to be located farther south to match the location of the City staff access. The Applicant will need to locate the Heron's Landing Apartment access opposite the City staff parking lot access. Along the Nyberg Main Entry access to the east and west parking lots are approximately 120 feet from SW Nyberg Road; however left turns are restricted by a median, therefore the location is acceptable.

The City further decided that the best operational environment would be preserved by closure of the driveways south of City Hall and south of the Council Building. The attached Site Plan, Exhibit O, Sheets C1.0 through C1.2, demonstrates compliance with all of these requirements.

SECTION 75.070 NEW INTERSECTIONS.

Except as shown in TDC Chapter 11, Transportation, (Figures 11-1 and 11-3), all new intersections with arterials shall have a minimum spacing of ½ mile between intersections. [Ord. 635-84, §49, 6/11/84]

Response: The Applicant is proposing to provide a new extension, Street "A" and the Loop Road that will connect with Boones Ferry Road in the north and Nyberg Street in the south as depicted within the City's TSP. The proposed location of the connection was arrived at based on site distance, topography and the conceptual alignment depicted in the City's TSP. The master plan adopted this Loop Road alignment and intersection location with Boones Ferry at pages 11-30 of the master plan decision incorporated herein by reference.

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SECTION 75.080 ALTERNATE ACCESS.

Except as provided in TDC 75.090 all properties which abut an arterial and another road or street shall not have access on the arterial. [Ord. 635-84, §50, 6/11/84]

Response: "Access Management Policy 2: Where a property abuts an arterial and another roadway, the access for the property shall be located on the other roadway, not the arterial."

This management policy is similar in wording to 75.080. The City found that the development as proposed satisfies this criteria. The master plan found the following:

First, the Loop Road is a required component of the Central Urban Renewal Master Plan, with its location within the site subject to modification. Section 75.120, which "describes in detail the freeways and arterials . . . with respect to access" clarifies that the existing intersection on Nyberg is intended to serve Urban Renewal Area Block 2 to the north of Nyberg and the Fred Meyer property to the south of Nyberg. 75.120(5). That section provides "On the south side between Fred Meyer and I-5 any development shall be served by the Fred Meyer driveway Tax Lot 2S1 24CA 200 or Urban Renewal Area Block 6) aligned with the Urban Renewal Area Block 2 driveway on the north side and shall not be granted any access to Nyberg Street. No additional driveways will be allowed." Further, as detailed in these findings and incorporated herein by reference, the Loop Road is a designated minor collector and is designed under this proposal to the minor collector standards as contemplated by the Urban Renewal Plan. The minor collector runs through the site and connects to the arterials that surround the site. Each of the properties within the site will have access to the minor collector and from the minor collector to the surrounding arterials. Intersections between arterials and collectors are not only encouraged by the code they are a necessary component of the street system. The Loop Road as a minor collector is a public road that with public access. Thus, the development takes access off of the minor collector.

The master plan area is also comprised of several separate lots. The City Council concluded that the reference to "Property" in TDC 11.630(5)(a)(ii) refers to each of the underlying lots within the Master Plan area. Several of the individual lots have frontage solely on SW Nyberg Street or have no street frontage whatsoever. For example, Tax Lot 2100, which comprises the K-Mart store and which will include the Loop Road has frontage solely along an arterial, SW Nyberg Street. Because Tax Lot 2100 abuts an arterial but does not abut another roadway, TDC 11.630(5)(a)(ii) does not apply and does not require access to Tax Lot 2100 be taken from the non-arterial.

Accordingly, because the Loop Road is a public minor collector and each of the properties within the project have access onto the minor collector, the proposal satisfies TDC 11.630(5)(a)(ii) and 75.080. Even if the Loop Road were a private road, the proposal still satisfies this criterion because each property within the site is evaluated individually under this section.

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SECTION 75.090 INTERIM ACCESS.

When a property abuts a freeway, expressway or arterial and a future street shown on Map 75-1, or abuts or bisects the property, the City Engineer may approve an interim access on the arterial subject to the following conditions:

Response: The Applicant is not seeking interim or temporary access onto any arterial roads. Thus this criterion does not apply.

SECTION 75.100 EXCEPTIONS.

If the City Engineer finds that it is physically impossible for a property to receive access from any other street or road than an arterial as defined in TDC 75.030 and that the property cannot physically be served by any new street as shown on Map 75-1 or any logical extension of or addition thereto, the City Engineer may grant a permanent access directly to an arterial. In doing so the City Engineer may impose conditions on the construction of said access including, but not limited to:

(1) Dedication of additional right-of-way on the arterial.

(2) Creation of a joint access.

(3) Construction of left turn lanes.

(4) Construction of right turn lanes.

(5) Installation of traffic signals.

(6) Limitation of access to right turn in, right turn out by construction of raised median barriers or other means. [Ord. 635-84, §52, 6/11/84]

Response: The Applicant is not currently seeking an arterial access exception.

SECTION 75.110 NEW STREETS.

(1) New streets designed to serve as alternatives to direct, parcel by parcel, access onto arterials are shown on Map 75-1. These streets are shown as corridors with the exact location determined through the partition, subdivision, public works permit or Architectural Review process. Unless modified by the City Council by the procedure set out below, these streets will be the only new intersections with arterials in the City. See map for changes

(2) Specific alignment of a new street may be altered by the City Engineer upon finding that the street, in the proposed alignment, will carry out the objectives of this chapter to the same, or a greater degree as the described alignment, that access to adjacent and nearby properties is as adequately maintained and that the revised alignment will result in a segment of the Tualatin road system which is reasonable and logical.

(3) The City Council may include additional streets on Map 75-1 through the plan amendment procedure. In addition to other required findings, the City Council must find that the addition is necessary to implement the objectives of this chapter. [Ord. 635-84, §53, 6/11/84; Ord. 743-88, §31, 3/28/88; Ord. 975-97, §3, 5/12/97; Ord. 1023-99, §11, 6/28/99]

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Response: The Applicant is proposing to provide a new extension, the Loop Road connecting Street "A",Boones Ferry Road and Nyberg Street as depicted within the City's TSP. The proposed location of the connection was arrived at based on site distance, topography and the conceptual alignment depicted in the City's TSP. Consistent with these criteria, the streets on the TSP are shown as corridors only with the exact location determined through public works or architectural review process. The applicant incorporates by reference the findings above in this narrative addressing the location, design and function of Street A and incorporating the master plan findings on the same.

SECTION 75.120 EXISTING STREETS.

The following list describes in detail the freeways, expressways and arterials as defined in TDC 75.030 with respect to access. Recommendations are made for future changes in accesses and location of future accesses. These recommendations are examples of possible solutions and shall not be construed as limiting the City' s authority to change or impose different conditions if additional studies result in different recommendations from those listed below.

S.W. NYBERG STREET
Tualatin-Sherwood Road to 65th Avenue:
On the south side between Fred Meyer and I-5 Freeway any development shall be served by the Fred Meyer driveway aligned with the K-Mart driveway on the north side and shall not be granted any access to Nyberg Street.

Response: The proposed redevelopment at Nyberg Rivers will utilize the existing Fred Meyer/K-Mart intersection to provide primary access into the Nyberg Rivers redevelopment site in compliance with this criterion. The Loop Road will be improved to a minor collector pursuant to its design and designation as a public minor collector. Particular engineering work was performed to ensure that the minor collector was aligned with the driveway entrance to Fred Meyer. This alignment and the design of the minor collector are illustrated in Exhibit A under cross-section A-A.

BOONES FERRY ROAD

North City Limits to Tualatin River:
All existing driveways will remain. No new driveways will be permitted.

Tualatin River to Tualatin Road:
Between the River and Martinazzi Avenue on the south side, the access for the apartments (2S1 24B/1500) will be closed and converted over to the Loop Road. The Loop Road may have a right-in, right-out connection to Boones Ferry Road between the river and Martinazzi Avenue. On the south side of Boones Ferry Road between Martinazzi Avenue and the driveway for the White Lot (old Lot C), any development or redevelopment shall take access over the White Lot or from Martinazzi Avenue. Between the White lot and 84th Avenue, all properties shall have combined accesses resulting in only one access on Boones Ferry Road. Between 84th Avenue and Tualatin Road on the south side, any redevelopment shall result in no driveways onto Boones Ferry Road and access shall be taken from 84th Avenue or Seneca Street.

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Response: The cross section under Exhibit A and Site Plan (Exhibit O- Sheets C1.0 through C1.2), show compliance with this standard. The Loop Road connects with Boones Ferry and provides future access to the apartments. An access easement from Street "A" is proposed to serve the high-density residential apartments located in the northwest portion of Nyberg Rivers. This access easement will provide access onto the future Loop Road, which will provide right-in, right-out access onto Boones Ferry Road. These connections, design and function were also approved as part of the master plan and are in compliance with the conditions or approval established at pages 14-16 of the master plan decision, incorporated herein by Exhibit A containing the City approved cross sections of Street A, City Parking Lot, and Heron's Landing.

MARTINAZZI AVENUE

Boones Ferry Road to Seneca Street:
On the west side, any redevelopment on the Doyle (old Silvey) property (2S1 24BC/1500, 1503) or the Halstin (old post office property) (2S1 24BC/1502) shall result in combining these two driveways into one driveway on Martinazzi Avenue, or the Halstin property shall take access from the White public parking lot (old Lot C) to Boones Ferry Road. On the east side the existing driveway shall be removed and access shall be taken off of the Loop Road.

Seneca Street to Nyberg Street:
No driveways shall be permitted. The raised center median prohibiting left turns in this area shall remain until driveways are removed. On the west side the Wells Fargo driveway shall be removed and access taken from Seneca Street or Nyberg Street. On the east side the driveway for 2S114B/2000 shall be removed and access taken from the Loop Road or Nyberg Street.

Nyberg Street to Tualatin-Sherwood Road:
There shall be no access to Martinazzi Avenue.

Response: There are two existing driveways on Seneca Street. The driveway access to Council Chambers will be preserved only until such time as the Seneca Street extension is constructed. At that time the driveway will be removed under this criterion. The other existing driveway located south of Seneca and between Seneca and Nyberg will be closed with this application in conformance with this requirement. No new driveways are proposed along any of the targeted frontages.

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TDC 50: OFFICE COMMERCIAL PLANNING DISTRICT (CO)

SECTION 50.020 PERMITTED USES.

No building, structure or land shall be used in this district except for the following uses when conducted wholly within a completely enclosed building, except for utility facilities and wireless communication facilities, and provided retail uses on land designated Employment Area, Corridor or Industrial Area on Map 9-4 shall not be greater than 60,000 square feet of gross floor area per building or business:

(1) Offices, studios or clinics of accountants, architects, artists, attorneys, authors, dentists, designers, investment counselors, landscape architects, management consultants, and physicians or other practitioners of the healing arts.

(2) Offices of administrative, editorial, educational, financial, governmental, insurance, real estate, religious, research, scientific or statistical organizations.

(3) Health or fitness facility as defined in TDC 31.060, with indoor operation only.

(4) Greenways, including but not limited to bike and pedestrian paths and interpretive stations.

(6) Parking lot, parking structure or underground parking.

(11) Other uses of similar character, found by the Planning Director to meet the purpose of this district, as provided by TDC 31.070.

(12) Transportation facilities and improvements. [Ord. 635-84 §16, 6/11/84; Ord. 668-85 §2, 6/10/85; Ord. 771-89 §2, 4/10/89; Ord. 824-91 §6, 2/11/91; Ord. 849-91 §16, 11/25/91; Ord. 920-94 §13, 4/11/94; Ord. 965-96 §38, 12/9/96; Ord. 991-98 §1, 2/23/988; Ord. 992-98 §1, 2/23/98; Ord. 1006-98 §1;7/13/98; Ord. 1026-99 §42, 8/9/99; Ord. 1103-02, 03/25/02]

Response: The buildings within the CO District contain uses that are permitted in the CO District. Proposed uses for these buildings include office or health/fitness facility use and a portion of a sporting goods store. The health and fitness and office uses are expressly permitted outright as listed above. The retail use within the CO portion of the Cabela's is a conditional use. That use has been approved by the City in the final decision Resolution No. 5164-13 CU 13-04, attached here as Exhibit A

CURD BLOCK 1 USES

Uses permitted in the Central Commercial Planning District are permitted as conditional uses.

Response: Within the CC district sporting goods stores are permitted uses. Consequently, on CURD Block 1, sporting goods stores are permitted as conditional uses. Pursuant to CUP 13-04, the City Council approved a sporting goods store as a conditional use on CURD Block 1. As a result, the proposed uses within the CO portion of the property are either outright permitted uses, or have previously been approved as conditional uses by the City Council.

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SECTION 50.050 LOT SIZE.

Except for lots for public utility facilities, natural gas pumping stations and a wireless communication facility which shall be established through the Subdivision, Partition or Lot Line Adjustment process, the following requirements shall apply:

(1) The minimum lot size shall be 10,000 square feet.

(2) The minimum average lot width shall be 80 feet.

(3) The minimum lot width at the street shall be 40 feet.

(4) For flag lots, the minimum lot width at the street shall be sufficient to comply with at least the minimum access requirements contained in TDC 73.400(8) to (12).

(5) The minimum lot width at the street shall be 40 feet on a cul-de-sac street. [Ord. 866-92, §13, 4/27/92; Ord. 965-96, §40, 12/9/96.; §50.055 Repealed by Ord. 862-92, §17, 3/23/92]

Response: The portion of the Nyberg Rivers site located in the CO District is located within a split-zoned lot approved by Property Line Adjustment PLA 13-03. PLA 13-03 consolidated three (3) lots into one (1) approximately 22.6 acres lot. This consolidated lot meets the minimum lot size and has an average lot width greater than 80 feet and a minimum lot width greater than 40 feet.

SECTION 50.060 SETBACK REQUIREMENTS.

(1) Front yard. Except for townhouses whose set backs shall conform to the setback standards in the RH District, the minimum front yard setback shall be 20 feet, except where a fish and wildlife habitat area on the subject property is placed in a Tract and dedicated to the City at the City's option, dedicated in a manner approved by the City to a nonprofit conservation organization or is retained in private ownership by the developer, the decision authority may allow a reduction of up to 35% of the required front yard setback, as determined in the Architectural Review process, if as a result the buildings are farther away from fish and wildlife habitat areas.

(2) Side yard. Except for townhouses whose setbacks and separation between buildings shall conform to the setback and separation standards in the RH District, and except for structures greater than 35 feet in height which shall have a setback of 30 feet when the subject side yard abuts a lot in the RL District and a setback of 20 to 30 feet as determined through the Architectural Review process when the subject side yard abuts a lot in a multifamily district, the side yard setback shall be zero to 15 feet, as determined through the Architectural Review process.

(3) Rear yard. Except for townhouses whose setbacks and separation between buildings shall conform to the setback and separation standards in the RH District, and except for structures greater than 35 feet in height which shall have a setback of 30 feet when the subject rear yard abuts a lot in the RL District and a

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setback of 20 to 30 feet as determined through the Architectural Review process when the subject side yard abuts a lot in a multifamily district, the rear yard setback shall be zero to 15 feet, as determined through the Architectural Review process.

(4) Corner lot yards. Except for town-houses whose setbacks shall conform to the setback standards in the RH District, zero to 20 feet along each street frontage for a sufficient distance to provide adequate sight distance for vehicular and pedestrian traffic at an intersection, as determined through the Architectural Review process.

(5) Except for townhouses whose set-backs shall conform to the setback standards in the RH District, off-street parking and vehicular circulation areas shall be set back a minimum of 5 feet from any public right-of-way or property line, except as approved through the Architectural Review process.

(6) Except for townhouses which may construct a fence on the property line, no fence shall be constructed within 5 feet of a public right-of-way.

Response: There are two buildings in the CO District: building N-100 and a portion of building 1040. Both buildings are oriented towards the interior of the site facing the central parking area. Therefore, the area between the building and the central drive aisles and parking stalls would be considered the front yard setback. The locations of the buildings, as well as the setbacks, were approved as part of the Master Plan approval. Each of the approved setbacks conforms to the above standards as follows: As shown on Exhibit O, the front yard setback for both structures is well over 100 feet, and therefore meets the 20-foot minimum setback. As shown on Exhibit O, the side yard setback is well over 50 feet, which meets the minimum 20 to 30 foot setback. The rear yard setback is well over 60 feet, as shown on Exhibit O, which exceeds the 20 to 30-foot requirement of the zone. No buildings are proposed in the CO zone on corner lots, therefore, the corner lot setback does not apply. All parking and circulation areas are setback at least 5 feet from public right of ways within the CO zone. No fences are proposed within 5 feet of any public right of way.

SECTION 50.065 CENTRAL URBAN RENEWAL AREA--LOT SIZES.

Except for townhouses whose lot sizes shall conform to the lot size standards in the RH District, the minimum lot sizes in the Central Urban Renewal District are as described on Map 9-3. [Ord. 694-86 §8, 5/27/86; Ord. 1025-99 §29, 7/26/99; Ord. 1026-99 §45, 8/9/99; Ord. 1046-00 §6, 2/14/00]

Response: The entire Nyberg Rivers site is located within the Urban Renewal Area. According to Map 9-3 in the Central Urban Renewal Report, Urban Renewal Area Blocks 1, 2, 3 and a portion of 4 are located within the Nyberg Rivers site. Based on Map 9-3, the minimum lot size for Blocks 1, 2, 3 and 5 is 25,000 SF. There are five (5) existing lots within the Nyberg Rivers site. Two (2) are a result of PLA 13-03 and PLA 13-04. The smallest lot contains approximately 30,492 SF, well above the minimum lot requirement. A portion of the SW Nyberg Street right-of-way is also proposed as being part of the Nyberg Rivers development. If approved as a lot, it would contain approximately 30,000 SF.

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SECTION 50.070 STRUCTURE HEIGHT.

(1) Except for flagpoles displaying the flag of the United States of America, either alone or with the State of Oregon flag which shall not exceed 100 feet in height above grade, and except as provided by subsection (2) of this section, the maximum height of any structure in this district is 45 feet.

(2) Maximum structure height for a wireless communication support structure and antennas located within 300 feet of the centerline of I-5 is 120 feet. [Ord. 792-90, §1, 1/8/90; Ord. 965-96, S§42, 12/9/96; Ord 974-97, §2, 5/12/97; Ord. 978-97, §1, 6/23/97; Ord. 1116-02, 08/26/2002]

Response: The Applicant is aware of the maximum structure heights within the CO District. Proposed building N-100 would have a maximum height of 38 feet. The portion of proposed building 1040 located in the CO District would have a maximum height of 28 feet. The proposed buildings would meet the district height requirements. For building elevations refer to Exhibit L.

SECTION 50.080 ACCESS.

All lots created after September 1, 1979, shall abut a public street, except secondary condominium lots, which shall conform to the access provisions in TDC 73.400 and TDC Chapter 75. Lots and tracts created to preserve wetlands, greenways, Natural Areas and Stormwater Quality Control Facilities identified by TDC Chapters 71, 72, Figure 3-4 of the Parks and Recreation Master Plan and the Surface Water Management Ordinance, TMC Chapter 3-5, as amended, respectively, or for the purpose of preserving park lands in accordance with the Parks and Recreation Master Plan, may not be required to abut a public street. [Ord. 872-92 §8, 6/29/92; Ord. 1025-99 §30, 7/26/99; Ord. 1026-99 §46, 8/9/99]

Response: No new lots are proposed as a part of this application; consequently, this standard does not apply in the context of Architectural Review. The lot resulting from the approval of PLA 13-03 abuts SW Nyberg Street, a public street. The proposed conservation area located at the northwestern corner of Nyberg Rivers, adjacent to the Tualatin River and including the shared pathway easement, may be established as a lot or tract to preserve the natural area.

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TDC 53: CENTRAL COMMERCIAL PLANNING DISTRICT (CC)

SECTION 53.020 PERMITTED USES.

No building, structure or land shall be used except for the following uses when conducted wholly within a completely enclosed building, except for utility facilities and wireless communication facilities, and provided retail uses on land designated Employment Area, Corridor or Industrial Area on Map 9-4 shall not be greater than 60,000 square feet of gross floor area per building or business.

Response: All proposed uses in the CC District qualify as permitted uses in the CC District, excepting only outdoor storage and sales associated with the sporting goods store which constitutes a conditional use, subject to the standards of Chapter 32. The outdoor storage and sales component was approved by the City Council under CUP 13-04. Consequently, all uses proposed are either permitted outright in the CC zone or have previously been approved by the City Council. CUP 13-04 is attached as Exhibit A.

SECTION 53.060 LOT SIZES.

Except for lots for public utility facilities, natural gas pumping stations and wireless communication facilities which shall be established through the Subdivision, Partition or Lot Line Adjustment process, the following requirements shall apply:

(1) The minimum lot area shall be 10,000 square feet.

(2) The minimum average lot width shall be 75 feet.

(3) The minimum lot width at the street shall be 40 feet.

(4) For flag lots, the minimum lot width at the street shall be sufficient to comply with at least the minimum access requirements contained in TDC 73.400(8) to (12).

(5) The minimum lot width at the street shall be 40 feet on a cul-de-sac street. [Ord. 866-92, §15, 4/27/92; Ord. 965-96, §48, 12/9/96]

Response: No new lots are proposed as a part of this application. There are four (4) lots located within the CC District on the site. Two (2) lots are existing and two (2) were approved recently (PLA 13-03 and PLA 13-04). The smallest lot contains approximately 52,272 SF. All lots exceed the minimum area, have an average lot width greater than 80 feet and a minimum lot width greater than 40 feet.

SECTION 53.070 CENTRAL URBAN RENEWAL AREA - LOT SIZES.

Except for lots for public utility facilities, natural gas pumping stations and wireless communication facilities which shall be established through the Subdivision, Partition or Lot Line Adjustment process, and excepting any lot in the Core Area Parking District where TDC 53.070(1)-(5) apply, the minimum lot size in the Central Urban Renewal District shall conform to the lot sizes described on Map 9-3:

(1) Except for mixed use developments, and common-wall dwellings on separate lots:

(a) The minimum lot area shall be 5,000 square feet.

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(b) The minimum average lot width shall be 40 feet.

(c) The minimum lot width at the street shall be 40 feet.

(d) For flag lots, the minimum lot width at the street shall be sufficient to comply with at least the minimum access requirements in TDC 73.400(8) - (12).

(e) The minimum lot width at the street shall be 35 feet on a cul-de-sac street.

(2) For mixed use developments, and common-wall dwellings on separate lots:

(a) Lot areas, widths and frontages shall be determined through the Architectural Review Process.

(b) Frontage on a public street shall not be required when access via easements is provided in accordance with TDC 73.400.

(3) The minimum lot width at the street shall be 40 feet.

(4) For flag lots, the minimum lot width at the street shall be sufficient to comply with at least the minimum access requirements in TDC 73.400(8) - (12).

(5) The minimum lot width at the street shall be 40 feet on a cul-de-sac street. [Ord. 635-84 §24, 6/11/84; Ord. 694-86 §6, 5/27/86; Ord. 872-92 §11, 6/29/92; Ord. 882-92 §7, 12/14/92; Ord. 965-96 §49, 12/9/96; Ord. 1026-99 §58, 8/9/99]

Response: Again, no new lots are proposed as part of the present Architectural Review application. The entire Nyberg Rivers site is located within the Urban Renewal Area. According to Map 9-3 in the Central Urban Renewal Report, Urban Renewal Area Blocks 1, 2, 3 and a portion of 4 are located within the Nyberg Rivers site. Based on Map 9-3, the minimum lot size for Blocks 1, 2, 3 and 5 is 5,000 SF. There are five (5) existing lots within the Nyberg Rivers site. Two (2) are a result of PLA 13-03 and PLA 13-04. The smallest lot contains approximately 30,492 SF, well above the minimum lot requirement. A portion of the SW Nyberg Street right-of-way is also proposed as being part of the Nyberg Rivers development, if approved as a lot, it would contain approximately 30,000 SF. All lots have an average lot width greater than 40 feet and a minimum lot width greater than 40 feet. To the extent that the minimum lot size standard applies to Architectural Review, the minimum lot standards have been met.

SECTION 53.080 SETBACK REQUIREMENTS.

(1) Front yard. Except as provided by TDC 53.090(2)(a), zero to 20 feet, as determined through the Architectural Review process.

(2) Side yard. Except as provided by TDC 53.090(2)(a), zero to 20 feet, as determined through the Architectural Review process.

(3) Rear yard. Zero to 15 feet, as deter-mined through the Architectural Review process.

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(4) **Corner lot yards. Zero to 20 feet for a sufficient distance to provide adequate sight distance for vehicular and pedestrian traffic at an intersection, as determined through the Architectural Review process.**

(5) **Off-street parking and vehicular circulation areas shall be set back a minimum of 5 feet from any public right-of-way or property line, except as approved through the Architectural Review process.**

(6) **No fence shall be constructed within 5 feet of a public right-of-way, except that in residential and mixed use residential developments within the Central Design District the minimum fence setback shall be determined through Architectural Review, with no minimum requirement.**

(7) **For residential garage doors facing a public street, the minimum setback shall be 20' from the right-of-way.**

(8) **Setbacks for a wireless communication facility shall be established through the Architectural Review process, shall consider TDC 73.510, shall be a minimum of 5 feet, and shall be set back from an RL District, or an RML District with an approved small lot subdivision, no less than 175 feet for a monopole that is no more than 35 feet in height and the setback shall increase five feet for each one foot increase in height up to 80 feet in height, and the setback shall increase 10 feet for each one foot increase in height above 80 feet. [Ord. 643-84, §2, 9/10/84; Ord. 862-92, §27, 3/23/92; Ord. 882-92, §8, 12/14/92; Ord. 904-93, §24, 9/13/93; Ord. 965-96, §50, 12/9/96; Ord. 1098-02, 2/11/02]**

Response: There are no previously approved Architectural Reviews for the Nyberg Rivers site that provide specific setback distances. The Master Plan approved a specific layout of all proposed buildings, with specifically identified setbacks. The current proposal is consistent with the approved Master Plan. Existing buildings located within lots that have remained unchanged during this application process are Building A, Building B, and Building C as shown on Exhibit L – C1.0. Because these buildings are existing, the setback standards do not apply. Existing building E-100 is located on the consolidated lot approved through PLA 13-03, which maintained or increased the existing setbacks. Buildings D-110, D-120, D-125, D-130, 1005, 1010 and 1030 share walls and effectively create one structure (see Exhibit L – C1.0). This structure is bisected by a property line running north-south along the wall shared by buildings 1005 and D-110. Buildings 1005 and D-110 are existing and are the only buildings located on the site with a zero-foot setback. Of the proposed buildings, the shortest setbacks are the rear setbacks for buildings G-100, H-100 and J-100 with 9 feet, 7 feet and 9 feet respectively. All remaining setbacks for new buildings would exceed the 20 foot maximum setback, however the specific location of building footprints was approved as part of the Master Plan process, detailed findings are included as Exhibit A. All buildings are oriented towards the interior of the site facing the central parking area. Therefore, the area between the building and the central drive aisles and parking stalls would be considered the front yard setback. All buildings feature a pedestrian accessway along the building frontage of at least 8-feet wide. And all off-street parking and vehicle circulation areas are set back at least 5-feet from any public right-of-way or property line.

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SECTION 53.090 STRUCTURE HEIGHT.

(1) Except for flagpoles displaying the flag of the United States of America, either alone or with the State of Oregon flag which shall not exceed 100 feet in height above grade, and except as provided in TDC 53.090(2), (3) and (4), the maximum height for a structure is 45 feet.

(2) In the CC Planning District north of SW Boones Ferry Road and south of the Tualatin River, the maximum height for a structure is 125 feet, when approved by Conditional Use Permit pursuant to TDC Chapter 32 and subject to the following setback requirements:

(a) Front yard. Any structure south of Hedges Creek shall comply with the CC District setbacks and any structure north of Hedges Creek shall comply with the TDC Chapter 72 setbacks for Hedges Creek.

(b) Side yard. The minimum side yard setback shall be:

(i) For structures 45 feet or less in height, zero to 15 feet as determined through the Architectural Review process.

(ii) For structures greater than 45 feet, but less than 84 feet, the side yard setback shall be 30 feet for that portion of the structure greater than 45 feet and less than 84 feet in height.

(iii) For structures greater than 84 feet but less than or equal to 125 feet in height, the side yard setback shall be 45 feet for that portion of the building greater than 84 feet in height.

(3) Maximum structure height for specified portions of the Central Urban Renewal Plan area is:

(a) 35 feet between the Tualatin Commons central water feature and the primary pedestrian corridor around the central water feature, except for architectural focal elements.

(b) Except as provided in TDC 53.090(3)(a), 75 feet in Block 13.

(c) Except as provided in TDC 53.090(3)(a), 60 feet in Blocks 1, 2, 3, 5, 14, 15, 16, 17, 18, 19, 20 and 22.

(d) 75 feet for architectural focal elements in Blocks 14, 17, 18 and 20.

(4) Maximum structure height for a wireless communication support structure and antennas located within 300 feet of the centerline of I-5 is 120 feet. [Ord. 792-90 §2, 1/8/90; Ord. 882-92 §9, 12/14/92; Ord. 965-96 §51, 12/9/96; Ord. 1026-99 §59, 8/9/99; Ord. 1116-02, 8/26/02; Ord. 1109-02, 4/22/02]

Response:

Proposed Height Maximum Height

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Building A – Existing N/A

Building B – Existing N/A

Building C – Existing N/A

D-110 – 34 feet

D-120 - 30 feet

D-125 – 26 feet

D-130 – 26 feet

E-100 – Existing

F-100 – 28 feet

G-100 – Not a part of the application

H-100 – Not a part of the application

J-100 – 30 feet

1005 – 34 feet

1010 – 34 feet

1030 – 34 feet

1040 – 38 feet

N-100 – 50.5 feet

SECTION 53.100 ACCESS.

Except as provided below, no lot shall be created without provision for access to the public right-of-way in accordance with TDC 73.400 and TDC Chapter 75. Such access may be provided by lot frontage on a public street, or via permanent access easement over one or more adjoining properties, creating uninterrupted vehicle and pedestrian access between the subject lot and the public right-of-way. Lots and tracts created to preserve wetlands, greenways, Natural Areas and Stormwater Quality Control Facilities identified by TDC Chapters 71, 72, Figure 3-4 of the Parks and Recreation Master Plan and the Surface Water Management Ordinance, TMC Chapter 3-5, as amended, respectively, or for the purpose of preserving park lands in accordance with the Parks and Recreation Master Plan, may not be required to abut a public street. [Ord. 872-92 §12, 6/29/92; Ord. 882-92 §10, 12/14/92; Ord. 979-97 §21, 7/14/97; Ord. 1026-99 §60, 8/9/99]

Response: No new lots are proposed in conjunction with Architectural Review. Several lots were recently consolidated pursuant to PLA 13-03 and PLA 13-04, resulting in

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the consolidation of five (5) lots into two (2) lots. The consolidated lot approved by PLA 13-03 has frontage along SW Nyberg Street and Interstate 5. The consolidated lot approved by PLA 13-04 has frontage along Interstate 5 and access to SW Nyberg Street through the parking lot of the consolidated lot approved by PLA 13-03. SW Nyberg Street is a public street. Both consolidated lots take primary access from that public street in compliance with this criterion. The new Loop Road is also a public road and minor collector. The proposed natural area located at the northern end of Nyberg Rivers, adjacent to the Tualatin River and including the shared pathway easement will be established as a lot or tract to preserve the natural area.

TDC 70: FLOOD PLAIN DISTRICT

SECTION 70.010 PURPOSE.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

(1) To protect human life and health;

(2) To minimize expenditure of public money and costly flood control projects;

(3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) To minimize prolonged business interruptions;

(5) To minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; streets; and bridges located in areas of special flood hazard;

(6) To help to maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;

(7) To ensure that potential buyers are notified that property is in an area of special flood hazard; and

(8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

(9) Comply with Metro's Urban Growth Management Functional Plan, Title 3. [Ord. 1070-01 §9, 4/9/01; Ord. 1070-01, 04/09/01]

Response: No structural development is proposed within the 100-year floodplain along Tualatin River. The proposed shared pathway easement within the natural area, portions of the vehicle circulation area in the northwest corner of the site, portions of Street A and portions of the Seneca relocation will be within the floodplain. All cuts and fills within these areas have been designed to balance onsite so that there is no net increase in the amount of fill located within the floodplain. The proposed improvements will be designed consistent with these requirements.

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The final engineering permitting process will assure that cuts and fills are balanced.

SECTION 70.020 METHODS OF REDUCING FLOOD LOSSES.

In order to accomplish its purposes, this chapter includes methods and provisions for:

(1) Restricting or prohibiting uses that are dangerous to health, safety, and property due to water or erosion hazards, or that result in damaging increases in erosion or in flood heights or velocities;

(2) Requiring that uses vulnerable to floods, including facilities that serve such uses, be protected against flood damage at the time of initial construction;

(3) Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;

(4) Controlling filling, grading, dredging, and other development that may increase flood damage; and

(5) Preventing or regulating the construction of flood barriers that will unnaturally divert flood waters or that may increase flood hazards in other areas.

Response: No structural development is proposed within the 100-year floodplain along Tualatin River. The proposed shared pathway easement within the natural area, portions of the vehicle circulation area in the northwest corner of the site, portions of Street A and portions of the Seneca relocation will be within the floodplain. All cuts and fills within these areas have been designed to balance onsite so that there is no net increase in the amount of fill located within the floodplain. The proposed improvements will be designed consistent with these requirements. The final engineering permitting process will assure that cuts and fills are balanced.

SECTION 70.040 LANDS TO WHICH THIS CHAPTER APPLIES.

This chapter shall apply to all areas of special flood hazards within the jurisdiction of the City of Tualatin.

Response: No structural development is proposed within the 100-year floodplain along Tualatin River. The proposed shared pathway easement within the natural area, portions of the vehicle circulation area in the northwest corner of the site, portions of Street A and portions of the Seneca relocation will be within the floodplain. All cuts and fills within these areas have been designed to balance onsite so that there is no net increase in the amount of fill located within the floodplain. The proposed improvements will be designed consistent with these requirements. The final engineering permitting process will assure that cuts and fills are balanced. (5) Review of Building Permits. Where elevation data is not available either through the Flood Insurance Study or from another authoritative source (TDC 70.140(2)), applications for buildings permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where

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available. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates. [Ord. 717-87, §14, 4/27/87; Ord. 988-97, §10, 12/8/97; Ord. 1265-08 §4, 7/28/08.

Response: The applicant is aware of the provision, but no structural development is proposed within the 100-year floodplain along the Tualatin River. The proposed shared pathway easement within the natural area will be within the floodplain, but no structures are proposed.

III. CONCLUSION

The Nyberg Rivers ARB package represents a comprehensive and collaborative effort to create a vibrant center that provides a seamless extension of the Tualatin City Center. The primary commercial tenants will work to attract regional visitors to the City core in an effort to create a more vibrant and active City Center. The mix of uses will create a sense of place, with vibrancy present during all hours and days of the week. In addition, this project will provide pedestrian and bicycle amenities and linkages to the regional framework to encourage a more active and healthy option for visitors to the site. The proposed public improvements, when combined with the on-site pedestrian and landscape amenities, provide a safe and efficient network for multi-modal access to and through the site. As evidenced throughout this project narrative, Nyberg Rivers does meet or exceed any applicable development regulation and objective of the Tualatin Development Code as it relates to the Architectural Review process. The design elevations show a high quality material and color palette that links the existing buildings with the new buildings to create a cohesive and attractive design. Based on this evidence provided, the applicant requests Architectural Board Review and approval to proceed to building and site development.

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Conditions of Approval Compliance Report

MP 13-01

Resolution No. 5163-13

Each condition of approval from the master plan MP 13-01 is listed below with a reference to how this Architectural Review narrative satisfies each of the conditions of approval. The condition of approval from MP 13-01 is listed in italics in order of its imposition under Resolution No. 5163-13 with a response in bold font.

A. *The City Council finds it necessary to condition the Master Plan to limit the number of drive-thru facilities in the Master Plan to no more than four and designing any new or re- located drive-thru facilities so the service windows and service aisles are screened from public streets.*

The AR site plan shows only four drive-thru facilities in compliance with this condition. See the Site Plan enclosed under Exhibit O, Sheets C1.0 through C1.2. The AR narrative at pages 16 and 17 demonstrate that the service windows and service aisles on the singular relocated drive-through are screened from public streets.

B. *The Master Plan area and Nyberg Rivers site shall provide attractive and pedestrian-oriented features including accessways and pathways that will connect to existing and future residential development in the downtown area and specifically to the adjoining Heron's Landing Apartments property.*

The AR site plan shows multiple pathways that connect to the adjoining Heron's Landing Apartments and the Tualatin downtown area. See the Site Plan enclosed under Exhibit O, Sheets C1.0 through C1.2. Sheet C1.0 shows both the shared pathway easement to the north of the property that provides pedestrian access to the natural area, the remainder of the Nyberg Rivers commercial center, as well as connectivity to Street 'A' and an additional shared pathway to connect to SW Seneca Street. Street 'A' connects to SW Boones Ferry Road, which then provides pedestrian connectivity to the downtown area. The proposed sidewalks on both side of SW Seneca Street will provide pedestrian access into the downtown area. The AR narrative at pages 13 through 16 demonstrate that the accessways and pathways will connect to Heron's Landing and the downtown area to the west.

C. *Recreational equipment, apparel and sports outfitting sales are prohibited in areas identified as public gathering, multi-function open plaza and plaza seating with fire pit as identified in the Building Frontage landscape plan.*

The conditional use exhibit included under Exhibit A with the ARB package, and originally submitted as a part of the Master Plan approval, showed potential outdoor sales areas along the Cabela's frontage. As shown on the AR Landscape Planting Plan

included under Exhibit O, Sheets L1.8A and L1.8B depict the proposed plaza along the Cabela's building frontage. The plaza seating and landscape amenities do not begin until the Cabela's (Building 1040) frontage recesses at the southwest corner of the building. Thus, the broom finished concrete areas shown on the landscape sheets are free and clear to serve the proposed outdoor sales use. The landscaping at the building façade on the eastern portion of the Cabela's frontage is also outside the proposed outdoor sales area. The AR narrative at pages 21 and 22 demonstrate that the outdoor sales areas do not conflict with the pedestrian plazas with enhanced landscape amenities.

D. *A minimum of 12 feet of clear, unobstructed width for walkways or accessways through a plaza or along the building frontage between Building D1 and northeast corner of the public gathering, multi-function plaza seating with fire pit as identified in the Building Frontage landscape plan.*

The AR landscape planting plan Sheets L1.7 and L1.8 display the walkway dimensions through the central plaza, with specific attention paid to access through the enhanced pedestrian plaza areas. A minimum of 12-feet clear, unobstructed width is shown throughout the plaza. site plan shows only four drive-thru facilities in compliance with this condition. See the Site Plan enclosed under Exhibit O, Sheets C1.0 through C1.2. The AR narrative at pages 15-16 and 21-22 provide responses pertaining to the 12-foot free and clear access through the central plaza.

E. *The Truck Route designations from "Street A" and Seneca Street are removed.*

Any reference to Street 'A' or Seneca Street as a designated truck route is removed from the ARB application package. The Transportation Plan submitted under this Exhibit A and referenced as Exhibit M has been updated to remove any reference to Street 'A' or Seneca Street as a designated truck route.

F. *City Council finds the following transportation improvements are needed for the Master Plan to comply with Goal 5, and therefore imposes them as conditions of approval:*

a. *The Seneca Street extension to the Nyberg Rivers site with a signal at SW Martinazzi Avenue constructed to the standards of a Minor Collector Street. The time of construction will be determined through the public facilities decision process and is not anticipated or required to occur prior to removal of the Council Chambers building.*

The AR site plan does show the proposed SW Seneca Street extension along with the proposed bicycle path, landscape strip, and detached sidewalk. See the Site Plan enclosed under Exhibit O, Sheets C1.0 through C1.2. However, as noted above, the "time of construction will be determined through the public facilities decision process". The AR narrative at page 68 notes this condition and the proposed timing for the SW Seneca Street extension.

b. A westbound right turn lane on SW Nyberg Road.

The AR site plan shows the proposed westbound right turn lane and the dedicated right-of-way needed for the additional turn lane. See the Site Plan enclosed under Exhibit O, Sheets C1.0 through C1.2, as well as Cross-Section G-G provided under Exhibit A. The AR narrative at page 69 discusses the proposed improvement to be provided by the applicant.

c. Two southbound left turn lanes and a shared through/right turn lane from the site's access onto SW Nyberg Road.

The AR site plan shows the two proposed southbound left turn lanes with a shared through/right turn lane for the central entry into the site via SW Nyberg Road. See the Site Plan enclosed under Exhibit O, Sheets C1.0 through C1.2, as well as Cross-Section A-A provided under Exhibit A. The AR narrative at page 20 discusses the proposed improvement to be provided by the applicant.

d. Two inbound receiving lanes; and

The AR site plan shows the two proposed inbound receiving lanes from SW Nyberg Road. See the Site Plan enclosed under Exhibit O, Sheets C1.0 through C1.2, as well as Cross-Section A-A provided under Exhibit A. The AR narrative at page 20 discusses the proposed improvement to be provided by the applicant.

e. The associated signal improvements at the main entrance.

The AR narrative at pages 19 and 79 discusses the proposed improvement to be provided by the applicant.

G. In addition, City Council finds the street cross-sections need to be modified to satisfy Goal 5 and are needed to serve the Master Plan area. The City Council approves the Master Plan cross sections with the following modifications:

a. Cross-section A-A:

A 4 to 7-foot planter strip on the east side with curb, streetlights, and trees

A 4-foot planter on the west side with curb, streetlights adjacent to the travel lanes, and groundcover and shrubs with a 14-foot shared path with tree wells

Three 12-foot southbound travel

lane Two northbound 12-foot travel

lanes

A center median consisting of an 18-inch concrete median, with striping on both sides for a total of 2.5-feet

The road shall be a public road.

The AR submittal package includes updated cross-sections under Exhibit A. Cross-section A-A has been updated to reflect the City Council request. These design details are also reflected on the Site Plan, Sheet C1.0 included as Exhibit O and an updated detail sheet xx to depict the proposed tree well design for the tree wells located within the 14-foot shared path. The AR narrative at page 20 discusses the proposed improvements to the main entry to be provided by the applicant.

b. Cross-section B-B:

A 12-foot pedestrian walkway on the north side with tree wells

Two 13-foot travel lanes. 12 foot travel lanes are acceptable.

A 6-foot planter on the south side

A 5-foot sidewalk on the south side

The road shall be a public road.

The AR submittal package includes updated cross-sections under Exhibit A. Cross-section B-B has been updated to reflect the City Council request. These design details are also reflected on the Site Plan, Sheet C1.0 and the Landscape Planting Plan, Sheet 1.7, both included as Exhibit O. The AR narrative at pages 13-16 discusses the proposed improvement to be provided by the applicant.

c. Cross-section C-C:

A 10-foot wide pedestrian walkway on the east side with tree wells

17.5-foot angled parking on both sides

Two 14-foot travel lanes

A 4-foot sloped landscape area on the west side

A 12-foot multi-use path on the west side

The road shall be a public road.

The AR submittal package includes updated cross-sections under Exhibit A. Cross-section C-C has been updated to reflect the City Council request. These design details are also reflected on the Site Plan, Sheet C1.0 included as Exhibit O.

d. "Street A": Cross section D-D:

A 12-foot multi-use path on the west side

A 4-foot planter strip with curb, streetlights, and trees

Two 12-foot travel lanes

A 6-foot bike lane on the east side
A 5-foot sidewalk on the east side

The pork chop at the intersection of Boones Ferry Road will be mountable for emergency vehicles

The road shall be a public road.

The AR submittal package includes updated cross-sections under Exhibit A. Cross-section D-D has been updated to reflect the City Council request. It should also be noted that the Street "A" improvements do not include curb extensions, as no on-street parking is proposed along Street "A". The AR narrative at page 92 has been updated to reflect this clarification. These design details are also reflected on the Site Plan, Sheet C1.0 included as Exhibit O. The AR narrative at page 63 discusses the proposed improvement to be provided by the applicant.

e. City Parking Lot/Heron's Landing/Access to "Street A" and intersection with the greenway:

The accessway shown is 40-feet wide

The multiuse path crossing is located south of the

accessway The crossing will include striping and bump-outs

The Heron's Landing Apartment access easement opposite the City staff parking lot access.

A crosswalk on "Street A" adjacent to SW Boones Ferry Road

The road shall be a public road.

The AR submittal package includes a Site Plan, Sheet C1.0 included as Exhibit O, that reflects the requested updates to the City Parking Lot/Heron's Landing/Street 'A' area. The AR narrative at page 92 discusses the proposed improvement to be provided by the applicant.

f. Nyberg Street between the entrance of the site and Martinazzi Avenue: Cross section F-F:

A 4-6 foot planter strip with trees. This planter does not include curbs and streetlights, which are placed on the curb-tight sidewalk.

A 5-6-foot curb-tight sidewalk on the north side of Nyberg Road

A 6-foot bike lane

Two 11-foot westbound travel lanes

The north-south crosswalk across Nyberg Street will have a dedicated pedestrian/bicyclist-activated sequence

The road shall be a public road.

The AR submittal package includes updated cross-sections under Exhibit A. Cross-section F-F has been updated to reflect the City Council request. These design details are also reflected on the Site Plan, Sheet C1.0 included as Exhibit O. The AR narrative at page 77 discusses the proposed improvement to Nyberg Street to be provided by the applicant.

g. *Nyberg Street between the entrance of the site and I-5: Cross section G-G:*

A 5-foot wide bike lane between the westbound right-turn lane and the central travel lanes

A 7-foot wide sidewalk for pedestrian use on the north side of Nyberg Road

A 4-foot planter strip with curb, streetlights, and trees

A 15-foot westbound right-turn lane

No proposed changes to the existing west and east-bound turn lanes

The road shall be a public road.

A two foot landscape strip prior to a hand rail on top of a retaining wall, then a water quality pond

The AR submittal package includes updated cross-sections under Exhibit A. Cross-section G-G has been updated to reflect the City Council request. These design details are also reflected on the Site Plan, Sheet C1.1 included as Exhibit O. The AR narrative at page 77 discusses the proposed improvement along Nyberg Street to be provided by the applicant.

h. *Seneca Street and the signal at SW Martinazzi*

Avenue Two 12-foot travel lanes

One 14-foot center turn lane

Two 6-foot bike lanes

Two 8-foot parking strips

Two 6-foot planter strips with curbs, streetlights, and street *trees Two 6-foot sidewalks*

The road shall be a public road.

These proposed design details for SW Seneca Street is shown on the Site Plan, Sheet C1.0 included as Exhibit O. The AR narrative at page 58 discusses the proposed design and improvements to Seneca Street to be provided by the applicant.

H. All shared pathways shall be open to the public.

All proposed shared pathways throughout the Nyberg Rivers commercial center will be open to the public.

I. New or relocated buildings on the Nyberg Rivers site shall have bicycle parking facilities.

Based on the shopping center land use designation, bicycle parking is required at a ratio of 0.50 spaces per 1,000 SF of gross floor area. The proposed building square footage for all buildings on-site is 293,559 SF, requiring 147 bicycle parking stalls. At least half of those stalls are required to be covered. The AR submittal package includes a Bicycle Parking Plan included with the Site Plan set under Exhibit O. As shown on the plan, bicycle parking areas are proposed along the building frontages for Buildings B, C, D, E and F and between Buildings K-100, J- 100, H-100 and G-100. Those spaces between buildings provide bicycle parking in close proximity to the buildings. The AR narrative at pages 52-55 discusses bicycle parking to be provided by the applicant.

J. The Master Plan area shall use vegetative treatment of stormwater where feasible.

Low Impact Development (LID) stormwater facilities have been located throughout the site where feasible, as detailed within sheets C4.0 through 4.2 of Exhibit O. Specifically these facilities have been located east and south of Building 1040. The AR narrative at page 86 discusses LID stormwater treatment to be provided by the applicant.

K. No increase in the 100-Year Floodplain associated with improvements to public "Street A" and SW Seneca Street.

No structural development is proposed within the 100-year floodplain along Tualatin River. While portions of Street A and the Seneca Street extension will be within the floodplain, all cuts and fills within these areas have been designed to balance onsite so that there is no net increase in the amount of fill located within the floodplain. The proposed improvements will be designed consistent with these requirements. The final engineering permitting process will assure that cuts and

fills are balanced. The AR narrative at pages 107-108 discusses floodplain management as proposed by the applicant.

L. There shall be additional windows and architectural features on each of the four sides of Buildings 1040, G-100, H-100, J-100 and N-100.

The AR submittal package includes updated building elevations under Exhibit O. The elevations for Buildings 1040, G-100, H-100, J-100 and N-100 do provide additional windows and architectural features on each of the four sides of the building. The AR narrative at page 32 discusses building elevation treatment to be provided by the applicant.

M. Building 10 40 shall have variations in building height,a dditonal gabled roof feature, canopy feature, entry feature, dimensional wall feature such as columns or pilasters and projected entries, show larger window and entry areas and show diversity in the exterior wall design and amterial on all four sides of the buildings.

The AR submittal package includes updated building elevations, including revised elevations and perspectives for propsoed building 1040. The AR narrative at page 32 discusses building elevations treatment to be provided by the applicant.

N. The loading and service facilities for the existing Michaels (Building D2) and new Buildings 1005, 1010 and 1040 shall provide adequate visual and noise buffering for the benefit of nearby public areas and residential areas.

The AR submittal package displays loading and service facilities included with the Site Plan, Sheets C1.0 through C1.2 under Exhibit O. As shown on the plan, loading and service facilities are proposed at the back portion of the buildings. Landscape planting plan Sheets L1.4 and L1.5 show Red Sunset Maples and Armstrong Maples as trees to buffer the loading facilities from the neighboring residential zone and those pedestrians using the shared pathway through the natural area. The AR narrative at pages 35-36 discusses bicycle parking to be provided by the applicant.

O. If oversized vehicle parking stalls are occupyor replace standard parking stalls proposed in the Master Plan, the total number of parking stalls and the dimensions shall be sadjusted accordingly to reflect the revision.

The AR submittal package does not include a proposal for oversized vehicle parking. No adjusments have been made, this condition is not applicable to this review.

P. Trees planted in "diamond planters" shall achieve a growth that is a minimum of 66 % (2/3) of the 30 ft. mature tree height standard in TDC 73.360(7)(a-e) within 5 years of planting.

As noted on the Landscape Planting Legends and Notes, Sheet L1.0 under Exhibit O, a Tree Maturity note states that, "trees delivered to the site will range from 10 to 20-

feet at the time of installation, depending on species. Trees will vary in growth rate and form during the establishment period and should take approximately 10-15 years for all parking lot species to reach the required minimum height of 30-feet." Therefore, trees planted in the diamond planters shall achieve a growth that is a minimum of 20-feet within 5 years of planting. The applicant will work with the landscape contractor to select more mature trees for placement within the landscape diamonds to ensure that the trees achieve the required height within the 5 year window. A discussion of the tree planting methodology is summarized on pages 40-42 of the AR narrative.

Q. Trees planted in the "diamond planters" shall be monitored annually. The applicant, its successors or assigns, shall submit a report from a certified arborist that documents tree height, health of canopy, and size of trunk by November 1 of each year after planting.

As noted on the Landscape Planting Legends and Notes, Sheet L1.0 under Exhibit O, the *General Notes: Landscape Planting Plan* includes note "13.) Installation **contractor shall maintain trees, shrubs, lawns and other plants for a period of one year (365 days) unless otherwise directed by the owner." This note will be updated to include an annual monitoring requirement for the diamond planters. A discussion of the tree planting methodology is summarized on pages 40-42 of the AR narrative.**

If the trees do not meet the performance requirement, then Applicant, its successors and assigns, must remedy the failure. Such remedy shall be up to and including rebuilding and expanding the planting area.

A note has been added to the General Notes located on the Landscape Planting Legends and Notes, Sheet L1.0 under Exhibit O. The note shall read, "If the trees do not meet the performance requirement, then Applicant, its successors and assigns, must remedy the failure. Such remedy shall be up to and including rebuilding and expanding the planting area." A discussion of the tree planting methodology is summarized on pages 40-42 of the AR narrative.

R. Prior to development, a tree maintenance plan shall be established for all trees in Master Plan area where development occurs.

As noted on the Landscape Planting Legends and Notes, Sheet L1.0 under Exhibit O, the *General Notes: Landscape Planting Plan* includes note "13.) Installation contractor shall maintain trees, shrubs, lawns and other plants for a period of one year (365 days) unless otherwise directed by the owner." This note will be updated to include an annual monitoring requirement for the diamond planters. Additionally,

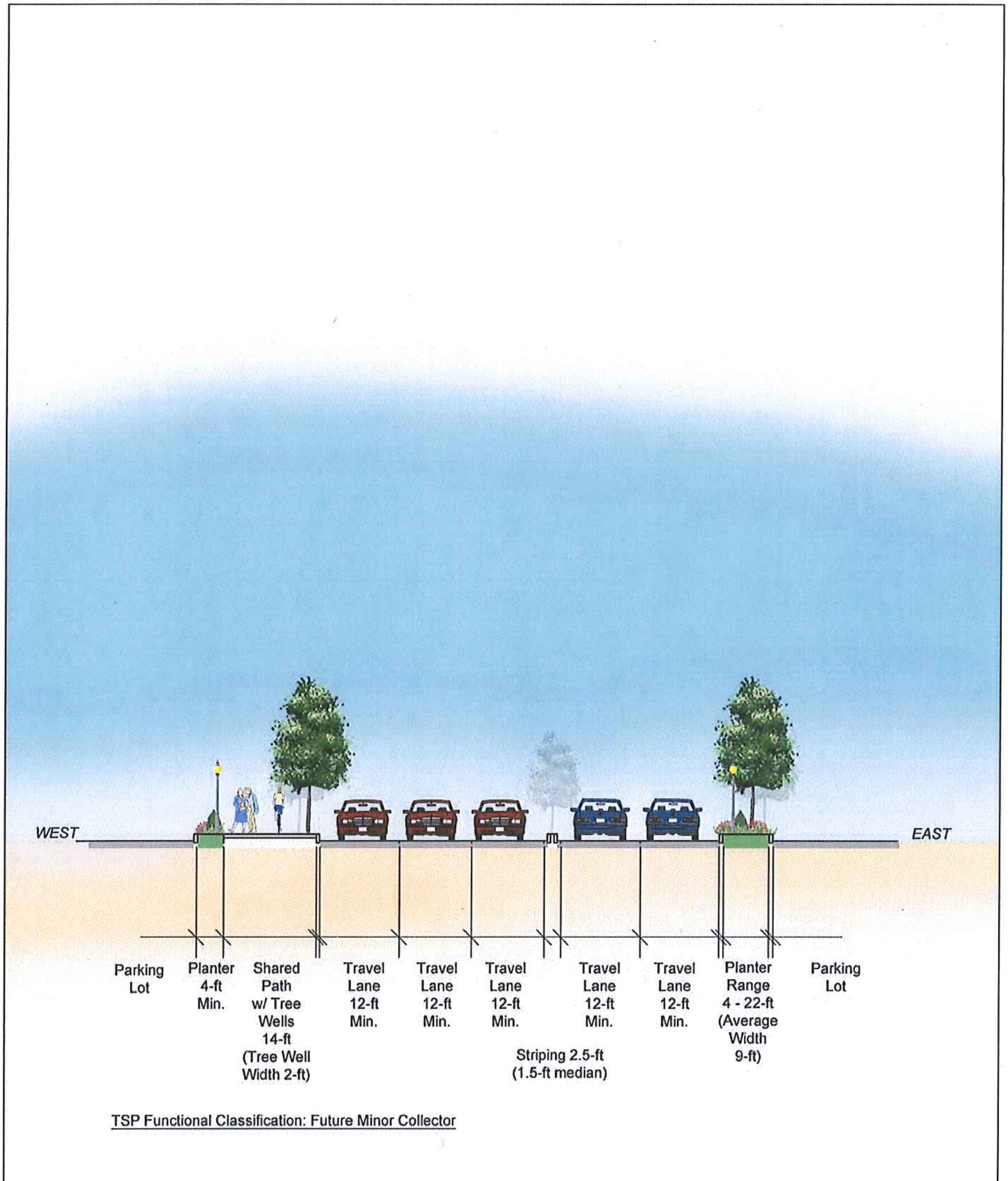
a Landscape and Maintenance (L & M) Manual will be provided to the owner outlining the maintenance requirements for plantings on site. A copy of the manual will be provided to the City at the time of final approval. A discussion of the tree planting methodology is summarized on pages 40-42 of the AR narrative.

S. *All trees on the former Nyberg House site (tax lot 2502), adjacent to Building C (Tax Lot 1602) and in the vicinity of the proposed Building N-100 shall be preserved and retained as reasonably feasible. Where tree preservation is not reasonably feasible, 3" caliper or 10-12 foot replacement tree plantings of a similar character shall be planted in the vicinity of where trees were removed on Tax Lot 2502.*

The AR submittal package includes a Tree Preservation Site Plan. Sheet C2.2 under Exhibit O does include the proposed tree preservation and tree removal elements in the vicinity of the proposed Building N-100. All proposed trees within the proposed parking area and building location will be removed, while a note is included stating, "Tree anticipated to be removed, effort to be taken during construction to preserve trees." There are approximately 10 trees "clouded" on Sheet C2.2 that the applicant will attempt to preserve. The AR narrative at page 42 discusses tree preservation elements to be provided by the applicant. The applicant has included an exhibit entitled *Tree Mitigation* attached to this document that details the trees proposed for removal on near building C, N-100 and G-100. The applicant is mitigating those trees that are not located within a building footprint or within the associated parking field depicted within the master plan. These trees cannot be retained do to the need to grade the subject property for building N-100 and G-100 and have therefore been mitigated as detailed within the planting plan included within the plan set. The trees proposed for removal on Building C will be impacted when the existing curb is removed and replaced and will be mitigated.

T. *Plant 15 additional Douglas Fir, Western Red Cedar, or other tall-maturing conifer tree plantings in the landscape plan for location on the site's eastern frontage along I-5.*

The AR submittal package includes a Landscape Planting Plan under Exhibit O, Sheet L1.3 that addresses landscape treatment for the eastern portion of the site along I-5. Sheet L1.3 and the Tree Preservation Site Plan C2.1 show (7) existing Western Red Cedars and (1) Lodgepole Pine that will remain, primarily along the back of Building G-100. Proposed plantings include a dense mix of Ponderosa Pine, Western Juniper, Thornless Honeylocust, Toba Hawthorn and River Birch. The retention of the existing trees and the dense mix of proposed trees will achieve the intent of the City Council request. The AR narrative at page 42 discusses tree preservation elements to be provided by the applicant.



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Nyberg Rivers

DATE: 09-11-2013

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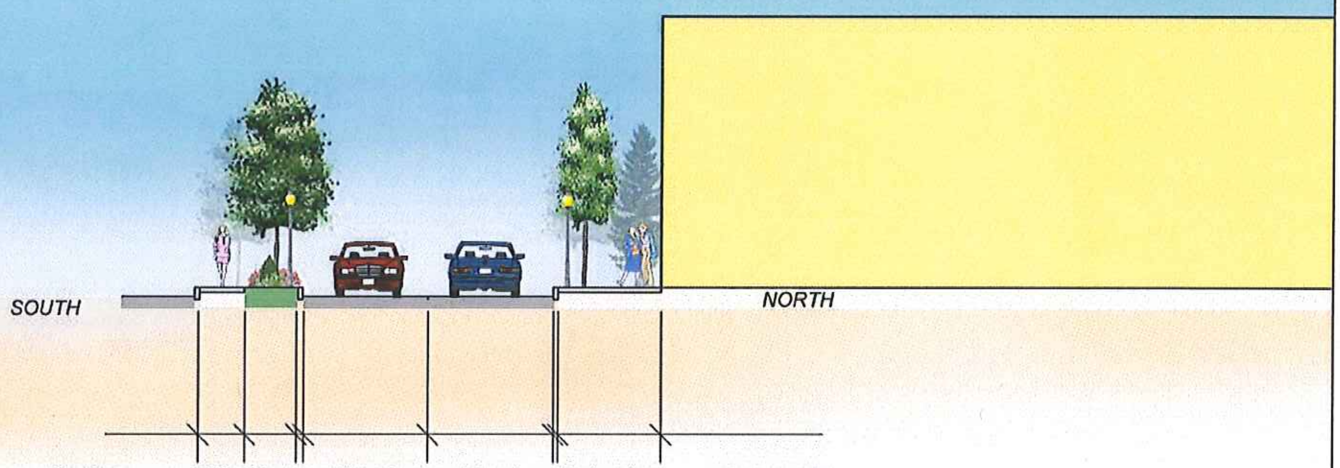
SCALE IN FEET

A-A- Nyberg Main Entry

TUALATIN, OREGON

Exhibit 1
Attachment A-4



TSP Functional Classification: Future Minor Collector

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Nyberg Rivers

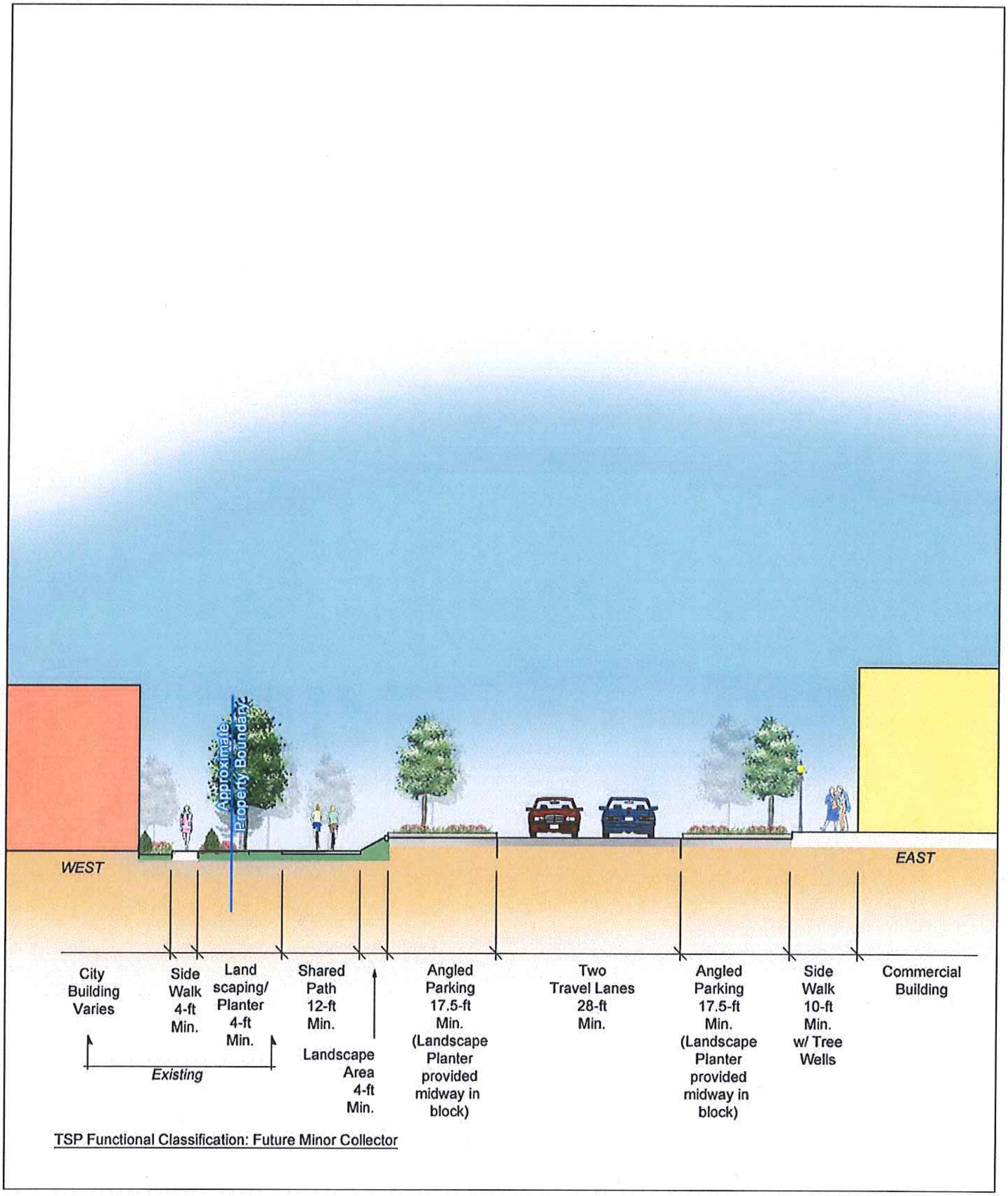
DATE: 09-11-2013

0 10' 20'
SCALE IN FEET

B-B - Michaels Frontage

TUALATIN, OREGON

Exhibit 1
Attachment A-4



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Nyberg Rivers

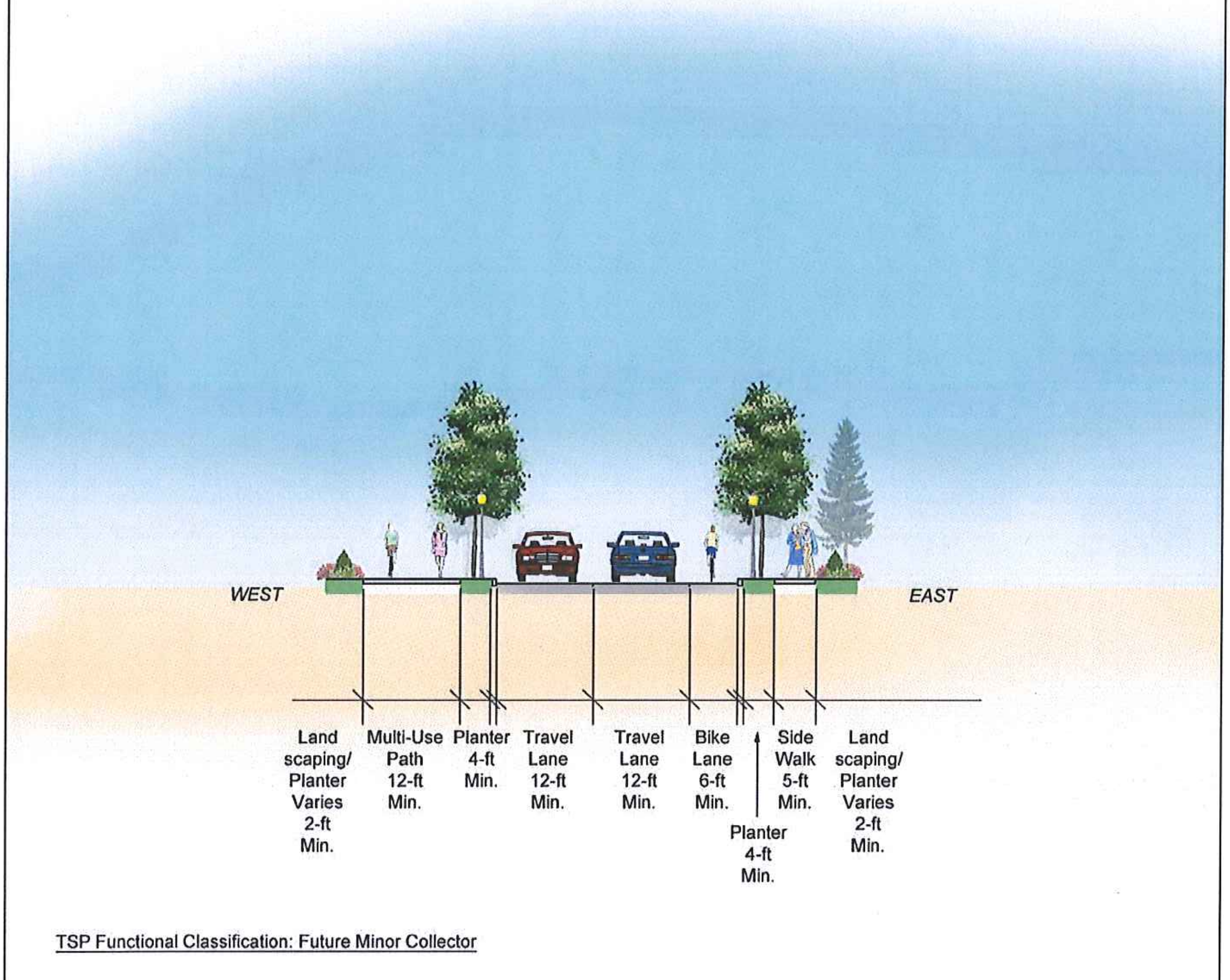
DATE: 10-18-2013

0 10' 20'
SCALE IN FEET

C-C - Retail Shop Frontage

TUALATIN, OREGON

Exhibit 1
Attachment A-4



TSP Functional Classification: Future Minor Collector

Cardno WRG

Nyberg Rivers

DATE: 09-11-2013

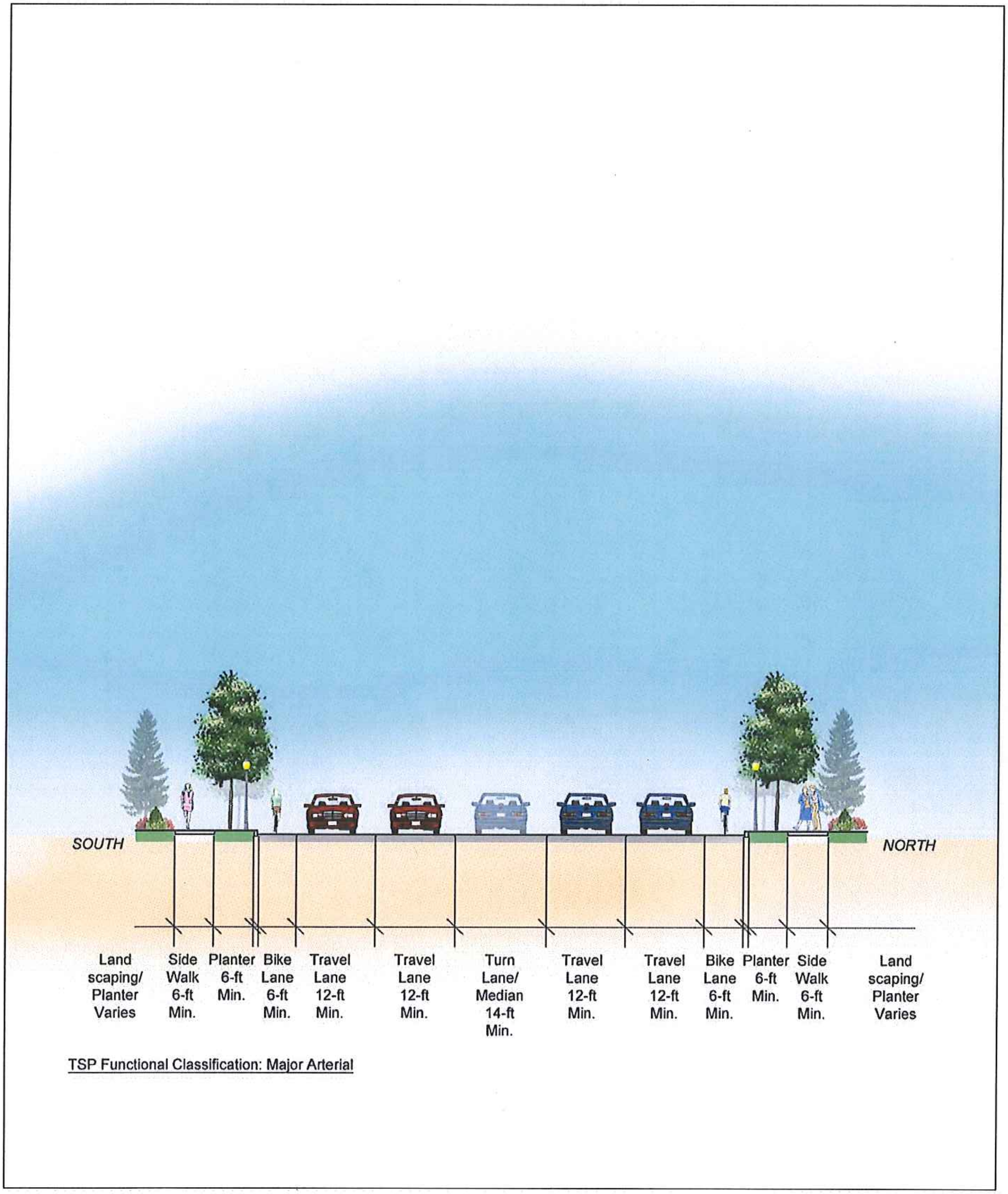
0 10' 20'

SCALE IN FEET

D-D - Street "A"

TUALATIN, OREGON

Exhibit 1
Attachment A-4



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Nyberg Rivers

DATE: 9-11-2013

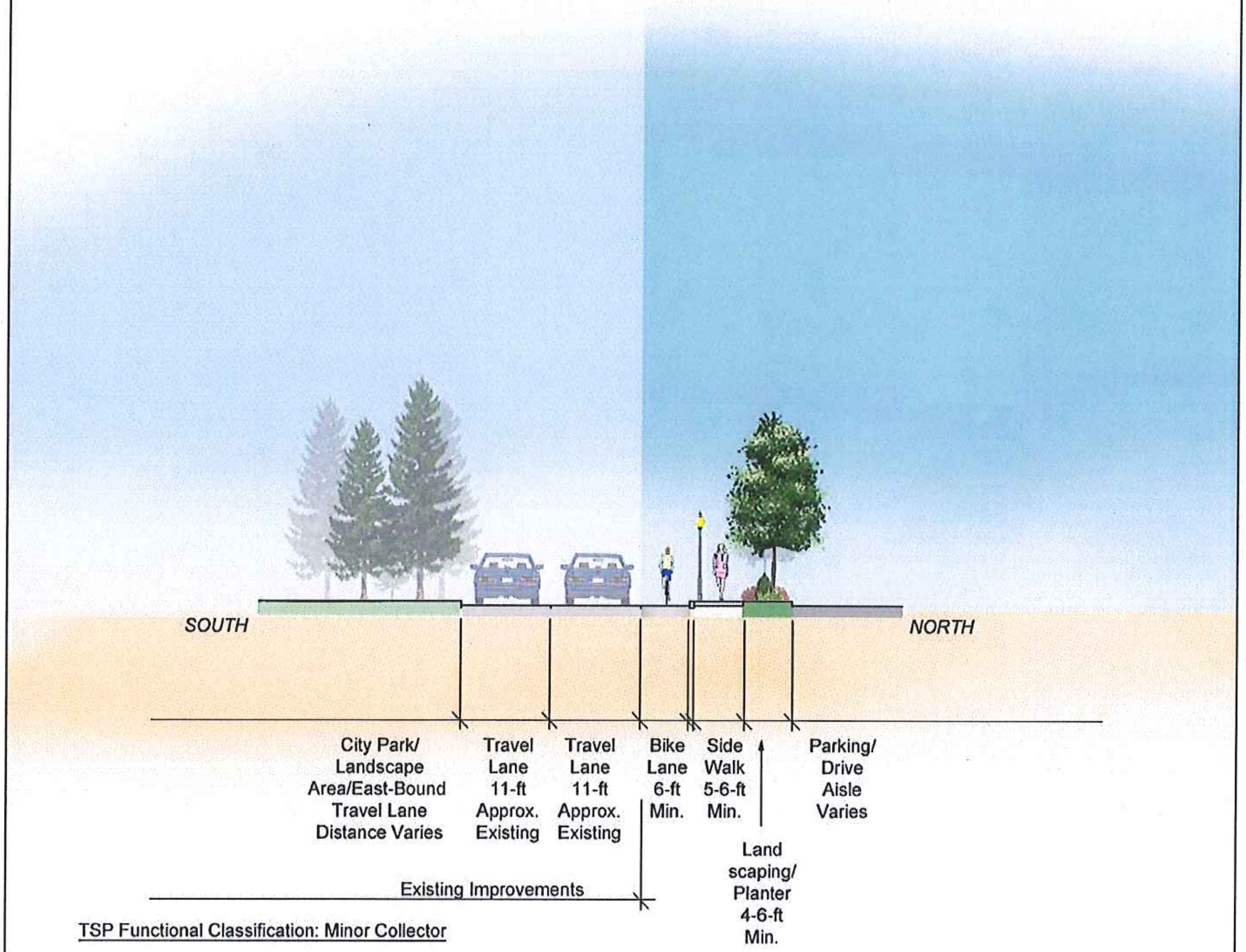
0 10' 20'

SCALE IN FEET

E-E - Boones Ferry Road

TUALATIN, OREGON

Exhibit 1
Attachment A-4



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Nyberg Rivers

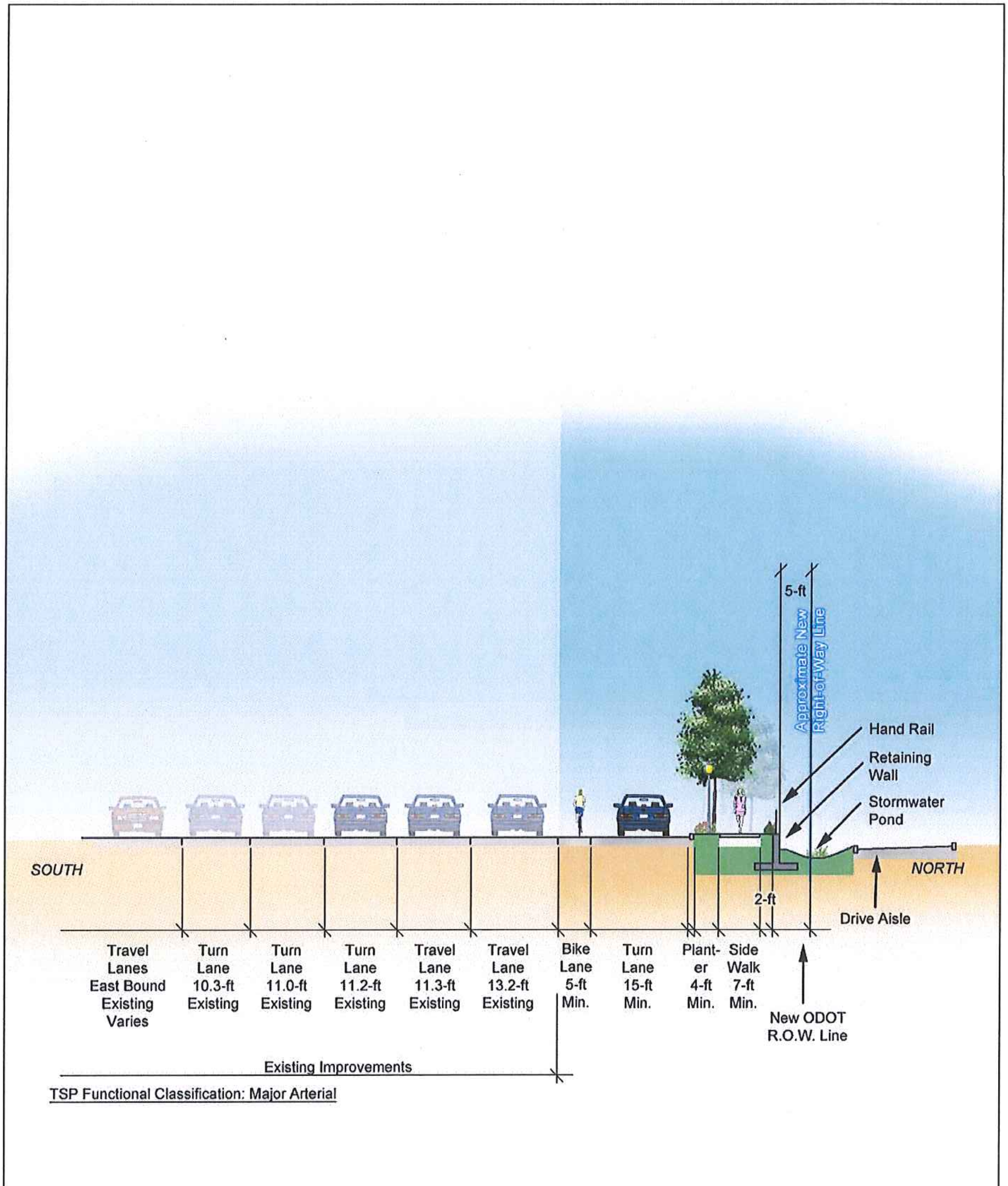
DATE: 9-11-2013

0 10' 20'
SCALE IN FEET

F-F - Nyberg Road - Entrance to Martinazzi

TUALATIN, OREGON

Exhibit 1
Attachment A-4



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Nyberg Rivers

DATE: 10-02-2013

0 10' 20'
SCALE IN FEET

G-G - Nyberg Road - I-5 to Eastern Entrance

TUALATIN, OREGON

EXHIBIT 4-7
Attachment A-4

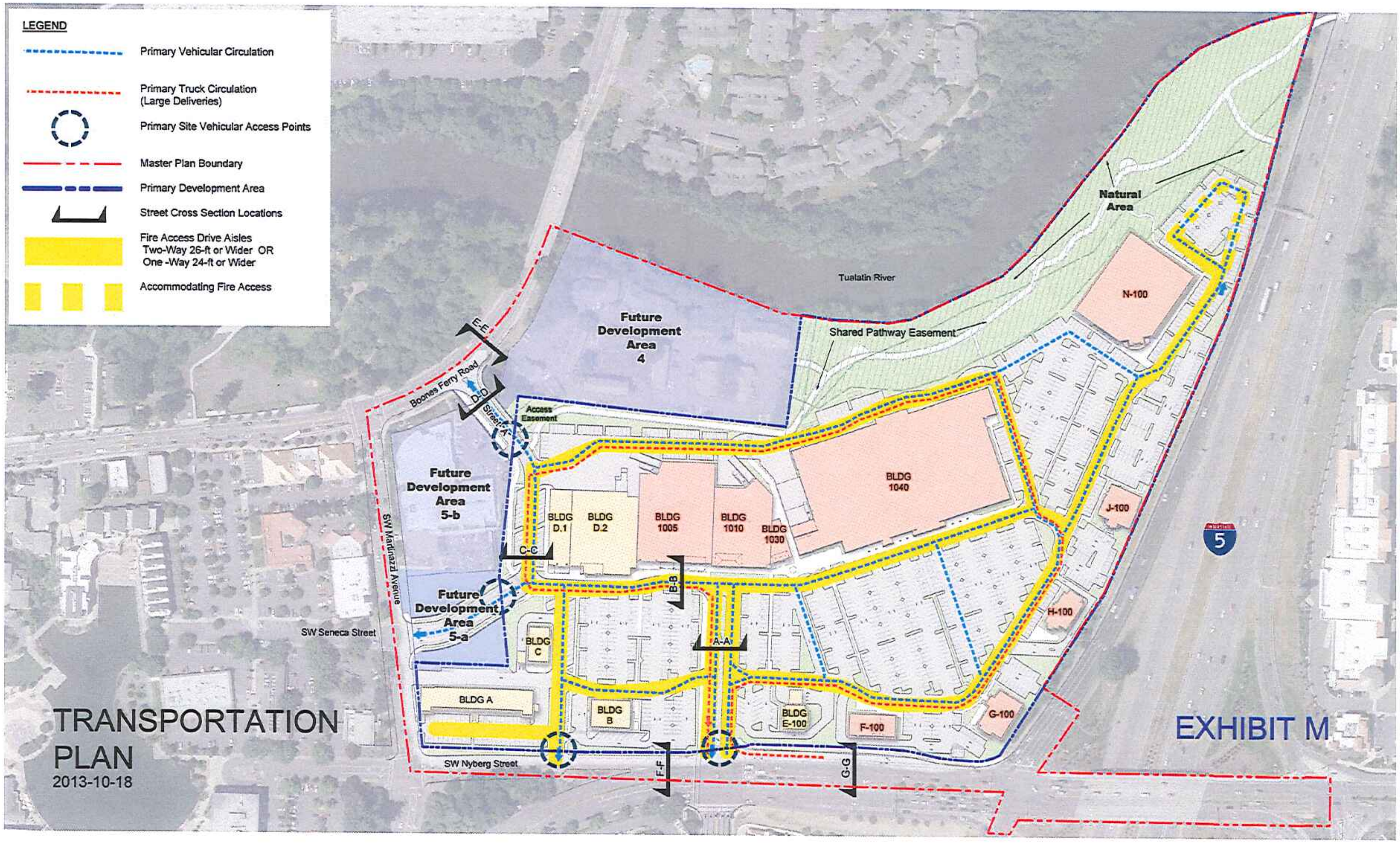
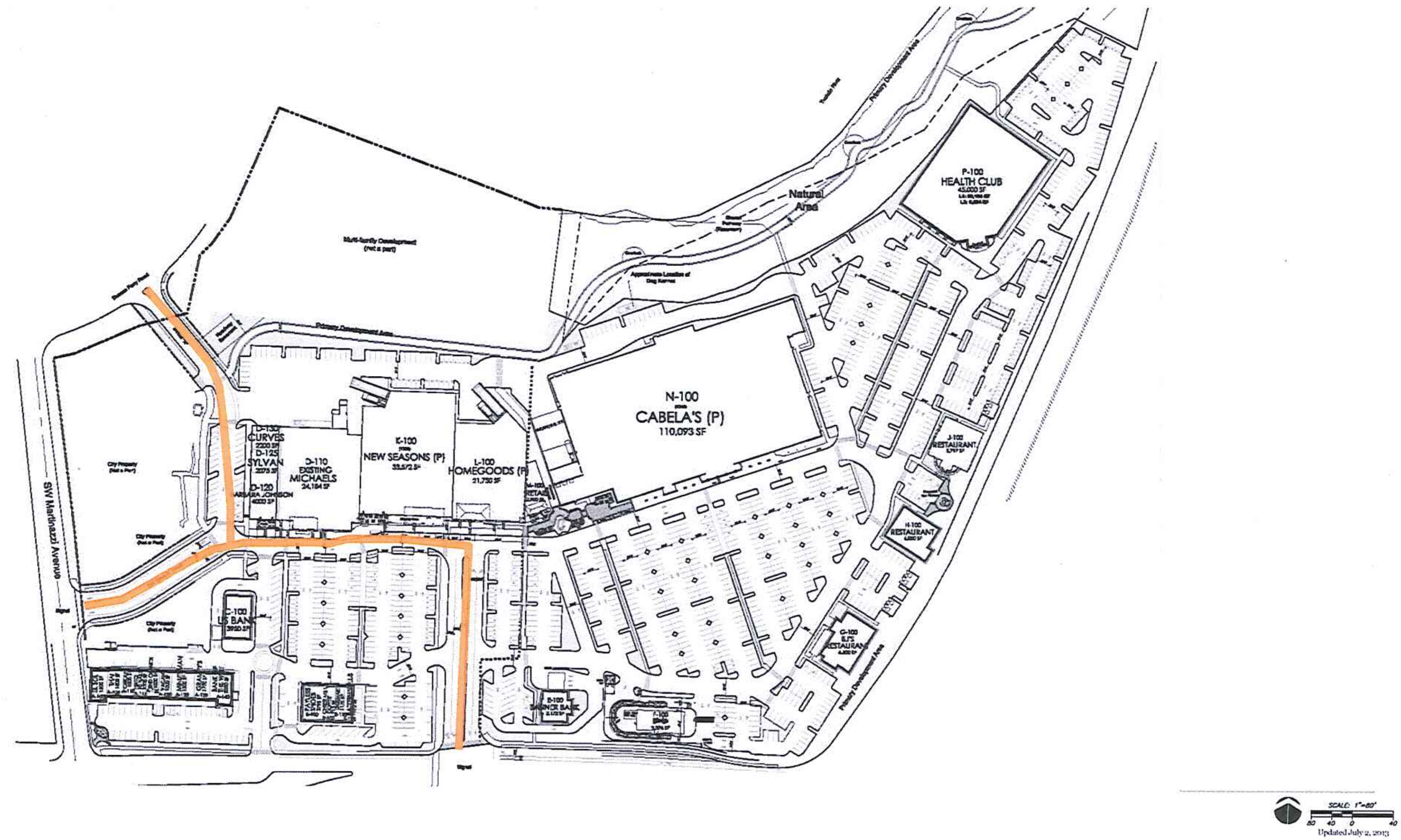


Exhibit 1
Attachment A-5

Exhibit 4



Nyberg Rivers

Future Minor Collector "Loop Road"

As shown on the approved City of Tualatin TSP, February 2013

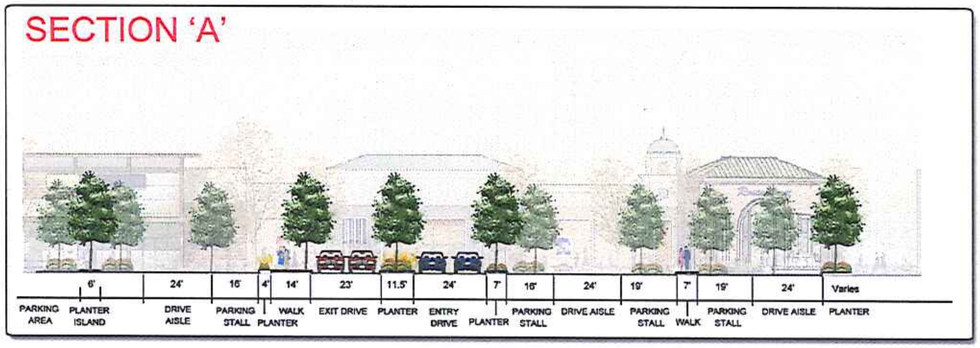
Cardno
Shaping the Future
PORTLAND

CENTERCAL

Tualatin, Oregon

Exhibit 1

Attachment A-6



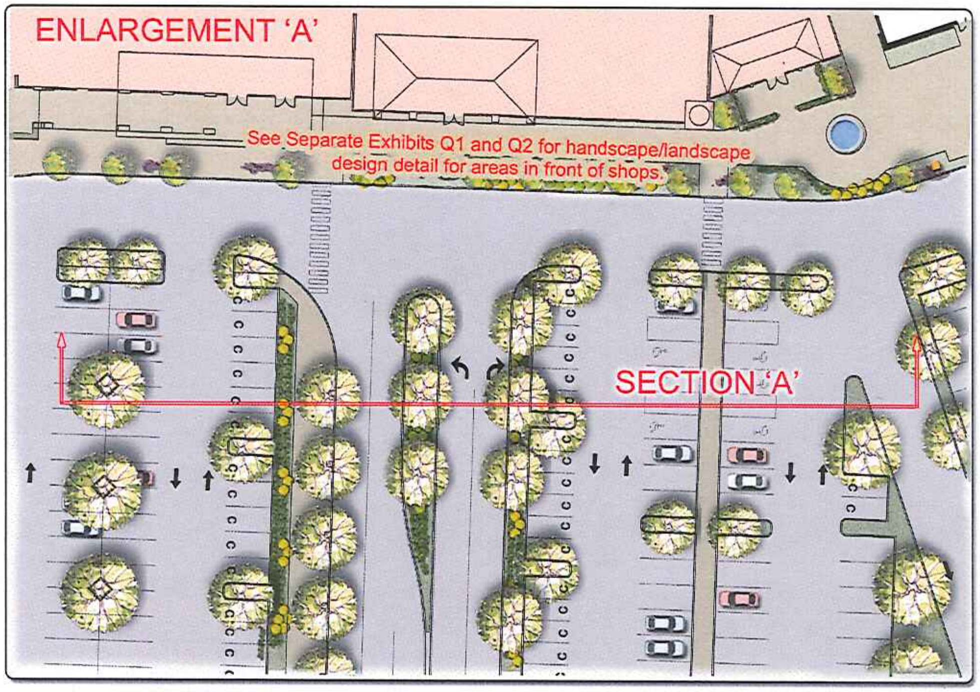


Exhibit K

Nyberg Rivers

Enlargement 'A' Plan View and Section

Cardno

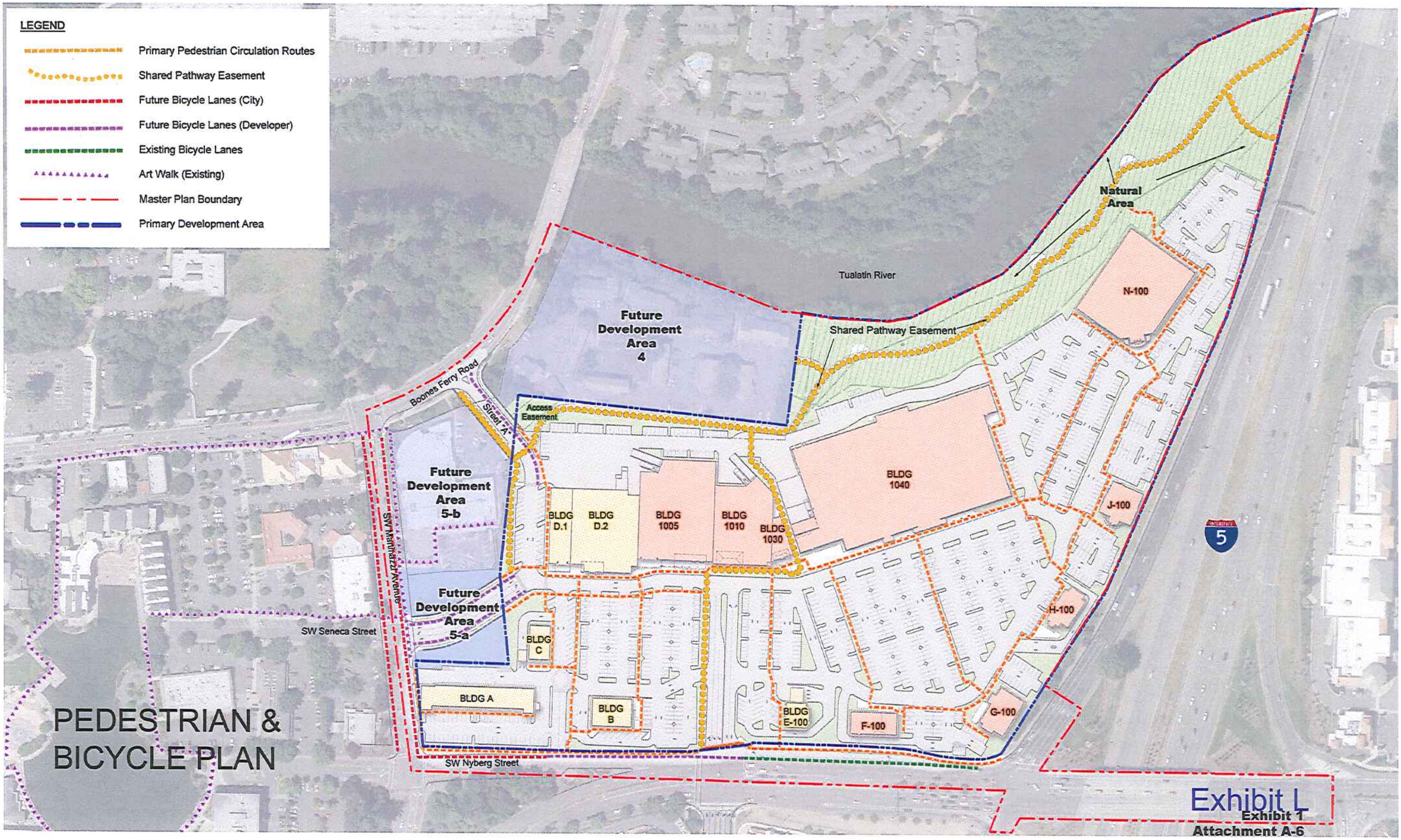
CENTERCAL PROPERTIES, LLC

NOT TO SCALE

TUALATIN, OREGON

DATE: June 27, 2013
21198310

Exhibit 1
Attachment A-6

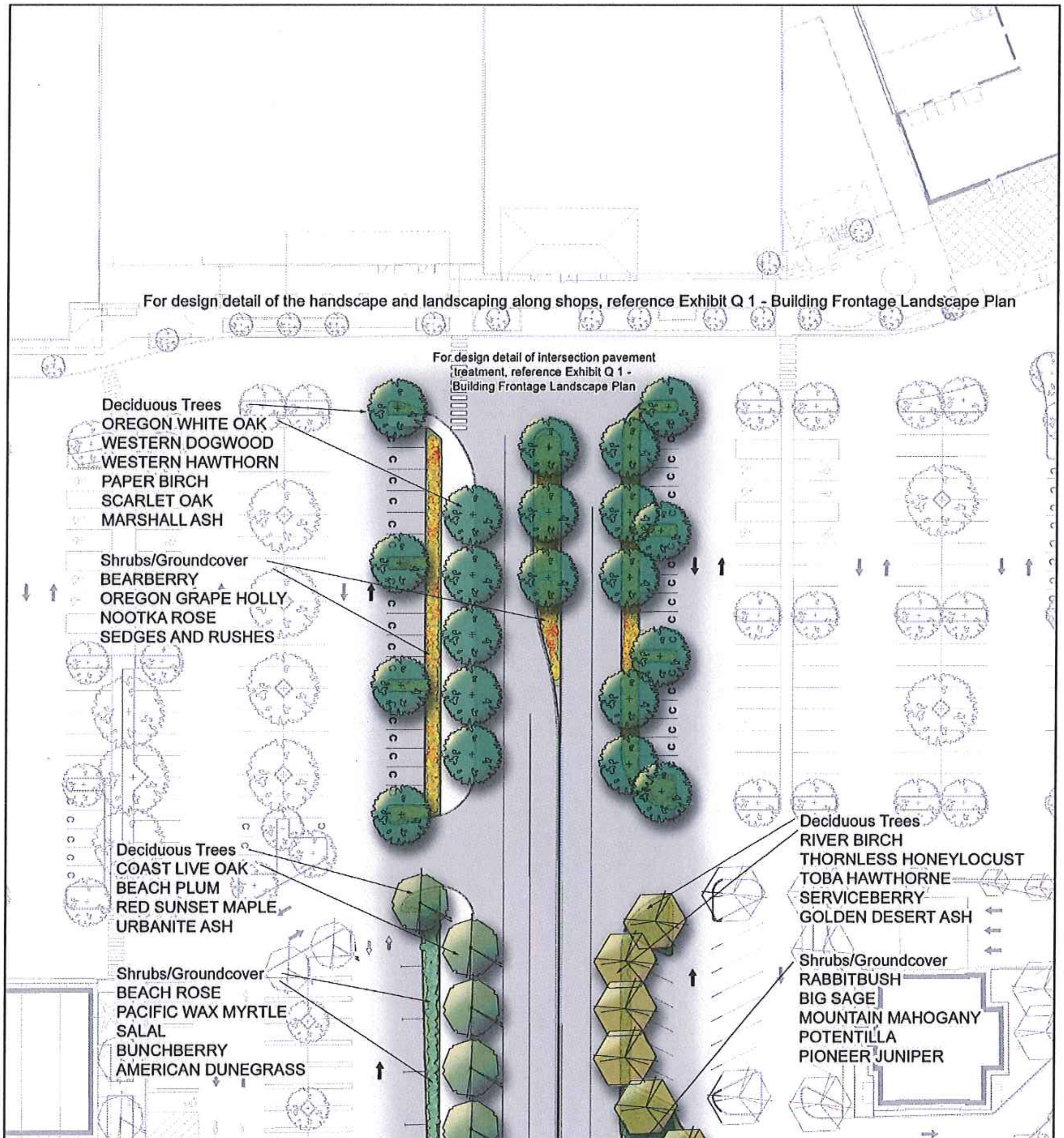


PEDESTRIAN & BICYCLE PLAN

Exhibit L

Exhibit 1

Attachment A-6



Nyberg Rivers

Entry Landscaping

Cardno

CENTERCAL PROPERTIES, LLC

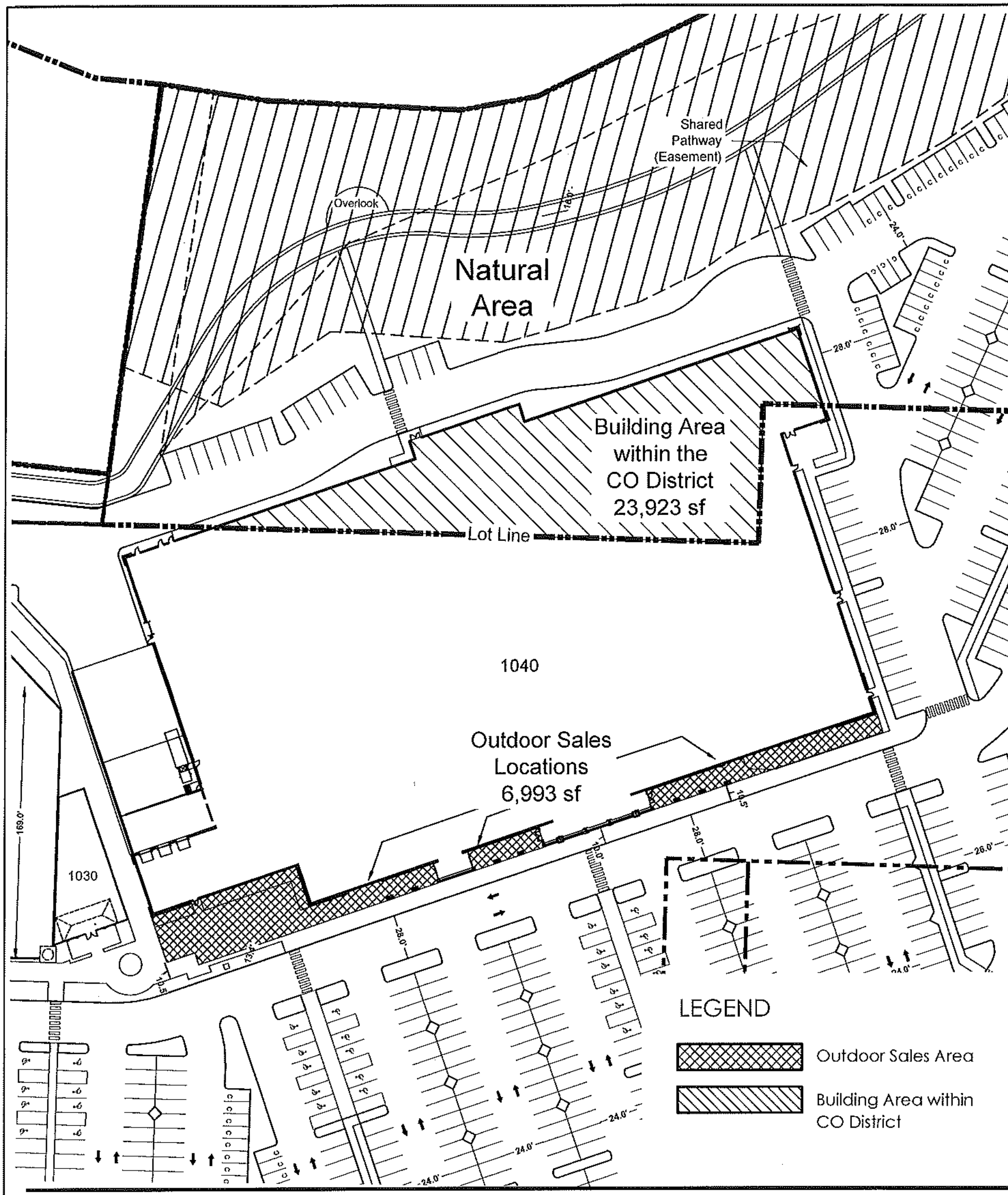
TUALATIN, OREGON

SCALE 0 10 20 40

DATE: June 24, 2013
21198310

Exhibit S

Exhibit 1
Attachment A-6



Cardno
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PORTLAND
5415 SW WESTGATE DR, STE 100, PORTLAND, OR 97221
TEL: (503) 419-2500 FAX: (503) 419-2600
www.cardno.com

Nyberg Rivers
Conditional Use Exhibit

CenterCal
Tualatin, Oregon

PROJECT NO.	21198310
DATE:	06/13/2013
BY:	RG
SCALE:	1" = 80'
SHEET NO.	__

Exhibit I
Exhibit I
Attachment A-6

EXISTING DECIDUOUS TREE IDENTIFIED FOR MITIGATION

EXISTING EVERGREEN TREE IDENTIFIED FOR MITIGATION

6 EVERGREEN TREES AND 1 DECIDUOUS TREE ARE TO BE REMOVED AND MITIGATED FOR ON TAX LOT 1502. PLEASE REFERENCE A.R.B. PLAN SET SHEET L1.3 FOR MITIGATION TREE TYPE AND LOCATION.

0 25 50 100 200

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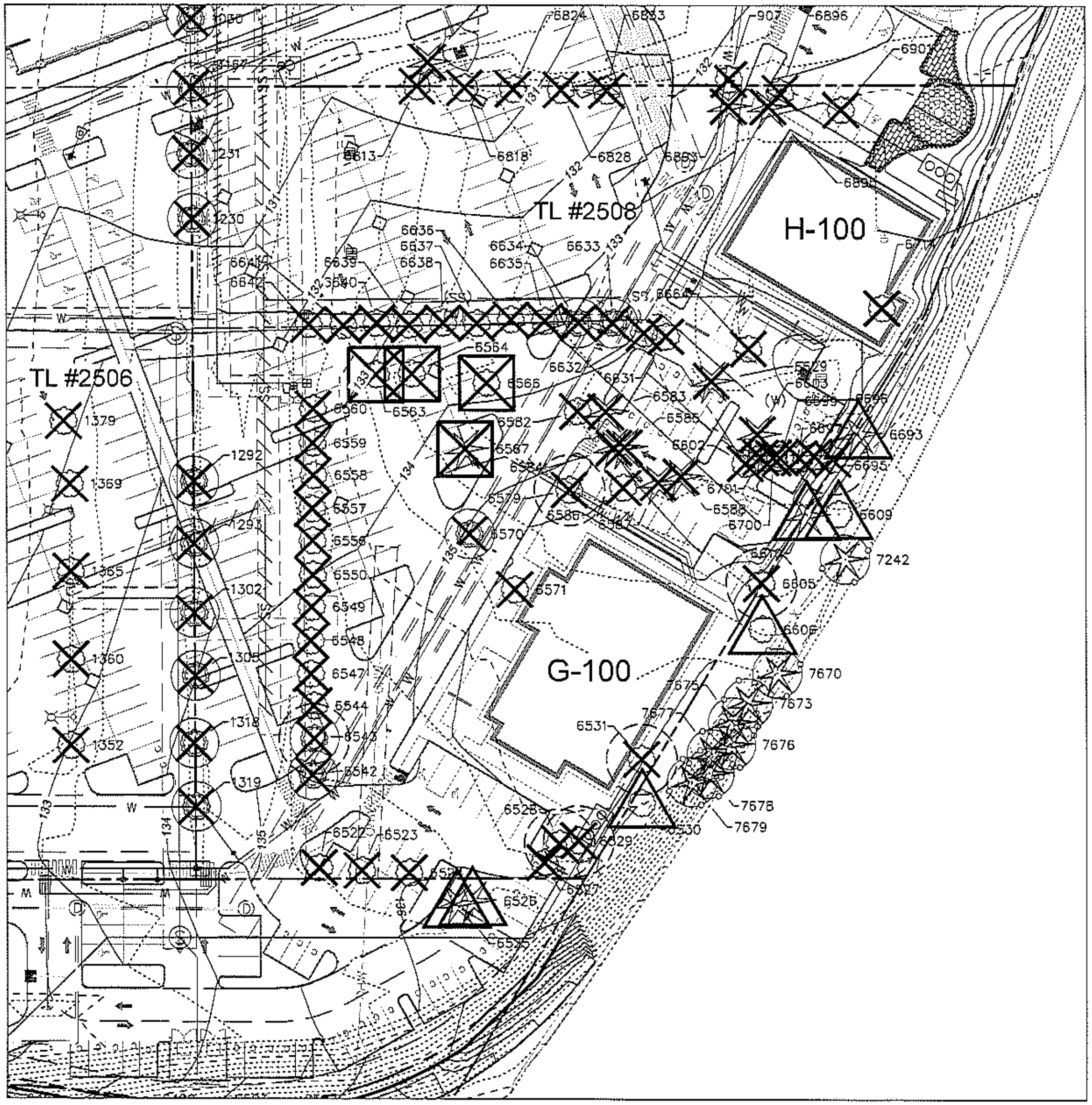
www.cardno.com

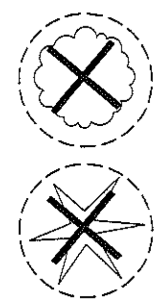
TREE MITIGATION EXHIBIT - TAX LOT 2700
NYBERG RIVERS

CENTERCAL PROPERTIES
TUALATIN, OREGON

PROJECT NO. 21198310
DATE: 10/23/2013
BY: PEG
SHEET NO. L-EX-01

Exhibit 1
Attachment A-7

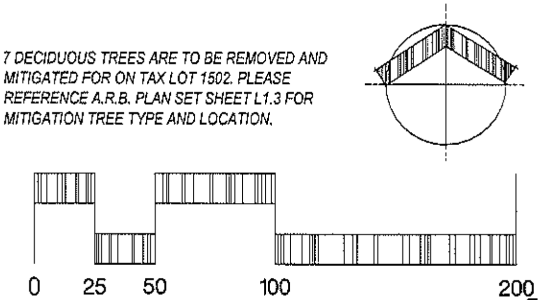




EXISTING DECIDUOUS TREE IDENTIFIED FOR MITIGATION

EXISTING EVERGREEN TREE IDENTIFIED FOR MITIGATION

7 DECIDUOUS TREES ARE TO BE REMOVED AND MITIGATED FOR ON TAX LOT 1502. PLEASE REFERENCE A.R.B. PLAN SET SHEET L1.3 FOR MITIGATION TREE TYPE AND LOCATION.



TREE MITIGATION EXHIBIT - TAX LOT 1502

NYBERG RIVERS

CENTERCAL PROPERTIES

TUALATIN, OREGON

PROJECT NO. 21198310

DATE: 10/23/2013

BY: PEG

SHEET NO. L-EX-02

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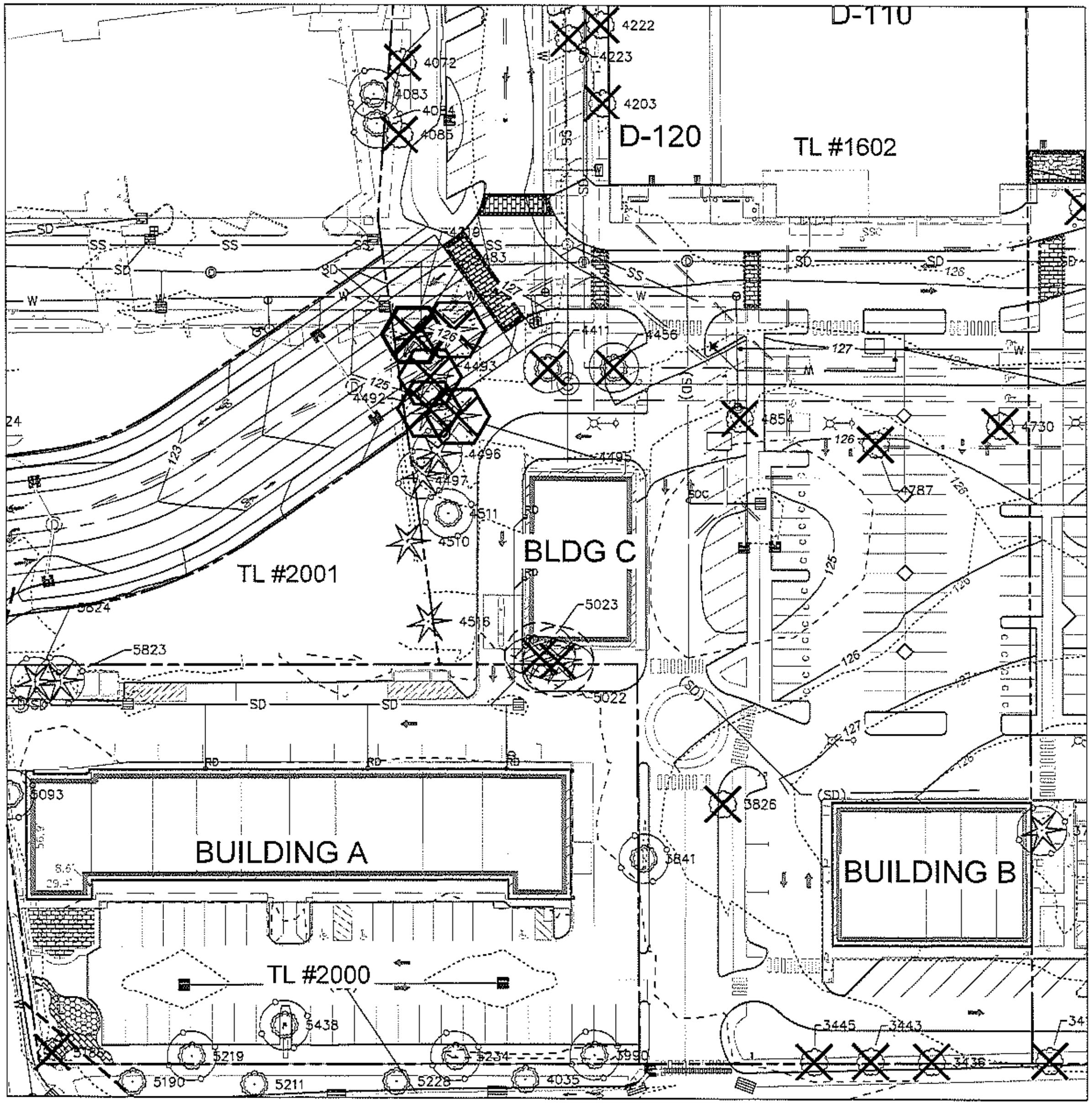
PORTLAND
5415 SW WESTGATE DR, STE 100 PORTLAND, OR 97221
TEL (503) 419-2500 FAX (503) 419-2600
www.cardno.com

Exhibit 1
Attachment A-7



EXISTING DECIDUOUS TREE IDENTIFIED FOR MITIGATION

EXISTING EVERGREEN TREE IDENTIFIED FOR MITIGATION

2 EVERGREEN TREES ARE TO BE REMOVED AND MITIGATED FOR ON TAX LOT 1502. PLEASE REFERENCE A.R.B. PLAN SET SHEET L1.3 FOR MITIGATION TREE TYPE AND LOCATION.

0 25 50 100 200

TREE MITIGATION EXHIBIT - NYBERG HOUSE

NYBERG RIVERS

CENTERCAL PROPERTIES

TUALATIN, OREGON

Cardno
Shaping the Future
PORTLAND
5415 SW WESTGATE DR, STE 100 PORTLAND, OR 97221
TEL (503) 419-2500 FAX (503) 419-2600
www.cardno.com

PROJECT NO. 2119831O

DATE: 10/23/2013

BY: PEG

SHEET NO. L-EX-03

Exhibit 1

Attachment A-7

APPLICATION FOR ARCHITECTURAL REVIEW

Direct Communication to	
Name: Michael Cerbone-- Cardno	Title: Planning Manager
Address: 5415 SW Westgate Dr, Suite 100 Portland, OR 97221	E-mail address: michael.cerbone@cardno.com
Phone Number: (503) 419-2500	Fax Number:
Applicant's Name: CenterCal Properties, LLC	E-mail address: mkirk@centercal.com
Address: 7455 SW Bridgeport Rd, Suite 205 Tigard, OR 97224	
Phone Number: (503) 968-8940	Fax Number:
Applicant's Signature: Michael Kirk	Date: 9/13/13
Property Owner's Name: Dean Macbale	Phone Number:
Address: 10860 Beaverton-Hillsdale Hwy Beaverton, OR 97005	
Property Owner's Signature: Dean Macbale	Date: 9-10-13
(NOTE: Letter of authorization is required if not signed by owner.)	
Architect Tom Ventura - Mulvanny G2 Architecture	E-mail address: tom.ventura@mulvannyg2.com
Address: 601 SW Second Ave, Suite 1200 Portland, OR 97204	
Phone Number: (503) 223-8030	Fax Number:
Landscape Architect: Pat Gaynor - Cardno	E-mail address: pat.gaynor@cardno.com
Address: 5415 SW Westgate Dr, Suite 100 Portland, OR 97221	
Phone Number: (503) 419-2500	Fax Number:
Engineer: Jeff Shoemaker - Cardno	E-mail address: jeff.shoemaker@cardno.com
Address: 5415 SW Westgate Dr, Suite 100 Portland, OR 97221	
Phone Number: (503) 419-2500	Fax Number:
Project Title: Nyberg Rivers	
Project Address: 7500 SW Nyberg St	
Brief Project Description: ARB for 307,000 SF commercial center	
Proposed Use: Shopping center	
VALUE OF IMPROVEMENTS: $	

AS THE PERSON RESPONSIBLE FOR THIS APPLICATION, I HEREBY ACKNOWLEDGE THAT I HAVE READ THIS APPLICATION AND STATE THAT THE INFORMATION ABOVE, ON THE FACT SHEET AND THE SURROUNDING PROPERTY OWNER MAILING LIST IS CORRECT. I AGREE TO COMPLY WITH ALL APPLICABLE CITY AND COUNTY ORDINANCES AND STATE LAWS REGULATING BUILDING CONSTRUCTION AND LAND USE.

APPLICANT'S SIGNATURE Michael Kirk DATE 9/13/13

Case No. ________ Date Received ________ Application Complete as of ________
Received by ________ Receipt No. ________ ARB hearing date (if applicable) ________
Fee: complete review ($111- $4829) ________ Posting verification ________
9 copies of drawings (folded) ________ 1 reproducible 8½ x 11" site, grading, LS, Public Facilities plan ________
1 reproducible 8½" X 11" vicinity map ___ Neighborhood / Developer meeting materials ________

Exhibit 1
Attachment B-1

APPLICATION FOR ARCHITECTURAL REVIEW

Direct Communication to		
Name: Michael Cerbone-- Cardno	Title: Planning Manager	
Address: 5415 SW Westgate Dr, Suite 100 Portland, OR 97221	E-mail address: michael.cerbone@cardno.com	
Phone Number: (503) 419-2500	Fax Number:	
Applicant's Name: CenterCal Properties, LLC	E-mail address: mkirk@centercal.com	
Address: 7455 SW Bridgeport Rd, Suite 205 Tigard, OR 97224		
Phone Number: (503) 968-8940	Fax Number:	
Applicant's Signature:		Date:
Property Owner's Name: TUALA Northwest, LLC	Phone Number: (503) 799-8324	
Address: 5638 Dogwood Drive Lake Oswego, OR 97035		
Property Owner's Signature:		Date:
(NOTE: Letter of authorization is required if not signed by owner.)		
Architect Tom Ventura - Mulvanny G2 Architecture	E-mail address: tom.ventura@mulvannyg2.com	
Address: 601 SW Second Ave, Suite 1200 Portland, OR 97204		
Phone Number: (503) 223-8030	Fax Number:	
Landscape Architect: Pat Gaynor - Cardno	E-mail address: pat.gaynor@cardno.com	
Address: 5415 SW Westgate Dr, Suite 100 Portland, OR 97221		
Phone Number: (503) 419-2500	Fax Number:	
Engineer: Jeff Shoemaker - Cardno	E-mail address: jeff.shoemaker@cardno.com	
Address: 5415 SW Westgate Dr, Suite 100 Portland, OR 97221		
Phone Number: (503) 419-2500	Fax Number:	
Project Title: Nyberg Rivers		
Project Address: 7500 SW Nyberg St		
Brief Project Description: ARB for 307,000 SF commercial center		
Proposed Use: Shopping center		
VALUE OF IMPROVEMENTS: $		

AS THE PERSON RESPONSIBLE FOR THIS APPLICATION, I HEREBY ACKNOWLEDGE THAT I HAVE READ THIS APPLICATION AND STATE THAT THE INFORMATION ABOVE, ON THE FACT SHEET AND THE SURROUNDING PROPERTY OWNER MAILING LIST IS CORRECT. I AGREE TO COMPLY WITH ALL APPLICABLE CITY AND COUNTY ORDINANCES AND STATE LAWS REGULATING BUILDING CONSTRUCTION AND LAND USE.

APPLICANT'S SIGNATURE ____________ DATE 9/11/13

Case No. ____________
Received by ____________
Fee: complete review ($111- $4829) ____________
9 copies of drawings (folded) ________
1 reproducible 8½" X 11" vicinity map ___

Date Received ________
Receipt No. ________
1 reproducible 8½ x 11" site, grading, LS, Public Facilities plan ________
Neighborhood / Developer meeting materials ________

Application Complete as of ________
ARB hearing date (if applicable) ________
Posting verification ________

Exhibit 1
Attachment B-2

Oregon
John A. Kitzhaber, M.D., Governor

Department of Transportation
Right of Way Section
4040 Fairview Industrial Dr. SE MS-2
Salem, OR 97302-1142
Phone: (503) 986-3600
Fax: (503) 986-3625
Web : www.oregon.gov/odot/hwy/row

October 8, 2013

File: 17888

Clare L. Fuchs, Senior Planner
Planning - Community Development
City of Tualatin
18880 SW Martinazzi Ave.
Tualatin, OR 97062

Dear Ms. Fuchs:

As you requested, I am sending you the original of ODOT's letter of authorization for the Nyberg Rivers architectural review. Please let me know if you need anything further. You may contact me via e-mail at tamara.s.patrick@odot.state.or.us or by phone at (503) 731-8444.

Sincerely,

Tamara Patrick

Tamara Patrick
Senior Property Agent

Enc.

c: Jean Paul Wardy, jwardy@centercal.com

Oregon
John A. Kitzhaber, M.D., Governor

Department of Transportation
Right of Way Section
4040 Fairview Industrial Dr. SE MS-2
Salem, OR 97302-1142
Phone: (503) 986-3600
Fax: (503) 986-3625
Web : www.oregon.gov/odot/hwy/row

September 10, 2013

Alice Cannon Rouyer
Assistant City Manager
18880 SW Martinazzi Ave.
Tualatin, Oregon 97062-7092

File: 17888

Dear Ms. Rouyer:

ODOT owns certain property along Nyberg Road in the northwest quadrant of the I-5 – Nyberg Road Interchange. Such property is currently used as an access road for adjacent property. CenterCal Properties, LLC ("Applicant") desires to purchase a portion of this property and include it in the Nyberg Rivers redevelopment project. Applicant has included the ODOT property in its Application for Architectural Review. As a result, ODOT, as the current property owner, is required to consent to the filing of the application. This letter will serve as ODOT's consent for Applicant to include ODOT's property in such application, subject to the limitations discussed below.

This letter is merely consent for Applicant to include ODOT's property in its Application for Architectural Review. It is not an approval of the application or any of the information contained therein. ODOT is not a co-applicant and shall not be deemed to be an applicant. This letter shall not in any way limit ODOT's ability to make comment on or object to the contents of the application; and ODOT specifically reserves the right to do so. This letter is not a commitment by ODOT to sell any of its property.

Although ODOT is working to sell some of its property, there are many prerequisites to sale which may or may not be met. Thus, it is possible that a sale may not take place. ODOT is signing this letter as an accommodation to the Applicant. This letter shall not be interpreted as an approval of the proposed property boundary, an agreement to sell any property, nor a guaranty that any property will be available for sale to Applicant.

If you have any questions regarding this letter, please feel free to contact Tamara Patrick at 503-731-8444.

Sincerely,

for Rick Crager

Rick Crager
State Right of Way Manager

TP

Exhibit 1
Attachment B-3

PUBLIC NOTICE POSTING

As the applicant for the NYBERG RIVERS ARB project, I hereby certify that on this day, September 16, 2013, four (4) signs were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Department - Planning Division.

Applicant's Name: THATCH MOYLE
(PLEASE PRINT)

Applicant's Signature: [signature]

Date: 9/17/2013

Exhibit 1
Attachment C

PUBLIC NOTICE POSTING

As the applicant for the NYBERG RIVERS ARB project, I hereby certify that on this day, September 16, 2013, four (4) signs were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Department - Planning Division.

Applicant's Name: THATCH MOYLE
(PLEASE PRINT)

Applicant's Signature: Thatch Moyle

Date: 9/17/2013

Clean Water Services
Our commitment is clear.

CWS File Number 13-000801

Service Provider Letter

13-000801

This form and the attached conditions will serve as your Service Provider Letter in accordance with Clean Water Services Design and Construction Standards (R&O 07-20).

Jurisdiction:	City of Tualatin	**Review Type:**	No Impact
Site Address / Location:	7055 SW Nyberg ST Tualatin, OR 97062	**SPL Issue Date:** **SPL Expiration Date:**	April 04, 2013 April 04, 2015

Applicant Information:		**Owner Information:**	
Name	MICHAEL CERBONE	Name	NYBERG LIMITED PARTNERSHIP
Company	CARDNO	Company	(MULTIPLE OWNERS)
Address	5415 SW WESTGATE DRIVE SUITE 100 PORTLAND, OR 97221	Address	
Phone/Fax	(503) 419-2500	Phone/Fax	
E-mail:	Michael.cerbone@cardno.com	E-mail:	

Tax lot ID	**Development Activity**
2S124A002502, 002507, 2S124A002700, 2S124B002100, 2S124A002506, 002508, 2S124B001601, 001602, 001900, 002000, 002001, 2S124B001601	Multi Lot Commercial

Pre-Development Site Conditions:		**Post Development Site Conditions:**	
Sensitive Area Present:	[X] On-Site [X] Off-Site	Sensitive Area Present:	[X] On-Site [X] Off-Site
Vegetated Corridor Width:	125	Vegetated Corridor Width:	125
Vegetated Corridor Condition:	Good/Marginal		

Enhancement of Remaining Vegetated Corridor Required: [X] **Square Footage to be enhanced:** 67,133

Encroachments into Pre-Development Vegetated Corridor:

Type and location of Encroachment:	Square Footage:
No Encroachment Proposed; Future Development of the Trail	0

Mitigation Requirements:

Type/Location	Sq. Ft./Ratio/Cost
No Mitigation Required	0

[X] Conditions Attached [X] Development Figures Attached (3) [ ] Planting Plan Attached [ ] Geotech Report Required

This Service Provider Letter does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered on your property.

Exhibit 1
Attachment E

In order to comply with Clean Water Services water quality protection requirements the project must comply with the following conditions:

1. No structures, development, construction activities, gardens, lawns, application of chemicals, uncontained areas of hazardous materials as defined by Oregon Department of Environmental Quality, pet wastes, dumping of materials of any kind, or other activities shall be permitted within the sensitive area or Vegetated Corridor which may negatively impact water quality, except those allowed in R&O 07-20, Chapter 3.
2. Prior to any site clearing, grading or construction the Vegetated Corridor and water quality sensitive areas shall be surveyed, staked, and temporarily fenced per approved plan. During construction the Vegetated Corridor shall remain fenced and undisturbed except as allowed by R&O 07-20, Section 3.06.1 and per approved plans.
3. If there is any activity within the sensitive area, the applicant shall gain authorization for the project from the Oregon Department of State Lands (DSL) and US Army Corps of Engineers (USACE). The applicant shall provide Clean Water Services or its designee (appropriate city) with copies of all DSL and USACE project authorization permits.
4. An approved Oregon Department of Forestry Notification is required for one or more trees harvested for sale, trade, or barter, on any non-federal lands within the State of Oregon.
5. **Prior to ground disturbance, an Erosion Control Permit is required through the City. Appropriate Best Management Practices (BMP's) for Erosion Control, in accordance with Clean Water Services' Erosion Prevention and Sediment Control Planning and Design Manual, shall be used prior to, during, and following earth disturbing activities.**
6. Prior to construction, a Stormwater Connection Permit from Clean Water Services or its designee is required pursuant to Ordinance 27, Section 4.B.
7. Activities located within the 100-year floodplain shall comply with R&O 07-20, Section 5.10.
8. Removal of native, woody vegetation shall be limited to the greatest extent practicable.
9. The water quality facility shall be planted with Clean Water Services approved native species, and designed to blend into the natural surroundings.
10. **Should final development plans differ significantly from those submitted for review by Clean Water Services, the applicant shall provide updated drawings, and if necessary, obtain a revised Service Provider Letter.**

SPECIAL CONDITIONS

11. The Vegetated Corridor width for sensitive areas within the project site shall be a minimum of 125 feet wide, as measured horizontally from the delineated boundary of the sensitive area.
12. **For Vegetated Corridors greater than 50 feet in width, the applicant shall enhance the first 50 feet closest to the sensitive area to meet or exceed good corridor condition as defined in R&O 07-20, Section 3.14.2, Table 3-3.**
13. Prior to any site clearing, grading or construction, the applicant shall provide Clean Water Services or the City with a Vegetated Corridor enhancement/restoration plan. Enhancement/restoration of the Vegetated Corridor shall be provided in accordance with R&O 07-20, Appendix A, and shall include planting specifications for all Vegetated Corridor, including any cleared areas larger than 25 square feet in Vegetated Corridor rated ""good.""
14. **Prior to installation of plant materials, all invasive vegetation within the Vegetated Corridor shall be removed per methods described in Clean Water Services' Integrated Pest Management Guide, 2009. During removal of invasive vegetation care shall be taken to minimize impacts to existing native tree and shrub species.**
15. Clean Water Services or the City shall be notified 72 hours prior to the start and completion of enhancement/restoration activities. Enhancement/restoration activities shall comply with the guidelines provided in Landscape Requirements (R&0 07-20, Appendix A).

16. **Maintenance and monitoring requirements shall comply with R&O 07-20, Section 2.11.2. If at any time during the warranty period the landscaping falls below the 80% survival level, the owner shall reinstall all deficient planting at the next appropriate planting opportunity and the two year maintenance period shall begin again from the date of replanting.**

17. **Performance assurances for the Vegetated Corridor shall comply with R&O 07-20, Section 2.06.2.**

18. **For any developments which create multiple parcels or lots intended for separate ownership, Clean Water Services may require that the sensitive area and Vegetated Corridor be contained in a separate tract and subject to a ""STORM SEWER, SURFACE WATER, DRAINAGE AND DETENTION EASEMENT OVER ITS ENTIRETY"" to be granted to the City or Clean Water Services.**

FINAL PLANS

19. **Final construction plans shall include landscape plans**. In the details section of the plans, a description of the methods for removal and control of exotic species, location, distribution, condition and size of plantings, existing plants and trees to be preserved, and installation methods for plant materials is required. Plantings shall be tagged for dormant season identification and shall remain on plant material after planting for monitoring purposes.

20. **A Maintenance Plan** shall be included on final plans including methods, responsible party contact information, and dates (minimum two times per year, by June 1 and September 30).

21. **Final construction plans shall clearly depict the location and dimensions of the sensitive area and the Vegetated Corridor** (indicating good, marginal, or degraded condition). Sensitive area boundaries shall be marked in the field.

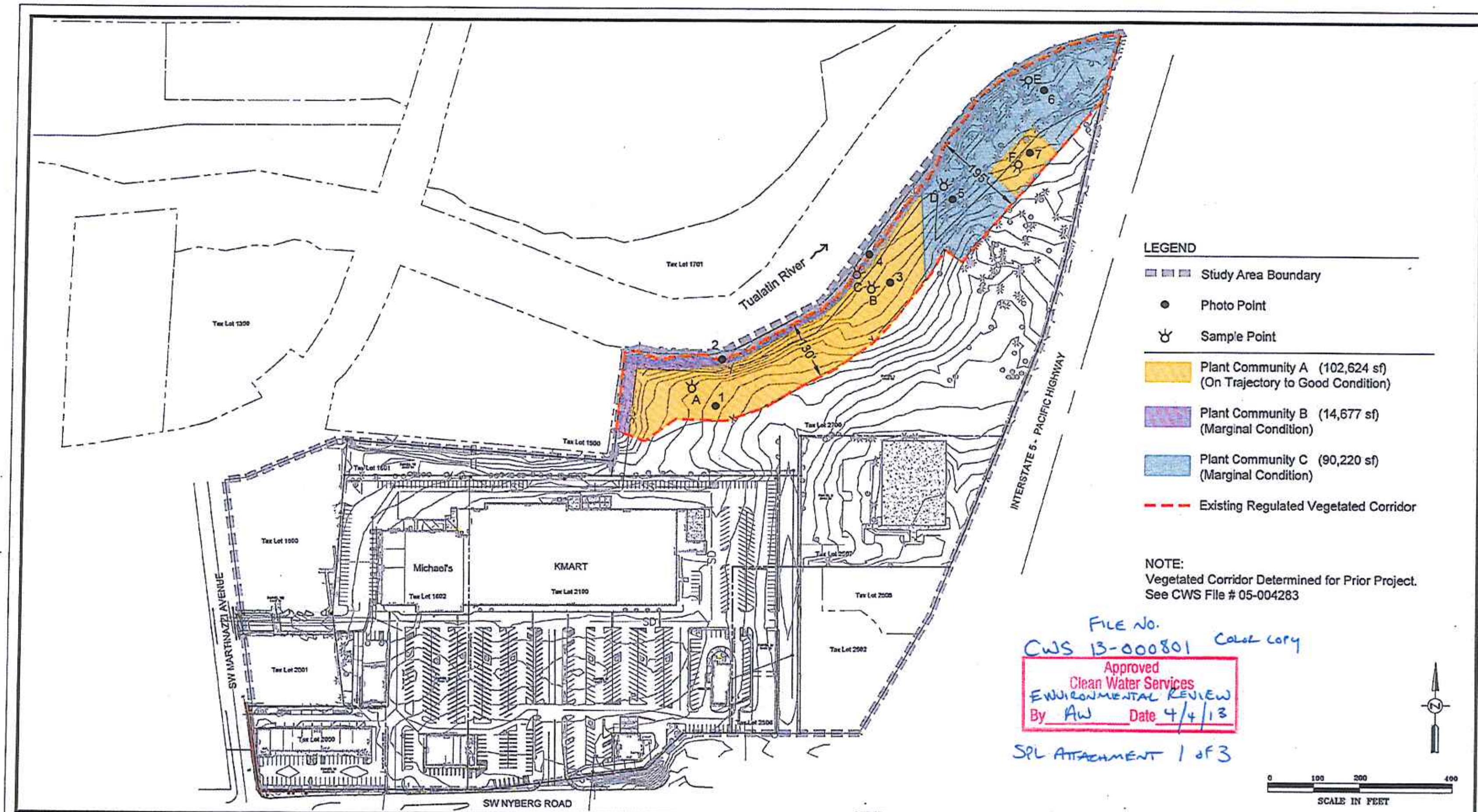
22. Protection of the Vegetated Corridors and associated sensitive areas shall be provided by the installation of signage between the development and the outer limits of the Vegetated Corridors. **Signage details to be included on final construction plans.**

<u>This Service Provider Letter is not valid unless CWS-approved site plan is attached.</u>

Please call (503) 681-3653 with any questions.

Amber Wierck
Environmental Plan Review

Attachments (3)



PHS
Pacific Habitat Services, Inc.

Base map provided by CARDNO WRG.

Existing Conditions

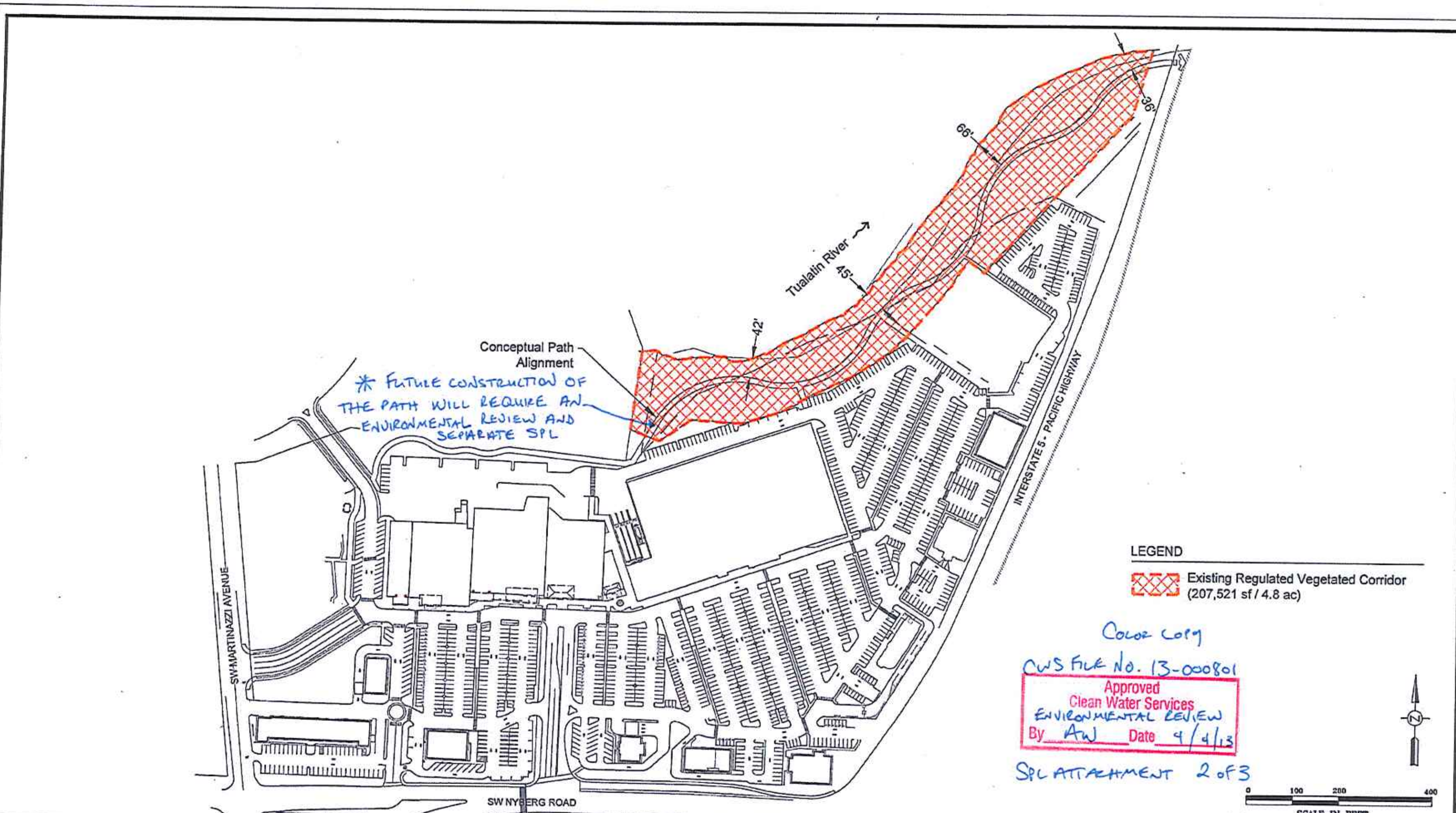
Nyberg Rivers Commercial Retail Development- Tualatin, Oregon

FIGURE 2

03-07-2013

CWS File Number

13-000801



Pacific Habitat Services, Inc.

Note:
Base Map provided by CARDNO WRG.

Proposed Development Plan

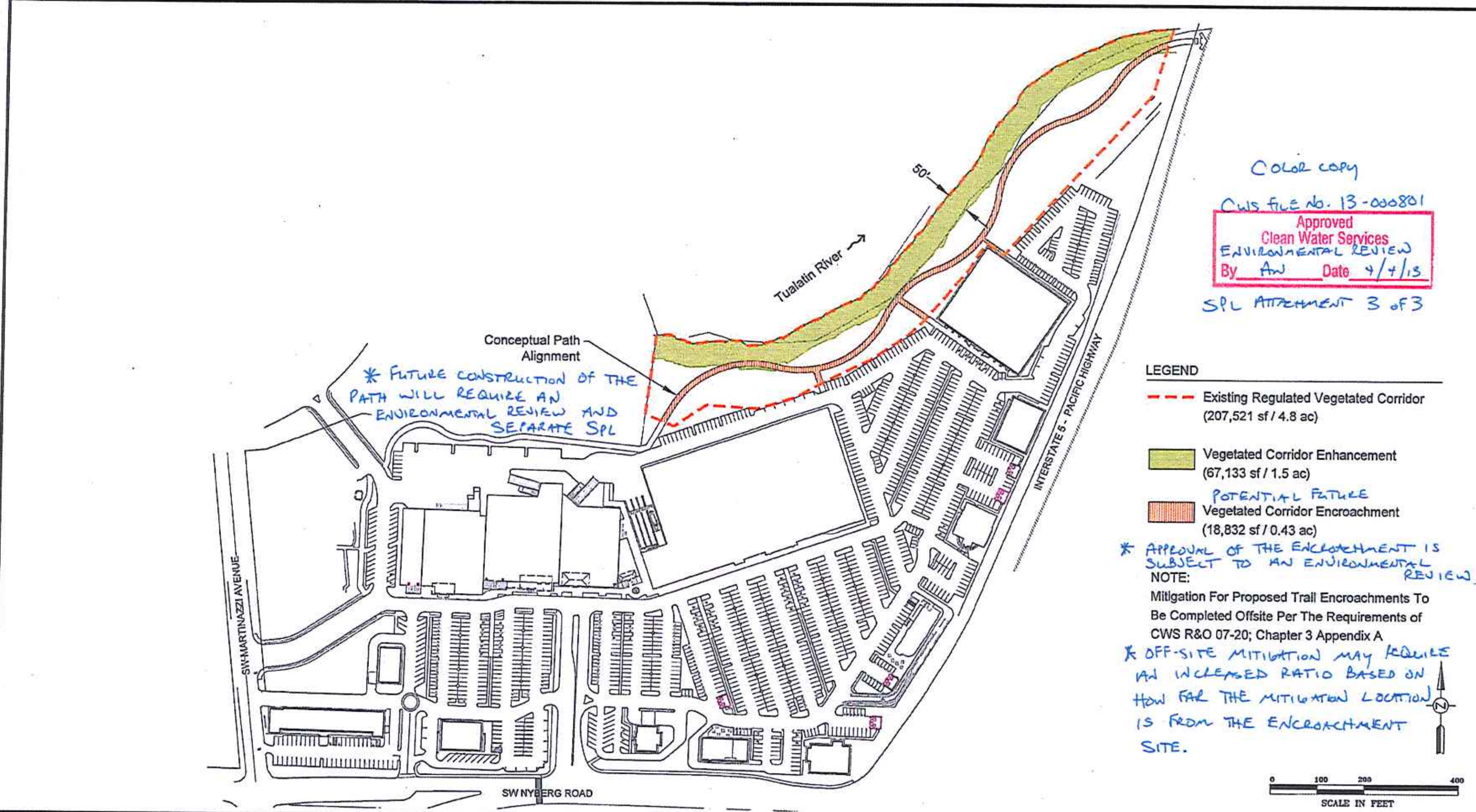
Nyberg Rivers Commercial Retail Development- Tualatin, Oregon

FIGURE 3

03-07-2013

CWS File Number

13-000801



Note:
Base map provided by CARDNO WRG.

Pacific Habitat Services, Inc.

Vegetated Corridor Encroachment and Necessary Enhancements
Nyberg Rivers Commercial Retail Development- Tualatin, Oregon

FIGURE 4

03-07-2013

Exhibit 1
Attachment E

NEIGHBORHOOD/DEVELOPER MEETING
AFFIDAVIT OF MAILING

STATE OF OREGON)
) SS
COUNTY OF WASHINGTON)

I, Thatch Moyle , being first duly sworn, depose and say:

That on the 25 day of July , 2013, I served upon the persons shown on Exhibit "A," attached hereto and by this reference incorporated herein, a copy of the Notice of Neighborhood/Developer meeting marked Exhibit "B," attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses shown on said Exhibit "A" are their regular addresses as determined from the books and records of the Washington County and/or Clackamas County Departments of Assessment and Taxation Tax Rolls, and that said envelopes were placed in the United States Mail with postage fully prepared thereon.

Signature

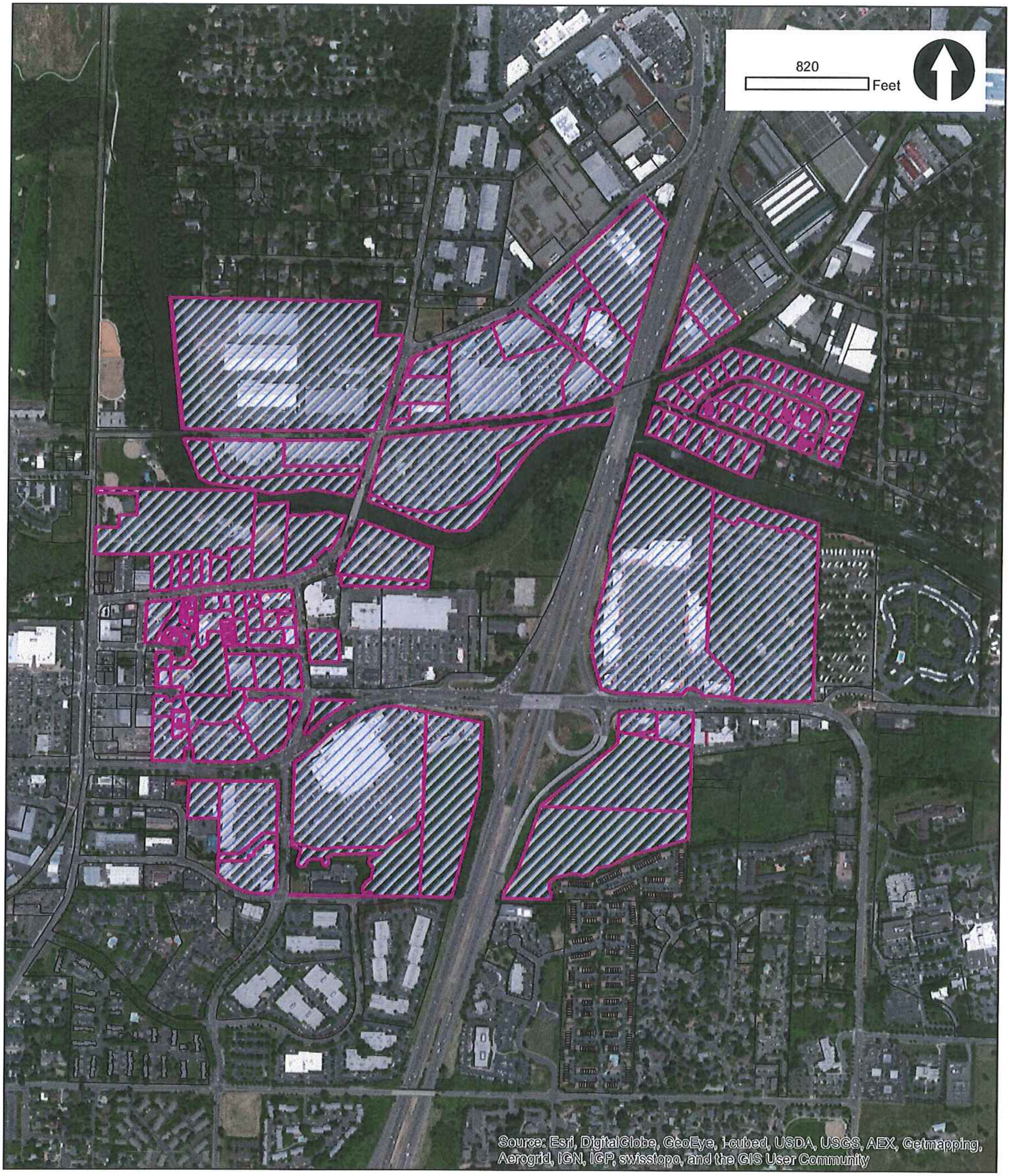
SUBSCRIBED AND SWORN to before me this 21st day of August, 2013.

OFFICIAL SEAL
SALINA ANDRES
NOTARY PUBLIC-OREGON
COMMISSION NO. 477916
MY COMMISSION EXPIRES APRIL 30, 2017

Notary Public for Oregon
My commission expires: April 30, 2017

RE: ______

Exhibit 1
Attachment F



Nyberg Rivers

Tax Lots & 1,000 Foot Buffer Within City Limits

Tualatin, Oregon

Cardno
Shaping the Future

NOTE: The difference in parcels reflects those parcels removed that are listed under a different Jurisdiction i.e. Lake Oswego, Tigard, Durham, Rivergrove

Exhibit 1
EXHIBIT "A-7"
Attachment F

EXHIBIT "B-1"

Cardno
Shaping the Future

5415 SW Westgate Drive
Suite 100
Portland, Oregon 97221
USA

Phone (503) 419-2500
Fax (503) 419-2600

www.cardno.com

July 25, 2013

Re: Architectural Review & Tree Removal Permit for Nyberg Rivers redevelopment

Dear Property Owner/Neighborhood Representative:

You are cordially invited to attend a meeting on August 8, 2013 from 5:30 p.m. to 6:30 p.m. at the Sylvan Learning Center branch located at 7809 SW Nyberg Street in Tualatin. This meeting shall be held to discuss a proposed architectural review & tree removal permit application for the proposed Nyberg Rivers development located at 7655 Nyberg Street in Tualatin. These applications follow the Nyberg Rivers Master Plan already submitted and under review by the City.

The tree removal permit pertains to Tax Lots 2502, 2507, 2508 and 2700. Generally, trees are proposed to be removed within the proposed commercial center, with trees retained within the Tualatin River greenway area. The Architectural Review pertains to the new proposed buildings onsite as shown on the attached site plan.

Please note that this will be an informational meeting on preliminary plans with the developer and representatives only and is not intended to take the place of a public hearing before the Architectural Review Board. You will have an opportunity to present testimony to this body and City staff when each application is submitted to the City for review.

We look forward to meeting you at the August meeting and hearing your thoughts on the proposed project!

Sincerely,

Thatch Moyle, AICP
Senior Planner, Cardno WRG

Enclosure: Site Plan

Exhibit 1
Attachment F

EXHIBIT "B-2"

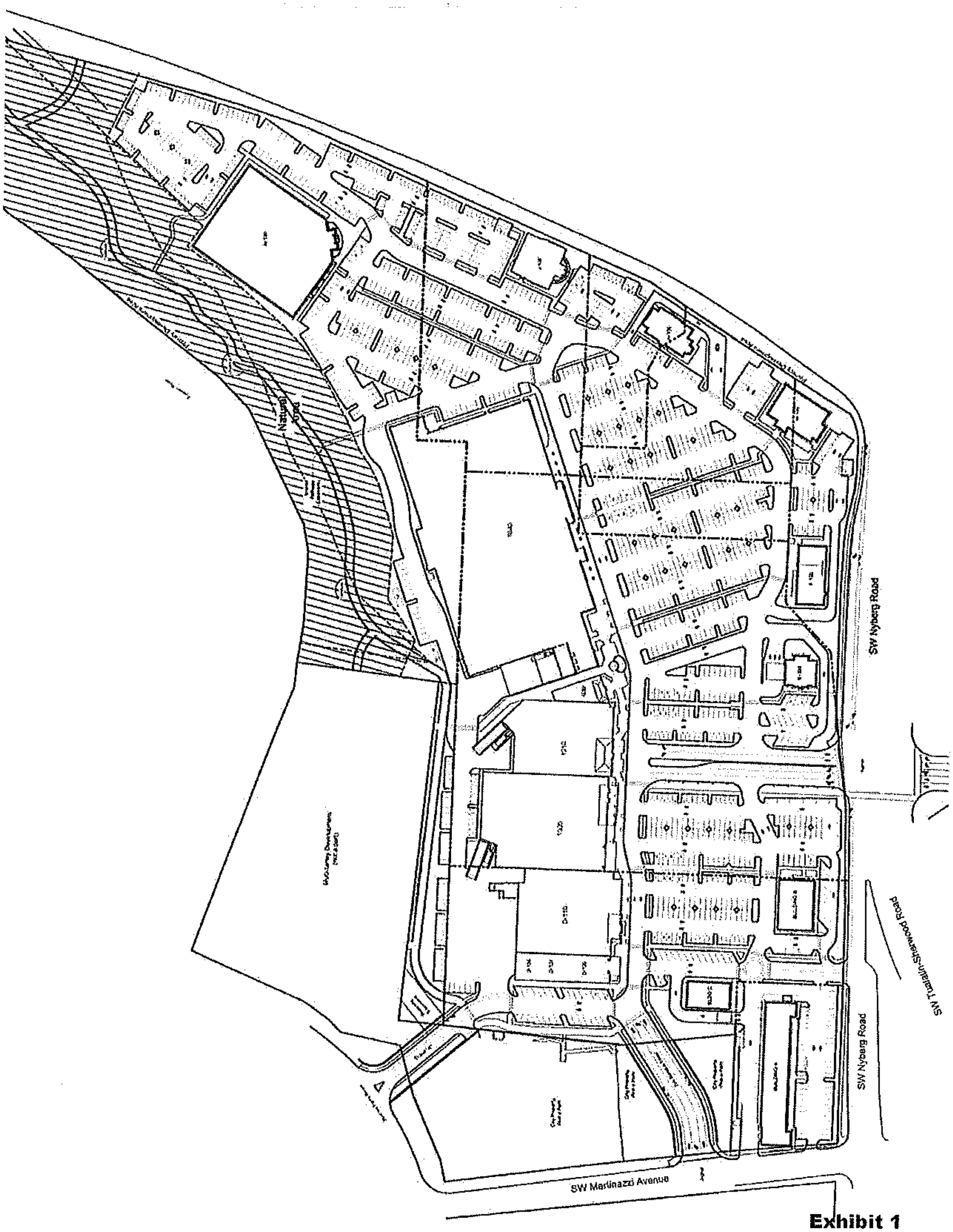


Exhibit 1
Attachment F

NEIGHBORHOOD/DEVELOPER MEETING
PUBLIC NOTICE MAILING

As the applicant for the NYBERG RIVERS ARB & TREE REMOVAL project, I hereby certify that on July 25, 2013, notice of the Neighborhood / Developer meeting was mailed in accordance with the requirements of the Tualatin Development Code and the Community Development Department - Planning Division.

Applicant's Name: THATCH MOYLE
(PLEASE PRINT)

Applicant's Signature: [signature]

Date: 8/31/2013

Exhibit 1
Attachment F

NEIGHBORHOOD/DEVELOPER MEETING
PUBLIC NOTICE POSTING

As the applicant for the NYBERG RIVERS ARB & TREE REMOVAL project, I hereby certify that on July 25, 2013, Six (6) sign(s) were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Department - Planning Division.

Applicant's Name: THATCH MOYLE
(PLEASE PRINT)

Applicant's Signature: Thatch Moyle

Date: 8/21/2013

Nyberg Rivers

Public Noticing-- Sign Locations

Tualatin, Oregon

Cardno WRG
Shaping the Future

Exhibit 1
Attachment F

Neighborhood Meeting Sign Posting Locations July 25, 2013

Site #1

Site #2

Site #3

Site #4

Exhibit 1
Attachment F


LIBRARY
NOTICE
ART SPLASH
Tualatin Commons
JULY 26,27,28

Site #5


NOTICE

Site #6

Nyberg Rivers

ARB/Tree Removal

Neighborhood Meeting

SIGN IN SHEET

August 8, 2013

Name	Address, Street, Zip	Phone Number	E-Mail Address
FORDSON WILDER	19190 SW 90th AVE. #4768 TUALATIN, OR - 97062-9997	(503) 882-6011	fordsonwilder@yahoo.com

Exhibit 1
Attachment F

NYBERG RIVERS NEIGHBORHOOD MEETING

MEETING MINUTES

Cardno
Shaping the Future

5415 SW Westgate Drive
Suite 100
Portland, Oregon 97221
USA

Phone (503) 419-2500
Fax (503) 419-2600

www.cardno.com

August 8, 2013

Cardno hosted a neighborhood meeting for the Nyberg Rivers redevelopment Architectural Review and Tree Removal Permit submittal at the Sylvan Learning Center on August 8, 2013 from 5:30 pm to 6:30 pm. The Sylvan Learning Center is located at 7809 SW Nyberg Street in Tualatin. There were two attendees at the neighborhood meeting, including one City of Tualatin planner and one private citizen. Cardno presented general information on the redevelopment project and answered specific questions regarding construction timelines and procedures. No comments or concerns were submitted in writing by the attendees during the meeting.

Exhibit "A"

LEGAL DESCRIPTION
Nyberg II 21198310
Boundary Description
May 31, 2013

A TRACT OF LAND LOCATED IN THE NORTHEAST AND NORTHWEST QUARTER OF SECTION 24, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF TUALATIN, WASHINGTON COUNTY, OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF PARCEL 1, PARTITION PLAT NO. 1993-123, WASHINGTON COUNTY SURVEY RECORDS, SAID POINT BEING 120.00 FEET WESTERLY OF THE CENTERLINE OF THE SOUTHBOUND LANE OF INTERSTATE HIGHWAY NO. 5, WHEN MEASURED PERPENDICULAR THERETO;

THENCE ALONG THE WESTERLY RIGHT OF WAY LINE OF INTERSTATE HIGHWAY NO. 5 (VARIABLE WIDTH) SOUTH 15°49'17" WEST, 169.04 FEET TO A POINT BEING 120.00 FEET WESTERLY OF THE CENTERLINE OF THE SOUTHBOUND LANE OF INTERSTATE HIGHWAY NO. 5, WHEN MEASURED PERPENDICULAR THERETO;

THENCE SOUTH 12°33'01" WEST, 350.57 FEET TO A POINT BEING 100.00 FEET WESTERLY OF THE CENTERLINE OF THE SOUTHBOUND LANE OF INTERSTATE HIGHWAY NO. 5, WHEN MEASURED PERPENDICULAR THERETO;

THENCE PARALLEL WITH SAID CENTERLINE SOUTH 15°49'17" WEST, 170.29 FEET TO A POINT BEING 100.00 FEET WESTERLY OF THE CENTERLINE OF THE SOUTHBOUND LANE OF INTERSTATE HIGHWAY NO. 5, WHEN MEASURED PERPENDICULAR THERETO;

THENCE SOUTH 21°33'44" WEST, 542.28 FEET TO A POINT BEING 154.33 FEET WESTERLY OF THE CENTERLINE OF THE SOUTHBOUND LANE OF INTERSTATE HIGHWAY NO. 5, WHEN MEASURED PERPENDICULAR THERETO, SAID POINT ALSO BEING THE NORTHEAST CORNER OF DEED DOCUMENT NO. 2004-135929, WASHINGTON COUNTY DEED RECORDS;

THENCE ALONG THE NORTHERLY LINE OF SAID DEED DOCUMENT NO. 2004-135929 SOUTH 89°46'15" WEST, 374.82 FEET TO THE NORTHWEST CORNER THEREOF;

THENCE ALONG THE WESTERLY LINE OF SAID DEED DOCUMENT NO. 2004-135929 SOUTH 00°13'45" EAST, 361.43 FEET TO THE NORTHERLY RIGHT OF WAY LINE OF SW NYBERG ROAD (COUNTY ROAD NO. 2545)(VARIABLE WIDTH);

THENCE ALONG SAID NORTHERLY RIGHT OF WAY LINE SOUTH 89°46'15" WEST, 203.68 FEET;

THENCE SOUTH 44°46'46" WEST, 110.68 FEET;

THENCE SOUTH 82°09'15" WEST, 343.77 FEET;

THENCE SOUTH 89°46'15" WEST, 497.24 FEET TO A POINT ON THE EASTERLY RIGHT OF WAY LINE OF SW MARTINAZZI AVENUE, 15.00 FEET FROM THE CENTERLINE THEREOF, WHEN MEASURED PERPENDICULAR THERETO;

THENCE ALONG SAID EASTERLY RIGHT OF WAY LINE NORTH 07°41'07" WEST, 183.49 FEET TO THE SOUTHWEST CORNER OF THAT TRACT OF LAND DESCRIBED IN BOOK 773, PAGE 872, WASHINGTON COUNTY DEED RECORDS , TO THE CITY OF TUALATIN (TUALATIN TRACT);

THENCE ALONG THE NORTHERLY LINE OF SAID TUALATIN TRACT NORTH 89°46'15" EAST, 206.44 FEET TO THE SOUTHEAST CORNER OF SAID TUALATIN TRACT;

THENCE ALONG THE EASTERLY LINE OF SAID TUALATIN TRACT NORTH 07°41'07" WEST, 206.02 FEET TO THE SOUTHEAST CORNER OF THAT TRACT OF LAND DESCRIBED AS PARCEL I, IN BOOK 709, PAGE 82, SAID COUNTY RECORDS;

THENCE ALONG THE EASTERLY LINE OF SAID PARCEL I, AND THE EASTERLY LINE OF THAT TRACT OF LAND DESCRIBED IN DEED TO TUALATIN FIRE PROTECTION DISTRICT IN BOOK 751, PAGE 314, SAID DEED RECORDS, AND A PORTION OF THE EASTERLY LINE OF THAT TRACT OF LAND DESCRIBED IN BOOK 714, PAGE 436, SAID DEED RECORDS, NORTH 04°17'34" EAST, 376.00 FEET TO THE SOUTHERLY LINE OF THAT TRACT OF LAND DESCRIBED IN DEED DOCUMENT NO. 2004-022480, SAID DEED RECORDS;

THENCE ALONG THE SOUTHERLY LINE OF SAID DEED DOCUMENT NO. 2004-022480, SOUTH 85°42'26" EAST, 578.02 FEET TO THE WESTERLY LINE OF SAID PARCEL I, PARTITION PLAT NO. 1993-123;

THENCE ALONG SAID WESTERLY LINE NORTH 05°34'18" EAST, 244.44 FEET TO THE NORTHERLY LINE OF SAID PARCEL I;

THENCE ALONG SAID NORTHERLY LINE SOUTH 83°06'05" EAST, 70.20 FEET;

THENCE SOUTH 89°16'30" EAST, 118.95 FEET;

THENCE NORTH 78°06'38" EAST, 47.99 FEET;

THENCE NORTH 63°03'09" EAST, 102.02 FEET;

THENCE NORTH 61°05'09" EAST, 113.50 FEET;

THENCE NORTH 43°58'54" EAST, 73.56 FEET;

THENCE NORTH 35°38'54" EAST, 211.29 FEET;

THENCE NORTH 37°11'23" EAST, 115.37 FEET;

THENCE NORTH 32°54'07" EAST, 136.68 FEET;

THENCE NORTH 47°49'30" EAST, 114.34 FEET;

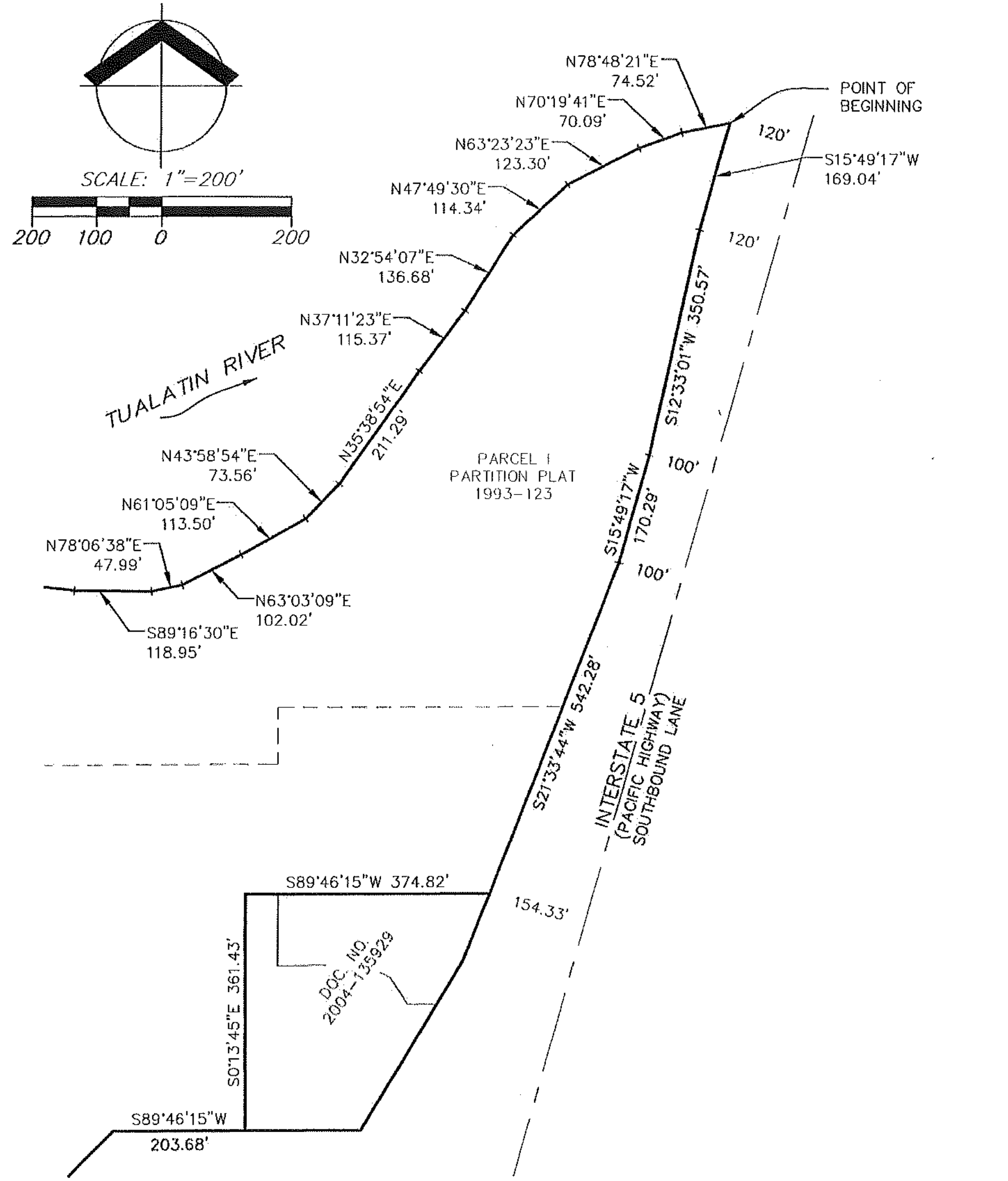
THENCE NORTH 63°23'23" EAST, 123.30 FEET;

THENCE NORTH 70°19'41" EAST, 70.09 FEET;

THENCE 78°48'21" EAST, 74.52 FEET TO THE POINT OF BEGINNING.

CONTAINS 1,248,324 SQUARE FEET OR 28.658 ACRES, MORE OR LESS.

THE ATTACHED EXHIBIT "B" ENTITLED "BOUNDARY EXHIBIT" IS MADE A PART HEREOF.



Cardno
Shaping the Future

PORTLAND
5415 SW WESTGATE DR, STE 100, PORTLAND, OR 97221
TEL: (503) 419-2500 FAX: (503) 419-2600
www.cardno.com

EXHIBIT "B"
BOUNDARY EXHIBIT

S 24, T 2 S., R 1 W., WILLAMETTE MERIDIAN
WASHINGTON COUNTY, OREGON

PROJECT NO. 21198310
DATE: 5/29/2013
BY: EDL
SCALE: 1"=200'

Exhibit 1
Attachment G

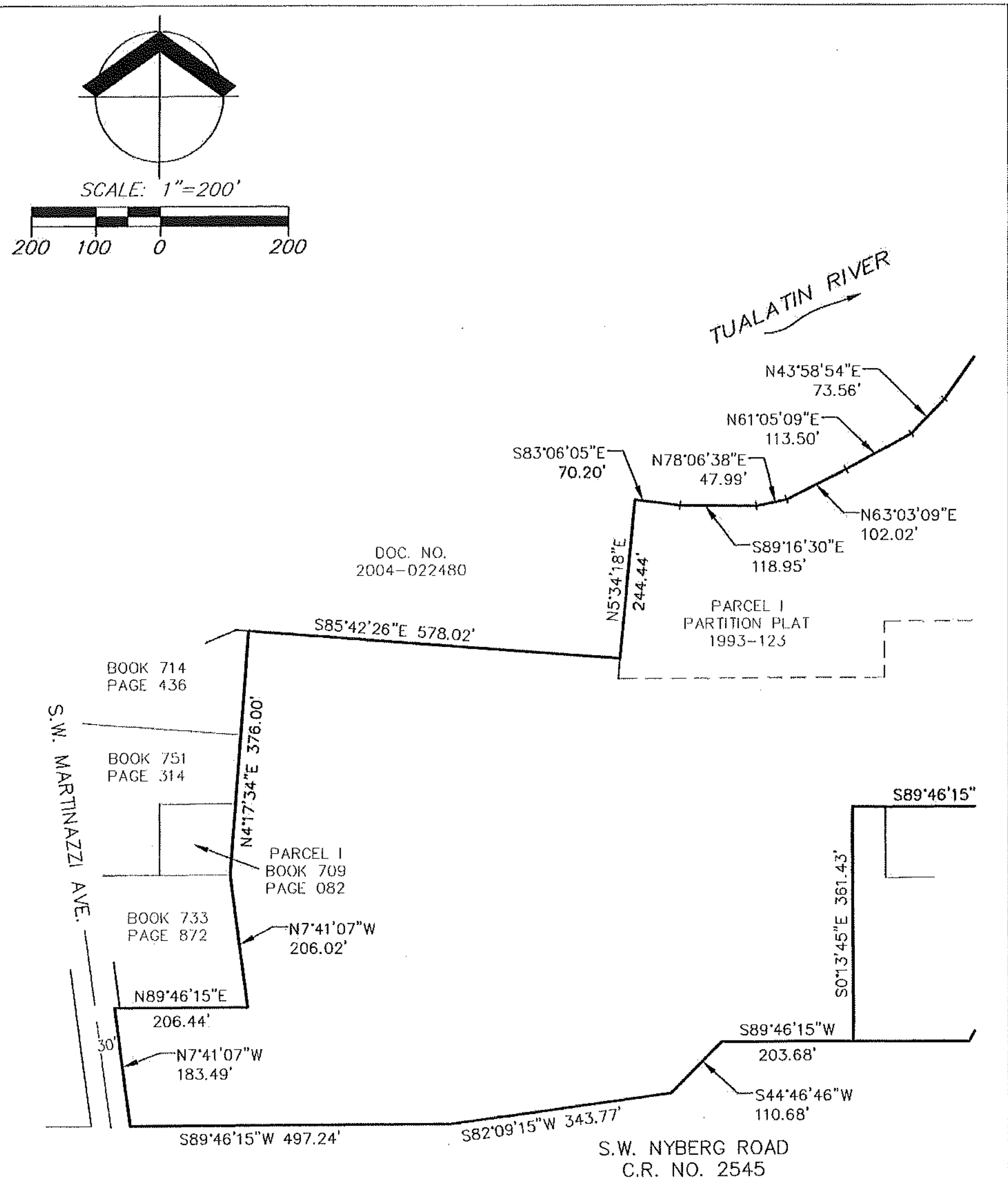


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EXHIBIT "B"
BOUNDARY EXHIBIT

S 24, T 2 S., R 1 W., WILLAMETTE MERIDIAN
WASHINGTON COUNTY, OREGON

PROJECT NO.	21198310
DATE:	5/29/2013
BY:	EDL
SCALE:	1"=200'
PAGE NO.	5 OF 5

Exhibit 1
Attachment G

Exhibit "A"

LEGAL DESCRIPTION
Nyberg II 21198310
McBale Boundary Description
May 31, 2013

THAT TRACT OF LAND DESCRIBED IN DEED DOCUMENT NO. 2004-135929, WASHINGTON COUNTY DEED RECORDS, LOCATED IN THE NORTHEAST QUARTER OF SECTION 24, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF TUALATIN, WASHINGTON COUNTY, OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID DEED DOCUMENT NO. 2004-135929, THENCE ALONG THE WESTERLY LINE OF SAID DEED DOCUMENT NORTH 00°13'45" WEST, 361.43 FEET TO THE NORTHWEST CORNER THEREOF;

THENCE ALONG THE NORTHERLY LINE OF SAID DEED DOCUMENT NORTH 89°46'15" EAST, 374.82 FEET TO A POINT ON THE WESTERLY RIGHT OF WAY LINE OF THE SOUTHBOUND LANE OF INTERSTATE HIGHWAY NO. 5, SAID POINT BEING 154.33 FEET WESTERLY OF THE CENTERLINE THEREOF, WHEN MEASURED PERPENDICULAR THERETO;

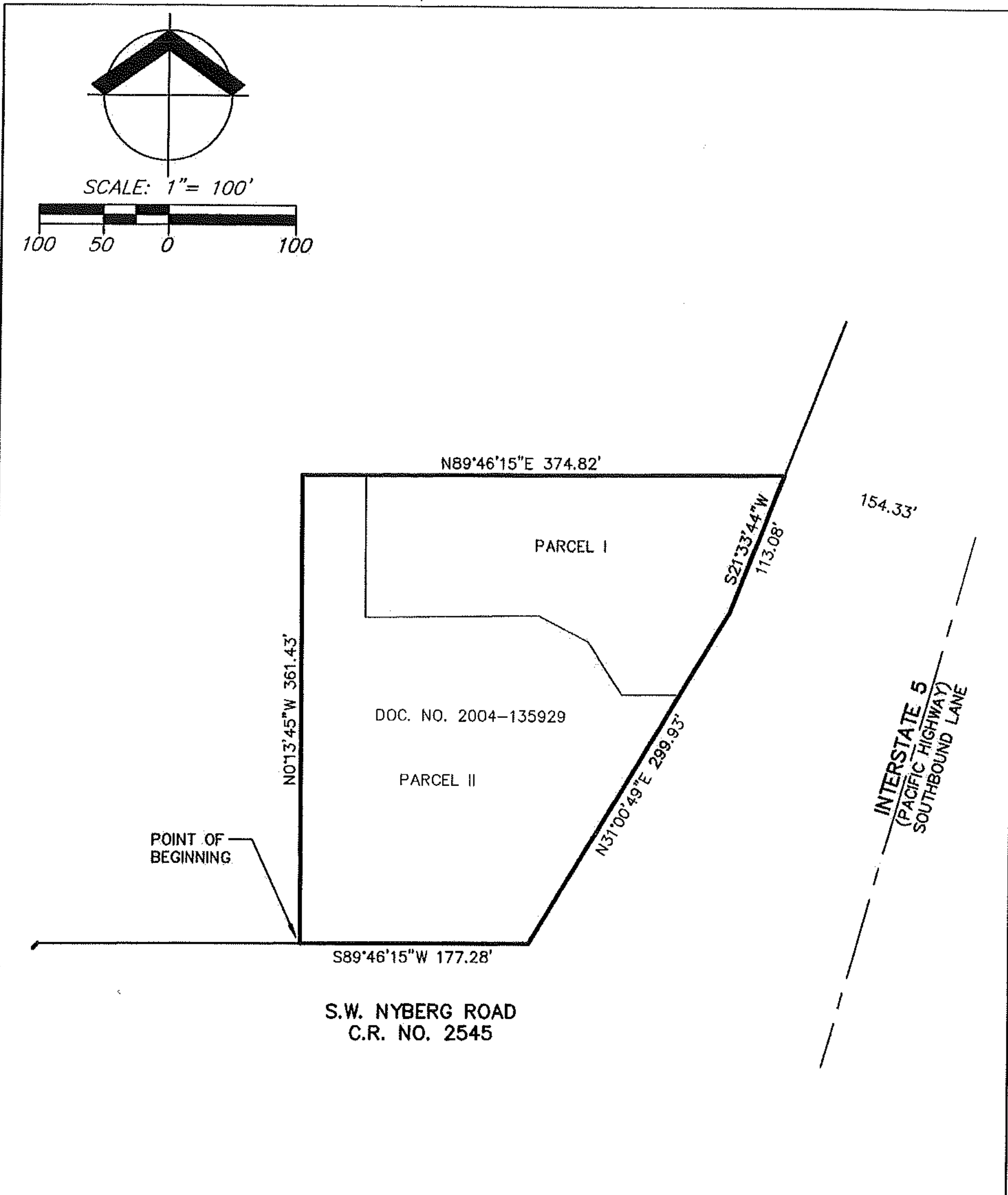
THENCE ALONG SAID WESTERLY RIGHT OF WAY LINE SOUTH 21°33'44" WEST, 113.08 FEET;

THENCE SOUTH 31°00'49" WEST, 299.93 FEET TO THE NORTHERLY RIGHT OF WAY LINE OF SW NYBERG ROAD (COUNTY ROAD NO. 2545)(VARIABLE WIDTH);

THENCE ALONG SAID NORTHERLY RIGHT OF WAY LINE SOUTH 89°46'15" WEST, 177.28 FEET TO THE POINT OF BEGINNING.

CONTAINS 102,557 SQUARE FEET OR 2.354 ACRES, MORE OR LESS.

THE ATTACHED EXHIBIT "B" ENTITLED "BOUNDARY EXHIBIT" IS MADE A PART HEREOF.



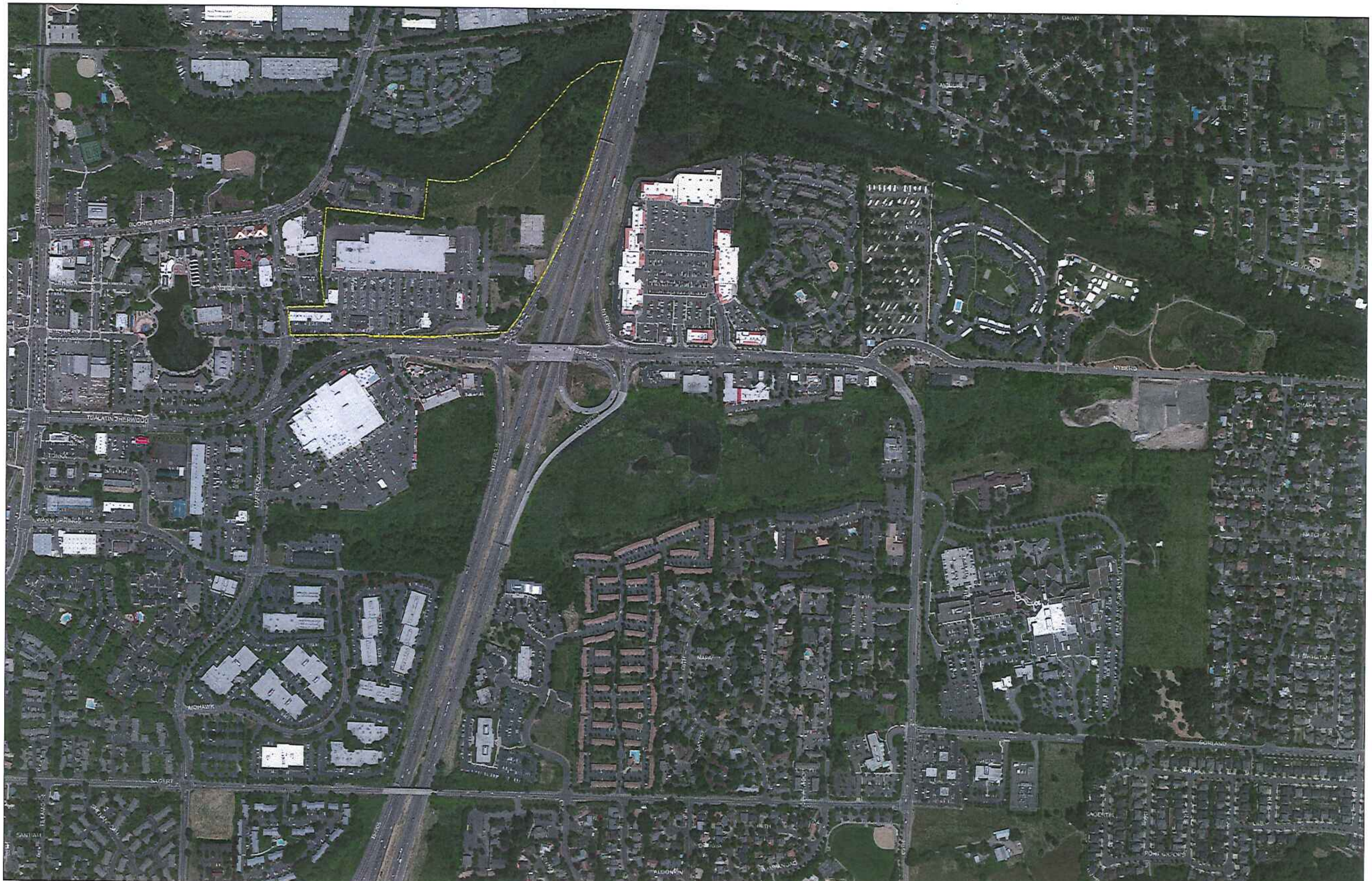
Cardno
Shaping the Future
PORTLAND
5415 SW WESTGATE DR. STE 100, PORTLAND, OR 97221
TEL: (503) 419-2500 FAX: (503) 419-2600
www.cardno.com

EXHIBIT "B"
BOUNDARY EXHIBIT

S 24, T 2 S., R 1 W., WILLAMETTE MERIDIAN
WASHINGTON COUNTY, OREGON

PROJECT NO. 21198310
DATE: 5/29/2013
BY: EDL
SCALE: 1"= 100'
PAGE NO. 2 OF 2

Exhibit 4
Attachment G



Nyberg Rivers

Aerial - Community Scale

0 100 200 400 Feet

Tualatin, Oregon

CENTERCAL PROPERTIES, LLC

Cardno Shaping the Future

KITTELSON & ASSOCIATES, INC. TRANSPORTATION ENGINEERING/PLANNING

Exhibit 1
Attachment H

REPUBLIC SERVICES

August 20, 2013

Korey Derrick
Project Designer
Cardno
5415 SW Westgate Drive
Suite 100
Portland. OR 97221

Re: Nyberg Rivers Mixed Solid Waste Plan

Dear Derrick;

Thank you, for sending us the site plans for this development located in Tualatin.

My Company: Republic Services of Clackamas & Washington Counties has the franchise agreement to service this area with the City of Tualatin. We will be able to continue to provide complete commercial waste removal services and recycling services as needed on a weekly basis for this location.

The plans for the enclosures look good and are accessible for my trucks too service. Please allow the gates to open over 90 degrees degrees, and be able to lock in an open position. No center pole in opening of enclosure. Thanks!

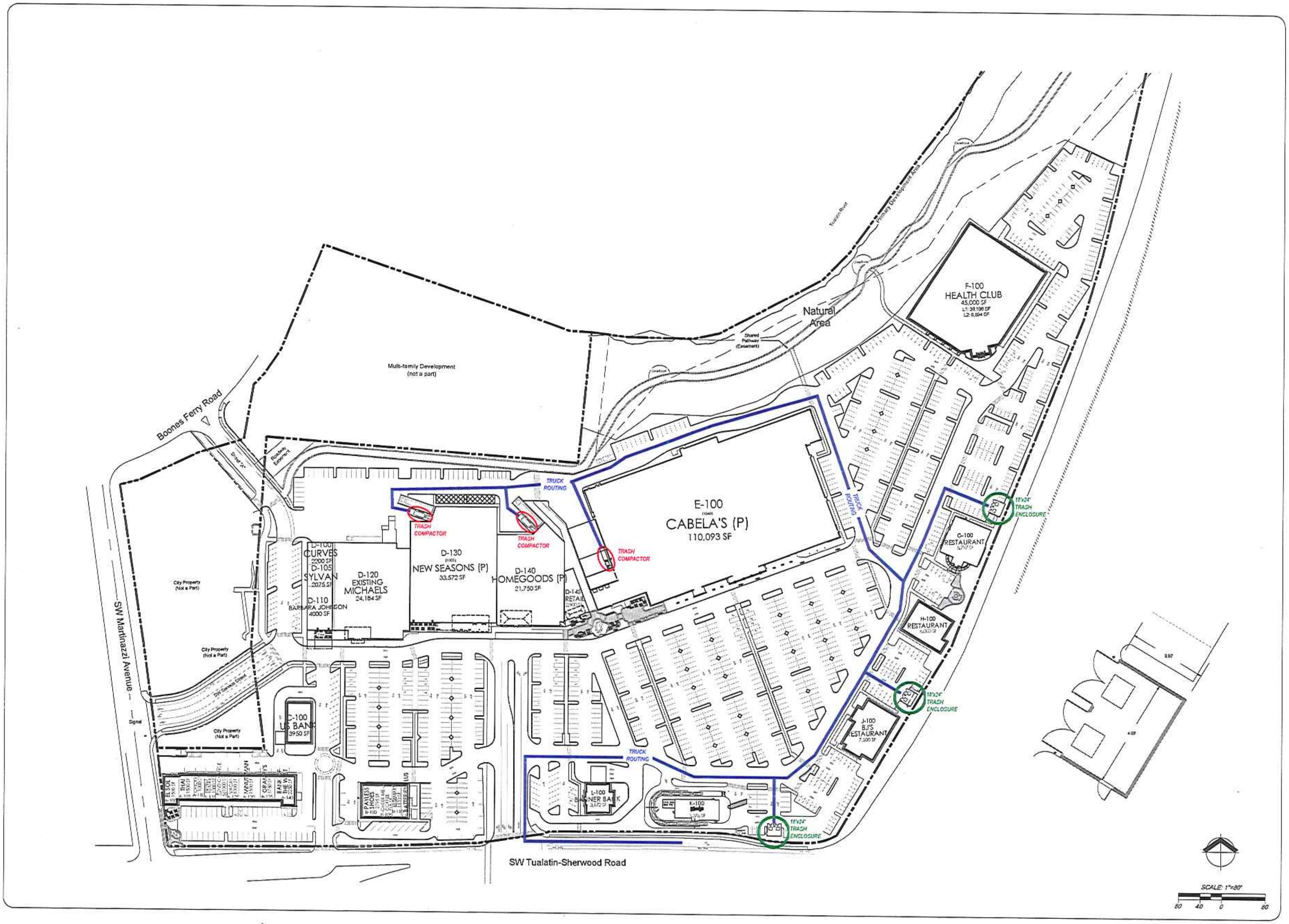
Sincerely,

Frank J. Lonergan

Frank J. Lonergan
Operations Manager
Republic Services

10295 SW Ridder Road
Wilsonville, OR 97070
503-570-0626 • Fax 503-570-0523
republicservices.com

Exhibit 1
Attachment I



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TEL (503) 419-2500 FAX (503) 419-2600
www.cardno.com

MIXED SOLID WASTE AND SOURCE SEPARATED RECYCLABLES PLAN

NYBERG RIVERS
CENTERCAL
UALATION, OREGON

PROJECT NO:	2110P210
DATE:	03/09/2011
DESIGNED BY:	KDC
DRAWN BY:	KDC
CHECKED BY:	JRS

TRASH
EXHIBIT

EX1

Exhibit 1
Attachment I

NW1/4 SECTION 24 T2S R1W W.M.

WASHINGTON COUNTY OREGON

SCALE 1"=200'

2S 1 24B

CANCELLED TAX LOTS
1003,1004,1401,2101,1001,1002,
1005,100,101,102,200,300,400,
401,401-M1,402,500,600,700,
701,800,900,1400,1200,1600,
1700,1800,

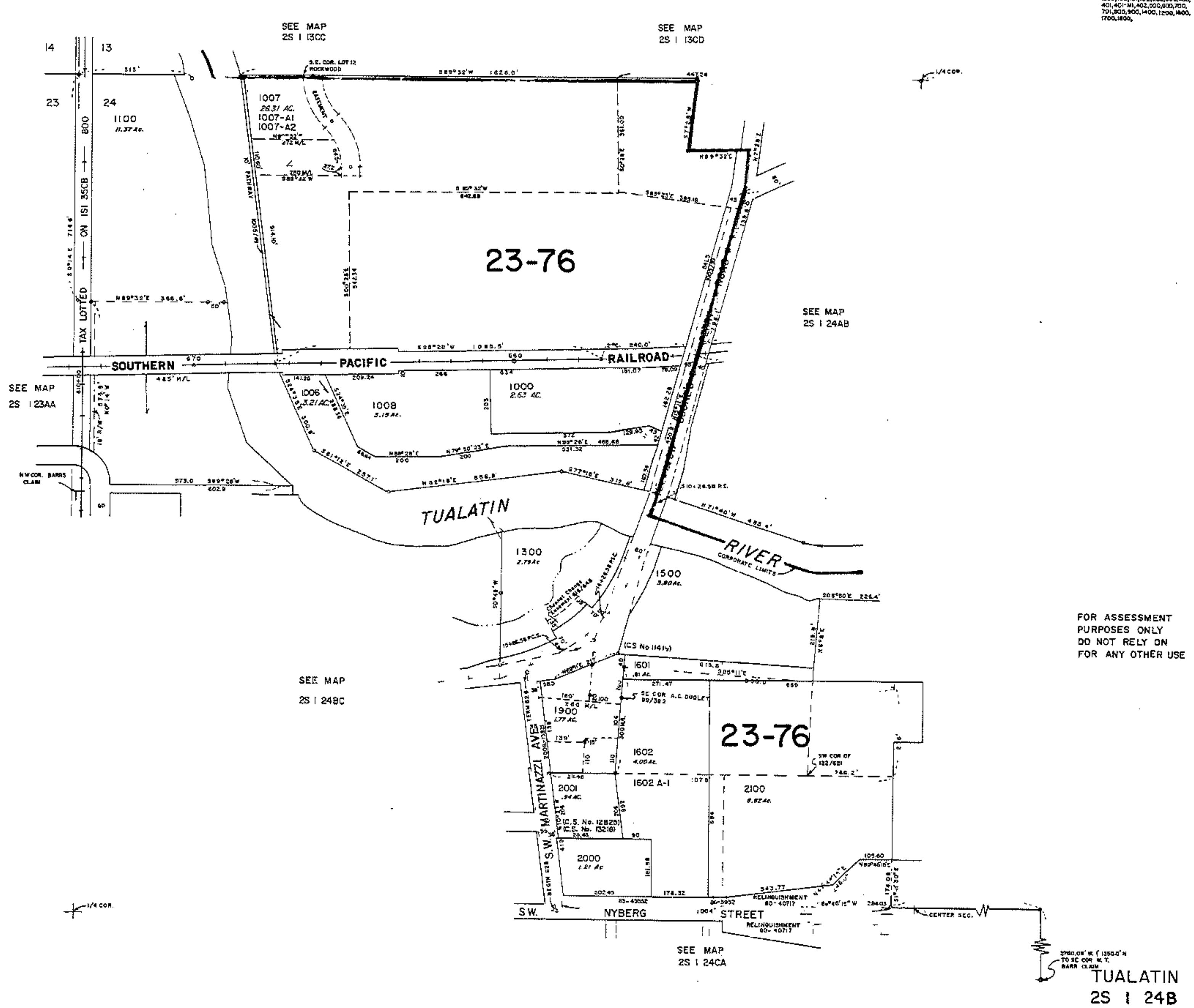

Exhibit 1
Attachmnet J

NE 1/4 SECTION 24 T2S R1W W.M.

WASHINGTON COUNTY OREGON

SCALE 1"=200'

2S 1 24A

CANCELLED TAX LOT NUMBERS
2400, 2504, 1501, 701, 800, 100, 101, 102
103, 104, 105, 200, 300, 400, 401, 500, 600
700, 900, 1000, 1100, 1200, 1300, 1400
1500, 1600, 1700, 1800, 1900, 2000, 2100
2200, 2300, 2500, 2500, 2501-A1, 2501,
2505, 2509,

FOR ASSESSMENT PURPOSES ONLY
DO NOT RELY ON FOR ANY OTHER USE

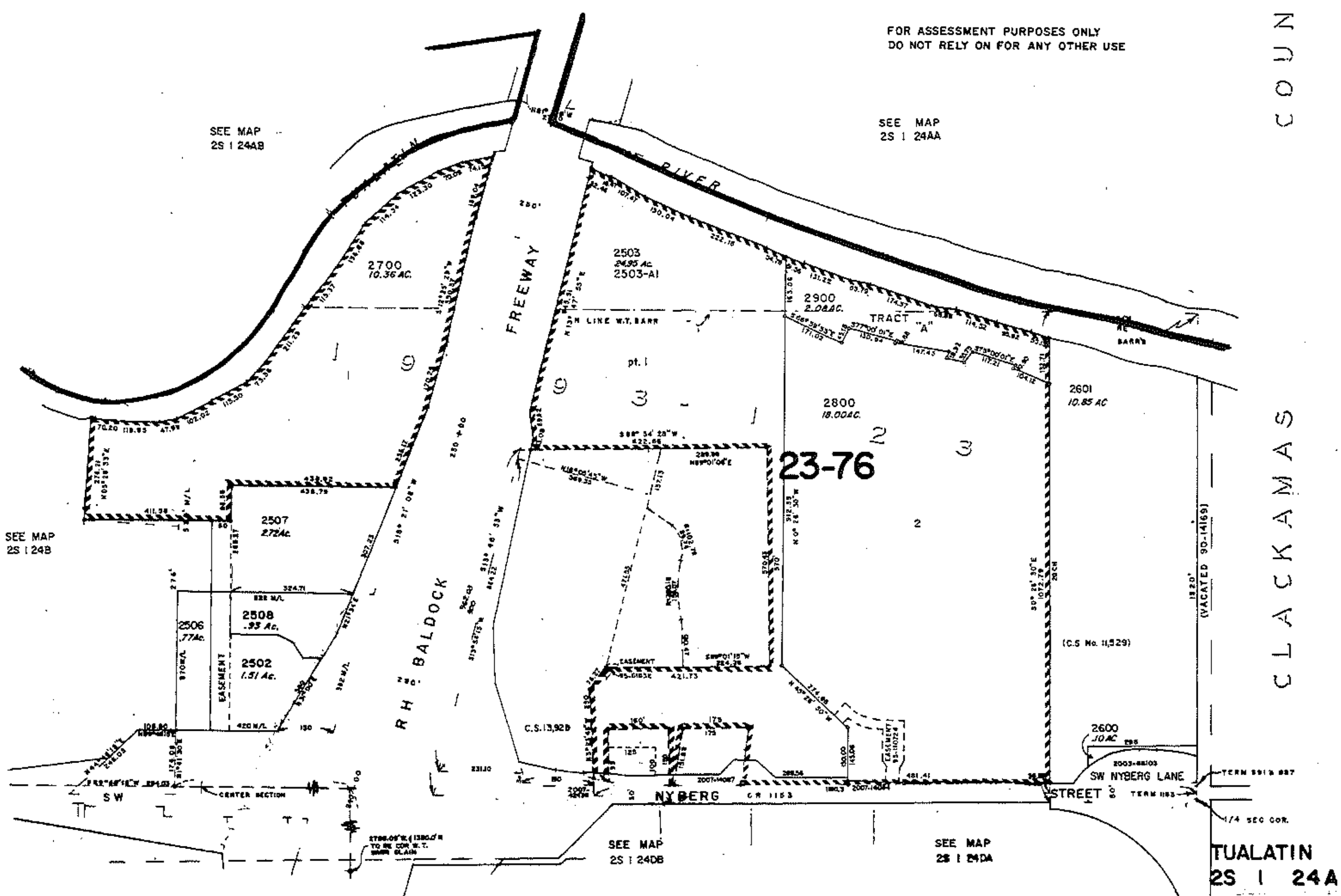

Exhibit 1
Attachmnet J

2S124BC01701
AMCO TUALATIN LLC
BY WYSE INVESTMENT SERVICES CO
1501 SW TAYLOR ST STE 100
PORTLAND, OR

2S124AA02900
ANDUEZA ANA I
2231 NE HALSEY ST
PORTLAND, OR

2S124AB01600
AXIOM INDUSTRIES INC
P O BOX 1147
TUALATIN, OR

2S124BC06800
BELL ROBERT P & SUZANNE
22605 PINEHURST DR
SHERWOOD, OR

2S124CB90000
BEN LAKE CONDOMINIUM
OWNERS OF UNITS

2S113DC02100
BLASER JOHN E & LORETTA
10555 SW LANCASTER RD
PORTLAND, OR

2S124BC02700
BLUMENKRON RACHEL & FRANK
BY STEPHENS & ASSOC
PO BOX 90427
PORTLAND, OR

2S124AB01301
BOONES BUILDING LLC
7007 SW CARDINAL LN #185
PORTLAND, OR

2S124BC07300
BRASHEAR GARY T
8175 SW SENECA ST
TUALATIN, OR

2S124BC08000
BROSMAN WAYNE H & BRIDGITTE
18710 SW BOONES FERRY RD
TUALATIN, OR

2S124AB01500
CAILEY PROPERTIES LLC
PO BOX 4223
TUALATIN, OR

2S124CB00201
CENTURY HOTEL LLC
4601 NE 78TH ST STE 130
VANCOUVER, WA

2S124BC07900
CHALUPNY CAROLINE
18720 SW BOONES FERRY RD
TUALATIN, OR

2S124AA03900
CHEN RENBO
16869 65TH AVE #360
LAKE OSWEGO, OR

2S124AA03500
CHILDS BARBARA C
PO BOX 90
OCEANSIDE, OR

2S124AB00800
CLUBSPORT OREGON LLC
18120 SW LOWER BOONES FY RD
TIGARD, OR

2S124AA04800
COLUMBIA REAL ESTATE SERVICES LL
4214 SW 51ST PL
PORTLAND, OR

2S124AA96928
CONNER GARY TIMOTHY
6928 SW MONTAUK CIR
LAKE OSWEGO, OR

2S124CB00204
COPPER MOUNTAIN TRUST CORP
BY QUEST PROPERTY MGMT
1 SW COLUMBIA ST #435
PORTLAND, OR

2S124AA86882
COURTIS MARY
6882 MONTAUK CIR
LAKE OSWEGO, OR

2S124BC01301
CSB LLC
PO BOX 2708
ISSAQUAH, WA

2S124AA05400
CUSICK LARRY & JUDY A
7190 SW CHILDS RD
LAKE OSWEGO, OR

2S124AA02000
CUSICK LARRY G
7190 SW CHILDS RD
LAKE OSWEGO, OR

2S124BC07000
DAVISON JAMES E
8145 SW SENECA #4
TUALATIN, OR

2S124BC01502
DIERINGER'S PROPERTIES INC
10505 SE 44TH AVE
MILWAUKIE, OR

2S124AA66931
DUDA IRENE E
6931 MONTAUK CIR
LAKE OSWEGO, OR

2S124AB01701
DURHAM CITY OF
17160 SW UPPER BOONES FY RD
PORTLAND, OR

2S124AA01601
ELLIS DAVID &
WARD CECILIA
6956 SW CHILDS RD
LAKE OSWEGO, OR

2S124AB00500
ESG INVESTMENTS LLC
BY DEERING MGMT GROUP INC
4800 SW MACADAM AVE STE 120
PORTLAND, OR

2S124AA66929
FAHRENDORF JOSEPH B &
FAHRENDORF JANET M
1143 MANOR DR
SONOMA, CA

Exhibit 1
Attachment K

2S124AA70000
FALCON RUN CONDO
OWNERS OF ALL UNITS

2S124A002800
FOREST RIM INVESTORS LP
BY GERSON BAKAR & ASSOCIATES
201 FILBERT ST 7TH FL
SAN FRANCISCO, CA

2S124DB00100
G&S FAMILY LTD PARTNERSHIP THE
20752 SW 120TH AVE
TUALATIN, OR

2S124AA04500
GIBBS CATHLEEN &
GIBBS JAMES
11621 SE 222ND AVE
DAMASCUS, OR

2S124CB90021
GIONET LEONARD A TRUST
1502 SW MONTGOMERY
PORTLAND, OR

2S124AA04900
GRANT EUGENE L & JANET K
11311 SE CHARVIEW CT
CLACKAMAS, OR

2S124AA77200
GRIFFITHS ROBERT
19748 WILDWOOD DR
WEST LINN, OR

2S124AA02600
GUIDER ROBERT S TRUST
BY GUIDER ROBERT S TR
17 LOCKE WAY
SCOTTS VALLEY, CA

2S124BC01503
HABERMAN PROPERTIES LLC
PO BOX 1562
BEAVERTON, OR

2S124BC05900
HARDEN ROBERT C
8285 SW SENECA ST
TUALATIN, OR

2S124AA05100
HARRIS DENISE
BY ARTHUR WINN PROPERTY SERVICES
10121 SE SUNNYSIDE RD #300
CLACKAMAS, OR

2S124AA01900
HARVEY ROBERT E REV LIV TRUST
10460 SW WINDWOOD WAY
PORTLAND, OR

2S124BC00800
HEDGES MEADOW LLC
22830 SW ENO PL
TUALATIN, OR

2S124AA66927
HILLER PHILIP J &
HILLER TRACEE R
16590 SW WOODCREST AVE
TIGARD, OR

2S124CA00600
HILLSBORO MALL LLC
BY ERIC LINDGREN
PO BOX 1681
GIG HARBOR, WA

2S124BC07200
HO SON &
TRAN HA
19905 SW 58TH TER
TUALATIN, OR

2S124AA50010
HOLLMAN PROPERTIES LLC
3161 SW RIVERFRONT TER
WILSONVILLE, OR

2S124AA04600
HUNT TROY E
8170 SW 87TH
PORTLAND, OR

2S124AA02700
HUNTER NANCY H REV LIV TRUST
19 BLOCH TER
LAKE OSWEGO, OR

2S124AA03800
I & A CORP
PO BOX 82002
PORTLAND, OR

2S113DC02200
INTERNATIONAL CHURCH OF THE
FOUR SQUARE GOSPEL
PO BOX 1027
TUALATIN, OR

2S124AA04000
IRONSIDE METAL CORPORATION
3210 VETERAN AVE
LOS ANGELES, CA

2S124B001007
JEWELL ATTACHMENTS LLC
ATTN: LUANNE PELTON
18135 SW BOONES FERRY RD
PORTLAND, OR

2S124BC00901
JONATHAN & JOANNE CRANE LLC
PO BOX 1935
TUALATIN, OR

2S124BC05700
JONES KEITH N
8305 SW SENECA ST
TUALATIN, OR

2S124AA77206
JOREK KRISTEN
7206 SW MONTAUK CIR
LAKE OSWEGO, OR

2S124BC01300
KAPLAN GORDON &
KAPLAN FAMILY TRUST
1025 NW COUCH ST #611
PORTLAND, OR

2S124AA03700
KENNEDY EILEEN
199 W STERLING POND
THE WOODLANDS, TX

2S124AA02100
KENNEDY KARA M
10127 SE CAMBRIDGE LN
MILWAUKIE, OR

2S124BC01802
KILHEFNER MARY JANE
PO BOX 67049
PORTLAND, OR

Exhibit 1
Attachment K

2S124AA03000
KURZ FRANK J & MARY W
5450 SE 40TH AVE
PORTLAND, OR

2S124BC05800
LARSEN DINAH W TRUST
PO BOX 623
TUALATIN, OR

2S124BC07600
LECLAIRE MOLLIE J
18750 SW BOONES FERRY RD
TUALATIN, OR

2S124AB01700
LOGOS ASSOCIATES LTD PARTNERSHIP
BY THOMSON REUTERS (PROPERTY TAX SE
2235 FARADAY AVE #O
CARLSBAD, CA

2S124AA04400
LU LAN
20801 NW ROCKSPRING LN
BEAVERTON, OR

2S124AA86880
MANNING LINDA L
6880 SW MONTAUK CIR
LAKE OSWEGO, OR

2S124CB02600
MARTINAZZI SQUARE LLC
BY API/PICHON VIII LLC
112 THIRD ST
LAKE OSWEGO, OR

2S124AA86886
MCCAGHREN KARIN A
6886 SW MONTAUK CIR
LAKE OSWEGO, OR

2S124BC06000
MEADE PAUL J
17667 SW 80TH PL
PORTLAND, OR

2S124AA80000
MEADOWLARK RUN CONDO
OWNERS OF ALL UNITS

2S124AA96926
MERLO-FLORES VALERIA
6926 SW MONTAUK CIR
LAKE OSWEGO, OR

2S124CA00200
METROPOLITAN LIFE INS CO
BY FRED MEYER INC STORE #393
1014 VINE ST
CINCINNATI, OH

2S124BC07400
MEWS AT THE COMMONS HOMEOWNERS
ASSOCIATION
4934 SE WOODSTOCK
PORTLAND, OR

2S124BC06200
MILTON NANCY E
8255 SW SENECA ST
TUALATIN, OR

2S124AA04100
MINOR MARYLUE &
MINOR J WARDEN & ELIOT QUINN &
16890 SW CAMINO DR
KING CITY, OR

2S124AA01500
MOHR JOHN H &
DEERING-MOHR LORI
6950 SW CHILDS RD
LAKE OSWEGO, OR

2S124AA03200
MONTAUK LLC
BY FIFTH & C LLC
1795 PALISADES TERRACE DR
LAKE OSWEGO, OR

2S124BC06700
MORLAN SUSAN E
6510 SE 32ND AVE
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2S124BC05600
MROCZKIEWICZ JACQUELINE
8315 SW SENECA ST
TUALATIN, OR

2S124B001500
NELSON ROSCOE C JR
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NOREEN LLC
2625 NW 205TH ST
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2S113DD01000
NORTHWEST NATURAL GAS CO
220 NW SECOND AVE
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2S124AA96930
NOUGUIER MARK A
6930 SW MONTAUK CIR
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2S124CB00202
NW MOJO III LLC
12012 SE WILLOW OTTY RD
HAPPEY VALLEY, OR

2S124DB00400
NYBERG CREEK FOUNDATION LLC
BY JOHN C NYBERG
21840 NE SUNNYCREST RD
NEWBERG, OR

2S124AA66925
OARD MICHAL
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TIGARD, OR

2S124BC06900
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BY OLSON LARENE TR
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2S124CB90011
OREGON EVERGREEN & HOLLY LAND
AND FARM
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WILSONVILLE, OR

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BEAVERTON, OR

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Exhibit 1
Attachment K

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PROVIDENCE HEALTH SYSTEM-OREGON
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OWNERS OF ALL UNITS

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2S124AA86884
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2S124AA77204
ROBERTS WAYNE V & SHERI REV LIV
c/o THORPE TOM &
7204 SW MONTAUK CIR
LAKE OSWEGO, OR

2S124CB01700
S & T SPOSITO LIVING TRUST
c/o BISACCIO GARY & PAULA
5283 SW 201ST AVE
ALOHA, OR

2S124AA01700
SANTORSOLA MICHAEL R &
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2S124BC08200
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18690 SW BOONES FY RD
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SD @ PIPERS'S RUN LLC
3750 SAINT ANDREWS DR
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2S124BC01708
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2S124BC02701
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2S124BC07500
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SPARROW RUN CONDOMINIUM ASSN

2S124AA04300
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1560 NW 116TH AVE
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2S124AB00700
SUMMIT PROPERTIES INC
5550 SW MACADAM BLVD #205
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2S124AA02500
SUSSMAN MARC REV LIV TRUST &
JOHNSON JUDY REV LIV TRUST
5908 SW KNIGHTS BRIDGE DR
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2S124BC05300
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OWNERS OF ALL UNITS

2S124AB00200
TRAIL BLAZERS INC
ONE CENTER COURT #200
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2S124A002503
TUALA NORTHEAST LLC
5638 DOGWOOD DR
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2S124A002900
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18880 SW MARTINAZZI AVE
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2S124CB00100
TUALATIN DEVELOPMENT COMM
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2S124CA00100
TUALATIN GARDENS PROPERTY LLC
5638 SW DOGWOOD LN
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2S124CD01000
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5809 JEAN RD
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Exhibit 1
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Transportation Impact Analysis

Nyberg Rivers

Tualatin, Oregon

April 2013

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Exhibit 1
Attachment L

Transportation Impact Analysis

Nyberg Rivers TIA

Tualatin, Oregon

Prepared For:
CenterCal Properties
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Prepared By:
Kittelson & Associates, Inc.
610 SW Alder, Suite 700
Portland, OR 97205
(503) 228-5230

Project No. 12116

April 2013

REGISTERED PROFESSIONAL ENGINEER
62836PE
Christopher Lynn Brehmer
OREGON
JULY 11, 2000
CHRISTOPHER LYNN BREHMER
Expires: 12-31-13

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Section 1
Executive Summary

EXECUTIVE SUMMARY

CenterCal Properties, LLC is proposing to redevelop a portion of an existing Tualatin retail center located in the northwest quadrant of the I-5/Nyberg Road interchange. The redevelopment, known as Nyberg Rivers, will consist of a reconfiguration of portions of the larger existing shopping center site. The redevelopment plan includes demolition of existing buildings, construction of new retail pads, and the relocation of some existing uses. In addition, several access changes will be made to the site to better accommodate the estimated traffic volumes being generated by the redevelopment. When complete, the proposed redeveloped plan will consist of a maximum total of 307,000 square feet of retail space.

The transportation analysis demonstrates that the proposed Nyberg Rivers redevelopment project can be constructed while maintaining acceptable traffic operations and safety at the study intersections within the immediate site vicinity, assuming provision of the recommended mitigation measures.

FINDINGS

Year 2012 Existing Conditions

- All of the study intersections currently operate acceptably during the weekday p.m. and Saturday midday peak hours with the exception of the SW Martinazzi Avenue/SW Sagert Street and SW 65th Avenue/SW Sagert Road intersections.
  - At both the SW Martinazzi Avenue/SW Sagert Street and SW 65th Avenue/SW Sagert Street intersections, the southbound approach during the weekday p.m. peak hour operates at LOS F.

Year 2014 Background Traffic Conditions

- All of the study intersections are forecast to operate acceptably during the weekday p.m. and Saturday midday peak hours with the exception of SW Martinazzi Avenue/SW Sagert Road and SW 65th Avenue/SW Sagert Road intersections.
  - At both the SW Martinazzi Avenue/SW Sagert Street and SW 65th Avenue/SW Sagert Street intersections, the southbound approach during the weekday p.m. peak hour is forecast to continue to operate at LOS F. These findings are consistent with analysis conducted as part of the recent Tualatin Transportation System Plan (TSP) Update and future improvements are identified within the TSP for both of these intersections.

Proposed Redevelopment Plan

- Under the redevelopment plan, the existing SW 75th Avenue connection to SW Nyberg Road will be closed to improve access management along SW Nyberg Road and to better accommodate the redevelopment proposal.
- The existing signalized access on SW Nyberg Road that currently serves the shopping center and the adjacent Fred Meyer site will remain. However, the following changes are proposed in order to better accommodate the proposed redevelopment, provide additional capacity for future growth in traffic, and improve safety relative to the existing condition:
    - A westbound right-turn lane will be developed on SW Nyberg Road to enhance access to the site and minimize vehicle queuing on SW Nyberg Road.
    - The existing site driveway is proposed to be widened as shown in the proposed site plan. This widening will include dual southbound left-turn lanes, a shared through/right-turn lane, and dual in-bound receiving lanes. A raised median will be constructed in the driveway throat to reduce turning conflicts on-site turning maneuvers and manage vehicle queues on the approach to the signal.
    - The north and south approach signal phasing is proposed to be modified from permissive left-turn phasing to split phasing.
- With the anticipated mix of new retail uses, the proposed redevelopment is estimated to generate 405 net new trips during the weekday p.m. peak hour and 725 net new trips during the Saturday midday peak hour.

Year 2014 Total Traffic Conditions

- All of the study intersections within the immediate site vicinity, including the site access points and internal site intersections, are forecast to operate acceptably during the weekday p.m. and Saturday midday peak hours.
- The SW Martinazzi Avenue/SW Sagert Road and SW 65th Avenue/SW Sagert Road intersections are forecast to continue to operate at LOS F.
    - The proposed development will have an insignificant impact at either intersection, resulting in an estimated 1.6% and 0.6% increase, respectively, during the weekday p.m. peak hour.
    - The Tualatin TSP has identified mitigations for these two intersections that, when implemented, will address the long-term operations.
    - The Washington County Transportation Development Tax (TDT) in part funds an improvement project on SW Sagert Street that will add capacity and reduce delay to both intersections.
- Beyond the site's frontage along SW Tualatin Sherwood Road and SW Martinazzi Avenue, where significant transportation improvements are proposed (including implementing the

intent of the City's Loop Road), the project will have an insignificant impact on the other study intersections (generally resulting in less than a two percent increase in traffic relative to 2014 background conditions).

- At all signalized intersections beyond the site frontage (with the exception of the I-5 interchange), the project will add on average one vehicle or less per signal cycle to any movement. This level of impact is less than significant by any traffic engineering standard and well below the level that would be perceived by motorists.
- Anticipated vehicle queues can be accommodated at the I-5 ramp terminals and the SW Nyberg Road/Signalized site driveway.
- The proposed Nyberg Rivers redevelopment project has proposed an on-site roadway network that will meet the intent of the loop road connection. The proposal includes the following:
    - A new roadway connection to SW Boones Ferry Road (shown as "Street A" in Figure 2) that includes sidewalks.
    - An enhanced site-access driveway to SW Nyberg Road that will better accommodate vehicular queuing and demand.
    - A potential future (assuming the City desires to move forward) new site-access connection to SW Martinazzi Avenue that aligns across from SW Seneca Street. This connection would be the Seneca Street extension envisioned in the Town Center Plan. Prior to the City making a decision on any new SW Street Seneca alignment, the redevelopment site plan preserves this connection opportunity in the present or future.
    - The preservation of east-west and north-south travel ways that will provide vehicular and pedestrian access between Street A, the Seneca Street alignment/extension, and enhanced access to SW Nyberg Road.
    - New sidewalks along the enhanced site-access driveway to SW Nyberg Road that provide pedestrian connections to the integrated site circulation network.
    - New bikeway connections along the perimeter of the site.

SW Martinazzi Avenue and SW Boones Ferry Road Site Access Alternatives

- An alternative site access scenario was evaluated that demonstrates the impact of potentially adding a fourth leg (in the form of a site-access driveway) to the existing SW Martinazzi Avenue/SW Seneca Street intersection and closing the existing SW Martinazzi Avenue site driveway adjacent to the library. This analysis produced the following results:
    - The east and west approaches to a modified SW Martinazzi Avenue/SW Seneca Street intersection would operate at Level of Service (LOS) F and over capacity during the

weekday p.m. peak hour with the addition of a fourth site-access leg. Signalizing the intersection would provide the following:

- Mitigation that results in LOS A or better (a significant improvement over existing conditions).
- Additional excess intersection capacity beyond what is needed to serve the Nyberg Rivers project traffic.
- Enhanced east-west pedestrian connectivity across SW Martinazzi Avenue.
- A safety improvement relative to stop sign control.

- In addition to the modified SW Martinazzi Avenue/SW Seneca Street intersection, another site-access alternative was evaluated that demonstrates the impacts of adding a limited access site-driveway to SW Boones Ferry Road. The analysis shows that with a direct connection to SW Boones Ferry Road, there would be some shifting of site-generated traffic off of SW Martinazzi Avenue. This additional access would further improve connectivity, help implement the City's loop road concept, and provide additional capacity beyond what is needed to serve the Nyberg Rivers project.

RECOMMENDATIONS

- With the proposed Nyberg Rivers redevelopment:
  - The existing SW 75th Avenue site-access driveway to SW Nyberg Road should be closed in order to minimize turning movement conflicts, allow for the construction of a westbound right-turn lane at the SW Nyberg Road/signalized site driveway, and improve the interchange access spacing conditions along SW Nyberg Road.
  - To better accommodate the anticipated site-generated traffic at the SW Nyberg Road/Signalized site driveway:
    - A new westbound right-turn lane should be constructed on SW Nyberg Road.
    - The site driveway should be modified to include dual southbound left-turn lanes, a shared through/right-turn lane, and two inbound receiving lanes.
    - The existing north/south traffic signal phasing should be modified from permissive phasing to split phasing. Right-turn overlap phasing should be provided for the westbound right-turn movement into the Nyberg Rivers site.
- If site access to SW Martinazzi Avenue is provided via a new fourth leg to the SW Martinazzi Avenue/SW Seneca Street intersection, the intersection should be signalized.
- If a new site access driveway is provided to SW Boones Ferry Road, the driveway should limited to right-in/right-out only access.

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Section 2
Introduction

Exhibit 1
Attachment L

INTRODUCTION

PROJECT DESCRIPTION

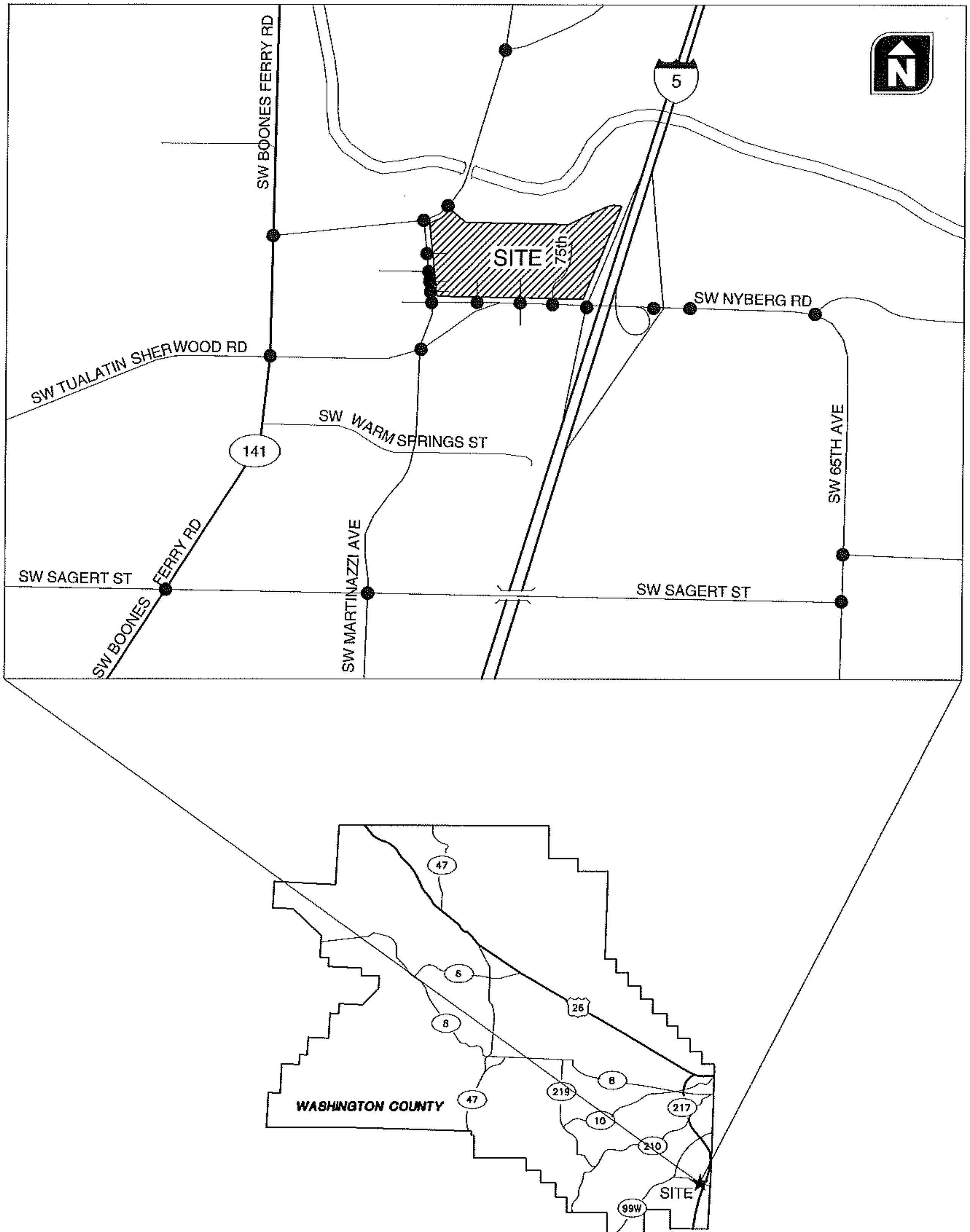
CenterCal Properties, LLC is proposing to redevelop a portion of the existing Tualatin shopping center located in the northwest quadrant of the I-5/Nyberg Road interchange. The existing shopping center has been anchored by K-Mart and includes an assortment of other supporting retail uses such as drive-thru banks, fast-food restaurants, and small to medium miscellaneous retailers. The Tualatin City Hall and Library is also located within the boundary of the shopping center site, but on its own legal lot of record and in separate ownership than the shopping center. Figure 1 illustrates the location of the site in relationship to the larger regional vicinity.

In an effort to enhance and reinvigorate the existing shopping center, CenterCal is proposing to redevelop the center as shown in Figure 2. Known as the Nyberg Rivers project, the full redevelopment vision will entail the following components:

- The existing 96,799 square foot former K-Mart building will be removed.
- The existing 3,500 square foot building currently occupied by a Wendy's will be relocated to a new pad within the shopping center site.
- All other existing buildings will remain and it has been assumed that the existing tenants will continue to operate as-is for the foreseeable future.
- While a specific tenant mix is still being developed by CenterCal, it is envisioned that the redevelopment will include a large retailer and an assortment of small and medium-sized retail/restaurant uses. For the purposes of this traffic study, it has been assumed that this mix of uses will total approximately 245,456 square feet of new leasable area bringing the total net leasable square footage for the entire shopping center to 307,000.
- The existing SW 75th Avenue access to SW Nyberg Road is proposed to be closed.
- The existing signalized access on SW Nyberg Road that currently serves the shopping center will remain and continue to serve as the main entrance.
- All other shopping center driveways located off of SW Nyberg Road and SW Martinazzi Avenue will remain.
- While not required under this proposal, in consultation and cooperation with the City of Tualatin, the existing SW Martinazzi Avenue driveway (adjacent to the library/city hall) could close and alternative access could be provided via a new driveway across from SW Seneca Street. This option would only be pursued if it was with the mutual agreement of the City and on a timeline acceptable to the City.

Redevelopment construction is expected to begin in 2013 and with completion and full occupancy anticipated in 2014.

Exhibit 1
Attachment L



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LEGEND

● - STUDY INTERSECTIONS

SITE VICINITY MAP
TUALATIN, OREGON

FIGURE
1

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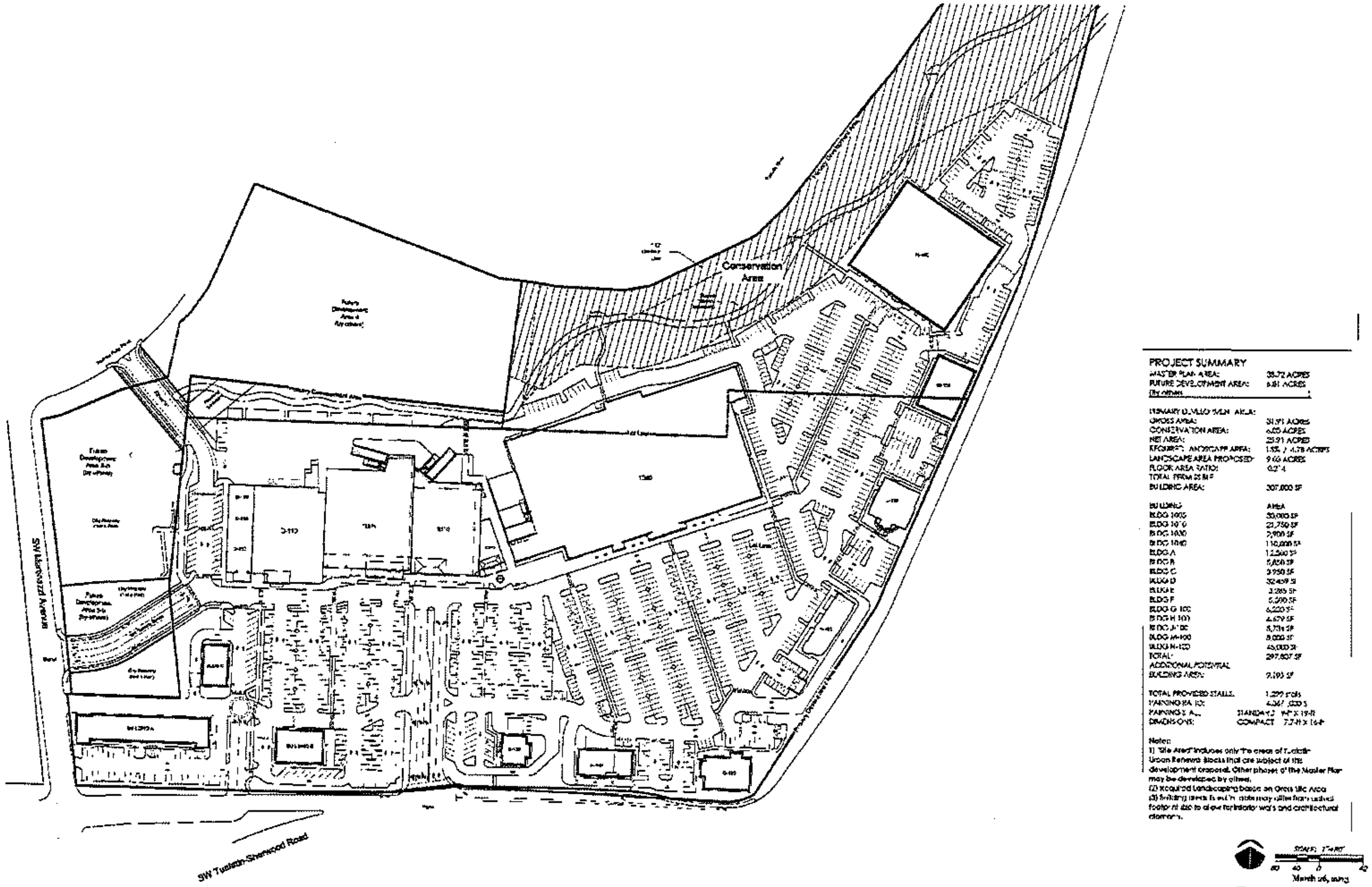
TRANSPORTATION ENGINEERING / PLANNING

Exhibit 1
Attachment L



Nyberg Rivers DRAFT

Concept Plan - 19V1c - Dual Entry Lanes

CENTERCAL

Cardno
Shaping the Future

PORTLAND

Tualatin, Oregon

PROPOSED SITE PLAN
TUALATIN, OREGON

FIGURE 2

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

Exhibit 1
Attachment L

SCOPE OF THE REPORT

This analysis determines the transportation-related impacts associated with the proposed Nyberg Rivers redevelopment and was prepared in accordance with the City of Tualatin, Washington County, and Oregon Department of Transportation (ODOT) requirements for traffic impact studies. The study intersections and scope of this project were selected in consultation with City, County, and ODOT staff. Appendix A contains a copy of the traffic impact study scoping letter and feedback received from the agency staff. Based on this correspondence, this study contains the following elements:

- Year 2012 existing land-use and transportation-system conditions within the site vicinity during the weekday p.m. and Saturday midday peak periods;
- Forecast year 2014 background traffic conditions during the weekday p.m. and Saturday midday peak periods;
- Trip generation and distribution estimates for the proposed Nyberg Rivers redevelopment;
- Forecast year 2014 total traffic conditions during the weekday p.m. and Saturday midday peak periods with build-out of the site;
- Vehicle queuing operations at the Nyberg Road site access driveway and the I-5 off-ramps;
- On-site traffic operations and circulation; and
- Recommendations

Section 3
Existing Conditions

EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current operational and geometric characteristics of the roadways within the study area. These conditions will be compared with future conditions later in this report.

Kittelson & Associates, Inc. (KAI) staff visited and inventoried the proposed Nyberg Rivers redevelopment site and surrounding study area. At that time, KAI collected information regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

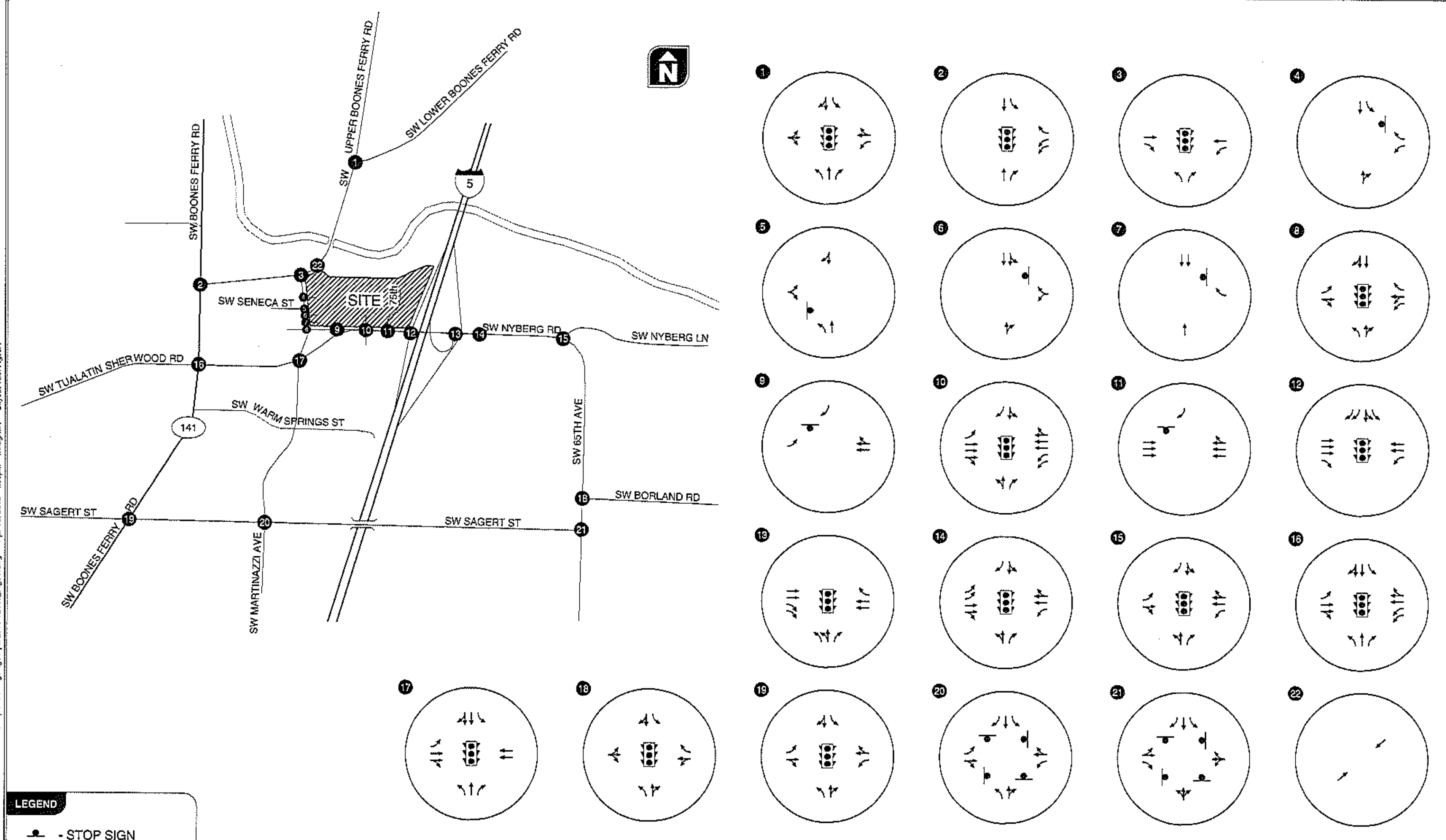
SITE CONDITIONS AND ADJACENT LAND USES

As shown in Figure 1, the existing shopping center is located in the northwest quadrant of the I-5/Nyberg Road interchange in Tualatin. The shopping center is bounded by Nyberg Road to the south, I-5 to the east, SW Martinazzi Avenue to the west, and Boones Ferry Road/Tualatin River to the north. The shopping center currently consists of an unoccupied former K-Mart, two drive-thru banks, a fast-food restaurant, and an assortment of retail uses. In addition, the Tualatin City Hall, city administrative offices, and public library are located in the northwest portion of the shopping center site on City-owned property and a separate legal lot of record.

TRANSPORTATION FACILITIES

Table 1 identifies the characteristics of key roadways located within the vicinity of the redevelopment site. Figure 3a identifies the existing lane configurations and traffic control devices at all of the study intersections while Figure 3b identifies the study area roadway ownership.

Exhibit 1
Attachment L



EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES
TUALATIN, OREGON

FIGURE 3A

KITTELSON & ASSOCIATES, INC.
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Exhibit 1
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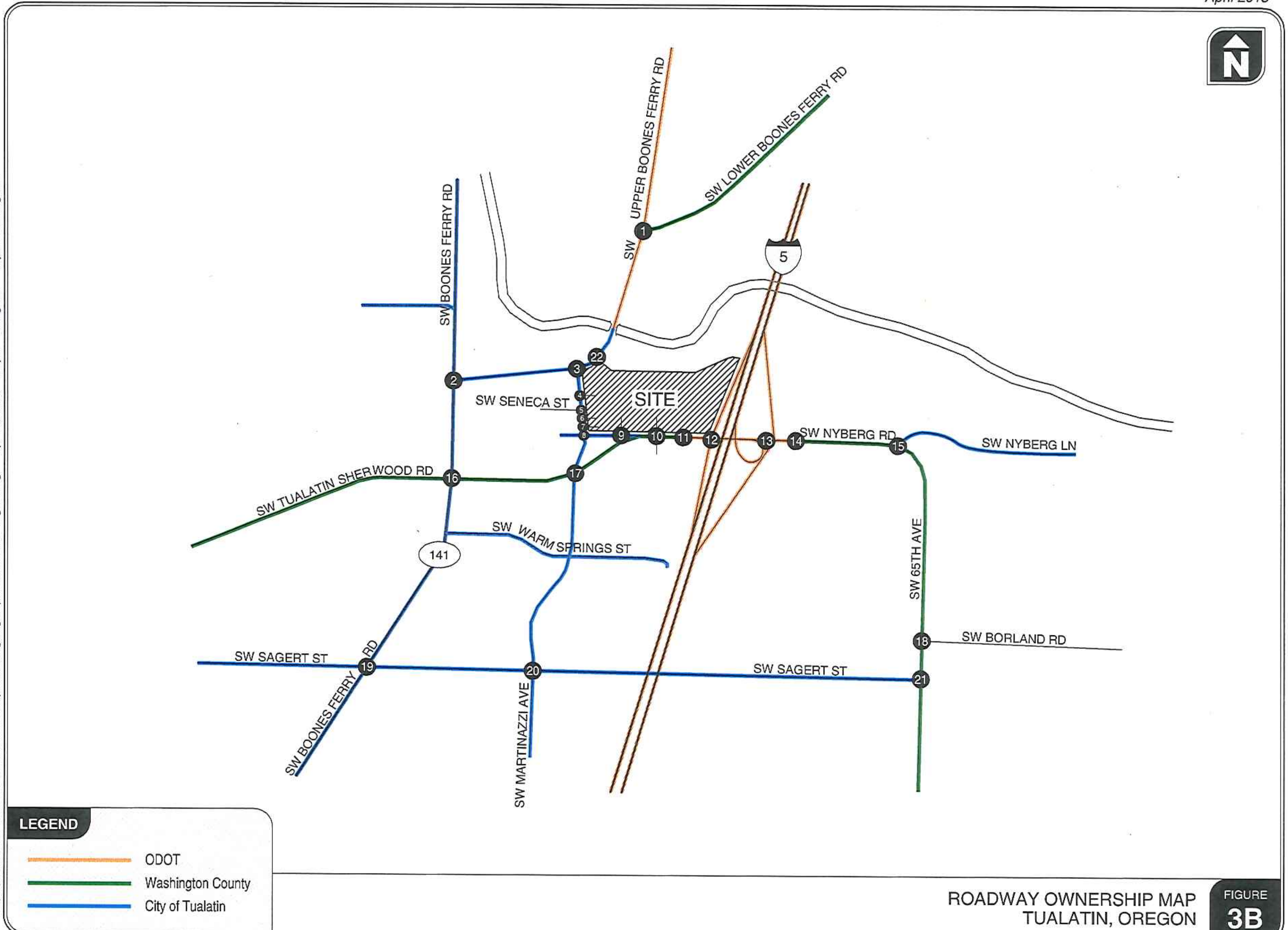

ROADWAY OWNERSHIP MAP
TUALATIN, OREGON

FIGURE 3B

KITTELSON & ASSOCIATES, INC.
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Exhibit 1
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Table 1: Existing Transportation Facilities

Roadway	Functional Classification (By Jurisdiction)	Number of Lanes	Posted Speed (mph)	Sidewalks	Bicycle Lanes	On-Street Parking
I-5	Interstate Highway - (ODOT)	7-8 lanes	55	No	No	No
SW Nyberg Road	Arterial (east of T-S Road) - (Washington County)[1] Minor Collector (west of T-S Road) – (Tualatin)	6 lanes 2 lanes	30 30	Yes Yes	Yes No	No No
Tualatin-Sherwood Road	Arterial – (Washington County)	5 lanes	35	Yes	No	No
SW Martinazzi Avenue	Minor Arterial (north of T-S Road) – (Tualatin) Major Arterial (south of T-S Road) – (Tualatin)	3 lanes 5 lanes	NP 35	Yes Yes	No No	No No
Boones Ferry Road	Major Arterial (east of Martinazzi) – (Tualatin) Minor Arterial (west of Martinazzi) – (Tualatin) Major Arterial (south of Tualatin Road) – (Tualatin)	3 lanes 3 lanes 2-4 lanes	35 30 30-35	Yes Yes Yes	Yes Yes Yes	No No No
Lower Boones Ferry Road	Minor Arterial – (Tualatin)	3 lanes	35	Yes	Yes	No
Upper Boones Ferry Road	District Highway – (ODOT)	3 lanes	35	Yes	Yes	No
SW Seneca Street	Local Commercial – (Tualatin)	2 lanes	NP	Yes	No	No
SW 65th Avenue	Major Arterial – (Tualatin)	3 lanes	35	Yes	No	No
SW Sagert Street	Major Arterial – (Tualatin) (east of SW Martinazzi Ave) Major Collector – (Tualatin) (west of SW Martinazzi Ave) Minor Arterial – (Tualatin) (west of SW Boones Ferry Rd)	2-3 lanes	35[2]	Yes	Yes	No
SW Borland Rd	Major Arterial – (Tualatin) Minor Arterial (Clackamas County)	2-3 lanes	35	Yes	Yes[3]	No

Notes:
[1] ODOT has jurisdictional control over SW Nyberg Road within the vicinity of the northbound and southbound I-5 ramp terminals
[2] 30 mph west of SW Martinazzi Avenue
[3] There are no bicycle lanes within the vicinity of the SW 65th Avenue intersection
NP = Not Posted
T-S Road = Tualatin-Sherwood Road

TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

In late May 2012 (while local schools were still in session), manual turning-movement counts were obtained for the all the study intersections and site driveways located within the immediate vicinity of the shopping center. In addition, traffic count data collected as part of the on-going Tualatin Transportation System Plan Update were utilized for all of the other study intersections[1]. Figures 4a and 4b provide a summary of the existing turning-movement counts, which are rounded to the nearest five vehicles per hour for the weekday p.m. and Saturday midday peak hours. *Appendix "B" contains the traffic count worksheets used in this study.*

[1] Saturday midday counts were only collected at the site-access driveways and adjacent study area intersections.

Operational Standards

Level of service (LOS) and volume-to-capacity (V/C) ratio are the two performance measures utilized by the affected review agencies for determining intersection operations. A description of each is outlined below.

Level of Service

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the 2000 *Highway Capacity Manual. A description of level of service and the criteria by which they are determined is presented in Appendix "C".* Appendix "C" also indicates how level of service is measured and what is generally considered the acceptable range of level of service. The City of Tualatin has adopted level-of-service standards for signalized and unsignalized intersections. LOS "D" is considered acceptable at signalized intersections and LOS "E" is considered acceptable at an unsignalized intersections.

V/C Ratio

The V/C ratio is a measure of an intersection's theoretical capacity. As the V/C ratio approaches 1.0, vehicle congestion worsens and the intersection becomes less capable of accommodating the vehicular demand. For all of the Washington County study intersections, the maximum acceptable V/C ratio is 0.99 during the first hour and 0.90 during second hour. For the ODOT study intersections, the minimum acceptable V/C ratio is 0.99.

All intersection level-of-service evaluations used the peak 15-minute flow rate during the weekday p.m. and Saturday midday peak hours. Using the peak 15-minute flow rate ensures that this analysis is based on a reasonable worst-case scenario. For this reason, the analysis reflects conditions that are only likely to occur for 15 minutes out of each average peak hour. The transportation system will likely operate under conditions better than those described in this report during all other time periods.

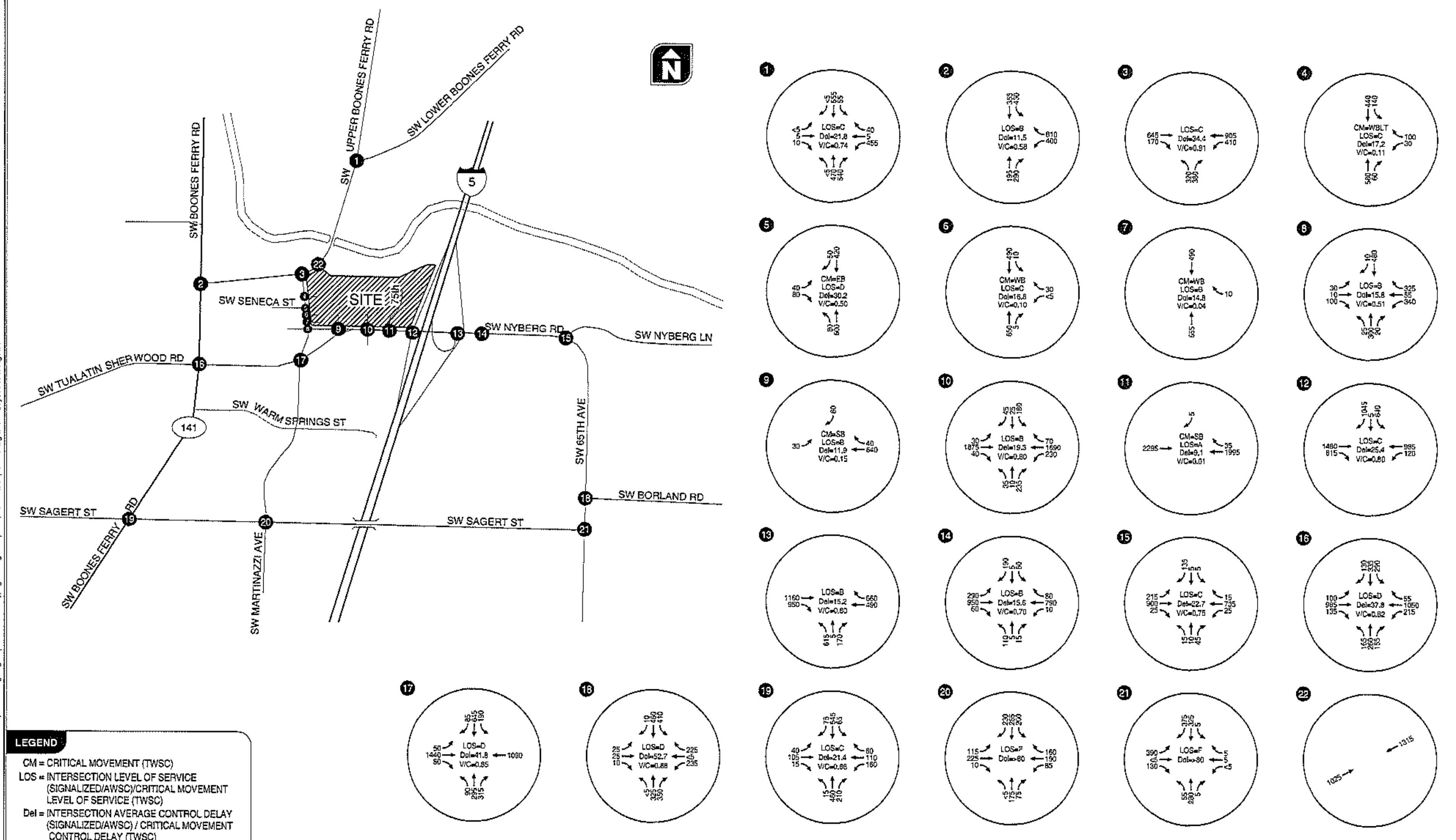
Figures 4a, 4b, and Table 2 summarize the operational performance for the study intersections under the existing peak hour conditions. As shown, all of the study intersections currently operate at acceptable levels of service and V/C ratios during the peak hours with the exception of the SW Martinazzi Avenue/SW Sagert Road and SW 65th Avenue/SW Sagert Road intersections. *Appendix "D" includes the operational worksheets under year 2012 existing traffic conditions.*

Table 2: 2012 Existing Conditions Operations Summary

Number	Intersection	Maximum Operating Standard	Weekday PM Peak Hour		Saturday Midday Peak Hour	
			LOS	V/C	LOS	V/C
Signalized Intersections						
1	SW Upper Boones Ferry Road/ SW Lower Boones Ferry Road/ SW Boones Ferry Road	0.99	C	0.74	Not Analyzed	Not Analyzed
2	SW Boones Ferry Road/ SW Tualatin Road	0.99	B	0.58	Not Analyzed	Not Analyzed
3	SW Boones Ferry Road/ SW Martinazzi Avenue	0.99	C	0.91	B	0.64
8	SW Nyberg Road/ SW Martinazzi Avenue	0.99	B	0.51	B	0.39
10	SW Nyberg Road/ SW Tualatin-Sherwood Road/ Fred Meyer/Site Access	0.99	B	0.80	B	0.66
12	I-5 SB Ramp Terminal/ SW Nyberg Road	0.85	C	0.80	C	0.77
13	I-5 NB Ramp Terminal/ SW Nyberg Road	0.85	B	0.60	C	0.55
14	SW Nyberg Road/ Nyberg Woods Driveway	0.99	B	0.70	B	0.64
15	SW Nyberg Road/ SW 65th Avenue	0.99	C	0.75	Not Analyzed	Not Analyzed
16	SW Tualatin-Sherwood Road/ SW Boones Ferry Road	0.99	D	0.82	Not Analyzed	Not Analyzed
17	SW Tualatin-Sherwood Road/ SW Martinazzi Avenue	0.99	D	0.85	C	0.76
18	SW 65th Avenue/ SW Borland Road	0.99	D	0.88	Not Analyzed	Not Analyzed
19	SW Boones Ferry Road/ SW Sagert Street	0.99	C	0.68	Not Analyzed	Not Analyzed
Unsignalized Intersections[1]						
4	SW Martinazzi Avenue/ North Site Driveway	E	C	0.11	B	0.11
5	SW Martinazzi Avenue/ SW Seneca Street	E	D	0.50	C	0.22
6	SW Martinazzi Avenue/ Site Driveway	E	C	0.10	B	0.07
7	SW Martinazzi Avenue/ Right-Out Only Site Driveway	E	B	0.04	B	0.02
9	SW Nyberg Road/ Site Driveway	E	B	0.15	B	0.08
11	SW Nyberg Road/ Right-in Right-Out Site Driveway	0.99	A	0.01	A	0.02
All-Way Stop controlled Intersections						
20	SW Sagert Street/ SW Martinazzi Avenue	D	F	N/A	Not Analyzed	Not Analyzed
21	SW Sagert Street/ SW 65th Avenue	D	F	N/A	Not Analyzed	Not Analyzed

Notes:
[1] LOS and V/C reported for the highest delay or critical movement
For intersections #4, #5, #6, and #7, it is recognized that the operational results shown may differ slightly due to the presence of vehicle queuing along SW Martinazzi Avenue during peak time periods.

Exhibit 1
Attachment L



LEGEND

CM = CRITICAL MOVEMENT (TWSC)
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TWSC = TWO-WAY STOP CONTROL
AWSC = ALL-WAY STOP CONTROL

EXISTING TRAFFIC CONDITIONS, WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE 4A

KITTELSON & ASSOCIATES, INC.
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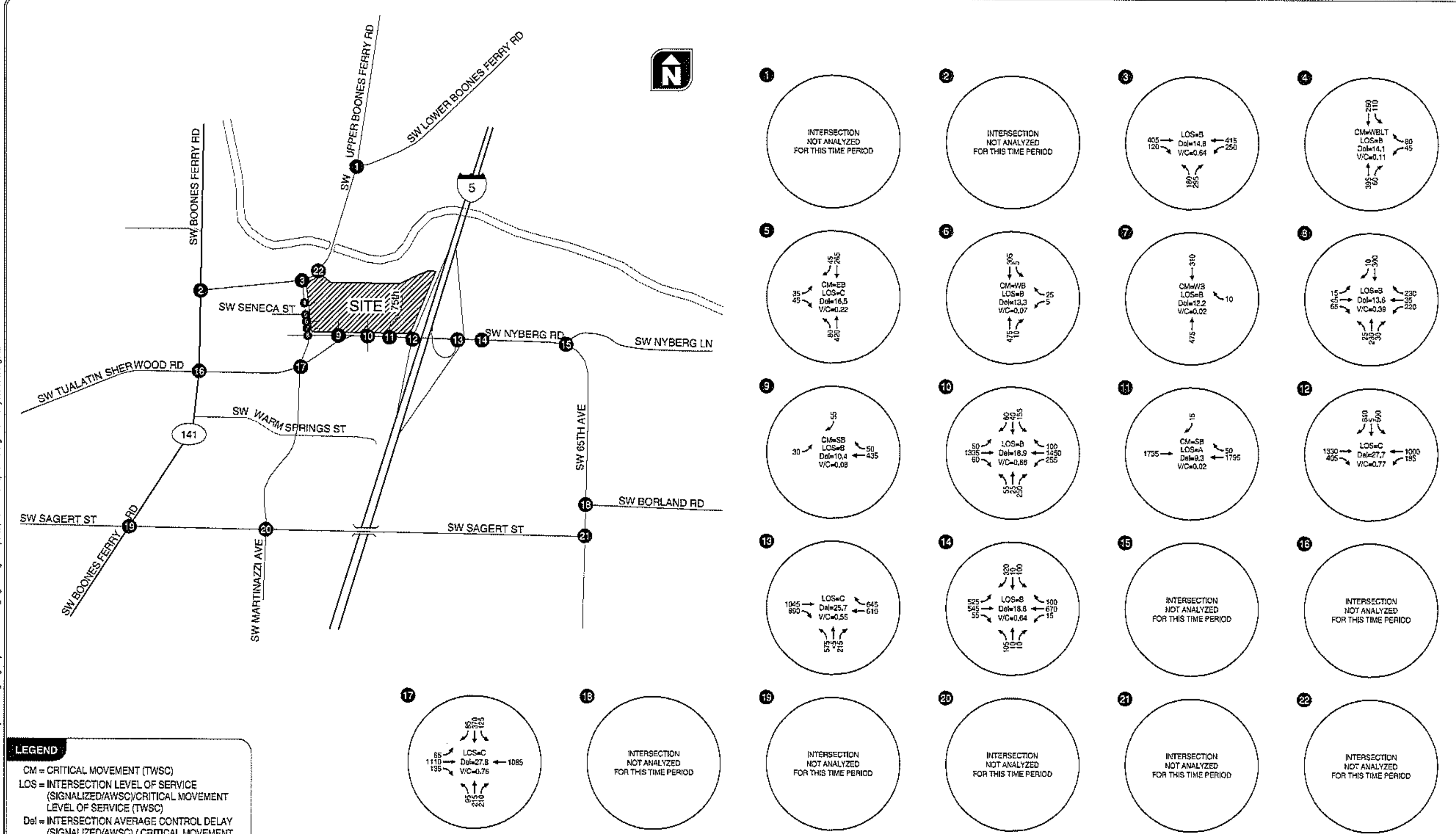
H:\proj\file\12116 - K-Mart Tualatin Redevelopment\dwgs\figs\April2013\12116_Fig01.dwg Apr 16, 2013 - 2:37pm - mhughart Layout Tab: Fig04A

Exhibit 1
Attachment L



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AWSC = ALL-WAY STOP CONTROL

EXISTING SATURDAY MIDDAY PEAK TRAFFIC VOLUMES
TUALATIN, OREGON

FIGURE 4B

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

Exhibit 1
Attachment L

SW 65th Avenue/SW Sagert Street

The SW 65th Avenue/SW Sagert Street intersection is an all-way stop-controlled intersection. Based on the existing traffic demand, the intersection currently operates at LOS F conditions during the weekday p.m. peak hour. These findings are consistent with the existing conditions analysis prepared as part of the recent update to the Tualatin Transportation System Plan (TSP).

SW Martinazzi Avenue/SW Sagert Road

The SW Martinazzi Avenue/SW Sagert Street intersection is an all-way stop-controlled intersection. Based on the existing traffic demand, the intersection currently operates at LOS F conditions during the weekday p.m. peak hour. These findings are consistent with existing conditions analysis prepared as part of the recent update to the Tualatin TSP.

Existing Daily Traffic Profile

A summation of daily traffic volumes was prepared at the request of the City of Tualatin. Using available daily traffic volume counts collected by Washington County and those daily counts collected as part of the on-going Tualatin Transportation System Plan Update, it was generally determined that the weekday p.m. peak hour traffic volumes are approximately 8% of the daily traffic profile. Applying this factor to the weekday p.m. peak hour turning movement volumes collected at the study area intersections, daily traffic volume estimates were derived and summarized in Table 3.

Table 3: Existing Daily Traffic Volumes on Select Roadway Segments

Roadway	Segment	Estimated Daily Volume
SW Lower Boones Ferry Road	East of SW Upper Boones Ferry Road	13,200
SW Boones Ferry Road	East of SW Martinazzi Avenue	28,100
SW Boones Ferry Road	West of SW Martinazzi Avenue	24,400
SW Martinazzi Avenue	South of SW Boones Ferry Road and north of SW Nyberg Road	13,700
SW Martinazzi Avenue	South of SW Tualatin-Sherwood Road	17,100
SW Boones Ferry Road	North of SW Tualatin-Sherwood Road	14,000
SW Boones Ferry Road	South of SW Tualatin-Sherwood Road	15,200
SW Tualatin-Sherwood Road	West of SW Boones Ferry Road	30,800
SW Tualatin-Sherwood Road	East of SW Boones Ferry Road and west of SW Martinazzi Avenue	34,000
SW Tualatin-Sherwood Road	East of SW Martinazzi Avenue and west of SW Nyberg Road	44,600
SW Nyberg Lane	West of SW Tualatin-Sherwood Road and east of SW Martinazzi Avenue	9,000
SW Nyberg Road	East of SW Tualatin-Sherwood Road and west of I-5 SB Ramp Terminal	51,900
SW Nyberg Road	West of I-5 SB Ramp Terminal and east of I-5 NB Ramp Terminal	38,600
SW Nyberg Road	East of I-5 NB Ramp Terminal and west of SW 65th Avenue	23,100
SW 65th Avenue	South of SW Nyberg Road	17,500
SW Borland Road	East of SW 65th Avenue	14,900
SW 65th Avenue	South of SW Sagert Street	9,600
SW Sagert Street	West of SW 65th Avenue	11,500
SW Sagert Street	East of SW Martinazzi Avenue	11,200

Exhibit 1
Attachment L

SAFETY ANALYSIS

This section provides analysis of roadway safety information within the site vicinity. Three sources of crash data were considered: the ODOT Safety Priority Index System, the Washington County Safety Priority Indexing System (SPIS), and review of crash data provided by ODOT. The ODOT crash data includes all reported crashes that occurred at the study intersections for the three-year period from January 1, 2009 to December 31, 2011 (matching the Tualatin TSP Update review period).

ODOT Statewide Priority Index System

The Statewide Priority Index System (ODOT SPIS) is a method developed by ODOT for identifying hazardous locations on state highways through consideration of crash frequency, crash rate, and crash severity. The ODOT SPIS designates a roadway segment as a SPIS site if a location experiences three or more crashes or one or more fatal crashes over a three-year period. Under this method, all state highways are analyzed in 0.10 mile segments to identify SPIS sites. Statewide, there are approximately 6,000 SPIS sites. SPIS sites are typically intersections, but can also be roadway segments.

Within the study area, none of the ODOT controlled intersections or roadway segments are included in ODOT's SPIS ranking program for 2009-2011.

Washington County Safety Priority Index System (SPIS)

Washington County ranks their high accident SPIS locations based on a formula that identifies potentially hazardous locations. The formula takes into consideration the frequency, rate, and severity of crashes.

Within the study area, there are two intersections that rank within the top 50 SPIS locations. These include SW Tualatin-Sherwood Road/SW Boones Ferry Road and SW Tualatin-Sherwood Road/SW Martinazzi Avenue.

Intersection Crash Data Analysis

The individual crash history of the study intersections was reviewed in an effort to identify potential intersection safety issues. The crash types and crash rates from the analysis are presented in Table 4. Typically, crash rates that meet or exceed 1.0 crashes per million entering vehicles are reviewed for additional geometric and operational investigation. As shown in the table, all of the reported intersections have crash rates less than 1.0. These findings are generally consistent with the crash assessment provided in the Tualatin TSP Update.

Table 4: Intersection Crash History (January 1, 2009 through December 31, 2011)

Intersection	Collision Type						Total Crashes	Estimated Annual Average Daily Traffic	Crash Rate (crashes per million entering vehicles)
	Angle	Turning	Rear End	Fixed Object	Ped / Bike	Other			
SW Upper Boones Ferry Road/ SW Lower Boones Ferry Road/ SW Boones Ferry Road	-	1	-	1	-	-	2	22,300	0.08
SW Boones Ferry Road/ SW Tualatin Road	-	-	4	-	2	-	6	24,800	0.22
SW Boones Ferry Road/ SW Martinazzi Avenue	-	-	4	-	-	-	4	28,300	0.13
SW Nyberg Road/ SW Martinazzi Avenue	-	4	4	-	-	-	8	16,950	0.43
SW Nyberg Road/ SW Tualatin-Sherwood Road	-	8	7	1	-	-	16	44,650	0.33
I-5 SB Ramp Terminal/ SW Nyberg Road	1	20	24	-	2	1	48	50,900	0.86
I-5 NB Ramp Terminal/ SW Nyberg Road	-	6	9	-	-	-	15	40,500	0.34
SW Nyberg Road/ SW 65th Avenue	-	1	2	-	-	-	3	21,300	0.13
SW Tualatin-Sherwood Road/ SW Boones Ferry Road	3	11	21	-	-	4	39	38,750	0.92
SW Tualatin-Sherwood Road/ SW Martinazzi Avenue	6	2	8	1	-	-	17	42,800	0.36
SW 65th Avenue/ SW Borland Road	-	1	1	-	-	-	2	20,750	0.09
SW Boones Ferry Road/ SW Sagert Street	-	3	2	-	-	-	5	18,600	0.25
SW Sagert Street/ SW Martinazzi Avenue	4	-	-	-	-	-	4	17,500	0.21
SW Sagert Street/ SW 65th Avenue	-	-	-	-	-	-	0	15,750	0.00

Exhibit 1
Attachment L

Section 4
Transportation Impact Analysis

Exhibit 1
Attachment L

TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system will operate in the year the proposed redevelopment is expected to be fully built and occupied (2014). The impact of traffic generated by the proposed Nyberg Rivers development during the typical weekday p.m. and Saturday midday peak hours was examined as follows:

- Background weekday p.m. and Saturday midday peak hour traffic conditions for the 2014 (build-out year of the Nyberg Rivers redevelopment) was analyzed at each of the study intersections.
- Background conditions were developed by applying a 1.5-percent annual growth rate to the existing traffic volumes to account for regional growth in the site vicinity between years 2012 and 2014.
- Site-generated trips were estimated for build-out of the site.
- Site trip-distribution patterns were derived from a review of existing traffic patterns and regional planning model outputs.
- Year 2014 (build-out year of the Nyberg Rivers redevelopment) total traffic conditions were analyzed at each of the study intersections and site-access points during the weekday p.m. and Saturday midday peak hours.
- On-site circulation issues and site-access alternatives were evaluated.

YEAR 2014 BACKGROUND TRAFFIC CONDITIONS

The year 2014 background traffic analysis identifies how the study area's transportation system will operate without the proposed Nyberg Rivers redevelopment. This analysis includes traffic attributed to general growth in the region, but does not include traffic from the proposed redevelopment.

Traffic Volumes

In order to develop a near-term traffic growth rate, the last five years of annual Washington County daily traffic counts were reviewed along SW Tualatin-Sherwood Road (just east of SW Boones Ferry Road) and SW Nyberg Road (west of SW 65th Avenue). A summary of these counts is provided in Table 5 below.

Table 5: Historical Traffic Counts

Count Location	2008	2009	2010	2011	2012
SW Nyberg Road (west of SW 65th Avenue)	21,837	20,764	21,733	21,506	21,351
SW Tualatin-Sherwood Road (east of SW Boones Ferry Road)	40,469	38,813	39,671	41,137	40,591

Exhibit 1
Attachment L

As shown in the table, traffic growth within the general site vicinity between 2008 and 2012 has been minimal to negative, in part reflecting the economic slowdown that occurred after 2008. City staff recommended a 1.5% annual growth rate be applied to reflect a reasonable, yet conservative approximation of traffic growth at each of the study intersections. This growth rate is consistent with other traffic studies that have been submitted in the past within the project vicinity. Figures 5a and 5b illustrate the resulting forecast year 2014 background traffic volumes during the weekday p.m. and Saturday midday peak hours.

2014 Background Operations Analysis

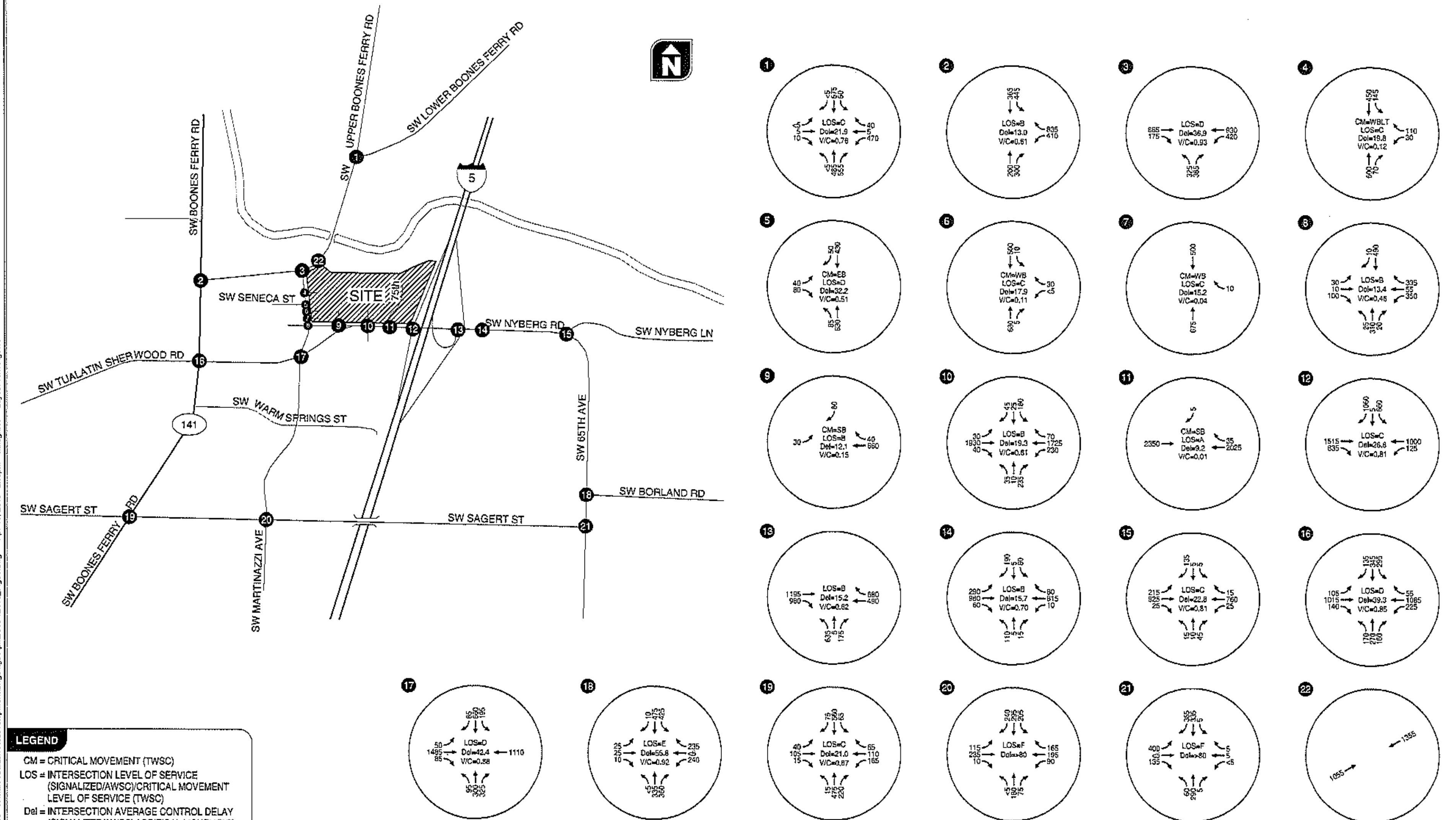
The weekday p.m. and Saturday midday peak-hour turning-movement volumes shown in Figure 5a and 5b were used to conduct an operational analysis at each study intersection to determine the year 2014 background traffic levels of service. As indicated by the respective figures and Table 6, the background traffic analysis determined that all of but two of the study intersections are forecast to operate at acceptable standards during both the weekday p.m. and Saturday midday peak hours. *Appendix "E" contains the year 2014 background traffic level-of-service worksheets.*

SW 65th Avenue/SW Sagert Street

Based on the estimated future traffic demand, the intersection is forecast to continue to operate at LOS F conditions during the weekday p.m. peak hour.

SW Martinazzi Avenue/SW Sagert Road

Based on the existing traffic demand, the intersection is forecast to continue to operate at LOS F conditions during the weekday p.m. peak hour.



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2014 BACKGROUND TRAFFIC CONDITIONS, WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE 5A

KITTELSON & ASSOCIATES, INC.
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Exhibit 1
Attachment L

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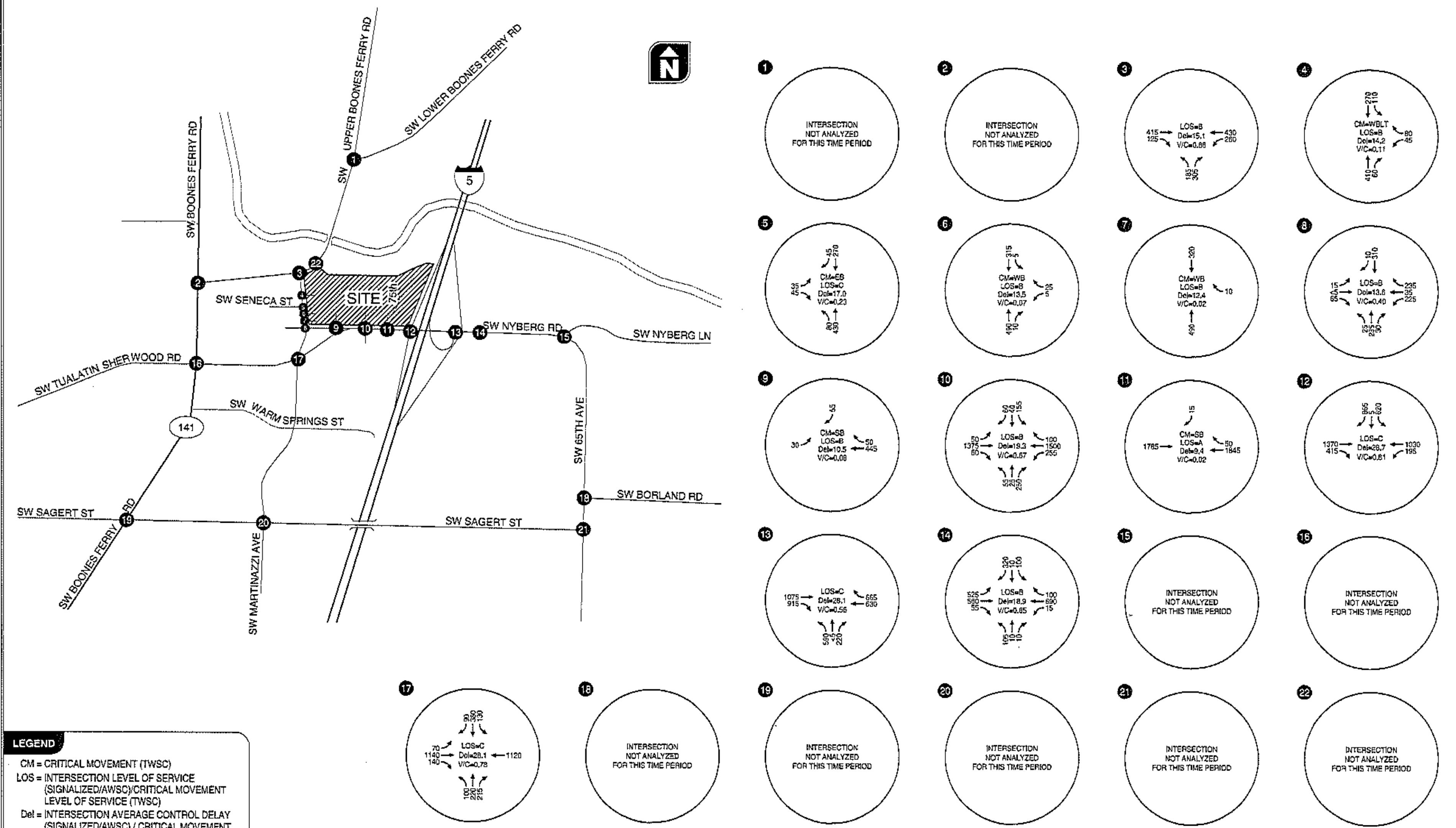

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2014 BACKGROUND TRAFFIC CONDITIONS, SATURDAY MIDDAY PEAK HOUR
TUALATIN, OREGON

FIGURE 5B

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

Exhibit 1
Attachment L

Table 6: 2014 Background Traffic Conditions

Number	Intersection	Maximum Operating Standard	Weekday PM Peak Hour		Saturday Midday Peak Hour	
			LOS	V/C	LOS	V/C
Signalized Intersections						
1	SW Upper Boones Ferry Road/ SW Lower Boones Ferry Road/ SW Boones Ferry Road	0.99	C	0.76	Not Analyzed	Not Analyzed
2	SW Boones Ferry Road/ SW Tualatin Road	0.99	B	0.61	Not Analyzed	Not Analyzed
3	SW Boones Ferry Road/ SW Martinazzi Avenue	0.99	D	0.93	B	0.66
8	SW Nyberg Road/ SW Martinazzi Avenue	0.99	B	0.46	B	0.40
10	SW Nyberg Road/ SW Tualatin-Sherwood Road/ Fred Meyer/Site Driveway	0.99	B	0.81	B	0.67
12	I-5 SB Ramp Terminal/ SW Nyberg Road	0.85	C	0.81	C	0.81
13	I-5 NB Ramp Terminal/ SW Nyberg Road	0.85	B	0.62	C	0.56
14	SW Nyberg Road/ Nyberg Woods Driveway	0.99	B	0.70	B	0.65
15	SW Nyberg Road/ SW 65th Avenue	0.99	C	0.81	Not Analyzed	Not Analyzed
16	SW Tualatin-Sherwood Road/ SW Boones Ferry Road	0.99	D	0.85	Not Analyzed	Not Analyzed
17	SW Tualatin-Sherwood Road/ SW Martinazzi Avenue	0.99	D	0.88	C	0.78
18	SW 65th Avenue/ SW Borland Road	0.99	E	0.92	Not Analyzed	Not Analyzed
19	SW Boones Ferry Road/ SW Sagert Street	0.99	C	0.67	Not Analyzed	Not Analyzed
Unsignalized Intersections[1]						
4	SW Martinazzi Avenue/ North Site Driveway	E	C	0.12	B	0.11
5	SW Martinazzi Avenue/ SW Seneca Street	E	D	0.51	C	0.23
6	SW Martinazzi Avenue/ Site Driveway	E	C	0.11	B	0.07
7	SW Martinazzi Avenue/ Right-Out Only Site Driveway	E	C	0.04	B	0.02
9	SW Nyberg Road/ Site Driveway	E	B	0.15	B	0.08
11	SW Nyberg Road/ Right-in Right-Out Site Driveway	0.99	A	0.01	A	0.02
All-Way Stop-Controlled Intersections						
20	SW Sagert Street/ SW Martinazzi Avenue	D	F	N/A	Not Analyzed	Not Analyzed
21	SW Sagert Street/ SW 65th Avenue	D	F	N/A	Not Analyzed	Not Analyzed

Notes:
[1] LOS and V/C reported for the highest delay or critical movement
For intersections #4, #5, #6, and #7, it is recognized that the operational results shown may differ slightly due to the presence of vehicle queuing along SW Martinazzi Avenue during peak time periods.

Exhibit 1
Attachment L

Background Daily Traffic Profile

A summation of the 2014 Background daily traffic volumes and their comparison to 2012 existing conditions is summarized in Table 7 below (the growth shown in Table 7 reflects the assumed 1.5% annual growth).

Table 7: 2014 Background Daily Traffic Profile

Roadway	Segment	Estimated Daily Volume 2012 Existing	 2014 Background
SW Lower Boones Ferry Road	East of SW Upper Boones Ferry Road	13,200	13,600
SW Boones Ferry Road	East of SW Martinazzi Avenue	28,100	28,800
SW Boones Ferry Road	West of SW Martinazzi Avenue	24,400	25,100
SW Martinazzi Avenue	South of SW Boones Ferry Road and north of SW Nyberg Road	13,700	14,100
SW Martinazzi Avenue	South of SW Tualatin-Sherwood Road	17,100	17,600
SW Boones Ferry Road	North of SW Tualatin-Sherwood Road	14,000	14,500
SW Boones Ferry Road	South of SW Tualatin-Sherwood Road	15,200	15,700
SW Tualatin-Sherwood Road	West of SW Boones Ferry Road	30,800	31,800
SW Tualatin-Sherwood Road	East of SW Boones Ferry Road and west of SW Martinazzi Avenue	34,000	34,900
SW Tualatin-Sherwood Road	East of SW Martinazzi Avenue and west of SW Nyberg Road	36,400	37,400
SW Nyberg Lane	West of SW Tualatin-Sherwood Road and east of SW Martinazzi Avenue	9,000	9,200
SW Nyberg Road	East of SW Tualatin-Sherwood Road and west of I-5 SB Ramp Terminal	51,900	52,900
SW Nyberg Road	West of I-5 SB Ramp Terminal and east of I-5 NB Ramp Terminal	38,600	39,600
SW Nyberg Road	East of I-5 NB Ramp Terminal and west of SW 65th Avenue	23,100	23,800
SW 65th Avenue	South of SW Nyberg Road	17,500	18,100
SW Borland Road	East of SW 65th Avenue	14,900	15,400
SW 65th Avenue	South of SW Sagert Street	9,600	9,900
SW Sagert Street	West of SW 65th Avenue	11,500	11,900
SW Sagert Street	East of SW Martinazzi Avenue	11,200	11,600

PROPOSED REDEVELOPMENT PLAN

In an effort to enhance and reinvigorate the existing shopping center, CenterCal is proposing to redevelop a portion of the existing center. The redevelopment is envisioned to entail the following:

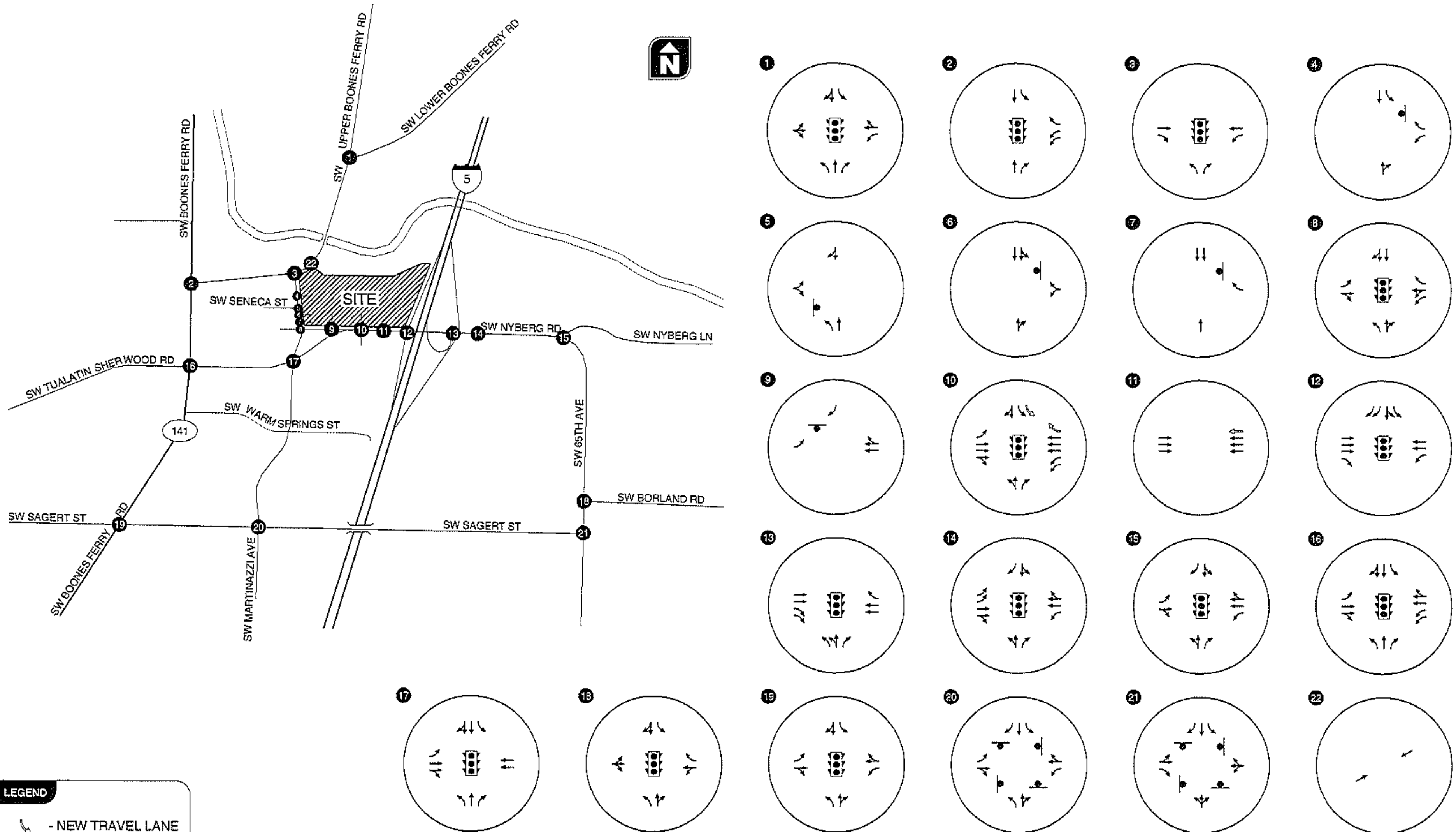
- The 96,799 square foot former K-Mart building will be removed.
- The existing 3,500 square foot building currently occupied by a Wendy's will be relocated to a new pad within the shopping center site.
- All other existing buildings (and associated access driveways) will remain as it has been assumed that the existing tenants will continue to operate as-is for the foreseeable future.
- While a specific tenant mix is still being developed by CenterCal, it is envisioned that the redeveloped portion of the center will include large and medium sized retailers and an assortment of smaller retail/restaurant uses. For the purposes of this traffic study, it has

been assumed that this mix of uses will total approximately 245,456 square feet of new leasable area bringing the total net leasable area for the entire shopping center to 307,000 square feet.

In order to enhance access to the redeveloped shopping center, several modifications to the existing shopping center driveways are proposed. These include the following:

- The existing SW 75th Avenue connection to SW Nyberg Road is proposed to be closed under the redevelopment plan. This closure will minimize turning movement conflicts along a busy segment of SW Nyberg Road and it will improve the interchange access spacing conditions within the I-5/Nyberg Interchange influence area.
- The existing signalized access on SW Nyberg Road that serves the shopping center and the adjacent Fred Meyer site will remain at its current location; however, the following changes are proposed to increase intersection capacity:
  - A westbound right-turn lane is proposed on SW Nyberg Street to enhance access to the site and minimize vehicle queuing on SW Nyberg Street.
  - The existing site driveway is proposed to be widened as shown in the site plan to accommodate increased site traffic. This widening will include dual southbound left-turn lanes, a shared through/right-turn lane, and dual in-bound receiving lanes (See the "*Impacts of the Nyberg Rivers Development on Identified Transportation Planning Projects*" section for further discussion on these improvements).
  - The north and south approach signal phasing is proposed to be modified from permissive left-turn phasing to split phasing. Westbound right-turn overlap phasing is proposed for the westbound right-turn lane into the Nyberg Rivers site.
  - No modifications are proposed to the existing Fred Meyer driveway at this intersection.

Figure 6 shows the proposed site-access configurations and traffic control devices that will be assumed as part of the total traffic analysis. Construction of this development is expected to begin in 2013 with the build-out projected to occur in year 2014.



LEGEND

- NEW TRAVEL LANE
- STOP SIGN
- TRAFFIC SIGNAL

ASSUMED SITE ACCESS CONFIGURATION AND TRAFFIC CONTROL DEVICES
TUALATIN, OREGON

FIGURE 6

KITTELSON & ASSOCIATES, INC.
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Exhibit 1
Attachment L

Redevelopment Plan Trip Generation

Given that the proposed project is only a partial redevelopment of the larger shopping center; a trip generation methodology was developed to reflect the characteristics of a unified and vibrant shopping center. The following outline describes the trip generation methodology that was used:

- Traffic counts were conducted at all of the site driveways to quantify the trip generation profile of the existing retail and civic uses currently operating on the site.
- Recognizing that the City offices/library are not retail uses and the layout of the site/parking fields prevents an accurate quantification of trips being generated by these uses, estimates were developed using the standard reference manual, *Trip Generation,* published by the Institute of Transportation Engineers (ITE). The Library and Single Tenant Office Building land uses were used in the estimate process. The resulting estimates were then subtracted from the existing site driveway counts to produce a trip profile estimate for the existing 158,343 square feet of retail building space at the site.
- A trip generation rate was calculated using the Shopping Center land use in ITE *Trip Generation* for the 245,456[2] square feet of new retail use plus the 61,544 square feet of remaining retail uses[3].
- The existing site retail traffic estimate was then subtracted from the total shopping center and office trip generation estimate to arrive at a total trip estimate for the net increase in shopping center and office square footage. A pass-by rate reduction of 34%[4] was assumed for the shopping center component to generate the net new trip estimate for the site. This pass-by estimate is consistent with ITE *Trip Generation* for similar shopping center uses. Furthermore, given the mix of existing uses (fast-food restaurants, drive-thru banks, and shopping center commercial uses) that will remain on the site and proposed mix of uses (large and medium sized general retailers and assortment of general retail/restaurant uses), this pass-by reduction rate is considered to be reasonable and conservatively appropriate.

---

[2] New Retail Uses = Total Proposed Area – Existing Uses that Remain = 307,000 sq. ft. – 61,544 sq. ft. = 245,456 sq. ft.

[3] Remaining uses = Existing building area – Existing Kmart = 158,343 sq. ft. - 96,799 sq. ft. = 61,544 sq. ft.)

[4] There are approximately 55,000-60,000 vehicles per day passing by the site frontage on SW Tualatin-Sherwood Road and SW Martinazzi Avenue. This volume is considered sufficient to justify the standard 34 percent pass-by assumption for the shopping center (the average 34 percent was obtained directly from the Institute of Transportation Engineers (ITE) *Trip Generation*, 9th Edition). It is also expected that some trips will re-route from I-5, which would be considered "diverted trips". All trips coming from I-5 were considered "primary" trips in an effort to present a conservative and reasonable worst-case condition. ITE *Trip Generation* Shopping Center trip rates indicate that an average 26 percent of shopping center trips are diverted, in addition to the 34 percent pass-by. By not accounting for diverted trips, the current study is inherently conservative and likely overstates impacts between the main site driveway and the I-5 interchange ramps.

Table 8 below illustrates the trip generation calculation process (all trip ends shown in Table 8 have been rounded to the nearest five trips).

Table 8: Estimated Nyberg Rivers Trip Generation

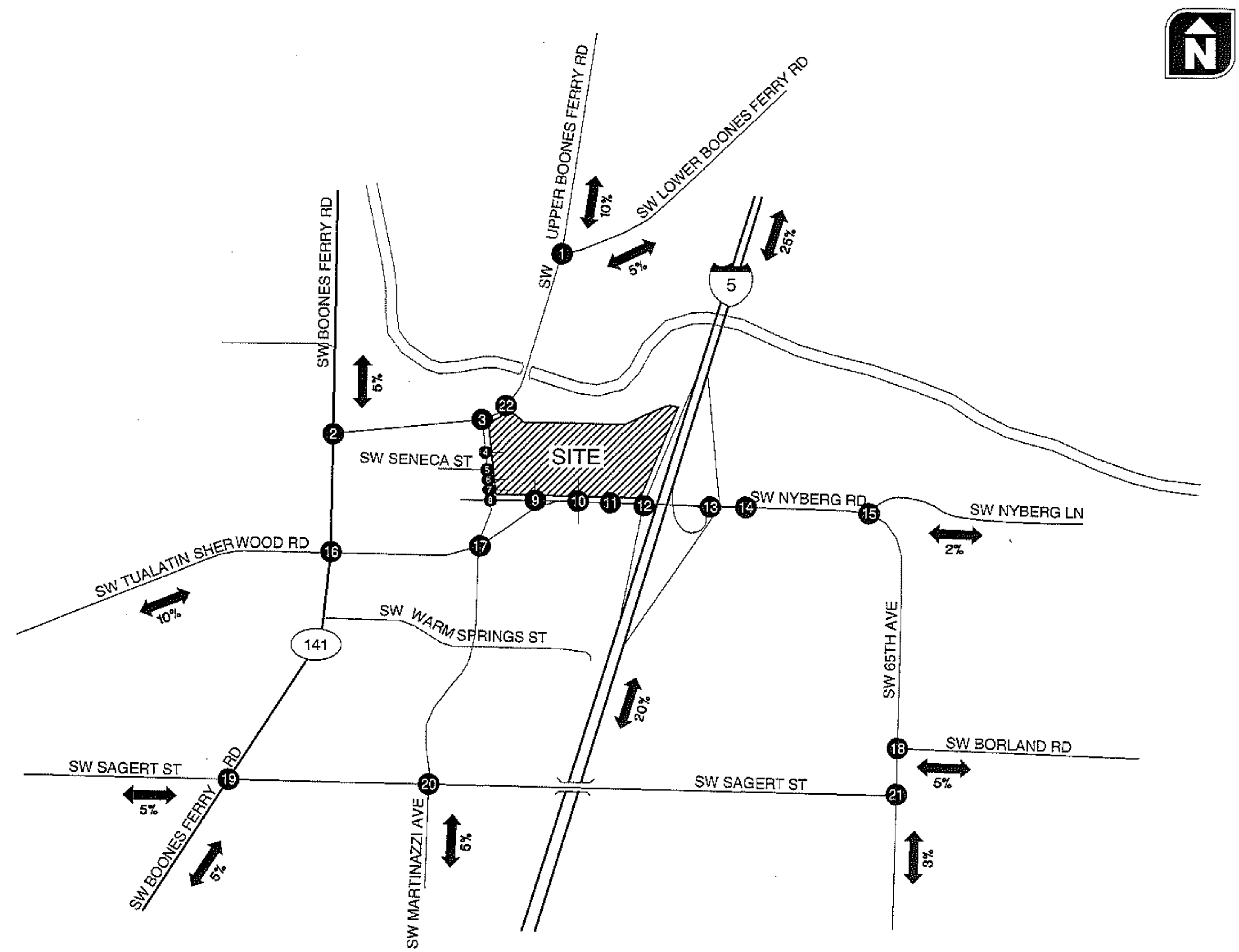
	ITE Code	Size (sq. ft.)	Weekday PM Peak Hour Total	Weekday PM Peak Hour In	Weekday PM Peak Hour Out	Saturday Midday Peak Hour Total	Saturday Midday Peak Hour In	Saturday Midday Peak Hour Out
Existing Site								
Existing Site Driveways[1]	-	-	945	435	510	970	490	480
Less Existing Library[2]	*590*	*22,123*	*(160)*	*(75)*	*(85)*	*(150)*	*(80)*	*(70)*
Less Existing Civic Uses[3]	*715*	*~10,000*	*(50)*	*(10)*	*(40)*	-	-	-
Total Existing Retail			**735**	**350**	**385**	**820**	**410**	**410**
Future Site								
Shopping Center	820	307,000[4]	1,350	660	690	1,775	925	850
Less Existing Retail Driveway Counts			*(735)*	*(350)*	*(385)*	*(820)*	*(410)*	*(410)*
Sub Total			615	310	305	955	515	440
Pass-by Trips (Weekday 34%, Saturday 26%)			*(210)*	*(105)*	*(105)*	*(230)*	*(115)*	*(115)*
Net New Trips			**405**	**205**	**200**	**725**	**400**	**325**

[1]Represents the total site driveway counts during the weekday p.m. peak hour of 4:35-5:35 p.m. and Saturday midday peak hour of 12:10-1:10 p.m. This is the traffic volume being generated by the existing 158,343 square feet of shopping center currently residing on the site prior to Kmart's closure.
[2]The library traffic counts were estimated using the *Library* land use in ITE *Trip Generation*.
[3]The City Hall traffic counts were estimated using the *Single Tenant Office Building* land use in ITE *Trip Generation*. The existing City Hall square footage was estimated to be approximately 10,000 square feet in size.
[4]Includes the 158,343 square feet of existing shopping center (minus the 96,799 square foot former K-Mart) plus the 245,456 square feet of proposed shopping center uses.

As shown in Table 8, the proposed redevelopment project is anticipated to generate approximately 405 net new weekday p.m. peak hour trips and 725 net new Saturday midday peak hour trips.

Site Trip Distribution/Trip Assignment

The trip distribution pattern for the proposed redevelopment project was estimated based on a review of existing traffic patterns and a select zone assignment obtained from Washington County's travel demand model. *A summary output sheet from the travel demand model and the distribution calculations derived from it is provided in the first part of Appendix F.* The trip distribution pattern used in the analysis is shown in Figure 7.



ESTIMATED TRIP DISTRIBUTION PATTERN
TUALATIN, OREGON

FIGURE 7

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Exhibit 1
Attachment L

The estimated site-generated trips were assigned to the network by distributing the trips shown in Table 8 according to the trip distribution pattern shown in Figure 7. Figures 8aA/8aPB and 8bA/8bBP illustrate the site-generated/pass-by trips that are expected to use the roadway system during the weekday p.m. and Saturday midday peak hours.

YEAR 2014 TOTAL TRAFFIC CONDITIONS

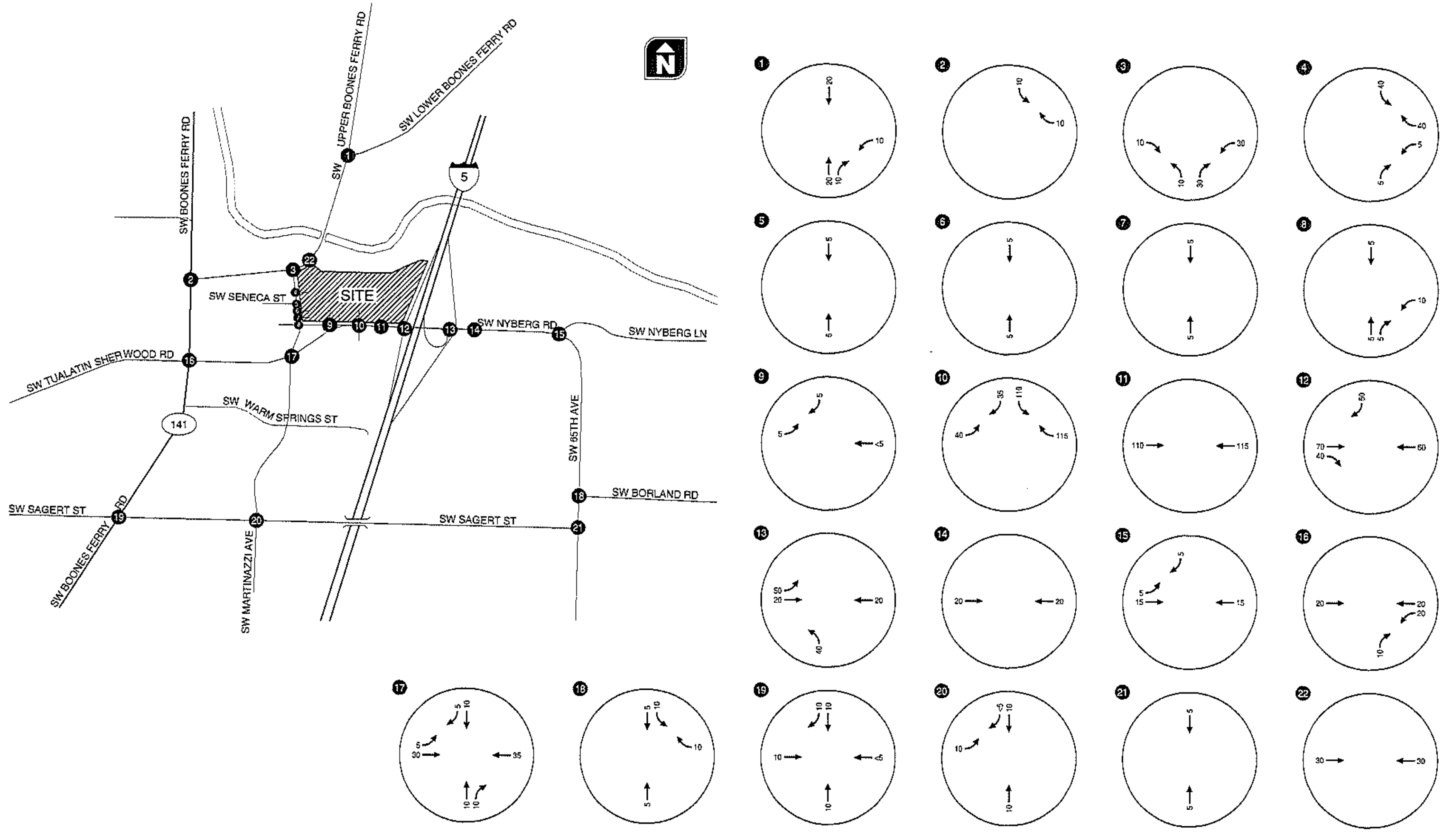
The total traffic conditions analysis forecasts how the study area's transportation system will operate with the traffic generated by the Nyberg Rivers redevelopment plan. The year 2014 background traffic volumes for the weekday p.m. and Saturday midday peak hours (shown in Figure 5a and 5b) were added to the site-generated traffic (shown in Figures 8aA/8aPB and 8bA/8bPB) to arrive at the total traffic volumes that are shown in Figures 9a and 9b.

2014 Total Traffic Operations

The weekday p.m. and Saturday midday peak hour turning-movement volumes shown in Figures 9a and 9b were used to conduct an operational analysis at each study intersection and site driveway to determine the year 2014 total traffic operations. The results of the total traffic analysis shown in Figures 9a, 9b, and Table 9 indicate that all of the study intersections and site access points, except for the SW 65th Avenue/SW Sager Road and SW Martinazzi Avenue/SW Sagert Road intersections, are forecast to operate at acceptable operations during the weekday p.m. and Saturday midday peak hours. *Appendix "F" contains the year 2014 total traffic level-of-service worksheets.*

The SW Martinazzi Avenue/SW Sagert Road and SW 65th Avenue/SW Sagert Road intersections are forecast to continue to operate at LOS F. The proposed development is estimated to contribute an additional 1.6% and 0.6%, respectively, during the weekday p.m. peak hour. Given this small increase, no development-driven traffic mitigation is recommended for the following reasons:

- The Tualatin TSP has identified mitigations for these two intersections that, when implemented, will address the long-term operations.
- The Washington County Transportation Development Tax (TDT) in part funds an improvement project on SW Sagert Street that will add capacity and reduce delay to both intersections.



SITE-GENERATED TRIPS (ADDED TRIPS), WEEKDAY PM PEAK HOUR
ASSUMED SITE ACCESS CONFIGURATION
TUALATIN, OREGON

FIGURE 8aA

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Exhibit 1
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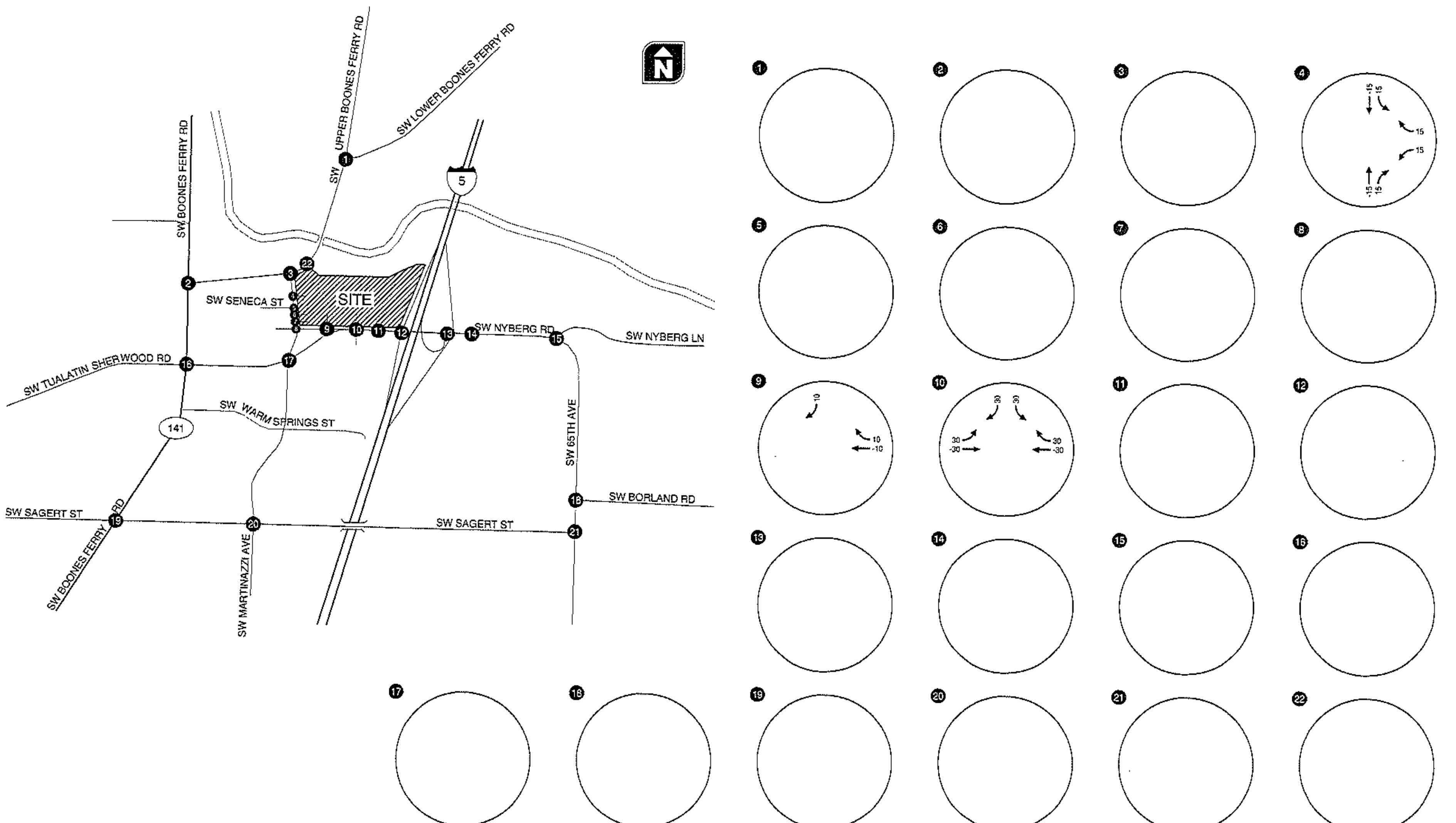

NOTE: NEGATIVE VOLUMES REPRESENT PASS-BY TRIPS

SITE-GENERATED TRIPS (PASS BY TRIPS), WEEKDAY PM PEAK HOUR
ASSUMED SITE ACCESS CONFIGURATION
TUALATIN, OREGON

FIGURE 8aPB

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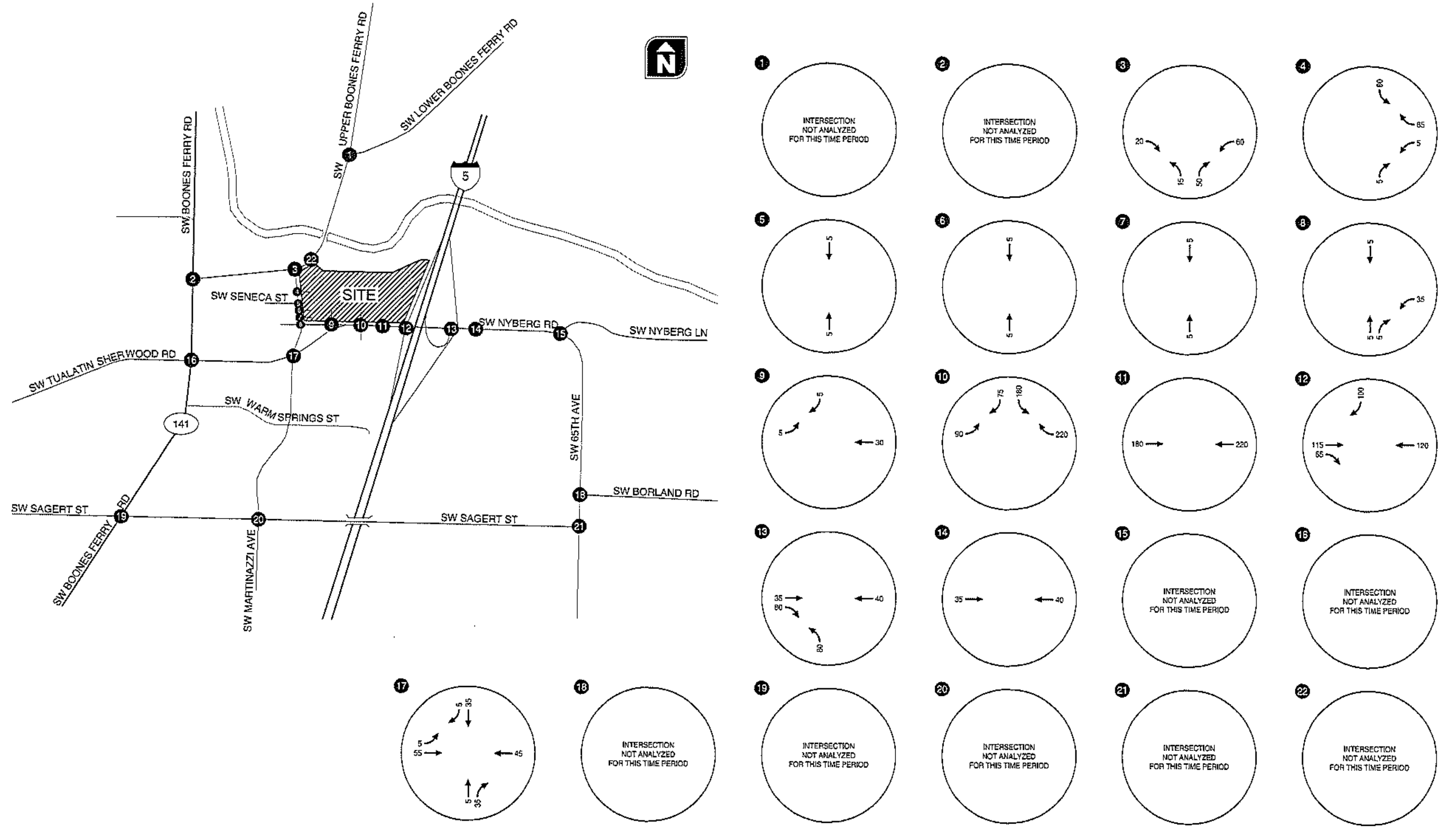
Exhibit 1
Attachment L



SITE-GENERATED TRIPS (ADDED TRIPS), SATURDAY MIDDAY PEAK HOUR
ASSUMED SITE ACCESS CONFIGURATION
TUALATIN, OREGON

FIGURE 8bA

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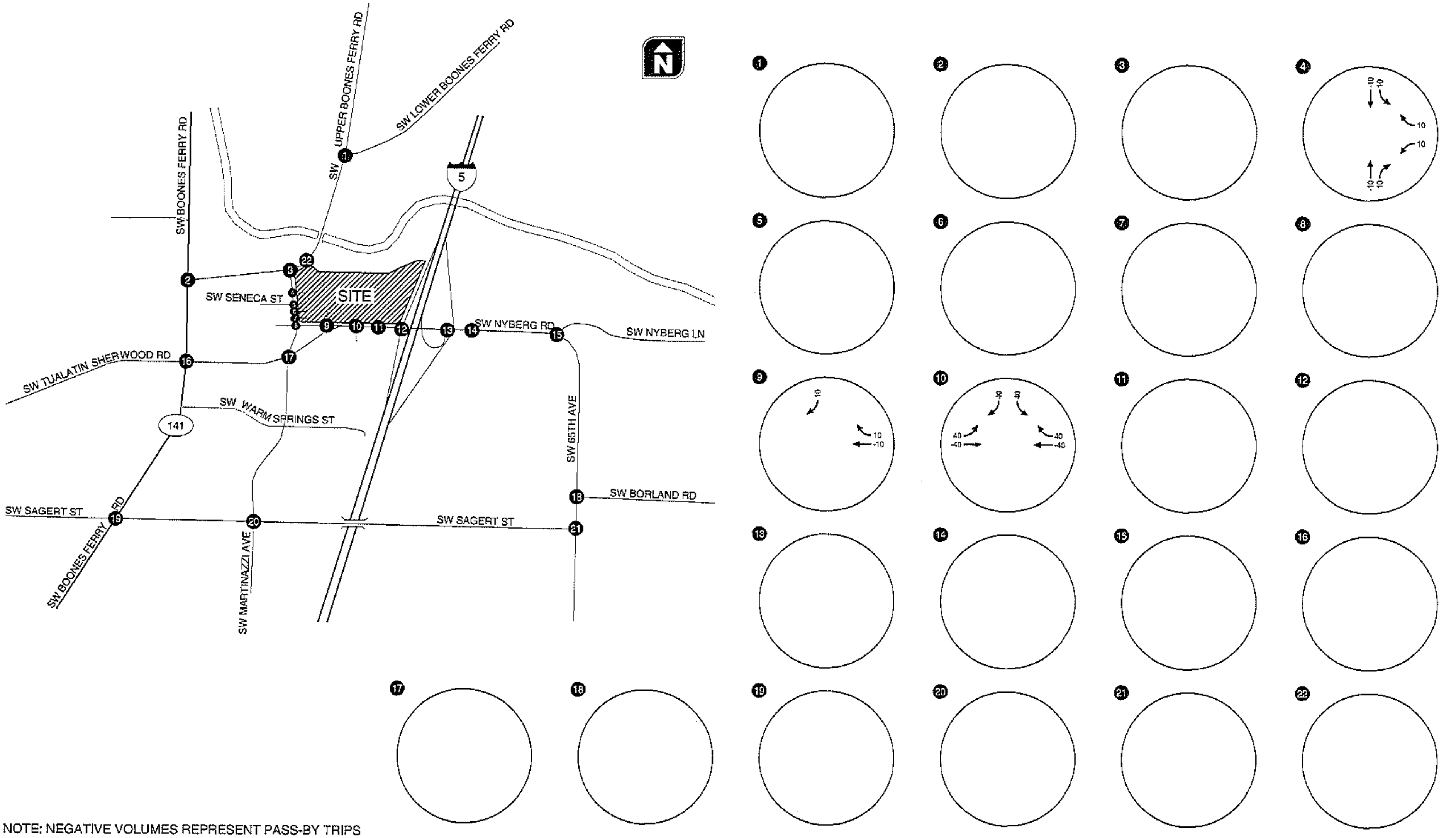
Exhibit 1
Attachment L



NOTE: NEGATIVE VOLUMES REPRESENT PASS-BY TRIPS

SITE-GENERATED TRIPS (PASS BY TRIPS), SATURDAY MIDDAY PEAK HOUR
ASSUMED SITE ACCESS CONFIGURATION
TUALATIN, OREGON

FIGURE 8bPB

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Exhibit 1
Attachment L

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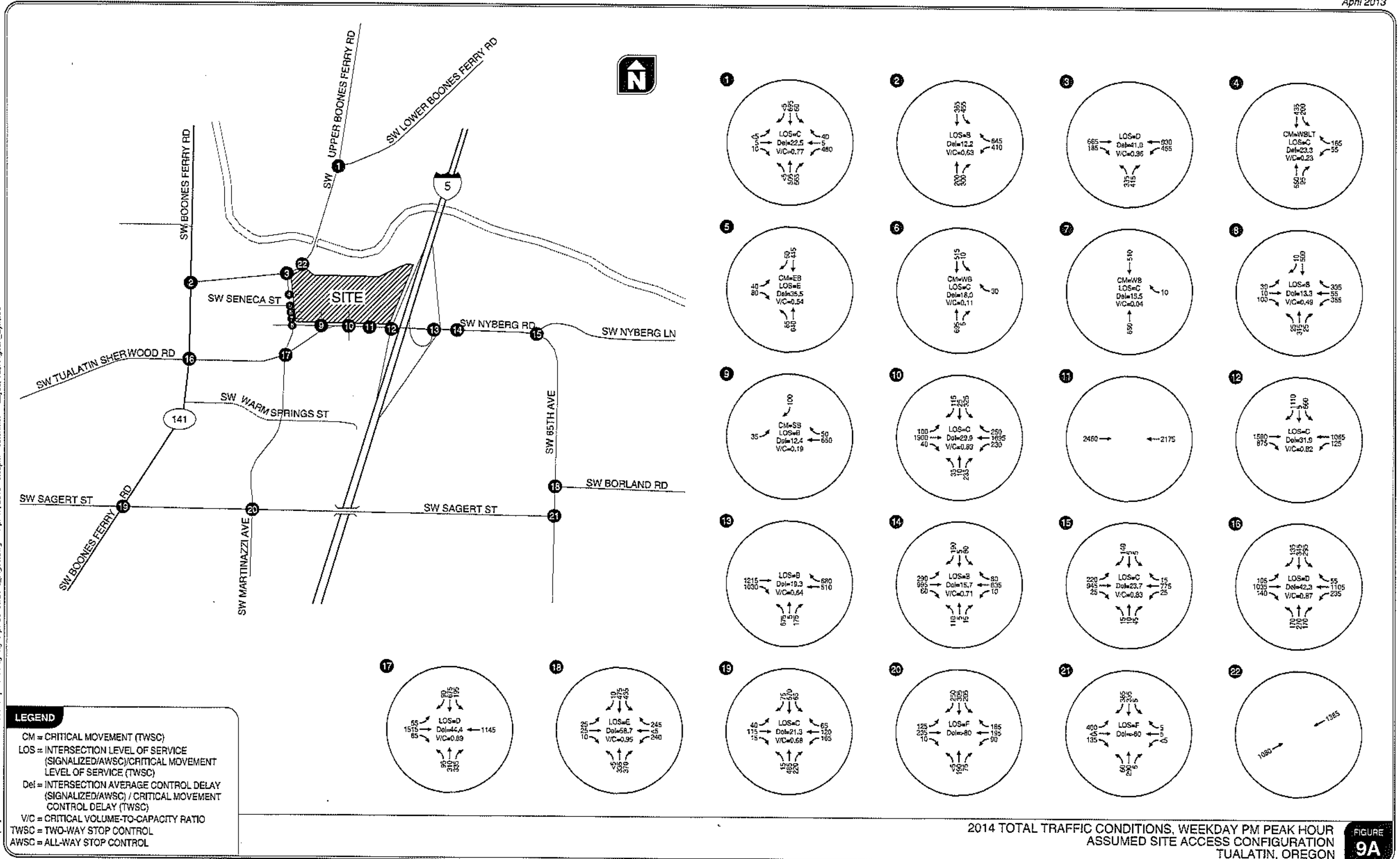

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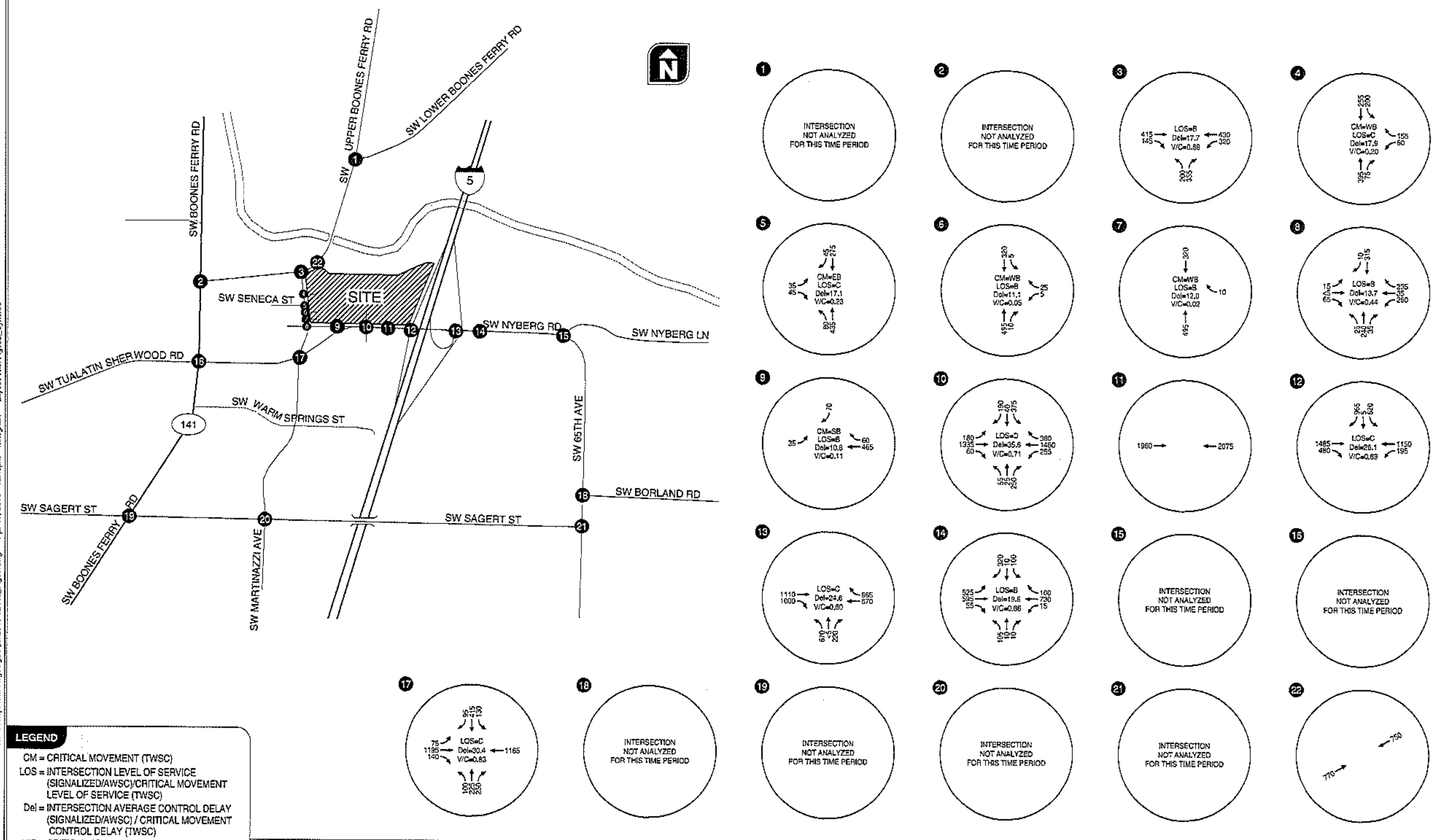
Exhibit 1
Attachment L



LEGEND

CM = CRITICAL MOVEMENT (TWSC)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWSC = TWO-WAY STOP CONTROL
AWSC = ALL-WAY STOP CONTROL

2014 TOTAL TRAFFIC CONDITIONS, SATURDAY MIDDAY PEAK HOUR
ASSUMED SITE ACCESS CONFIGURATION
TUALATIN, OREGON

FIGURE 9B

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Exhibit 1
Attachment L

Table 9: 2014 Total Traffic Operations

Number	Intersection	Maximum Operating Standard	Weekday PM Peak Hour		Saturday Midday Peak Hour	
			LOS	V/C	LOS	V/C
Signalized Intersections						
1	SW Upper Boones Ferry Road/ SW Lower Boones Ferry Road/ SW Boones Ferry Road	0.99	C	0.77	Not Analyzed	Not Analyzed
2	SW Boones Ferry Road/ SW Tualatin Road	0.99	B	0.63	Not Analyzed	Not Analyzed
3	SW Boones Ferry Road/ SW Martinazzi Avenue	0.99	D	0.96	B	0.68
8	SW Nyberg Road/ SW Martinazzi Avenue	0.99	B	0.49	B	0.44
10	SW Nyberg Road/ SW Tualatin-Sherwood Road/ Fred Meyer/Site Access	0.99	C	0.83	D	0.71
12	I-5 SB Ramp Terminal/ SW Nyberg Road	0.85	C	0.82	C	0.89
13	I-5 NB Ramp Terminal/ SW Nyberg Road	0.85	B	0.64	C	0.60
14	SW Nyberg Road/ Nyberg Woods Driveway	0.99	B	0.71	B	0.66
15	SW Nyberg Road/ SW 65th Avenue	0.99	C	0.83	Not Analyzed	Not Analyzed
16	SW Tualatin-Sherwood Road/ SW Boones Ferry Road	0.99	D	0.87	Not Analyzed	Not Analyzed
17	SW Tualatin-Sherwood Road/ SW Martinazzi Avenue	0.99	D	0.89	C	0.83
18	SW 65th Avenue/ SW Borland Road	0.99	E	0.95	Not Analyzed	Not Analyzed
19	SW Boones Ferry Road/ SW Sagert Street	0.99	C	0.68	Not Analyzed	Not Analyzed
Unsignalized Intersections[1]						
4	SW Martinazzi Avenue/ North Site Driveway	E	C	0.23	C	0.20
5	SW Martinazzi Avenue/ SW Seneca Street	E	E	0.54	C	0.23
7	SW Martinazzi Avenue/ Right-Out Only Site Driveway	E	C	0.04	B	0.02
9	SW Nyberg Road/ Site Driveway	E	B	0.19	B	0.11
22*	SW Boones Ferry Road/ Right-in/Right-Out Site Driveway	0.99	D	0.23	C	0.16
All-Way Stop-Controlled Intersections						
20	SW Sagert Street/ SW Martinazzi Avenue	D	F	N/A	Not Analyzed	Not Analyzed
21	SW Sagert Street/ SW 65th Avenue	D	F	N/A	Not Analyzed	Not Analyzed

Notes:
[1] LOS and V/C reported for the highest delay or critical movement
* Results reported reflect SW Martinazzi Avenue and SW Boones Ferry Road Site Access Alternatives discussed beginning on page 45.
For intersections #4, #5, #6, and #7, it is recognized that the operational results shown may differ slightly due to the presence of vehicle queuing along SW Martinazzi Avenue during peak time periods.
Existing and background conditions along the Tualatin-Sherwood corridor between the I-5 ramp terminals and Boones Ferry Road reflect consistent timing parameters due to the limited change in traffic volumes. Under the total conditions, with the new site traffic, timing parameters have been optimized in a more focused effort to approximate the SCATS adaptive system's response to the new traffic. The difference in timing optimization levels contributes to the variation in performance between background and total conditions.

Exhibit 1
Attachment L

Total Daily Traffic Profile

A summation of the 2014 Total Traffic daily traffic volumes is summarized in Table 10 below.

Table 10: 2014 Total Daily Traffic Profile

Roadway	Segment	Estimated Daily Volume		
		2012 Existing	2014 Background	2014 Total
SW Lower Boones Ferry Road	East of SW Upper Boones Ferry Road	13,200	13,600	13,900
SW Boones Ferry Road	East of SW Martinazzi Avenue	28,100	28,800	29,600
SW Boones Ferry Road	West of SW Martinazzi Avenue	24,400	25,100	25,400
SW Martinazzi Avenue	South of SW Boones Ferry Road and north of SW Nyberg Road	13,700	14,100	14,400
SW Martinazzi Avenue	South of SW Tualatin-Sherwood Road	17,100	17,600	18,100
SW Boones Ferry Road	North of SW Tualatin-Sherwood Road	14,000	14,500	14,500
SW Boones Ferry Road	South of SW Tualatin-Sherwood Road	15,200	15,700	16,100
SW Tualatin-Sherwood Road	West of SW Boones Ferry Road	30,800	31,800	32,300
SW Tualatin-Sherwood Road	East of SW Boones Ferry Road and west of SW Martinazzi Avenue	34,000	34,900	35,900
SW Tualatin-Sherwood Road	East of SW Martinazzi Avenue and west of SW Nyberg Road	36,400	37,400	38,300
SW Nyberg Lane	West of SW Tualatin-Sherwood Road and east of SW Martinazzi Ave	9,000	9,200	9,500
SW Nyberg Road	East of SW Tualatin-Sherwood Road and west of I-5 SB Ramp Terminal	51,900	52,900	55,900
SW Nyberg Road	West of I-5 SB Ramp Terminal and east of I-5 NB Ramp Terminal	38,600	39,600	41,300
SW Nyberg Road	East of I-5 NB Ramp Terminal and west of SW 65th Avenue	23,100	23,800	24,300
SW 65th Avenue	South of SW Nyberg Road	17,500	18,100	18,400
SW Borland Road	East of SW 65th Avenue	14,900	15,400	15,700
SW 65th Avenue	South of SW Sagert Street	9,600	9,900	10,000
SW Sagert Street	West of SW 65th Avenue	11,500	11,900	11,900
SW Sagert Street	East of SW Martinazzi Avenue	11,200	11,600	11,700

Queuing Analysis

A 95th percentile vehicle queuing analysis was performed at the I-5 off-ramps and the SW Nyberg Road/Signalized site driveway. Per ODOT requirements, the ramp terminal queuing was assessed using SimTraffic software[5]. The queuing analysis was completed in accordance with the assumptions stipulated in the ODOT *Analysis Procedures Manual* (APM).

Each vehicle was assumed to occupy 25 feet. Table 11 summarizes the queuing analysis at the study intersections for the 2014 total traffic conditions (critical weekday p.m. peak hour). All queues reported

[5] Tualatin-Sherwood Road between the I-5 ramp terminals and Teton Avenue currently operates with an adaptive signal system (TransCore SCATSTM), which adjusts cycle length, green splits and offsets to match capacity to traffic demands. This traffic analysis approximated the SCATS system using an upper-end cycle length based on the existing logs from the SCATS system, provided by Washington County. The Synchro/SimTraffic analysis is still a static representation of the adaptive system, thus better than reported results for delay and queue lengths are expected due to the adaptive system capabilities.

Exhibit 1
Attachment L

are rounded up to the nearest vehicle length. *Appendix "F" contains the year 2014 total traffic queuing analysis worksheets.*

Table 11: Estimated 95th Percentile Queuing Analysis

Intersection	Movement	Estimated 95th Percentile Queue (ft)				Storage Length
		Weekday PM Peak Hour		Saturday Midday Peak Hour		
		Background Traffic	Total Traffic	Background Traffic	Total Traffic	
I-5 SB Ramp Terminal/ SW Nyberg Road	SB LT/TH	675	700	550	650	700[1]
	SB RT	550	450	400	475	700[1]
I-5 NB Ramp Terminal/ SW Nyberg Road	NB TH/LT	400	625	375	675	1,270
	NB RT	225	275	250	300	1,270
SW Nyberg Road/ Signalized Site Driveway	WB LT	150	150	150	150	225
	SB LT	225	200	100	200	250
	EB LT	75	150	100	225	225
	NB RT	250	275	250	250	275

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound

LT = Left-Turn; TH = Through; RT = Right-Turn

[1]Storage length is framed by the portion of the freeway off-ramp needed to bring a vehicle to a full stop from the posted freeway speed (55 mph) at a deceleration rate of 6.5 feet/second^2. Ramp length is approximately 1,200 feet long with a deceleration distance of approximately 500 feet.

Table 11 shows that adequate storage exists for the forecast 95th percentile queues at the identified intersections and main sight-access driveway under total traffic conditions.

SW Martinazzi Avenue and SW Boones Ferry Road Site Access Alternatives

As part of this study, a separate site access alternative was evaluated that includes the following options:

- Adding a fourth leg (in the form of a site-access driveway) to the existing SW Martinazzi Avenue/SW Seneca Street intersection and closing the existing SW Martinazzi Avenue site driveway adjacent to the library[6]. For initial evaluation purposes, it was assumed that the modified intersection would be stop-controlled on the east-west Seneca Street approaches

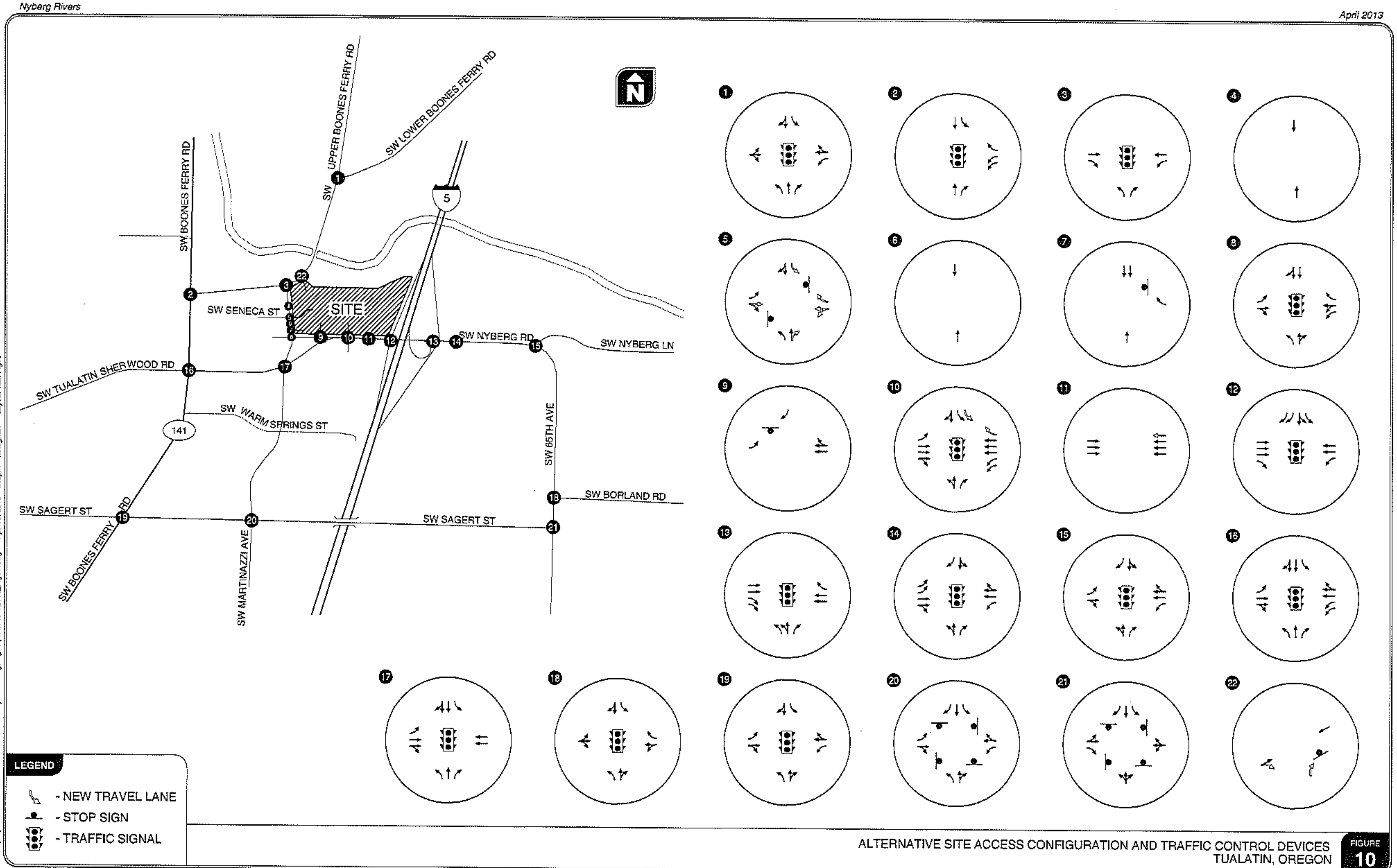
[6] It should be noted that this site-access is not required to mitigate for any impacts from the proposed development. Rather, it was evaluated in the event the City determined that it had a desire to reconfigure its property and therefore realign the access. Such realignment is not immediately required and can await the City's preferred timeline for redevelopment of its site. For the purposes of analyzing this scenario, it was assumed that the City buildings would be relocated somewhere within the existing shopping center site to ensure that this transportation impact analysis accounted for the trips associated with those uses.

Exhibit 1
Attachment L

and the new westbound approach would have a separate left- and shared through-right lane.

- Adding a new site driveway that would connect to SW Boones Ferry Road (identified as the Street "A" connection in Figure 2). Given the limited site frontage along SW Boones Ferry Road, the nearby SW Martinazzi Avenue/SW Boones Ferry Road intersection, and the nearby Tualatin River Bridge, it was assumed that this driveway connection would be limited to right-in/right-out access.

Figure 10 shows the assumed site-access configurations and traffic control devices associated with these site-access alternatives. Figures 11a and 11b summarize the resulting intersection operations for the weekday p.m. and Saturday midday peak hours.



ALTERNATIVE SITE ACCESS CONFIGURATION AND TRAFFIC CONTROL DEVICES
TUALATIN, OREGON

FIGURE 10

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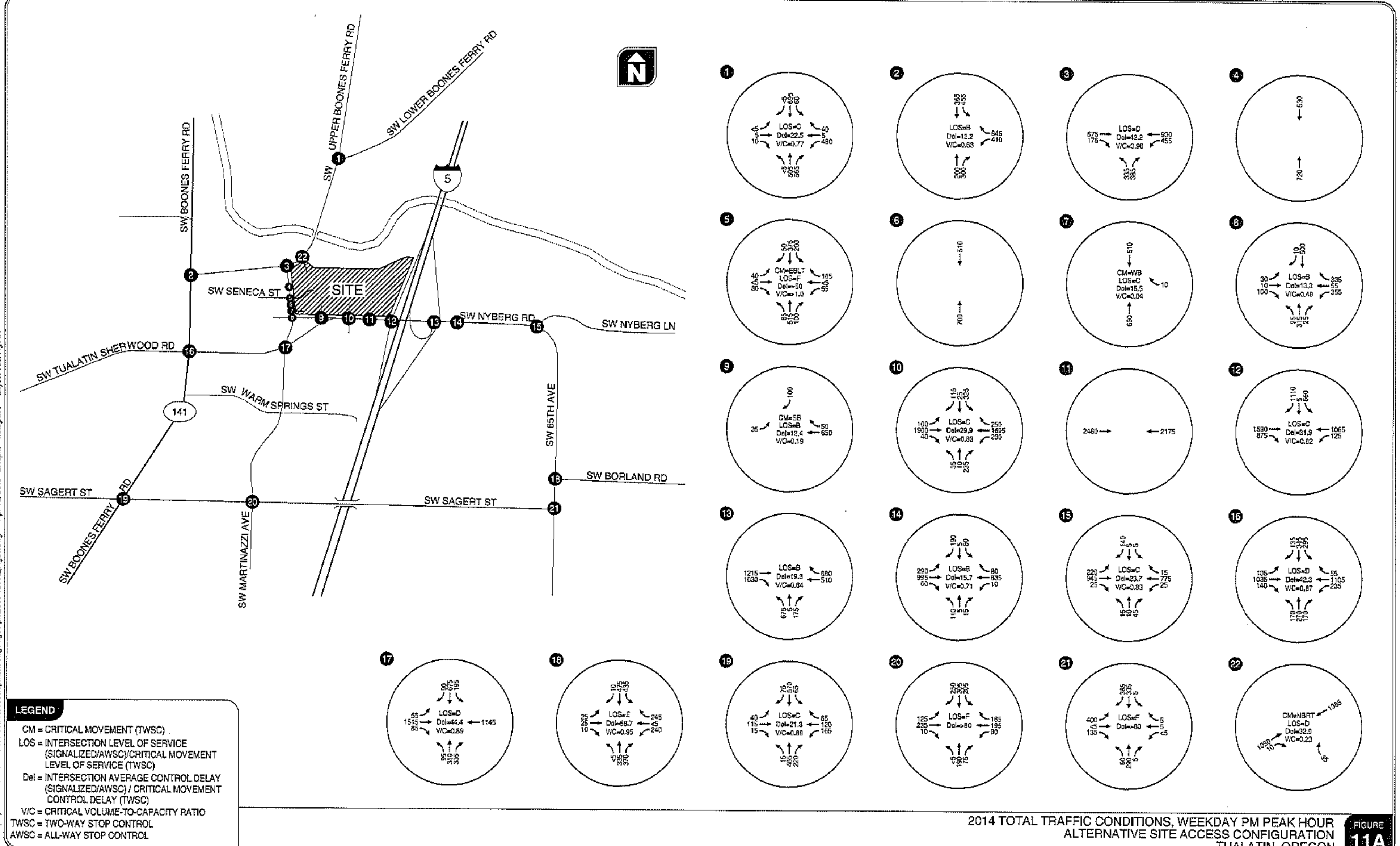
Exhibit 1
Attachment L



2014 TOTAL TRAFFIC CONDITIONS, WEEKDAY PM PEAK HOUR
ALTERNATIVE SITE ACCESS CONFIGURATION
TUALATIN, OREGON

FIGURE 11A

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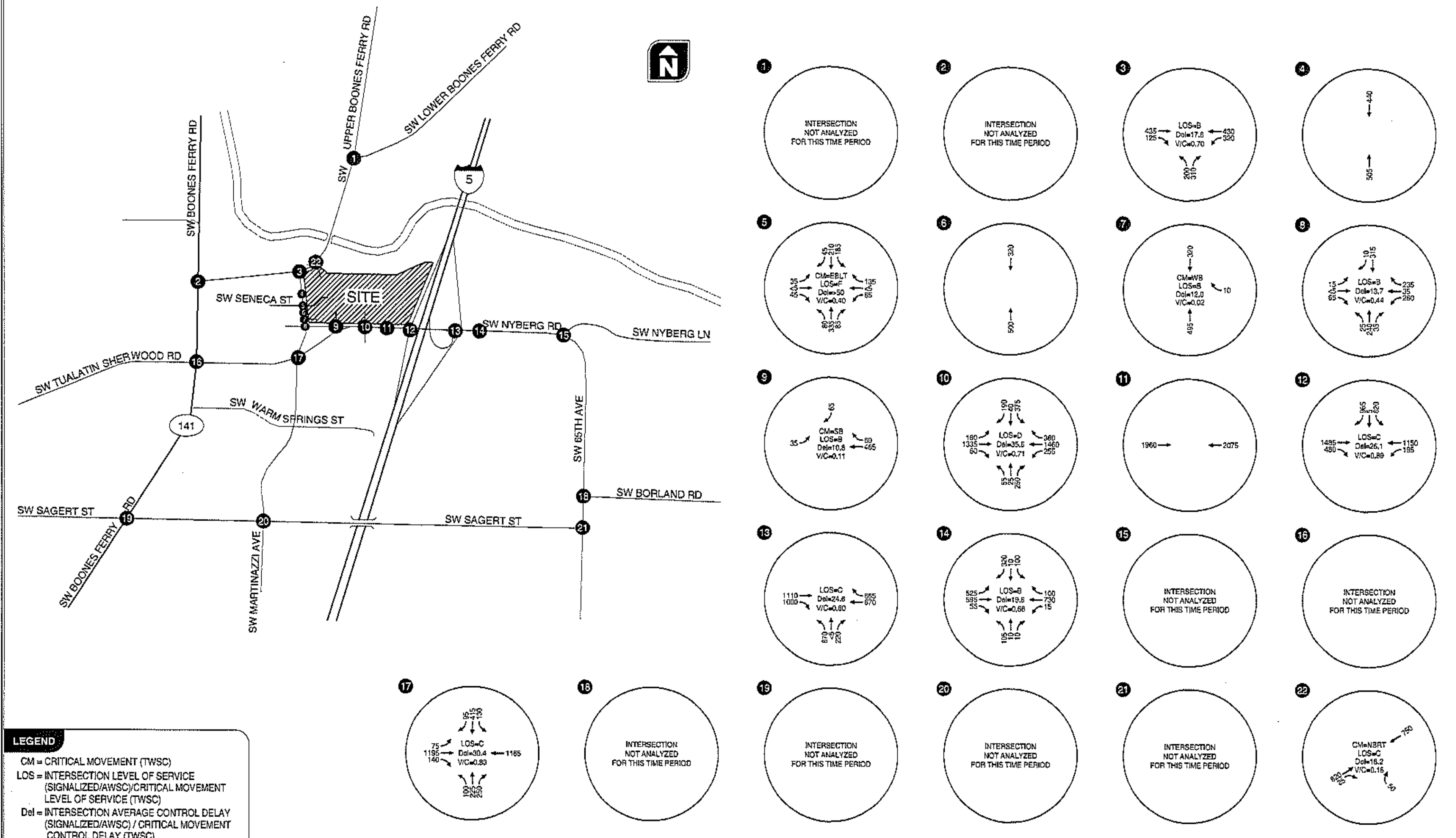
Exhibit 1
Attachment L



LEGEND

CM = CRITICAL MOVEMENT (TWSC)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
TWSC = TWO-WAY STOP CONTROL
AWSC = ALL-WAY STOP CONTROL

2014 TOTAL TRAFFIC CONDITIONS, SATURDAY MIDDAY PEAK HOUR
ALTERNATIVE SITE ACCESS CONFIGURATION
TUALATIN, OREGON

FIGURE 11B

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Exhibit 1
Attachment L

As shown in the Figure 11a, both the eastbound and westbound left-turn volumes at the modified SW Martinazzi Avenue/SW Seneca Street intersection are forecast to operate at LOS F and over capacity during the weekday p.m. peak hour conditions under this alternative. Based on these conditions, a traffic signal with permissive left-turn phasing was evaluated as a potential mitigation measure. Table 12 summarizes the resulting operations for the weekday p.m. and Saturday midday peak hours.

Table 12: SW Martinazzi Avenue/SW Seneca Street Intersection Mitigation (2014 Total Traffic Conditions)

	Weekday PM Peak Hour			Saturday Midday Peak Hour		
Mitigation	Delay	LOS	V/C	Delay	LOS	V/C
Traffic Signal[1]	10.6	B	0.68	5.5	A	0.37

[1] Permissive left-turn phasing was assumed on all approaches.

Table 12 indicates that signalization of the intersection will mitigate the LOS F conditions under the previously assumed two-way stop-controlled approach on SW Seneca Street. *Appendix "G" contains the year 2014 total traffic operations worksheets for the alternative access scenario at SW Martinazzi Avenue/SW Seneca Street intersection.* As indicated in Table 12, a traffic signal at the SW Martinazzi Avenue/SW Seneca Street intersection provides a significant capacity and safety benefit. In particular, signalization would:

- Provide additional excess capacity compared to an unsignalized east-west stop-controlled intersection.
- Enhance east-west pedestrian movements by providing a signalized crossing where one does not exist today.

From a signal operations standpoint, progression along SW Martinazzi Avenue is constrained by the endpoints of SW Tualatin-Sherwood Road and SW Boones Ferry. Operational analysis indicates a new signal at Seneca and the existing signal at SW Martinazzi Avenue/SW Boones Ferry Road could operate well during the peak period as a fully actuated, uncoordinated signal. Queuing should be monitored, particularly for other time periods to determine if including one or both of these signals into the adaptive signal system would be advantageous. Note, the new signal at Seneca provides much needed queue management on SW Martinazzi (as seen in SimTraffic modeling) to facilitate traffic flows and represents a large improvement over the no-build conditions for the assumed 2014 traffic demand.

In addition to the modified SW Martinazzi Avenue/SW Seneca Street intersection, Figures 11a and 11b demonstrate the impacts of adding a limited access site-driveway to SW Boones Ferry Road (Street "A" connection). The analysis shows that the driveway would provide a direct connection to SW Boones Ferry Road, but that it would not provide an operational benefit to any other study intersection of site driveway beyond the base site layout analysis.

Exhibit 1
Attachment L

IMPACTS OF THE NYBERG RIVERS DEVELOPMENT ON IDENTIFIED TRANSPORTATION PLANNING PROJECTS

Figure 1 of the current Tualatin Transportation System Plan (TSP) has identified a future minor collector (Cb) roadway through the proposed Nyberg Rivers development area that would connect SW Nyberg Road to SW Boones Ferry Road. The TSP does not identify a specific alignment for this roadway. The *Tualatin Town Center Plan* subsequently identifies this connection as a "loop road" that would conceptually extend from SW Boones Ferry Road around the Kmart building and internally connect with a future Seneca Street extension from the west. The TSP and Town Center Plan do not specifically address how or where the loop road would make the final connection to SW Nyberg Road.

The Nyberg Rivers redevelopment project has proposed an on-site roadway network that will meet the intent of the loop road connection and completes the connection to SW Nyberg Road. While not meeting all the specific design requirements called for in the City's proposed collector roadway designation, offers the functionality and connectivity that would be provided by a fully developed collector street system. The proposal includes the following:

- A new roadway connection to SW Boones Ferry Road (shown as "Street A" in Figure 2) that includes sidewalks.
- An enhanced site-access driveway to SW Nyberg Road that will better accommodate vehicular queuing and demand.
- A potential future (assuming the City desires to move forward) new site-access connection to SW Martinazzi Avenue that aligns across from SW Seneca Street. This connection would be the Seneca Street extension envisioned in the Town Center Plan. Prior to the City making a decision on any new SW Street Seneca alignment, the redevelopment site plan preserves this connection opportunity in the present or future.
- The preservation of east-west and north-south travel ways that will provide vehicular and pedestrian access between Street A, the Seneca Street alignment/extension, and enhanced access to SW Nyberg Road.
- New sidewalks along the enhanced site-access driveway to SW Nyberg Road that provide pedestrian connections to the integrated site circulation network.
- New bikeway connections along the perimeter of the site.

While all of these elements contribute towards the desired connectivity identified in the Tualatin TSP, development to full city standards is difficult for the following reasons:

- The TSP and Town Center Plan do not specifically address how or where the loop road would connect to SW Nyberg Road, however the graphics suggest the connection would occur somewhere within the vicinity of the existing SW 75th Avenue connection to SW Nyberg Road. Based on current ODOT access management policies, it is recognized that ODOT would not allow such a connection to be made given that it would be within 200-300 feet of the I-5 Southbound ramp terminal. Instead, it has been assumed that the existing SW

Exhibit 1
Attachment L

Nyberg Road/signalized site driveway would represent the only access connection that ODOT would continue to support within the influence area of the interchange.

- The proposed Nyberg Rivers project is not a complete redevelopment of the existing shopping center site. A large number of existing uses (Michaels, US Bank, Banner Bank, Tualatin City Library and administrative offices, and other retail space) will remain on the site. As a result, much of the site layout (including buildings and parking areas) will remain substantially unchanged.
  - For example, the "loop road" concept in the Tualatin Town Center Plan suggested that the conceptual connection occur around and behind the existing Kmart building. As noted in the proposed development plan, this area of the site will be redeveloped with retail pads. A limited site configuration for the placement of new buildings and a need to maintain a sizable number of existing buildings/parking areas does not accommodate a "loop road" alignment.

Section 5
Conclusions and Recommendations

CONCLUSIONS AND RECOMMENDATIONS

The results of this study indicate that the proposed Nyberg Rivers redevelopment project can be constructed while maintaining acceptable traffic operations and safety at the study intersections, assuming provision of the recommended mitigation measures.

FINDINGS

Year 2012 Existing Conditions

- All of the study intersections currently operate acceptably during the weekday p.m. and Saturday midday peak hours with the exception of the SW Martinazzi Avenue/SW Sagert Street and SW 65th Avenue/SW Sagert Road intersections.
  - At both the SW Martinazzi Avenue/SW Sagert Street and SW 65th Avenue/SW Sagert Street intersections, the southbound approach during the weekday p.m. peak hour operates at LOS F.

Year 2014 Background Traffic Conditions

- All of the study intersections are forecast to operate acceptably during the weekday p.m. and Saturday midday peak hours with the exception of SW Martinazzi Avenue/SW Sagert Road and SW 65th Avenue/SW Sagert Road intersections.
  - At both the SW Martinazzi Avenue/SW Sagert Street and SW 65th Avenue/SW Sagert Street intersections, the southbound approach during the weekday p.m. peak hour is forecast to continue to operate at LOS F. These findings are consistent with analysis conducted as part of the recent Tualatin Transportation System Plan (TSP) Update and future improvements are identified within the TSP for both of these intersections.

Proposed Redevelopment Plan

- Under the redevelopment plan, the existing SW 75th Avenue connection to SW Nyberg Road will be closed to improve access management along SW Nyberg Road and to better accommodate the redevelopment proposal.
- The existing signalized access on SW Nyberg Road that currently serves the shopping center and the adjacent Fred Meyer site will remain. However, the following changes are proposed in order to better accommodate the proposed redevelopment, provide additional capacity for future growth in traffic, and improve safety relative to the existing condition:
  - A westbound right-turn lane will be developed on SW Nyberg Road to enhance access to the site and minimize vehicle queuing on SW Nyberg Road.

Exhibit 1
Attachment L

  - The existing site driveway is proposed to be widened as shown in the proposed site plan. This widening will include dual southbound left-turn lanes, a shared through/right-turn lane, and dual in-bound receiving lanes. A raised median will be constructed in the driveway throat to reduce turning conflicts on-site turning maneuvers and manage vehicle queues on the approach to the signal.
  - The north and south approach signal phasing is proposed to be modified from permissive left-turn phasing to split phasing.
- With the anticipated mix of new retail uses, the proposed redevelopment is estimated to generate 405 net new trips during the weekday p.m. peak hour and 725 net new trips during the Saturday midday peak hour.

Year 2014 Total Traffic Conditions

- All of the study intersections within the immediate site vicinity, including the site access points and internal site intersections, are forecast to operate acceptably during the weekday p.m. and Saturday midday peak hours.
- The SW Martinazzi Avenue/SW Sagert Road and SW 65th Avenue/SW Sagert Road intersections are forecast to continue to operate at LOS F.
  - The proposed development will have an insignificant impact at either intersection, resulting in an estimated 1.6% and 0.6% increase, respectively, during the weekday p.m. peak hour.
  - The Tualatin TSP has identified mitigations for these two intersections that, when implemented, will address the long-term operations.
  - The Washington County Transportation Development Tax (TDT) in part funds an improvement project on SW Sagert Street that will add capacity and reduce delay to both intersections.
- Beyond the site's frontage along SW Tualatin Sherwood Road and SW Martinazzi Avenue, where significant transportation improvements are proposed (including implementing the intent of the City's Loop Road), the project will have an insignificant impact on the other study intersections (generally resulting in less than a two percent increase in traffic relative to 2014 background conditions).
- At all signalized intersections beyond the site frontage (with the exception of the I-5 interchange), the project will add on average one vehicle or less per signal cycle to any movement. This level of impact is less than significant by any traffic engineering standard and well below the level that would be perceived by motorists.
- Anticipated vehicle queues can be accommodated at the I-5 ramp terminals and the SW Nyberg Road/Signalized site driveway.

- The proposed Nyberg Rivers redevelopment project has proposed an on-site roadway network that will meet the intent of the loop road connection. The proposal includes the following:
    - A new roadway connection to SW Boones Ferry Road (shown as "Street A" in Figure 2) that includes sidewalks.
    - An enhanced site-access driveway to SW Nyberg Road that will better accommodate vehicular queuing and demand.
    - A potential future (assuming the City desires to move forward) new site-access connection to SW Martinazzi Avenue that aligns across from SW Seneca Street. This connection would be the Seneca Street extension envisioned in the Town Center Plan. Prior to the City making a decision on any new SW Street Seneca alignment, the redevelopment site plan preserves this connection opportunity in the present or future.
    - The preservation of east-west and north-south travel ways that will provide vehicular and pedestrian access between Street A, the Seneca Street alignment/extension, and enhanced access to SW Nyberg Road.
    - New sidewalks along the enhanced site-access driveway to SW Nyberg Road that provide pedestrian connections to the integrated site circulation network.
    - New bikeway connections along the perimeter of the site.

SW Martinazzi Avenue and SW Boones Ferry Road Site Access Alternatives

- An alternative site access scenario was evaluated that demonstrates the impact of potentially adding a fourth leg (in the form of a site-access driveway) to the existing SW Martinazzi Avenue/SW Seneca Street intersection and closing the existing SW Martinazzi Avenue site driveway adjacent to the library. This analysis produced the following results:
    - The east and west approaches to a modified SW Martinazzi Avenue/SW Seneca Street intersection would operate at Level of Service (LOS) F and over capacity during the weekday p.m. peak hour with the addition of a fourth site-access leg. Signalizing the intersection would provide the following:
        - Mitigation that results in LOS A or better (a significant improvement over existing conditions).
        - Additional excess intersection capacity beyond what is needed to serve the Nyberg Rivers project traffic.
        - Enhanced east-west pedestrian connectivity across SW Martinazzi Avenue.
        - A safety improvement relative to stop sign control.

- In addition to the modified SW Martinazzi Avenue/SW Seneca Street intersection, another site-access alternative was evaluated that demonstrates the impacts of adding a limited access site-driveway to SW Boones Ferry Road. The analysis shows that with a direct connection to SW Boones Ferry Road, there would be some shifting of site-generated traffic off of SW Martinazzi Avenue. This additional access would further improve connectivity, help implement the City's loop road concept, and provide additional capacity beyond what is needed to serve the Nyberg Rivers project.

RECOMMENDATIONS

- With the proposed Nyberg Rivers redevelopment:
  - The existing SW 75th Avenue site-access driveway to SW Nyberg Road should be closed in order to minimize turning movement conflicts, allow for the construction of a westbound right-turn lane at the SW Nyberg Road/signalized site driveway, and improve the interchange access spacing conditions along SW Nyberg Road.
  - To better accommodate the anticipated site-generated traffic at the SW Nyberg Road/Signalized site driveway:
    - A new westbound right-turn lane should be constructed on SW Nyberg Road.
    - The site driveway should be modified to include dual southbound left-turn lanes, a shared through/right-turn lane, and two inbound receiving lanes.
    - The existing north/south traffic signal phasing should be modified from permissive phasing to split phasing. Right-turn overlap phasing should be provided for the westbound right-turn movement into the Nyberg Rivers site.
- If site access to SW Martinazzi Avenue is provided via a new fourth leg to the SW Martinazzi Avenue/SW Seneca Street intersection, the intersection should be signalized.
- If a new site access driveway is provided to SW Boones Ferry Road, the driveway should limited to right-in/right-out only access.

Exhibit 1
Attachment L

Appendix A
Scoping Memorandum

Exhibit 1
Attachment L

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

DRAFT SCOPING MEMORANDUM #1

Date:	August 22, 2012	Project #: 12116
To:	Kaaren Hofmann, P.E., Tony Doran, City of Tualatin Jinde Zhu, P.E., Washington County Avi Tayar, P.E., Doug Baumgartner, Marah Danielson, ODOT	
From:	Matt Hughart, AICP; Chris Brehmer, P.E.; Mark Vandehey, P.E.	
Project:	Nyberg Woods II – Tualatin, OR	
Subject:	Proposed Traffic Study Scope of Work	

The purpose of this memorandum is to provide an opportunity for the City of Tualatin, Washington County, and ODOT staff to review and provide guidance on project assumptions associated with conducting a traffic study for a proposed partial redevelopment of the existing K-Mart shopping center in Tualatin, Oregon. Details of the proposed project assumptions are documented below.

Proposed Development Plan

The project entails a partial redevelopment of the existing shopping center currently anchored by a K-Mart and supported by a number of other retail uses. While a specific site plan and tenant mix is still being developed, the redevelopment will likely entail the following components:

- K-Mart will close and its existing 96,799 square foot building will be removed.
- The existing adult cabaret will close and its 4,800 square foot building will be removed.
- Approximately 208,180 square feet of new shopping center uses and 30,000 square feet of office space will be constructed on the site.
- The existing 3,500 square foot building currently occupied by a Wendy's will be relocated to a new pad within the shopping center site.
- All other existing buildings will remain and their uses will continue to operate as is.
- The existing 75th Avenue access to SW Nyberg Road is proposed to be closed.

- The existing signalized access on SW Nyberg Road that currently serves the site and the Fred Meyer site will remain. The traffic study will look at potential enhancements to this intersection to better accommodate site traffic and vehicle queuing.
- The traffic study will look at different access scenarios to SW Martinazzi Avenue and SW Boones Ferry Road. Specifically, the impacts/improvements necessary to realign the existing SW Martinazzi Avenue driveway (adjacent to the library/city hall) to access SW Martinazzi Avenue across from Seneca Street and a new site access driveway to SW Boones Ferry Road.

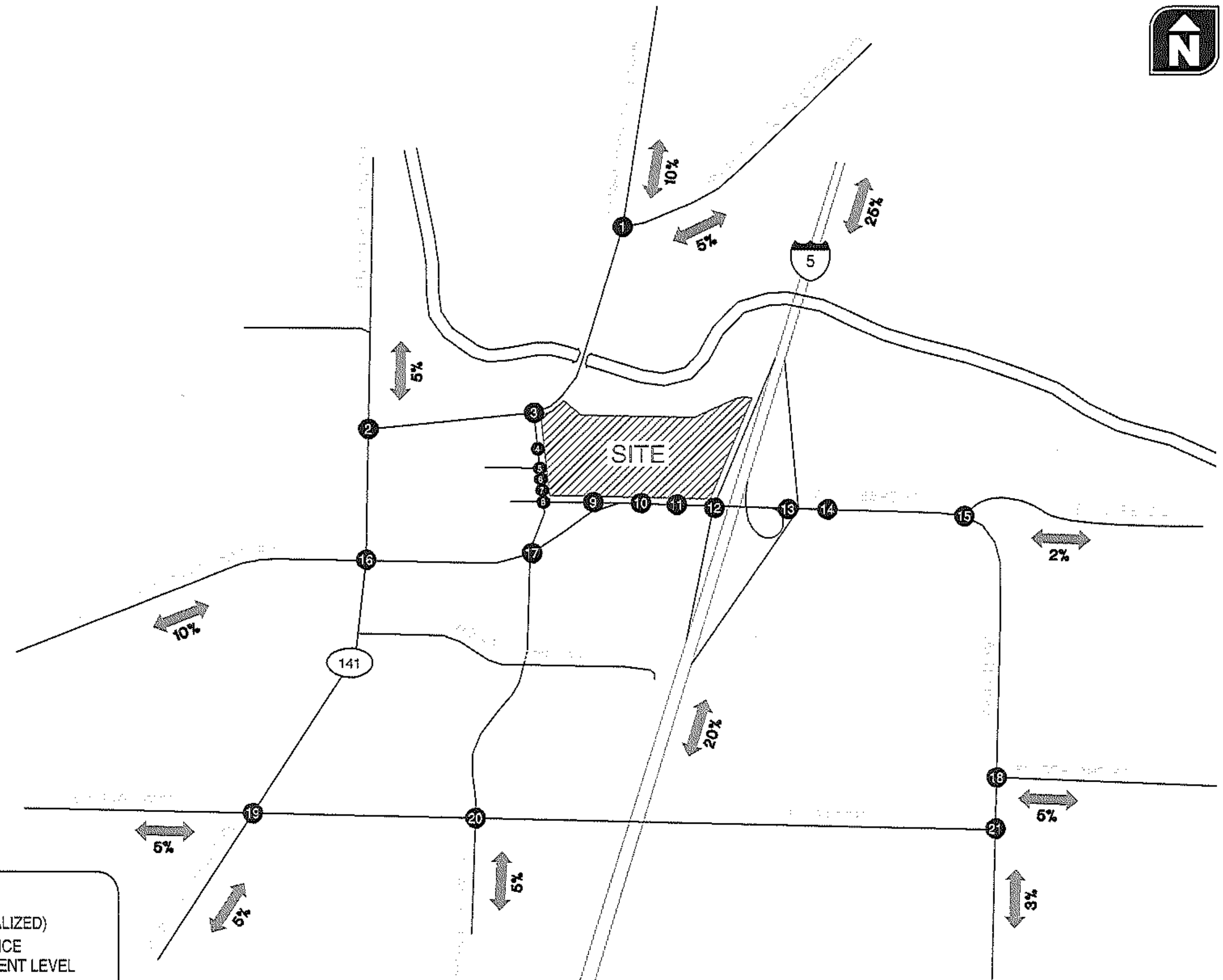
Proposed Study Intersections

A preliminary list of study intersections was identified based on the size of the anticipated development and its location. This list of intersections is identified below. Figures 1 and 2 illustrate their location and associated lane configurations/traffic control devices.

- SW Martinazzi Avenue/SW Boones Ferry Road (#3)
- SW Martinazzi Avenue/Existing Site Driveway (near City Hall) (#4)
- SW Martinazzi Avenue/SW Seneca Street (#5)
- SW Martinazzi Avenue/Existing Site Driveway (#6)
- SW Martinazzi Avenue/Existing Right-Out Only Driveway (#7)
- SW Tualatin-Sherwood Road/SW Martinazzi Avenue (#17)
- SW Nyberg Street/SW Martinazzi Avenue (#8)
- SW Nyberg Street/Unsignalized Site Driveway (#9)
- SW Nyberg Street/SW Tualatin-Sherwood Road/Fred Meyer/Site Driveway (#10)
- SW Nyberg Street/SW 75th Avenue (#11)
- SW Nyberg Street/I-5 SB Ramp Terminal (#12)
- SW Nyberg Street/I-5 NB Ramp Terminal (#13)
- SW Nyberg Street/Signalized entrance to Nyberg Woods (#14)

In anticipation of the need to study these intersections at a minimum, traffic counts were obtained in May 2012 (before the end of the spring school semester) during the analysis periods discussed in the following section.

Exhibit 1
Attachment L



LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

STUDY INTERSECTIONS AND TRIP DISTRIBUTION PATTERN
TUALATIN, OREGON

FIGURE 1

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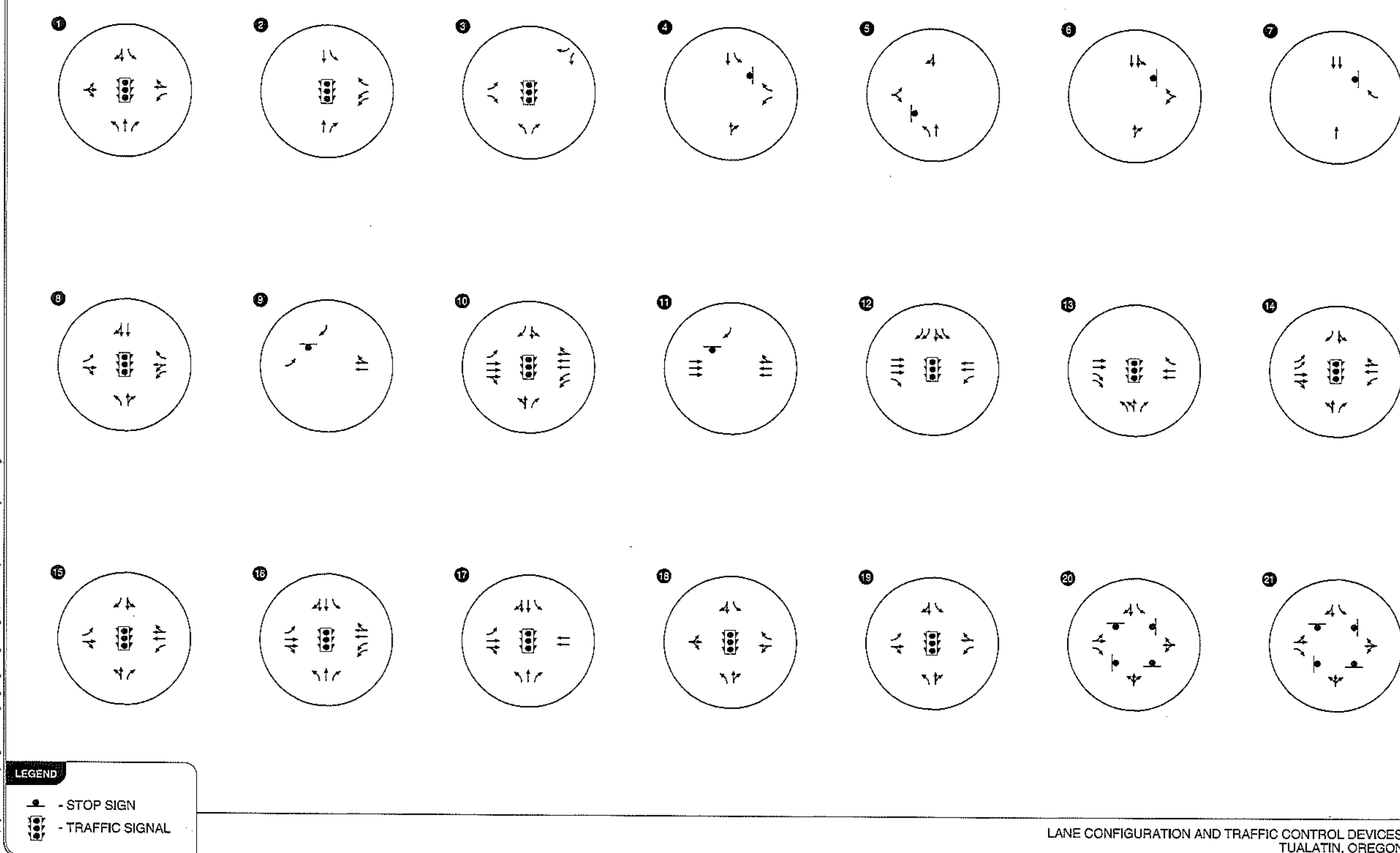
Exhibit 1
Attachment L



LANE CONFIGURATION AND TRAFFIC CONTROL DEVICES
TUALATIN, OREGON

FIGURE 2

KITTELSON & ASSOCIATES, INC.
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Traffic Analysis Periods and Scenarios

In order to assess the impact of the proposed development, traffic conditions are proposed to be analyzed during the peak hour of the following time periods:

- Weekday evening roadway peak hour (3:00-6:00 p.m.)
- Saturday midday peak hour (11:00 a.m. - 2:00 p.m.)

The proposed redevelopment is anticipated to be completed by 2014. Intersections are proposed to be analyzed for the following three time periods:

- Existing (2012)
- Background (without shopping center redevelopment) (2014)
- Total Traffic (with shopping center redevelopment) (2014)

EXISTING CONDITIONS ANALYSIS

The existing operations will be assessed at the identified study intersections during the weekday evening and Saturday midday peak periods using the traffic data collected. Synchro 8 analysis software will be used in accordance with the methodology in the *2010 Highway Capacity Manual* and the *ODOT Analysis Procedures Manual* (where applicable). The most recent 5-year crash data at each study intersection will be obtained and reviewed.

BACKGROUND ANALYSIS

This analysis will assess traffic operations at the study intersections during the two study periods in the year 2014 without any improvements or changes to the roadway network. Traffic volumes for the year 2014 will be based on an assumed growth rate of 1.0% per year. This near-term growth rate was derived from a review of Washington County traffic counts on Tualatin-Sherwood Road and Nyberg Street. In-process development data will be obtained from the City of Tualatin and Washington County and included as part of year 2014 forecast traffic volumes.

TRIP GENERATION

Given that the proposed project is only a partial redevelopment of the larger shopping center, a trip generation methodology was developed that would more accurately reflect the characteristics of a unified and vibrant shopping center. This methodology is outlined in greater detail in Appendix A. The resulting trip estimate is summarized in Table 1 below.

Table 1 Trip Generation

	ITE Code	Size (sq. ft.)	Weekday PM Peak Hour			Saturday Midday Peak Hour		
			Total	In	Out	Total	In	Out
Existing Site								
Existing Site Driveways[1]	-	-	945	435	510	970	490	480
Less Existing Library[2]	*590*	*22,123*	*(160)*	*(75)*	*(85)*	*(150)*	*(80)*	*(70)*
Less Existing Civic Uses[3]	*715*	*~10,000*	*(50)*	*(10)*	*(40)*	-	-	-
Total Existing Retail			**735**	**350**	**385**	**820**	**410**	**410**
Future Site								
Shopping Center	820	264,924[4]	1,225	600	625	1,615	840	775
Less Existing Retail Driveway Counts	-	-	*(735)*	*(350)*	*(385)*	*(820)*	*(410)*	*(410)*
Sub Total	-	-	490	250	240	795	430	365
Pass-by Trips (Weekday 34%, Sat. 26%)	-	-	*(160)*	*(80)*	*(80)*	*(190)*	*(95)*	*(95)*
Office	710	30,000	45	10	35	10	5	5
Net New Trips			**375**	**180**	**195**	**615**	**340**	**275**

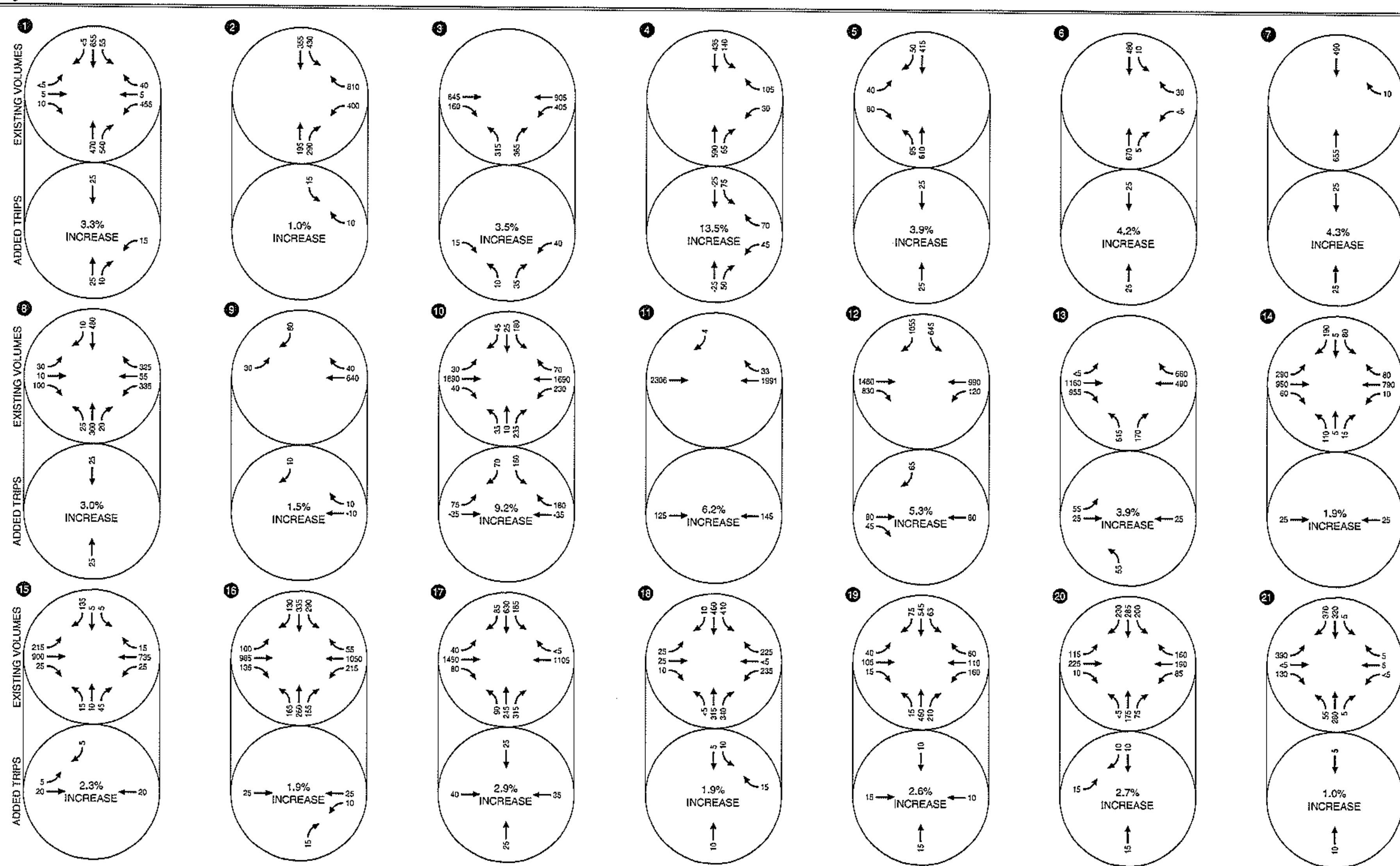
[1]Represents the total site driveway counts during the weekday p.m. peak hour of 4:35-5:35 p.m. and Saturday midday peak hour of 12:10-1:10 p.m. This is the traffic volume being generated by the existing 158,343 square feet of shopping center currently residing on the site.
[2]The library traffic counts were estimated using the *Library* land use in ITE Trip Generation.
[3]The City Hall traffic counts were estimated using the *Single Tenant Office Building* land use in ITE Trip Generation. The existing City Hall square footage was estimated to be approximately 10,000 square feet in size.
[4]Includes the 158,343 square feet of existing shopping center (minus the 96,799 square foot K-Mart and 4,800 square foot adult cabaret) plus the 208,180 square feet of proposed shopping center uses.

TRIP ASSIGNMENT

The trip distribution pattern for the proposed project was estimated based on a select zone assignment obtained from Washington County's travel demand model. The resulting trip distribution pattern is also shown in Figure 1.

PROPORTIONATE SHARE IMPACT

City staff requested a proportional impact analysis for the project based on the proposed trip generation and distribution for the site at the May 30, 2012 preliminary project meeting with the City of Tualatin. To complete this analysis, regionally significant traffic counts used in the on-going Tualatin Transportation System Plan Update were reused. The resulting proportional impact of the net new site-generate trips at each regionally significant intersection is illustrated in Figure 3. Based on these findings, we request that City, County, and ODOT staff review these impacts and confirm the need to study the remaining list of intersections not previously identified earlier in this memorandum.



NOTE: SEE FIGURE 1 FOR LEGEND

PROPORTIONAL SHARE IMPACT
SITE GENERATED TRIPS - WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
3

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KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

Exhibit 1
Attachment L

We trust that this memorandum provide adequate documentation of the proposed development plan, study intersections, analysis scenarios, and estimated trip generation. We formally request that the City of Tualatin, Washington County, and ODOT provide written confirmation regarding the proposed methodology and project assumptions as soon as possible. If you have any questions, please give us a call at (503)228-5230.

Appendix A
Trip Generation
Methodology

Exhibit 1
Attachment L

PROPOSED TRIP GENERATION METHODOLOGY

The proposed project is only a partial redevelopment of the larger shopping center. In order to avoid overestimating the trip generation characteristics of the net new retail uses, the following trip generation methodology is proposed:

- Traffic counts were conducted at all of the site driveways to quantify the trip generation profile of the existing retail and civic uses currently operating on the site.
- Recognizing that the City offices/library are not retail uses and the layout of the site/parking fields prevents a accurate quantification of trips being generated by these uses, estimates were developed using the standard reference manual, *Trip Generation*. The Library and Single Tenant Office Building land uses were used in the estimate process. The resulting estimates were then subtracted from the existing site driveway counts to produce a trip profile estimate for the existing 158,343 square feet of retail building space at the site.
- A trip generation rate was calculated using the Shopping Center land use in ITE *Trip Generation* for the 208,180 square feet of new retail use plus the 56,744 square feet of remaining retail uses (158,343 square feet of existing retail minus 96,799 square foot K-Mart and 4,800 square foot adult cabaret). A separate estimate for the 30,000 square foot of office use was also prepared.
- The existing site retail traffic estimate was then subtracted from the total shopping center and office trip generation estimate to arrive at a total trip estimate for the net increase in shopping center and office square footage. A pass-by rate reduction of 34% was assumed for the shopping center component to generate the Net New Trip estimate for the site.

Table 2 below illustrates the trip generation calculation process.

Exhibit 1
Attachment L

Table 2 Trip Generation Estimate

	ITE Code	Size (sq. ft.)	Weekday PM Peak Hour			Saturday Midday Peak Hour		
			Total	In	Out	Total	In	Out
Existing Site								
Existing Site Driveways[1]	-	-	945	435	510	970	490	480
Less Existing Library[2]	*590*	*22,123*	*(160)*	*(75)*	*(85)*	*(150)*	*(80)*	*(70)*
Less Existing Civic Uses[3]	*715*	*~10,000*	*(50)*	*(10)*	*(40)*	-	-	-
Total Existing Retail			**735**	**350**	**385**	**820**	**410**	**410**
Future Site								
Shopping Center	820	264,924[4]	1,225	600	625	1,615	840	775
Less Existing Retail Driveway Counts	-	-	*(735)*	*(350)*	*(385)*	*(820)*	*(410)*	*(410)*
Sub Total	-	-	490	250	240	795	430	365
Pass-by Trips (Weekday 34%, Sat. 26%)	-	-	*(160)*	*(80)*	*(80)*	*(190)*	*(95)*	*(95)*
Office	710	30,000	45	10	35	10	5	5
Net New Trips			**375**	**180**	**195**	**615**	**340**	**275**

[1]Represents the total site driveway counts during the weekday p.m. peak hour of 4:35-5:35 p.m. and Saturday midday peak hour of 12:10-1:10 p.m. This is the traffic volume being generated by the existing 158,343 square feet of shopping center currently residing on the site.
[2]The library traffic counts were estimated using the *Library* land use in ITE Trip Generation.
[3]The City Hall traffic counts were estimated using the *Single Tenant Office Building* land use in ITE Trip Generation. The existing City Hall square footage was estimated to be approximately 10,000 square feet in size.
[4]Includes the 158,343 square feet of existing shopping center (minus the 96,799 square foot K-Mart and 4,800 square foot adult cabaret) plus the 208,180 square feet of proposed shopping center uses.

As shown in Table 2, the combined 264,180 square feet of shopping center use is estimated to generate 1,225 weekday p.m. peak hour trips and 1,615 Saturday midday peak hour trips, respectfully. To check the validity of this methodology, weekday p.m. and Saturday midday peak hour traffic counts were taken at the previously developed 215,000 square foot Nyberg Woods shopping center on the east side of I-5. Based on these counts, it was determined that this shopping center is generating approximately 3.76 trips/1,000 square feet during the weekday p.m. peak hour and 4.76 trips/1,000 square feet during the Saturday midday peak period. Applying these rates to proposed addition of 208,180 square feet of new retail space indicates that the proposed trip generation methodology is consistent with or more conservative than actual trip generation observations at similar retail centers.

Exhibit 1
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Appendix B
Traffic Count Data

Exhibit 1
Attachment L

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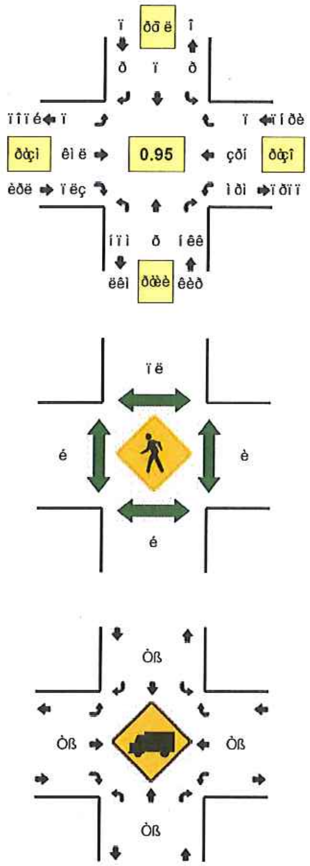
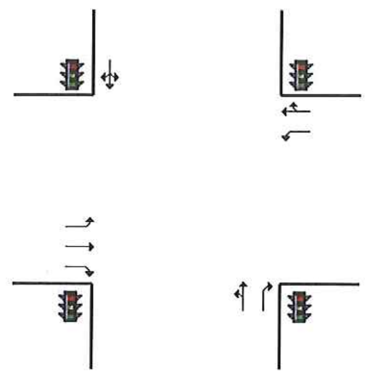
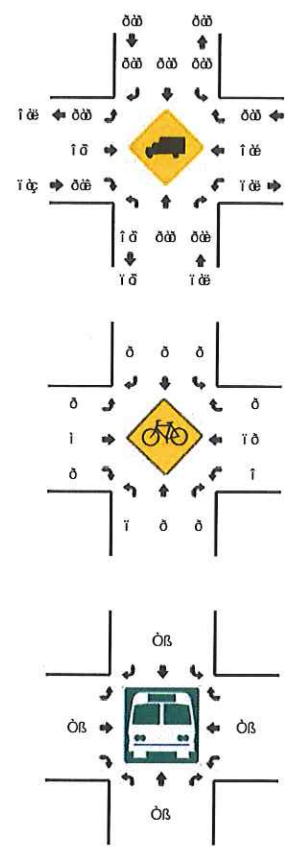
Peak 15-Min: 5:00 PM -- 5:15 PM







5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound) Left	Thru	Right	U	SW Martinazzi Ave (Southbound) Left	Thru	Right	U	SW Boones Ferry Rd (Eastbound) Left	Thru	Right	U	SW Boones Ferry Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
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Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
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Comments: Ò

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

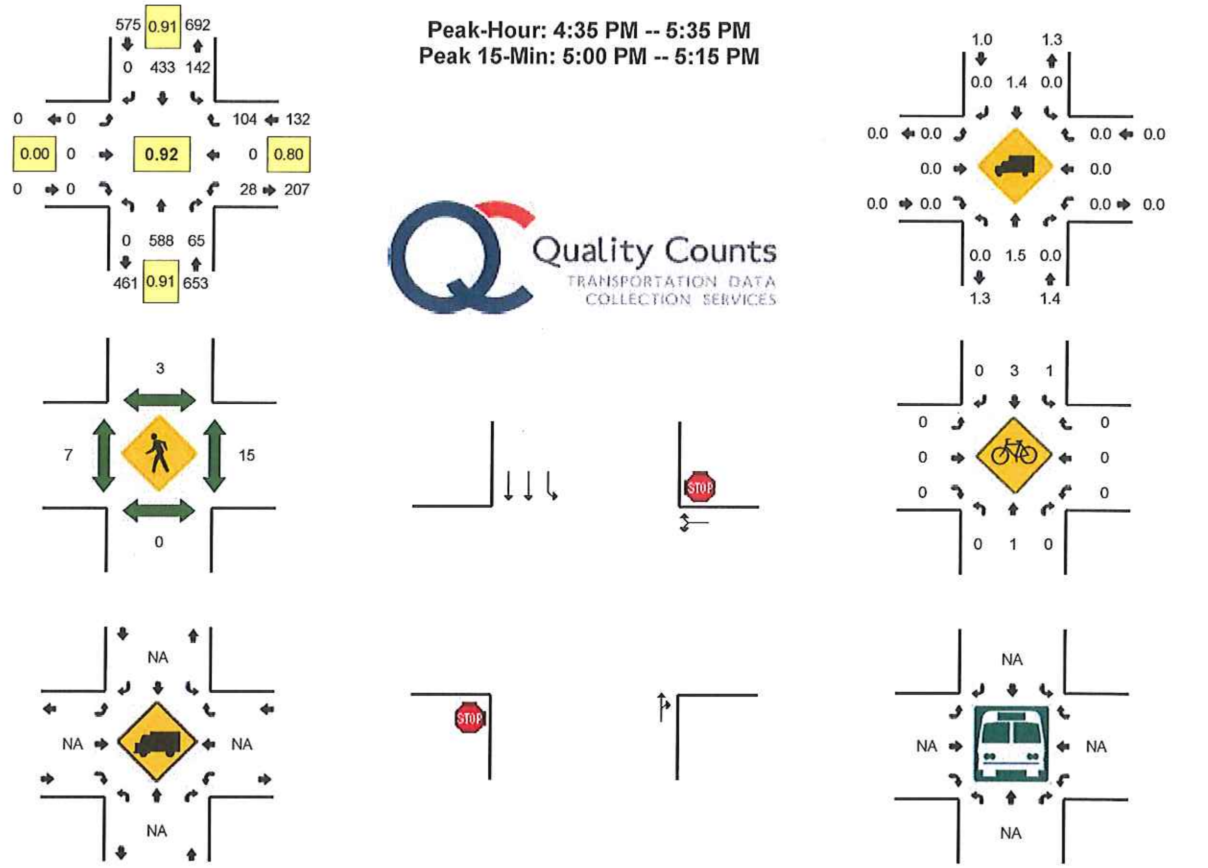
Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- Existing Site Dwy near City Hall

QC JOB #: 10772123

CITY/STATE: Tualatin, OR

DATE: Tue, Jun 05 2012



5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				Existing Site Dwy near City Hall (Eastbound)				Existing Site Dwy near City Hall (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	39	8	0	14	30	0	0	0	0	0	0	3	0	8	0	102	1149
4:05 PM	0	57	6	0	14	18	0	0	0	0	0	0	3	0	11	0	109	1166
4:10 PM	0	54	5	0	8	30	0	0	0	0	0	0	5	0	14	0	116	1192
4:15 PM	0	50	3	0	13	34	0	0	0	0	0	0	1	0	9	0	110	1208
4:20 PM	0	42	9	0	11	25	0	0	0	0	0	0	4	0	6	0	97	1210
4:25 PM	0	48	7	0	11	26	0	0	0	0	0	0	2	0	14	0	108	1226
4:30 PM	0	37	8	0	12	32	0	0	0	0	0	0	4	0	5	0	98	1228
4:35 PM	0	58	3	0	13	27	0	0	0	0	0	0	3	0	18	0	122	1252
4:40 PM	0	47	5	0	15	35	0	0	0	0	0	0	0	0	10	0	112	1275
4:45 PM	0	37	5	0	12	40	0	0	0	0	0	0	0	0	8	0	102	1283
4:50 PM	0	42	6	0	10	37	0	0	0	0	0	0	2	0	11	0	108	1276
4:55 PM	0	50	3	0	14	27	0	0	0	0	0	0	2	0	9	0	105	1289
5:00 PM	0	54	5	0	13	43	0	0	0	0	0	0	4	0	9	0	128	1315
5:05 PM	0	47	7	0	7	40	0	0	0	0	0	0	3	0	14	0	118	1324
5:10 PM	0	59	7	0	14	41	0	0	0	0	0	0	0	0	1	0	122	1330
5:15 PM	0	49	10	0	14	30	0	0	0	0	0	0	3	0	8	0	114	1334
5:20 PM	0	44	6	0	11	38	0	0	0	0	0	0	2	0	8	0	109	1346
5:25 PM	0	52	4	0	10	40	0	0	0	0	0	0	4	0	3	0	113	1351
5:30 PM	0	49	4	0	9	35	0	0	0	0	0	0	5	0	5	0	107	1360
5:35 PM	0	57	5	0	9	32	0	0	0	0	0	0	2	0	5	0	110	1348
5:40 PM	0	46	6	0	9	35	0	0	0	0	0	0	4	0	10	0	110	1346
5:45 PM	0	48	4	0	4	35	0	0	0	0	0	0	5	0	7	0	103	1347
5:50 PM	0	47	4	0	6	39	0	0	0	0	0	0	3	0	5	0	104	1343
5:55 PM	0	44	3	0	9	20	0	0	0	0	0	0	0	0	7	0	83	1321

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	640	76	0	136	496	0	0	0	0	0	0	28	0	96	0	1472
Heavy Trucks	0	4	0		0	4	0		0	0	0		0	0	0		8
Pedestrians		0				0				4				12			16
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- SW Seneca St

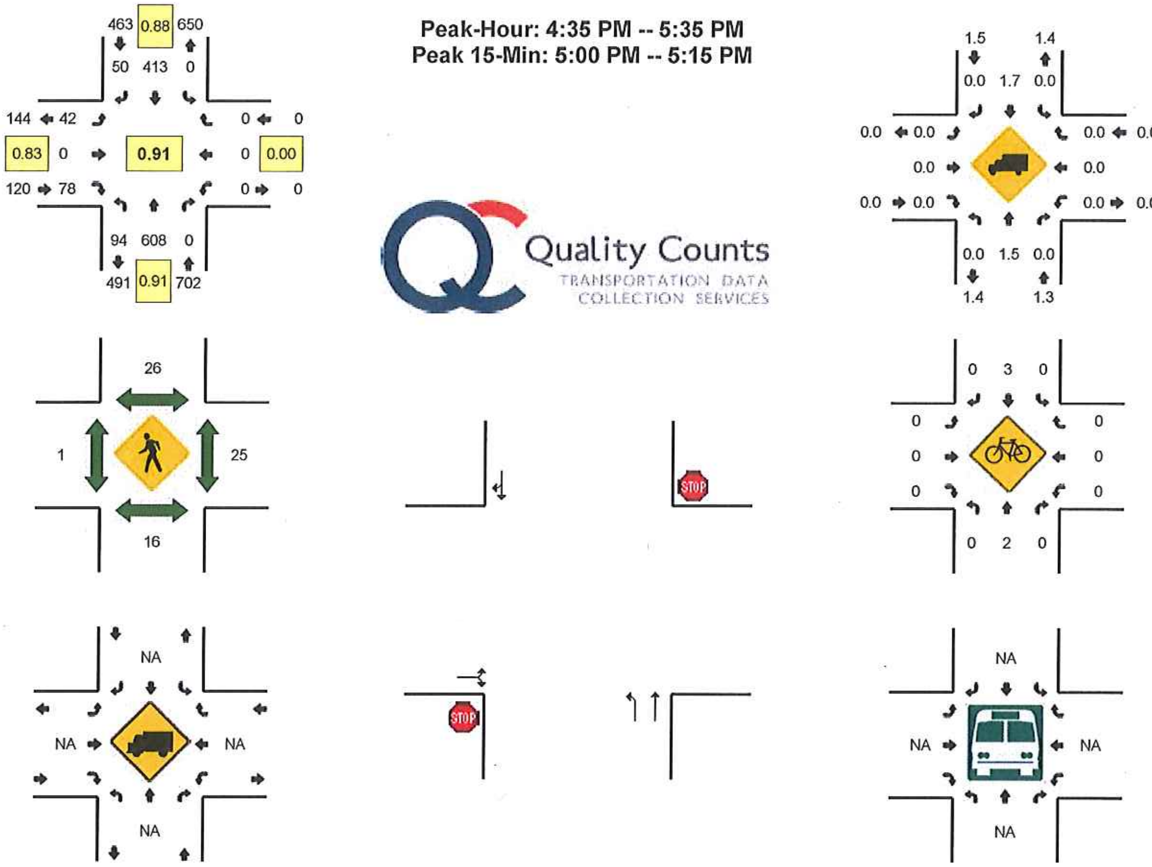
CITY/STATE: Tualatin, OR

QC JOB #: 10772121

DATE: Tue, Jun 05 2012

Peak-Hour: 4:35 PM -- 5:35 PM

Peak 15-Min: 5:00 PM -- 5:15 PM



5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				SW Seneca St (Eastbound)				SW Seneca St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	6	43	0	0	0	24	7	0	2	0	5	0	0	0	0	0	87	1076
4:05 PM	6	66	0	0	0	25	2	0	3	0	9	0	0	0	0	0	111	1101
4:10 PM	11	46	0	0	0	29	4	0	3	0	5	0	0	0	0	0	98	1109
4:15 PM	7	57	0	0	0	32	1	0	2	0	6	0	0	0	0	0	105	1130
4:20 PM	7	43	0	0	0	22	5	0	5	0	5	0	0	0	0	0	87	1128
4:25 PM	10	56	0	0	0	31	1	0	3	0	3	0	0	0	0	0	104	1140
4:30 PM	9	36	0	0	0	34	3	0	3	0	1	0	0	0	0	0	86	1130
4:35 PM	6	62	0	0	0	27	1	0	3	0	7	0	0	0	0	0	106	1153
4:40 PM	9	47	0	0	0	30	5	0	2	0	10	0	0	0	0	0	103	1174
4:45 PM	10	45	0	0	0	41	1	0	3	0	4	0	0	0	0	0	104	1186
4:50 PM	1	45	0	0	0	30	5	0	4	0	10	0	0	0	0	0	95	1179
4:55 PM	9	48	0	0	0	32	5	0	1	0	7	0	0	0	0	0	102	1188
5:00 PM	12	60	0	0	0	38	5	0	1	0	6	0	0	0	0	0	122	1223
5:05 PM	7	56	0	0	0	46	1	0	2	0	9	0	0	0	0	0	121	1233
5:10 PM	5	53	0	0	0	37	5	0	6	0	4	0	0	0	0	0	110	1245
5:15 PM	8	51	0	0	0	20	3	0	7	0	8	0	0	0	0	0	97	1237
5:20 PM	9	42	0	0	0	38	5	0	7	0	1	0	0	0	0	0	102	1252
5:25 PM	12	55	0	0	0	40	7	0	3	0	3	0	0	0	0	0	120	1268
5:30 PM	6	44	0	0	0	34	7	0	3	0	9	0	0	0	0	0	103	1285
5:35 PM	10	66	0	0	0	25	6	0	2	0	7	0	0	0	0	0	116	1295
5:40 PM	9	43	0	0	0	35	4	0	5	0	10	0	0	0	0	0	106	1298
5:45 PM	5	59	0	0	0	38	4	0	2	0	7	0	0	0	0	0	115	1309
5:50 PM	6	41	0	0	0	36	5	0	2	0	3	0	0	0	0	0	93	1307
5:55 PM	3	49	0	0	0	25	2	0	4	0	1	0	0	0	0	0	84	1289

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	96	676	0	0	0	484	44	0	36	0	76	0	0	0	0	0	1412
Heavy Trucks	0	4	0		0	8	0		0	0	0		0	0	0		12
Pedestrians		4				20				0				8			32
Bicycles	0	1	0		0	1	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments: N

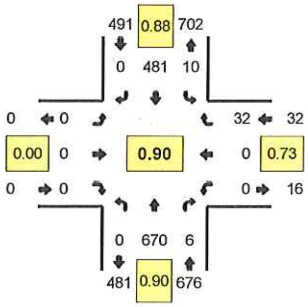
Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

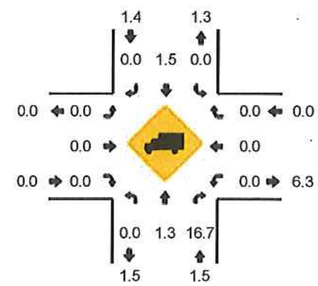
Exhibit 1
Attachment L

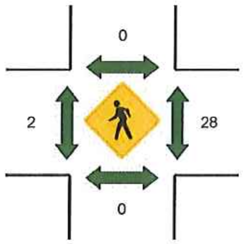
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

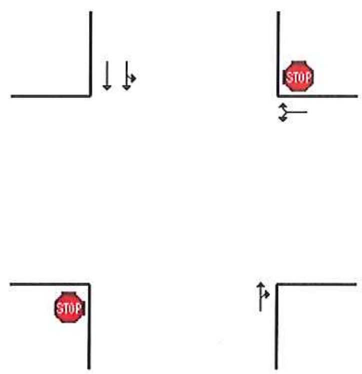
LOCATION: SW Martinazzi Ave -- Existing Site Dwy | **QC JOB #:** 10772119
CITY/STATE: Tualatin, OR | **DATE:** Tue, Jun 05 2012

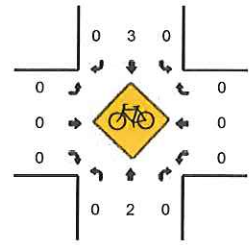


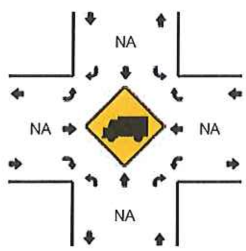
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

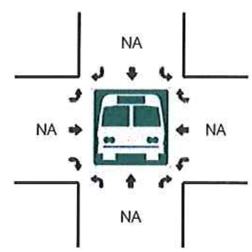












5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound) Left	Thru	Right	U	SW Martinazzi Ave (Southbound) Left	Thru	Right	U	Existing Site Dwy (Eastbound) Left	Thru	Right	U	Existing Site Dwy (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	48	0	0	0	29	0	0	0	0	0	0	0	0	1	0	78	978
4:05 PM	0	72	1	0	0	34	0	0	0	0	0	0	1	0	0	0	108	1007
4:10 PM	0	52	0	0	1	33	0	0	0	0	0	0	1	0	5	0	92	1013
4:15 PM	0	63	1	0	1	37	0	0	0	0	0	0	0	0	1	0	103	1044
4:20 PM	0	47	0	0	2	25	0	0	0	0	0	0	1	0	3	0	78	1037
4:25 PM	0	62	0	0	0	34	0	0	0	0	0	0	1	0	4	0	101	1054
4:30 PM	0	44	0	0	0	35	0	0	0	0	0	0	1	0	1	0	81	1051
4:35 PM	0	61	1	0	1	33	0	0	0	0	0	0	0	0	7	0	103	1075
4:40 PM	0	55	0	0	1	39	0	0	0	0	0	0	0	0	1	0	96	1095
4:45 PM	0	54	0	0	0	45	0	0	0	0	0	0	0	0	1	0	100	1117
4:50 PM	0	42	1	0	1	39	0	0	0	0	0	0	0	0	4	0	87	1113
4:55 PM	0	55	1	0	2	37	0	0	0	0	0	0	0	0	2	0	97	1124
5:00 PM	0	71	0	0	0	44	0	0	0	0	0	0	0	0	1	0	116	1162
5:05 PM	0	59	1	0	4	51	0	0	0	0	0	0	0	0	4	0	119	1173
5:10 PM	0	55	0	0	1	40	0	0	0	0	0	0	0	0	3	0	99	1180
5:15 PM	0	55	2	0	0	28	0	0	0	0	0	0	0	0	4	0	89	1166
5:20 PM	0	48	0	0	0	39	0	0	0	0	0	0	0	0	3	0	90	1178
5:25 PM	0	66	0	0	0	43	0	0	0	0	0	0	0	0	1	0	110	1187
5:30 PM	0	49	0	0	0	43	0	0	0	0	0	0	0	0	1	0	93	1199
5:35 PM	0	74	1	0	1	31	0	0	0	0	0	0	0	0	2	0	109	1205
5:40 PM	0	47	0	0	2	43	0	0	0	0	0	0	0	0	5	0	97	1206
5:45 PM	0	62	0	0	0	45	0	0	0	0	0	0	0	0	2	0	109	1215
5:50 PM	0	47	1	0	0	39	0	0	0	0	0	0	0	0	0	0	87	1215
5:55 PM	0	52	0	0	0	26	0	0	0	0	0	0	0	0	0	0	78	1196

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	740	4	0	20	540	0	0	0	0	0	0	0	0	32	0	1336
Heavy Trucks	0	4	0		0	8	0		0	0	0		0	0	0		12
Pedestrians		0				0				0				12			12
Bicycles	0	1	0		0	1	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- Existing Right-Out Only Dwy

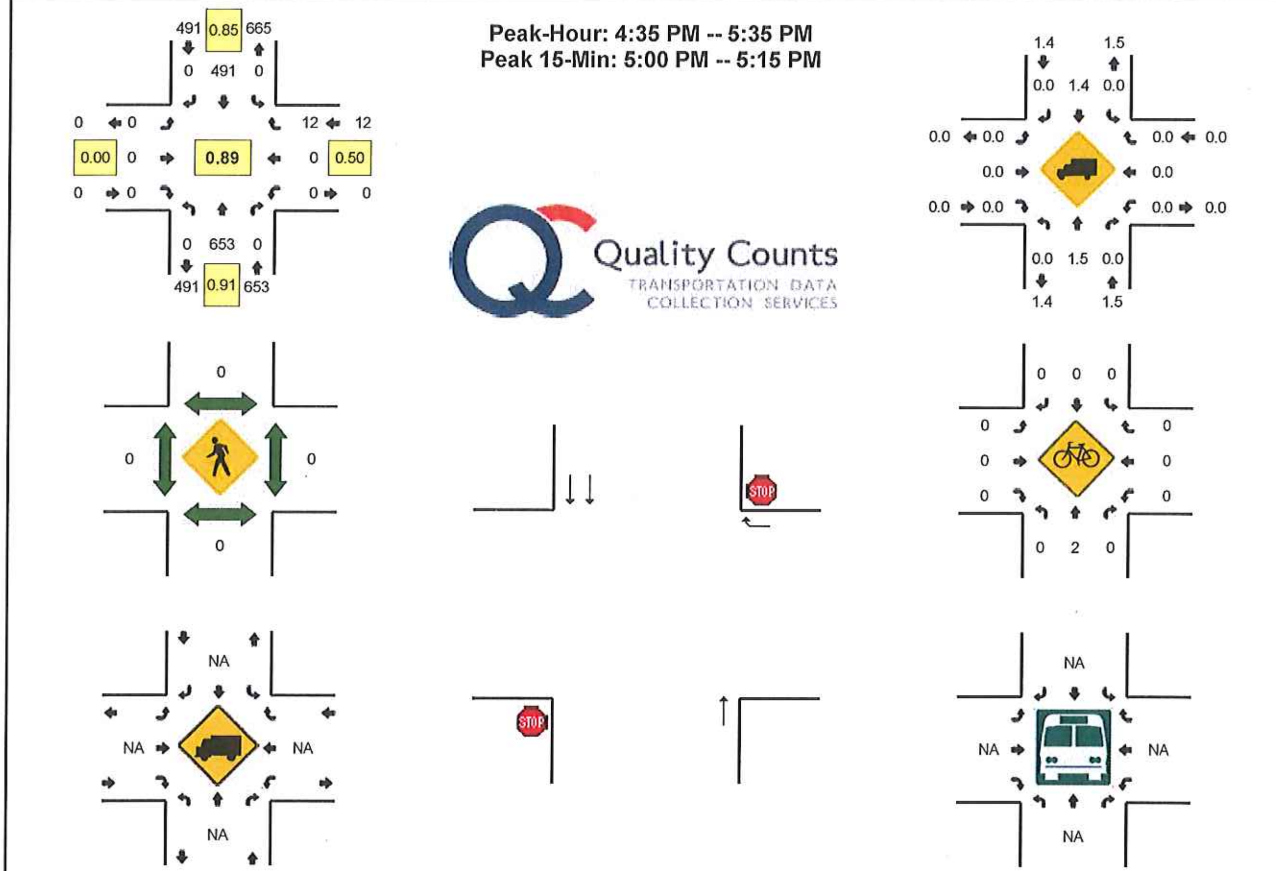
CITY/STATE: Tualatin, OR

QC JOB #: 10772117

DATE: Tue, Jun 05 2012

Peak-Hour: 4:35 PM -- 5:35 PM

Peak 15-Min: 5:00 PM -- 5:15 PM



5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				Existing Right-Out Only Dwy (Eastbound)				Existing Right-Out Only Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	51	0	0	0	28	0	0	0	0	0	0	0	0	0	0	79	962
4:05 PM	0	70	0	0	0	35	0	0	0	0	0	0	0	0	1	0	106	989
4:10 PM	0	50	0	0	0	34	0	0	0	0	0	0	0	0	0	0	84	990
4:15 PM	0	61	0	0	0	35	0	0	0	0	0	0	0	0	1	0	97	1018
4:20 PM	0	45	0	0	0	37	0	0	0	0	0	0	0	0	2	0	84	1009
4:25 PM	0	62	0	0	0	41	0	0	0	0	0	0	0	0	0	0	103	1027
4:30 PM	0	39	0	0	0	40	0	0	0	0	0	0	0	0	1	0	80	1029
4:35 PM	0	62	0	0	0	30	0	0	0	0	0	0	0	0	1	0	93	1041
4:40 PM	0	52	0	0	0	39	0	0	0	0	0	0	0	0	1	0	92	1059
4:45 PM	0	52	0	0	0	37	0	0	0	0	0	0	0	0	0	0	89	1074
4:50 PM	0	43	0	0	0	44	0	0	0	0	0	0	0	0	0	0	87	1080
4:55 PM	0	53	0	0	0	37	0	0	0	0	0	0	0	0	0	0	90	1084
5:00 PM	0	66	0	0	0	46	0	0	0	0	0	0	0	0	2	0	114	1119
5:05 PM	0	58	0	0	0	46	0	0	0	0	0	0	0	0	0	0	104	1117
5:10 PM	0	55	0	0	0	52	0	0	0	0	0	0	0	0	0	0	107	1140
5:15 PM	0	54	0	0	0	33	0	0	0	0	0	0	0	0	2	0	89	1132
5:20 PM	0	46	0	0	0	33	0	0	0	0	0	0	0	0	2	0	81	1129
5:25 PM	0	63	0	0	0	52	0	0	0	0	0	0	0	0	1	0	116	1142
5:30 PM	0	49	0	0	0	42	0	0	0	0	0	0	0	0	3	0	94	1156
5:35 PM	0	75	0	0	0	38	0	0	0	0	0	0	0	0	0	0	113	1176
5:40 PM	0	45	0	0	0	38	0	0	0	0	0	0	0	0	0	0	83	1167
5:45 PM	0	60	0	0	0	47	0	0	0	0	0	0	0	0	0	0	107	1185
5:50 PM	0	48	0	0	0	37	0	0	0	0	0	0	0	0	0	0	85	1183
5:55 PM	0	51	0	0	0	29	0	0	0	0	0	0	0	0	0	0	80	1173

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	716	0	0	0	576	0	0	0	0	0	0	0	0	8	0	1300
Heavy Trucks	0	4	0		0	8	0		0	0	0		0	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- SW Tualatin-Sherwood Rd

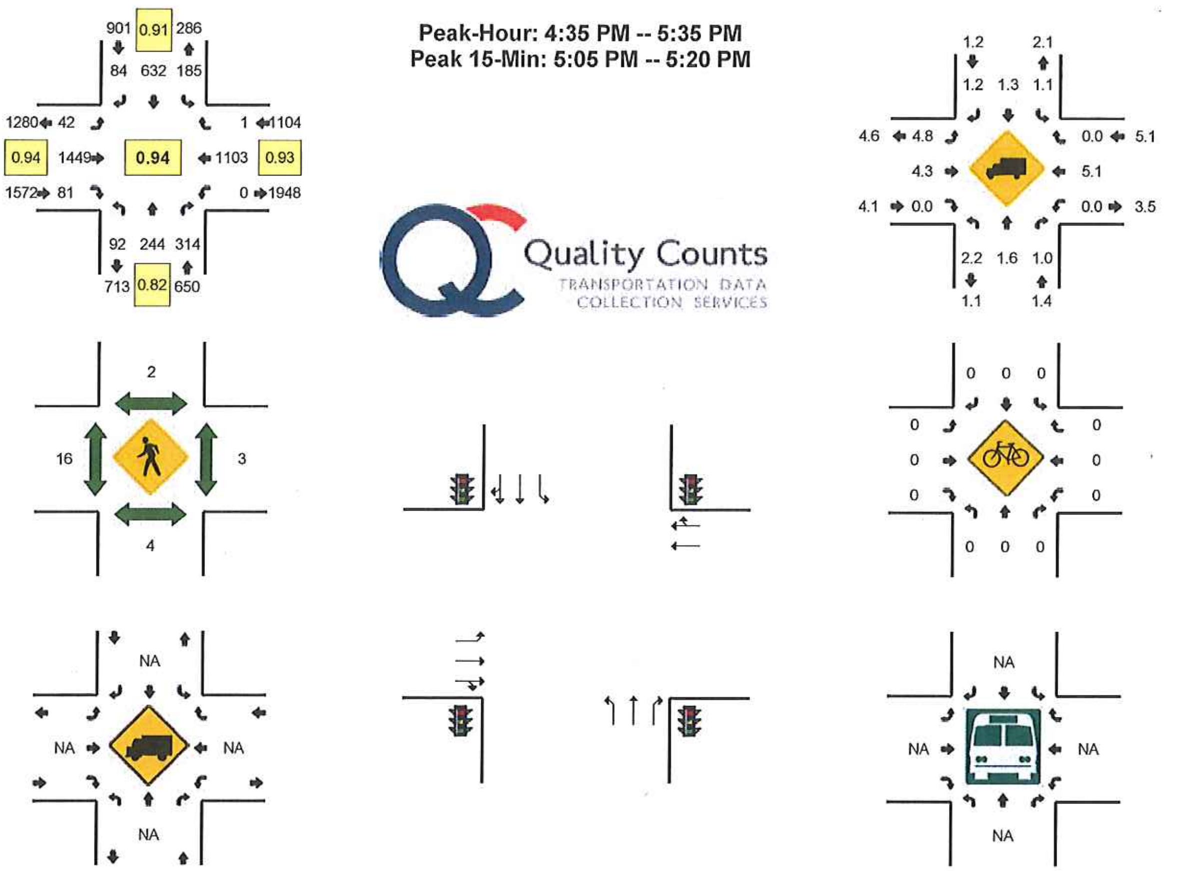
CITY/STATE: Tualatin, OR

QC JOB #: 10772115

DATE: Wed, Jun 06 2012

Peak-Hour: 4:35 PM -- 5:35 PM

Peak 15-Min: 5:05 PM -- 5:20 PM



5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	23	22	0	11	42	4	0	4	116	6	0	0	86	0	0	321	3812
4:05 PM	5	16	25	0	10	42	5	0	4	109	8	0	0	119	0	0	343	3845
4:10 PM	12	28	21	0	19	45	12	0	4	90	5	0	0	86	0	0	322	3893
4:15 PM	6	16	25	0	16	39	5	0	5	141	11	0	0	106	0	0	370	3950
4:20 PM	8	13	11	0	20	38	7	0	4	129	7	0	0	77	0	0	314	3971
4:25 PM	7	23	33	0	5	58	9	0	8	114	4	0	0	83	0	0	344	4000
4:30 PM	7	13	14	0	10	30	1	0	7	140	5	0	0	104	0	0	331	3990
4:35 PM	8	27	35	0	17	71	7	0	2	100	8	0	0	79	0	0	354	4039
4:40 PM	6	22	26	0	14	37	1	0	4	141	6	1	0	130	0	0	388	4058
4:45 PM	10	17	20	0	18	32	6	0	1	112	3	0	0	73	0	0	292	4061
4:50 PM	7	11	24	0	11	48	8	0	5	119	5	0	0	94	0	0	332	4060
4:55 PM	11	18	18	0	26	53	11	0	0	109	4	0	0	69	0	0	319	4030
5:00 PM	6	22	20	0	12	45	13	0	8	127	5	0	0	84	0	0	342	4051
5:05 PM	12	22	33	0	15	45	4	0	2	127	6	0	0	103	0	0	369	4077
5:10 PM	7	34	36	0	15	78	9	0	4	116	3	0	0	78	1	0	381	4136
5:15 PM	6	25	22	0	11	43	7	0	5	133	7	0	0	111	0	0	370	4136
5:20 PM	14	16	31	0	21	57	3	0	4	119	9	0	0	93	0	0	367	4189
5:25 PM	0	17	27	0	13	83	10	0	4	123	15	0	0	91	0	0	383	4228
5:30 PM	5	13	22	0	12	40	5	0	2	123	10	0	0	98	0	0	330	4227
5:35 PM	12	19	29	0	19	66	5	0	5	59	2	0	0	94	0	0	310	4183
5:40 PM	3	3	19	0	12	37	10	0	5	124	4	0	1	97	0	0	315	4110
5:45 PM	8	17	25	0	21	51	8	0	6	79	13	0	0	79	0	0	307	4125
5:50 PM	5	24	20	0	10	42	4	0	5	78	6	0	0	139	0	0	333	4126
5:55 PM	9	18	15	1	17	50	11	0	5	80	7	0	0	69	0	0	282	4089

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	100	324	364	0	164	664	80	0	44	1504	64	0	0	1168	4	0	4480
Heavy Trucks	0	4	4		0	4	0		4	40	0		0	68	0		124
Pedestrians		0				4				32				0			36
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

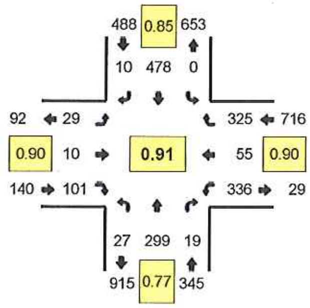
Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- SW Nyberg St

CITY/STATE: Tualatin, OR

QC JOB #: 10772113

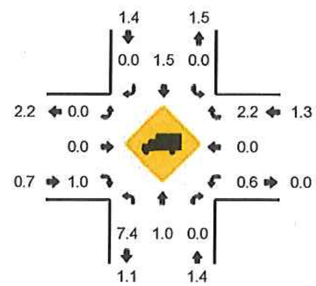
DATE: Tue, Jun 05 2012

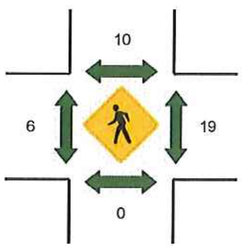


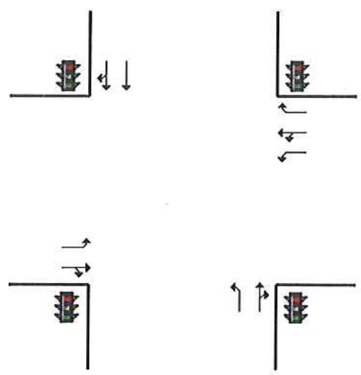
Peak-Hour: 4:35 PM -- 5:35 PM

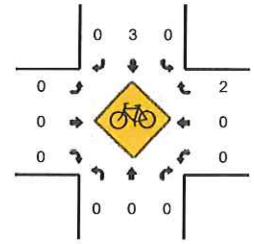
Peak 15-Min: 5:00 PM -- 5:15 PM

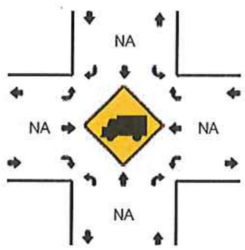
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

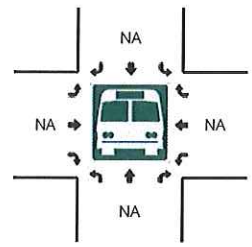












5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound) Left	Thru	Right	U	SW Martinazzi Ave (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	20	2	0	0	27	1	0	1	2	13	0	17	3	30	0	116	1367
4:05 PM	1	27	3	0	0	32	1	0	4	0	8	0	24	2	39	0	141	1392
4:10 PM	2	26	0	0	0	36	1	0	4	0	5	0	20	5	20	0	119	1395
4:15 PM	2	31	2	0	0	30	2	0	2	0	13	0	25	3	28	0	138	1424
4:20 PM	2	18	2	0	0	36	1	0	1	1	5	0	22	3	26	0	117	1417
4:25 PM	1	28	0	0	0	32	3	0	2	0	6	0	32	3	32	0	139	1445
4:30 PM	0	13	0	0	0	33	3	0	3	1	6	0	22	2	23	0	106	1441
4:35 PM	3	32	0	0	0	34	3	0	3	2	8	0	23	2	27	0	137	1466
4:40 PM	1	25	1	0	0	36	1	0	0	0	8	0	25	3	27	0	127	1489
4:45 PM	3	22	3	0	0	41	1	0	5	2	10	0	25	5	25	0	142	1536
4:50 PM	4	15	3	0	0	41	0	0	1	0	7	0	27	6	27	0	131	1547
4:55 PM	0	21	0	0	0	34	1	0	2	0	11	0	35	5	30	0	139	1552
5:00 PM	2	35	2	0	0	47	0	0	5	1	9	0	33	7	26	0	167	1603
5:05 PM	1	30	0	0	0	42	1	0	1	1	9	0	31	6	27	0	149	1611
5:10 PM	5	33	4	0	0	54	0	0	1	3	9	0	14	2	21	0	146	1638
5:15 PM	1	20	1	0	0	33	1	0	2	0	6	0	27	7	32	0	130	1630
5:20 PM	2	21	2	0	0	31	0	0	3	1	8	0	26	1	22	0	117	1630
5:25 PM	1	27	2	0	0	50	1	0	4	0	10	0	32	6	32	0	165	1656
5:30 PM	4	18	1	0	0	35	1	0	2	0	6	0	38	5	29	0	139	1689
5:35 PM	3	40	1	0	0	45	1	0	6	0	8	0	24	6	29	0	163	1715
5:40 PM	0	17	2	0	0	36	2	0	1	0	6	0	23	1	27	0	115	1703
5:45 PM	2	24	2	0	0	48	0	0	2	0	7	0	32	4	34	0	155	1716
5:50 PM	1	15	2	0	0	36	2	0	1	0	6	0	31	1	32	0	127	1712
5:55 PM	2	17	0	0	0	26	1	0	1	2	12	0	31	4	33	0	129	1702

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	32	392	24	0	0	572	4	0	28	20	108	0	312	60	296	0	1848
Heavy Trucks	0	0	0		0	12	0		0	0	0		4	0	4		20
Pedestrians		0				8				0				16			24
Bicycles	0	0	0		0	1	0		0	0	0		0	0	1		2
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

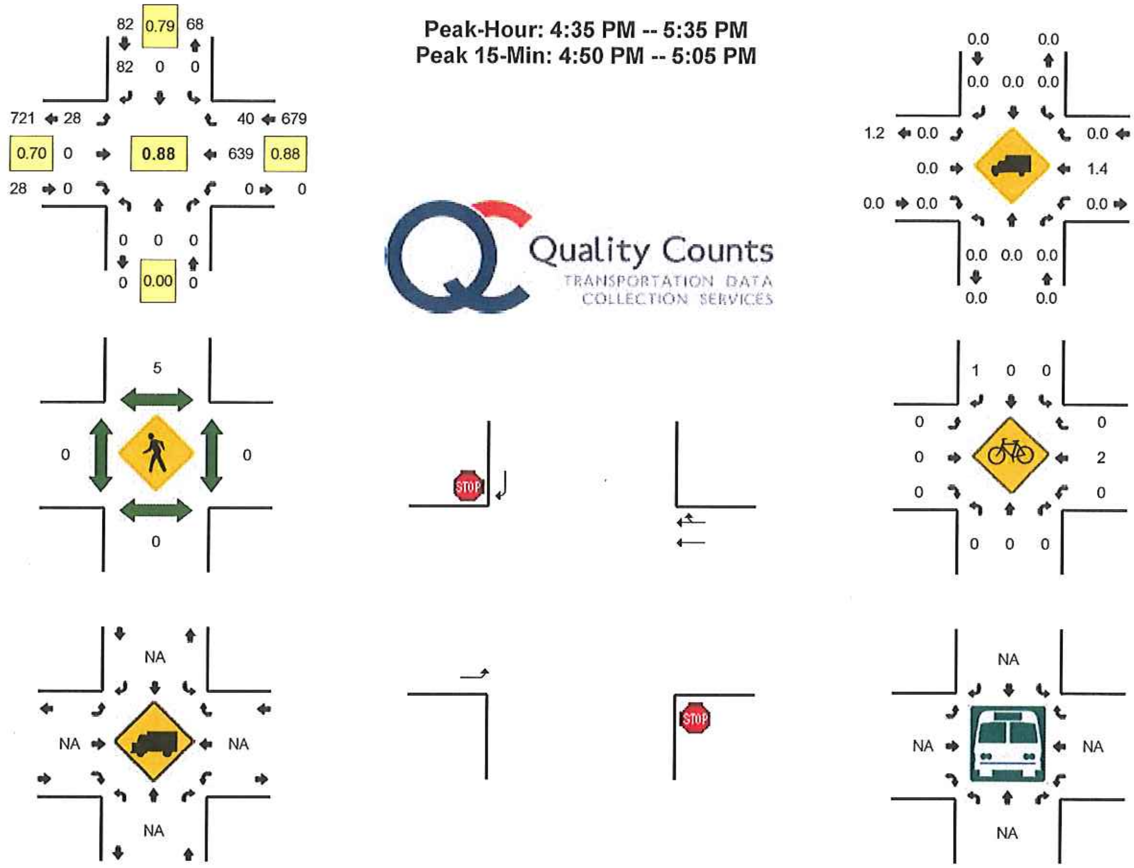
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Unsignalized Site Dwy -- SW Nyberg St
CITY/STATE: Tualatin, OR

QC JOB #: 10772111
DATE: Tue, Jun 05 2012

Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 4:50 PM -- 5:05 PM



5-Min Count Period Beginning At	Unsignalized Site Dwy (Northbound) Left	Thru	Right	U	Unsignalized Site Dwy (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	0	0	0	0	0	3	0	4	0	0	0	0	48	5	0	60	668
4:05 PM	0	0	0	0	0	0	13	0	3	0	0	0	0	51	5	0	72	696
4:10 PM	0	0	0	0	0	0	3	0	1	0	0	0	0	53	3	0	60	700
4:15 PM	0	0	0	0	0	0	7	0	1	0	0	0	0	46	1	0	55	700
4:20 PM	0	0	0	0	0	0	5	0	4	0	0	0	0	43	2	0	54	699
4:25 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	65	2	0	71	715
4:30 PM	0	0	0	0	0	0	3	0	1	0	0	0	0	45	7	0	56	722
4:35 PM	0	0	0	0	0	0	5	0	2	0	0	0	0	53	3	0	63	729
4:40 PM	0	0	0	0	0	0	8	0	1	0	0	0	0	40	3	0	52	729
4:45 PM	0	0	0	0	0	0	6	0	4	0	0	0	0	41	5	0	56	724
4:50 PM	0	0	0	0	0	0	7	0	3	0	0	0	0	62	4	0	76	736
4:55 PM	0	0	0	0	0	0	12	0	1	0	0	0	0	47	5	0	65	740
5:00 PM	0	0	0	0	0	0	7	0	3	0	0	0	0	72	2	0	84	764
5:05 PM	0	0	0	0	0	0	6	0	0	0	0	0	0	46	0	0	52	744
5:10 PM	0	0	0	0	0	0	2	0	6	0	0	0	0	53	8	0	69	753
5:15 PM	0	0	0	0	0	0	4	0	1	0	0	0	0	53	1	0	59	757
5:20 PM	0	0	0	0	0	0	7	0	3	0	0	0	0	39	3	0	52	755
5:25 PM	0	0	0	0	0	0	7	0	3	0	0	0	0	74	3	0	87	771
5:30 PM	0	0	0	0	0	0	11	0	1	0	0	0	0	59	3	0	74	789
5:35 PM	0	0	0	0	0	0	3	0	2	0	0	0	0	56	5	0	66	792
5:40 PM	0	0	0	0	0	0	5	0	2	0	0	0	0	53	4	0	64	804
5:45 PM	0	0	0	0	0	0	5	0	0	0	0	0	0	62	2	0	69	817
5:50 PM	0	0	0	0	0	0	3	0	2	0	0	0	0	68	6	0	79	820
5:55 PM	0	0	0	0	0	0	6	0	0	0	0	0	0	45	3	0	54	809

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	0	0	104	0	28	0	0	0	0	724	44	0	900
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	12	0		12
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

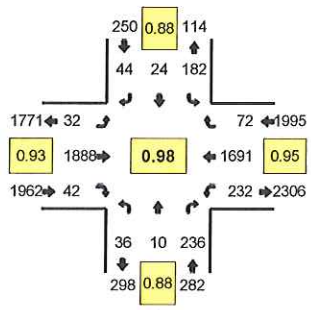
Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

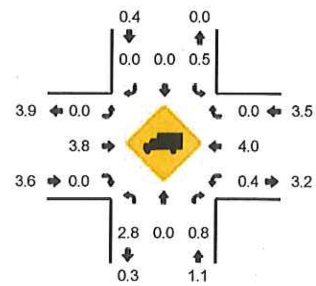
Method for determining peak hour: Total Entering Volume

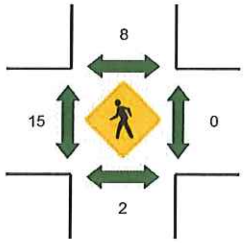
LOCATION: Fred Meyer/Site Dwy -- SW Nyberg St/SW Tualatin-Sherwood Rd
CITY/STATE: Tualatin, OR

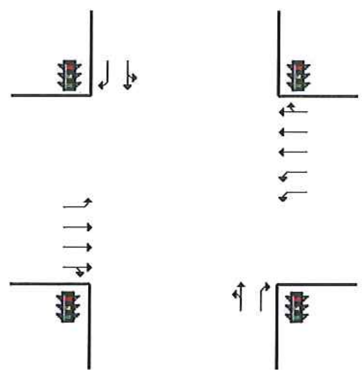
QC JOB #: 10772109
DATE: Tue, Jun 05 2012

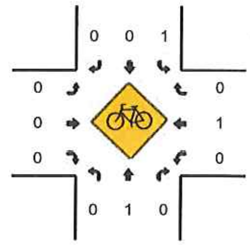


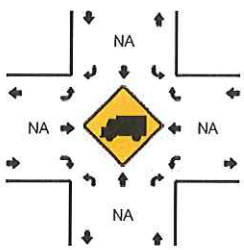
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:20 PM -- 5:35 PM

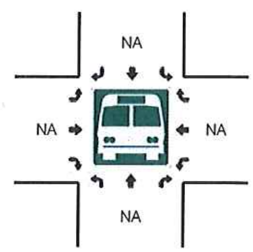












5-Min Count Period Beginning At	Fred Meyer/Site Dwy (Northbound) Left	Thru	Right	U	Fred Meyer/Site Dwy (Southbound) Left	Thru	Right	U	SW Nyberg St/SW Tualatin-Sherwood Rd (Eastbound) Left	Thru	Right	U	SW Nyberg St/SW Tualatin-Sherwood Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	5	3	15	0	15	1	1	0	1	133	0	0	16	115	6	0	311	4116
4:05 PM	4	0	20	0	15	1	7	0	1	178	0	0	12	137	9	0	384	4156
4:10 PM	2	3	25	0	19	3	3	0	1	124	8	0	26	133	6	0	353	4151
4:15 PM	2	2	26	0	9	5	6	0	1	176	9	0	23	150	6	0	415	4256
4:20 PM	4	5	27	0	6	4	3	0	6	133	0	1	28	138	11	0	366	4255
4:25 PM	2	1	17	0	26	1	6	0	4	140	3	0	12	134	13	0	359	4289
4:30 PM	3	0	15	0	7	2	2	0	1	180	8	0	16	162	5	0	401	4351
4:35 PM	4	1	27	0	19	2	4	0	3	134	2	0	26	117	11	0	350	4340
4:40 PM	1	2	16	0	7	0	2	0	5	185	5	0	7	168	4	0	402	4386
4:45 PM	2	2	24	0	19	2	3	0	2	143	4	0	24	123	5	0	353	4422
4:50 PM	3	3	16	0	15	2	2	0	5	176	2	0	13	145	5	0	387	4406
4:55 PM	2	0	26	0	15	1	3	0	2	149	2	0	21	150	6	0	377	4458
5:00 PM	7	0	23	0	20	3	3	0	5	155	2	0	14	137	4	0	373	4520
5:05 PM	0	0	17	0	16	3	3	0	2	162	1	0	19	135	5	0	363	4499
5:10 PM	2	1	23	0	12	2	3	0	1	155	5	0	27	150	3	0	384	4530
5:15 PM	0	1	10	0	13	2	3	0	2	162	5	0	16	132	5	0	351	4466
5:20 PM	5	0	25	0	13	2	4	0	0	141	3	0	22	137	7	0	359	4459
5:25 PM	7	0	16	0	20	4	10	0	1	144	4	0	17	143	10	0	376	4476
5:30 PM	3	0	13	0	13	1	4	0	4	182	7	0	26	154	7	0	414	4489
5:35 PM	1	1	17	0	12	2	5	0	0	124	3	0	26	138	6	0	335	4474
5:40 PM	1	2	11	0	16	0	2	0	5	156	5	0	17	163	8	0	386	4458
5:45 PM	3	1	18	0	16	2	0	0	2	132	5	1	26	164	5	0	375	4480
5:50 PM	4	3	11	0	8	6	6	0	4	117	2	0	9	155	3	0	328	4421
5:55 PM	2	1	19	0	5	1	4	0	2	126	4	0	26	135	6	0	331	4375

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	60	0	216	0	184	28	72	0	20	1868	56	0	260	1736	96	0	4596
Heavy Trucks	0	0	0		0	0	0		0	112	0		0	60	0		172
Pedestrians		0				24				28				0			52
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW 75th Ave -- SW Nyberg St

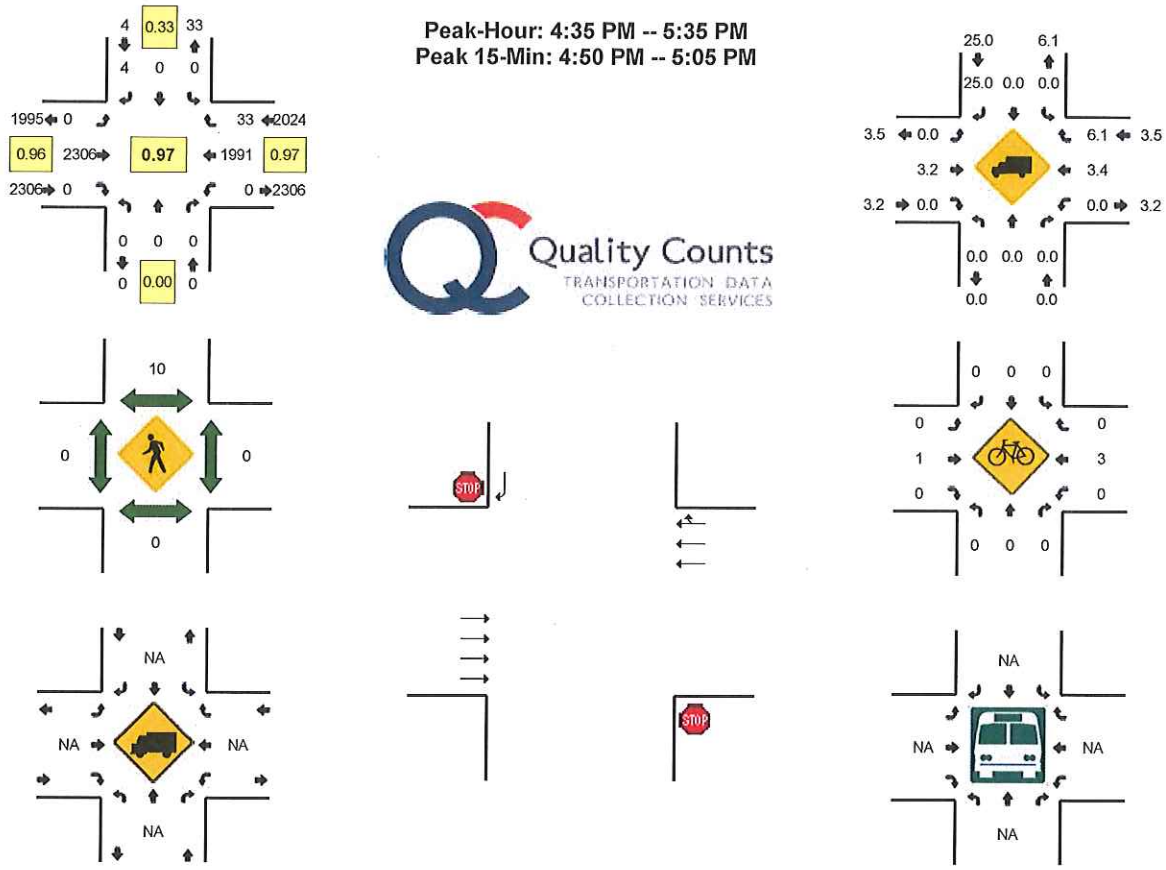
CITY/STATE: Tualatin, OR

QC JOB #: 10772107

DATE: Tue, Jun 05 2012

Peak-Hour: 4:35 PM -- 5:35 PM

Peak 15-Min: 4:50 PM -- 5:05 PM



5-Min Count Period Beginning At	SW 75th Ave (Northbound) Left	Thru	Right	U	SW 75th Ave (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	0	0	0	0	0	1	0	0	163	0	0	0	149	5	0	318	4008
4:05 PM	0	0	0	0	0	0	1	0	0	213	0	0	0	149	6	0	369	4056
4:10 PM	0	0	0	0	0	0	0	0	0	168	0	0	0	177	9	0	354	4060
4:15 PM	0	0	0	0	0	0	0	0	0	211	0	0	0	167	5	0	383	4136
4:20 PM	0	0	0	0	0	0	0	0	0	166	0	0	0	164	3	0	333	4126
4:25 PM	0	0	0	0	0	0	1	0	0	183	0	0	0	184	1	0	369	4172
4:30 PM	0	0	0	0	0	0	0	0	0	202	0	0	0	170	1	0	373	4213
4:35 PM	0	0	0	0	0	0	0	0	0	180	0	0	0	181	1	0	362	4218
4:40 PM	0	0	0	0	0	0	0	0	0	208	0	0	0	156	4	0	368	4257
4:45 PM	0	0	0	0	0	0	0	0	0	186	0	0	0	153	5	0	344	4266
4:50 PM	0	0	0	0	0	0	0	0	0	207	0	0	0	171	4	0	382	4259
4:55 PM	0	0	0	0	0	0	1	0	0	190	0	0	0	174	2	0	367	4322
5:00 PM	0	0	0	0	0	0	1	0	0	198	0	0	0	167	3	0	369	4373
5:05 PM	0	0	0	0	0	0	1	0	0	195	0	0	0	153	2	0	351	4355
5:10 PM	0	0	0	0	0	0	0	0	0	190	0	0	0	169	5	0	364	4365
5:15 PM	0	0	0	0	0	0	0	0	0	185	0	0	0	158	4	0	347	4329
5:20 PM	0	0	0	0	0	0	1	0	0	179	0	0	0	152	1	0	333	4329
5:25 PM	0	0	0	0	0	0	0	0	0	180	0	0	0	171	1	0	352	4312
5:30 PM	0	0	0	0	0	0	0	0	0	208	0	0	0	186	1	0	395	4334
5:35 PM	0	0	0	0	0	0	0	0	0	153	0	0	0	167	4	0	324	4296
5:40 PM	0	0	0	0	0	0	0	0	0	183	0	0	0	180	6	0	369	4297
5:45 PM	0	0	0	0	0	0	2	0	0	166	0	0	0	196	5	0	369	4322
5:50 PM	0	0	0	0	0	0	0	0	0	136	0	0	0	168	2	0	306	4246
5:55 PM	0	0	0	0	0	0	0	0	0	150	0	0	0	163	2	0	315	4194

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	0	0	8	0	0	2380	0	0	0	2048	36	0	4472
Heavy Trucks	0	0	0		0	0	0		0	72	0		0	84	0		156
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	1	0		0	1	0		2
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

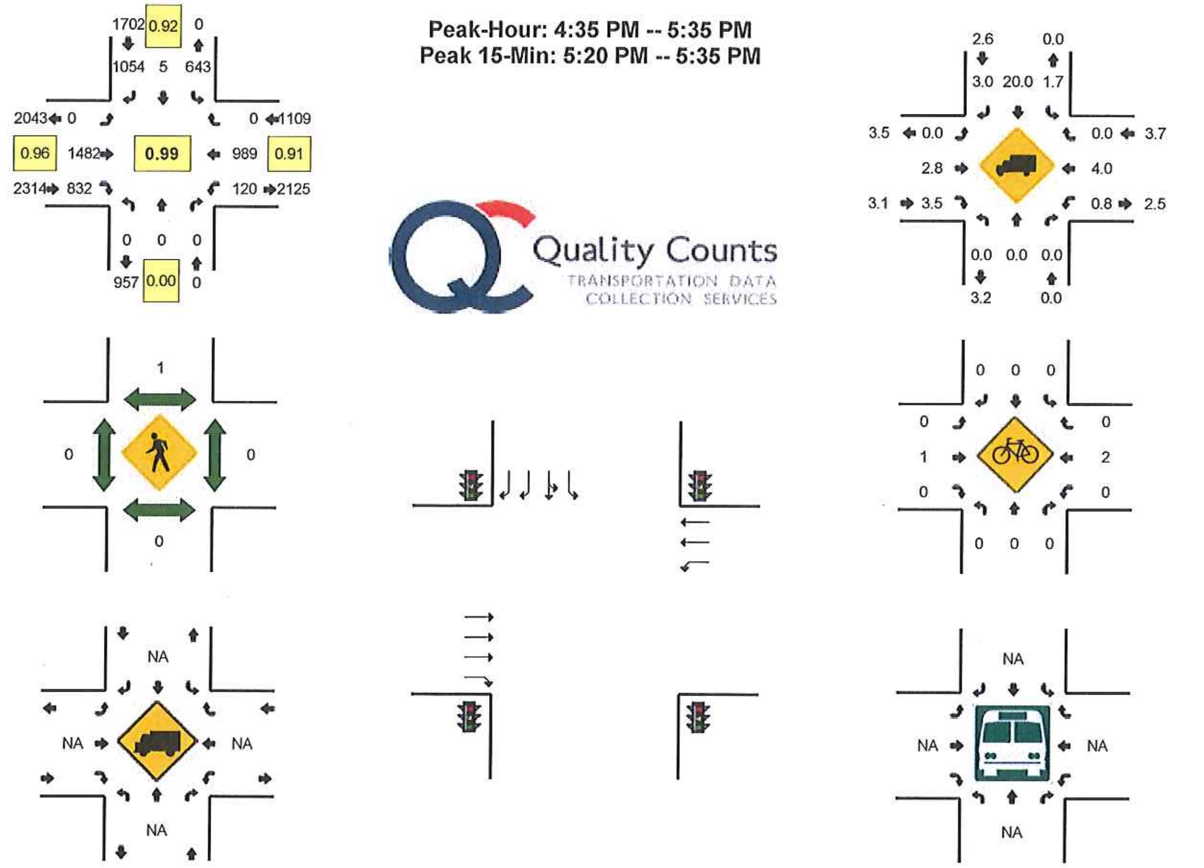
Exhibit 1

Attachment L

Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

LOCATION: I-5 SB Ramp Terminal -- SW Nyberg St | **QC JOB #:** 10772105
CITY/STATE: Tualatin, OR | **DATE:** Tue, Jun 05 2012

Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:20 PM -- 5:35 PM



5-Min Count Period Beginning At	I-5 SB Ramp Terminal (Northbound) Left	Thru	Right	U	I-5 SB Ramp Terminal (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	0	0	0	42	0	66	0	0	104	55	0	15	86	0	0	368	4708
4:05 PM	0	0	0	0	49	0	89	0	0	102	83	0	10	72	0	0	405	4759
4:10 PM	0	0	0	0	34	0	65	0	0	154	67	0	13	107	0	0	440	4797
4:15 PM	0	0	0	0	44	0	93	0	0	116	63	0	8	84	0	0	408	4837
4:20 PM	0	0	0	0	47	0	82	0	0	128	64	0	15	80	0	0	416	4856
4:25 PM	0	0	0	0	33	0	79	0	0	121	54	0	6	111	0	0	404	4851
4:30 PM	0	0	0	0	54	1	105	0	0	103	65	0	12	64	0	0	404	4855
4:35 PM	0	0	0	0	44	0	73	0	0	146	69	0	8	106	0	0	446	4902
4:40 PM	0	0	0	0	68	2	84	0	0	115	76	0	8	76	0	0	429	4917
4:45 PM	0	0	0	0	53	0	78	0	0	112	65	0	19	77	0	0	404	4908
4:50 PM	0	0	0	0	39	0	76	0	0	162	69	0	9	97	0	0	452	4950
4:55 PM	0	0	0	0	58	1	106	0	0	106	61	0	14	72	0	0	418	4994
5:00 PM	0	0	0	0	41	0	69	0	0	131	72	0	12	102	0	0	427	5053
5:05 PM	0	0	0	0	64	1	86	0	0	110	71	0	5	76	0	0	413	5061
5:10 PM	0	0	0	0	36	1	95	0	0	131	71	0	11	83	0	0	428	5049
5:15 PM	0	0	0	0	66	0	96	0	0	106	63	0	12	66	0	0	409	5050
5:20 PM	0	0	0	0	57	0	89	0	0	128	70	0	11	65	0	0	420	5054
5:25 PM	0	0	0	0	47	0	88	0	0	135	64	0	7	90	0	0	431	5081
5:30 PM	0	0	0	0	70	0	114	0	0	100	81	0	4	79	0	0	448	5125
5:35 PM	0	0	0	0	46	0	82	0	0	101	61	0	18	90	0	0	398	5077
5:40 PM	0	0	0	0	64	1	84	0	0	127	66	0	10	101	0	0	453	5101
5:45 PM	0	0	0	0	50	0	111	0	0	109	49	0	14	93	0	0	426	5123
5:50 PM	0	0	0	0	64	0	96	0	0	119	56	0	10	78	0	0	423	5094
5:55 PM	0	0	0	0	43	0	96	0	0	88	45	0	10	72	0	0	354	5030

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	696	0	1164	0	0	1452	860	0	88	936	0	0	5196
Heavy Trucks	0	0	0		24	0	32		0	48	44		4	28	0		180
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

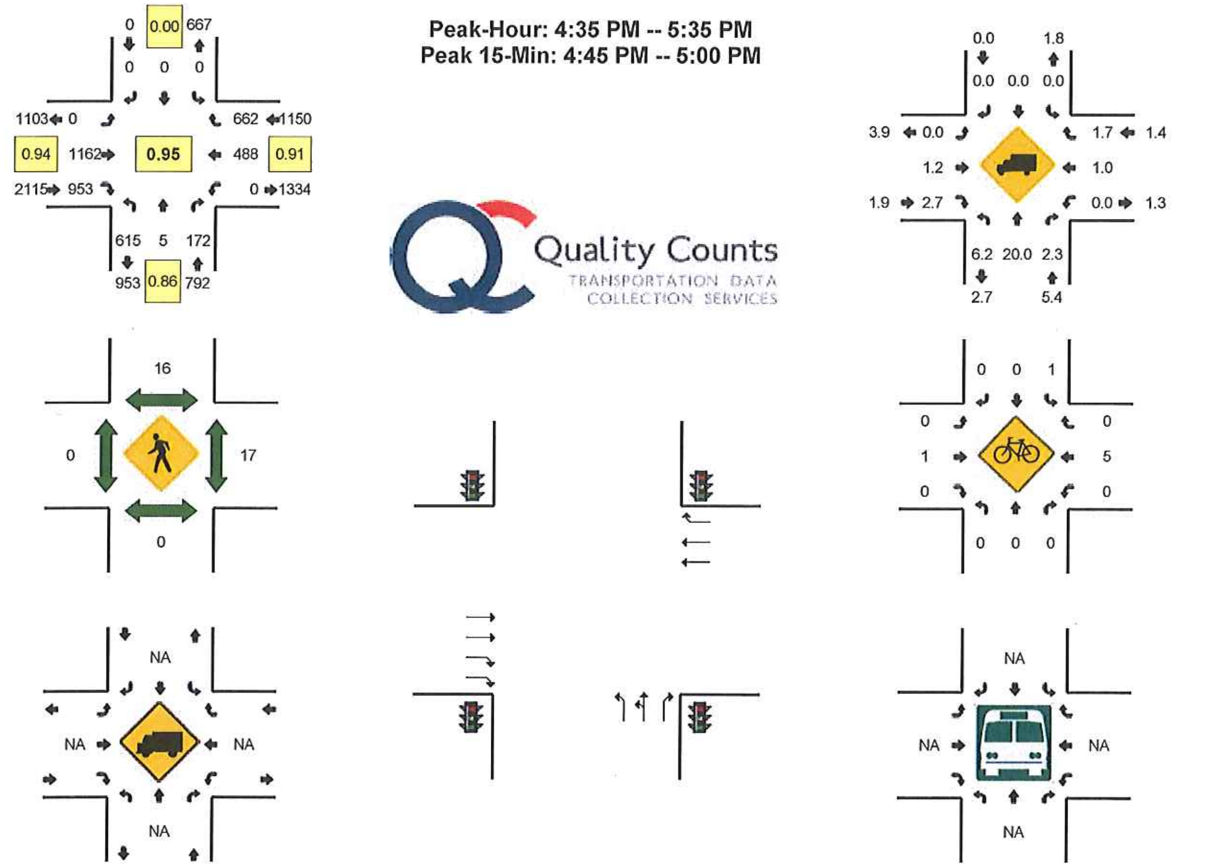
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined — Method for determining peak hour: Total Entering Volume

LOCATION: I-5 NB Ramp Terminal -- SW Nyberg St — **QC JOB #:** 10772103
CITY/STATE: Tualatin, OR — **DATE:** Tue, Jun 05 2012

Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 4:45 PM -- 5:00 PM



5-Min Count Period Beginning At	I-5 NB Ramp Terminal (Northbound) Left	Thru	Right	U	I-5 NB Ramp Terminal (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	35	0	14	0	0	0	0	0	0	85	74	0	0	45	46	0	299	3767
4:05 PM	51	0	9	0	0	0	0	0	0	92	54	0	0	41	48	0	295	3763
4:10 PM	60	0	11	0	0	0	0	0	0	77	102	0	0	57	56	0	363	3795
4:15 PM	44	0	8	0	0	0	0	0	0	69	90	0	0	39	52	0	302	3824
4:20 PM	96	0	12	0	0	0	0	0	0	76	84	0	0	27	46	0	341	3829
4:25 PM	46	1	12	0	0	0	0	0	0	89	85	0	0	39	52	0	324	3818
4:30 PM	61	0	12	0	0	0	0	0	0	84	72	0	0	33	46	0	308	3823
4:35 PM	63	1	10	0	0	0	0	0	0	82	96	0	0	33	46	0	331	3851
4:40 PM	46	0	15	0	0	0	0	0	0	118	67	0	0	49	60	0	355	3852
4:45 PM	67	1	10	0	0	0	0	0	0	80	85	0	0	39	56	0	338	3864
4:50 PM	39	0	21	0	0	0	0	0	0	108	101	0	0	41	65	0	375	3918
4:55 PM	75	1	16	0	0	0	0	0	0	96	77	0	0	30	64	0	359	3990
5:00 PM	43	0	8	0	0	0	0	0	0	92	88	0	0	52	55	0	338	4029
5:05 PM	49	0	20	0	0	0	0	0	0	106	68	0	0	37	62	0	342	4076
5:10 PM	51	0	7	0	0	0	0	0	0	78	91	0	0	50	59	0	336	4049
5:15 PM	30	0	5	0	0	0	0	0	0	104	62	0	0	49	56	0	306	4053
5:20 PM	46	1	16	0	0	0	0	0	0	99	78	0	0	31	58	0	329	4041
5:25 PM	54	1	17	0	0	0	0	0	0	88	79	0	0	41	47	0	327	4044
5:30 PM	52	0	27	0	0	0	0	0	0	111	61	0	0	36	34	0	321	4057
5:35 PM	72	0	25	0	0	0	0	0	0	75	64	0	0	40	44	0	320	4046
5:40 PM	57	0	23	0	0	0	0	0	0	114	83	0	0	49	48	0	374	4065
5:45 PM	70	0	17	0	0	0	0	0	0	92	57	0	0	35	47	0	318	4045
5:50 PM	39	0	10	0	0	0	0	0	0	113	81	0	0	44	52	0	339	4009
5:55 PM	45	0	17	0	0	0	0	0	0	76	53	0	0	35	52	0	278	3928

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	724	8	188	0	0	0	0	0	0	1136	1052	0	0	440	740	0	4288
Heavy Trucks	56	0	4		0	0	0		0	8	20		0	0	20		108
Pedestrians		0				4				0				4			8
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

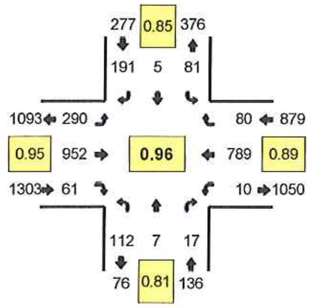
Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

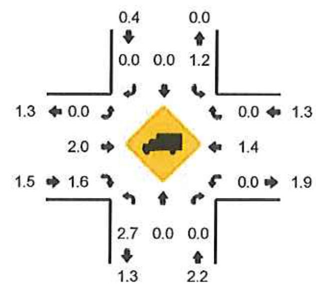
Method for determining peak hour: Total Entering Volume

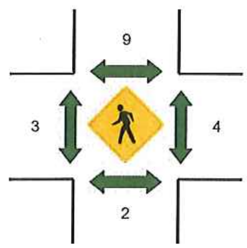
LOCATION: Signalized Entrance to Nyberg Woods -- SW Nyberg St
CITY/STATE: Tualatin, OR

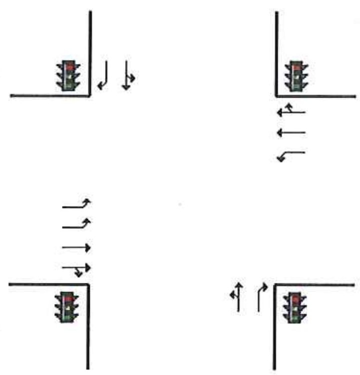
QC JOB #: 10772101
DATE: Tue, Jun 05 2012

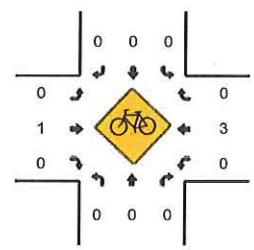


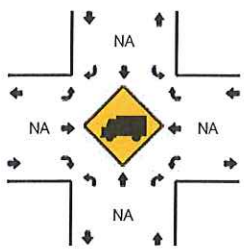
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

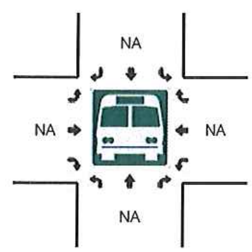












5-Min Count Period Beginning At	Signalized Entrance to Nyberg Woods (Northbound)				Signalized Entrance to Nyberg Woods (Southbound)				SW Nyberg St (Eastbound)				SW Nyberg St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	1	2	0	7	0	16	0	15	76	1	0	2	67	6	0	198	2420
4:05 PM	13	1	2	0	11	0	18	0	20	64	5	0	3	66	4	0	207	2443
4:10 PM	9	1	0	0	9	0	14	0	17	82	6	0	1	73	8	0	220	2454
4:15 PM	3	0	1	0	9	0	19	0	28	38	2	0	1	60	5	1	167	2439
4:20 PM	5	0	1	0	8	1	13	0	21	83	5	0	0	65	2	0	204	2445
4:25 PM	6	0	2	0	4	1	15	0	20	64	4	0	1	52	5	0	174	2382
4:30 PM	7	0	2	0	5	0	15	0	13	67	6	0	0	60	7	0	182	2375
4:35 PM	9	1	0	0	9	0	13	0	22	85	6	0	1	66	5	0	217	2400
4:40 PM	9	1	1	0	4	1	16	0	29	86	6	0	0	78	5	0	236	2415
4:45 PM	13	0	1	0	5	1	13	0	16	70	1	0	0	64	7	0	191	2386
4:50 PM	12	3	0	0	2	1	14	0	32	78	10	0	1	70	6	0	229	2427
4:55 PM	12	0	1	0	7	0	19	0	23	82	4	0	0	61	13	0	222	2447
5:00 PM	8	0	3	0	10	0	17	0	18	69	4	0	1	63	5	0	198	2447
5:05 PM	9	0	4	0	4	1	19	0	28	89	5	0	1	69	6	0	235	2475
5:10 PM	11	1	1	0	5	0	15	0	20	67	4	0	1	80	7	0	212	2467
5:15 PM	8	1	0	0	11	0	21	0	18	85	2	0	1	76	7	0	230	2530
5:20 PM	6	0	2	0	12	1	11	0	24	81	4	0	1	53	3	0	198	2524
5:25 PM	9	0	1	0	6	0	19	0	25	89	7	1	3	59	3	0	222	2572
5:30 PM	6	0	3	0	6	0	14	0	34	71	8	0	0	50	13	0	205	2595
5:35 PM	8	0	0	0	3	2	21	0	25	101	7	0	2	52	7	0	228	2606
5:40 PM	3	1	0	0	10	0	14	0	31	79	9	0	1	68	6	0	222	2592
5:45 PM	4	1	1	0	7	1	17	0	35	88	7	0	0	48	3	0	212	2613
5:50 PM	6	1	2	0	7	1	15	0	26	78	5	0	1	68	6	0	216	2600
5:55 PM	8	0	3	0	17	2	16	0	21	61	4	0	0	59	9	0	200	2578

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	112	8	20	0	80	4	220	0	264	964	44	0	12	900	80	0	2708
Heavy Trucks	0	0	0		0	0	0		0	12	0		0	20	0		32
Pedestrians		0				12				4				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

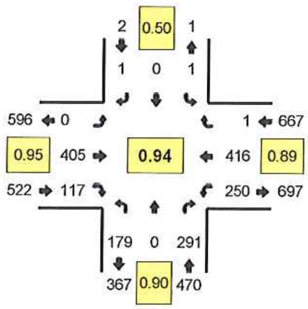
Type of peak hour being reported: User-Defined

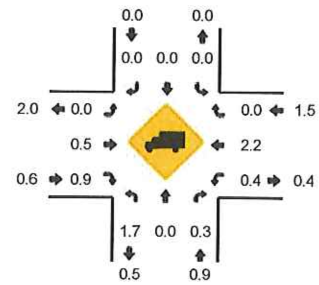
Method for determining peak hour: Total Entering Volume

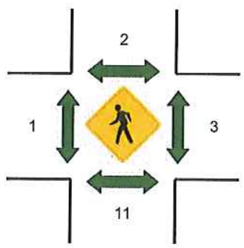
LOCATION: SW Martinazzi Ave -- SW Boones Ferry Rd
CITY/STATE: Tualatin, OR

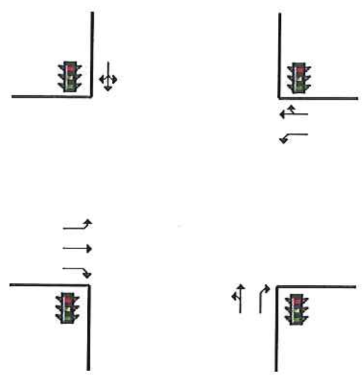
QC JOB #: 10772126
DATE: Sat, Jun 09 2012

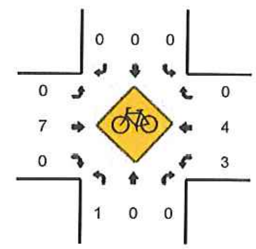
Peak-Hour: 12:10 PM -- 1:10 PM
Peak 15-Min: 12:50 PM -- 1:05 PM

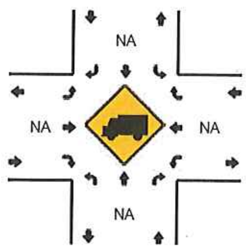


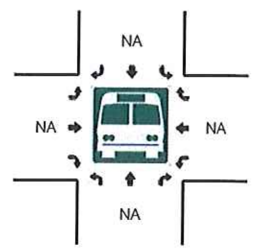












5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				SW Boones Ferry Rd (Eastbound)				SW Boones Ferry Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:40 AM	16	0	17	0	0	0	0	0	0	41	5	0	31	38	0	0	148	
11:45 AM	13	1	20	0	0	0	0	0	0	40	8	0	21	40	0	0	143	
11:50 AM	18	0	30	0	0	0	0	0	0	39	10	0	26	39	0	0	162	
11:55 AM	20	0	17	0	0	0	0	0	0	29	9	0	15	37	0	0	127	1525
12:00 PM	15	0	20	0	0	0	0	0	0	39	9	0	21	35	0	0	139	1560
12:05 PM	7	1	17	0	0	0	0	0	0	36	7	0	17	49	0	0	134	1576
12:10 PM	8	0	34	0	1	0	0	0	0	32	14	0	22	26	1	0	138	1603
12:15 PM	14	0	23	0	0	0	0	0	0	44	4	0	20	36	0	0	141	1631
12:20 PM	12	0	23	0	0	0	0	0	0	37	6	0	20	35	0	0	133	1635
12:25 PM	16	0	25	0	0	0	0	0	0	27	17	0	33	34	0	0	152	1663
12:30 PM	21	0	24	0	0	0	1	0	0	30	9	0	20	32	0	0	137	1690
12:35 PM	15	0	30	0	0	0	0	0	0	31	8	0	14	30	0	0	128	1682
12:40 PM	7	0	17	0	0	0	0	0	0	33	8	0	16	33	0	0	114	1648
12:45 PM	19	0	27	0	0	0	0	0	0	36	9	0	17	44	0	0	152	1657
12:50 PM	16	0	24	0	0	0	0	0	0	31	10	0	21	40	0	0	142	1637
12:55 PM	20	0	22	0	0	0	0	0	0	31	7	0	29	33	0	0	142	1652
1:00 PM	22	0	22	0	0	0	0	0	0	37	13	0	22	42	0	0	158	1671
1:05 PM	9	0	20	0	0	0	0	0	0	36	12	0	16	31	0	0	124	1661
1:10 PM	9	0	17	0	0	0	0	0	0	38	4	0	18	38	0	0	124	1647
1:15 PM	11	0	18	0	0	0	0	0	0	36	4	0	25	38	0	0	132	1638
1:20 PM	18	0	20	0	0	0	0	0	0	25	3	0	24	39	0	0	129	1634
1:25 PM	13	0	28	0	0	0	0	0	0	35	5	0	18	36	0	0	135	1617
1:30 PM	19	0	19	0	0	0	0	0	0	33	9	0	18	40	0	0	138	1618
1:35 PM	14	0	24	0	0	0	0	0	0	36	6	0	26	40	0	0	146	1636

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	232	0	272	0	0	0	0	0	0	396	120	0	288	460	0	0	1768
Heavy Trucks	8	0	4		0	0	0		0	0	0		0	12	0		24
Pedestrians		12				0				0				4			16
Bicycles	1	0	0		0	0	0		0	0	0		0	1	0		2
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:46 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- Existing Site Dwy near City Hall

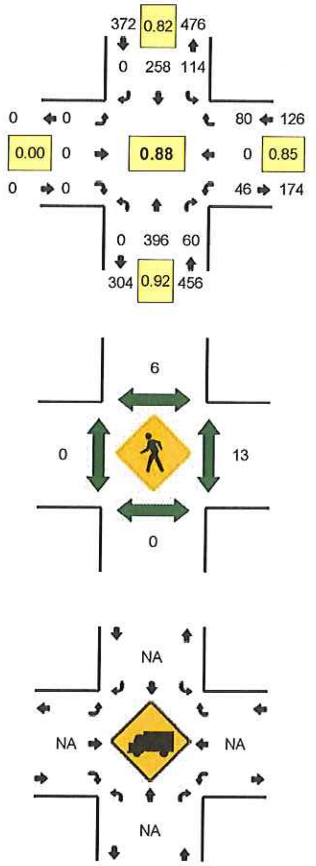
CITY/STATE: Tualatin, OR

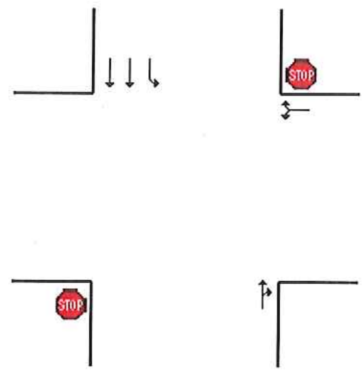
QC JOB #: 10772124

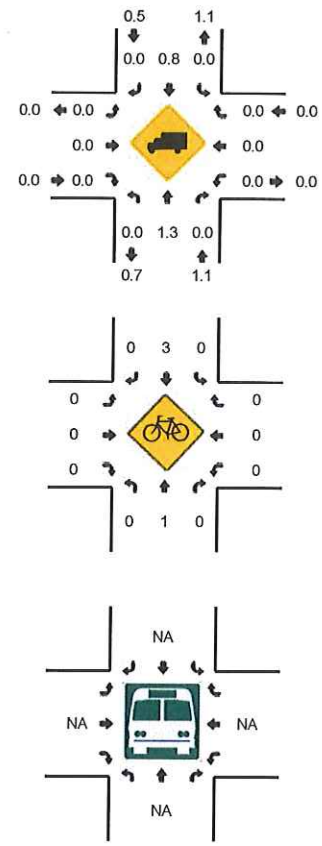
DATE: Sat, Jun 09 2012

Peak-Hour: 12:10 PM -- 1:10 PM

Peak 15-Min: 12:20 PM -- 12:35 PM







5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				Existing Site Dwy near City Hall (Eastbound)				Existing Site Dwy near City Hall (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:40 AM	0	31	10	0	11	22	0	0	0	0	0	0	2	0	5	0	81	
11:45 AM	0	32	7	0	8	21	0	0	0	0	0	0	2	0	5	0	75	
11:50 AM	0	31	5	0	13	23	0	0	0	0	0	0	4	0	8	0	84	
11:55 AM	0	32	4	0	7	17	0	0	0	0	0	0	2	0	7	0	69	831
12:00 PM	0	33	3	0	9	19	0	0	0	0	0	0	4	0	3	0	71	845
12:05 PM	0	23	4	0	7	22	0	0	0	0	0	0	2	0	4	0	62	843
12:10 PM	0	30	4	0	9	26	0	0	0	0	0	0	3	0	10	0	82	864
12:15 PM	0	35	9	0	8	14	0	0	0	0	0	0	3	0	6	0	75	877
12:20 PM	0	28	6	0	15	18	0	0	0	0	0	0	5	0	6	0	78	885
12:25 PM	0	38	6	0	17	28	0	0	0	0	0	0	4	0	11	0	104	913
12:30 PM	0	39	3	0	14	21	0	0	0	0	0	0	5	0	6	0	88	939
12:35 PM	0	34	4	0	6	17	0	0	0	0	0	0	4	0	6	0	71	940
12:40 PM	0	21	9	0	2	20	0	0	0	0	0	0	3	0	5	0	60	919
12:45 PM	0	38	2	0	7	18	0	0	0	0	0	0	6	0	6	0	77	921
12:50 PM	0	37	5	0	13	18	0	0	0	0	0	0	3	0	5	0	81	918
12:55 PM	0	32	5	0	8	28	0	0	0	0	0	0	3	0	9	0	85	934
1:00 PM	0	37	2	0	5	31	0	0	0	0	0	0	4	0	6	0	85	948
1:05 PM	0	27	5	0	10	19	0	0	0	0	0	0	3	0	4	0	68	954
1:10 PM	0	21	3	0	3	19	0	0	0	0	0	0	3	0	7	0	56	928
1:15 PM	0	25	5	0	7	25	0	0	0	0	0	0	1	0	6	0	69	922
1:20 PM	0	31	6	0	4	21	0	0	0	0	0	0	3	0	3	0	68	912
1:25 PM	0	34	5	0	7	16	0	0	0	0	0	0	4	0	9	0	75	883
1:30 PM	0	31	6	0	6	20	0	0	0	0	0	0	3	0	4	0	70	865
1:35 PM	0	33	5	0	11	22	0	0	0	0	0	0	4	0	7	0	82	876

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	420	60	0	184	268	0	0	0	0	0	0	56	0	92	0	1080
Heavy Trucks	0	4	0		0	4	0		0	0	0		0	0	0		8
Pedestrians		0				0				0				8			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:46 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- SW Seneca St

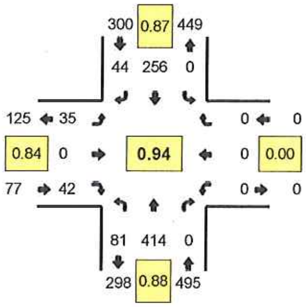
CITY/STATE: Tualatin, OR

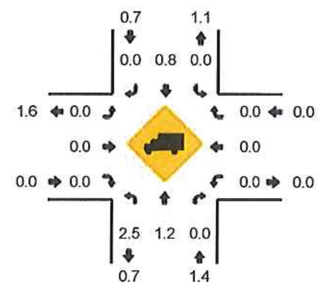
QC JOB #: 10772122

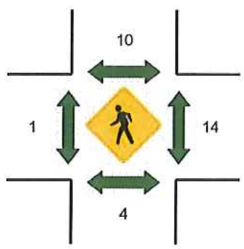
DATE: Sat, Jun 09 2012

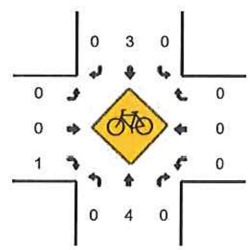
Peak-Hour: 12:10 PM -- 1:10 PM

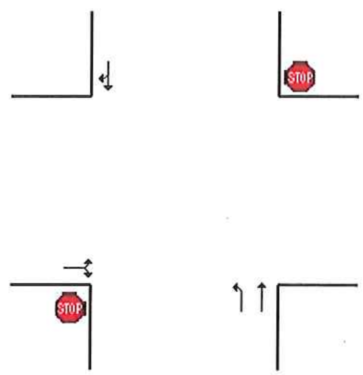
Peak 15-Min: 12:45 PM -- 1:00 PM

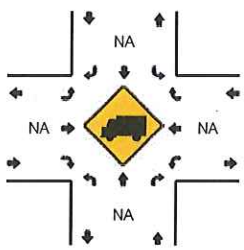


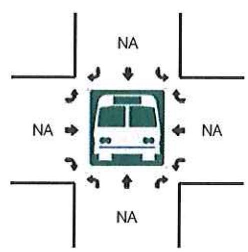












5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				SW Seneca St (Eastbound)				SW Seneca St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:40 AM	4	35	0	0	0	28	0	0	2	0	3	0	0	0	0	0	72	
11:45 AM	4	41	0	0	0	24	1	0	3	0	2	0	0	0	0	0	75	
11:50 AM	5	36	0	0	0	18	1	0	3	0	3	0	0	0	0	0	66	
11:55 AM	10	28	0	0	0	15	2	0	2	0	0	0	0	0	0	0	57	764
12:00 PM	5	32	0	0	0	23	5	0	3	0	7	0	0	0	0	0	75	776
12:05 PM	8	26	0	0	0	24	2	0	0	0	2	0	0	0	0	0	62	778
12:10 PM	10	35	0	0	0	22	2	0	4	0	6	0	0	0	0	0	79	801
12:15 PM	3	42	0	0	0	17	3	0	1	0	6	0	0	0	0	0	72	808
12:20 PM	5	29	0	0	0	19	3	0	4	0	2	0	0	0	0	0	62	816
12:25 PM	5	43	0	0	0	26	4	0	3	0	1	0	0	0	0	0	82	829
12:30 PM	8	33	0	0	0	21	3	0	3	0	5	0	0	0	0	0	73	845
12:35 PM	4	32	0	0	0	14	5	0	5	0	2	0	0	0	0	0	62	837
12:40 PM	3	25	0	0	0	22	5	0	4	0	1	0	0	0	0	0	60	825
12:45 PM	9	42	0	0	0	24	3	0	3	0	1	0	0	0	0	0	82	832
12:50 PM	6	41	0	0	0	21	0	0	1	0	5	0	0	0	0	0	74	840
12:55 PM	10	33	0	0	0	25	7	0	0	0	2	0	0	0	0	0	77	860
1:00 PM	8	33	0	0	0	23	4	0	1	0	7	0	0	0	0	0	76	861
1:05 PM	10	26	0	0	0	22	5	0	6	0	4	0	0	0	0	0	73	872
1:10 PM	5	28	0	0	0	15	3	0	2	0	4	0	0	0	0	0	57	850
1:15 PM	6	29	0	0	0	22	4	0	5	0	8	0	0	0	0	0	74	852
1:20 PM	8	33	0	0	0	21	3	0	3	0	5	0	0	0	0	0	73	863
1:25 PM	5	40	0	0	0	14	6	0	3	0	6	0	0	0	0	0	74	855
1:30 PM	7	26	0	0	0	19	4	0	1	0	6	0	0	0	0	0	63	845
1:35 PM	6	37	0	0	0	21	6	0	3	0	3	0	0	0	0	0	76	859

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	100	464	0	0	0	280	40	0	16	0	32	0	0	0	0	0	932
Heavy Trucks	4	16	0		0	0	0		0	0	0		0	0	0		20
Pedestrians		8				12				4				28			52
Bicycles	0	2	0		0	1	0		0	0	0		0	0	0		3
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:46 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

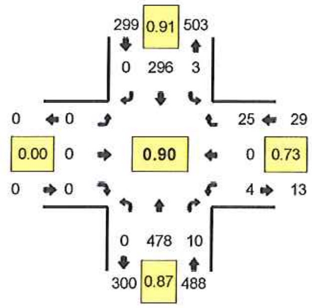
Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

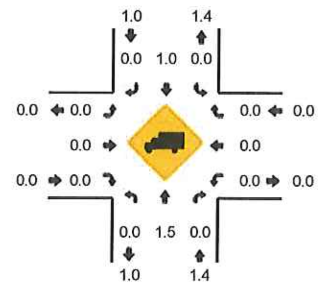
Method for determining peak hour: Total Entering Volume

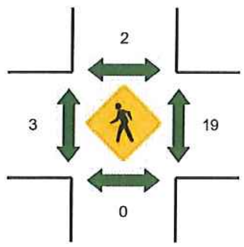
LOCATION: SW Martinazzi Ave -- Existing Site Dwy
CITY/STATE: Tualatin, OR

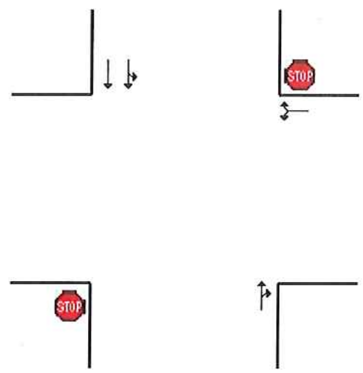
QC JOB #: 10772120
DATE: Sat, Jun 09 2012

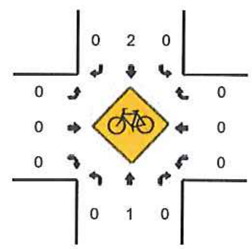


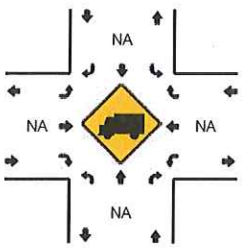
Peak-Hour: 12:10 PM -- 1:10 PM
Peak 15-Min: 12:45 PM -- 1:00 PM

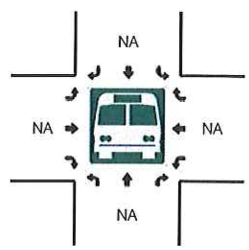












5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound) Left	Thru	Right	U	SW Martinazzi Ave (Southbound) Left	Thru	Right	U	Existing Site Dwy (Eastbound) Left	Thru	Right	U	Existing Site Dwy (Westbound) Left	Thru	Right	U	Total	Hourly Totals
11:40 AM	0	39	1	0	0	31	0	0	0	0	0	0	0	0	1	0	72	
11:45 AM	0	44	0	0	0	26	0	0	0	0	0	0	0	0	1	0	71	
11:50 AM	0	35	0	0	0	23	0	0	0	0	0	0	0	0	5	0	63	
11:55 AM	0	37	2	0	0	16	0	0	0	0	0	0	0	0	2	0	57	725
12:00 PM	0	35	1	0	0	29	0	0	0	0	0	0	1	0	3	0	69	738
12:05 PM	0	34	0	0	0	24	0	0	0	0	0	0	0	0	0	0	58	736
12:10 PM	0	41	1	0	0	28	0	0	0	0	0	0	0	0	2	0	72	761
12:15 PM	0	49	2	0	1	22	0	0	0	0	0	0	0	0	0	0	74	772
12:20 PM	0	33	1	0	1	21	0	0	0	0	0	0	1	0	1	0	58	781
12:25 PM	0	43	0	0	0	28	0	0	0	0	0	0	0	0	3	0	74	789
12:30 PM	0	37	1	0	0	25	0	0	0	0	0	0	0	0	4	0	67	800
12:35 PM	0	33	2	0	0	16	0	0	0	0	0	0	1	0	2	0	54	789
12:40 PM	0	31	0	0	0	24	0	0	0	0	0	0	0	0	1	0	56	773
12:45 PM	0	50	0	0	0	25	0	0	0	0	0	0	0	0	2	0	77	779
12:50 PM	0	45	1	0	1	25	0	0	0	0	0	0	0	0	4	0	76	792
12:55 PM	0	42	2	0	0	27	0	0	0	0	0	0	0	0	2	0	73	808
1:00 PM	0	37	0	0	0	29	0	0	0	0	0	0	1	0	2	0	69	808
1:05 PM	0	37	0	0	0	26	0	0	0	0	0	0	1	0	2	0	66	816
1:10 PM	0	26	0	0	0	19	0	0	0	0	0	0	0	0	2	0	47	791
1:15 PM	0	34	0	0	0	32	0	0	0	0	0	0	0	0	0	0	66	783
1:20 PM	0	43	1	0	0	26	0	0	0	0	0	0	1	0	0	0	71	796
1:25 PM	0	41	0	0	1	18	0	0	0	0	0	0	0	0	3	0	63	785
1:30 PM	0	33	0	0	0	25	0	0	0	0	0	0	1	0	1	0	60	778
1:35 PM	0	41	0	0	0	24	0	0	0	0	0	0	1	0	0	0	66	790

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	548	12	0	4	308	0	0	0	0	0	0	0	0	32	0	904
Heavy Trucks	0	20	0		0	0	0		0	0	0		0	0	0		20
Pedestrians		0				4				12				36			52
Bicycles	0	1	0		0	1	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments: N

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- Existing Right-Out Only Dwy

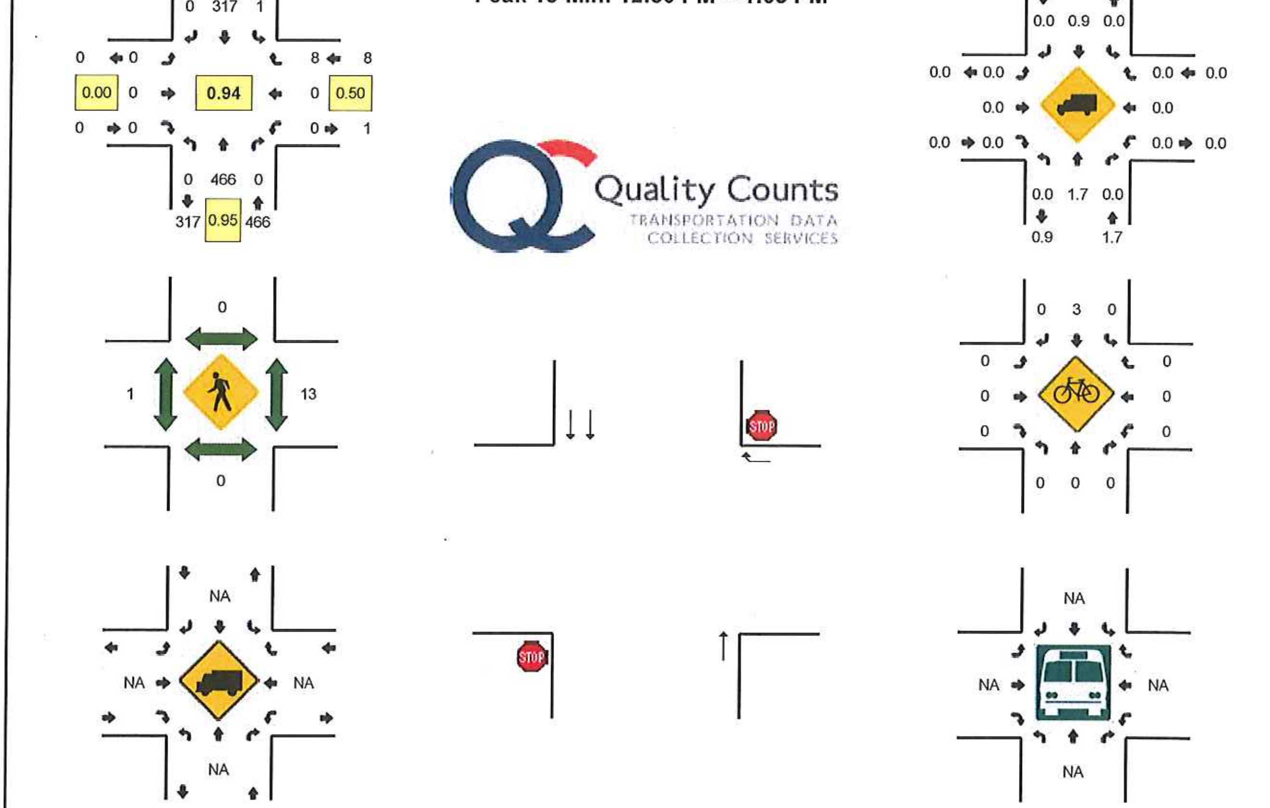
CITY/STATE: Tualatin, OR

QC JOB #: 10772118

DATE: Sat, Jun 09 2012

Peak-Hour: 12:10 PM -- 1:10 PM

Peak 15-Min: 12:50 PM -- 1:05 PM



5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound) Left	Thru	Right	U	SW Martinazzi Ave (Southbound) Left	Thru	Right	U	Existing Right-Out Only Dwy (Eastbound) Left	Thru	Right	U	Existing Right-Out Only Dwy (Westbound) Left	Thru	Right	U	Total	Hourly Totals
11:40 AM	0	35	0	0	0	30	0	0	0	0	0	0	0	0	0	0	65	
11:45 AM	0	42	0	0	0	25	0	0	0	0	0	0	0	0	1	0	68	
11:50 AM	0	35	0	0	0	23	0	0	0	0	0	0	0	0	0	0	58	
11:55 AM	0	37	0	0	0	17	0	0	0	0	0	0	0	0	2	0	56	707
12:00 PM	0	37	0	0	0	32	0	0	0	0	0	0	0	0	1	0	70	716
12:05 PM	0	31	0	0	0	27	0	0	0	0	0	0	0	0	0	0	58	717
12:10 PM	0	41	0	0	0	29	0	0	0	0	0	0	0	0	4	0	74	737
12:15 PM	0	44	0	0	0	21	0	0	0	0	0	0	0	0	0	0	65	744
12:20 PM	0	34	0	0	0	22	0	0	0	0	0	0	0	0	0	0	56	748
12:25 PM	0	43	0	0	0	28	0	0	0	0	0	0	0	0	0	0	71	761
12:30 PM	0	43	0	0	0	25	0	0	0	0	0	0	0	0	0	0	68	774
12:35 PM	0	29	0	0	0	18	0	0	0	0	0	0	0	0	0	0	47	756
12:40 PM	0	33	0	0	0	28	0	0	0	0	0	0	0	0	1	0	62	753
12:45 PM	0	43	0	0	0	27	0	0	0	0	0	0	0	0	1	0	71	756
12:50 PM	0	45	0	0	0	26	0	0	0	0	0	0	0	0	1	0	72	770
12:55 PM	0	33	0	0	0	24	0	0	0	0	0	0	0	0	0	0	57	771
1:00 PM	0	44	0	0	1	37	0	0	0	0	0	0	0	0	0	0	82	783
1:05 PM	0	34	0	0	0	32	0	0	0	0	0	0	0	0	1	0	67	792
1:10 PM	0	23	0	0	0	25	0	0	0	0	0	0	0	0	1	0	49	767
1:15 PM	0	33	0	0	0	31	0	0	0	0	0	0	0	0	1	0	65	767
1:20 PM	0	45	0	0	0	34	0	0	0	0	0	0	0	0	1	0	80	791
1:25 PM	0	37	0	0	0	20	0	0	0	0	0	0	0	0	3	0	60	780
1:30 PM	0	31	0	0	0	27	0	0	0	0	0	0	0	0	1	0	59	771
1:35 PM	0	43	0	0	0	27	0	0	0	0	0	0	0	0	3	0	73	797

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	488	0	0	4	348	0	0	0	0	0	0	0	0	4	0	844
Heavy Trucks	0	16	0		0	0	0		0	0	0		0	0	0		16
Pedestrians		0				0				4				24			28
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

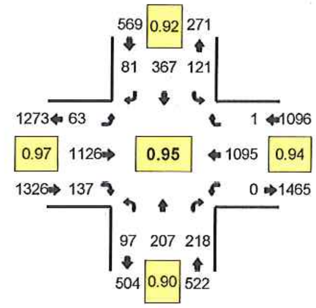
Report generated on 6/19/2012 3:46 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

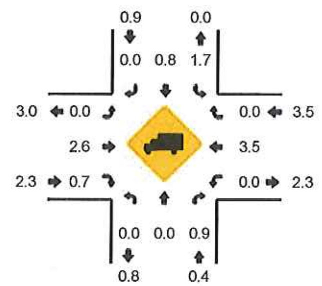
Exhibit 1
Attachment L

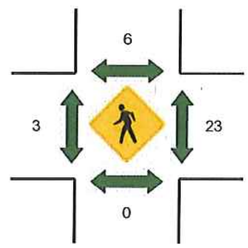
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

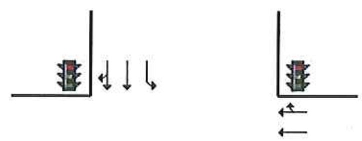
LOCATION: SW Martinazzi Ave -- SW Tualatin-Sherwood Rd | **QC JOB #:** 10772116
CITY/STATE: Tualatin, OR | **DATE:** Sat, Jun 09 2012

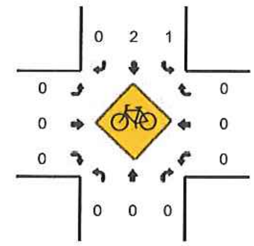


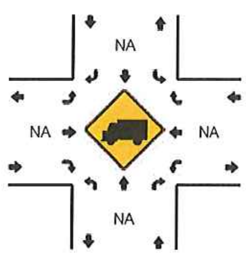
Peak-Hour: 12:10 PM -- 1:10 PM
Peak 15-Min: 12:25 PM -- 12:40 PM

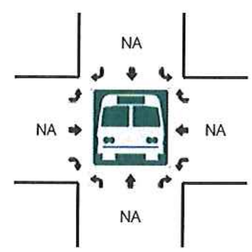












5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound) Left	Thru	Right	U	SW Martinazzi Ave (Southbound) Left	Thru	Right	U	SW Tualatin-Sherwood Rd (Eastbound) Left	Thru	Right	U	SW Tualatin-Sherwood Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
11:40 AM	8	25	16	0	11	29	9	0	6	84	10	0	0	82	0	0	280	
11:45 AM	6	14	27	0	10	38	6	0	7	83	9	0	0	100	0	0	300	
11:50 AM	12	20	20	0	9	26	9	0	5	111	21	0	0	80	0	0	313	
11:55 AM	6	14	23	0	8	24	8	0	6	87	7	0	0	104	0	0	287	3388
12:00 PM	14	10	19	0	10	30	9	0	1	97	14	0	0	85	1	0	290	3416
12:05 PM	3	17	23	0	8	35	9	0	1	88	7	0	0	86	0	0	277	3411
12:10 PM	10	15	16	0	15	25	3	0	4	98	14	0	0	74	0	0	274	3429
12:15 PM	10	16	12	0	9	46	5	0	6	93	10	0	0	106	0	0	313	3450
12:20 PM	5	19	15	0	2	29	12	0	5	80	6	0	0	95	1	0	269	3452
12:25 PM	10	13	19	0	5	35	9	0	7	114	17	0	0	90	0	0	319	3511
12:30 PM	11	24	21	0	17	39	2	0	7	81	15	0	0	96	0	0	313	3547
12:35 PM	8	18	21	0	14	29	4	0	6	87	8	0	0	97	0	0	292	3527
12:40 PM	7	14	16	0	5	29	10	0	3	113	11	0	0	89	0	0	297	3544
12:45 PM	4	27	20	0	10	36	7	0	5	81	14	0	0	74	0	0	278	3522
12:50 PM	11	10	18	0	12	20	5	0	7	95	13	0	0	98	0	0	289	3498
12:55 PM	8	15	17	0	7	36	4	0	7	95	3	0	0	97	0	0	289	3500
1:00 PM	5	16	24	0	12	26	14	0	3	75	15	0	0	88	0	0	278	3488
1:05 PM	8	20	19	0	13	17	6	0	3	114	11	0	0	91	0	0	302	3513
1:10 PM	15	15	22	0	16	37	5	0	4	91	10	0	0	73	0	0	288	3527
1:15 PM	10	13	12	0	11	39	4	0	5	74	7	0	0	75	0	0	250	3464
1:20 PM	7	17	22	0	14	36	8	0	9	115	10	0	0	107	0	0	345	3540
1:25 PM	7	11	16	0	11	30	4	0	6	102	16	0	0	108	0	0	311	3532
1:30 PM	11	20	25	0	9	44	6	0	6	88	9	0	0	72	0	0	290	3509
1:35 PM	14	17	19	0	9	25	5	0	4	108	8	0	0	104	0	0	313	3530

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	116	220	244	0	144	412	60	0	80	1128	160	0	0	1132	0	0	3696
Heavy Trucks	0	0	4		4	4	0		0	44	0		0	24	0		80
Pedestrians		0				8				8				4			20
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:46 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Martinazzi Ave -- SW Nyberg St

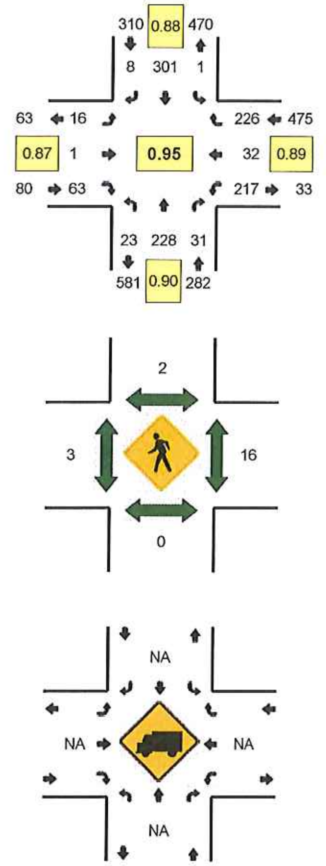
CITY/STATE: Tualatin, OR

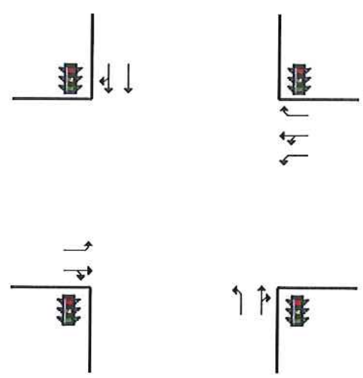
QC JOB #: 10772114

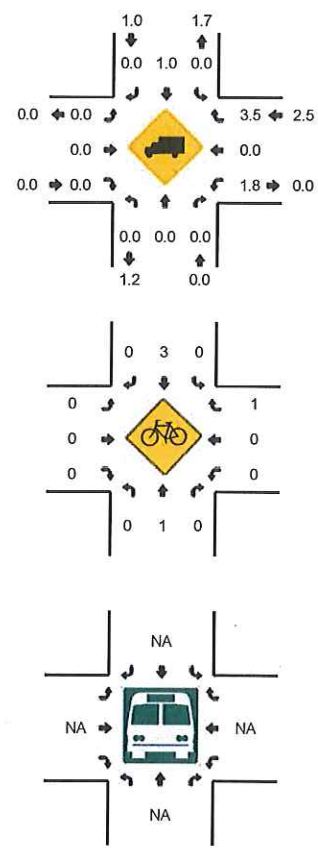
DATE: Sat, Jun 09 2012

Peak-Hour: 12:10 PM -- 1:10 PM

Peak 15-Min: 12:20 PM -- 12:35 PM







5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound) Left	Thru	Right	U	SW Martinazzi Ave (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
11:40 AM	1	17	2	0	0	30	1	0	1	0	4	0	15	3	20	0	94	
11:45 AM	2	16	5	0	0	27	0	0	1	0	5	0	25	4	22	0	107	
11:50 AM	5	17	1	0	0	23	0	0	1	0	4	0	15	5	17	0	88	
11:55 AM	2	15	2	0	0	19	0	0	1	0	7	0	15	3	23	0	87	1043
12:00 PM	0	16	1	0	0	28	0	0	1	0	3	0	19	4	22	0	94	1052
12:05 PM	0	15	0	0	0	32	0	0	1	0	7	0	16	4	16	0	91	1059
12:10 PM	0	17	4	0	0	27	1	0	1	0	2	0	22	6	25	0	105	1086
12:15 PM	4	26	1	0	1	22	2	0	3	0	6	0	11	2	11	0	89	1087
12:20 PM	1	13	1	0	0	22	0	0	0	0	8	0	22	4	21	0	92	1107
12:25 PM	2	21	4	0	0	25	1	0	3	0	2	0	21	1	18	0	98	1123
12:30 PM	2	27	1	0	0	29	0	0	2	0	5	0	26	4	17	0	113	1151
12:35 PM	1	17	1	0	0	16	0	0	1	0	9	0	22	1	12	0	80	1138
12:40 PM	5	14	3	0	0	24	2	0	1	0	5	0	27	0	18	0	99	1143
12:45 PM	2	21	7	0	0	26	0	0	0	1	6	0	14	4	22	0	103	1139
12:50 PM	1	24	1	0	0	24	0	0	1	0	6	0	11	1	21	0	90	1141
12:55 PM	3	16	1	0	0	30	1	0	3	0	3	0	14	1	26	0	98	1152
1:00 PM	0	9	2	0	0	29	0	0	1	0	6	0	9	3	22	0	81	1139
1:05 PM	2	23	5	0	0	27	1	0	0	0	5	0	18	5	13	0	99	1147
1:10 PM	2	12	1	0	0	22	0	0	1	0	9	0	23	1	11	0	82	1124
1:15 PM	1	18	1	0	0	31	0	0	1	0	3	0	25	1	15	0	96	1131
1:20 PM	1	22	0	0	0	32	0	0	2	0	5	0	16	6	18	0	102	1141
1:25 PM	0	24	4	0	0	18	0	0	1	0	6	0	27	5	12	0	97	1140
1:30 PM	0	12	4	0	0	24	2	0	1	1	7	0	16	2	18	0	87	1114
1:35 PM	1	24	2	0	0	28	2	0	2	1	4	0	16	2	18	0	100	1134

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	20	244	24	0	0	304	4	0	20	0	60	0	276	36	224	0	1212
Heavy Trucks	0	0	0		0	4	0		0	0	0		8	0	8		20
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:46 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Unsignalized Site Dwy -- SW Nyberg St

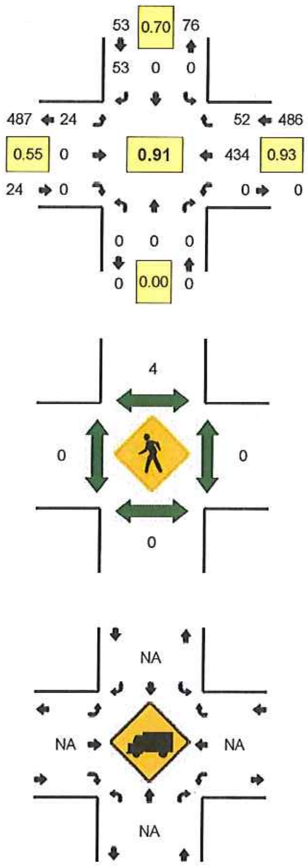
CITY/STATE: Tualatin, OR

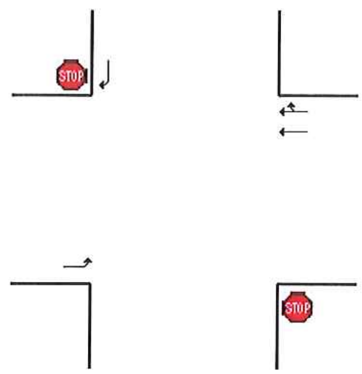
QC JOB #: 10772112

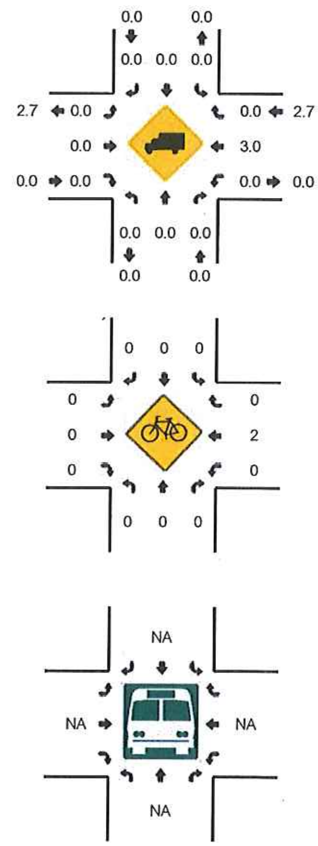
DATE: Sat, Jun 09 2012

Peak-Hour: 12:10 PM -- 1:10 PM

Peak 15-Min: 12:20 PM -- 12:35 PM







5-Min Count Period Beginning At	Unsignalized Site Dwy (Northbound) Left	Thru	Right	U	Unsignalized Site Dwy (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
11:40 AM	0	0	0	0	0	0	2	0	2	0	0	0	0	34	2	0	40	
11:45 AM	0	0	0	0	0	0	10	0	2	0	0	0	0	37	5	0	54	
11:50 AM	0	0	0	0	0	0	3	0	3	0	0	0	0	31	4	0	41	
11:55 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	40	1	0	42	481
12:00 PM	0	0	0	0	0	0	6	0	1	0	0	0	0	39	3	0	49	497
12:05 PM	0	0	0	0	0	0	5	0	1	0	0	0	0	27	2	0	35	488
12:10 PM	0	0	0	0	0	0	3	0	2	0	0	0	0	48	4	0	57	508
12:15 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	35	4	0	41	515
12:20 PM	0	0	0	0	0	0	8	0	1	0	0	0	0	33	5	0	47	527
12:25 PM	0	0	0	0	0	0	9	0	2	0	0	0	0	38	6	0	55	540
12:30 PM	0	0	0	0	0	0	2	0	2	0	0	0	0	43	5	0	52	557
12:35 PM	0	0	0	0	0	0	8	0	1	0	0	0	0	28	4	0	41	554
12:40 PM	0	0	0	0	0	0	7	0	2	0	0	0	0	34	4	0	47	561
12:45 PM	0	0	0	0	0	0	4	0	5	0	0	0	0	34	3	0	46	553
12:50 PM	0	0	0	0	0	0	4	0	3	0	0	0	0	35	4	0	46	558
12:55 PM	0	0	0	0	0	0	4	0	3	0	0	0	0	35	4	0	46	562
1:00 PM	0	0	0	0	0	0	2	0	1	0	0	0	0	42	4	0	49	562
1:05 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	29	5	0	36	563
1:10 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	29	6	0	39	545
1:15 PM	0	0	0	0	0	0	5	0	1	0	0	0	0	31	5	0	42	546
1:20 PM	0	0	0	0	0	0	7	0	1	0	0	0	0	32	4	0	44	543
1:25 PM	0	0	0	0	0	0	7	0	2	0	0	0	0	40	9	0	58	546
1:30 PM	0	0	0	0	0	0	4	0	5	0	0	0	0	39	2	0	50	544
1:35 PM	0	0	0	0	0	0	3	0	4	0	0	0	0	31	5	0	43	546

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	0	0	76	0	20	0	0	0	0	456	64	0	616
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	16	0		16
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:46 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Fred Meyer/Site Dwy -- SW Nyberg St/SW Tualatin-Sherwood Rd

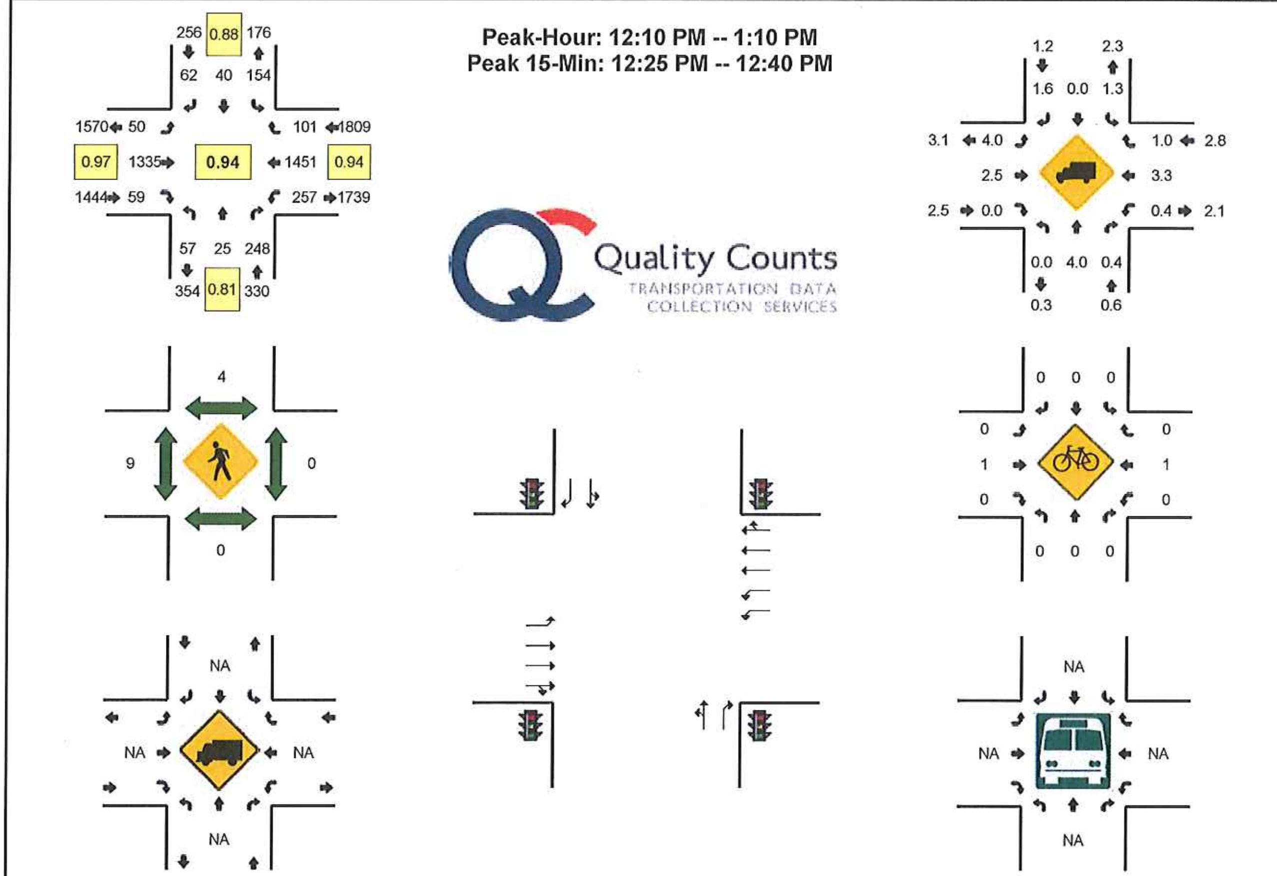
QC JOB #: 10772110

CITY/STATE: Tualatin, OR

DATE: Sat, Jun 09 2012

Peak-Hour: 12:10 PM -- 1:10 PM

Peak 15-Min: 12:25 PM -- 12:40 PM



5-Min Count Period Beginning At	Fred Meyer/Site Dwy (Northbound)				Fred Meyer/Site Dwy (Southbound)				SW Nyberg St/SW Tualatin-Sherwood Rd (Eastbound)				SW Nyberg St/SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:40 AM	3	3	19	0	12	4	3	0	3	110	4	0	18	114	4	0	297	
11:45 AM	4	2	21	0	10	2	4	0	4	101	6	0	18	143	9	1	325	
11:50 AM	3	1	12	0	10	6	1	0	5	133	1	0	13	110	5	0	300	
11:55 AM	4	2	20	0	14	3	5	0	6	118	5	0	21	124	13	1	336	3590
12:00 PM	3	2	17	0	12	3	3	0	2	108	9	0	26	128	7	0	320	3602
12:05 PM	3	1	12	0	13	3	3	0	5	115	4	0	17	106	9	0	291	3617
12:10 PM	5	4	26	0	9	3	5	0	5	104	9	0	29	130	13	0	342	3663
12:15 PM	1	1	15	0	14	3	7	0	5	99	10	0	20	122	10	0	307	3687
12:20 PM	8	2	26	0	14	1	10	0	6	92	2	0	26	120	10	0	317	3717
12:25 PM	7	2	17	0	14	3	4	0	4	127	3	0	19	130	8	0	338	3776
12:30 PM	7	1	32	0	15	4	6	0	5	105	3	0	25	121	11	2	337	3803
12:35 PM	6	3	27	0	17	6	2	0	4	113	5	0	20	129	10	0	342	3852
12:40 PM	4	1	16	0	14	3	6	0	4	117	5	0	13	113	9	0	305	3860
12:45 PM	4	3	23	0	19	1	4	0	4	102	4	0	26	103	4	0	297	3832
12:50 PM	4	1	19	0	11	3	7	0	0	129	5	0	21	135	8	0	343	3875
12:55 PM	3	2	19	0	11	4	2	0	6	102	4	0	13	131	5	0	302	3841
1:00 PM	5	2	16	0	9	4	6	0	4	112	3	0	22	101	5	0	289	3810
1:05 PM	3	3	12	0	7	5	3	0	3	133	6	0	21	116	8	0	320	3839
1:10 PM	7	2	21	0	11	5	2	0	9	117	2	0	24	106	4	0	310	3807
1:15 PM	4	0	21	0	8	4	4	0	3	105	7	0	19	108	7	0	290	3790
1:20 PM	6	1	19	0	13	2	2	0	5	125	6	0	18	140	11	0	348	3821
1:25 PM	1	1	17	0	12	0	4	0	5	134	2	0	12	137	5	0	330	3813
1:30 PM	9	0	14	0	10	4	10	0	0	101	3	0	25	119	11	0	306	3782
1:35 PM	5	1	18	0	4	3	4	0	3	126	10	0	22	121	5	0	322	3762

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	80	24	304	0	184	52	48	0	52	1380	44	0	256	1520	116	8	4068
Heavy Trucks	0	0	0		4	0	0		8	48	0		4	40	0		104
Pedestrians		0				4				12				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:45 PM

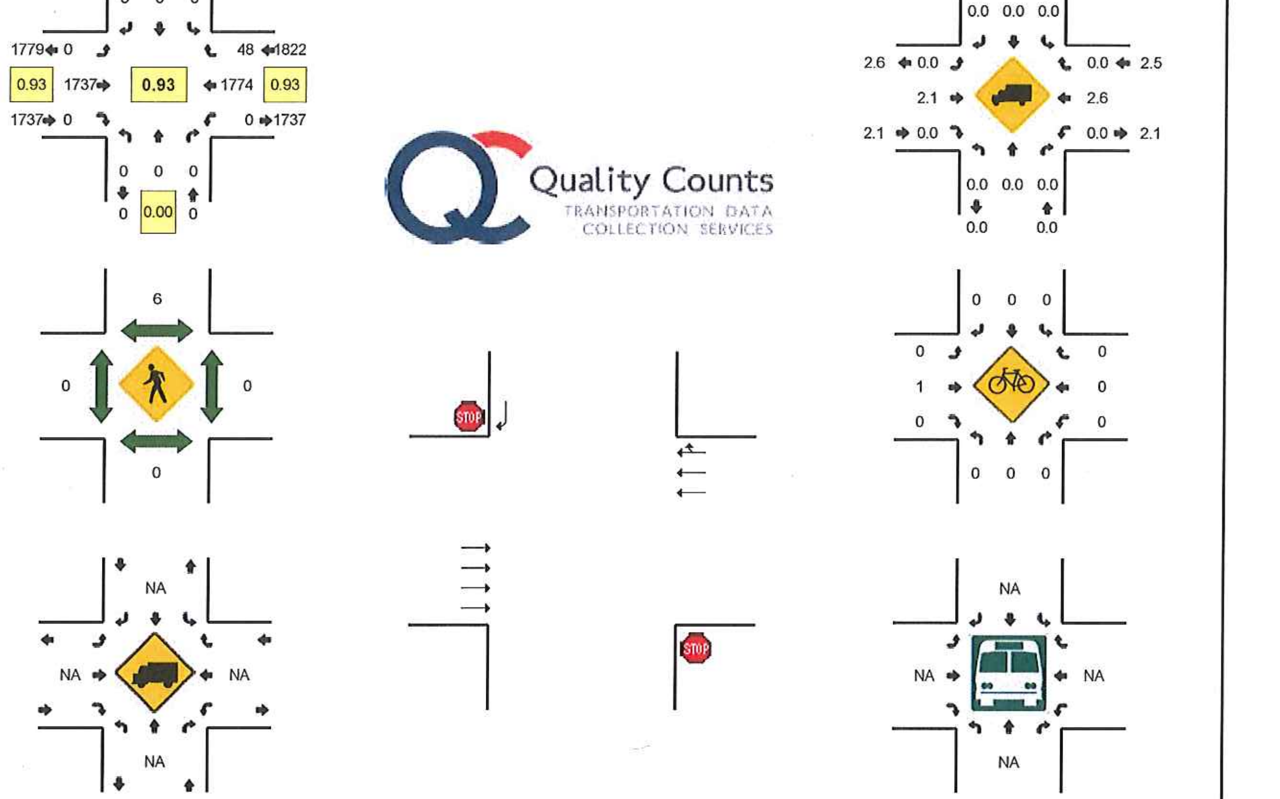
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined — Method for determining peak hour: Total Entering Volume

LOCATION: SW 75th Ave -- SW Nyberg St — **QC JOB #:** 10772108
CITY/STATE: Tualatin, OR — **DATE:** Sat, Jun 09 2012

Peak-Hour: 12:10 PM -- 1:10 PM
Peak 15-Min: 12:25 PM -- 12:40 PM



5-Min Count Period Beginning At	SW 75th Ave (Northbound) Left	Thru	Right	U	SW 75th Ave (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
11:40 AM	0	0	0	0	0	0	0	0	0	141	0	0	0	147	6	0	294	
11:45 AM	0	0	0	0	0	0	0	0	0	132	0	0	0	167	6	0	305	
11:50 AM	0	0	0	0	0	0	0	0	0	155	0	0	0	137	5	0	297	
11:55 AM	0	0	0	0	0	0	0	0	0	152	0	0	0	155	2	0	309	3418
12:00 PM	0	0	0	0	0	0	0	0	0	137	0	0	0	161	1	0	299	3435
12:05 PM	0	0	0	0	0	0	0	0	0	140	0	0	0	137	3	0	280	3449
12:10 PM	0	0	0	0	0	0	0	0	0	139	0	0	0	157	5	0	301	3464
12:15 PM	0	0	0	0	0	0	0	0	0	128	0	0	0	161	0	0	289	3510
12:20 PM	0	0	0	0	0	0	1	0	0	132	0	0	0	145	2	0	280	3502
12:25 PM	0	0	0	0	0	0	0	0	0	158	0	0	0	161	3	0	322	3554
12:30 PM	0	0	0	0	0	0	1	0	0	152	0	0	0	164	4	0	321	3588
12:35 PM	0	0	0	0	0	0	0	0	0	157	0	0	0	150	7	0	314	3611
12:40 PM	0	0	0	0	0	0	1	0	0	147	0	0	0	125	4	0	277	3594
12:45 PM	0	0	0	0	0	0	0	0	0	144	0	0	0	132	5	0	281	3570
12:50 PM	0	0	0	0	0	0	1	0	0	159	0	0	0	159	2	0	321	3594
12:55 PM	0	0	0	0	0	0	0	0	0	132	0	0	0	156	5	0	293	3578
1:00 PM	0	0	0	0	0	0	1	0	0	137	0	0	0	114	6	0	258	3537
1:05 PM	0	0	0	0	0	0	0	0	0	152	0	0	0	150	5	0	307	3564
1:10 PM	0	0	0	0	0	0	0	0	0	149	0	0	0	133	5	0	287	3550
1:15 PM	0	0	0	0	0	0	0	0	0	134	0	0	0	133	6	0	273	3534
1:20 PM	0	0	0	0	0	0	0	0	0	157	0	0	0	165	4	0	326	3580
1:25 PM	0	0	0	0	0	0	1	0	0	163	0	0	0	138	7	0	309	3567
1:30 PM	0	0	0	0	0	0	0	0	0	125	0	0	0	152	3	0	280	3526
1:35 PM	0	0	0	0	0	0	2	0	0	148	0	0	0	133	5	0	288	3500

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	0	0	4	0	0	1868	0	0	0	1900	56	0	3828
Heavy Trucks	0	0	0		0	0	0		0	52	0		0	44	0		96
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:45 PM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

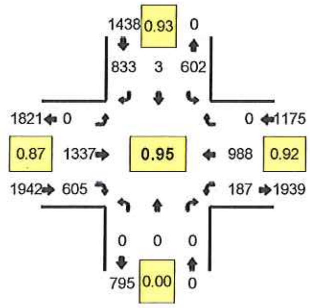
Method for determining peak hour: Total Entering Volume

LOCATION: I-5 SB Ramp Terminal -- SW Nyberg St

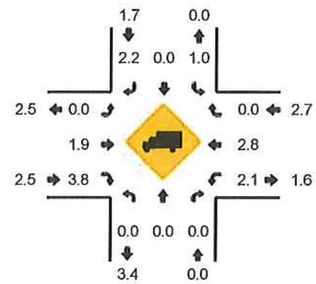
CITY/STATE: Tualatin, OR

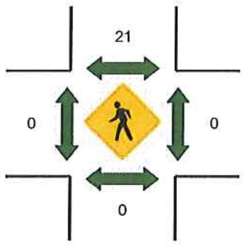
QC JOB #: 10772106

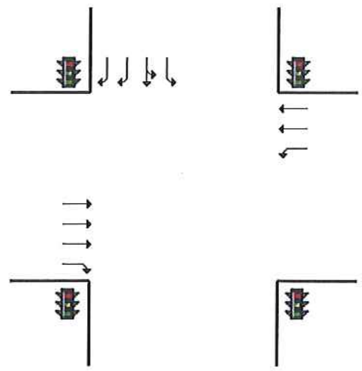
DATE: Sat, Jun 16 2012

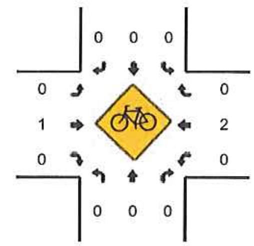


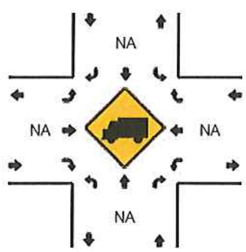
Peak-Hour: 12:10 PM -- 1:10 PM
Peak 15-Min: 12:50 PM -- 1:05 PM

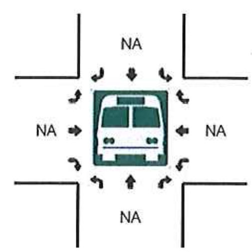












5-Min Count Period Beginning At	I-5 SB Ramp Terminal (Northbound)				I-5 SB Ramp Terminal (Southbound)				SW Nyberg St (Eastbound)				SW Nyberg St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:40 AM	0	0	0	0	39	0	82	0	0	80	57	0	6	77	0	0	341	
11:45 AM	0	0	0	0	32	1	49	0	0	100	44	0	13	87	0	0	326	
11:50 AM	0	0	0	0	54	0	90	0	0	103	55	0	10	80	0	0	392	
11:55 AM	0	0	0	0	39	0	68	0	0	99	49	0	15	75	0	0	345	4077
12:00 PM	0	0	0	0	30	0	58	0	0	109	52	0	12	99	0	0	360	4127
12:05 PM	0	0	0	0	47	0	57	0	0	81	53	0	17	59	0	0	314	4126
12:10 PM	0	0	0	0	47	0	75	0	0	136	50	0	11	92	0	0	411	4197
12:15 PM	0	0	0	0	41	0	71	0	0	105	41	0	18	100	0	0	376	4216
12:20 PM	0	0	0	0	49	0	74	0	0	90	44	0	19	79	0	0	355	4287
12:25 PM	0	0	0	0	44	0	63	0	0	115	43	0	12	74	0	0	351	4287
12:30 PM	0	0	0	0	55	1	55	0	0	90	54	0	20	60	0	0	335	4250
12:35 PM	0	0	0	0	54	1	74	0	0	127	47	0	12	93	0	0	408	4314
12:40 PM	0	0	0	0	51	0	67	0	0	112	54	0	15	102	0	0	401	4374
12:45 PM	0	0	0	0	55	0	72	0	0	105	51	0	22	57	0	0	362	4410
12:50 PM	0	0	0	0	39	0	64	0	0	144	60	0	13	89	0	0	409	4427
12:55 PM	0	0	0	0	68	0	71	0	0	106	54	0	19	69	0	0	387	4469
1:00 PM	0	0	0	0	34	1	58	0	0	131	62	0	8	103	0	0	397	4506
1:05 PM	0	0	0	0	65	0	89	0	0	76	45	0	18	70	0	0	363	4555
1:10 PM	0	0	0	0	48	1	67	0	0	102	64	0	10	89	0	0	381	4525
1:15 PM	0	0	0	0	50	0	67	0	0	95	50	0	19	75	0	0	356	4505
1:20 PM	0	0	0	0	64	0	74	0	0	92	56	0	13	63	0	0	362	4512
1:25 PM	0	0	0	0	53	0	68	0	0	105	44	0	11	95	0	0	376	4537
1:30 PM	0	0	0	0	59	0	74	0	0	112	49	0	11	81	0	0	386	4588
1:35 PM	0	0	0	0	60	0	87	0	0	89	51	0	21	57	0	0	365	4545

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	564	4	772	0	0	1524	704	0	160	1044	0	0	4772
Heavy Trucks	0	0	0		4	0	8		0	24	16		4	24	0		80
Pedestrians		0				16				0				0			16
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:45 PM

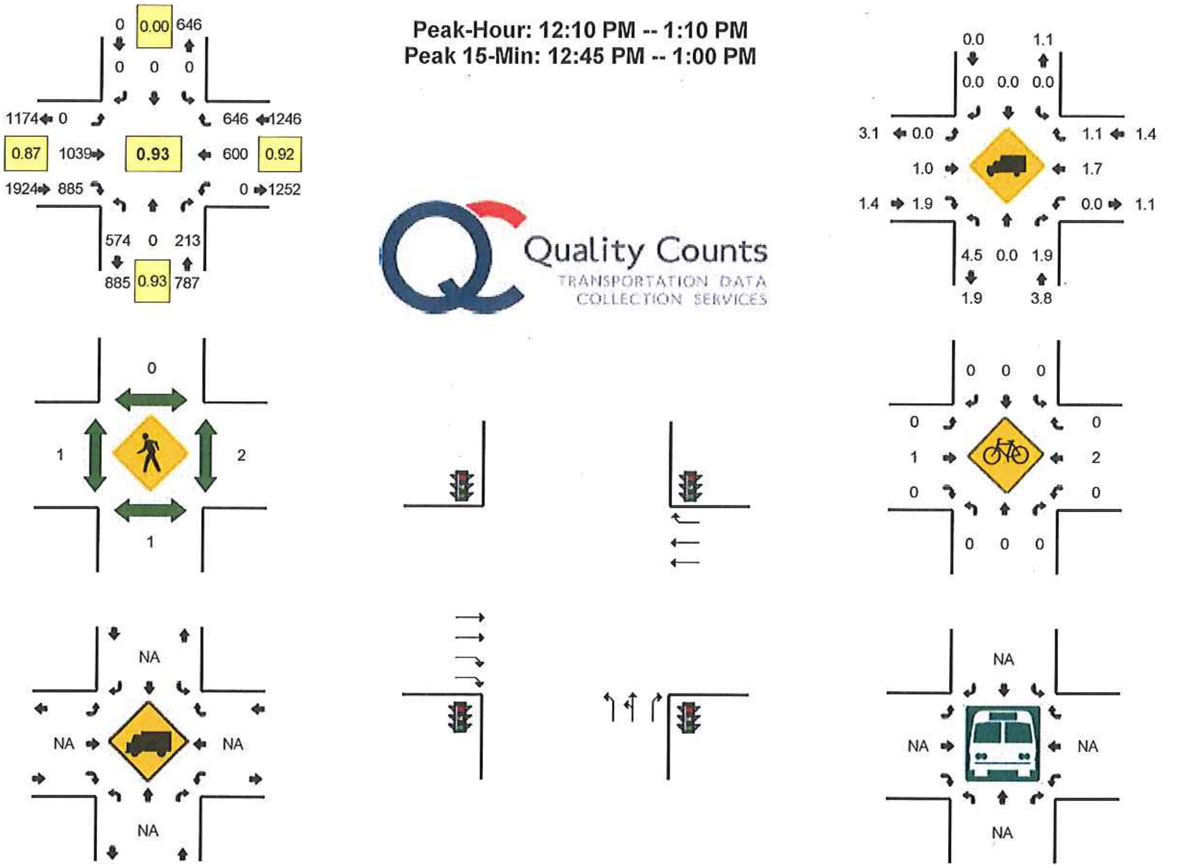
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

LOCATION: I-5 NB Ramp Terminal -- SW Nyberg St | **QC JOB #:** 10772104
CITY/STATE: Tualatin, OR | **DATE:** Sat, Jun 16 2012

Peak-Hour: 12:10 PM -- 1:10 PM
Peak 15-Min: 12:45 PM -- 1:00 PM



5-Min Count Period Beginning At	I-5 NB Ramp Terminal (Northbound) Left	Thru	Right	U	I-5 NB Ramp Terminal (Southbound) Left	Thru	Right	U	SW Nyberg St (Eastbound) Left	Thru	Right	U	SW Nyberg St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
11:40 AM	40	0	23	0	0	0	0	0	0	55	62	0	0	43	50	0	273	
11:45 AM	63	0	19	0	0	0	0	0	0	62	58	0	0	36	57	0	295	
11:50 AM	49	0	15	0	0	0	0	0	0	82	72	0	0	42	58	0	318	
11:55 AM	35	0	20	0	0	0	0	0	0	83	69	0	0	50	36	0	293	3449
12:00 PM	63	0	17	0	0	0	0	0	0	69	66	0	0	46	55	0	316	3498
12:05 PM	36	0	15	0	0	0	0	0	0	71	61	0	0	51	61	0	295	3558
12:10 PM	55	0	17	0	0	0	0	0	0	82	81	0	0	40	50	0	325	3605
12:15 PM	67	0	13	0	0	0	0	0	0	86	63	0	0	48	43	0	320	3616
12:20 PM	36	0	15	0	0	0	0	0	0	82	64	0	0	62	41	0	300	3654
12:25 PM	38	0	22	0	0	0	0	0	0	79	64	0	0	45	66	0	314	3687
12:30 PM	28	0	13	0	0	0	0	0	0	99	63	0	0	58	66	0	327	3705
12:35 PM	57	0	21	0	0	0	0	0	0	87	79	0	0	44	50	0	338	3714
12:40 PM	60	0	13	0	0	0	0	0	0	83	57	0	0	55	55	0	323	3764
12:45 PM	33	0	21	0	0	0	0	0	0	101	95	0	0	47	56	0	353	3822
12:50 PM	53	0	25	0	0	0	0	0	0	66	91	0	0	41	60	0	336	3840
12:55 PM	40	0	20	0	0	0	0	0	0	101	97	0	0	59	56	0	373	3920
1:00 PM	59	0	15	0	0	0	0	0	0	84	73	0	0	48	44	0	323	3927
1:05 PM	48	0	18	0	0	0	0	0	0	89	58	0	0	53	59	0	325	3957
1:10 PM	42	0	18	0	0	0	0	0	0	72	72	0	0	47	51	0	302	3934
1:15 PM	51	0	13	0	0	0	0	0	0	89	39	0	0	45	46	0	283	3897
1:20 PM	41	0	23	0	0	0	0	0	0	100	81	0	0	43	59	0	347	3944
1:25 PM	51	0	21	0	0	0	0	0	0	79	67	0	0	41	43	0	302	3932
1:30 PM	49	0	15	0	0	0	0	0	0	91	67	0	0	43	49	0	314	3919
1:35 PM	37	0	22	0	0	0	0	0	0	104	74	0	0	48	50	0	335	3916

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	504	0	264	0	0	0	0	0	0	1072	1132	0	0	588	688	0	4248
Heavy Trucks	16	0	4		0	0	0		0	8	16		0	24	8		76
Pedestrians		4				0				4				4			12
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:45 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Type of peak hour being reported: User-Defined

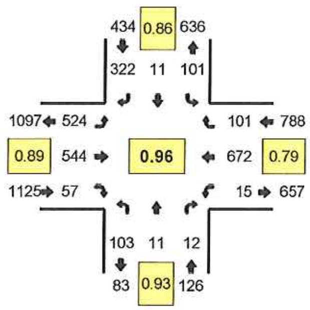
Method for determining peak hour: Total Entering Volume

LOCATION: Signalized Entrance to Nyberg Woods -- SW Nyberg St

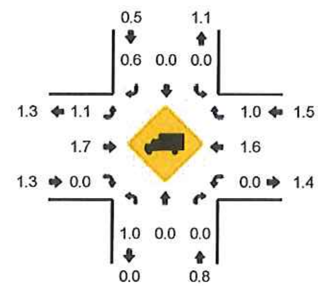
QC JOB #: 10772102

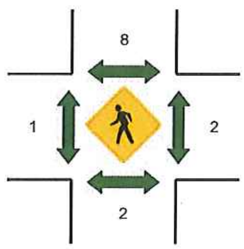
CITY/STATE: Tualatin, OR

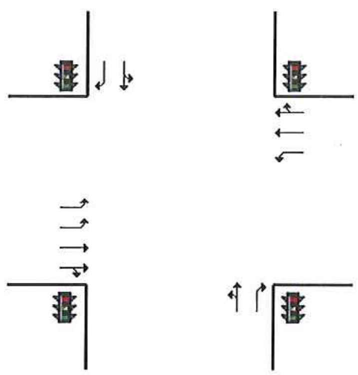
DATE: Sat, Jun 09 2012

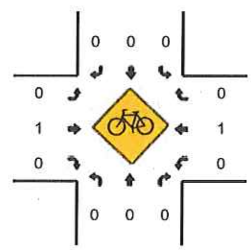


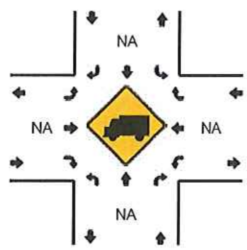
Peak-Hour: 12:10 PM -- 1:10 PM
Peak 15-Min: 12:35 PM -- 12:50 PM

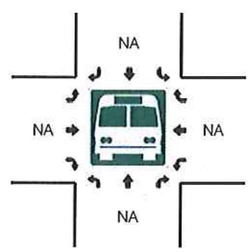












5-Min Count Period Beginning At	Signalized Entrance to Nyberg Woods (Northbound)				Signalized Entrance to Nyberg Woods (Southbound)				SW Nyberg St (Eastbound)				SW Nyberg St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:40 AM	3	0	1	0	13	0	21	0	41	41	4	0	1	49	8	0	182	
11:45 AM	3	4	0	0	9	2	20	0	22	45	4	1	0	46	17	0	173	
11:50 AM	7	1	0	0	8	0	23	0	32	43	5	0	2	54	12	0	187	
11:55 AM	7	1	1	0	5	0	25	0	45	44	6	0	0	55	7	0	196	2141
12:00 PM	10	1	1	0	6	3	31	0	27	47	3	0	0	64	11	0	204	2170
12:05 PM	8	0	2	0	8	2	19	0	58	44	7	1	1	77	10	0	237	2239
12:10 PM	12	1	0	0	5	0	28	0	34	38	4	0	0	82	11	0	215	2310
12:15 PM	9	2	0	0	6	2	26	0	41	34	3	0	1	77	6	0	207	2327
12:20 PM	5	1	0	0	13	1	28	0	46	39	6	0	1	56	14	0	210	2348
12:25 PM	9	0	3	0	8	1	28	0	32	44	4	0	2	62	13	0	206	2377
12:30 PM	8	2	2	0	5	0	26	0	39	42	6	0	0	53	8	0	191	2393
12:35 PM	8	0	1	0	10	0	29	0	61	37	7	0	3	51	15	0	222	2430
12:40 PM	11	1	1	0	13	1	33	0	44	54	4	0	1	42	8	0	213	2461
12:45 PM	5	1	1	0	8	0	30	0	42	43	6	0	2	67	4	0	209	2497
12:50 PM	10	1	0	0	11	1	29	0	57	53	2	0	1	33	8	0	206	2516
12:55 PM	2	0	1	0	4	1	15	0	43	55	7	0	0	58	4	0	190	2510
1:00 PM	12	1	2	0	12	2	25	0	44	51	3	0	2	42	5	0	201	2507
1:05 PM	12	1	1	0	6	2	25	0	41	54	5	0	2	49	5	0	203	2473
1:10 PM	10	3	3	0	5	0	31	0	34	50	2	0	0	38	6	0	182	2440
1:15 PM	9	3	0	0	8	0	24	0	34	54	7	0	2	52	9	0	202	2435
1:20 PM	5	2	1	0	2	1	32	0	46	47	1	0	2	48	12	0	199	2424
1:25 PM	10	0	0	0	8	1	25	0	45	50	5	0	1	36	10	0	191	2409
1:30 PM	6	1	1	0	5	0	32	0	26	58	1	0	2	44	5	0	181	2399
1:35 PM	5	2	0	0	6	0	28	0	29	45	6	0	0	45	6	0	172	2349

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	96	8	12	0	124	4	368	0	588	536	68	0	24	640	108	0	2576
Heavy Trucks	0	0	0		0	0	0		8	4	0		0	20	0		32
Pedestrians		4				16				0				8			28
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: N

Report generated on 6/19/2012 3:45 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Exhibit 1
Attachment L

Raw Count Data (unadjusted)	Count Date	Peak Hr Start	Total Vehicle Volumes – Northbound NBL	NBT	NBR	Southbound SBL	SBT	SBR	Eastbound EBL	EBT	EBR	Westbound WBL	WBT	WBR	TEV	PHF
I-5 SB Ramps & SW Nyberg Rd	10/18/11	4:00 PM	0	0	0	622	1	990	0	1,178	750	137	870	0	4,548	0.87
SW Martinazzi Ave & SW Tualatin Sherwood Rd	10/18/11	4:05 PM	96	305	350	155	519	81	54	1,398	90	0	1,117	2	4,167	0.94
SW Boones Ferry Rd & SW Tualatin Sherwood Rd	10/18/11	4:00 PM	166	260	154	288	335	129	100	984	134	217	1,051	54	3,872	0.99
I-5 NB Ramps & SW Nyberg Rd	10/18/11	4:00 PM	584	1	152	0	0	0	0	1,147	711	0	478	706	3,779	0.94
SW Boones Ferry Rd & SW Lower Boones Ferry Rd	10/18/11	4:30 PM	0	470	541	57	656	1	1	7	9	455	7	39	2,243	0.96
SW Boones Ferry Rd & SW Avery St	10/18/11	4:35 PM	167	494	28	13	654	80	168	107	246	36	53	12	2,058	0.94
SW Teton Ave & SW Avery St	10/18/11	4:30 PM	3	36	21	179	81	110	87	279	29	33	169	130	1,157	0.90
I-5 NB Ramps & SW Lower Boones Ferry Rd	10/19/11	4:40 PM	552	3	585	0	0	0	632	1,142	0	0	1,198	585	4,697	0.91
SW Martinazzi Ave & SW Avery St	10/18/11	4:55 PM	8	138	1	29	301	58	82	8	20	4	7	20	676	0.90
SW 72nd Ave & Lower Boones Ferry Rd	10/18/11	4:35 PM	19	86	621	529	165	70	42	635	10	532	541	572	3,822	0.95
SW Teton Ave & SW Tualatin Sherwood Rd	10/18/11	4:25 PM	13	185	114	229	210	15	28	694	22	136	722	202	2,570	0.93
SW 90th Ave & SW Tualatin Sherwood Rd	10/19/11	4:10 PM	11	20	48	106	6	82	101	1,054	9	23	941	147	2,548	0.94
SW 124th Ave & SW Tualatin Sherwood Rd	10/18/11	4:35 PM	0	0	0	182	0	72	67	837	0	0	902	90	2,150	0.94
SW 90th Ave & SW Tualatin Rd	10/18/11	4:30 PM	228	0	7	14	6	9	1	640	171	3	829	5	1,913	0.96
SW Boones Ferry Rd & SW Sagert St	10/18/11	4:25 PM	16	462	212	63	545	73	41	104	13	161	109	62	1,861	0.92
SW 124th Ave & SW Herman Rd	10/18/11	4:25 PM	11	173	23	42	159	18	63	144	15	54	268	102	1,072	0.84
SW 105th Ave & SW Avery St	10/18/11	4:25 PM	53	0	139	0	0	0	0	256	166	160	135	0	909	0.89
SW Tualatin Rd & SW Boones Ferry Rd	10/18/11	4:30 PM	0	194	289	430	354	0	0	0	0	398	0	810	2,475	0.96
SW 65th Ave & SW Borland Rd	10/18/11	4:40 PM	2	315	339	411	460	10	23	23	10	233	0	227	2,053	0.95
SW Tualatin Rd & SW Herman Rd	10/18/11	4:30 PM	0	0	0	371	0	1	10	405	0	0	273	760	1,820	0.95
SW 65th Ave & SW Sagert St	10/18/11	4:35 PM	56	280	3	3	321	369	389	2	131	2	7	6	1,569	0.93
SW Teton Ave & SW Tualatin Rd	10/18/11	4:45 PM	208	0	63	0	0	0	0	318	93	34	694	0	1,410	0.91
SW Teton Ave & SW Herman Rd	10/18/11	4:25 PM	185	227	42	22	133	4	3	291	155	43	251	14	1,370	0.90
SW 124th Ave & Hwy 99W	10/18/11	4:00 PM	501	0	482	0	0	0	0	922	139	310	776	0	3,130	0.89
SW Martinazzi Ave & SW Boones Ferry Rd	10/18/11	4:40 PM	317	0	333	0	0	0	0	653	121	329	856	0	2,609	0.98
SW Avery St & SW Tualatin Sherwood Rd	10/18/11	4:35 PM	176	6	4	22	5	29	4	712	362	2	745	10	2,077	0.93
SW Boones Ferry Rd & SW Ibach St	10/18/11	4:35 PM	130	531	2	4	658	243	154	0	150	0	0	2	1,874	0.89
SW Martinazzi Ave & SW Sagert St	10/18/11	4:40 PM	2	175	74	201	287	232	114	226	12	87	189	159	1,758	0.90
SW 124th Ave & SW Tualatin Rd	10/18/11	4:30 PM	0	465	42	334	204	0	0	0	0	10	0	567	1,622	0.84
I-5 SB Ramps & SW Lower Boones Ferry Rd	10/18/11	4:50 PM	0	0	0	508	0	580	0	1,200	579	670	1,066	0	4,603	0.91

Raw Count Data (unadjusted)	Heavy Vehicle Percentages – Northbound NBL	NBT	NBR	Southbound SBL	SBT	SBR	Eastbound EBL	EBT	EBR	Westbound WBL	WBT	WBR	Pedestrian Volumes – Intersection Leg N	S	E	W	TOTALS	Bicycle Volumes – Approach Leg N	S	E	W	TOTALS
I-5 SB Ramps & SW Nyberg Rd	0	0	0	1	0	4	0	3	4	1	5	0	0	0	0	0	0	0	0	2	3	5
SW Martinazzi Ave & SW Tualatin Sherwood Rd	2	5	3	1	2	0	0	4	4	0	7	0	5	8	17	11	41	1	1	0	3	5
SW Boones Ferry Rd & SW Tualatin Sherwood Rd	4	5	3	2	4	3	6	7	3	0	7	6	15	0	20	0	35	1	1	1	2	5
I-5 NB Ramps & SW Nyberg Rd	7	0	2	0	0	0	0	1	5	0	1	1	30	0	6	0	36	0	0	2	3	5
SW Boones Ferry Rd & SW Lower Boones Ferry Rd	0	3	2	2	1	0	0	0	0	3	0	0	5	0	12	1	18	4	1	0	0	5
SW Boones Ferry Rd & SW Avery St	3	2	0	0	1	0	1	0	0	3	2	0	9	9	11	2	31	1	2	1	1	5
SW Teton Ave & SW Avery St	0	6	5	1	1	5	5	1	0	3	0	3	3	3	0	0	6	0	0	3	2	5
I-5 NB Ramps & SW Lower Boones Ferry Rd	1	0	1	0	0	0	1	1	0	0	1	1	8	10	0	0	18	0	0	3	1	4
SW Martinazzi Ave & SW Avery St	0	2	0	0	1	2	0	0	10	0	0	0	6	5	11	10	32	2	2	0	0	4
SW 72nd Ave & Lower Boones Ferry Rd	0	6	1	1	4	0	0	1	0	3	1	1	3	9	0	1	13	0	0	1	2	3
SW Teton Ave & SW Tualatin Sherwood Rd	0	5	4	6	1	20	11	4	0	4	5	12	0	0	2	0	2	0	0	1	2	3
SW 90th Ave & SW Tualatin Sherwood Rd	9	0	0	2	0	2	0	6	11	13	6	3	2	0	0	0	2	0	1	1	1	3
SW 124th Ave & SW Tualatin Sherwood Rd	0	0	0	1	0	3	7	2	0	0	4	2	2	0	0	0	2	0	0	2	1	3
SW 90th Ave & SW Tualatin Rd	1	0	0	0	0	0	0	1	2	0	2	0	11	0	4	6	21	0	0	2	1	3
SW Boones Ferry Rd & SW Sagert St	0	3	1	0	1	0	0	2	0	3	1	2	7	5	9	5	26	2	1	0	0	3
SW 124th Ave & SW Herman Rd	0	1	4	5	4	11	2	2	0	6	5	0	0	0	0	0	0	0	1	0	2	3
SW 105th Ave & SW Avery St	2	0	1	0	0	0	0	2	1	3	1	0	0	1	1	0	2	0	0	3	0	3
SW Tualatin Rd & SW Boones Ferry Rd	0	1	4	1	1	0	0	0	0	2	0	2	2	0	16	0	18	2	0	0	0	2
SW 65th Ave & SW Borland Rd	0	1	2	0	3	0	0	0	0	1	0	2	11	0	7	7	25	1	1	0	0	2
SW Tualatin Rd & SW Herman Rd	0	0	0	2	0	0	0	1	0	0	4	1	0	0	0	2	2	0	0	0	2	2
SW 65th Ave & SW Sagert St	0	1	0	0	4	1	3	0	1	0	14	0	0	1	2	3	6	1	1	0	0	2
SW Teton Ave & SW Tualatin Rd	1	0	3	0	0	0	0	2	19	0	1	0	0	0	0	0	0	0	0	1	1	2
SW Teton Ave & SW Herman Rd	8	3	5	0	13	25	0	0	6	9	3	0	2	0	2	1	5	2	0	0	0	2
SW 124th Ave & Hwy 99W	1	0	3	0	0	0	0	3	8	6	2	0	0	1	2	0	3	0	0	0	1	1
SW Martinazzi Ave & SW Boones Ferry Rd	1	0	3	0	0	0	0	2	4	2	2	0	0	33	12	7	52	0	0	0	1	1
SW Avery St & SW Tualatin Sherwood Rd	1	0	0	9	0	7	0	4	1	0	4	20	2	0	0	0	2	0	0	0	1	1
SW Boones Ferry Rd & SW Ibach St	0	2	0	0	1	1	0	0	1	0	0	0	47	1	60	4	112	0	1	0	0	1
SW Martinazzi Ave & SW Sagert St	0	1	3	2	1	2	4	0	8	0	0	3	8	4	9	10	31	0	0	0	1	1
SW 124th Ave & SW Tualatin Rd	0	1	2	5	4	0	0	0	0	10	0	1	0	0	0	0	0	0	1	0	0	1
I-5 SB Ramps & SW Lower Boones Ferry Rd	0	0	0	1	0	2	0	1	2	1	1	0	5	6	0	0	11	0	0	0	0	0

Exhibit 1
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Appendix C
Description of Level-of-Service Methods and Criteria

Exhibit 1
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APPENDIX C LEVEL-OF-SERVICE CONCEPT

Level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from "A" to "F".[1]

SIGNALIZED INTERSECTIONS

The six level-of-service grades are described qualitatively for signalized intersections in Table C1. Additionally, Table C2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, Level of Service "D" is generally considered to represent the minimum acceptable design standard.

Table C-1 Level-of-Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
A	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
C	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

[1] Most of the material in this appendix is adapted from the Transportation Research Board, *Highway Capacity Manual*, (2000).

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Table C2 Level-of-Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

UNSIGNALIZED INTERSECTIONS

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The 2000 *Highway Capacity Manual* (HCM) provides models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table C3. A quantitative definition of level of service for unsignalized intersections is presented in Table C4. Using this definition, Level of Service "E" is generally considered to represent the minimum acceptable design standard.

Table C3 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
A	• Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in queue.
B	• Some drivers begin to consider the delay an inconvenience. • Occasionally there is more than one vehicle in queue.
C	• Many times there is more than one vehicle in queue. • Most drivers feel restricted, but not objectionably so.
D	• Often there is more than one vehicle in queue. • Drivers feel quite restricted.
E	• Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement. • There is almost always more than one vehicle in queue. • Drivers find the delays approaching intolerable levels.
F	• Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.

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Table C4 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10.0 and ≤ 15.0
C	>15.0 and ≤ 25.0
D	>25.0 and ≤ 35.0
E	>35.0 and ≤ 50.0
F	>50.0

It should be noted that the level-of-service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less galling than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: level of service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOEs) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th-percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level-of-service thresholds are adopted as legal standards, as is the case in many public agencies.

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Appendix D
Existing Operations Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	7	9	455	7	39	0	470	541	57	656	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5	3.5			4.0	3.5	3.5	4.0	
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.94		1.00	1.00			1.00	0.99	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt		0.93		1.00	0.87			1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1655		1752	1657			1845	1567	1770	1881	
Flt Permitted		1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1655		1752	1657			1845	1567	1770	1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	7	9	474	7	41	0	490	564	59	683	1
RTOR Reduction (vph)	0	9	0	0	25	0	0	0	153	0	0	0
Lane Group Flow (vph)	0	8	0	474	23	0	0	490	411	59	684	0
Confl. Peds. (#/hr)			5	5			12		1	1		12
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	3%	2%	2%	1%	0%
Turn Type	Split			Split			Prot		pm+ov	Prot		
Protected Phases	8	8		4	4		1	6	4	5	2	
Permitted Phases									6			
Actuated Green, G (s)		1.7		32.1	32.1			27.0	59.1	5.2	36.2	
Effective Green, g (s)		2.2		32.6	32.6			27.5	60.1	5.7	36.7	
Actuated g/C Ratio		0.03		0.40	0.40			0.33	0.73	0.07	0.44	
Clearance Time (s)		4.0		4.0	4.0			4.5	4.0	4.0	4.5	
Vehicle Extension (s)		2.5		2.2	2.2			3.5	2.2	2.2	3.5	
Lane Grp Cap (vph)		44		692	655			615	1142	122	837	
v/s Ratio Prot		c0.00		c0.27	0.01			0.27	0.14	0.03	c0.36	
v/s Ratio Perm									0.12			
v/c Ratio		0.19		0.68	0.04			0.80	0.36	0.48	0.82	
Uniform Delay, d1		39.3		20.7	15.3			25.0	4.1	37.0	20.0	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.5		2.4	0.0			7.3	0.1	1.5	6.4	
Delay (s)		40.8		23.1	15.3			32.3	4.2	38.5	26.4	
Level of Service		D		C	B			C	A	D	C	
Approach Delay (s)		40.8			22.4			17.3			27.3	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	82.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	398	810	194	289	430	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	3.5	3.5	3.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	1881	1553	1787	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	1881	1553	1787	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	415	844	202	301	448	369
RTOR Reduction (vph)	0	208	0	84	0	0
Lane Group Flow (vph)	415	636	202	217	448	369
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	2%	2%	1%	4%	1%	1%
Turn Type		pm+ov		pm+ov	Prot	
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.2	29.9	10.5	21.7	18.7	32.7
Effective Green, g (s)	11.7	30.9	11.0	22.7	19.2	33.2
Actuated g/C Ratio	0.23	0.60	0.21	0.44	0.37	0.64
Clearance Time (s)	4.0	4.0	3.5	4.0	4.0	4.0
Vehicle Extension (s)	3.0	2.0	5.0	3.0	2.0	2.0
Lane Grp Cap (vph)	774	1049	399	679	661	1203
v/s Ratio Prot	0.12	c0.22	c0.11	0.07	0.25	0.20
v/s Ratio Perm		0.18		0.07		
v/c Ratio	0.54	0.61	0.51	0.32	0.68	0.31
Uniform Delay, d1	17.7	6.6	18.1	9.6	13.7	4.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.7	2.1	0.3	2.2	0.1
Delay (s)	18.4	7.3	20.2	9.8	15.9	4.2
Level of Service	B	A	C	A	B	A
Approach Delay (s)	11.0		14.0			10.7
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	6.5
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	645	170	410	903	320	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1599	1787	1845	1770	1572
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1599	1787	1845	1770	1572
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	679	179	432	951	337	400
RTOR Reduction (vph)	0	51	0	0	0	41
Lane Group Flow (vph)	679	128	432	951	337	359
Confl. Peds. (#/hr)		7	7		7	8
Confl. Bikes (#/hr)	4		2	10	1	
Heavy Vehicles (%)	2%	1%	1%	3%	2%	1%
Turn Type		Prot	Prot			pm+ov
Protected Phases	2	2	1	6	8	1
Permitted Phases					8	8
Actuated Green, G (s)	41.2	41.2	29.2	75.4	21.1	50.3
Effective Green, g (s)	41.7	41.7	29.7	75.9	21.6	51.3
Actuated g/C Ratio	0.39	0.39	0.28	0.71	0.20	0.48
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	729	626	498	1315	359	824
v/s Ratio Prot	c0.36	0.08	c0.24	0.52	c0.19	0.12
v/s Ratio Perm						0.11
v/c Ratio	0.93	0.20	0.87	0.72	0.94	0.44
Uniform Delay, d1	31.0	21.4	36.5	9.1	41.8	18.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.6	0.2	14.7	2.0	31.7	0.4
Delay (s)	49.6	21.6	51.3	11.1	73.5	18.5
Level of Service	D	C	D	B	E	B
Approach Delay (s)	43.8			23.6	43.6	
Approach LOS	D			C	D	

Intersection Summary			
HCM Average Control Delay	34.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	106.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	100	580	60	142	438
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	33	110	637	66	156	481
Pedestrians	25		16			26
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	2		1			2
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			428			355
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	1505	721			728	
vC1, stage 1 conf vol	695					
vC2, stage 2 conf vol	809					
vCu, unblocked vol	1505	630			638	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	74			81	
cM capacity (veh/h)	292	416			838	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	33	110	703	156	481
Volume Left	33	0	0	156	0
Volume Right	0	110	66	0	0
cSH	292	416	1700	838	1700
Volume to Capacity	0.11	0.26	0.41	0.19	0.28
Queue Length 95th (ft)	10	27	0	18	0
Control Delay (s)	18.9	16.7	0.0	10.3	0.0
Lane LOS	C	C		B	
Approach Delay (s)	17.2		0.0	2.5	
Approach LOS	C				

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	42	80	80	600	418	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	47	90	90	674	470	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				308	475	
pX, platoon unblocked	0.88					
vC, conflicting volume	1352	498	526			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1332	498	526			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	84	91			
cM capacity (veh/h)	139	577	1051			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	137	90	674	526
Volume Left	47	90	0	0
Volume Right	90	0	0	56
cSH	276	1051	1700	1700
Volume to Capacity	0.50	0.09	0.40	0.31
Queue Length 95th (ft)	67	7	0	0
Control Delay (s)	30.2	8.7	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	30.2	1.0		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	32	650	6	10	488
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	35	714	7	11	536
Pedestrians	25		16			26
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	2		1			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			227			556
pX, platoon unblocked	0.85	0.85			0.85	
vC, conflicting volume	1049	769			746	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	969	639			612	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	90			99	
cM capacity (veh/h)	206	345			812	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	35	721	190	358
Volume Left	0	0	11	0
Volume Right	35	7	0	0
cSH	345	1700	812	1700
Volume to Capacity	0.10	0.42	0.01	0.21
Queue Length 95th (ft)	9	0	1	0
Control Delay (s)	16.6	0.0	0.7	0.0
Lane LOS	C		A	
Approach Delay (s)	16.6	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	12	655	0	0	488
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	13	736	0	0	548
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			125			658
pX, platoon unblocked	0.84	0.84			0.84	
vC, conflicting volume	1010	736			736	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	918	592			592	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	231	382			836	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	13	736	274	274
Volume Left	0	0	0	0
Volume Right	13	0	0	0
cSH	382	1700	1700	1700
Volume to Capacity	0.04	0.43	0.16	0.16
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	14.8	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	14.8	0.0	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	10	101	338	55	327	27	299	19	0	478	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.99			1.00	
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1805	1626		1698	1730	1526	1681	1860			3562	
Flt Permitted	0.95	1.00		0.95	0.97	1.00	0.43	1.00			1.00	
Satd. Flow (perm)	1805	1626		1698	1730	1526	768	1860			3562	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	32	11	111	371	60	359	30	329	21	0	525	11
RTOR Reduction (vph)	0	98	0	0	0	276	0	3	0	0	2	0
Lane Group Flow (vph)	32	24	0	215	216	83	30	347	0	0	534	0
Confl. Peds. (#/hr)	10					10	6		19	19		6
Confl. Bikes (#/hr)						2					3	
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%	7%	1%	0%	0%	1%	0%
Turn Type	Split			Split		Perm	Perm					
Protected Phases	8	8		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	4.8	4.8		10.4	10.4	10.4	13.8	13.8			13.8	
Effective Green, g (s)	5.3	5.3		10.9	10.9	10.9	14.3	14.3			14.3	
Actuated g/C Ratio	0.11	0.11		0.23	0.23	0.23	0.30	0.30			0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	5.0	5.0			5.0	
Lane Grp Cap (vph)	204	183		394	401	354	234	566			1084	
v/s Ratio Prot	c0.02	0.01		c0.13	0.12			c0.19			0.15	
v/s Ratio Perm						0.05	0.04					
v/c Ratio	0.16	0.13		0.55	0.54	0.24	0.13	0.61			0.49	
Uniform Delay, d1	18.8	18.8		15.9	15.8	14.7	11.8	14.0			13.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.2		1.2	1.1	0.3	0.5	2.8			0.7	
Delay (s)	19.1	19.0		17.1	16.9	14.9	12.4	16.8			14.1	
Level of Service	B	B		B	B	B	B	B			B	
Approach Delay (s)		19.0			16.1			16.5			14.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	47.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	29	0	639	40	0	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	33	0	726	45	0	93
Pedestrians					5	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		242				
pX, platoon unblocked						
vC, conflicting volume	777				820	391
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	777				820	391
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	85
cM capacity (veh/h)	845				304	611

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	33	484	288	93
Volume Left	33	0	0	0
Volume Right	0	0	45	93
cSH	845	1700	1700	611
Volume to Capacity	0.04	0.28	0.17	0.15
Queue Length 95th (ft)	3	0	0	14
Control Delay (s)	9.4	0.0	0.0	11.9
Lane LOS	A			B
Approach Delay (s)	9.4	0.0		11.9
Approach LOS				B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	1877	42	232	1691	72	36	10	236	182	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0			5.0	4.5		5.0	5.0
Lane Util. Factor	1.00	*0.75		0.97	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	4099		3502	4956			1768	1599		1803	1565
Flt Permitted	0.95	1.00		0.95	1.00			0.54	1.00		0.72	1.00
Satd. Flow (perm)	1805	4099		3502	4956			1000	1599		1350	1565
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	33	1915	43	237	1726	73	37	10	241	186	24	45
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	0	0	0	37
Lane Group Flow (vph)	33	1957	0	237	1796	0	0	47	241	0	210	8
Confl. Peds. (#/hr)			2			8	15					15
Confl. Bikes (#/hr)					1			1		1		
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	1%	0%	0%
Turn Type	Prot			Prot			Perm		pm+ov	Perm		Perm
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	5.4	73.7		11.8	80.1			22.5	34.3		22.5	22.5
Effective Green, g (s)	5.9	74.2		12.3	80.6			23.0	35.3		23.0	23.0
Actuated g/C Ratio	0.05	0.59		0.10	0.64			0.18	0.28		0.18	0.18
Clearance Time (s)	5.0	6.5		5.0	6.5			5.5	5.0		5.5	5.5
Vehicle Extension (s)	2.5	4.0		2.5	4.0			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	85	2433		345	3196			184	452		248	288
v/s Ratio Prot	0.02	c0.48		c0.07	0.36				0.05			
v/s Ratio Perm								0.05	0.10		c0.16	0.01
v/c Ratio	0.39	0.80		0.69	0.56			0.26	0.53		0.85	0.03
Uniform Delay, d1	57.8	19.8		54.5	12.4			43.7	37.9		49.3	41.8
Progression Factor	0.76	0.49		0.99	0.98			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	1.6		3.7	0.5			0.5	0.9		22.2	0.0
Delay (s)	45.1	11.3		57.7	12.7			44.2	38.8		71.5	41.9
Level of Service	D	B		E	B			D	D		E	D
Approach Delay (s)		11.8			17.9			39.7			66.3	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	2295	1995	35	0	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	0	2318	2015	35	0	4
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		373	260			
pX, platoon unblocked	0.81				0.75	0.81
vC, conflicting volume	2052				2807	690
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1465				477	0
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	376				385	872

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	773	773	773	806	806	438	4
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	35	4
cSH	1700	1700	1700	1700	1700	1700	872
Volume to Capacity	0.45	0.45	0.45	0.47	0.47	0.26	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.1
Approach LOS							A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↰↑	↱↱
Volume (vph)	0	1480	815	119	984	0	0	0	0	640	5	1045
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5	5.5	5.5
Lane Util. Factor		*0.75	1.00	1.00	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4150	1568	1787	3471					1681	1682	2760
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4150	1568	1787	3471					1681	1682	2760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1495	823	120	994	0	0	0	0	646	5	1056
RTOR Reduction (vph)	0	0	346	0	0	0	0	0	0	0	0	32
Lane Group Flow (vph)	0	1495	477	120	994	0	0	0	0	323	328	1024
Confl. Bikes (#/hr)		1			2							
Heavy Vehicles (%)	0%	3%	3%	1%	4%	0%	0%	0%	0%	2%	20%	3%
Turn Type			Perm	Prot						Split		custom
Protected Phases		2		1	6					4	4	4 5
Permitted Phases			2									
Actuated Green, G (s)		58.8	58.8	11.0	53.8					37.2	37.2	59.2
Effective Green, g (s)		59.3	59.3	11.5	54.3					37.7	37.7	59.7
Actuated g/C Ratio		0.47	0.47	0.09	0.43					0.30	0.30	0.48
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	
Vehicle Extension (s)		6.1	6.1	2.3	6.1					2.3	2.3	
Lane Grp Cap (vph)		1969	744	164	1508					507	507	1318
v/s Ratio Prot		c0.36		0.07	c0.29					0.19	0.20	c0.37
v/s Ratio Perm			0.30									
v/c Ratio		0.76	0.64	0.73	0.66					0.64	0.65	0.78
Uniform Delay, d1		27.0	24.8	55.2	28.0					37.7	37.9	27.1
Progression Factor		0.71	0.50	1.26	0.62					1.00	1.00	1.00
Incremental Delay, d2		1.8	2.7	13.5	2.2					2.2	2.4	2.8
Delay (s)		21.0	15.1	83.2	19.5					39.9	40.2	29.9
Level of Service		C	B	F	B					D	D	C
Approach Delay (s)		18.9			26.3			0.0			33.8	
Approach LOS		B			C			A			C	

Intersection Summary			
HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1161	952	0	488	662	615	5	172	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		6.0	6.0	5.5	5.5	5.5			
Lane Util. Factor		0.95	0.88		0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes		1.00	1.00		1.00	0.95	1.00	1.00	0.96			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		3574	2760		3574	1502	1618	1620	1512			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		3574	2760		3574	1502	1618	1620	1512			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1222	1002	0	514	697	647	5	181	0	0	0
RTOR Reduction (vph)	0	0	320	0	0	240	0	0	25	0	0	0
Lane Group Flow (vph)	0	1222	682	0	514	457	323	329	156	0	0	0
Confl. Peds. (#/hr)						16			17			
Confl. Bikes (#/hr)		1			5					1		
Heavy Vehicles (%)	0%	1%	3%	0%	1%	2%	6%	20%	2%	0%	0%	0%
Turn Type			Perm			Perm	Split		Perm			
Protected Phases		2			6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		82.0	82.0		81.5	81.5	31.0	31.0	31.0			
Effective Green, g (s)		82.5	82.5		82.0	82.0	31.5	31.5	31.5			
Actuated g/C Ratio		0.66	0.66		0.66	0.66	0.25	0.25	0.25			
Clearance Time (s)		6.0	6.0		6.5	6.5	6.0	6.0	6.0			
Vehicle Extension (s)		6.1	6.1		4.2	4.2	2.3	2.3	2.3			
Lane Grp Cap (vph)		2359	1822		2345	985	408	408	381			
v/s Ratio Prot		c0.34			0.14		0.20	c0.20				
v/s Ratio Perm			0.25			0.30			0.10			
v/c Ratio		0.52	0.37		0.22	0.46	0.79	0.81	0.41			
Uniform Delay, d1		11.0	9.6		8.6	10.6	43.7	43.9	39.0			
Progression Factor		0.45	0.24		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.6	0.4		0.2	1.6	9.6	10.7	0.4			
Delay (s)		5.5	2.8		8.9	12.2	53.3	54.6	39.4			
Level of Service		A	A		A	B	D	D	D			
Approach Delay (s)		4.3			10.8			50.8			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Volume (vph)	290	952	61	10	789	80	112	7	17	81	5	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	3502	3502		1805	3522			1761	1590		1793	1592
Flt Permitted	0.95	1.00		0.95	1.00			0.67	1.00		0.65	1.00
Satd. Flow (perm)	3502	3502		1805	3522			1243	1590		1221	1592
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	302	992	64	10	822	83	117	7	18	84	5	199
RTOR Reduction (vph)	0	4	0	0	7	0	0	0	15	0	0	164
Lane Group Flow (vph)	302	1052	0	10	898	0	0	124	3	0	89	35
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Confl. Bikes (#/hr)		1			3							
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	8.9	32.0		0.7	23.8			10.2	10.2		10.2	10.2
Effective Green, g (s)	9.4	32.5		1.2	24.3			10.7	10.7		10.7	10.7
Actuated g/C Ratio	0.15	0.53		0.02	0.40			0.18	0.18		0.18	0.18
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.3	2.5		2.4	2.5			2.4	2.4		2.3	2.3
Lane Grp Cap (vph)	541	1869		36	1405			218	279		215	280
v/s Ratio Prot	c0.09	c0.30		0.01	c0.25							
v/s Ratio Perm								c0.10	0.00		0.07	0.02
v/c Ratio	0.56	0.56		0.28	0.64			0.57	0.01		0.41	0.12
Uniform Delay, d1	23.8	9.5		29.4	14.8			23.0	20.7		22.3	21.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	0.3		2.7	0.8			2.6	0.0		0.8	0.1
Delay (s)	24.7	9.8		32.2	15.6			25.6	20.7		23.1	21.3
Level of Service	C	A		C	B			C	C		C	C
Approach Delay (s)		13.1			15.8			25.0			21.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	217	900	26	24	737	16	17	9	45	5	7	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	4.8		4.8	4.8			5.6	5.6		5.3	4.8
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1805	1867		1805	3563			1762	1583		1861	1607
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.69	1.00
Satd. Flow (perm)	1805	1867		1805	3563			1762	1583		1313	1607
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	231	957	28	26	784	17	18	10	48	5	7	144
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	45	0	0	115
Lane Group Flow (vph)	231	985	0	26	800	0	0	28	3	0	12	29
Confl. Peds. (#/hr)			30	30			6					6
Heavy Vehicles (%)	0%	1%	5%	0%	1%	1%	7%	0%	2%	0%	0%	0%
Turn Type	Prot			Prot			Split		Perm	Perm		pm+ov
Protected Phases	5	2		1	6		8	8			4	5
Permitted Phases									8	4		4
Actuated Green, G (s)	11.6	48.9		1.7	39.0			4.1	4.1		3.6	15.2
Effective Green, g (s)	12.1	49.4		2.2	39.5			4.6	4.6		4.1	16.2
Actuated g/C Ratio	0.15	0.61		0.03	0.49			0.06	0.06		0.05	0.20
Clearance Time (s)	5.3	5.3		5.3	5.3			6.1	6.1		5.8	5.3
Vehicle Extension (s)	2.5	3.0		1.0	3.0			1.0	1.0		2.0	2.5
Lane Grp Cap (vph)	270	1141		49	1742			100	90		67	322
v/s Ratio Prot	c0.13	c0.53		0.01	0.22			c0.02				0.01
v/s Ratio Perm									0.00		c0.01	0.00
v/c Ratio	0.86	0.86		0.53	0.46			0.28	0.03		0.18	0.09
Uniform Delay, d1	33.5	12.9		38.8	13.6			36.5	36.0		36.7	26.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	22.1	6.9		5.4	0.2			0.6	0.1		0.5	0.1
Delay (s)	55.6	19.8		44.2	13.8			37.1	36.0		37.2	26.4
Level of Service	E	B		D	B			D	D		D	C
Approach Delay (s)		26.6			14.8			36.4			27.2	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.8	Sum of lost time (s)	15.7
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	984	134	217	1051	54	166	260	154	288	335	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.5	5.5		4.5	5.0	4.5	4.5	5.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1703	3319		3502	3338		1732	1810	1542	1761	3313	
Flt Permitted	0.95	1.00		0.95	1.00		0.42	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	1703	3319		3502	3338		760	1810	1542	1107	3313	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	101	994	135	219	1062	55	168	263	156	291	338	130
RTOR Reduction (vph)	0	8	0	0	3	0	0	0	59	0	35	0
Lane Group Flow (vph)	101	1121	0	219	1114	0	168	263	97	291	433	0
Confl. Peds. (#/hr)			7			15	7		8	8		7
Heavy Vehicles (%)	6%	7%	3%	0%	7%	6%	4%	5%	3%	2%	4%	3%
Turn Type	Prot			Prot			pm+pt		pm+ov	pm+pt		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	10.0	56.7		9.4	56.1		20.9	20.9	30.3	26.6	26.1	
Effective Green, g (s)	10.5	57.2		9.9	56.6		21.4	21.4	31.3	27.1	26.6	
Actuated g/C Ratio	0.08	0.46		0.08	0.45		0.17	0.17	0.25	0.22	0.21	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.5	5.0	5.0	5.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	143	1519		277	1511		222	310	386	329	705	
v/s Ratio Prot	0.06	c0.34		0.06	c0.33		0.07	c0.15	0.02	c0.12	0.13	
v/s Ratio Perm							0.06		0.04	c0.07		
v/c Ratio	0.71	0.74		0.79	0.74		0.76	0.85	0.25	0.88	0.61	
Uniform Delay, d1	55.7	27.8		56.5	28.1		47.7	50.2	37.5	46.2	44.6	
Progression Factor	1.00	1.00		0.99	0.45		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.2	3.3		9.0	2.1		12.3	18.3	0.1	22.8	1.1	
Delay (s)	67.9	31.0		64.9	14.7		59.9	68.5	37.6	69.0	45.7	
Level of Service	E	C		E	B		E	E	D	E	D	
Approach Delay (s)		34.1			22.9			57.8			54.6	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱			↑↑		↰	↑	↱	↰	↑↱	
Volume (vph)	50	1440	81	0	1091	1	92	293	314	188	643	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	*0.95			0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99			1.00		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3447			3438		1770	1863	1574	1787	3498	
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	3447			3438		1770	1863	1574	1787	3498	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	53	1532	86	0	1161	1	98	312	334	200	684	90
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	50	0	8	0
Lane Group Flow (vph)	53	1615	0	0	1162	0	98	312	284	200	766	0
Confl. Peds. (#/hr)			4			2			3			16
Heavy Vehicles (%)	5%	4%	0%	0%	5%	0%	2%	2%	1%	1%	1%	1%
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	8.0	67.7			54.7		9.0	23.5	23.5	16.8	31.3	
Effective Green, g (s)	8.5	68.2			55.2		9.5	24.0	24.0	17.3	31.8	
Actuated g/C Ratio	0.07	0.55			0.44		0.08	0.19	0.19	0.14	0.25	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	3.5			3.5		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	117	1881			1518		135	358	302	247	890	
v/s Ratio Prot	0.03	c0.47			0.34		0.06	0.17		0.11	c0.22	
v/s Ratio Perm									c0.18			
v/c Ratio	0.45	0.86			0.77		0.73	0.87	0.94	0.81	0.86	
Uniform Delay, d1	56.0	24.3			29.4		56.5	49.0	49.8	52.3	44.5	
Progression Factor	0.84	1.11			0.64		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	4.3			3.3		17.6	19.5	35.8	17.5	8.2	
Delay (s)	47.6	31.1			22.0		74.0	68.5	85.6	69.8	52.7	
Level of Service	D	C			C		E	E	F	E	D	
Approach Delay (s)		31.7			22.0			76.9			56.2	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	41.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	23	10	233	0	227	2	324	349	411	460	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.3	5.6	4.8	4.8		4.8	4.8	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98			1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	0.99	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1775			1787	1583	1794	1686		1805	1838	
Flt Permitted		0.98			0.95	1.00	0.48	1.00		0.10	1.00	
Satd. Flow (perm)		1775			1787	1583	911	1686		189	1838	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	24	24	11	245	0	239	2	341	367	433	484	11
RTOR Reduction (vph)	0	6	0	0	0	226	0	25	0	0	0	0
Lane Group Flow (vph)	0	53	0	0	245	13	2	683	0	433	495	0
Confl. Peds. (#/hr)			11	11			7		7	7		7
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	1%	2%	0%	3%	0%
Turn Type	Split			Split		custom	pm+pt			pm+pt		
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases						8	6			2		
Actuated Green, G (s)		7.4			20.0	7.4	64.4	63.4		98.7	92.4	
Effective Green, g (s)		7.9			20.5	7.9	65.4	63.9		99.2	92.9	
Actuated g/C Ratio		0.06			0.14	0.06	0.46	0.45		0.69	0.65	
Clearance Time (s)		6.1			5.8	6.1	5.3	5.3		5.3	5.3	
Vehicle Extension (s)		1.0			2.0	1.0	1.0	3.0		2.5	0.2	
Lane Grp Cap (vph)		98			256	87	425	752		475	1192	
v/s Ratio Prot		c0.03			c0.14		0.00	0.41		c0.19	0.27	
v/s Ratio Perm						0.01	0.00			c0.44		
v/c Ratio		0.54			0.96	0.15	0.00	0.91		0.91	0.41	
Uniform Delay, d1		65.9			61.0	64.5	21.2	37.0		41.0	12.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.3			43.7	0.3	0.0	14.7		21.7	0.1	
Delay (s)		69.2			104.7	64.8	21.2	51.7		62.6	12.2	
Level of Service		E			F	E	C	D		E	B	
Approach Delay (s)		69.2			85.0			51.6			35.7	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	52.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	143.3	Sum of lost time (s)	15.7
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	104	13	161	109	62	16	462	212	63	545	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	4.0		3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1797	1829		1745	1754		1804	1753		1805	1843	
Flt Permitted	0.64	1.00		0.44	1.00		0.26	1.00		0.17	1.00	
Satd. Flow (perm)	1212	1829		806	1754		490	1753		327	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	113	14	175	118	67	17	502	230	68	592	79
RTOR Reduction (vph)	0	4	0	0	18	0	0	11	0	0	3	0
Lane Group Flow (vph)	45	123	0	175	167	0	17	721	0	68	668	0
Confl. Peds. (#/hr)	5		7	7		5	9		5	5		9
Heavy Vehicles (%)	0%	2%	0%	3%	1%	2%	0%	3%	1%	0%	1%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.2	12.2		25.8	18.8		47.0	45.5		51.6	47.8	
Effective Green, g (s)	16.2	12.7		26.3	19.3		48.0	46.0		52.6	48.3	
Actuated g/C Ratio	0.18	0.14		0.30	0.22		0.55	0.53		0.60	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	2.2	2.2		2.2	2.2		2.2	5.0		2.2	5.0	
Lane Grp Cap (vph)	248	265		350	386		298	921		269	1016	
v/s Ratio Prot	0.01	0.07		c0.06	0.10		0.00	c0.41		c0.01	0.36	
v/s Ratio Perm	0.03			c0.09			0.03			0.14		
v/c Ratio	0.18	0.46		0.50	0.43		0.06	0.78		0.25	0.66	
Uniform Delay, d1	29.8	34.3		24.1	29.4		10.7	16.8		11.8	13.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.7		0.6	0.4		0.0	5.1		0.3	2.1	
Delay (s)	30.0	35.0		24.6	29.8		10.8	21.8		12.0	15.9	
Level of Service	C	C		C	C		B	C		B	B	
Approach Delay (s)		33.7			27.3			21.6			15.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	87.6	Sum of lost time (s)	14.5
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst:
Agency/Co.:
Date Performed: 4/16/2013
Analysis Time Period: Weekday PM
Intersection: Sagert/Martinazzi
Jurisdiction:
Units: U. S. Customary
Analysis Year: Existing
Project ID:
East/West Street: Sagert
North/South Street: Martinazzi

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	114	226	12	87	189	159	2	175	74	201	287	232
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	L	TR	L	TR	L	TR
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	126	264	96	386	2	276	223	575
% Heavy Veh	1	1	1	1	1	1	1	1
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	126	264	96	386	2	276	223	575
Left-Turn	126	0	96	0	2	0	223	0
Right-Turn	0	13	0	176	0	82	0	257
Prop. Left-Turns	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.5	0.0	0.3	0.0	0.4
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	

Exhibit 1
Attachment L

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	-0.0	0.5	-0.3	0.5	-0.2	0.5	-0.3

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	126	264	96	386	2	276	223	575
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.11	0.23	0.09	0.34	0.00	0.25	0.20	0.51
hd, final value	9.14	8.60	8.93	8.11	9.32	8.61	8.67	7.86
x, final value	0.32	0.63	0.24	0.87	0.01	0.66	0.54	1.26
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	6.8	6.3	6.6	5.8	7.0	6.3	6.4	5.6

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	126	264	96	386	2	276	223	575
Service Time	6.8	6.3	6.6	5.8	7.0	6.3	6.4	5.6
Utilization, x	0.32	0.63	0.24	0.87	0.01	0.66	0.54	1.26
Dep. headway, hd	9.14	8.60	8.93	8.11	9.32	8.61	8.67	7.86
Capacity	376	413	346	442	252	411	413	575
Delay	16.08	24.90	14.39	44.90	12.07	26.51	20.99	155.89
LOS	C	C	B	E	B	D	C	F
Approach:								
Delay	22.05		38.83		26.41		118.19	
LOS	C		E		D		F	

Intersection Delay 66.21 Intersection LOS F

Exhibit 1
Attachment L

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst:
Agency/Co.:
Date Performed: 4/16/2013
Analysis Time Period: Weekday PM
Intersection: Sagert/65th
Jurisdiction:
Units: U. S. Customary
Analysis Year: Existing
Project ID:
East/West Street: Sagert
North/South Street: 65th

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	389	2	131	2	7	6	56	280	3	3	326	
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	L	TR	L	TR	L	TR	L	TR
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	432	147	2	13	62	314	3	790
% Heavy Veh	1	1	0	0	1	2	1	2
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	432	147	2	13	62	314	3	790
Left-Turn	432	0	2	0	62	0	3	0
Right-Turn	0	145	0	6	0	3	0	428
Prop. Left-Turns	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	

Exhibit 1
Attachment L

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	-0.7	0.5	-0.3	0.5	0.0	0.5	-0.3

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	432	147	2	13	62	314	3	790
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.38	0.13	0.00	0.01	0.06	0.28	0.00	0.70
hd, final value	7.70	6.51	9.15	8.33	7.93	7.44	7.69	6.83
x, final value	0.92	0.27	0.01	0.03	0.14	0.65	0.01	1.50
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.4	4.2	6.8	6.0	5.6	5.1	5.4	4.5

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	432	147	2	13	62	314	3	790
Service Time	5.4	4.2	6.8	6.0	5.6	5.1	5.4	4.5
Utilization, x	0.92	0.27	0.01	0.03	0.14	0.65	0.01	1.50
Dep. headway, hd	7.70	6.51	9.15	8.33	7.93	7.44	7.69	6.83
Capacity	467	397	252	263	312	479	253	790
Delay	52.42	11.55	11.90	11.28	11.89	22.90	10.44	252.56
LOS	F	B	B	B	B	C	B	F
Approach:								
Delay	42.04		11.37		21.08		251.65	
LOS	E		B		C		F	

Intersection Delay 131.59 Intersection LOS F

Exhibit 1
Attachment L

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Volume (vph)	405	121	250	416	180	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1599	1787	1845	1770	1582
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1599	1787	1845	1770	1582
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	127	263	438	189	311
RTOR Reduction (vph)	0	88	0	0	0	97
Lane Group Flow (vph)	426	39	263	438	189	214
Confl. Peds. (#/hr)		11	11		1	3
Confl. Bikes (#/hr)	4		2	10	1	
Heavy Vehicles (%)	2%	1%	1%	3%	2%	1%
Turn Type		Prot	Prot			pm+ov
Protected Phases	2	2	1	6	8	1
Permitted Phases					8	8
Actuated Green, G (s)	16.7	16.7	13.3	35.0	10.8	24.1
Effective Green, g (s)	17.2	17.2	13.8	35.5	11.3	25.1
Actuated g/C Ratio	0.31	0.31	0.25	0.64	0.20	0.45
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	574	493	442	1174	358	839
v/s Ratio Prot	c0.23	0.02	c0.15	0.24	c0.11	0.06
v/s Ratio Perm						0.07
v/c Ratio	0.74	0.08	0.60	0.37	0.53	0.25
Uniform Delay, d1	17.3	13.7	18.5	4.8	19.9	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.1	2.2	0.2	1.4	0.2
Delay (s)	22.5	13.8	20.7	5.0	21.3	9.7
Level of Service	C	B	C	A	C	A
Approach Delay (s)	20.5			10.9	14.1	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	46	80	396	60	110	261
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	87	430	65	120	284
Pedestrians	13					6
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			428			355
pX, platoon unblocked	0.98	0.98			0.98	
vC, conflicting volume	999	482			509	
vC1, stage 1 conf vol	476					
vC2, stage 2 conf vol	523					
vCu, unblocked vol	988	460			488	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	85			89	
cM capacity (veh/h)	447	583			1052	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	50	87	496	120	284
Volume Left	50	0	0	120	0
Volume Right	0	87	65	0	0
cSH	447	583	1700	1052	1700
Volume to Capacity	0.11	0.15	0.29	0.11	0.17
Queue Length 95th (ft)	10	14	0	10	0
Control Delay (s)	14.1	12.3	0.0	8.9	0.0
Lane LOS	B	B		A	
Approach Delay (s)	12.9		0.0	2.6	
Approach LOS	B				

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	37	45	81	419	263	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	41	49	89	460	289	48
Pedestrians	1			4	10	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				308	475	
pX, platoon unblocked	0.96					
vC, conflicting volume	963	318	338			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	942	318	338			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	93	93			
cM capacity (veh/h)	261	724	1231			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	90	89	460	337
Volume Left	41	89	0	0
Volume Right	49	0	0	48
cSH	402	1231	1700	1700
Volume to Capacity	0.22	0.07	0.27	0.20
Queue Length 95th (ft)	22	6	0	0
Control Delay (s)	16.5	8.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.5	1.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	25	475	9	3	305
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	28	528	10	3	339
Pedestrians	19					2
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			227			556
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	728	554			557	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	641	448			451	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	94			100	
cM capacity (veh/h)	363	498			991	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	33	538	116	226
Volume Left	6	0	3	0
Volume Right	28	10	0	0
cSH	469	1700	991	1700
Volume to Capacity	0.07	0.32	0.00	0.13
Queue Length 95th (ft)	6	0	0	0
Control Delay (s)	13.3	0.0	0.3	0.0
Lane LOS	B		A	
Approach Delay (s)	13.3	0.0	0.1	
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑			↑↑
Volume (veh/h)	0	10	474	0	1	309
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	11	533	0	1	347
Pedestrians	13					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			125			658
pX, platoon unblocked	0.89	0.89			0.89	
vC, conflicting volume	721	546			546	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	623	425			425	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	371	512			1006	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	11	533	117	231
Volume Left	0	0	1	0
Volume Right	11	0	0	0
cSH	512	1700	1006	1700
Volume to Capacity	0.02	0.31	0.00	0.14
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	12.2	0.0	0.1	0.0
Lane LOS	B		A	
Approach Delay (s)	12.2	0.0	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	1	63	220	37	230	23	228	31	0	301	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1805	1603		1698	1730	1542	1683	1841			3559	
Flt Permitted	0.95	1.00		0.95	0.97	1.00	0.55	1.00			1.00	
Satd. Flow (perm)	1805	1603		1698	1730	1542	970	1841			3559	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	1	69	242	41	253	25	251	34	0	331	9
RTOR Reduction (vph)	0	63	0	0	0	198	0	7	0	0	3	0
Lane Group Flow (vph)	18	7	0	140	143	55	25	278	0	0	337	0
Confl. Peds. (#/hr)	2					2	3		16	16		3
Confl. Bikes (#/hr)						2					3	
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%	7%	1%	0%	0%	1%	0%
Turn Type	Split			Split		Perm	Perm					
Protected Phases	8	8		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	3.1	3.1		8.9	8.9	8.9	13.6	13.6			13.6	
Effective Green, g (s)	3.6	3.6		9.4	9.4	9.4	14.1	14.1			14.1	
Actuated g/C Ratio	0.08	0.08		0.22	0.22	0.22	0.32	0.32			0.32	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	5.0	5.0			5.0	
Lane Grp Cap (vph)	149	132		366	373	332	314	595			1151	
v/s Ratio Prot	c0.01	0.00		0.08	c0.08			c0.15			0.09	
v/s Ratio Perm						0.04	0.03					
v/c Ratio	0.12	0.05		0.38	0.38	0.16	0.08	0.47			0.29	
Uniform Delay, d1	18.5	18.4		14.6	14.6	13.9	10.2	11.8			11.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.1		0.5	0.5	0.2	0.2	1.2			0.3	
Delay (s)	18.8	18.5		15.1	15.1	14.1	10.5	13.0			11.3	
Level of Service	B	B		B	B	B	B	B			B	
Approach Delay (s)		18.6			14.6			12.8			11.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰		↑↱			↱
Volume (veh/h)	32	0	434	50	0	53
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	36	0	493	57	0	60
Pedestrians					4	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		245				
pX, platoon unblocked						
vC, conflicting volume	554				598	279
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	554				598	279
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	92
cM capacity (veh/h)	1023				421	722

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	36	329	221	60
Volume Left	36	0	0	0
Volume Right	0	0	57	60
cSH	1023	1700	1700	722
Volume to Capacity	0.04	0.19	0.13	0.08
Queue Length 95th (ft)	3	0	0	7
Control Delay (s)	8.6	0.0	0.0	10.4
Lane LOS	A			B
Approach Delay (s)	8.6	0.0		10.4
Approach LOS				B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1335	59	257	1451	101	57	25	248	154	40	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0			5.0	4.5		5.0	5.0
Lane Util. Factor	1.00	*0.75		0.97	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.96	1.00
Satd. Flow (prot)	1805	4091		3502	4941			1799	1599		1813	1579
Flt Permitted	0.95	1.00		0.95	1.00			0.50	1.00		0.71	1.00
Satd. Flow (perm)	1805	4091		3502	4941			925	1599		1347	1579
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	1362	60	262	1481	103	58	26	253	157	41	63
RTOR Reduction (vph)	0	3	0	0	5	0	0	0	0	0	0	52
Lane Group Flow (vph)	51	1419	0	262	1579	0	0	84	253	0	198	11
Confl. Peds. (#/hr)						4						9
Confl. Bikes (#/hr)					1			1		1		
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	1%	0%	0%
Turn Type	Prot			Prot			Perm		pm+ov	Perm		Perm
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	5.9	66.0		11.6	71.7			20.4	32.0		20.4	20.4
Effective Green, g (s)	6.4	66.5		12.1	72.2			20.9	33.0		20.9	20.9
Actuated g/C Ratio	0.06	0.58		0.11	0.63			0.18	0.29		0.18	0.18
Clearance Time (s)	5.0	6.5		5.0	6.5			5.5	5.0		5.5	5.5
Vehicle Extension (s)	2.5	4.0		2.5	4.0			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	100	2366		368	3102			168	459		245	287
v/s Ratio Prot	0.03	c0.35		c0.07	0.32				0.06			
v/s Ratio Perm								0.09	0.10		c0.15	0.01
v/c Ratio	0.51	0.60		0.71	0.51			0.50	0.55		0.81	0.04
Uniform Delay, d1	52.8	15.7		49.8	11.7			42.3	34.7		45.1	38.8
Progression Factor	0.84	0.72		1.01	0.63			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.6	0.9		4.9	0.5			1.7	1.1		17.1	0.0
Delay (s)	47.0	12.2		55.2	7.8			44.0	35.9		62.2	38.8
Level of Service	D	B		E	A			D	D		E	D
Approach Delay (s)		13.4			14.6			37.9			56.5	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	1737	1794	48	0	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1791	1849	49	0	15
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		373	260			
pX, platoon unblocked	0.84				0.88	0.84
vC, conflicting volume	1905				2477	647
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1407				982	0
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	100				100	98
cM capacity (veh/h)	410				220	847

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	597	597	597	740	740	419	15
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	49	15
cSH	1700	1700	1700	1700	1700	1700	847
Volume to Capacity	0.35	0.35	0.35	0.44	0.44	0.25	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.3
Approach LOS							A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1332	405	187	1000	0	0	0	0	602	3	840
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	3.5	5.5					5.5	5.5	5.5
Lane Util. Factor		*0.75	1.00	1.00	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4150	1568	1787	3471					1681	1683	2760
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4150	1568	1787	3471					1681	1683	2760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1345	409	189	1010	0	0	0	0	608	3	848
RTOR Reduction (vph)	0	0	199	0	0	0	0	0	0	0	0	68
Lane Group Flow (vph)	0	1345	210	189	1010	0	0	0	0	304	307	780
Confl. Bikes (#/hr)		1			2							
Heavy Vehicles (%)	0%	3%	3%	1%	4%	0%	0%	0%	0%	2%	20%	3%
Turn Type			Perm	Prot						Split		custom
Protected Phases		2		1	6					4	4	4 5
Permitted Phases			2									
Actuated Green, G (s)		57.4	57.4	14.7	59.1					26.9	26.9	43.9
Effective Green, g (s)		57.9	57.9	15.2	59.6					27.4	27.4	40.9
Actuated g/C Ratio		0.50	0.50	0.13	0.52					0.24	0.24	0.36
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0	6.0	
Vehicle Extension (s)		6.1	6.1	2.3	6.1					2.3	2.3	
Lane Grp Cap (vph)		2089	789	236	1799					401	401	982
v/s Ratio Prot		c0.32		c0.11	0.29					0.18	0.18	c0.28
v/s Ratio Perm			0.13									
v/c Ratio		0.64	0.27	0.80	0.56					0.76	0.77	0.79
Uniform Delay, d1		21.0	16.4	48.4	18.8					40.7	40.8	33.3
Progression Factor		0.72	0.65	0.72	1.23					1.00	1.00	1.00
Incremental Delay, d2		1.3	0.7	16.2	1.2					7.4	7.9	4.3
Delay (s)		16.3	11.3	51.0	24.5					48.1	48.7	37.6
Level of Service		B	B	D	C					D	D	D
Approach Delay (s)		15.1			28.6			0.0			42.1	
Approach LOS		B			C			A			D	

Intersection Summary			
HCM Average Control Delay	27.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1045	890	0	610	646	575	0	213	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		6.0	6.0	5.5	5.5	5.5			
Lane Util. Factor		0.95	0.88		0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	1.00	0.98			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		3574	2694		3574	1583	1618	1618	1559			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		3574	2694		3574	1583	1618	1618	1559			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1100	937	0	642	680	605	0	224	0	0	0
RTOR Reduction (vph)	0	0	313	0	0	230	0	0	37	0	0	0
Lane Group Flow (vph)	0	1100	624	0	642	450	302	303	187	0	0	0
Confl. Peds. (#/hr)			1	1			1		2	2		1
Confl. Bikes (#/hr)		1			5					1		
Heavy Vehicles (%)	0%	1%	3%	0%	1%	2%	6%	20%	2%	0%	0%	0%
Turn Type			Perm			Perm	Split		Perm			
Protected Phases		2			6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		76.1	76.1		75.6	75.6	26.9	26.9	26.9			
Effective Green, g (s)		76.6	76.6		76.1	76.1	27.4	27.4	27.4			
Actuated g/C Ratio		0.67	0.67		0.66	0.66	0.24	0.24	0.24			
Clearance Time (s)		6.0	6.0		6.5	6.5	6.0	6.0	6.0			
Vehicle Extension (s)		6.1	6.1		4.2	4.2	2.3	2.3	2.3			
Lane Grp Cap (vph)		2381	1794		2365	1048	386	386	371			
v/s Ratio Prot		c0.31			0.18		0.19	c0.19				
v/s Ratio Perm			0.23			0.28			0.12			
v/c Ratio		0.46	0.35		0.27	0.43	0.78	0.78	0.51			
Uniform Delay, d1		9.3	8.3		8.0	9.2	41.0	41.0	37.9			
Progression Factor		1.29	5.34		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.5	0.4		0.3	1.3	9.4	9.6	0.6			
Delay (s)		12.5	45.0		8.3	10.5	50.4	50.6	38.6			
Level of Service		B	D		A	B	D	D	D			
Approach Delay (s)		27.5			9.4			47.3			0.0	
Approach LOS		C			A			D			A	

Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	524	544	57	15	672	101	103	11	12	101	11	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3502	3481		1805	3500			1768	1593		1799	1594
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.66	1.00
Satd. Flow (perm)	3502	3481		1805	3500			1229	1593		1249	1594
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	546	567	59	16	700	105	107	11	12	105	11	335
RTOR Reduction (vph)	0	6	0	0	11	0	0	0	10	0	0	282
Lane Group Flow (vph)	546	620	0	16	794	0	0	118	2	0	116	53
Confl. Peds. (#/hr)	8		2	2		8	1		2	2		1
Confl. Bikes (#/hr)		1			3							
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	13.8	35.6		0.8	22.6			9.7	9.7		9.7	9.7
Effective Green, g (s)	14.3	36.1		1.3	23.1			10.2	10.2		10.2	10.2
Actuated g/C Ratio	0.22	0.56		0.02	0.36			0.16	0.16		0.16	0.16
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.3	2.5		2.4	2.5			2.4	2.4		2.3	2.3
Lane Grp Cap (vph)	781	1960		37	1261			196	253		199	254
v/s Ratio Prot	c0.16	0.18		0.01	c0.23							
v/s Ratio Perm								c0.10	0.00		0.09	0.03
v/c Ratio	0.70	0.32		0.43	0.63			0.60	0.01		0.58	0.21
Uniform Delay, d1	22.9	7.4		31.0	17.0			25.1	22.7		25.0	23.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	0.1		5.2	0.9			4.2	0.0		3.3	0.2
Delay (s)	25.3	7.5		36.3	17.8			29.2	22.7		28.2	23.7
Level of Service	C	A		D	B			C	C		C	C
Approach Delay (s)		15.8			18.2			28.6			24.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	64.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱			↑↑		↰	↑	↱	↰	↑↱	
Volume (vph)	67	1110	137	0	1086	0	97	215	210	125	371	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98			1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3428			3438		1770	1863	1537	1787	3465	
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	3428			3438		1770	1863	1537	1787	3465	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	71	1181	146	0	1155	0	103	229	223	133	395	90
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	113	0	20	0
Lane Group Flow (vph)	71	1321	0	0	1155	0	103	229	110	133	465	0
Confl. Peds. (#/hr)						6			23			3
Heavy Vehicles (%)	5%	4%	0%	0%	5%	0%	2%	2%	1%	1%	1%	1%
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	7.4	67.9			55.5		10.4	17.4	17.4	12.7	19.7	
Effective Green, g (s)	7.9	68.4			56.0		10.9	17.9	17.9	13.2	20.2	
Actuated g/C Ratio	0.07	0.59			0.49		0.09	0.16	0.16	0.11	0.18	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	3.5			3.5		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	118	2039			1674		168	290	239	205	609	
v/s Ratio Prot	0.04	c0.39			c0.34		0.06	c0.12		0.07	c0.13	
v/s Ratio Perm									0.07			
v/c Ratio	0.60	0.65			0.69		0.61	0.79	0.46	0.65	0.76	
Uniform Delay, d1	52.0	15.4			22.8		50.0	46.7	44.2	48.7	45.1	
Progression Factor	1.00	1.00			0.51		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.8	1.6			2.1		6.5	12.4	0.5	6.9	5.1	
Delay (s)	57.8	17.0			13.9		56.5	59.1	44.7	55.6	50.2	
Level of Service	E	B			B		E	E	D	E	D	
Approach Delay (s)		19.0			13.9			52.8			51.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Intersection Sign configuration not allowed in HCM analysis.

Exhibit 1
Attachment L

Appendix E
2014 Background Operations Worksheets

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	7	9	469	7	40	0	484	557	59	676	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5	3.5			4.0	3.5	3.5	4.0	
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.92		1.00	0.96			1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt		0.93		1.00	0.87			1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1597		1787	1575			1900	1571	1805	1900	
Flt Permitted		1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1597		1787	1575			1900	1571	1805	1900	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	7	9	494	7	42	0	509	586	62	712	1
RTOR Reduction (vph)	0	9	0	0	26	0	0	0	157	0	0	0
Lane Group Flow (vph)	0	8	0	494	23	0	0	509	429	62	713	0
Confl. Peds. (#/hr)	15		7	7		15	7		8	8		7
Heavy Vehicles (%)	0%	2%	1%	1%	3%	0%	2%	0%	1%	0%	0%	0%
Turn Type	Split			Split			Prot		pm+ov	Prot		
Protected Phases	8	8		4	4		1	6	4	5	2	
Permitted Phases									6			
Actuated Green, G (s)		1.7		32.0	32.0			28.3	60.3	5.3	37.6	
Effective Green, g (s)		2.2		32.5	32.5			28.8	61.3	5.8	38.1	
Actuated g/C Ratio		0.03		0.39	0.39			0.34	0.73	0.07	0.45	
Clearance Time (s)		4.0		4.0	4.0			4.5	4.0	4.0	4.5	
Vehicle Extension (s)		2.5		2.2	2.2			3.5	2.2	2.2	3.5	
Lane Grp Cap (vph)		42		693	611			653	1149	125	864	
v/s Ratio Prot		c0.01		c0.28	0.01			0.27	0.14	0.03	c0.38	
v/s Ratio Perm									0.13			
v/c Ratio		0.20		0.71	0.04			0.78	0.37	0.50	0.83	
Uniform Delay, d1		39.9		21.7	15.9			24.7	4.2	37.6	19.9	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.7		3.0	0.0			6.0	0.1	1.6	6.6	
Delay (s)		41.6		24.7	16.0			30.7	4.3	39.2	26.6	
Level of Service		D		C	B			C	A	D	C	
Approach Delay (s)		41.6			23.9			16.5			27.6	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

HCM Signalized Intersection Capacity Analysis
2: SW Boones Ferry Rd & SW Tualatin Rd

4/15/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	410	834	200	298	443	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	3.5	3.5	3.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3467	1589	1900	1571	1805	1900
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3467	1589	1900	1571	1805	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	432	878	211	314	466	384
RTOR Reduction (vph)	0	196	0	74	0	0
Lane Group Flow (vph)	432	682	211	240	466	384
Confl. Peds. (#/hr)	7	15		8	8	
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Turn Type		pm+ov		pm+ov	Prot	
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.6	32.0	13.4	25.0	20.4	37.3
Effective Green, g (s)	12.1	33.0	13.9	26.0	20.9	37.8
Actuated g/C Ratio	0.21	0.58	0.24	0.46	0.37	0.66
Clearance Time (s)	4.0	4.0	3.5	4.0	4.0	4.0
Vehicle Extension (s)	3.0	2.0	5.0	3.0	2.0	2.0
Lane Grp Cap (vph)	737	1019	464	718	663	1262
v/s Ratio Prot	0.12	c0.25	c0.11	0.07	0.26	0.20
v/s Ratio Perm		0.18		0.08		
v/c Ratio	0.59	0.67	0.45	0.33	0.70	0.30
Uniform Delay, d1	20.1	8.2	18.3	9.9	15.4	4.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.3	1.5	0.3	2.8	0.0
Delay (s)	21.3	9.5	19.8	10.2	18.1	4.1
Level of Service	C	A	B	B	B	A
Approach Delay (s)	13.4		14.0			11.8
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	6.5
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	664	175	422	930	325	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1599	1787	1845	1770	1572
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1599	1787	1845	1770	1572
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	699	184	444	979	342	405
RTOR Reduction (vph)	0	51	0	0	0	38
Lane Group Flow (vph)	699	133	444	979	342	367
Confl. Peds. (#/hr)		7	7		7	8
Confl. Bikes (#/hr)	4		2	10	1	
Heavy Vehicles (%)	2%	1%	1%	3%	2%	1%
Turn Type		Prot	Prot			pm+ov
Protected Phases	2	2	1	6	8	1
Permitted Phases					8	8
Actuated Green, G (s)	41.2	41.2	29.9	76.1	21.1	51.0
Effective Green, g (s)	41.7	41.7	30.4	76.6	21.6	52.0
Actuated g/C Ratio	0.39	0.39	0.28	0.71	0.20	0.49
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	725	622	507	1318	357	829
v/s Ratio Prot	c0.38	0.08	c0.25	0.53	c0.19	0.13
v/s Ratio Perm						0.11
v/c Ratio	0.96	0.21	0.88	0.74	0.96	0.44
Uniform Delay, d1	32.0	21.8	36.6	9.3	42.4	18.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.7	0.2	15.5	2.3	36.3	0.4
Delay (s)	56.7	22.0	52.1	11.6	78.6	18.5
Level of Service	E	C	D	B	E	B
Approach Delay (s)	49.5			24.2	46.0	
Approach LOS	D			C	D	

Intersection Summary			
HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	107.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	110	598	70	145	450
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	33	121	657	77	159	495
Pedestrians	25		16			26
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	2		1			2
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			428			355
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	1550	747			759	
vC1, stage 1 conf vol	721					
vC2, stage 2 conf vol	829					
vCu, unblocked vol	1555	668			682	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	69			80	
cM capacity (veh/h)	276	393			795	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	33	121	734	159	495
Volume Left	33	0	0	159	0
Volume Right	0	121	77	0	0
cSH	276	393	1700	795	1700
Volume to Capacity	0.12	0.31	0.43	0.20	0.29
Queue Length 95th (ft)	10	33	0	19	0
Control Delay (s)	19.8	18.2	0.0	10.7	0.0
Lane LOS	C	C		B	
Approach Delay (s)	18.5		0.0	2.6	
Approach LOS	C				

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	40	80	85	628	431	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	45	90	96	706	484	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				308	475	
pX, platoon unblocked	0.89					
vC, conflicting volume	1409	512	540			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1398	512	540			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	84	91			
cM capacity (veh/h)	127	566	1038			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	135	96	706	540
Volume Left	45	96	0	0
Volume Right	90	0	0	56
cSH	263	1038	1700	1700
Volume to Capacity	0.51	0.09	0.42	0.32
Queue Length 95th (ft)	70	8	0	0
Control Delay (s)	32.2	8.8	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	32.2	1.1		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	32	681	6	10	502
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	35	748	7	11	552
Pedestrians	25		16			26
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	2		1			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			227			556
pX, platoon unblocked	0.86	0.86			0.86	
vC, conflicting volume	1090	803			780	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1023	687			661	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	89			99	
cM capacity (veh/h)	185	314			759	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	35	755	195	368
Volume Left	0	0	11	0
Volume Right	35	7	0	0
cSH	314	1700	759	1700
Volume to Capacity	0.11	0.44	0.01	0.22
Queue Length 95th (ft)	10	0	1	0
Control Delay (s)	17.9	0.0	0.7	0.0
Lane LOS	C		A	
Approach Delay (s)	17.9	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

HCM Unsignalized Intersection Capacity Analysis
7: RO Only & Martinazzi Ave

4/15/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	12	675	0	0	502
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	13	758	0	0	564
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			125			658
pX, platoon unblocked	0.85	0.85			0.85	
vC, conflicting volume	1040	758			758	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	960	629			629	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	220	366			820	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	13	758	282	282
Volume Left	0	0	0	0
Volume Right	13	0	0	0
cSH	366	1700	1700	1700
Volume to Capacity	0.04	0.45	0.17	0.17
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	15.2	0.0	0.0	0.0
Lane LOS	C			
Approach Delay (s)	15.2	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↰↑	↱	↰	↑↱			↑↑↱	
Volume (vph)	29	10	100	349	55	337	27	308	19	0	492	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.99			1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1805	1626		1698	1728	1528	1682	1861			3562	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.41	1.00			1.00	
Satd. Flow (perm)	1805	1626		1698	1728	1528	719	1861			3562	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	32	11	110	384	60	370	30	338	21	0	541	11
RTOR Reduction (vph)	0	97	0	0	0	279	0	3	0	0	2	0
Lane Group Flow (vph)	32	24	0	219	225	91	30	356	0	0	550	0
Confl. Peds. (#/hr)	10					10	6		19	19		6
Confl. Bikes (#/hr)						2					3	
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%	7%	1%	0%	0%	1%	0%
Turn Type	Split			Split		Perm	Perm					
Protected Phases	8	8		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	4.8	4.8		10.5	10.5	10.5	15.9	15.9			15.9	
Effective Green, g (s)	5.3	5.3		11.0	11.0	11.0	16.4	16.4			16.4	
Actuated g/C Ratio	0.12	0.12		0.25	0.25	0.25	0.37	0.37			0.37	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5			4.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	5.0	5.0			5.0	
Lane Grp Cap (vph)	214	193		418	425	376	264	683			1307	
v/s Ratio Prot	c0.02	0.01		0.13	c0.13			c0.19			0.15	
v/s Ratio Perm						0.06	0.04					
v/c Ratio	0.15	0.12		0.52	0.53	0.24	0.11	0.52			0.42	
Uniform Delay, d1	17.7	17.6		14.6	14.6	13.5	9.3	11.1			10.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.2		0.9	0.9	0.2	0.4	1.4			0.5	
Delay (s)	17.9	17.8		15.5	15.5	13.8	9.7	12.4			11.1	
Level of Service	B	B		B	B	B	A	B			B	
Approach Delay (s)		17.9			14.7			12.2			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	44.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	28	0	658	40	0	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	32	0	748	45	0	93
Pedestrians					5	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		243				
pX, platoon unblocked						
vC, conflicting volume	798				839	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	798				839	402
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	85
cM capacity (veh/h)	830				295	601

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	32	498	295	93
Volume Left	32	0	0	0
Volume Right	0	0	45	93
cSH	830	1700	1700	601
Volume to Capacity	0.04	0.29	0.17	0.15
Queue Length 95th (ft)	3	0	0	14
Control Delay (s)	9.5	0.0	0.0	12.1
Lane LOS	A			B
Approach Delay (s)	9.5	0.0		12.1
Approach LOS				B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1930	40	232	1725	72	36	10	236	182	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0			5.0	4.5		5.0	5.0
Lane Util. Factor	1.00	*0.75		0.97	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	4100		3502	4957			1768	1599		1803	1565
Flt Permitted	0.95	1.00		0.95	1.00			0.54	1.00		0.72	1.00
Satd. Flow (perm)	1805	4100		3502	4957			1000	1599		1350	1565
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	31	1969	41	237	1760	73	37	10	241	186	24	45
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	0	0	0	37
Lane Group Flow (vph)	31	2009	0	237	1830	0	0	47	241	0	210	8
Confl. Peds. (#/hr)			2			8	15					15
Confl. Bikes (#/hr)					1			1		1		
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	1%	0%	0%
Turn Type	Prot			Prot			Perm		pm+ov	Perm		Perm
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	5.4	73.7		11.8	80.1			22.5	34.3		22.5	22.5
Effective Green, g (s)	5.9	74.2		12.3	80.6			23.0	35.3		23.0	23.0
Actuated g/C Ratio	0.05	0.59		0.10	0.64			0.18	0.28		0.18	0.18
Clearance Time (s)	5.0	6.5		5.0	6.5			5.5	5.0		5.5	5.5
Vehicle Extension (s)	2.5	4.0		2.5	4.0			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	85	2434		345	3196			184	452		248	288
v/s Ratio Prot	0.02	c0.49		c0.07	0.37				0.05			
v/s Ratio Perm								0.05	0.10		c0.16	0.01
v/c Ratio	0.36	0.83		0.69	0.57			0.26	0.53		0.85	0.03
Uniform Delay, d1	57.7	20.2		54.5	12.5			43.7	37.9		49.3	41.8
Progression Factor	0.75	0.48		1.00	0.97			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	1.7		3.7	0.5			0.5	0.9		22.2	0.0
Delay (s)	44.1	11.5		58.4	12.7			44.2	38.8		71.5	41.9
Level of Service	D	B		E	B			D	D		E	D
Approach Delay (s)		12.0			17.9			39.7			66.3	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			
Volume (veh/h)	0	2295	1995	35	0	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	0	2318	2015	35	0	4
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		373	260			
pX, platoon unblocked	0.80				0.73	0.80
vC, conflicting volume	2052				2807	690
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1447				355	0
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	380				450	866

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	773	773	773	806	806	438	4
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	35	4
cSH	1700	1700	1700	1700	1700	1700	866
Volume to Capacity	0.45	0.45	0.45	0.47	0.47	0.26	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.2
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.2
Approach LOS							A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1514	835	123	1001	0	0	0	0	659	5	1060
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5	5.5	5.5
Lane Util. Factor		*0.75	1.00	1.00	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4150	1568	1787	3471					1681	1682	2760
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4150	1568	1787	3471					1681	1682	2760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1529	843	124	1011	0	0	0	0	666	5	1071
RTOR Reduction (vph)	0	0	350	0	0	0	0	0	0	0	0	30
Lane Group Flow (vph)	0	1529	493	124	1011	0	0	0	0	333	338	1041
Confl. Bikes (#/hr)		1			2							
Heavy Vehicles (%)	0%	3%	3%	1%	4%	0%	0%	0%	0%	2%	20%	3%
Turn Type			Perm	Prot						Split		custom
Protected Phases		2		1	6					4	4	4 5
Permitted Phases			2									
Actuated Green, G (s)		58.2	58.2	11.1	53.3					37.7	37.7	59.7
Effective Green, g (s)		58.7	58.7	11.6	53.8					38.2	38.2	60.2
Actuated g/C Ratio		0.47	0.47	0.09	0.43					0.31	0.31	0.48
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	
Vehicle Extension (s)		6.1	6.1	2.3	6.1					2.3	2.3	
Lane Grp Cap (vph)		1949	736	166	1494					514	514	1329
v/s Ratio Prot		c0.37		0.07	c0.29					0.20	0.20	c0.38
v/s Ratio Perm			0.31									
v/c Ratio		0.78	0.67	0.75	0.68					0.65	0.66	0.78
Uniform Delay, d1		27.8	25.7	55.3	28.6					37.6	37.7	27.0
Progression Factor		0.75	0.55	1.27	0.62					1.00	1.00	1.00
Incremental Delay, d2		2.1	3.1	14.7	2.4					2.3	2.6	2.9
Delay (s)		22.9	17.3	85.1	20.1					39.9	40.3	29.9
Level of Service		C	B	F	C					D	D	C
Approach Delay (s)		20.9			27.2			0.0			33.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱↱		↑↑	↱	↰	↰↑	↱			
Volume (vph)	0	1196	981	0	490	682	634	5	177	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		6.0	6.0	5.5	5.5	5.5			
Lane Util. Factor		0.95	0.88		0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes		1.00	1.00		1.00	0.95	1.00	1.00	0.96			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		3574	2760		3574	1502	1618	1620	1512			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		3574	2760		3574	1502	1618	1620	1512			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1259	1033	0	516	718	667	5	186	0	0	0
RTOR Reduction (vph)	0	0	327	0	0	252	0	0	23	0	0	0
Lane Group Flow (vph)	0	1259	706	0	516	466	333	339	163	0	0	0
Confl. Peds. (#/hr)						16			17			
Confl. Bikes (#/hr)		1			5					1		
Heavy Vehicles (%)	0%	1%	3%	0%	1%	2%	6%	20%	2%	0%	0%	0%
Turn Type			Perm			Perm	Split		Perm			
Protected Phases		2			6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		81.1	81.1		80.6	80.6	31.9	31.9	31.9			
Effective Green, g (s)		81.6	81.6		81.1	81.1	32.4	32.4	32.4			
Actuated g/C Ratio		0.65	0.65		0.65	0.65	0.26	0.26	0.26			
Clearance Time (s)		6.0	6.0		6.5	6.5	6.0	6.0	6.0			
Vehicle Extension (s)		6.1	6.1		4.2	4.2	2.3	2.3	2.3			
Lane Grp Cap (vph)		2333	1802		2319	974	419	420	392			
v/s Ratio Prot		c0.35			0.14		0.21	c0.21				
v/s Ratio Perm			0.26			0.31			0.11			
v/c Ratio		0.54	0.39		0.22	0.48	0.79	0.81	0.42			
Uniform Delay, d1		11.6	10.1		9.0	11.2	43.2	43.4	38.4			
Progression Factor		0.44	0.20		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.6	0.5		0.2	1.7	9.6	10.4	0.4			
Delay (s)		5.8	2.5		9.2	12.9	52.8	53.8	38.9			
Level of Service		A	A		A	B	D	D	D			
Approach Delay (s)		4.3			11.3			50.2			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	981	61	10	813	80	112	7	17	81	5	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	3502	3503		1805	3523			1761	1590		1793	1592
Flt Permitted	0.95	1.00		0.95	1.00			0.67	1.00		0.65	1.00
Satd. Flow (perm)	3502	3503		1805	3523			1243	1590		1221	1592
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	302	1022	64	10	847	83	117	7	18	84	5	199
RTOR Reduction (vph)	0	3	0	0	7	0	0	0	15	0	0	165
Lane Group Flow (vph)	302	1083	0	10	923	0	0	124	3	0	89	34
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Confl. Bikes (#/hr)		1			3							
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	9.1	33.8		0.7	25.4			10.3	10.3		10.3	10.3
Effective Green, g (s)	9.6	34.3		1.2	25.9			10.8	10.8		10.8	10.8
Actuated g/C Ratio	0.15	0.55		0.02	0.41			0.17	0.17		0.17	0.17
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.3	2.5		2.4	2.5			2.4	2.4		2.3	2.3
Lane Grp Cap (vph)	535	1913		34	1453			214	273		210	274
v/s Ratio Prot	c0.09	c0.31		0.01	c0.26							
v/s Ratio Perm								c0.10	0.00		0.07	0.02
v/c Ratio	0.56	0.57		0.29	0.64			0.58	0.01		0.42	0.12
Uniform Delay, d1	24.7	9.4		30.4	14.7			23.9	21.6		23.2	22.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.3		3.1	0.8			3.0	0.0		0.8	0.1
Delay (s)	25.7	9.7		33.5	15.5			26.9	21.6		24.0	22.1
Level of Service	C	A		C	B			C	C		C	C
Approach Delay (s)		13.2			15.7			26.2			22.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	62.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	217	927	26	24	759	16	17	9	45	5	7	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	4.8		4.8	4.8			5.6	5.6		5.3	4.8
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1805	1854		1805	3561			1803	1527		1848	1609
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.69	1.00
Satd. Flow (perm)	1805	1854		1805	3561			1803	1527		1304	1609
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	226	966	27	25	791	17	18	9	47	5	7	141
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	44	0	0	113
Lane Group Flow (vph)	226	993	0	25	807	0	0	27	3	0	12	28
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Split		Perm	Perm		pm+ov
Protected Phases	5	2		1	6		8	8			4	5
Permitted Phases									8	4		4
Actuated Green, G (s)	11.5	48.9		1.7	39.1			4.1	4.1		3.6	15.1
Effective Green, g (s)	12.0	49.4		2.2	39.6			4.6	4.6		4.1	16.1
Actuated g/C Ratio	0.15	0.61		0.03	0.49			0.06	0.06		0.05	0.20
Clearance Time (s)	5.3	5.3		5.3	5.3			6.1	6.1		5.8	5.3
Vehicle Extension (s)	2.5	3.0		1.0	3.0			1.0	1.0		2.0	2.5
Lane Grp Cap (vph)	268	1134		49	1745			103	87		66	321
v/s Ratio Prot	c0.13	c0.54		0.01	0.23			c0.01				0.01
v/s Ratio Perm									0.00		c0.01	0.00
v/c Ratio	0.84	0.88		0.51	0.46			0.26	0.03		0.18	0.09
Uniform Delay, d1	33.5	13.1		38.8	13.6			36.5	36.0		36.7	26.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	20.5	7.8		3.7	0.2			0.5	0.1		0.5	0.1
Delay (s)	54.0	20.9		42.5	13.8			37.0	36.0		37.2	26.4
Level of Service	D	C		D	B			D	D		D	C
Approach Delay (s)		27.0			14.6			36.4			27.3	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.8	Sum of lost time (s)	20.5
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

HCM Signalized Intersection Capacity Analysis
16: SW Tualatin Sherwood Rd & SW Boones Ferry Rd 4/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	1014	138	224	1083	56	171	268	159	297	345	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.5	5.5		4.5	5.0	4.5	4.5	5.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1703	3319		3502	3338		1733	1810	1542	1761	3313	
Flt Permitted	0.95	1.00		0.95	1.00		0.40	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	1703	3319		3502	3338		737	1810	1542	1099	3313	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	104	1024	139	226	1094	57	173	271	161	300	348	134
RTOR Reduction (vph)	0	8	0	0	3	0	0	0	54	0	34	0
Lane Group Flow (vph)	104	1155	0	226	1148	0	173	271	107	300	448	0
Confl. Peds. (#/hr)			7			15	7		8	8		7
Heavy Vehicles (%)	6%	7%	3%	0%	7%	6%	4%	5%	3%	2%	4%	3%
Turn Type	Prot			Prot			pm+pt		pm+ov	pm+pt		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	10.0	55.9		9.4	55.3		21.3	21.3	30.7	27.3	26.8	
Effective Green, g (s)	10.5	56.4		9.9	55.8		21.8	21.8	31.7	27.8	27.3	
Actuated g/C Ratio	0.08	0.45		0.08	0.45		0.17	0.17	0.25	0.22	0.22	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.5	5.0	5.0	5.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	143	1498		277	1490		223	316	391	337	724	
v/s Ratio Prot	0.06	c0.35		0.06	c0.34		0.07	c0.15	0.02	c0.12	0.14	
v/s Ratio Perm							0.06		0.05	c0.07		
v/c Ratio	0.73	0.77		0.82	0.77		0.78	0.86	0.27	0.89	0.62	
Uniform Delay, d1	55.9	28.9		56.7	29.2		47.5	50.1	37.4	45.8	44.1	
Progression Factor	1.00	1.00		1.26	0.41		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	3.9		10.4	2.4		14.2	19.3	0.1	23.5	1.1	
Delay (s)	70.3	32.8		82.0	14.3		61.7	69.3	37.5	69.4	45.3	
Level of Service	E	C		F	B		E	E	D	E	D	
Approach Delay (s)		35.9			25.4			58.7			54.5	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱			↑↑		↰	↑	↱	↰	↑↑↱	
Volume (vph)	52	1484	83	0	1110	0	95	302	323	194	663	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	*0.95			0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99			1.00		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3447			3438		1770	1863	1574	1787	3497	
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	3447			3438		1770	1863	1574	1787	3497	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	55	1579	88	0	1181	0	101	321	344	206	705	94
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	82	0	9	0
Lane Group Flow (vph)	55	1664	0	0	1181	0	101	321	262	206	790	0
Confl. Peds. (#/hr)			4			2			3			16
Heavy Vehicles (%)	5%	4%	0%	0%	5%	0%	2%	2%	1%	1%	1%	1%
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	7.8	65.5			52.7		10.0	23.5	23.5	19.0	32.5	
Effective Green, g (s)	8.3	66.0			53.2		10.5	24.0	24.0	19.5	33.0	
Actuated g/C Ratio	0.07	0.53			0.43		0.08	0.19	0.19	0.16	0.26	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	3.5			3.5		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	114	1820			1463		149	358	302	279	923	
v/s Ratio Prot	0.03	c0.48			0.34		0.06	c0.17		0.12	c0.23	
v/s Ratio Perm									0.17			
v/c Ratio	0.48	0.91			0.81		0.68	0.90	0.87	0.74	0.86	
Uniform Delay, d1	56.3	26.9			31.4		55.6	49.3	49.0	50.3	43.7	
Progression Factor	0.74	1.13			0.56		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	6.8			4.3		11.6	23.3	21.6	9.8	7.6	
Delay (s)	42.5	37.2			21.9		67.2	72.6	70.6	60.1	51.3	
Level of Service	D	D			C		E	E	E	E	D	
Approach Delay (s)		37.4			21.9			71.0			53.1	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM Average Control Delay	42.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	23	10	240	0	234	2	334	359	423	474	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.3	5.6	4.8	4.8		4.8	4.8	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	0.90	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1786			1805	1457	1748	1721		1787	1893	
Flt Permitted		0.98			0.95	1.00	0.48	1.00		0.09	1.00	
Satd. Flow (perm)		1786			1805	1457	880	1721		165	1893	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	24	24	10	250	0	244	2	348	374	441	494	10
RTOR Reduction (vph)	0	6	0	0	0	230	0	24	0	0	0	0
Lane Group Flow (vph)	0	52	0	0	250	14	2	698	0	441	504	0
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Split			Split		custom	pm+pt			pm+pt		
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases						8	6			2		
Actuated Green, G (s)		7.6			20.0	7.6	64.4	63.4		98.7	92.4	
Effective Green, g (s)		8.1			20.5	8.1	65.4	63.9		99.2	92.9	
Actuated g/C Ratio		0.06			0.14	0.06	0.46	0.45		0.69	0.65	
Clearance Time (s)		6.1			5.8	6.1	5.3	5.3		5.3	5.3	
Vehicle Extension (s)		1.0			2.0	1.0	1.0	3.0		2.5	0.2	
Lane Grp Cap (vph)		101			258	82	410	766		459	1226	
v/s Ratio Prot		c0.03			c0.14		0.00	0.41		c0.20	0.27	
v/s Ratio Perm						0.01	0.00			c0.46		
v/c Ratio		0.52			0.97	0.17	0.00	0.91		0.96	0.41	
Uniform Delay, d1		65.8			61.2	64.5	21.3	37.1		43.9	12.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9			46.6	0.4	0.0	15.0		32.0	0.1	
Delay (s)		67.7			107.8	64.8	21.3	52.1		75.9	12.2	
Level of Service		E			F	E	C	D		E	B	
Approach Delay (s)		67.7			86.6			52.0			41.9	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	55.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	143.5	Sum of lost time (s)	15.7
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	107	13	166	112	64	16	476	218	65	561	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	4.0		3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1781	1827		1780	1733		1768	1787		1804	1860	
Flt Permitted	0.64	1.00		0.44	1.00		0.26	1.00		0.17	1.00	
Satd. Flow (perm)	1202	1827		825	1733		482	1787		331	1860	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	44	113	14	175	118	67	17	501	229	68	591	79
RTOR Reduction (vph)	0	4	0	0	18	0	0	11	0	0	3	0
Lane Group Flow (vph)	44	123	0	175	167	0	17	719	0	68	667	0
Confl. Peds. (#/hr)	15		7	7		15	7		8	8		7
Heavy Vehicles (%)	0%	2%	1%	1%	3%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.3	12.3		25.7	18.7		47.0	45.5		51.6	47.8	
Effective Green, g (s)	16.3	12.8		26.2	19.2		48.0	46.0		52.6	48.3	
Actuated g/C Ratio	0.19	0.15		0.30	0.22		0.55	0.53		0.60	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	2.2	2.2		2.2	2.2		2.2	5.0		2.2	5.0	
Lane Grp Cap (vph)	247	267		355	380		294	939		271	1027	
v/s Ratio Prot	0.01	0.07		c0.06	0.10		0.00	c0.40		c0.01	0.36	
v/s Ratio Perm	0.03			c0.09			0.03			0.14		
v/c Ratio	0.18	0.46		0.49	0.44		0.06	0.77		0.25	0.65	
Uniform Delay, d1	29.7	34.2		24.0	29.5		10.7	16.5		11.7	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.6		0.6	0.4		0.0	4.4		0.2	1.9	
Delay (s)	29.9	34.8		24.6	29.9		10.7	20.9		11.9	15.6	
Level of Service	C	C		C	C		B	C		B	B	
Approach Delay (s)		33.6			27.3			20.7			15.3	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst:
Agency/Co.:
Date Performed: 4/16/2013
Analysis Time Period: Weekday PM
Intersection: Sagert/Martinazzi
Jurisdiction:
Units: U. S. Customary
Analysis Year: Background
Project ID:
East/West Street: Sagert
North/South Street: Martinazzi

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	117	233	12	90	195	164	2	180	76	207	296	
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	L	TR	L	TR	L	TR
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	130	271	100	398	2	284	230	585
% Heavy Veh	1	1	1	1	1	1	1	1
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	130	271	100	398	2	284	230	585
Left-Turn	130	0	100	0	2	0	230	0
Right-Turn	0	13	0	182	0	84	0	257
Prop. Left-Turns	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.5	0.0	0.3	0.0	0.4
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	

Exhibit 1
Attachment L

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	-0.0	0.5	-0.3	0.5	-0.2	0.5	-0.3

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	130	271	100	398	2	284	230	585
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.12	0.24	0.09	0.35	0.00	0.25	0.20	0.52
hd, final value	9.23	8.70	9.00	8.18	9.42	8.71	8.80	7.99
x, final value	0.33	0.65	0.25	0.90	0.01	0.69	0.56	1.30
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	6.9	6.4	6.7	5.9	7.1	6.4	6.5	5.7

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	130	271	100	398	2	284	230	585
Service Time	6.9	6.4	6.7	5.9	7.1	6.4	6.5	5.7
Utilization, x	0.33	0.65	0.25	0.90	0.01	0.69	0.56	1.30
Dep. headway, hd	9.23	8.70	9.00	8.18	9.42	8.71	8.80	7.99
Capacity	380	408	350	439	252	406	407	585
Delay	16.48	26.44	14.68	51.04	12.17	28.50	22.21	173.73
LOS	C	D	B	F	B	D	C	F
Approach:								
Delay	23.21		43.74		28.38		130.97	
LOS	C		E		D		F	

Intersection Delay 72.97 Intersection LOS F

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst:
Agency/Co.:
Date Performed: 4/16/2013
Analysis Time Period: Weekday PM
Intersection: Sagert/65th
Jurisdiction:
Units: U. S. Customary
Analysis Year: Background
Project ID:
East/West Street: Sagert
North/South Street: 65th

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	401	2	135	2	7	6	58	288	3	3	335	386
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	L	TR	L	TR	L	TR	L	TR
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	445	152	2	13	64	323	3	800
% Heavy Veh	1	1	0	0	1	2	1	2
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	445	152	2	13	64	323	3	800
Left-Turn	445	0	2	0	64	0	3	0
Right-Turn	0	150	0	6	0	3	0	428
Prop. Left-Turns	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	

Exhibit 1
Attachment L

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	-0.7	0.5	-0.3	0.5	0.0	0.5	-0.3

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	445	152	2	13	64	323	3	800
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.40	0.14	0.00	0.01	0.06	0.29	0.00	0.71
hd, final value	7.73	6.54	9.23	8.40	8.00	7.51	7.77	6.91
x, final value	0.96	0.28	0.01	0.03	0.14	0.67	0.01	1.54
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.4	4.2	6.9	6.1	5.7	5.2	5.5	4.6

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	445	152	2	13	64	323	3	800
Service Time	5.4	4.2	6.9	6.1	5.7	5.2	5.5	4.6
Utilization, x	0.96	0.28	0.01	0.03	0.14	0.67	0.01	1.54
Dep. headway, hd	7.73	6.54	9.23	8.40	8.00	7.51	7.77	6.91
Capacity	466	402	252	263	314	475	253	800
Delay	58.85	11.71	11.98	11.37	12.02	24.33	10.52	269.49
LOS	F	B	B	B	B	C	B	F
Approach:								
Delay	46.85		11.45		22.29		268.52	
LOS	E		B		C		F	

Intersection Delay 140.06 Intersection LOS F

Exhibit 1
Attachment L

Intersection: 12: Tualatin Sherwood Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	L	T	T	L	LT	R	R
Maximum Queue (ft)	284	274	264	152	433	501	537	275	719	625	476
Average Queue (ft)	172	189	171	14	133	250	270	190	349	304	173
95th Queue (ft)	265	285	246	89	324	483	512	304	664	552	387
Link Distance (ft)	181	181	181	181	635	635	635		1148	1148	
Upstream Blk Time (%)	6	8	8	0	1	2	2		0	0	
Queuing Penalty (veh)	32	48	45	1	2	7	7		0	0	
Storage Bay Dist (ft)								200			700
Storage Blk Time (%)								7	25	1	0
Queuing Penalty (veh)								22	82	4	0

Exhibit 1
Attachment L

Intersection: 13: Tualatin Sherwood Rd & I-5 NB Ramps

Movement	EB	EB	WB	WB	WB	NB	NB	NB	B33
Directions Served	T	T	T	T	R	L	LT	R	T
Maximum Queue (ft)	469	436	198	301	225	356	441	299	54
Average Queue (ft)	186	174	82	101	14	222	238	102	10
95th Queue (ft)	384	364	166	218	103	336	401	225	93
Link Distance (ft)	635	635	468	468			463		253
Upstream Blk Time (%)				0			2		2
Queuing Penalty (veh)				1			0		0
Storage Bay Dist (ft)					150	300		225	
Storage Blk Time (%)				3	0	3	10	0	
Queuing Penalty (veh)				18	0	15	51	2	

Exhibit 1
Attachment L

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	417	125	258	429	185	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1599	1787	1845	1770	1581
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1599	1787	1845	1770	1581
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	439	132	272	452	195	320
RTOR Reduction (vph)	0	90	0	0	0	93
Lane Group Flow (vph)	439	42	272	452	195	227
Confl. Peds. (#/hr)		11	11		1	3
Confl. Bikes (#/hr)	4		2	10	1	
Heavy Vehicles (%)	2%	1%	1%	3%	2%	1%
Turn Type		Prot	Prot			pm+ov
Protected Phases	2	2	1	6	8	1
Permitted Phases					8	8
Actuated Green, G (s)	17.1	17.1	12.7	34.8	11.0	23.7
Effective Green, g (s)	17.6	17.6	13.2	35.3	11.5	24.7
Actuated g/C Ratio	0.32	0.32	0.24	0.63	0.21	0.44
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	588	504	423	1167	365	827
v/s Ratio Prot	c0.24	0.03	c0.15	0.25	c0.11	0.06
v/s Ratio Perm						0.08
v/c Ratio	0.75	0.08	0.64	0.39	0.53	0.27
Uniform Delay, d1	17.1	13.4	19.2	5.0	19.8	9.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	0.1	3.3	0.2	1.5	0.2
Delay (s)	22.2	13.5	22.5	5.2	21.3	10.0
Level of Service	C	B	C	A	C	B
Approach Delay (s)	20.2			11.7	14.3	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	46	80	408	60	110	269
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	87	443	65	120	292
Pedestrians	13					6
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			428			355
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	1021	495			522	
vC1, stage 1 conf vol	489					
vC2, stage 2 conf vol	532					
vCu, unblocked vol	1007	467			494	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	85			88	
cM capacity (veh/h)	441	574			1039	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	50	87	509	120	292
Volume Left	50	0	0	120	0
Volume Right	0	87	65	0	0
cSH	441	574	1700	1039	1700
Volume to Capacity	0.11	0.15	0.30	0.12	0.17
Queue Length 95th (ft)	10	14	0	10	0
Control Delay (s)	14.2	12.4	0.0	8.9	0.0
Lane LOS	B	B		A	
Approach Delay (s)	13.1		0.0	2.6	
Approach LOS	B				

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	37	45	81	432	271	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	41	49	89	475	298	48
Pedestrians	1			4	10	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				308	475	
pX, platoon unblocked	0.96					
vC, conflicting volume	986	327	347			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	962	327	347			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	93	93			
cM capacity (veh/h)	251	716	1222			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	90	89	475	346
Volume Left	41	89	0	0
Volume Right	49	0	0	48
cSH	391	1222	1700	1700
Volume to Capacity	0.23	0.07	0.28	0.20
Queue Length 95th (ft)	23	6	0	0
Control Delay (s)	17.0	8.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.0	1.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	25	489	9	3	314
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	28	543	10	3	349
Pedestrians	19					2
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			227			556
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	748	569			572	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	660	460			464	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	94			100	
cM capacity (veh/h)	352	487			976	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	33	553	120	233
Volume Left	6	0	3	0
Volume Right	28	10	0	0
cSH	457	1700	976	1700
Volume to Capacity	0.07	0.33	0.00	0.14
Queue Length 95th (ft)	6	0	0	0
Control Delay (s)	13.5	0.0	0.3	0.0
Lane LOS	B		A	
Approach Delay (s)	13.5	0.0	0.1	
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	10	488	0	0	318
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	11	548	0	0	357
Pedestrians	13					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			125			658
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	740	561			561	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	640	438			438	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	361	500			990	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	11	548	179	179
Volume Left	0	0	0	0
Volume Right	11	0	0	0
cSH	500	1700	1700	1700
Volume to Capacity	0.02	0.32	0.11	0.11
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	12.4	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	12.4	0.0	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	1	63	227	37	237	23	235	31	0	310	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1805	1603		1698	1730	1542	1683	1842			3559	
Flt Permitted	0.95	1.00		0.95	0.97	1.00	0.54	1.00			1.00	
Satd. Flow (perm)	1805	1603		1698	1730	1542	960	1842			3559	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	1	69	249	41	260	25	258	34	0	341	9
RTOR Reduction (vph)	0	63	0	0	0	204	0	7	0	0	3	0
Lane Group Flow (vph)	18	7	0	144	146	56	25	285	0	0	347	0
Confl. Peds. (#/hr)	2					2	3		16	16		3
Confl. Bikes (#/hr)						2					3	
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%	7%	1%	0%	0%	1%	0%
Turn Type	Split			Split		Perm	Perm					
Protected Phases	8	8		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	3.1	3.1		8.9	8.9	8.9	13.8	13.8			13.8	
Effective Green, g (s)	3.6	3.6		9.4	9.4	9.4	14.3	14.3			14.3	
Actuated g/C Ratio	0.08	0.08		0.21	0.21	0.21	0.33	0.33			0.33	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	5.0	5.0			5.0	
Lane Grp Cap (vph)	148	132		364	371	331	313	601			1162	
v/s Ratio Prot	c0.01	0.00		c0.08	0.08			c0.15			0.10	
v/s Ratio Perm						0.04	0.03					
v/c Ratio	0.12	0.05		0.40	0.39	0.17	0.08	0.47			0.30	
Uniform Delay, d1	18.6	18.5		14.8	14.8	14.0	10.2	11.8			11.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.1		0.5	0.5	0.2	0.2	1.2			0.3	
Delay (s)	18.9	18.6		15.3	15.3	14.2	10.4	13.0			11.3	
Level of Service	B	B		B	B	B	B	B			B	
Approach Delay (s)		18.7			14.8			12.8			11.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	43.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	32	0	447	50	0	53
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	36	0	508	57	0	60
Pedestrians					4	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		248				
pX, platoon unblocked						
vC, conflicting volume	569				613	286
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	569				613	286
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	92
cM capacity (veh/h)	1010				412	714

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	36	339	226	60
Volume Left	36	0	0	0
Volume Right	0	0	57	60
cSH	1010	1700	1700	714
Volume to Capacity	0.04	0.20	0.13	0.08
Queue Length 95th (ft)	3	0	0	7
Control Delay (s)	8.7	0.0	0.0	10.5
Lane LOS	A			B
Approach Delay (s)	8.7	0.0		10.5
Approach LOS				B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑↱		↰↰	↑↑↑↱			↰↑	↱		↰↑	↱
Volume (vph)	50	1375	59	257	1498	101	57	25	248	154	40	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0			5.0	4.5		5.0	5.0
Lane Util. Factor	1.00	*0.75		0.97	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.96	1.00
Satd. Flow (prot)	1805	4092		3502	4943			1799	1599		1813	1579
Flt Permitted	0.95	1.00		0.95	1.00			0.50	1.00		0.71	1.00
Satd. Flow (perm)	1805	4092		3502	4943			925	1599		1347	1579
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	1403	60	262	1529	103	58	26	253	157	41	63
RTOR Reduction (vph)	0	3	0	0	5	0	0	0	0	0	0	52
Lane Group Flow (vph)	51	1460	0	262	1627	0	0	84	253	0	198	11
Confl. Peds. (#/hr)						4						9
Confl. Bikes (#/hr)					1			1		1		
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	1%	0%	0%
Turn Type	Prot			Prot			Perm		pm+ov	Perm		Perm
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	8.0	65.9		11.7	69.6			20.4	32.1		20.4	20.4
Effective Green, g (s)	8.5	66.4		12.2	70.1			20.9	33.1		20.9	20.9
Actuated g/C Ratio	0.07	0.58		0.11	0.61			0.18	0.29		0.18	0.18
Clearance Time (s)	5.0	6.5		5.0	6.5			5.5	5.0		5.5	5.5
Vehicle Extension (s)	2.5	4.0		2.5	4.0			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	133	2363		372	3013			168	460		245	287
v/s Ratio Prot	0.03	c0.36		c0.07	0.33				0.06			
v/s Ratio Perm								0.09	0.10		c0.15	0.01
v/c Ratio	0.38	0.62		0.70	0.54			0.50	0.55		0.81	0.04
Uniform Delay, d1	50.8	16.0		49.7	13.1			42.3	34.6		45.1	38.8
Progression Factor	0.84	0.72		0.98	0.68			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.1	1.0		4.4	0.6			1.7	1.1		17.1	0.0
Delay (s)	43.8	12.5		52.9	9.4			44.0	35.8		62.2	38.8
Level of Service	D	B		D	A			D	D		E	D
Approach Delay (s)		13.6			15.5			37.8			56.5	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			
Volume (veh/h)	0	1785	1847	48	0	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1840	1904	49	0	15
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		373	260			
pX, platoon unblocked	0.83				0.88	0.83
vC, conflicting volume	1960				2548	665
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1432				956	0
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	100				100	98
cM capacity (veh/h)	396				227	835

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	613	613	613	762	762	430	15
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	49	15
cSH	1700	1700	1700	1700	1700	1700	835
Volume to Capacity	0.36	0.36	0.36	0.45	0.45	0.25	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.4
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.4
Approach LOS							A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↰	↱↱
Volume (vph)	0	1370	415	193	1030	0	0	0	0	620	3	865
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5	5.5	5.5
Lane Util. Factor		*0.75	1.00	1.00	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4150	1568	1787	3471					1681	1683	2760
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4150	1568	1787	3471					1681	1683	2760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1384	419	195	1040	0	0	0	0	626	3	874
RTOR Reduction (vph)	0	0	208	0	0	0	0	0	0	0	0	61
Lane Group Flow (vph)	0	1384	211	195	1040	0	0	0	0	313	316	813
Confl. Bikes (#/hr)		1			2							
Heavy Vehicles (%)	0%	3%	3%	1%	4%	0%	0%	0%	0%	2%	20%	3%
Turn Type			Perm	Prot						Split		custom
Protected Phases		2		1	6					4	4	4 5
Permitted Phases			2									
Actuated Green, G (s)		54.8	54.8	14.6	58.4					27.6	27.6	44.6
Effective Green, g (s)		55.3	55.3	15.1	58.9					28.1	28.1	41.6
Actuated g/C Ratio		0.48	0.48	0.13	0.51					0.24	0.24	0.36
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	
Vehicle Extension (s)		6.1	6.1	2.3	6.1					2.3	2.3	
Lane Grp Cap (vph)		1996	754	235	1778					411	411	998
v/s Ratio Prot		c0.33		c0.11	0.30					0.19	0.19	c0.29
v/s Ratio Perm			0.13									
v/c Ratio		0.69	0.28	0.83	0.58					0.76	0.77	0.81
Uniform Delay, d1		23.2	17.9	48.7	19.5					40.3	40.4	33.2
Progression Factor		0.71	0.55	0.74	1.22					1.00	1.00	1.00
Incremental Delay, d2		1.6	0.8	19.4	1.3					7.6	7.9	5.0
Delay (s)		18.1	10.6	55.5	25.2					47.9	48.3	38.2
Level of Service		B	B	E	C					D	D	D
Approach Delay (s)		16.4			30.0			0.0			42.4	
Approach LOS		B			C			A			D	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1077	917	0	628	666	592	0	219	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		6.0	6.0	5.5	5.5	5.5			
Lane Util. Factor		0.95	0.88		0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	1.00	0.98			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		3574	2694		3574	1583	1618	1618	1559			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		3574	2694		3574	1583	1618	1618	1559			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1134	965	0	661	701	623	0	231	0	0	0
RTOR Reduction (vph)	0	0	328	0	0	241	0	0	32	0	0	0
Lane Group Flow (vph)	0	1134	637	0	661	460	311	312	199	0	0	0
Confl. Peds. (#/hr)			1	1			1		2	2		1
Confl. Bikes (#/hr)		1			5					1		
Heavy Vehicles (%)	0%	1%	3%	0%	1%	2%	6%	20%	2%	0%	0%	0%
Turn Type			Perm			Perm	Split		Perm			
Protected Phases		2			6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		75.4	75.4		74.9	74.9	27.6	27.6	27.6			
Effective Green, g (s)		75.9	75.9		75.4	75.4	28.1	28.1	28.1			
Actuated g/C Ratio		0.66	0.66		0.66	0.66	0.24	0.24	0.24			
Clearance Time (s)		6.0	6.0		6.5	6.5	6.0	6.0	6.0			
Vehicle Extension (s)		6.1	6.1		4.2	4.2	2.3	2.3	2.3			
Lane Grp Cap (vph)		2359	1778		2343	1038	395	395	381			
v/s Ratio Prot		c0.32			0.18		0.19	c0.19				
v/s Ratio Perm			0.24			0.29			0.13			
v/c Ratio		0.48	0.36		0.28	0.44	0.79	0.79	0.52			
Uniform Delay, d1		9.7	8.7		8.4	9.6	40.7	40.7	37.6			
Progression Factor		1.39	6.09		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.5	0.4		0.3	1.4	9.5	9.6	0.8			
Delay (s)		14.0	53.5		8.7	11.0	50.1	50.3	38.5			
Level of Service		B	D		A	B	D	D	D			
Approach Delay (s)		32.2			9.9			47.0			0.0	
Approach LOS		C			A			D			A	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	524	560	57	15	692	101	103	11	12	101	11	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3502	3483		1805	3502			1768	1593		1799	1594
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.66	1.00
Satd. Flow (perm)	3502	3483		1805	3502			1229	1593		1249	1594
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	546	583	59	16	721	105	107	11	12	105	11	335
RTOR Reduction (vph)	0	5	0	0	10	0	0	0	10	0	0	282
Lane Group Flow (vph)	546	637	0	16	816	0	0	118	2	0	116	53
Confl. Peds. (#/hr)	8		2	2		8	1		2	2		1
Confl. Bikes (#/hr)		1			3							
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	13.9	36.2		0.8	23.1			9.8	9.8		9.8	9.8
Effective Green, g (s)	14.4	36.7		1.3	23.6			10.3	10.3		10.3	10.3
Actuated g/C Ratio	0.22	0.57		0.02	0.36			0.16	0.16		0.16	0.16
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.3	2.5		2.4	2.5			2.4	2.4		2.3	2.3
Lane Grp Cap (vph)	778	1973		36	1275			195	253		199	253
v/s Ratio Prot	c0.16	0.18		0.01	c0.23							
v/s Ratio Perm								c0.10	0.00		0.09	0.03
v/c Ratio	0.70	0.32		0.44	0.64			0.61	0.01		0.58	0.21
Uniform Delay, d1	23.2	7.5		31.4	17.1			25.4	22.9		25.3	23.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.5	0.1		5.6	0.9			4.3	0.0		3.3	0.2
Delay (s)	25.8	7.5		37.0	18.0			29.6	23.0		28.5	24.0
Level of Service	C	A		D	B			C	C		C	C
Approach Delay (s)		15.9			18.4			29.0			25.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	64.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱			↑↑		↰	↑	↱	↰	↑↱	
Volume (vph)	69	1140	141	0	1119	0	100	221	216	129	382	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98			1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3428			3438		1770	1863	1537	1787	3463	
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	3428			3438		1770	1863	1537	1787	3463	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	73	1213	150	0	1190	0	106	235	230	137	406	94
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	108	0	20	0
Lane Group Flow (vph)	73	1357	0	0	1190	0	106	235	122	137	480	0
Confl. Peds. (#/hr)						6			23			3
Heavy Vehicles (%)	5%	4%	0%	0%	5%	0%	2%	2%	1%	1%	1%	1%
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	7.4	67.3			54.9		10.6	17.7	17.7	13.0	20.1	
Effective Green, g (s)	7.9	67.8			55.4		11.1	18.2	18.2	13.5	20.6	
Actuated g/C Ratio	0.07	0.59			0.48		0.10	0.16	0.16	0.12	0.18	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	3.5			3.5		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	118	2021			1656		171	295	243	210	620	
v/s Ratio Prot	0.04	c0.40			c0.35		0.06	c0.13		0.08	c0.14	
v/s Ratio Perm									0.08			
v/c Ratio	0.62	0.67			0.72		0.62	0.80	0.50	0.65	0.77	
Uniform Delay, d1	52.1	16.0			23.6		49.9	46.6	44.3	48.5	45.0	
Progression Factor	1.00	1.00			0.46		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.6	1.8			2.4		6.5	13.0	0.6	7.1	5.5	
Delay (s)	58.7	17.8			13.3		56.5	59.6	44.9	55.6	50.5	
Level of Service	E	B			B		E	E	D	E	D	
Approach Delay (s)		19.9			13.3			53.1			51.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Intersection: 12: Tualatin Sherwood Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	L	T	T	L	LT	R	R
Maximum Queue (ft)	187	219	211	107	391	526	506	275	592	473	336
Average Queue (ft)	137	147	148	8	191	283	312	185	295	210	120
95th Queue (ft)	209	216	215	47	324	418	437	285	540	396	270
Link Distance (ft)	169	169	169	169	625	625	625		1146	1146	
Upstream Blk Time (%)	5	6	6	0							
Queuing Penalty (veh)	22	25	26	0							
Storage Bay Dist (ft)								200			700
Storage Blk Time (%)								4	19	0	0
Queuing Penalty (veh)								12	60	1	0

Exhibit 1
Attachment L

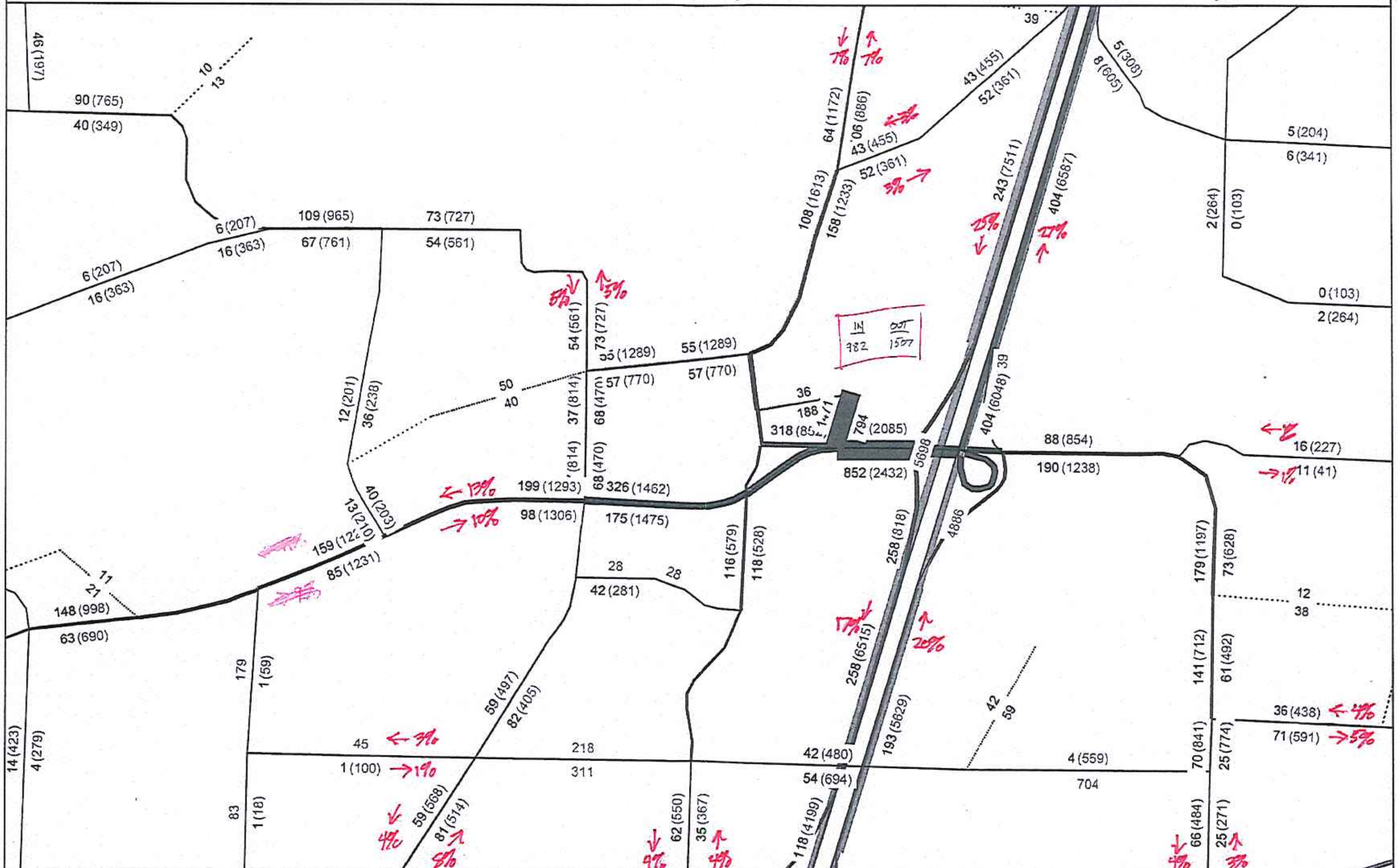
Intersection: 13: Tualatin Sherwood Rd & I-5 NB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	B33
Directions Served	T	T	R	R	T	T	R	L	LT	R	T
Maximum Queue (ft)	474	446	57	55	269	381	223	323	444	296	61
Average Queue (ft)	289	252	2	2	104	138	19	174	232	101	4
95th Queue (ft)	442	397	44	43	209	265	120	275	372	229	51
Link Distance (ft)	625	625	625	625	459	459			467		253
Upstream Blk Time (%)						0			0		0
Queuing Penalty (veh)						1			0		0
Storage Bay Dist (ft)							150	300		225	
Storage Blk Time (%)						5		0	8	0	
Queuing Penalty (veh)						33		1	41	1	

Exhibit 1
Attachment L

Appendix F
Year 2014 Total Traffic Operations Worksheets

2010 Network: Select Zone Vehicles (Total PM Peak 1-Hour Vehicles)



Washington County	Westside Focus Model	2010 Existing Network
Steve L Kelley	2010_PM2veh_SZ_Tualatin.ver	15.06.2012

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	7	9	479	7	40	0	504	567	59	697	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5	3.5			4.0	3.5	3.5	4.0	
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.92		1.00	0.95			1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt		0.93		1.00	0.87			1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1596		1787	1574			1900	1570	1805	1900	
Flt Permitted		1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1596		1787	1574			1900	1570	1805	1900	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	7	9	504	7	42	0	531	597	62	734	1
RTOR Reduction (vph)	0	9	0	0	26	0	0	0	158	0	0	0
Lane Group Flow (vph)	0	8	0	504	23	0	0	531	439	62	735	0
Confl. Peds. (#/hr)	15		7	7		15	7		8	8		7
Heavy Vehicles (%)	0%	2%	1%	1%	3%	0%	2%	0%	1%	0%	0%	0%
Turn Type	Split			Split			Prot		pm+ov	Prot		
Protected Phases	8	8		4	4		1	6	4	5	2	
Permitted Phases									6			
Actuated Green, G (s)		1.7		31.9	31.9			29.5	61.4	5.3	38.8	
Effective Green, g (s)		2.2		32.4	32.4			30.0	62.4	5.8	39.3	
Actuated g/C Ratio		0.03		0.38	0.38			0.35	0.73	0.07	0.46	
Clearance Time (s)		4.0		4.0	4.0			4.5	4.0	4.0	4.5	
Vehicle Extension (s)		2.5		2.2	2.2			3.5	2.2	2.2	3.5	
Lane Grp Cap (vph)		41		682	601			671	1154	123	880	
v/s Ratio Prot		c0.01		c0.28	0.01			0.28	0.15	0.03	c0.39	
v/s Ratio Perm									0.13			
v/c Ratio		0.20		0.74	0.04			0.79	0.38	0.50	0.84	
Uniform Delay, d1		40.5		22.6	16.5			24.6	4.1	38.2	20.0	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.8		3.8	0.0			6.5	0.1	1.7	7.1	
Delay (s)		42.2		26.4	16.5			31.2	4.2	39.8	27.0	
Level of Service		D		C	B			C	A	D	C	
Approach Delay (s)		42.2			25.5			16.9			28.0	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	11.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	410	844	200	298	453	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	3.5	3.5	3.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3467	1590	1900	1574	1805	1900
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3467	1590	1900	1574	1805	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	432	888	211	314	477	384
RTOR Reduction (vph)	0	182	0	75	0	0
Lane Group Flow (vph)	432	706	211	239	477	384
Confl. Peds. (#/hr)	7	15		8	8	
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Turn Type		pm+ov		pm+ov	Prot	
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.4	32.2	10.7	22.1	20.8	35.0
Effective Green, g (s)	11.9	33.2	11.2	23.1	21.3	35.5
Actuated g/C Ratio	0.22	0.61	0.21	0.42	0.39	0.65
Clearance Time (s)	4.0	4.0	3.5	4.0	4.0	4.0
Vehicle Extension (s)	3.0	2.0	5.0	3.0	2.0	2.0
Lane Grp Cap (vph)	758	1073	391	668	707	1240
v/s Ratio Prot	0.12	c0.26	c0.11	0.08	0.26	0.20
v/s Ratio Perm		0.19		0.07		
v/c Ratio	0.57	0.66	0.54	0.36	0.67	0.31
Uniform Delay, d1	19.0	6.9	19.3	10.6	13.7	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	1.1	2.6	0.3	2.0	0.1
Delay (s)	20.0	8.0	21.9	10.9	15.7	4.2
Level of Service	B	A	C	B	B	A
Approach Delay (s)	11.9		15.4			10.6
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	6.5
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

M□□□□ □□□	EBT	EBR	WBL	WBT	NBL	NBR
L□□□ C□□□□□r□□□□□						
V□□□□ □ □□□□□	664	18	4 3	930	33	41
Id F	1900	1900	1900	1900	1900	1900
T L	4.	4.	4.	4.	4.	4.
L U . F r	1.00	1.00	1.00	1.00	1.00	1.00
Fr , d/	1.00	1.00	1.00	1.00	1.00	0.98
F , d/	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.8	1.00	1.00	1.00	0.8
F Pr d	1.00	1.00	0.9	1.00	0.9	1.00
S d. F r	1863	1 99	1 8	184	1 0	1 1
F Pr d	1.00	1.00	0.9	1.00	0.9	1.00
S d. F r	1863	1 99	1 8	184	1 0	1 1
P r r, PHF	0.9	0.9	0.9	0.9	0.9	0.9
Ad. F	699	19	4	9 9	3 3	43
RTOR R d	0	6	0	0	0	33
L Gr F	699	130	4	9 9	3 3	404
C . P d . / r						8
H V	2	1	1	3	2	1
T r T		Pr	Pr			
Pr d P	2	2	1	6	8	1
P r d P					8	8
A d Gr , G	41.2	41.2	31.8	8.0	24.1	.9
E Gr ,	41.	41.	32.3	8.	24.6	6.9
A d /C R	0.3	0.3	0.29	0. 0	0.22	0. 1
C r T	.0	.0	.0	.0	.0	.0
V E	3.0	3.0	3.0	3.0	3.0	3.0
L Gr C	693	9	1	1292	388	860
/ R Pr	0.38	0.08	0.2	0. 3	0.20	0.14
/ R Pr						0.12
/ R	1.01	0.22	0.93	0. 6	0.91	0.4
U r D , d1	3 .2	24.1	38.	10.	42.	1 .8
Pr r F r	1.00	1.00	1.00	1.00	1.00	1.00
I r D , d2	36.3	0.2	22.	2.6	24.	0.4
D	1.	24.2	61.	13.3	6 .2	18.2
L S r	E	C	E	B	E	B
A r D	61.2			29.1	40.1	
A r LOS	E			C	D	

I r S r			
HCM A r C r D	41.0	HCM L S r	D
HCM V C r	0.96		
A d C L	112.1	S	13.
I r C U	89.9	ICU L S r	E
A P r d	1		
Cr L Gr			

Exhibit 1
Attachment L

M	WBL	WBR	NBT	NBR	SBL	SBT
L C r						
V /	3	166	82	93	202	434
S C r	S		Fr			Fr
Gr d	0		0			0
P H r F r	0.92	0.92	0.92	0.92	0.92	0.92
H r r	8	180	633	101	220	4 2
Pd r						
L Wd						
W S d /						
Pr B						
R r r						
M d			N			TWLTL
M d r						2
U r			4			306
, d	0.91	0.91			0.91	
C,	1 94	683			34	
C1, 1	683					
C2, 2	911					
C , d	1603	604			660	
C,	6.4	6.2			4.1	
C, 2	.4					
F	3.	3.3			2.2	
0 r		60			4	
M /	2 3	4 4			84	

Dr , L	WB 1	WB 2	NB 1	SB 1	SB 2
V T	8	180	34	220	4 2
V L	8	0	0	220	0
V R	0	180	101	0	0
SH	2 3	4 4	1 00	84	1 00
V C	0.23	0.40	0.43	0.26	0.28
L 9	21	4	0	26	0
C r D	23.3	18.0	0.0	10.	0.0
L LOS	C	C		B	
A r D	19.3		0.0	3.4	
A r LOS	C				

I r S r			
A r D	4.2		
I r C U	60.8	ICU L S r	B
A Prd	1		

Exhibit 1
Attachment L

M	EBL	EBR	NBL	NBT	SBT	SBR
L C r						
V /	40	80	8	642	446	0
S C r	S			Fr	Fr	
Gr d	0			0	0	
P H r F r	0.91	0.91	0.91	0.91	0.91	0.91
H r r	44	88	93	0	490	
P d r				16	26	
L Wd	12.0			12.0	12.0	
W S d /	4.0			4.0	4.0	
Pr B	0			1	2	
R r r						
Md				N	N	
Md r						
U r				316	46	
, d	0.89					
C,	1441	39	0			
C1, 1						
C2, 2						
C , d	1434	39	0			
C,	6.4	6.2	4.1			
C, 2						
F	3.	3.3	2.2			
0 r	63	84	91			
M /	118	3	1026			

Dr , L	EB 1	NB 1	NB 2	SB 1
V T	132	93	0	4
V L	44	93	0	0
V R	88	0	0	
SH	24	1026	1 00	1 00
V C	0. 4	0.09	0.41	0.32
L 9	2		0	0
C r D	3 .	8.9	0.0	0.0
L LOS	E	A		
A r D	3 .	1.0		0.0
A r LOS	E			

Ir S r				
A r D	3.			
Ir C U	1.6	ICU L	S r	A
A Prd	1			

Exhibit 1
Attachment L

M	WBL	WBR	NBT	NBR	SBL	SBT
L C r						
V /	0	32	69	6	10	1
S C r	S		Fr			Fr
Gr d	0		0			0
P H rF r	0.91	0.91	0.91	0.91	0.91	0.91
H r r	0	3	64		11	68
P d r	26					2
L Wd	12.0					12.0
W S d /	4.0					4.0
Pr B	2					2
R r r						
M d			N			N
M d r						
U r			223			60
, d	0.8	0.8			0.8	
C,	1099	818			96	
C1, 1						
C2, 2						
C , d	1029	699			6 4	
C,	6.8	6.9			4.1	
C, 2						
F	3.	3.3			2.2	
0 r	100	89			99	
M /	188	312			61	

Dr , L	WB 1	NB 1	SB 1	SB 2
V T	3	0	200	3 9
V L	0	0	11	0
V R	3		0	0
SH	312	1 00	61	1 00
V C	0.11	0.4	0.01	0.22
L 9	9	0	1	0
C r D	18.0	0.0	0.	0.0
L LOS	C		A	
A r D	18.0	0.0	0.2	
A r LOS	C			

I r S r				
A r D	0.6			
I r C U	3.0	ICU L	S r	A
A Prd	1			

Exhibit 1
Attachment L

M	WBL	WBR	NBT	NBR	SBL	SBT
L C r						
V /	0	12	682	0	0	09
S C r	S		Fr			Fr
Gr d	0		0			0
P H r F r	0.89	0.89	0.89	0.89	0.89	0.89
H r r	0	13	66	0	0	2
P d r						
L Wd						
W S d /						
Pr B						
R r r						
M d			N			N
M d r						
U r			101			682
, d	0.84	0.84			0.84	
C,	10 2	66			66	
C1, 1						
C2, 2						
C , d	9 0	632			632	
C,	6.8	6.9			4.1	
C, 2						
F	3.	3.3			2.2	
0 r	100	96			100	
M /	212	3 8			800	

Dr , L	WB 1	NB 1	SB 1	SB 2
V T	13	66	286	286
V L	0	0	0	0
V R	13	0	0	0
SH	3 8	1 00	1 00	1 00
V C	0.04	0.4	0.1	0.1
L 9	3	0	0	0
C r D	1 .	0.0	0.0	0.0
L LOS	C			
A r D	1 .	0.0	0.0	
A r LOS	C			

I r S r				
A r D	0.2			
I r C U	4 .9	ICU L	S r	A
A Prd	1			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	10	100	357	55	337	27	315	26	0	499	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.99			1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1805	1626		1698	1728	1533	1682	1855			3563	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.40	1.00			1.00	
Satd. Flow (perm)	1805	1626		1698	1728	1533	701	1855			3563	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	32	11	110	392	60	370	30	346	29	0	548	11
RTOR Reduction (vph)	0	96	0	0	0	276	0	4	0	0	2	0
Lane Group Flow (vph)	32	25	0	223	229	94	30	371	0	0	557	0
Confl. Peds. (#/hr)	10					10	6		19	19		6
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%	7%	1%	0%	0%	1%	0%
Turn Type	Split			Split		Perm	Perm					
Protected Phases	8	8		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	4.8	4.8		10.3	10.3	10.3	13.7	13.7			13.7	
Effective Green, g (s)	5.3	5.3		10.8	10.8	10.8	14.2	14.2			14.2	
Actuated g/C Ratio	0.13	0.13		0.26	0.26	0.26	0.34	0.34			0.34	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5			4.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	5.0	5.0			5.0	
Lane Grp Cap (vph)	226	204		434	441	391	235	623			1196	
v/s Ratio Prot	c0.02	0.02		0.13	c0.13			c0.20			0.16	
v/s Ratio Perm						0.06	0.04					
v/c Ratio	0.14	0.12		0.51	0.52	0.24	0.13	0.60			0.47	
Uniform Delay, d1	16.5	16.4		13.5	13.5	12.5	9.8	11.7			11.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.2		0.8	0.8	0.2	0.5	2.3			0.6	
Delay (s)	16.7	16.6		14.3	14.3	12.7	10.3	14.0			11.7	
Level of Service	B	B		B	B	B	B	B			B	
Approach Delay (s)		16.6			13.6			13.7			11.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	42.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	35	0	648	51	0	100
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	40	0	736	58	0	114
Pedestrians					5	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		278				
pX, platoon unblocked						
vC, conflicting volume	799				850	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	799				850	402
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	81
cM capacity (veh/h)	829				288	601

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	40	491	303	114
Volume Left	40	0	0	0
Volume Right	0	0	58	114
cSH	829	1700	1700	601
Volume to Capacity	0.05	0.29	0.18	0.19
Queue Length 95th (ft)	4	0	0	17
Control Delay (s)	9.6	0.0	0.0	12.4
Lane LOS	A			B
Approach Delay (s)	9.6	0.0		12.4
Approach LOS				B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	99	1899	40	232	1694	251	36	10	236	323	24	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		5.0	4.5	5.0	5.0	
Lane Util. Factor	1.00	*0.75		0.97	0.91	1.00		1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96		1.00	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1805	4100		3502	4988	1545		1786	1599	3502	1622	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1805	4100		3502	4988	1545		1786	1599	3502	1622	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	101	1938	41	237	1729	256	37	10	241	330	24	115
RTOR Reduction (vph)	0	1	0	0	0	126	0	0	0	0	99	0
Lane Group Flow (vph)	101	1978	0	237	1729	130	0	47	241	330	40	0
Confl. Peds. (#/hr)			2			8						15
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Split		pt+ov	Split		
Protected Phases	5	2		1	6		8	8	1 8	4	4	
Permitted Phases						6						
Actuated Green, G (s)	14.1	61.1		16.1	63.1	63.1		8.6	24.7	16.7	16.7	
Effective Green, g (s)	14.6	61.6		16.6	63.6	63.6		9.1	25.7	17.2	17.2	
Actuated g/C Ratio	0.12	0.49		0.13	0.51	0.51		0.07	0.21	0.14	0.14	
Clearance Time (s)	5.0	6.5		5.0	6.5	6.5		5.5		5.5	5.5	
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	211	2020		465	2538	786		130	329	482	223	
v/s Ratio Prot	0.06	c0.48		0.07	0.35			0.03	c0.15	c0.09	0.02	
v/s Ratio Perm						0.08						
v/c Ratio	0.48	0.98		0.51	0.68	0.17		0.36	0.73	0.68	0.18	
Uniform Delay, d1	51.6	31.1		50.4	23.1	16.5		55.2	46.4	51.3	47.7	
Progression Factor	0.88	0.56		1.04	0.86	1.12		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	9.4		0.4	1.0	0.3		1.2	7.7	3.7	0.3	
Delay (s)	46.2	26.6		53.0	20.9	18.7		56.4	54.2	55.0	47.9	
Level of Service	D	C		D	C	B		E	D	D	D	
Approach Delay (s)		27.6			24.1			54.5			52.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↰	↱↱
Volume (vph)	0	1590	875	123	1063	0	0	0	0	659	5	1111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5	5.5	5.5
Lane Util. Factor		*0.75	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4150	1568	1787	3471					1681	1682	2760
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4150	1568	1787	3471					1681	1682	2760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1606	884	124	1074	0	0	0	0	666	5	1122
RTOR Reduction (vph)	0	0	476	0	0	0	0	0	0	0	0	23
Lane Group Flow (vph)	0	1606	408	124	1074	0	0	0	0	333	338	1099
Heavy Vehicles (%)	0%	3%	3%	1%	4%	0%	0%	0%	0%	2%	20%	3%
Turn Type			Perm	Prot						Split		custom
Protected Phases		2		1	6					4	4	4 5
Permitted Phases			2									
Actuated Green, G (s)		56.5	56.5	11.1	51.5					39.4	39.4	61.5
Effective Green, g (s)		57.0	57.0	11.6	52.0					39.9	39.9	62.0
Actuated g/C Ratio		0.46	0.46	0.09	0.42					0.32	0.32	0.50
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	
Vehicle Extension (s)		6.1	6.1	2.3	6.1					2.3	2.3	
Lane Grp Cap (vph)		1892	715	166	1444					537	537	1369
v/s Ratio Prot		c0.39		0.07	c0.31					0.20	0.20	c0.40
v/s Ratio Perm			0.26									
v/c Ratio		0.85	0.57	0.75	0.74					0.62	0.63	0.80
Uniform Delay, d1		30.2	25.0	55.3	30.9					36.1	36.3	26.4
Progression Factor		0.50	2.46	0.79	0.64					1.00	1.00	1.00
Incremental Delay, d2		2.5	1.6	14.5	3.3					1.8	1.9	3.4
Delay (s)		17.6	63.1	58.3	23.1					37.9	38.1	29.8
Level of Service		B	E	E	C					D	D	C
Approach Delay (s)		33.7			26.8			0.0			32.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱↱		↑↑	↱	↰	↰↑	↱			
Volume (vph)	0	1216	1031	0	511	682	675	5	177	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		6.0	6.0	5.5	5.5	5.5			
Lane Util. Factor		0.95	0.88		0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes		1.00	1.00		1.00	0.95	1.00	1.00	0.96			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		3574	2760		3574	1502	1618	1620	1512			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		3574	2760		3574	1502	1618	1620	1512			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1280	1085	0	538	718	711	5	186	0	0	0
RTOR Reduction (vph)	0	0	352	0	0	263	0	0	21	0	0	0
Lane Group Flow (vph)	0	1280	733	0	538	455	355	361	165	0	0	0
Confl. Peds. (#/hr)						16			17			
Heavy Vehicles (%)	0%	1%	3%	0%	1%	2%	6%	20%	2%	0%	0%	0%
Turn Type			Perm			Perm	Split		Perm			
Protected Phases		2			6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		79.3	79.3		78.8	78.8	33.7	33.7	33.7			
Effective Green, g (s)		79.8	79.8		79.3	79.3	34.2	34.2	34.2			
Actuated g/C Ratio		0.64	0.64		0.63	0.63	0.27	0.27	0.27			
Clearance Time (s)		6.0	6.0		6.5	6.5	6.0	6.0	6.0			
Vehicle Extension (s)		6.1	6.1		4.2	4.2	2.3	2.3	2.3			
Lane Grp Cap (vph)		2282	1762		2267	953	443	443	414			
v/s Ratio Prot		c0.36			0.15		0.22	c0.22				
v/s Ratio Perm			0.27			0.30			0.11			
v/c Ratio		0.56	0.42		0.24	0.48	0.80	0.81	0.40			
Uniform Delay, d1		12.7	11.1		9.8	12.0	42.2	42.4	37.0			
Progression Factor		0.72	1.20		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.7	0.5		0.2	1.7	9.6	10.6	0.4			
Delay (s)		9.9	13.8		10.1	13.7	51.9	53.1	37.4			
Level of Service		A	B		B	B	D	D	D			
Approach Delay (s)		11.7			12.2			49.4			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

HCM Signalized Intersection Capacity Analysis
14: Tualatin Sherwood Rd & Nyberg Woods

4/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	995	61	10	834	80	112	7	17	81	5	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	3502	3504		1805	3525			1761	1590		1793	1592
Flt Permitted	0.95	1.00		0.95	1.00			0.67	1.00		0.65	1.00
Satd. Flow (perm)	3502	3504		1805	3525			1243	1590		1221	1592
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	302	1036	64	10	869	83	117	7	18	84	5	199
RTOR Reduction (vph)	0	3	0	0	7	0	0	0	15	0	0	165
Lane Group Flow (vph)	302	1097	0	10	945	0	0	124	3	0	89	34
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	9.0	33.1		0.7	24.8			10.2	10.2		10.2	10.2
Effective Green, g (s)	9.5	33.6		1.2	25.3			10.7	10.7		10.7	10.7
Actuated g/C Ratio	0.15	0.54		0.02	0.41			0.17	0.17		0.17	0.17
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.3	2.5		2.4	2.5			2.4	2.4		2.3	2.3
Lane Grp Cap (vph)	537	1899		35	1438			215	274		211	275
v/s Ratio Prot	c0.09	c0.31		0.01	c0.27							
v/s Ratio Perm								c0.10	0.00		0.07	0.02
v/c Ratio	0.56	0.58		0.29	0.66			0.58	0.01		0.42	0.12
Uniform Delay, d1	24.3	9.5		30.0	14.8			23.6	21.3		22.9	21.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.4		2.9	1.0			2.9	0.0		0.8	0.1
Delay (s)	25.3	9.8		32.9	15.8			26.5	21.3		23.7	21.8
Level of Service	C	A		C	B			C	C		C	C
Approach Delay (s)		13.2			16.0			25.8			22.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	221	943	26	24	775	16	17	9	45	5	7	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	4.8		4.8	4.8			5.6	5.6		5.3	4.8
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1805	1854		1805	3561			1803	1527		1848	1609
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.69	1.00
Satd. Flow (perm)	1805	1854		1805	3561			1803	1527		1304	1609
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	230	982	27	25	807	17	18	9	47	5	7	145
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	44	0	0	116
Lane Group Flow (vph)	230	1009	0	25	823	0	0	27	3	0	12	29
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Split		Perm	Perm		pm+ov
Protected Phases	5	2		1	6		8	8			4	5
Permitted Phases									8	4		4
Actuated Green, G (s)	11.5	48.8		1.7	39.0			4.1	4.1		3.6	15.1
Effective Green, g (s)	12.0	49.3		2.2	39.5			4.6	4.6		4.1	16.1
Actuated g/C Ratio	0.15	0.61		0.03	0.49			0.06	0.06		0.05	0.20
Clearance Time (s)	5.3	5.3		5.3	5.3			6.1	6.1		5.8	5.3
Vehicle Extension (s)	2.5	3.0		1.0	3.0			1.0	1.0		2.0	2.5
Lane Grp Cap (vph)	268	1133		49	1743			103	87		66	321
v/s Ratio Prot	c0.13	c0.54		0.01	0.23			c0.01				0.01
v/s Ratio Perm									0.00		c0.01	0.00
v/c Ratio	0.86	0.89		0.51	0.47			0.26	0.03		0.18	0.09
Uniform Delay, d1	33.5	13.4		38.7	13.7			36.4	35.9		36.7	26.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	22.5	9.0		3.7	0.2			0.5	0.1		0.5	0.1
Delay (s)	56.1	22.4		42.4	13.9			36.9	36.0		37.2	26.4
Level of Service	E	C		D	B			D	D		D	C
Approach Delay (s)		28.6			14.7			36.3			27.2	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.7	Sum of lost time (s)	20.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	1035	138	234	1103	56	171	268	169	297	345	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.5	5.5		4.5	5.0	4.5	4.5	5.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1703	3320		3502	3339		1732	1810	1543	1761	3313	
Flt Permitted	0.95	1.00		0.95	1.00		0.41	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	1703	3320		3502	3339		744	1810	1543	1099	3313	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	104	1045	139	236	1114	57	173	271	171	300	348	134
RTOR Reduction (vph)	0	7	0	0	3	0	0	0	55	0	34	0
Lane Group Flow (vph)	104	1177	0	236	1168	0	173	271	116	300	448	0
Confl. Peds. (#/hr)			7			15	7		8	8		7
Heavy Vehicles (%)	6%	7%	3%	0%	7%	6%	4%	5%	3%	2%	4%	3%
Turn Type	Prot			Prot			pm+pt		pm+ov	pm+pt		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	10.0	54.6		10.7	55.3		21.2	21.2	31.9	27.3	26.8	
Effective Green, g (s)	10.5	55.1		11.2	55.8		21.7	21.7	32.9	27.8	27.3	
Actuated g/C Ratio	0.08	0.44		0.09	0.45		0.17	0.17	0.26	0.22	0.22	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.5	5.0	5.0	5.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	143	1463		314	1491		223	314	406	337	724	
v/s Ratio Prot	0.06	c0.35		0.07	c0.35		0.07	c0.15	0.03	c0.12	0.14	
v/s Ratio Perm							0.06		0.05	c0.07		
v/c Ratio	0.73	0.80		0.75	0.78		0.78	0.86	0.29	0.89	0.62	
Uniform Delay, d1	55.9	30.3		55.5	29.5		47.6	50.2	36.7	45.8	44.1	
Progression Factor	1.00	1.00		0.61	0.96		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.8		5.3	2.5		14.2	20.3	0.1	23.5	1.1	
Delay (s)	70.3	35.1		39.2	30.9		61.8	70.5	36.8	69.4	45.3	
Level of Service	E	D		D	C		E	E	D	E	D	
Approach Delay (s)		37.9			32.3			58.7			54.5	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM Average Control Delay	42.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	1515	83	0	1146	0	95	312	333	194	673	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99			1.00		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3448			3438		1770	1863	1574	1787	3497	
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	3448			3438		1770	1863	1574	1787	3497	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	59	1612	88	0	1219	0	101	332	354	206	716	96
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	80	0	10	0
Lane Group Flow (vph)	59	1697	0	0	1219	0	101	332	274	206	802	0
Confl. Peds. (#/hr)			4			2			3			16
Heavy Vehicles (%)	5%	4%	0%	0%	5%	0%	2%	2%	1%	1%	1%	1%
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	7.2	65.2			53.0		9.9	24.1	24.1	18.7	32.9	
Effective Green, g (s)	7.7	65.7			53.5		10.4	24.6	24.6	19.2	33.4	
Actuated g/C Ratio	0.06	0.53			0.43		0.08	0.20	0.20	0.15	0.27	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	3.5			3.5		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	106	1812			1471		147	367	310	274	934	
v/s Ratio Prot	0.03	c0.49			0.35		0.06	c0.18		0.12	c0.23	
v/s Ratio Perm									0.17			
v/c Ratio	0.56	0.94			0.83		0.69	0.90	0.88	0.75	0.86	
Uniform Delay, d1	57.0	27.7			31.7		55.7	49.1	48.8	50.6	43.6	
Progression Factor	1.20	0.74			1.09		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	8.5			4.4		12.5	24.3	23.7	11.0	7.7	
Delay (s)	70.9	29.0			38.9		68.3	73.4	72.5	61.7	51.2	
Level of Service	E	C			D		E	E	E	E	D	
Approach Delay (s)		30.4			38.9			72.3			53.3	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	44.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	23	10	240	0	244	2	334	369	433	474	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.3	5.6	4.8	4.8		4.8	4.8	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	0.90	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1785			1805	1456	1748	1719		1787	1893	
Flt Permitted		0.98			0.95	1.00	0.48	1.00		0.08	1.00	
Satd. Flow (perm)		1785			1805	1456	880	1719		157	1893	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	24	24	10	250	0	254	2	348	384	451	494	10
RTOR Reduction (vph)	0	6	0	0	0	240	0	25	0	0	0	0
Lane Group Flow (vph)	0	52	0	0	250	14	2	707	0	451	504	0
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Split			Split		custom	pm+pt			pm+pt		
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases						8	6			2		
Actuated Green, G (s)		7.6			20.0	7.6	65.3	64.3		99.6	93.3	
Effective Green, g (s)		8.1			20.5	8.1	66.3	64.8		100.1	93.8	
Actuated g/C Ratio		0.06			0.14	0.06	0.46	0.45		0.69	0.65	
Clearance Time (s)		6.1			5.8	6.1	5.3	5.3		5.3	5.3	
Vehicle Extension (s)		1.0			2.0	1.0	1.0	3.0		2.5	0.2	
Lane Grp Cap (vph)		100			256	82	413	771		453	1230	
v/s Ratio Prot		c0.03			c0.14		0.00	0.41		c0.21	0.27	
v/s Ratio Perm						0.01	0.00			c0.48		
v/c Ratio		0.52			0.98	0.17	0.00	0.92		1.00	0.41	
Uniform Delay, d1		66.3			61.7	65.0	21.1	37.3		45.6	12.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3			49.0	0.4	0.0	15.5		40.9	0.1	
Delay (s)		68.5			110.8	65.3	21.1	52.8		86.5	12.2	
Level of Service		E			F	E	C	D		F	B	
Approach Delay (s)		68.5			87.9			52.7			47.2	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	58.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	144.4	Sum of lost time (s)	15.7
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	117	13	166	122	64	16	486	218	65	571	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	4.0		3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1782	1830		1781	1739		1769	1789		1804	1860	
Flt Permitted	0.64	1.00		0.42	1.00		0.25	1.00		0.17	1.00	
Satd. Flow (perm)	1191	1830		785	1739		468	1789		319	1860	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	44	123	14	175	128	67	17	512	229	68	601	79
RTOR Reduction (vph)	0	4	0	0	16	0	0	11	0	0	3	0
Lane Group Flow (vph)	44	133	0	175	179	0	17	730	0	68	677	0
Confl. Peds. (#/hr)	15		7	7		15	7		8	8		7
Heavy Vehicles (%)	0%	2%	1%	1%	3%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.3	12.4		25.7	18.8		47.1	45.6		51.5	47.8	
Effective Green, g (s)	16.3	12.9		26.2	19.3		48.1	46.1		52.5	48.3	
Actuated g/C Ratio	0.19	0.15		0.30	0.22		0.55	0.53		0.60	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	2.2	2.2		2.2	2.2		2.2	5.0		2.2	5.0	
Lane Grp Cap (vph)	245	270		347	384		287	943		263	1027	
v/s Ratio Prot	0.01	0.07		c0.06	0.10		0.00	c0.41		c0.01	0.36	
v/s Ratio Perm	0.03			c0.09			0.03			0.14		
v/c Ratio	0.18	0.49		0.50	0.47		0.06	0.77		0.26	0.66	
Uniform Delay, d1	29.7	34.3		24.1	29.6		10.8	16.5		11.9	13.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.7		0.6	0.5		0.0	4.7		0.3	2.1	
Delay (s)	29.9	35.0		24.7	30.1		10.8	21.2		12.2	15.9	
Level of Service	C	D		C	C		B	C		B	B	
Approach Delay (s)		33.8			27.5			21.0			15.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Intersection: 12: Tualatin Sherwood Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	L	T	T	L	LT	R	R
Maximum Queue (ft)	410	477	487	381	515	642	679	225	801	538	436
Average Queue (ft)	190	187	192	61	167	391	435	177	393	280	209
95th Queue (ft)	352	369	372	232	422	641	680	267	703	449	373
Link Distance (ft)	507	507	507		641	641	641		1156	1156	
Upstream Blk Time (%)	0	0	1		1	2	3				
Queuing Penalty (veh)	1	3	4		2	9	13				
Storage Bay Dist (ft)				400				200			700
Storage Blk Time (%)			1	0				6	23	0	
Queuing Penalty (veh)			6	0				21	77	0	

Exhibit 1
Attachment L

Intersection: 13: Tualatin Sherwood Rd & I-5 NB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	R	T	T	R	L	LT	R
Maximum Queue (ft)	634	555	111	105	194	328	223	357	652	300
Average Queue (ft)	336	215	11	7	83	119	18	237	295	121
95th Queue (ft)	589	466	146	110	164	235	116	350	628	267
Link Distance (ft)	641	641	641	641	478	478			1328	
Upstream Blk Time (%)	1	0	0	0		0			0	
Queuing Penalty (veh)	7	1	0	0		1			0	
Storage Bay Dist (ft)							150	300		225
Storage Blk Time (%)						3	0	3	13	0
Queuing Penalty (veh)						21	0	16	67	3

Exhibit 4
Attachment L

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst:
Agency/Co.:
Date Performed: 4/16/2013
Analysis Time Period: Weekday PM
Intersection: Sagert/Martinazzi
Jurisdiction:
Units: U. S. Customary
Analysis Year: Total
Project ID:
East/West Street: Sagert
North/South Street: Martinazzi

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	127	233	12	90	195	164	2		76	207	306	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	L	TR	L	TR	L	TR
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	141	271	100	398	2	284	230	340
% Heavy Veh	1	1	1	1	1	1	1	1
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	141	271	100	398	2	284	230	340
Left-Turn	141	0	100	0	2	0	230	0
Right-Turn	0	13	0	182	0	84	0	0
Prop. Left-Turns	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.5	0.0	0.3	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	

Exhibit 1
Attachment L

	Eastbound		Westbound		Northbound		Southbound	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	-0.0	0.5	-0.3	0.5	-0.2	0.5	0.0

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	141	271	100	398	2	284	230	340
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13	0.24	0.09	0.35	0.00	0.25	0.20	0.30
hd, final value	8.96	8.42	8.76	7.94	9.19	8.48	8.72	8.22
x, final value	0.35	0.63	0.24	0.88	0.01	0.67	0.56	0.78
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	6.7	6.1	6.5	5.6	6.9	6.2	6.4	5.9

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	141	271	100	398	2	284	230	340
Service Time	6.7	6.1	6.5	5.6	6.9	6.2	6.4	5.9
Utilization, x	0.35	0.63	0.24	0.88	0.01	0.67	0.56	0.78
Dep. headway, hd	8.96	8.42	8.76	7.94	9.19	8.48	8.72	8.22
Capacity	391	418	350	450	252	413	407	433
Delay	16.42	24.61	14.25	45.54	11.93	26.70	21.85	34.14
LOS	C	C	B	E	B	D	C	D
Approach:								
Delay	21.81		39.26		26.59		29.18	
LOS	C		E		D		D	

Intersection Delay 29.88 Intersection LOS D

Exhibit 1
Attachment L

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst:
Agency/Co.:
Date Performed: 4/16/2013
Analysis Time Period: Weekday PM
Intersection: Sagert/65th
Jurisdiction:
Units: U. S. Customary
Analysis Year: Total
Project ID:
East/West Street: Sagert
North/South Street: 65th

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	401	2	135	2	7	6	58		3	3	340	386
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	L	TR	L	TR	L	TR	L	TR
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	445	152	2	13	64	323	3	805
% Heavy Veh	1	1	0	0	1	2	1	2
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	445	152	2	13	64	323	3	805
Left-Turn	445	0	2	0	64	0	3	0
Right-Turn	0	150	0	6	0	3	0	428
Prop. Left-Turns	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	

Exhibit 1
Attachment L

	Eastbound		Westbound		Northbound		Southbound	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	-0.7	0.5	-0.3	0.5	0.0	0.5	-0.3

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	445	152	2	13	64	323	3	805
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.40	0.14	0.00	0.01	0.06	0.29	0.00	0.72
hd, final value	7.73	6.54	9.23	8.40	8.00	7.51	7.77	6.92
x, final value	0.96	0.28	0.01	0.03	0.14	0.67	0.01	1.55
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.4	4.2	6.9	6.1	5.7	5.2	5.5	4.6

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	445	152	2	13	64	323	3	805
Service Time	5.4	4.2	6.9	6.1	5.7	5.2	5.5	4.6
Utilization, x	0.96	0.28	0.01	0.03	0.14	0.67	0.01	1.55
Dep. headway, hd	7.73	6.54	9.23	8.40	8.00	7.51	7.77	6.92
Capacity	466	402	252	263	314	475	253	805
Delay	58.85	11.71	11.98	11.37	12.02	24.33	10.52	273.87
LOS	F	B	B	B	B	C	B	F
Approach:								
Delay	46.85		11.45		22.29		272.89	
LOS	E		B		C		F	

Intersection Delay 142.37 Intersection LOS F

Exhibit 1
Attachment L

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1051	10	0	1384	0	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1142	11	0	1504	0	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	252					
pX, platoon unblocked			0.63		0.63	0.63
vC, conflicting volume			1153		1900	1148
vC1, stage 1 conf vol					1148	
vC2, stage 2 conf vol					752	
vCu, unblocked vol			949		2136	940
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	77
cM capacity (veh/h)			453		185	167

Direction, Lane #	EB 1	WB 1	WB 2	NW 1
Volume Total	1153	752	752	38
Volume Left	0	0	0	0
Volume Right	11	0	0	38
cSH	1700	1700	1700	167
Volume to Capacity	0.68	0.44	0.44	0.23
Queue Length 95th (ft)	0	0	0	21
Control Delay (s)	0.0	0.0	0.0	32.9
Lane LOS				D
Approach Delay (s)	0.0	0.0		32.9
Approach LOS				D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

Exhibit 1
Attachment L

M	EBT	EBR	WBL	WBT	NBL	NBR
L C r						
V	41	14	318	429	201	3 3
Id F	1900	1900	1900	1900	1900	1900
T L	4.	4.	4.	4.	4.	4.
L U .F r	1.00	1.00	1.00	1.00	1.00	1.00
Fr , d/	1.00	1.00	1.00	1.00	1.00	0.99
F , d/	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.8	1.00	1.00	1.00	0.8
F Pr d	1.00	1.00	0.9	1.00	0.9	1.00
S d. F r	1863	1 99	1 8	184	1 0	1 81
F P r d	1.00	1.00	0.9	1.00	0.9	1.00
S d. F r	1863	1 99	1 8	184	1 0	1 81
P r r, PHF	0.9	0.9	0.9	0.9	0.9	0.9
Ad. F	439	1 3	33	4 2	212	3 2
RTOR R d	0	10	0	0	0	96
L Gr F	439	48	33	4 2	212	2 6
C .P d . / r		11	11		1	3
C . B /r	4		2	10	1	
H V	2	1	1	3	2	1
Tr T		Pr	Pr			
Pr d P	2	2	1	6	8	1
P r d P					8	8
A d Gr , G	20.4	20.4	1 .3	42.	14.1	31.4
E Gr ,	20.9	20.9	1 .8	43.2	14.6	32.4
A d /C R	0.31	0.31	0.2	0.6	0.22	0.49
C r T	.0	.0	.0	.0	.0	.0
V E	3.0	3.0	3.0	3.0	3.0	3.0
L Gr C	83	00	4 6	1193	38	8 3
/ R Pr	0.24	0.03	0.19	0.2	0.12	0.08
/ R P r						0.09
/ R	0.	0.10	0. 0	0.38	0.	0.32
U r D , d1	20.6	16.3	22.1	.	23.2	10.
Pr r F r	1.00	1.00	1.00	1.00	1.00	1.00
I r D , d2	.	0.1	4.	0.2	1.6	0.2
D	26.1	16.3	26.8	.	24.8	10.
L S r	C	B	C	A	C	B
A r D	23.6			14.	1 .8	
A r LOS	C			B	B	

I r S r			
HCM A r C r D	1 .	HCM L S r	B
HCM V C r	0.68		
A d C L	66.8	S	13.
I r C U	62.6	ICU L S r	B
A P r d	1		
Cr L Gr			

Exhibit 1
Attachment L

M	WBL	WBR	NBT	NBR	SBL	SBT
L C r						
V /	62	1	396		202	2
S C r	S		Fr			Fr
Gr d	0		0			0
P H r F r	0.92	0.92	0.92	0.92	0.92	0.92
H r r	6	1 1	430	84	220	2 9
P d r						
L Wd						
W S d /						
Pr B						
R r r						
M d			N			TWLTL
M d r						2
U r			46			31
, d	1.00	1.00			1.00	
C,	1191	4 2			14	
C1, 1	4 2					
C2, 2	18					
C , d	1191	4 2			14	
C,	6.4	6.2			4.1	
C, 2	.4					
F	3.	3.3			2.2	
0 r	80	1			9	
M /	34	92			10 1	

Dr , L	WB 1	WB 2	NB 1	SB 1	SB 2
V T	6	1 1	14	220	2 9
V L	6	0	0	220	0
V R	0	1 1	84	0	0
SH	34	92	1 00	10 1	1 00
V C	0.20	0.29	0.30	0.21	0.16
L 9	19	31	0	20	0
C r D	1 .9	13.	0.0	9.3	0.0
L LOS	C	B		A	
A r D	14.8		0.0	4.1	
A r LOS	B				

I r S r			
A r D	4.4		
I r C U	0.1	ICU L S r	A
A P r d	1		

Exhibit 1
Attachment L

M	EBL	EBR	NBL	NBT	SBT	SBR
L C r						
V /	3	4	81	43	2	44
S C r	S			Fr	Fr	
Gr d	0			0	0	
P H rF r	0.91	0.91	0.91	0.91	0.91	0.91
H r r	41	49	89	480	302	48
P d r	1			4	10	
L Wd	12.0			12.0	12.0	
W S d /	4.0			4.0	4.0	
Pr B	0			0	1	
R r r						
M d				N	N	
M d r						
U r				30	4	
, d	0.9					
C,	996	331	3 2			
C1, 1						
C2, 2						
C , d	9 9	331	3 2			
C,	6.4	6.2	4.1			
C, 2						
F	3.	3.3	2.2			
0 r	84	93	93			
M /	249	12	121			

Dr , L	EB 1	NB 1	NB 2	SB 1
V T	90	89	480	3 1
V L	41	89	0	0
V R	49	0	0	48
SH	38	121	1 00	1 00
V C	0.23	0.0	0.28	0.21
L 9	23	6	0	0
C r D	1 .1	8.2	0.0	0.0
L LOS	C	A		
A r D	1 .1	1.3		0.0
A r LOS	C			

I r S r				
A r D	2.2			
I r C U	3 .	ICU L	S r	A
A Prd	1			

Exhibit 1
Attachment L

M	WBL	WBR	NBT	NBR	SBL	SBT
L C r						
V /		2	494	9	3	318
S C r	S		Fr			Fr
Gr d	0		0			0
P H rF r	0.92	0.92	0.92	0.92	0.92	0.92
H r r		2	3	10	3	346
P d r						
L Wd						
W S d /						
Pr B						
R r r						
M d			N			N
M d r						
U r			239			43
, d						
C,	21	2 3			4	
C1, 1						
C2, 2						
C , d	21	2 3			4	
C,	6.8	6.9			4.1	
C, 2						
F	3.	3.3			2.2	
0 r	98	96			100	
M /	361	24			1019	

Dr , L	WB 1	NB 1	NB 2	SB 1	SB 2
V T	33	3 8	189	118	230
V L		0	0	3	0
V R	2	0	10	0	0
SH	620	1 00	1 00	1019	1 00
V C	0.0	0.21	0.11	0.00	0.14
L 9	4	0	0	0	0
C r D	11.1	0.0	0.0	0.3	0.0
L LOS	B			A	
A r D	11.1	0.0		0.1	
A r LOS	B				

I r S r				
A r D	0.4			
I r C U	23.9	ICU L	S r	A
A Prd	1			

Exhibit 1
Attachment L

M	WBL	WBR	NBT	NBR	SBL	SBT
L C r						
V /	0	10	493	0	0	322
S C r	S		Fr			Fr
Gr d	0		0			0
P H rF r	0.92	0.92	0.92	0.92	0.92	0.92
H r r	0	11	36	0	0	3 0
P d r						
L Wd						
W S d /						
Pr B						
R r r						
M d			N			N
M d r						
U r			111			6 1
, d	0.89	0.89			0.89	
C,	11	36			36	
C1, 1						
C2, 2						
C , d	610	412			412	
C,	6.8	6.9			4.1	
C, 2						
F	3.	3.3			2.2	
0 r	100	98			100	
M /	3 8	22			1013	

Dr , L	WB 1	NB 1	SB 1	SB 2
V T	11	36	1	1
V L	0	0	0	0
V R	11	0	0	0
SH	22	1 00	1 00	1 00
V C	0.02	0.32	0.10	0.10
L 9	2	0	0	0
C r D	12.0	0.0	0.0	0.0
L LOS	B			
A r D	12.0	0.0	0.0	
A r LOS	B			

I r S r					
A r D	0.1				
I r C U	3 .9	ICU L	S r		A
A Prd	1				

Exhibit 1
Attachment L

HCM Signalized Intersection Capacity Analysis
8: Nyberg St & Martinazzi Ave

4/17/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	1	63	260	37	237	23	240	36	0	314	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1805	1603		1698	1727	1543	1683	1837			3559	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.54	1.00			1.00	
Satd. Flow (perm)	1805	1603		1698	1727	1543	957	1837			3559	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	1	69	286	41	260	25	264	40	0	345	9
RTOR Reduction (vph)	0	63	0	0	0	202	0	8	0	0	3	0
Lane Group Flow (vph)	18	7	0	163	164	58	25	296	0	0	351	0
Confl. Peds. (#/hr)	2					2	3		16	16		3
Confl. Bikes (#/hr)						2					3	
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%	7%	1%	0%	0%	1%	0%
Turn Type	Split			Split		Perm	Perm					
Protected Phases	8	8		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	3.1	3.1		9.1	9.1	9.1	12.5	12.5			12.5	
Effective Green, g (s)	3.6	3.6		9.6	9.6	9.6	13.0	13.0			13.0	
Actuated g/C Ratio	0.08	0.08		0.22	0.22	0.22	0.30	0.30			0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	5.0	5.0			5.0	
Lane Grp Cap (vph)	152	135		382	388	347	291	559			1084	
v/s Ratio Prot	c0.01	0.00		c0.10	0.09			c0.16			0.10	
v/s Ratio Perm						0.04	0.03					
v/c Ratio	0.12	0.05		0.43	0.42	0.17	0.09	0.53			0.32	
Uniform Delay, d1	18.1	18.0		14.2	14.2	13.3	10.6	12.3			11.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.1		0.6	0.5	0.2	0.3	1.8			0.4	
Delay (s)	18.3	18.1		14.8	14.7	13.5	10.9	14.1			11.8	
Level of Service	B	B		B	B	B	B	B			B	
Approach Delay (s)		18.1			14.2			13.8			11.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	42.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	37	0	466	60	0	67
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	42	0	530	68	0	76
Pedestrians					4	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		232				
pX, platoon unblocked						
vC, conflicting volume	602				652	303
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	602				652	303
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	89
cM capacity (veh/h)	982				387	697

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	42	353	245	76
Volume Left	42	0	0	0
Volume Right	0	0	68	76
cSH	982	1700	1700	697
Volume to Capacity	0.04	0.21	0.14	0.11
Queue Length 95th (ft)	3	0	0	10
Control Delay (s)	8.8	0.0	0.0	10.8
Lane LOS	A			B
Approach Delay (s)	8.8	0.0		10.8
Approach LOS				B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	1335	59	257	1458	361	57	25	248	373	40	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		5.0	4.5	5.0	5.0	
Lane Util. Factor	1.00	*0.75		0.97	0.91	1.00		1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		1.00	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1805	4091		3502	4988	1565		1799	1599	3467	1634	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (perm)	1805	4091		3502	4988	1565		1799	1599	3467	1634	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	184	1362	60	262	1488	368	58	26	253	381	41	194
RTOR Reduction (vph)	0	3	0	0	0	201	0	0	0	0	164	0
Lane Group Flow (vph)	184	1419	0	262	1488	167	0	84	253	381	71	0
Confl. Peds. (#/hr)						4						9
Confl. Bikes (#/hr)					1			1		1		
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	1%	0%	0%
Turn Type	Prot			Prot		Perm	Split		pt+ov	Split		
Protected Phases	5	2		1	6		8	8	1 8	4	4	
Permitted Phases						6						
Actuated Green, G (s)	14.8	49.6		17.0	51.8	51.8		8.5	25.5	17.4	17.4	
Effective Green, g (s)	15.3	50.1		17.5	52.3	52.3		9.0	26.5	17.9	17.9	
Actuated g/C Ratio	0.13	0.44		0.15	0.45	0.45		0.08	0.23	0.16	0.16	
Clearance Time (s)	5.0	6.5		5.0	6.5	6.5		5.5		5.5	5.5	
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	240	1782		533	2268	712		141	368	540	254	
v/s Ratio Prot	0.10	c0.35		0.07	c0.30			0.05	c0.16	c0.11	0.04	
v/s Ratio Perm						0.11						
v/c Ratio	0.77	0.80		0.49	0.66	0.24		0.60	0.69	0.71	0.28	
Uniform Delay, d1	48.1	28.0		44.7	24.4	19.1		51.2	40.5	46.1	42.9	
Progression Factor	0.90	1.35		0.96	0.90	1.07		1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.1	2.9		0.3	1.0	0.5		5.5	4.8	3.9	0.4	
Delay (s)	53.6	40.7		43.3	23.0	20.9		56.8	45.3	49.9	43.3	
Level of Service	D	D		D	C	C		E	D	D	D	
Approach Delay (s)		42.2			25.2			48.2			47.4	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↰	↱↱
Volume (vph)	0	1484	480	193	1150	0	0	0	0	620	3	965
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5	5.5	5.5
Lane Util. Factor		*0.75	1.00	1.00	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4150	1568	1787	3471					1681	1683	2760
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4150	1568	1787	3471					1681	1683	2760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1499	485	195	1162	0	0	0	0	626	3	975
RTOR Reduction (vph)	0	0	242	0	0	0	0	0	0	0	0	40
Lane Group Flow (vph)	0	1499	243	195	1162	0	0	0	0	313	316	935
Confl. Bikes (#/hr)		1			2							
Heavy Vehicles (%)	0%	3%	3%	1%	4%	0%	0%	0%	0%	2%	20%	3%
Turn Type			Perm	Prot						Split		custom
Protected Phases		2		1	6					4	4	4 5
Permitted Phases			2									
Actuated Green, G (s)		49.4	49.4	17.0	55.4					30.6	30.6	47.6
Effective Green, g (s)		49.9	49.9	17.5	55.9					31.1	31.1	44.6
Actuated g/C Ratio		0.43	0.43	0.15	0.49					0.27	0.27	0.39
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	
Vehicle Extension (s)		6.1	6.1	2.3	6.1					2.3	2.3	
Lane Grp Cap (vph)		1801	680	272	1687					455	455	1070
v/s Ratio Prot		c0.36		c0.11	0.33					0.19	0.19	c0.34
v/s Ratio Perm			0.16									
v/c Ratio		0.83	0.36	0.72	0.69					0.69	0.69	0.87
Uniform Delay, d1		28.8	21.8	46.4	22.8					37.6	37.7	32.6
Progression Factor		0.60	0.38	0.88	0.62					1.00	1.00	1.00
Incremental Delay, d2		3.3	1.0	7.3	2.2					3.7	4.0	7.9
Delay (s)		20.5	9.4	48.1	16.3					41.3	41.7	40.5
Level of Service		C	A	D	B					D	D	D
Approach Delay (s)		17.8			20.9			0.0			40.9	
Approach LOS		B			C			A			D	

Intersection Summary			
HCM Average Control Delay	26.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱↱		↑↑	↱	↰	↰↑	↱			
Volume (vph)	0	1110	998	0	668	666	672	0	219	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		6.0	6.0	5.5	5.5	5.5			
Lane Util. Factor		0.95	0.88		0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	1.00	0.98			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		3574	2694		3574	1583	1618	1618	1559			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		3574	2694		3574	1583	1618	1618	1559			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1168	1051	0	703	701	707	0	231	0	0	0
RTOR Reduction (vph)	0	0	388	0	0	262	0	0	28	0	0	0
Lane Group Flow (vph)	0	1168	663	0	703	439	353	354	203	0	0	0
Confl. Peds. (#/hr)			1	1			1		2	2		1
Confl. Bikes (#/hr)		1			5					1		
Heavy Vehicles (%)	0%	1%	3%	0%	1%	2%	6%	20%	2%	0%	0%	0%
Turn Type			Perm			Perm	Split		Perm			
Protected Phases		2			6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		72.0	72.0		71.5	71.5	31.0	31.0	31.0			
Effective Green, g (s)		72.5	72.5		72.0	72.0	31.5	31.5	31.5			
Actuated g/C Ratio		0.63	0.63		0.63	0.63	0.27	0.27	0.27			
Clearance Time (s)		6.0	6.0		6.5	6.5	6.0	6.0	6.0			
Vehicle Extension (s)		6.1	6.1		4.2	4.2	2.3	2.3	2.3			
Lane Grp Cap (vph)		2253	1698		2238	991	443	443	427			
v/s Ratio Prot		c0.33			0.20		0.22	c0.22				
v/s Ratio Perm			0.25			0.28			0.13			
v/c Ratio		0.52	0.39		0.31	0.44	0.80	0.80	0.47			
Uniform Delay, d1		11.7	10.4		10.0	11.1	38.8	38.8	34.8			
Progression Factor		1.39	3.10		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.6	0.4		0.4	1.4	9.2	9.3	0.5			
Delay (s)		16.7	32.8		10.4	12.6	48.0	48.1	35.3			
Level of Service		B	C		B	B	D	D	D			
Approach Delay (s)		24.3			11.5			44.9			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	524	593	57	15	732	101	103	11	12	101	11	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3502	3486		1805	3505			1768	1593		1799	1594
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.66	1.00
Satd. Flow (perm)	3502	3486		1805	3505			1229	1593		1248	1594
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	546	618	59	16	762	105	107	11	12	105	11	335
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	10	0	0	279
Lane Group Flow (vph)	546	672	0	16	858	0	0	118	2	0	116	56
Confl. Peds. (#/hr)	8		2	2		8	1		2	2		1
Confl. Bikes (#/hr)		1			3							
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	14.5	38.4		0.8	24.7			10.9	10.9		10.9	10.9
Effective Green, g (s)	15.0	38.9		1.3	25.2			11.4	11.4		11.4	11.4
Actuated g/C Ratio	0.22	0.57		0.02	0.37			0.17	0.17		0.17	0.17
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.3	2.5		2.4	2.5			2.4	2.4		2.3	2.3
Lane Grp Cap (vph)	771	1991		34	1297			206	267		209	267
v/s Ratio Prot	c0.16	0.19		0.01	c0.24							
v/s Ratio Perm								c0.10	0.00		0.09	0.04
v/c Ratio	0.71	0.34		0.47	0.66			0.57	0.01		0.56	0.21
Uniform Delay, d1	24.5	7.8		33.1	17.9			26.1	23.6		26.0	24.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.6	0.1		6.6	1.2			3.0	0.0		2.3	0.2
Delay (s)	27.2	7.8		39.7	19.0			29.1	23.6		28.3	24.7
Level of Service	C	A		D	B			C	C		C	C
Approach Delay (s)		16.5			19.4			28.6			25.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	68.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	1194	141	0	1163	0	100	225	252	129	415	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98			1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3430			3438		1770	1863	1537	1787	3466	
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	3430			3438		1770	1863	1537	1787	3466	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	80	1270	150	0	1237	0	106	239	268	137	441	99
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	104	0	19	0
Lane Group Flow (vph)	80	1414	0	0	1237	0	106	239	164	137	521	0
Confl. Peds. (#/hr)						6			23			3
Heavy Vehicles (%)	5%	4%	0%	0%	5%	0%	2%	2%	1%	1%	1%	1%
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	8.6	66.5			52.9		10.6	17.9	17.9	13.6	20.9	
Effective Green, g (s)	9.1	67.0			53.4		11.1	18.4	18.4	14.1	21.4	
Actuated g/C Ratio	0.08	0.58			0.46		0.10	0.16	0.16	0.12	0.19	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	3.5			3.5		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	136	1998			1596		171	298	246	219	645	
v/s Ratio Prot	0.05	c0.41			c0.36		0.06	c0.13		0.08	c0.15	
v/s Ratio Perm									0.11			
v/c Ratio	0.59	0.71			0.78		0.62	0.80	0.67	0.63	0.81	
Uniform Delay, d1	51.1	17.0			25.8		49.9	46.5	45.4	47.9	44.8	
Progression Factor	1.00	1.00			0.56		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	2.1			3.0		6.5	13.6	5.2	5.5	7.0	
Delay (s)	55.3	19.2			17.5		56.5	60.1	50.6	53.4	51.8	
Level of Service	E	B			B		E	E	D	D	D	
Approach Delay (s)		21.1			17.5			55.3			52.1	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	CLB
Date:	4/16/2013
Filename:	C:\Users\mvandehey\Documents\[Signalized Queue FM Driveway2.xls]SIGQUEUE

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Fred Meyer Access/Nyberg Road
Conditions (yr, alt., etc.):	Weekday

GENERAL INPUT PARAMETERS:

Cycle Length:	125	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	EB LT EX	EB LT BK	EB LT WS	EX SB LT	BK SB LT	WS SB LT		
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	30	30	100	182	182	323		
G/C for movement:	0.05	0.05	0.12	0.18	0.18	0.14		
Number of lanes:	1	1	1	1	1	2	2	2
CALCULATIONS:								
Length of red interval (sec):	118.8	118.8	110.0	102.5	102.5	107.5		
Average total queue (veh):	1.0	1.0	3.1	5.2	5.2	9.6		
Maximum total queue (veh):	3	3	6	9	9	15		
Total queue length (feet):	75	75	150	225	225	375		
Required storage/lane (feet):	**75**	**75**	**150**	**225**	**225**	**200**		
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	CLB
Date:	4/16/2013
Filename:	C:\Users\mvandehey\AppData\Local\Microsoft\Windows\Temporary Internet F...

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Fred Meyer Access/Nyberg Road
Conditions (yr, alt., etc.):

GENERAL INPUT PARAMETERS:

Cycle Length:	125	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB RT EX PI	NB RT BK	NB RT WS	NB 2RT WS	EX WB LT	WB LT EX	WB LT BK	WB LT WS
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	236	236	236	236	232	232	232	232
G/C for movement:	0.28	0.28	0.21	0.17	0.10	0.10	0.10	0.13
Number of lanes:	1	1	1	2	2	2	2	2
CALCULATIONS:								
Length of red interval (sec):	90.0	90.0	98.8	103.8	112.5	112.5	112.5	108.8
Average total queue (veh):	5.9	5.9	6.5	6.8	7.3	7.3	7.3	7.0
Maximum total queue (veh):	**10**	**10**	**11**	**11**	**12**	**12**	**12**	**12**
Total queue length (feet):	250	250	275	275	300	300	300	300
Required storage/lane (feet):	**250**	**250**	**275**	**150**	**150**	**150**	**150**	**150**
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	CLB
Date:	4/17/2013
Filename:	C:\Users\mvandehoy\Documents\[Signalized Queue FM Driveway saturday2.x

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Fred Meyer Access/Nyberg Road
Conditions (yr, alt., etc.):	Saturday

GENERAL INPUT PARAMETERS:

Cycle Length:	115	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	
	EX EB LT	BK EB LT	WS EB LT		EX SB LT	BK SB LT	WS SB LT	
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	50	50	180		154	154	373	
G/C for movement:	0.06	0.07	0.13		0.18	0.18	0.16	
Number of lanes:	1	1	1		2	2	2	
CALCULATIONS:								
Length of red interval (sec):	108.1	107.0	100.1		94.3	94.3	96.6	
Average total queue (veh):	1.5	1.5	5.0		4.0	4.0	10.0	
Maximum total queue (veh):	**4**	**4**	**9**		**8**	**8**	**15**	
Total queue length (feet):	100	100	225		200	200	375	
Required storage/lane (feet):	**100**	**100**	**225**		**100**	**100**	**200**	
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name: Nyberg Rivers
Project Number: 12116
Analyst: CLB
Date: 4/17/2013
Filename: C:\Users\mvandehey\Documents\[Signalized Queue FM Driveway saturday2.x

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Fred Meyer Access/Nyberg Road
Conditions (yr, alt., etc.): Saturday

GENERAL INPUT PARAMETERS:

Cycle Length:	115	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	
	NB RT EX PI	NB RT BK	NB RT WS		EX WB LT	WB LT EX	WB LT BK	
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	248	248	248		257	257	257	
G/C for movement:	0.29	0.29	0.23		0.11	0.11	0.15	
Number of lanes:	1	1	1		2	2	2	
CALCULATIONS:								
Length of red interval (sec):	81.7	81.7	88.6		102.4	102.4	97.8	
Average total queue (veh):	5.6	5.6	6.1		7.3	7.3	7.0	
Maximum total queue (veh):	**10**	**10**	**10**		**12**	**12**	**12**	
Total queue length (feet):	250	250	250		300	300	300	
Required storage/lane (feet):	**250**	**250**	**250**		**150**	**150**	**150**	
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

Intersection: 12: Tualatin Sherwood Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	L	T	T	L	LT	R	R
Maximum Queue (ft)	445	482	482	299	653	651	680	274	654	570	440
Average Queue (ft)	193	214	224	43	275	371	393	196	348	281	203
95th Queue (ft)	342	374	385	164	614	671	659	296	631	476	355
Link Distance (ft)	522	522	522	522	616	616	616		1139	1139	
Upstream Blk Time (%)	0	0	0		4	3	2				
Queuing Penalty (veh)	0	1	1		19	12	11				
Storage Bay Dist (ft)								200			700
Storage Blk Time (%)								7	25	0	
Queuing Penalty (veh)								23	79	0	

Exhibit 1
Attachment L

Intersection: 13: Tualatin Sherwood Rd & I-5 NB Ramps

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	T	T	R	L	LT	R
Maximum Queue (ft)	616	590	356	335	450	225	374	924	300
Average Queue (ft)	383	352	16	124	165	49	214	332	136
95th Queue (ft)	610	578	161	251	323	201	354	675	287
Link Distance (ft)	616	616	616	459	459			1328	
Upstream Blk Time (%)	0	0	0	0	0				
Queuing Penalty (veh)	1	1	0	0	1				
Storage Bay Dist (ft)						150	300		225
Storage Blk Time (%)					10	0	1	16	0
Queuing Penalty (veh)					64	0	6	90	1

Exhibit 1
Attachment L

Appendix G
Year 2014 Operations Worksheets (for Alternative Access Scenario)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	7	9	479	7	40	0	504	567	59	697	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5	3.5			4.0	3.5	3.5	4.0	
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.92		1.00	0.95			1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt		0.93		1.00	0.87			1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1596		1787	1574			1900	1570	1805	1900	
Flt Permitted		1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1596		1787	1574			1900	1570	1805	1900	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	7	9	504	7	42	0	531	597	62	734	1
RTOR Reduction (vph)	0	9	0	0	26	0	0	0	158	0	0	0
Lane Group Flow (vph)	0	8	0	504	23	0	0	531	439	62	735	0
Confl. Peds. (#/hr)	15		7	7		15	7		8	8		7
Heavy Vehicles (%)	0%	2%	1%	1%	3%	0%	2%	0%	1%	0%	0%	0%
Turn Type	Split			Split			Prot		pm+ov	Prot		
Protected Phases	8	8		4	4		1	6	4	5	2	
Permitted Phases									6			
Actuated Green, G (s)		1.7		31.9	31.9			29.5	61.4	5.3	38.8	
Effective Green, g (s)		2.2		32.4	32.4			30.0	62.4	5.8	39.3	
Actuated g/C Ratio		0.03		0.38	0.38			0.35	0.73	0.07	0.46	
Clearance Time (s)		4.0		4.0	4.0			4.5	4.0	4.0	4.5	
Vehicle Extension (s)		2.5		2.2	2.2			3.5	2.2	2.2	3.5	
Lane Grp Cap (vph)		41		682	601			671	1154	123	880	
v/s Ratio Prot		c0.01		c0.28	0.01			0.28	0.15	0.03	c0.39	
v/s Ratio Perm									0.13			
v/c Ratio		0.20		0.74	0.04			0.79	0.38	0.50	0.84	
Uniform Delay, d1		40.5		22.6	16.5			24.6	4.1	38.2	20.0	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.8		3.8	0.0			6.5	0.1	1.7	7.1	
Delay (s)		42.2		26.4	16.5			31.2	4.2	39.8	27.0	
Level of Service		D		C	B			C	A	D	C	
Approach Delay (s)		42.2			25.5			16.9			28.0	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	11.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	410	844	200	298	453	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.0	3.5	3.5	3.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3467	1590	1900	1574	1805	1900
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3467	1590	1900	1574	1805	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	432	888	211	314	477	384
RTOR Reduction (vph)	0	182	0	75	0	0
Lane Group Flow (vph)	432	706	211	239	477	384
Confl. Peds. (#/hr)	7	15		8	8	
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Turn Type		pm+ov		pm+ov	Prot	
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.4	32.2	10.7	22.1	20.8	35.0
Effective Green, g (s)	11.9	33.2	11.2	23.1	21.3	35.5
Actuated g/C Ratio	0.22	0.61	0.21	0.42	0.39	0.65
Clearance Time (s)	4.0	4.0	3.5	4.0	4.0	4.0
Vehicle Extension (s)	3.0	2.0	5.0	3.0	2.0	2.0
Lane Grp Cap (vph)	758	1073	391	668	707	1240
v/s Ratio Prot	0.12	c0.26	c0.11	0.08	0.26	0.20
v/s Ratio Perm		0.19		0.07		
v/c Ratio	0.57	0.66	0.54	0.36	0.67	0.31
Uniform Delay, d1	19.0	6.9	19.3	10.6	13.7	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	1.1	2.6	0.3	2.0	0.1
Delay (s)	20.0	8.0	21.9	10.9	15.7	4.2
Level of Service	B	A	C	B	B	A
Approach Delay (s)	11.9		15.4			10.6
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	6.5
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	674	175	453	930	335	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1599	1787	1845	1770	1571
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1599	1787	1845	1770	1571
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	709	184	477	979	353	405
RTOR Reduction (vph)	0	61	0	0	0	34
Lane Group Flow (vph)	709	123	477	979	353	371
Confl. Peds. (#/hr)		7	7		7	8
Heavy Vehicles (%)	2%	1%	1%	3%	2%	1%
Turn Type		Prot	Prot			pm+ov
Protected Phases	2	2	1	6	8	1
Permitted Phases					8	8
Actuated Green, G (s)	42.2	42.2	33.1	80.3	24.1	57.2
Effective Green, g (s)	42.7	42.7	33.6	80.8	24.6	58.2
Actuated g/C Ratio	0.37	0.37	0.29	0.71	0.22	0.51
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	695	597	525	1303	381	861
v/s Ratio Prot	c0.38	0.08	c0.27	0.53	c0.20	0.13
v/s Ratio Perm						0.11
v/c Ratio	1.02	0.21	0.91	0.75	0.93	0.43
Uniform Delay, d1	35.9	24.3	38.9	10.5	44.0	17.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	39.3	0.2	19.4	2.5	28.1	0.3
Delay (s)	75.2	24.5	58.4	13.0	72.1	18.0
Level of Service	E	C	E	B	E	B
Approach Delay (s)	64.7			27.9	43.2	
Approach LOS	E			C	D	

Intersection Summary			
HCM Average Control Delay	42.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	114.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	0	80	53	0	163	85	516	99	202	376	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5	3.5	3.5	3.5		3.5	3.5	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00			0.99	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.85			1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1739	1573			1747	1540	1802	1825		1769	1828	
Flt Permitted	0.72	1.00			0.70	1.00	0.47	1.00		0.20	1.00	
Satd. Flow (perm)	1317	1573			1287	1540	895	1825		370	1828	
Peak-hour factor, PHF	0.91	0.92	0.91	0.92	0.92	0.92	0.91	0.91	0.92	0.92	0.91	0.91
Adj. Flow (vph)	44	0	88	58	0	177	93	567	108	220	413	55
RTOR Reduction (vph)	0	76	0	0	0	127	0	9	0	0	6	0
Lane Group Flow (vph)	44	12	0	0	58	50	93	667	0	220	462	0
Confl. Peds. (#/hr)	26		16	16		26	5		5	5		5
Heavy Vehicles (%)	0%	2%	0%	2%	2%	2%	0%	1%	2%	2%	2%	0%
Turn Type	Perm			Perm		pm+ov	pm+pt			pm+pt		
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	5.9	5.9			5.9	12.8	27.8	23.8		33.6	26.7	
Effective Green, g (s)	6.4	6.4			6.4	13.8	28.8	24.3		34.6	27.2	
Actuated g/C Ratio	0.13	0.13			0.13	0.28	0.59	0.50		0.71	0.56	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	173	207			169	548	614	913		476	1023	
v/s Ratio Prot		0.01				0.01	0.01	c0.37		c0.07	0.25	
v/s Ratio Perm	0.03				c0.05	0.02	0.08			0.26		
v/c Ratio	0.25	0.06			0.34	0.09	0.15	0.73		0.46	0.45	
Uniform Delay, d1	19.0	18.5			19.2	12.8	4.3	9.6		5.1	6.3	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.1			1.2	0.1	0.1	3.0		0.7	0.3	
Delay (s)	19.7	18.6			20.4	12.9	4.4	12.6		5.8	6.6	
Level of Service	B	B			C	B	A	B		A	A	
Approach Delay (s)		19.0			14.7			11.6			6.4	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	48.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	10	100	357	55	337	27	315	26	0	499	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.99			1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1805	1626		1698	1728	1533	1682	1855			3563	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.40	1.00			1.00	
Satd. Flow (perm)	1805	1626		1698	1728	1533	701	1855			3563	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	32	11	110	392	60	370	30	346	29	0	548	11
RTOR Reduction (vph)	0	96	0	0	0	276	0	4	0	0	2	0
Lane Group Flow (vph)	32	25	0	223	229	94	30	371	0	0	557	0
Confl. Peds. (#/hr)	10					10	6		19	19		6
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%	7%	1%	0%	0%	1%	0%
Turn Type	Split			Split		Perm	Perm					
Protected Phases	8	8		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	4.8	4.8		10.3	10.3	10.3	13.7	13.7			13.7	
Effective Green, g (s)	5.3	5.3		10.8	10.8	10.8	14.2	14.2			14.2	
Actuated g/C Ratio	0.13	0.13		0.26	0.26	0.26	0.34	0.34			0.34	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5			4.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	5.0	5.0			5.0	
Lane Grp Cap (vph)	226	204		434	441	391	235	623			1196	
v/s Ratio Prot	c0.02	0.02		0.13	c0.13			c0.20			0.16	
v/s Ratio Perm						0.06	0.04					
v/c Ratio	0.14	0.12		0.51	0.52	0.24	0.13	0.60			0.47	
Uniform Delay, d1	16.5	16.4		13.5	13.5	12.5	9.8	11.7			11.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.2		0.8	0.8	0.2	0.5	2.3			0.6	
Delay (s)	16.7	16.6		14.3	14.3	12.7	10.3	14.0			11.7	
Level of Service	B	B		B	B	B	B	B			B	
Approach Delay (s)		16.6			13.6			13.7			11.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	42.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	35	0	648	51	0	100
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	40	0	736	58	0	114
Pedestrians					5	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		278				
pX, platoon unblocked						
vC, conflicting volume	799				850	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	799				850	402
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	81
cM capacity (veh/h)	829				288	601

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	40	491	303	114
Volume Left	40	0	0	0
Volume Right	0	0	58	114
cSH	829	1700	1700	601
Volume to Capacity	0.05	0.29	0.18	0.19
Queue Length 95th (ft)	4	0	0	17
Control Delay (s)	9.6	0.0	0.0	12.4
Lane LOS	A			B
Approach Delay (s)	9.6	0.0		12.4
Approach LOS				B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	99	1899	40	232	1694	251	36	10	236	323	24	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		5.0	4.5	5.0	5.0	
Lane Util. Factor	1.00	*0.75		0.97	0.91	1.00		1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96		1.00	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1805	4100		3502	4988	1545		1786	1599	3502	1622	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1805	4100		3502	4988	1545		1786	1599	3502	1622	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	101	1938	41	237	1729	256	37	10	241	330	24	115
RTOR Reduction (vph)	0	1	0	0	0	126	0	0	0	0	99	0
Lane Group Flow (vph)	101	1978	0	237	1729	130	0	47	241	330	40	0
Confl. Peds. (#/hr)			2			8						15
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Split		pt+ov	Split		
Protected Phases	5	2		1	6		8	8	1 8	4	4	
Permitted Phases						6						
Actuated Green, G (s)	14.1	61.1		16.1	63.1	63.1		8.6	24.7	16.7	16.7	
Effective Green, g (s)	14.6	61.6		16.6	63.6	63.6		9.1	25.7	17.2	17.2	
Actuated g/C Ratio	0.12	0.49		0.13	0.51	0.51		0.07	0.21	0.14	0.14	
Clearance Time (s)	5.0	6.5		5.0	6.5	6.5		5.5		5.5	5.5	
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	211	2020		465	2538	786		130	329	482	223	
v/s Ratio Prot	0.06	c0.48		0.07	0.35			0.03	c0.15	c0.09	0.02	
v/s Ratio Perm						0.08						
v/c Ratio	0.48	0.98		0.51	0.68	0.17		0.36	0.73	0.68	0.18	
Uniform Delay, d1	51.6	31.1		50.4	23.1	16.5		55.2	46.4	51.3	47.7	
Progression Factor	0.88	0.56		1.04	0.86	1.12		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	9.4		0.4	1.0	0.3		1.2	7.7	3.7	0.3	
Delay (s)	46.2	26.6		53.0	20.9	18.7		56.4	54.2	55.0	47.9	
Level of Service	D	C		D	C	B		E	D	D	D	
Approach Delay (s)		27.6			24.1			54.5			52.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↰↑	↱↱
Volume (vph)	0	1590	875	123	1063	0	0	0	0	659	5	1111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5	5.5	5.5
Lane Util. Factor		*0.75	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4150	1568	1787	3471					1681	1682	2760
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4150	1568	1787	3471					1681	1682	2760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1606	884	124	1074	0	0	0	0	666	5	1122
RTOR Reduction (vph)	0	0	476	0	0	0	0	0	0	0	0	23
Lane Group Flow (vph)	0	1606	408	124	1074	0	0	0	0	333	338	1099
Heavy Vehicles (%)	0%	3%	3%	1%	4%	0%	0%	0%	0%	2%	20%	3%
Turn Type			Perm	Prot						Split		custom
Protected Phases		2		1	6					4	4	4 5
Permitted Phases			2									
Actuated Green, G (s)		56.5	56.5	11.1	51.5					39.4	39.4	61.5
Effective Green, g (s)		57.0	57.0	11.6	52.0					39.9	39.9	62.0
Actuated g/C Ratio		0.46	0.46	0.09	0.42					0.32	0.32	0.50
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	
Vehicle Extension (s)		6.1	6.1	2.3	6.1					2.3	2.3	
Lane Grp Cap (vph)		1892	715	166	1444					537	537	1369
v/s Ratio Prot		c0.39		0.07	c0.31					0.20	0.20	c0.40
v/s Ratio Perm			0.26									
v/c Ratio		0.85	0.57	0.75	0.74					0.62	0.63	0.80
Uniform Delay, d1		30.2	25.0	55.3	30.9					36.1	36.3	26.4
Progression Factor		0.50	2.46	0.79	0.64					1.00	1.00	1.00
Incremental Delay, d2		2.5	1.6	14.5	3.3					1.8	1.9	3.4
Delay (s)		17.6	63.1	58.3	23.1					37.9	38.1	29.8
Level of Service		B	E	E	C					D	D	C
Approach Delay (s)		33.7			26.8			0.0			32.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1216	1031	0	511	682	675	5	177	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		6.0	6.0	5.5	5.5	5.5			
Lane Util. Factor		0.95	0.88		0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes		1.00	1.00		1.00	0.95	1.00	1.00	0.96			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		3574	2760		3574	1502	1618	1620	1512			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		3574	2760		3574	1502	1618	1620	1512			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1280	1085	0	538	718	711	5	186	0	0	0
RTOR Reduction (vph)	0	0	352	0	0	263	0	0	21	0	0	0
Lane Group Flow (vph)	0	1280	733	0	538	455	355	361	165	0	0	0
Confl. Peds. (#/hr)						16			17			
Heavy Vehicles (%)	0%	1%	3%	0%	1%	2%	6%	20%	2%	0%	0%	0%
Turn Type			Perm			Perm	Split		Perm			
Protected Phases		2			6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		79.3	79.3		78.8	78.8	33.7	33.7	33.7			
Effective Green, g (s)		79.8	79.8		79.3	79.3	34.2	34.2	34.2			
Actuated g/C Ratio		0.64	0.64		0.63	0.63	0.27	0.27	0.27			
Clearance Time (s)		6.0	6.0		6.5	6.5	6.0	6.0	6.0			
Vehicle Extension (s)		6.1	6.1		4.2	4.2	2.3	2.3	2.3			
Lane Grp Cap (vph)		2282	1762		2267	953	443	443	414			
v/s Ratio Prot		c0.36			0.15		0.22	c0.22				
v/s Ratio Perm			0.27			0.30			0.11			
v/c Ratio		0.56	0.42		0.24	0.48	0.80	0.81	0.40			
Uniform Delay, d1		12.7	11.1		9.8	12.0	42.2	42.4	37.0			
Progression Factor		0.72	1.20		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.7	0.5		0.2	1.7	9.6	10.6	0.4			
Delay (s)		9.9	13.8		10.1	13.7	51.9	53.1	37.4			
Level of Service		A	B		B	B	D	D	D			
Approach Delay (s)		11.7			12.2			49.4			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	995	61	10	834	80	112	7	17	81	5	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	3502	3504		1805	3525			1761	1590		1793	1592
Flt Permitted	0.95	1.00		0.95	1.00			0.67	1.00		0.65	1.00
Satd. Flow (perm)	3502	3504		1805	3525			1243	1590		1221	1592
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	302	1036	64	10	869	83	117	7	18	84	5	199
RTOR Reduction (vph)	0	3	0	0	7	0	0	0	15	0	0	165
Lane Group Flow (vph)	302	1097	0	10	945	0	0	124	3	0	89	34
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	9.0	33.1		0.7	24.8			10.2	10.2		10.2	10.2
Effective Green, g (s)	9.5	33.6		1.2	25.3			10.7	10.7		10.7	10.7
Actuated g/C Ratio	0.15	0.54		0.02	0.41			0.17	0.17		0.17	0.17
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.3	2.5		2.4	2.5			2.4	2.4		2.3	2.3
Lane Grp Cap (vph)	537	1899		35	1438			215	274		211	275
v/s Ratio Prot	c0.09	c0.31		0.01	c0.27							
v/s Ratio Perm								c0.10	0.00		0.07	0.02
v/c Ratio	0.56	0.58		0.29	0.66			0.58	0.01		0.42	0.12
Uniform Delay, d1	24.3	9.5		30.0	14.8			23.6	21.3		22.9	21.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.4		2.9	1.0			2.9	0.0		0.8	0.1
Delay (s)	25.3	9.8		32.9	15.8			26.5	21.3		23.7	21.8
Level of Service	C	A		C	B			C	C		C	C
Approach Delay (s)		13.2			16.0			25.8			22.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑↱			↰	↱		↰	↱
Volume (vph)	221	943	26	24	775	16	17	9	45	5	7	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	4.8		4.8	4.8			5.6	5.6		5.3	4.8
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1805	1854		1805	3561			1803	1527		1848	1609
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.69	1.00
Satd. Flow (perm)	1805	1854		1805	3561			1803	1527		1304	1609
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	230	982	27	25	807	17	18	9	47	5	7	145
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	44	0	0	116
Lane Group Flow (vph)	230	1009	0	25	823	0	0	27	3	0	12	29
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Split		Perm	Perm		pm+ov
Protected Phases	5	2		1	6		8	8			4	5
Permitted Phases									8	4		4
Actuated Green, G (s)	11.5	48.8		1.7	39.0			4.1	4.1		3.6	15.1
Effective Green, g (s)	12.0	49.3		2.2	39.5			4.6	4.6		4.1	16.1
Actuated g/C Ratio	0.15	0.61		0.03	0.49			0.06	0.06		0.05	0.20
Clearance Time (s)	5.3	5.3		5.3	5.3			6.1	6.1		5.8	5.3
Vehicle Extension (s)	2.5	3.0		1.0	3.0			1.0	1.0		2.0	2.5
Lane Grp Cap (vph)	268	1133		49	1743			103	87		66	321
v/s Ratio Prot	c0.13	c0.54		0.01	0.23			c0.01				0.01
v/s Ratio Perm									0.00		c0.01	0.00
v/c Ratio	0.86	0.89		0.51	0.47			0.26	0.03		0.18	0.09
Uniform Delay, d1	33.5	13.4		38.7	13.7			36.4	35.9		36.7	26.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	22.5	9.0		3.7	0.2			0.5	0.1		0.5	0.1
Delay (s)	56.1	22.4		42.4	13.9			36.9	36.0		37.2	26.4
Level of Service	E	C		D	B			D	D		D	C
Approach Delay (s)		28.6			14.7			36.3			27.2	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.7	Sum of lost time (s)	20.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	1035	138	234	1103	56	171	268	169	297	345	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.5	5.5		4.5	5.0	4.5	4.5	5.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1703	3320		3502	3339		1732	1810	1543	1761	3313	
Flt Permitted	0.95	1.00		0.95	1.00		0.41	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	1703	3320		3502	3339		744	1810	1543	1099	3313	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	104	1045	139	236	1114	57	173	271	171	300	348	134
RTOR Reduction (vph)	0	7	0	0	3	0	0	0	55	0	34	0
Lane Group Flow (vph)	104	1177	0	236	1168	0	173	271	116	300	448	0
Confl. Peds. (#/hr)			7			15	7		8	8		7
Heavy Vehicles (%)	6%	7%	3%	0%	7%	6%	4%	5%	3%	2%	4%	3%
Turn Type	Prot			Prot			pm+pt		pm+ov	pm+pt		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	10.0	54.6		10.7	55.3		21.2	21.2	31.9	27.3	26.8	
Effective Green, g (s)	10.5	55.1		11.2	55.8		21.7	21.7	32.9	27.8	27.3	
Actuated g/C Ratio	0.08	0.44		0.09	0.45		0.17	0.17	0.26	0.22	0.22	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.5	5.0	5.0	5.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	143	1463		314	1491		223	314	406	337	724	
v/s Ratio Prot	0.06	c0.35		0.07	c0.35		0.07	c0.15	0.03	c0.12	0.14	
v/s Ratio Perm							0.06		0.05	c0.07		
v/c Ratio	0.73	0.80		0.75	0.78		0.78	0.86	0.29	0.89	0.62	
Uniform Delay, d1	55.9	30.3		55.5	29.5		47.6	50.2	36.7	45.8	44.1	
Progression Factor	1.00	1.00		0.61	0.96		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.8		5.3	2.5		14.2	20.3	0.1	23.5	1.1	
Delay (s)	70.3	35.1		39.2	30.9		61.8	70.5	36.8	69.4	45.3	
Level of Service	E	D		D	C		E	E	D	E	D	
Approach Delay (s)		37.9			32.3			58.7			54.5	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM Average Control Delay	42.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	1515	83	0	1146	0	95	312	333	194	673	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99			1.00		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3448			3438		1770	1863	1574	1787	3497	
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	3448			3438		1770	1863	1574	1787	3497	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	59	1612	88	0	1219	0	101	332	354	206	716	96
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	80	0	10	0
Lane Group Flow (vph)	59	1697	0	0	1219	0	101	332	274	206	802	0
Confl. Peds. (#/hr)			4			2			3			16
Heavy Vehicles (%)	5%	4%	0%	0%	5%	0%	2%	2%	1%	1%	1%	1%
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	7.2	65.2			53.0		9.9	24.1	24.1	18.7	32.9	
Effective Green, g (s)	7.7	65.7			53.5		10.4	24.6	24.6	19.2	33.4	
Actuated g/C Ratio	0.06	0.53			0.43		0.08	0.20	0.20	0.15	0.27	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	3.5			3.5		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	106	1812			1471		147	367	310	274	934	
v/s Ratio Prot	0.03	c0.49			0.35		0.06	c0.18		0.12	c0.23	
v/s Ratio Perm									0.17			
v/c Ratio	0.56	0.94			0.83		0.69	0.90	0.88	0.75	0.86	
Uniform Delay, d1	57.0	27.7			31.7		55.7	49.1	48.8	50.6	43.6	
Progression Factor	1.20	0.74			1.09		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	8.5			4.4		12.5	24.3	23.7	11.0	7.7	
Delay (s)	70.9	29.0			38.9		68.3	73.4	72.5	61.7	51.2	
Level of Service	E	C			D		E	E	E	E	D	
Approach Delay (s)		30.4			38.9			72.3			53.3	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	44.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	23	10	240	0	244	2	334	369	433	474	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.3	5.6	4.8	4.8		4.8	4.8	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	0.90	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1785			1805	1456	1748	1719		1787	1893	
Flt Permitted		0.98			0.95	1.00	0.48	1.00		0.08	1.00	
Satd. Flow (perm)		1785			1805	1456	880	1719		157	1893	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	24	24	10	250	0	254	2	348	384	451	494	10
RTOR Reduction (vph)	0	6	0	0	0	240	0	25	0	0	0	0
Lane Group Flow (vph)	0	52	0	0	250	14	2	707	0	451	504	0
Confl. Peds. (#/hr)	9		2	2		9	3		4	4		3
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Split			Split		custom	pm+pt			pm+pt		
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases						8	6			2		
Actuated Green, G (s)		7.6			20.0	7.6	65.3	64.3		99.6	93.3	
Effective Green, g (s)		8.1			20.5	8.1	66.3	64.8		100.1	93.8	
Actuated g/C Ratio		0.06			0.14	0.06	0.46	0.45		0.69	0.65	
Clearance Time (s)		6.1			5.8	6.1	5.3	5.3		5.3	5.3	
Vehicle Extension (s)		1.0			2.0	1.0	1.0	3.0		2.5	0.2	
Lane Grp Cap (vph)		100			256	82	413	771		453	1230	
v/s Ratio Prot		c0.03			c0.14		0.00	0.41		c0.21	0.27	
v/s Ratio Perm						0.01	0.00			c0.48		
v/c Ratio		0.52			0.98	0.17	0.00	0.92		1.00	0.41	
Uniform Delay, d1		66.3			61.7	65.0	21.1	37.3		45.6	12.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3			49.0	0.4	0.0	15.5		40.9	0.1	
Delay (s)		68.5			110.8	65.3	21.1	52.8		86.5	12.2	
Level of Service		E			F	E	C	D		F	B	
Approach Delay (s)		68.5			87.9			52.7			47.2	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	58.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	144.4	Sum of lost time (s)	15.7
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

HCM Signalized Intersection Capacity Analysis
19: SW Sagert St & SW Boones Ferry Rd

4/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	117	13	166	122	64	16	486	218	65	571	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5		3.5	4.0		3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1782	1830		1781	1739		1769	1789		1804	1860	
Flt Permitted	0.64	1.00		0.42	1.00		0.25	1.00		0.17	1.00	
Satd. Flow (perm)	1191	1830		785	1739		468	1789		319	1860	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	44	123	14	175	128	67	17	512	229	68	601	79
RTOR Reduction (vph)	0	4	0	0	16	0	0	11	0	0	3	0
Lane Group Flow (vph)	44	133	0	175	179	0	17	730	0	68	677	0
Confl. Peds. (#/hr)	15		7	7		15	7		8	8		7
Heavy Vehicles (%)	0%	2%	1%	1%	3%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.3	12.4		25.7	18.8		47.1	45.6		51.5	47.8	
Effective Green, g (s)	16.3	12.9		26.2	19.3		48.1	46.1		52.5	48.3	
Actuated g/C Ratio	0.19	0.15		0.30	0.22		0.55	0.53		0.60	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	2.2	2.2		2.2	2.2		2.2	5.0		2.2	5.0	
Lane Grp Cap (vph)	245	270		347	384		287	943		263	1027	
v/s Ratio Prot	0.01	0.07		c0.06	0.10		0.00	c0.41		c0.01	0.36	
v/s Ratio Perm	0.03			c0.09			0.03			0.14		
v/c Ratio	0.18	0.49		0.50	0.47		0.06	0.77		0.26	0.66	
Uniform Delay, d1	29.7	34.3		24.1	29.6		10.8	16.5		11.9	13.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.7		0.6	0.5		0.0	4.7		0.3	2.1	
Delay (s)	29.9	35.0		24.7	30.1		10.8	21.2		12.2	15.9	
Level of Service	C	D		C	C		B	C		B	B	
Approach Delay (s)		33.8			27.5			21.0			15.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst:
Agency/Co.:
Date Performed: 4/16/2013
Analysis Time Period: Weekday PM
Intersection: Sagert/Martinazzi
Jurisdiction:
Units: U. S. Customary
Analysis Year: Total
Project ID:
East/West Street: Sagert
North/South Street: Martinazzi

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	127	233	12	90	195	164	2		76	207	306	0
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	L	TR	L	TR	L	TR	L	TR
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	141	271	100	398	2	284	230	340
% Heavy Veh	1	1	1	1	1	1	1	1
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	141	271	100	398	2	284	230	340
Left-Turn	141	0	100	0	2	0	230	0
Right-Turn	0	13	0	182	0	84	0	0
Prop. Left-Turns	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.5	0.0	0.3	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	

Exhibit 1
Attachment L

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	-0.0	0.5	-0.3	0.5	-0.2	0.5	0.0

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	141	271	100	398	2	284	230	340
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13	0.24	0.09	0.35	0.00	0.25	0.20	0.30
hd, final value	8.96	8.42	8.76	7.94	9.19	8.48	8.72	8.22
x, final value	0.35	0.63	0.24	0.88	0.01	0.67	0.56	0.78
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	6.7	6.1	6.5	5.6	6.9	6.2	6.4	5.9

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	141	271	100	398	2	284	230	340
Service Time	6.7	6.1	6.5	5.6	6.9	6.2	6.4	5.9
Utilization, x	0.35	0.63	0.24	0.88	0.01	0.67	0.56	0.78
Dep. headway, hd	8.96	8.42	8.76	7.94	9.19	8.48	8.72	8.22
Capacity	391	418	350	450	252	413	407	433
Delay	16.42	24.61	14.25	45.54	11.93	26.70	21.85	34.14
LOS	C	C	B	E	B	D	C	D
Approach:								
Delay	21.81		39.26		26.59		29.18	
LOS	C		E		D		D	

Intersection Delay 29.88 Intersection LOS D

Exhibit 1
Attachment L

HCS+: Unsignalized Intersections Release 5.6

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst:
Agency/Co.:
Date Performed: 4/16/2013
Analysis Time Period: Weekday PM
Intersection: Sagert/65th
Jurisdiction:
Units: U. S. Customary
Analysis Year: Total
Project ID:
East/West Street: Sagert
North/South Street: 65th

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	401	2	135	2	7	6	58		3	3	340	386
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	L	TR	L	TR	L	TR
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	445	152	2	13	64	323	3	805
% Heavy Veh	1	1	0	0	1	2	1	2
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	445	152	2	13	64	323	3	805
Left-Turn	445	0	2	0	64	0	3	0
Right-Turn	0	150	0	6	0	3	0	428
Prop. Left-Turns	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	

Exhibit 1
Attachment L

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	-0.7	0.5	-0.3	0.5	0.0	0.5	-0.3

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	445	152	2	13	64	323	3	805
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.40	0.14	0.00	0.01	0.06	0.29	0.00	0.72
hd, final value	7.73	6.54	9.23	8.40	8.00	7.51	7.77	6.92
x, final value	0.96	0.28	0.01	0.03	0.14	0.67	0.01	1.55
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.4	4.2	6.9	6.1	5.7	5.2	5.5	4.6

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	445	152	2	13	64	323	3	805
Service Time	5.4	4.2	6.9	6.1	5.7	5.2	5.5	4.6
Utilization, x	0.96	0.28	0.01	0.03	0.14	0.67	0.01	1.55
Dep. headway, hd	7.73	6.54	9.23	8.40	8.00	7.51	7.77	6.92
Capacity	466	402	252	263	314	475	253	805
Delay	58.85	11.71	11.98	11.37	12.02	24.33	10.52	273.87
LOS	F	B	B	B	B	C	B	F
Approach:								
Delay	46.85		11.45		22.29		272.89	
LOS	E		B		C		F	

Intersection Delay 142.37 Intersection LOS F

Exhibit 1
Attachment L

HCM Unsignalized Intersection Capacity Analysis
22: SW Boones Fe &

4/15/2013

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1051	10	0	1384	0	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1142	11	0	1504	0	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	252					
pX, platoon unblocked			0.63		0.63	0.63
vC, conflicting volume			1153		1900	1148
vC1, stage 1 conf vol					1148	
vC2, stage 2 conf vol					752	
vCu, unblocked vol			949		2136	940
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	77
cM capacity (veh/h)			453		185	167

Direction, Lane #	EB 1	WB 1	WB 2	NW 1
Volume Total	1153	752	752	38
Volume Left	0	0	0	0
Volume Right	11	0	0	38
cSH	1700	1700	1700	167
Volume to Capacity	0.68	0.44	0.44	0.23
Queue Length 95th (ft)	0	0	0	21
Control Delay (s)	0.0	0.0	0.0	32.9
Lane LOS				D
Approach Delay (s)	0.0	0.0		32.9
Approach LOS				D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

Exhibit 1
Attachment L

HCM Signalized Intersection Capacity Analysis
3: SW Boones Ferry Rd & SW Martinazzi Ave

4/17/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	435	127	318	429	201	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1599	1787	1845	1770	1582
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1599	1787	1845	1770	1582
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	458	134	335	452	212	325
RTOR Reduction (vph)	0	89	0	0	0	86
Lane Group Flow (vph)	458	45	335	452	212	239
Confl. Peds. (#/hr)		11	11		1	3
Confl. Bikes (#/hr)	4		2	10	1	
Heavy Vehicles (%)	2%	1%	1%	3%	2%	1%
Turn Type		Prot	Prot			pm+ov
Protected Phases	2	2	1	6	8	1
Permitted Phases					8	8
Actuated Green, G (s)	20.0	20.0	16.8	41.8	12.6	29.4
Effective Green, g (s)	20.5	20.5	17.3	42.3	13.1	30.4
Actuated g/C Ratio	0.32	0.32	0.27	0.66	0.20	0.47
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	593	509	480	1212	360	857
v/s Ratio Prot	c0.25	0.03	c0.19	0.25	c0.12	0.07
v/s Ratio Perm						0.08
v/c Ratio	0.77	0.09	0.70	0.37	0.59	0.28
Uniform Delay, d1	19.8	15.4	21.2	5.0	23.2	10.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	0.1	4.4	0.2	2.5	0.2
Delay (s)	26.0	15.5	25.6	5.2	25.7	10.5
Level of Service	C	B	C	A	C	B
Approach Delay (s)	23.6			13.9	16.5	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	64.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	0	45	65	0	136	81	337	84	185	212	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5			1.5	1.5	1.5	1.5		1.5	1.5	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.85			1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1790	1592			1770	1583	1804	1822		1770	1815	
Flt Permitted	0.75	1.00			0.75	1.00	0.59	1.00		0.34	1.00	
Satd. Flow (perm)	1422	1592			1406	1583	1115	1822		638	1815	
Peak-hour factor, PHF	0.91	0.92	0.91	0.92	0.92	0.92	0.91	0.91	0.92	0.92	0.91	0.91
Adj. Flow (vph)	41	0	49	71	0	148	89	370	91	201	233	48
RTOR Reduction (vph)	0	40	0	0	0	121	0	11	0	0	10	0
Lane Group Flow (vph)	41	9	0	0	71	27	89	450	0	201	271	0
Confl. Peds. (#/hr)	10		4				1					1
Confl. Bikes (#/hr)								2			3	
Heavy Vehicles (%)	0%	2%	0%	2%	2%	2%	0%	1%	2%	2%	2%	0%
Turn Type	Perm			Perm		Perm	pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	4.8	4.8			4.8	4.8	17.1	14.2		20.1	15.7	
Effective Green, g (s)	5.3	5.3			5.3	5.3	18.1	14.7		21.1	16.2	
Actuated g/C Ratio	0.18	0.18			0.18	0.18	0.62	0.50		0.72	0.55	
Clearance Time (s)	2.0	2.0			2.0	2.0	2.0	2.0		2.0	2.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	256	287			253	285	766	911		647	1000	
v/s Ratio Prot		0.01					0.01	c0.25		c0.05	0.15	
v/s Ratio Perm	0.03				c0.05	0.02	0.06			0.17		
v/c Ratio	0.16	0.03			0.28	0.09	0.12	0.49		0.31	0.27	
Uniform Delay, d1	10.2	9.9			10.4	10.0	2.3	4.9		1.9	3.5	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.0			0.6	0.1	0.1	0.4		0.3	0.1	
Delay (s)	10.5	10.0			11.0	10.2	2.4	5.3		2.2	3.6	
Level of Service	B	A			B	B	A	A		A	A	
Approach Delay (s)		10.2			10.5			4.8			3.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	29.4	Sum of lost time (s)	4.5
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↰↑	↱	↰	↱			↑↱	
Volume (vph)	16	1	63	260	37	237	23	240	36	0	314	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1805	1603		1698	1727	1543	1683	1837			3559	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.54	1.00			1.00	
Satd. Flow (perm)	1805	1603		1698	1727	1543	957	1837			3559	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	1	69	286	41	260	25	264	40	0	345	9
RTOR Reduction (vph)	0	63	0	0	0	202	0	8	0	0	3	0
Lane Group Flow (vph)	18	7	0	163	164	58	25	296	0	0	351	0
Confl. Peds. (#/hr)	2					2	3		16	16		3
Confl. Bikes (#/hr)						2					3	
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%	7%	1%	0%	0%	1%	0%
Turn Type	Split			Split		Perm	Perm					
Protected Phases	8	8		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	3.1	3.1		9.1	9.1	9.1	12.5	12.5			12.5	
Effective Green, g (s)	3.6	3.6		9.6	9.6	9.6	13.0	13.0			13.0	
Actuated g/C Ratio	0.08	0.08		0.22	0.22	0.22	0.30	0.30			0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	5.0	5.0			5.0	
Lane Grp Cap (vph)	152	135		382	388	347	291	559			1084	
v/s Ratio Prot	c0.01	0.00		c0.10	0.09			c0.16			0.10	
v/s Ratio Perm						0.04	0.03					
v/c Ratio	0.12	0.05		0.43	0.42	0.17	0.09	0.53			0.32	
Uniform Delay, d1	18.1	18.0		14.2	14.2	13.3	10.6	12.3			11.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.1		0.6	0.5	0.2	0.3	1.8			0.4	
Delay (s)	18.3	18.1		14.8	14.7	13.5	10.9	14.1			11.8	
Level of Service	B	B		B	B	B	B	B			B	
Approach Delay (s)		18.1			14.2			13.8			11.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	42.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	37	0	466	60	0	67
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	42	0	530	68	0	76
Pedestrians					4	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		232				
pX, platoon unblocked						
vC, conflicting volume	602				652	303
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	602				652	303
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	89
cM capacity (veh/h)	982				387	697

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	42	353	245	76
Volume Left	42	0	0	0
Volume Right	0	0	68	76
cSH	982	1700	1700	697
Volume to Capacity	0.04	0.21	0.14	0.11
Queue Length 95th (ft)	3	0	0	10
Control Delay (s)	8.8	0.0	0.0	10.8
Lane LOS	A			B
Approach Delay (s)	8.8	0.0		10.8
Approach LOS				B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	1335	59	257	1458	361	57	25	248	373	40	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		5.0	4.5	5.0	5.0	
Lane Util. Factor	1.00	*0.75		0.97	0.91	1.00		1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97		1.00	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1805	4091		3502	4988	1565		1799	1599	3467	1634	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (perm)	1805	4091		3502	4988	1565		1799	1599	3467	1634	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	184	1362	60	262	1488	368	58	26	253	381	41	194
RTOR Reduction (vph)	0	3	0	0	0	201	0	0	0	0	164	0
Lane Group Flow (vph)	184	1419	0	262	1488	167	0	84	253	381	71	0
Confl. Peds. (#/hr)						4						9
Confl. Bikes (#/hr)					1			1		1		
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	1%	0%	0%
Turn Type	Prot			Prot		Perm	Split		pt+ov	Split		
Protected Phases	5	2		1	6		8	8	1 8	4	4	
Permitted Phases						6						
Actuated Green, G (s)	14.8	49.6		17.0	51.8	51.8		8.5	25.5	17.4	17.4	
Effective Green, g (s)	15.3	50.1		17.5	52.3	52.3		9.0	26.5	17.9	17.9	
Actuated g/C Ratio	0.13	0.44		0.15	0.45	0.45		0.08	0.23	0.16	0.16	
Clearance Time (s)	5.0	6.5		5.0	6.5	6.5		5.5		5.5	5.5	
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	240	1782		533	2268	712		141	368	540	254	
v/s Ratio Prot	0.10	c0.35		0.07	c0.30			0.05	c0.16	c0.11	0.04	
v/s Ratio Perm						0.11						
v/c Ratio	0.77	0.80		0.49	0.66	0.24		0.60	0.69	0.71	0.28	
Uniform Delay, d1	48.1	28.0		44.7	24.4	19.1		51.2	40.5	46.1	42.9	
Progression Factor	0.90	1.35		0.96	0.90	1.07		1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.1	2.9		0.3	1.0	0.5		5.5	4.8	3.9	0.4	
Delay (s)	53.6	40.7		43.3	23.0	20.9		56.8	45.3	49.9	43.3	
Level of Service	D	D		D	C	C		E	D	D	D	
Approach Delay (s)		42.2			25.2			48.2			47.4	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1484	480	193	1150	0	0	0	0	620	3	965
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5	5.5					5.5	5.5	5.5
Lane Util. Factor		*0.75	1.00	1.00	0.95					0.95	0.95	0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4150	1568	1787	3471					1681	1683	2760
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4150	1568	1787	3471					1681	1683	2760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1499	485	195	1162	0	0	0	0	626	3	975
RTOR Reduction (vph)	0	0	242	0	0	0	0	0	0	0	0	40
Lane Group Flow (vph)	0	1499	243	195	1162	0	0	0	0	313	316	935
Confl. Bikes (#/hr)		1			2							
Heavy Vehicles (%)	0%	3%	3%	1%	4%	0%	0%	0%	0%	2%	20%	3%
Turn Type			Perm	Prot						Split		custom
Protected Phases		2		1	6					4	4	4 5
Permitted Phases			2									
Actuated Green, G (s)		49.4	49.4	17.0	55.4					30.6	30.6	47.6
Effective Green, g (s)		49.9	49.9	17.5	55.9					31.1	31.1	44.6
Actuated g/C Ratio		0.43	0.43	0.15	0.49					0.27	0.27	0.39
Clearance Time (s)		6.0	6.0	6.0	6.0					6.0	6.0	
Vehicle Extension (s)		6.1	6.1	2.3	6.1					2.3	2.3	
Lane Grp Cap (vph)		1801	680	272	1687					455	455	1070
v/s Ratio Prot		c0.36		c0.11	0.33					0.19	0.19	c0.34
v/s Ratio Perm			0.16									
v/c Ratio		0.83	0.36	0.72	0.69					0.69	0.69	0.87
Uniform Delay, d1		28.8	21.8	46.4	22.8					37.6	37.7	32.6
Progression Factor		0.60	0.38	0.88	0.62					1.00	1.00	1.00
Incremental Delay, d2		3.3	1.0	7.3	2.2					3.7	4.0	7.9
Delay (s)		20.5	9.4	48.1	16.3					41.3	41.7	40.5
Level of Service		C	A	D	B					D	D	D
Approach Delay (s)		17.8			20.9			0.0			40.9	
Approach LOS		B			C			A			D	

Intersection Summary			
HCM Average Control Delay	26.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1110	998	0	668	666	672	0	219	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		6.0	6.0	5.5	5.5	5.5			
Lane Util. Factor		0.95	0.88		0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	1.00	0.98			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		3574	2694		3574	1583	1618	1618	1559			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		3574	2694		3574	1583	1618	1618	1559			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1168	1051	0	703	701	707	0	231	0	0	0
RTOR Reduction (vph)	0	0	388	0	0	262	0	0	28	0	0	0
Lane Group Flow (vph)	0	1168	663	0	703	439	353	354	203	0	0	0
Confl. Peds. (#/hr)			1	1			1		2	2		1
Confl. Bikes (#/hr)		1			5					1		
Heavy Vehicles (%)	0%	1%	3%	0%	1%	2%	6%	20%	2%	0%	0%	0%
Turn Type			Perm			Perm	Split		Perm			
Protected Phases		2			6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		72.0	72.0		71.5	71.5	31.0	31.0	31.0			
Effective Green, g (s)		72.5	72.5		72.0	72.0	31.5	31.5	31.5			
Actuated g/C Ratio		0.63	0.63		0.63	0.63	0.27	0.27	0.27			
Clearance Time (s)		6.0	6.0		6.5	6.5	6.0	6.0	6.0			
Vehicle Extension (s)		6.1	6.1		4.2	4.2	2.3	2.3	2.3			
Lane Grp Cap (vph)		2253	1698		2238	991	443	443	427			
v/s Ratio Prot		c0.33			0.20		0.22	c0.22				
v/s Ratio Perm			0.25			0.28			0.13			
v/c Ratio		0.52	0.39		0.31	0.44	0.80	0.80	0.47			
Uniform Delay, d1		11.7	10.4		10.0	11.1	38.8	38.8	34.8			
Progression Factor		1.39	3.10		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.6	0.4		0.4	1.4	9.2	9.3	0.5			
Delay (s)		16.7	32.8		10.4	12.6	48.0	48.1	35.3			
Level of Service		B	C		B	B	D	D	D			
Approach Delay (s)		24.3			11.5			44.9			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	524	593	57	15	732	101	103	11	12	101	11	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	5.5
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3502	3486		1805	3505			1768	1593		1799	1594
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.66	1.00
Satd. Flow (perm)	3502	3486		1805	3505			1229	1593		1248	1594
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	546	618	59	16	762	105	107	11	12	105	11	335
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	10	0	0	279
Lane Group Flow (vph)	546	672	0	16	858	0	0	118	2	0	116	56
Confl. Peds. (#/hr)	8		2	2		8	1		2	2		1
Confl. Bikes (#/hr)		1			3							
Heavy Vehicles (%)	0%	2%	2%	0%	1%	0%	3%	0%	0%	1%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	14.5	38.4		0.8	24.7			10.9	10.9		10.9	10.9
Effective Green, g (s)	15.0	38.9		1.3	25.2			11.4	11.4		11.4	11.4
Actuated g/C Ratio	0.22	0.57		0.02	0.37			0.17	0.17		0.17	0.17
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.3	2.5		2.4	2.5			2.4	2.4		2.3	2.3
Lane Grp Cap (vph)	771	1991		34	1297			206	267		209	267
v/s Ratio Prot	c0.16	0.19		0.01	c0.24							
v/s Ratio Perm								c0.10	0.00		0.09	0.04
v/c Ratio	0.71	0.34		0.47	0.66			0.57	0.01		0.56	0.21
Uniform Delay, d1	24.5	7.8		33.1	17.9			26.1	23.6		26.0	24.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.6	0.1		6.6	1.2			3.0	0.0		2.3	0.2
Delay (s)	27.2	7.8		39.7	19.0			29.1	23.6		28.3	24.7
Level of Service	C	A		D	B			C	C		C	C
Approach Delay (s)		16.5			19.4			28.6			25.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	68.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱			↑↑		↰	↑	↱	↰	↑↱	
Volume (vph)	75	1194	141	0	1163	0	100	225	252	129	415	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98			1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3430			3438		1770	1863	1537	1787	3466	
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	3430			3438		1770	1863	1537	1787	3466	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	80	1270	150	0	1237	0	106	239	268	137	441	99
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	104	0	19	0
Lane Group Flow (vph)	80	1414	0	0	1237	0	106	239	164	137	521	0
Confl. Peds. (#/hr)						6			23			3
Heavy Vehicles (%)	5%	4%	0%	0%	5%	0%	2%	2%	1%	1%	1%	1%
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	8.6	66.5			52.9		10.6	17.9	17.9	13.6	20.9	
Effective Green, g (s)	9.1	67.0			53.4		11.1	18.4	18.4	14.1	21.4	
Actuated g/C Ratio	0.08	0.58			0.46		0.10	0.16	0.16	0.12	0.19	
Clearance Time (s)	5.0	6.0			6.0		5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	3.5			3.5		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	136	1998			1596		171	298	246	219	645	
v/s Ratio Prot	0.05	c0.41			c0.36		0.06	c0.13		0.08	c0.15	
v/s Ratio Perm									0.11			
v/c Ratio	0.59	0.71			0.78		0.62	0.80	0.67	0.63	0.81	
Uniform Delay, d1	51.1	17.0			25.8		49.9	46.5	45.4	47.9	44.8	
Progression Factor	1.00	1.00			0.56		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	2.1			3.0		6.5	13.6	5.2	5.5	7.0	
Delay (s)	55.3	19.2			17.5		56.5	60.1	50.6	53.4	51.8	
Level of Service	E	B			B		E	E	D	D	D	
Approach Delay (s)		21.1			17.5			55.3			52.1	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Exhibit 1
Attachment L

Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	822	23	0	49	0	747
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	893	25	0	53	0	812
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (ft)	324					
pX, platoon unblocked			0.77	0.77	0.77	
vC, conflicting volume			1718	906	918	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1783	728	745	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			100	84	100	
cM capacity (veh/h)			69	326	664	

Direction, Lane #	EB 1	NB 1	SW 1
Volume Total	918	53	812
Volume Left	0	0	0
Volume Right	25	53	0
cSH	1700	326	1700
Volume to Capacity	0.54	0.16	0.48
Queue Length 95th (ft)	0	15	0
Control Delay (s)	0.0	18.2	0.0
Lane LOS		C	
Approach Delay (s)	0.0	18.2	0.0
Approach LOS		C	

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Exhibit 1
Attachment L

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

May 16, 2013

Project #: 12116

Kaaren Hofmann/Tony Doran
City of Tualatin
18880 SW Martinazzi Avenue
Tualatin, OR 97062

RE: Additional Nyberg Rivers Traffic Analysis

Dear Kaaren/Tony,

At your request, we have prepared the following traffic analysis to supplement our *April 2013 Nyberg Rivers Transportation Impact Analysis* (TIA). The request for supplemental information was initially outlined in your May 6, 2013 e-mail and discussed in more detail at our follow up meeting on May 7, 2013. For documentation purposes, your request is shown in italics followed by our response:

Comment/Request #1

We would still like to see the following scenarios run-

1. *Shows Seneca Street extension with signal – other driveways on Martinazzi Avenue closed.*
2. *Shows no Seneca Street extension but shows true LOS at City Hall driveway.*
3. *Shows no Seneca Street extension and no driveway access for the development.*

Response to Scenario Request #1:

The first scenario (Seneca Street extension with signal) has been completed and is included in the April 2013 TIA. Figures 11A and 11B provide the volume assignments for this scenario and Table 12 summarizes the operational results of this analysis. In this scenario the only driveway on SW Martinazzi Avenue that is assumed to remain open is the driveway closest to Nyberg Road that serves the retail development that is not part of the Nyberg Rivers development application.

Response to Scenario Request #2

In an effort to provide more detailed information regarding the second scenario (no Seneca Street extension) the operation of the SW Martinazzi Avenue/City Library driveway, a more precise measurement of delay and capacity was calculated for each of the three critical unsignalized movements during the weekday p.m. peak hour based on extracted video data. Table 1 below summarizes the results of the analysis. As shown in the table, field-measured delay and capacity for the three critical unsignalized movements indicate that the intersection is operating relatively consistent with the operations reported in the April 2013 TIA.

Table 1 – Detailed Operations of the SW Martinazzi Avenue/City Library Driveway (Existing Conditions)

	Existing Traffic Conditions SW Martinazzi Avenue/ City Library Driveway
SB LT Movement	LOS = B
	Control Delay = 11.3 sec
	V/C = 0.18
WB LT Movement	LOS = D
	Control Delay = 30.3 sec
	V/C = 0.16
WB RT Movement	LOS = B
	Control Delay = 14.1 sec
	V/C = 0.18

Since the project is adding very little additional conflicting traffic for the three movements identified above, the field measured capacity represents a reasonable estimate of capacity for the total traffic condition for the major street left and minor street right turn movements. The minor street westbound left turn capacity will be slightly lower given the increased southbound left turn demand. Table 2 below illustrates the estimated LOS for total traffic conditions based on the field measurements. As indicated in Table 2, the intersection will meet City standards for unsignalized intersection operations. *Appendix A contains the calculation worksheets.*

Table 2 – Detailed Operations of the SW Martinazzi Avenue/City Library Driveway (2014 Total Conditions)

	2014 Total Traffic Conditions SW Martinazzi Avenue/ City Library Driveway
SB LT Movement	LOS = B
	Control Delay = 12.1 sec
	V/C = 0.26
WB LT Movement	LOS = E
	Control Delay = 43.8 sec
	V/C = 0.29
WB RT Movement	LOS = C
	Control Delay = 15.7
	V/C = 0.30

In addition to the field measured operations analysis, the impacts of vehicle queue spillback from the SW Martinazzi Avenue/SW Boones Ferry Intersection were also examined in more detail in attempt to provide City staff with additional operational and safety information as requested. During the weekday p.m. peak hour, it was noted that there are instances when the northbound left-turn vehicle queue at the SW Martinazzi Avenue/SW Boones Ferry Road intersection spills back to and beyond the SW Martinazzi Avenue/City Library driveway. When this occurs, the majority of queued vehicles leave a gap so that southbound left-turn vehicles can enter the City Library driveway (this is expected as most drivers try to avoid blocking movements at intersections). However, there are instances where the vehicle queue blocks the driveway.

Based on observations taken from video data, the existing percentage of time when a southbound left-turning vehicle is blocked is approximately 1.4% of the peak hour (less than one minute). With the additional traffic estimated to be generated by the proposed redevelopment project, it is estimated that the percentage of blockage time will increase 40 seconds to approximately 2.1%, which represents an insignificant change relative to existing conditions. In lay terms, the driveway will perform in a manner that is quite similar to existing conditions. The only movement that will experience a significant increase in delay is the westbound left turn. This movement will continue to meet City standards. Further, the project is only anticipated to add 5 five vehicles during a typical weekday p.m. peak hour, and drivers have several alternative routes to avoid this movement (i.e. turning right from the development's two access driveways onto Nyberg Road).

Response to Scenario Request #3

With regard to the third scenario (no Seneca extension and no access to the City Hall/Library driveway from the Nyberg Rivers development), this site layout and access scenario was not studied. In general, it was felt that the scenario would be contrary to good planning, it does not advance the City's connectivity goals, and is contrary to the City's recently adopted Transportation System Plan concept of a "Loop Road" and Seneca Street extension.

Comment/Request #2

> *The intersections of Nyberg/Martinazzi, Tualatin-Sherwood/Martinazzi, Boones Ferry Road/Martinazzi, Seneca/Martinazzi, and development driveways were not added to the queuing report. There was only a brief footnote that if you did the queuing the LOS may be different. Also no discussion of safety at these intersections with additional trips and no revisions made.*

Response: Table 3 summarizes the estimated 95th percentile queuing information along the SW Martinazzi Avenue corridor for background and total traffic conditions. As indicated, the Nyberg Rivers project will have an insignificant to no impact on queuing at the intersections along SW Martinazzi Avenue. The additional traffic added by the project to the intersections along SW Martinazzi Avenue is not expected to change the safety performance characteristics of these intersections relative to existing conditions beyond a small increase in exposure due to the small increase in traffic volumes. *Appendix B contains the queuing work sheets.*

Table 3 – SW Martinazzi Avenue Corridor Queuing

Intersection	Movement	Estimated 95th Percentile Queue (ft)			
		Weekday PM Peak Hour		Saturday Midday Peak Hour	
		Background Traffic	Total Traffic	Background Traffic	Total Traffic
SW Martinazzi Avenue/ SW Boones Ferry Road	NB LT	325	325	125	150
	NB RT	250	275	150	175
	WB LT	350	375	150	200
	EB RT	150	175	75	100
SW Martinazzi Avenue/ Site Driveway (library)	SB LT	75	100	25	50
	WB LT	75	100	25	50
	WB RT	50	50	25	50
SW Martinazzi Avenue/ SW Seneca Street/ Potential Site Access Driveway*	SB LT	-	50	-	50
	SB THRT	-	125	-	75
	WB RT	-	100	-	75
	WB THLT	-	50	-	50
	NB THRT	-	200	-	100
	NB LT	-	50	-	25
SW Martinazzi Avenue/ Nyberg Road	SB TH	100	100	75	75
	NB THRT	125	150	125	125
	WB LT	100	100	75	75
	WB RT	150	150	125	125
SW Martinazzi Avenue/ SW Tualatin-Sherwood Road	SB THRT	350	350	225	225
	SB LT	250	250	175	175
	NB THRT	350	350	250	250
	EB LT	100	100	125	125

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound
LT = Left-Turn; TH = Through; RT = Right-Turn
* - Under the assumption that scenario that includes a Seneca Street extension into the project site

Comment/Request #3

The report assumes that all of the driveways on Martinazzi Avenue remain open.

Response: As discussed at our follow-up meeting on May 7, the report does not assume that all the Martinazzi Avenue driveways remain open. The *April 2013 TIA* included the following assumptions regarding the existing site driveways along SW Martinazzi Avenue:

Existing and Background Conditions (represented in Figures 4A/4B and 5A/5B)

- All three site driveways (driveways #4, #6, and #7 in the TIA) continue to remain open.

Exhibit 1
Attachment L

2014 Total Traffic Conditions (represented in Figures 9A/9B)

- This scenario looks at maintaining the existing SW Martinazzi Avenue driveways. As such, all three site driveways continue to remain open in this scenario.

2014 Total Traffic Conditions Alternative Access Scenario (represented in Figure 11A/11B)

- This scenario evaluates the impact of adding a fourth leg to the SW Martinazzi Avenue/SW Seneca Street intersection. As such, the following driveway modifications were assumed:
  - The existing driveway adjacent to the library (#4) was closed and the traffic was rerouted to the modified SW Martinazzi Avenue/SW Seneca Street intersection (#5).
  - The existing driveway (#6) was assumed to be closed given its close proximity to the new SW Martinazzi Avenue/SW Seneca Street intersection. Existing traffic at this driveway was rerouted to the modified SW Martinazzi Avenue/SW Seneca Street intersection (#5).
  - The existing southernmost site driveway (#7) was assumed to remain open.

Comment/Request #4

There is no mention in the report of on-site queuing either. Will the configuration proposed work?

Response: During our May 7th follow-up discussion, City staff clarified this request is regarding the operation of the first right-in/right-out drive aisle on the main driveway serving the site (opposite the Fred Meyer driveway). Under existing conditions this first drive aisle allows for both left and right turns and creates a conflict with standing queues exiting the site. Under the proposed configuration, a raised median will be constructed along the main driveway that will limit turn movements at the first drive aisle to right turns only. This will eliminate any queuing conflicts and represents a significant improvement relative to the existing condition.

Comment/Request #5

Shopping Center ITE (3.75) code was used. No mention in the TIA about another drive-thru (34.64) or the health club (4.05).

Response: The April 2013 TIA summarizes the trip generation methodology while Table 8 provides the summary trip generation calculations for the proposed Nyberg Rivers redevelopment. To estimate the additional traffic generated by the variety of potential uses on the Nyberg Rivers site, the 'Shopping Center' land use category in ITE *Trip Generation* was used. The Shopping Center category is typically used for projects such as the Nyberg Rivers development. The 'Shopping Center' category includes an integrated group of small and large commercial uses as well as non-retail facilities (office, restaurants, health clubs, drive-in banks, sit down and fast food restaurants, etc.). This mix of uses is consistent with CenterCal's overall vision for the site.

Another point worth noting is that CenterCal is still working to formalize leases with potential tenants. The use of the 'Shopping Center' category provides CenterCal and the City of Tualatin flexibility to accommodate a variety of uses so long as the total development size (gross square feet of development) stays approximately the same as or less than the amount assumed in the TIA.

The above notwithstanding, at your request we've provided some additional analysis regarding the sensitivity of adding another fast food restaurant with a drive-thru above and beyond what has already been studied (i.e. assuming it is part of the currently planned shopping center). Table 4 below shows the impact of a 4,500 square-foot fast-food restaurant with drive-through window.

Table 4 – Nyberg Rivers Trip Generation (Assuming the Addition of a 4,500 square foot Fast-Food Restaurant with Drive-Through Window

	ITE Code	Size (sq. ft.)	Weekday PM Peak Hour			Saturday Midday Peak Hour		
			Total	In	Out	Total	In	Out
Existing Site								
Existing Site Driveways[1]	-	-	945	435	510	970	490	480
Less Existing Library[2]	590	22,123	(160)	(75)	(85)	(150)	(80)	(70)
Less Existing Civic Uses[3]	715	~10,000	(50)	(10)	(40)	-	-	-
Total Existing Retail			**735**	**350**	**385**	**820**	**410**	**410**
Future Site								
Shopping Center	820	307,000[4]	1,350	660	690	1,775	925	850
Less Existing Retail Driveway Counts			(735)	(350)	(385)	(820)	(410)	(410)
Sub Total			615	310	305	955	515	440
Pass-by Trips (Weekday 34%, Saturday 26%)			(210)	(105)	(105)	(230)	(115)	(115)
Net New Trips			**405**	**205**	**200**	**725**	**400**	**325**
Fast-Food Restaurant with Drive-Through Window	934	4,500	145	75	70	265	135	130
Internal Trips (10%)			(10)	(5)	(5)	(30)	(15)	(15)
Pass-by Trips (50%)			(60)	(30)	(30)	(120)	(60)	(60)
Fast Food Net New Trips			**75**	**40**	**35**	**115**	**60**	**55**

[1]Represents the total site driveway counts during the weekday p.m. peak hour of 4:35-5:35 p.m. and Saturday midday peak hour of 12:10-1:10 p.m. This is the traffic volume being generated by the existing 158,343 square feet of shopping center currently residing on the site prior to Kmart's closure.
[2]The library traffic counts were estimated using the *Library* land use in ITE *Trip Generation*.
[3]The City Hall traffic counts were estimated using the *Single Tenant Office Building* land use in ITE *Trip Generation*. The existing City Hall square footage was estimated to be approximately 10,000 square feet in size.
[4]Includes the 158,343 square feet of existing shopping center (minus the 96,799 square foot former K-Mart) plus the 245,456 square feet of proposed shopping center uses.

As shown in Table 4, a 4,500 square-foot fast-food restaurant with drive-through window (if evaluated as a separate use) would add approximately 75 net new trips to the overall study network and 135 additional trips (when accounting for pass-by trips) to the driveways serving the site. Assuming similar trip assignments to those used in the April 2013 TIA, a fast-food restaurant would have the following impacts:

- The SW Nyberg Road/SW Tualatin-Sherwood Road/Fred Meyer Driveway/Site Driveway intersection (#10) is estimated to convey an additional 86 p.m. peak hour trips (represents a 1.7 percent increase in total entering volumes during the critical weekday p.m. peak hour). With this additional traffic, the intersection is forecast to continue to operate acceptably at a v/c ratio of 0.84 during the critical weekday p.m. peak hour. *Appendix C contains the operations summary worksheet for this intersection.*
- The SW Martinazzi Avenue/Site Driveway (near the library) is estimated to experience a 17 trip increase which represents a 1.1 percent increase in total entering volumes during the critical weekday p.m. peak hour. Sufficient capacity exists at this intersection to accommodate the additional traffic impacts.
- At any other off-site intersection the additional trip generation would have a negligible traffic impact and would not change any of the key findings in the original TIA.
- In summary, even if evaluated separately from a Shopping Center, all agency operating standards would be met with the addition of a 4,500 fast food restaurant with a drive-thru.

We trust this additional information in addition to the information included in the original TIA adequately addresses any traffic related concerns regarding an additional fast food restaurant with a drive-through window.

Comment/Request #6

You should explain more about why all of the intersections were not evaluated for Saturday.

Response: As documented in the April 22, 2012 Scoping Memorandum, it was agreed that the TIA would investigate the proposed development's impact at select study area intersections during the Saturday midday period. Given that the traffic volumes at the study area intersections are anywhere from 20-50% lower during the Saturday midday time period, the analysis only focused on the site driveways, immediately adjacent intersections, and those intersections that are forecast to experience a significant increase in site-generated traffic such as the I-5 ramp terminal intersections. At all other study intersections (due to the 20-50% reduction in background traffic relative to existing conditions), it necessarily follows that operations will be better on Saturday than during the weekday p.m. peak hour. Accordingly, the intersections studied under Saturday conditions were limited to those in the TIA.

Exhibit 1
Attachment L

Comment/Request #7

There is nothing in the report about adding dual right turns at Fred Meyer.

Response: The TIA demonstrates that with the proposed transportation improvements (both on-site and off-site) associated with the proposed development all applicable agency standards will be met relative to transportation facilities with full build out of the proposed development. At the request of, and in cooperation with Fred Meyer, CenterCal is exploring an improvement to the SW Nyberg Road/SW Tualatin-Sherwood Road/Fred Meyer/Site Access. This improvement is not required to maintain agency operating standards. Rather, it will mitigate the small increase in on-site queuing for the right turn movement exiting the Fred Meyer site that will result from the proposed signal phasing modification. The proposed improvement, which would add an additional exiting right turn lane from the Fred Meyer site, would result in a net improvement (reduction) in on-site queuing relative to the existing condition, and further improve the v/c and LOS at the intersection.

Given that the details of this modification are still being investigated between CenterCal and Fred Meyer, the improvement scenario was not formally included in the April 2013 TIA. If CenterCal decides to formally move forward with the improvement, an operations and queuing analysis will be submitted to the City of Tualatin, Washington County, and ODOT for review.

This memorandum addresses each of your requests for additional information. If you have any questions, please contact us.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Mark Vandehey, P.E.

Exhibit 1
Attachment L

Appendix A SW Martinazzi Avenue/City Library Field Calculation Worksheets

EX SB LT		EX WB LT		EX WB RT	
capacity=	774	capacity=	188	capacity=	542
volume=	140	volume=	30	volume=	100
delay =	11.33	delay =	30.31	delay =	14.09
v/c=	0.18	v/c=	0.16	v/c=	0.18

TTSB LT		TT WB LT		TT WB RT	
capacity=	774	capacity=	158	capacity=	542
volume=	200	volume=	55	volume=	165
delay =	12.05	delay =	43.77	delay =	15.68
v/c=	0.26	v/c=	0.35	v/c=	0.30

SW Martinazzi Avenue/City Library Driveway (peak 15-minute period 5:00-5:15)

Service Time for SB LT	Service Time for WB RT	Service Time for WB LT
0	11	10
0	12	10
1	2	21
0	9	36
0	2	30
3	1	21
0	2	30
3	1	50
0	1	3
0	1	48
0	1	4
30	5	4
27	1	6
3	29	6
0	5	2
1	14	10
10	1	6
1	3	2
0	3	24
0	12	69
10	5	21
13	9	9
17	4	422
0	7	
10	25	
20	166	
2		
0		
0		
17		
1		
0		
2		
0		
0		
6		
6		
3		
0		
0		
186		

Avg Service Time = 19.18
Capacity= 188

Avg Service Time = 6.64
Capacity= 542

Avg Service Time = 4.65
Capacity= 774

Exhibit 1
Attachment L

Appendix B Queuing Worksheets

SIGNALIZED QUEUE ANALYSIS

Project Name: Nyberg Rivers
Project Number: 12116
Analyst: jxh
Date: 5/16/2013
Filename: H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Martinazzi/Tualatin-Sherwood SAT
Conditions (yr, alt., etc.): BK

GENERAL INPUT PARAMETERS:

Cycle Length:	115	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	SB THRT	SB LT	EB LT	NB THRT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	470	129	69	221				
G/C for movement:	0.18	0.12	0.07	0.16				
Number of lanes:	2	1	1	1				
CALCULATIONS:								
Length of red interval (sec):	94.3	101.2	107.0	96.6				
Average total queue (veh):	12.3	3.6	2.0	5.9				
Maximum total queue (veh):	**18**	**7**	**5**	**10**				
Total queue length (feet):	450	175	125	250				
Required storage/lane (feet):	**225**	**175**	**125**	**250**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name: Nyberg Rivers
Project Number: 12116
Analyst: jxh
Date: 5/16/2013
Filename: H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido[illegible]

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Martinazzi/Tualatin-Sherwood Weekday PM
Conditions (yr, alt., etc.): BK

GENERAL INPUT PARAMETERS:

Cycle Length:	125	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	SB THRT	SB LT	EB LT	NB THRT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	751	194	52	302				
G/C for movement:	0.26	0.16	0.07	0.19				
Number of lanes:	2	1	1	1				
CALCULATIONS:								
Length of red interval (sec):	92.5	105.0	116.3	101.3				
Average total queue (veh):	19.3	5.7	1.7	8.5				
Maximum total queue (veh):	**27**	**10**	**4**	**14**				
Total queue length (feet):	675	250	100	350				
Required storage/lane (feet):	**350**	**250**	**100**	**350**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers	
Project Number:	12116	
Analyst:	jxh	
Date:	5/16/2013	
Filename:	H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido	

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Martinazzi/Nyberg SAT
Conditions (yr, alt., etc.): BK

GENERAL INPUT PARAMETERS:

Cycle Length:	44	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB TH	SB TH	WB LT	WB RT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	266	318	264	237				
G/C for movement:	0.33	0.33	0.21	0.21				
Number of lanes:	1	2	2	1				
CALCULATIONS:								
Length of red interval (sec):	29.5	29.5	34.8	34.8				
Average total queue (veh):	2.2	2.6	2.5	2.3				
Maximum total queue (veh):	**5**	**5**	**5**	**5**				
Total queue length (feet):	125	125	125	125				
Required storage/lane (feet):	**125**	**75**	**75**	**125**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	jxh
Date:	5/16/2013
Filename:	H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido[illegible]

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Martinazzi/Nyberg Weekday PM
Conditions (yr, alt., etc.):	BK

GENERAL INPUT PARAMETERS:

Cycle Length:	45	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB TH	SB TH	WB LT	WB RT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	327	502	404	337				
G/C for movement:	0.37	0.37	0.25	0.25				
Number of lanes:	1	2	2	1				
CALCULATIONS:								
Length of red interval (sec):	28.4	28.4	33.8	33.8				
Average total queue (veh):	2.6	4.0	3.8	3.2				
Maximum total queue (veh):	5	7	7	6				
Total queue length (feet):	125	175	175	150				
Required storage/lane (feet):	**125**	**100**	**100**	**150**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	jxh
Date:	5/16/2013
Filename:	H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido...

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Martinazzi/Boones Ferry Weekday SAT
Conditions (yr, alt., etc.):	BK

GENERAL INPUT PARAMETERS:

Cycle Length:	56	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB LT	NB RT	WB LT	EB RT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	185	304	258	125				
G/C for movement:	0.21	0.44	0.24	0.32				
Number of lanes:	1	1	1	1				
CALCULATIONS:								
Length of red interval (sec):	44.2	31.4	42.6	38.1				
Average total queue (veh):	2.3	2.6	3.1	1.3				
Maximum total queue (veh):	**5**	**6**	**6**	**3**				
Total queue length (feet):	125	150	150	75				
Required storage/lane (feet):	**125**	**150**	**150**	**75**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name: Nyberg Rivers
Project Number: 12116
Analyst: jxh
Date: 5/16/2013
Filename: H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Martinazzi/Boones Ferry Weekday PM
Conditions (yr, alt., etc.): BK

GENERAL INPUT PARAMETERS:

Cycle Length:	107	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB LT	NB RT	WB LT	EB RT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	325	385	422	175				
G/C for movement:	0.20	0.49	0.28	0.39				
Number of lanes:	1	1	1	1				
CALCULATIONS:								
Length of red interval (sec):	85.6	54.6	77.0	65.3				
Average total queue (veh):	7.7	5.8	9.0	3.2				
Maximum total queue (veh):	**13**	**10**	**14**	**6**				
Total queue length (feet):	325	250	350	150				
Required storage/lane (feet):	**325**	**250**	**350**	**150**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	jxh
Date:	5/16/2013
Filename:	H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido...

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Martinazzi/Tualatin-Sherwood SAT
Conditions (yr, alt., etc.):	WS

GENERAL INPUT PARAMETERS:

Cycle Length:	115	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	SB THRT	SB LT	EB LT	NB THRT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	470	129	69	221				
G/C for movement:	0.18	0.12	0.07	0.16				
Number of lanes:	2	1	1	1				
CALCULATIONS:								
Length of red interval (sec):	94.3	101.2	107.0	96.6				
Average total queue (veh):	12.3	3.6	2.0	5.9				
Maximum total queue (veh):	**18**	**7**	**5**	**10**				
Total queue length (feet):	450	175	125	250				
Required storage/lane (feet):	**225**	**175**	**125**	**250**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name: Nyberg Rivers
Project Number: 12116
Analyst: jxh
Date: 5/16/2013
Filename: H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Martinazzi/Tualatin-Sherwood Weekday PM
Conditions (yr, alt., etc.): WS

GENERAL INPUT PARAMETERS:

Cycle Length:	125	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	SB THRT	SB LT	EB LT	NB THRT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	763	194	55	645				
G/C for movement:	0.27	0.15	0.06	0.20				
Number of lanes:	2	1	1	2				
CALCULATIONS:								
Length of red interval (sec):	91.3	106.3	117.5	100.0				
Average total queue (veh):	19.3	5.7	1.8	17.9				
Maximum total queue (veh):	**27**	**10**	**4**	**25**				
Total queue length (feet):	675	250	100	625				
Required storage/lane (feet):	**350**	**250**	**100**	**325**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	jxh
Date:	5/16/2013
Filename:	H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido[illegible]

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Martinazzi/Seneca SAT
Conditions (yr, alt., etc.):	WS

GENERAL INPUT PARAMETERS:

Cycle Length:	30	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB LT	NB THRT	SB THRT	SB LT	WB THLT	WB RT		
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	81	421	256	185	65	136		
G/C for movement:	0.62	0.50	0.55	0.72	0.18	0.18		
Number of lanes:	1	1	1	1	1	1		
CALCULATIONS:								
Length of red interval (sec):	11.4	15.0	13.5	8.4	24.6	24.6		
Average total queue (veh):	0.3	1.8	1.0	0.4	0.4	0.9		
Maximum total queue (veh):	1	4	3	2	2	3		
Total queue length (feet):	25	100	75	50	50	75		
Required storage/lane (feet):	**25**	**100**	**75**	**50**	**50**	**75**		
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	jxh
Date:	5/16/2013
Filename:	H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido…

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Martinazzi/Seneca Weekday PM
Conditions (yr, alt., etc.):	WS

GENERAL INPUT PARAMETERS:

Cycle Length:	49	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB LT	NB THRT	SB THRT	SB LT	WB THLT	WB RT		
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	85	615	426	202	53	163		
G/C for movement:	0.59	0.50	0.56	0.71	0.13	0.28		
Number of lanes:	1	1	1	1	1	1		
CALCULATIONS:								
Length of red interval (sec):	20.1	24.5	21.6	14.2	42.6	35.3		
Average total queue (veh):	0.5	4.2	2.6	0.8	0.6	1.6		
Maximum total queue (veh):	**2**	**8**	**5**	**2**	**2**	**4**		
Total queue length (feet):	50	200	125	50	50	100		
Required storage/lane (feet):	**50**	**200**	**125**	**50**	**50**	**100**		
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name: Nyberg Rivers
Project Number: 12116
Analyst: jxh
Date: 5/16/2013
Filename: H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Martinazzi/Nyberg SAT
Conditions (yr, alt., etc.): WS

GENERAL INPUT PARAMETERS:

Cycle Length:	42	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB TH	SB TH	WB LT	WB RT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	276	322	297	237				
G/C for movement:	0.30	0.30	0.22	0.22				
Number of lanes:	1	2	2	1				
CALCULATIONS:								
Length of red interval (sec):	29.4	29.4	32.8	32.8				
Average total queue (veh):	2.3	2.6	2.7	2.2				
Maximum total queue (veh):	**5**	**6**	**6**	**5**				
Total queue length (feet):	125	150	150	125				
Required storage/lane (feet):	**125**	**75**	**75**	**125**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	jxh
Date:	5/16/2013
Filename:	H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Martinazzi/Nyberg Weekday PM
Conditions (yr, alt., etc.):	WS

GENERAL INPUT PARAMETERS:

Cycle Length:	42	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB TH	SB TH	WB LT	WB RT				
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	341	509	412	337				
G/C for movement:	0.34	0.34	0.26	0.26				
Number of lanes:	1	2	2	1				
CALCULATIONS:								
Length of red interval (sec):	27.7	27.7	31.1	31.1				
Average total queue (veh):	2.6	3.9	3.6	2.9				
Maximum total queue (veh):	6	7	7	6				
Total queue length (feet):	150	175	175	150				
Required storage/lane (feet):	**150**	**100**	**100**	**150**				
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name: Nyberg Rivers
Project Number: 12116
Analyst: jxh
Date: 5/16/2013
Filename: #N/A

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection: Martinazzi/Boones Ferry Weekday SAT
Conditions (yr, alt., etc.): WS

GENERAL INPUT PARAMETERS:

Cycle Length:	67	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB LT	NB RT	WB LT	EB RT	NB LT WDW	NB RT WDW	WB LT WDW	EB RT WDW
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	201	353	318	145	201	309	318	127
G/C for movement:	0.22	0.49	0.27	0.31	0.20	0.47	0.27	0.32
Number of lanes:	1	1	1	1	1	1	1	1
CALCULATIONS:								
Length of red interval (sec):	52.3	34.2	48.9	46.2	53.6	35.5	48.9	45.6
Average total queue (veh):	2.9	3.4	4.3	1.9	3.0	3.0	4.3	1.6
Maximum total queue (veh):	**6**	**7**	**8**	**4**	**6**	**6**	**8**	**4**
Total queue length (feet):	150	175	200	100	150	150	200	100
Required storage/lane (feet):	**150**	**175**	**200**	**100**	**150**	**150**	**200**	**100**
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

SIGNALIZED QUEUE ANALYSIS

Project Name:	Nyberg Rivers
Project Number:	12116
Analyst:	jxh
Date:	5/16/2013
Filename:	H:\projfile\12116 - K-Mart Tualatin Redevelopment\queuing\Martinazzi Corrido

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Intersection:	Martinazzi/Boones Ferry Weekday PM
Conditions (yr, alt., etc.):	WS

GENERAL INPUT PARAMETERS:

Cycle Length:	112	sec
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25	feet

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NB LT	NB RT	WB LT	EB RT	NB LT WDW	NB RT WDW	WB LT WDW	EB RT WDW
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	335	415	453	185	335	385	453	175
G/C for movement:	0.22	0.51	0.29	0.37	0.22	0.51	0.29	0.37
Number of lanes:	1	1	1	1	1	1	1	1
CALCULATIONS:								
Length of red interval (sec):	87.4	54.9	79.5	70.6	87.4	54.9	79.5	70.6
Average total queue (veh):	8.1	6.3	10.0	3.6	8.1	5.9	10.0	3.4
Maximum total queue (veh):	**13**	**11**	**15**	**7**	**13**	**10**	**15**	**7**
Total queue length (feet):	325	275	375	175	325	250	375	175
Required storage/lane (feet):	**325**	**275**	**375**	**175**	**325**	**250**	**375**	**175**
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):								
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):								
Average total queue (veh):								
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution)
(Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1
Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded
up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = (g/C - Yo)/(1-Yo)

Exhibit 1
Attachment L

Appendix C Nyberg Road/Fred Meyer/Site Access Driveway Operations (Assuming a Fast-Food Restaurant)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	122	1884	40	232	1679	288	36	10	236	358	24	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		5.0	4.5	5.0	5.0	
Lane Util. Factor	1.00	*0.75		0.97	0.91	1.00		1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96		1.00	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1805	4100		3502	4988	1545		1786	1599	3502	1614	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1805	4100		3502	4988	1545		1786	1599	3502	1614	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	124	1922	41	237	1713	294	37	10	241	365	24	137
RTOR Reduction (vph)	0	1	0	0	0	146	0	0	0	0	117	0
Lane Group Flow (vph)	124	1962	0	237	1713	148	0	47	241	365	44	0
Confl. Peds. (#/hr)			2			8						15
Heavy Vehicles (%)	0%	4%	0%	0%	4%	0%	3%	0%	1%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Split		pt+ov	Split		
Protected Phases	5	2		1	6		8	8	1 8	4	4	
Permitted Phases						6						
Actuated Green, G (s)	13.9	60.3		15.9	62.3	62.3		8.7	24.6	17.6	17.6	
Effective Green, g (s)	14.4	60.8		16.4	62.8	62.8		9.2	25.6	18.1	18.1	
Actuated g/C Ratio	0.12	0.49		0.13	0.50	0.50		0.07	0.20	0.14	0.14	
Clearance Time (s)	5.0	6.5		5.0	6.5	6.5		5.5		5.5	5.5	
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		2.5		2.5	2.5	
Lane Grp Cap (vph)	208	1994		459	2506	776		131	327	507	234	
v/s Ratio Prot	0.07	c0.48		0.07	0.34			0.03	c0.15	c0.10	0.03	
v/s Ratio Perm						0.10						
v/c Ratio	0.60	0.98		0.52	0.68	0.19		0.36	0.74	0.72	0.19	
Uniform Delay, d1	52.5	31.6		50.6	23.6	17.1		55.1	46.5	51.0	47.0	
Progression Factor	0.89	0.56		1.04	0.87	1.15		1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	10.2		0.5	1.0	0.4		1.2	7.9	4.5	0.3	
Delay (s)	48.4	28.1		53.3	21.4	20.0		56.3	54.5	55.6	47.3	
Level of Service	D	C		D	C	B		E	D	E	D	
Approach Delay (s)		29.3			24.6			54.8			53.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Exhibit 1
Attachment L

KITTELSON & ASSOCIATES, INC.
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July 22, 2013 | Project #: 12116.0

Sherilyn Lombos, City Manager
City of Tualatin
18880 SW Martinazzi Ave.
Tualatin, OR 97062

RE: Response to DKS Supplemental Traffic Analysis Included in City of Tualatin's Staff Report for the Nyberg Rivers Master Plan

As a follow-up to your correspondence with Fred Bruning, Centercal Properties, LLC, this letter addresses the July 11, 2013 *Nyberg Rivers Supplemental Traffic Analysis* prepared by DKS Associates (herein referred to as the *Supplemental Traffic Analysis Review*) for the Nyberg Rivers project in Tualatin, Oregon. An executive summary is presented below followed by additional details. Please include this as part of the formal record for the Nyberg Rivers Master Plan application.

EXECUTIVE SUMMARY

The *Supplemental Traffic Analysis Review* identifies two fundamental issues, trip generation and access.

Trip Generation:

The *Supplemental Traffic Analysis Review* opines that the April 2013 Transportation Impact Analysis (April 2013 TIA) underestimates site trip generation and should have individually accounted for a grocery store and fast-food restaurant.

- In our professional opinion, we conclude the April 2013 TIA trip generation offers the most reliable trip generation estimate. We base this conclusion on:
    - Comparison of the April 2013 TIA methodology to two other existing sites in Tualatin including Nyberg Woods to the east and Bridgeport Village to the north; and
    - Calculation errors and no traffic engineering basis for the approach taken by DKS in the *Supplemental Traffic Analysis Review* trip generation.

Access to SW Martinazzi Avenue:

The *Supplemental Traffic Analysis Review* compares the April 2013 TIA queuing with the probable gap acceptance of left-turn vehicles and queuing on SW Martinazzi Avenue at a theoretical level.

- The review assessment is based on outdated information. The Applicant provided a May 16, 2013 supplemental analysis relying on additional field-collected data on site at the existing

City Hall/Library driveway that is specifically calibrated to the available gaps and capacity on SW Martinazzi Avenue. This is a far more accurate method than that used by DKS.

- The *Supplemental Traffic Analysis Review* methodology uses software-based simulation analysis that relies upon 1) unreasonably high site trip generation estimates and 2) an assumption that drivers won't use other available site driveways with less delay and queuing, which is clearly unreasonable.

The specific Comments/Conclusions made in the *Supplemental Traffic Analysis Review* are included in *italics* below followed by our response and any necessary supporting documentation.

ISSUE 1 - REFINED TRIP GENERATION

DKS Comment: *Based on our review of the Nyberg Rivers Master Plan, we recommend an alternative trip generation estimate be used for the proposed development. Rather than treating all uses the same (i.e., part of a single "shopping center" land use category), as was done in the April 2013 TIA, we recommend treating several uses separately since they are significantly different from typical shopping center use. When these uses are treated separately, the resulting net increase in peak hour traffic generation is 405 to 435 trips higher than the estimates in the applicant's TIA report.*

Response Refined Trip Generation Comment:

Kittelson & Associates, Inc. prepared and submitted a June 21, 2013 letter that provided a detailed summary of trip generation considerations in response to City staff questions regarding the April 2013 TIA. For reasons previously stated in our June 21, 2013 letter, we continue to strongly disagree with the premise that some uses should be separated from the shopping center for the purposes of the TIA.

In our professional opinion, there is no traffic engineering basis for separating the highest trip generating uses from the shopping center as the *Supplemental Traffic Analysis Review* suggested and then continuing to apply the shopping center trip generation rate for the lower trip generating uses (which assumes a blend of higher and lower trip generating uses). The result of the DKS approach is in an unreasonably high trip generation estimate. To support this opinion, two case studies of local shopping centers are presented for illustrative purposes.

Case Study 1) Bridgeport Village Trip Generation Comparison

To provide further evidence that the using the ITE shopping center trip generation rate results in a reasonable yet conservative estimate of trip generation, we reviewed the trip of Bridgeport Village as described below.

- Traffic counts were completed at all of the driveways serving Bridgeport Village in 2007.
- At the time Bridgeport Village had approximately 440,000 gross square feet of leasable retail floor area (GLA) which included a Wild Oats supermarket.

Table 1 compares the traffic count results with ITE *Trip Generation, 9th Edition* data.

Table 1 – Bridgeport Village Site Traffic Counts Compared ITE Shopping Center Trip Data

Data Source	PM Peak Hour Trip Rate (Trips/1,000 Square Feet of Gross Leasable Area)	Comments
On-site Field Traffic Counts	2.99	Actual Trip Generation
ITE Trip Generation *Shopping Center*	3.67	23% Higher Than Actual

As shown in Table 1, use of ITE Shopping Center data (*without breaking out the grocery store separately*) overestimates the actual site trip generation by over 20%. As detailed in our June 21, 2013 letter, similar comparison of Saturday peak hour data found the actual trip rate was approximately 25 percent lower than that forecast with the ITE Shopping Center trip generation rate.

Clearly, further increasing the site trip generation estimate by breaking out the grocery store and other individual pad buildings at Bridgeport Village would exacerbate the over-estimation of trips.

Case Study 2) Nyberg Woods Trip Generation Comparison

Similar to Case Study 1, we reviewed the trip of Nyberg Woods (located directly across I-5 to the east of the site) as described below.

- Traffic counts were completed at all of the Nyberg Woods driveways in 2012.
- At the time Nyberg Woods had approximately 207,000 gross square feet of leasable retail floor area (GLA).

Table 2 compares the traffic count results with ITE *Trip Generation, 9th Edition* data.

Table 2 – Nyberg Woods Site Traffic Counts Compared ITE Shopping Center Trip Data

Data Source	PM Peak Hour Trip Rate (Trips/1,000 Square Feet of GLA)	Comments
On-site Field Traffic Counts	3.74	Actual Trip Generation
ITE Trip Generation *Shopping Center*	4.71	26% Higher Than Actual

As shown in Table 2, the ITE Shopping Center trip generation rate was also over 20 percent higher than the actual trip generation rate during the weekday p.m. peak hour. The actual Saturday midday peak hour trip rate was found to be approximately 7 percent lower than the ITE Shopping Center trip generation rate.

Based on the three case studies above and the mix of uses they reflect, we remain confident that use of the ITE Shopping Center data as applied in the April 2013 TIA is not only appropriate, but likely *overestimates* the impact of the proposed development.

Other Considerations:

The *Supplemental Traffic Analysis Review* states that a separation of the grocery and fast food land uses would result in a net increase of 435 weekday p.m. peak hour trips and 405 Saturday midday peak hour trips compared the April 2013 TIA trip generation estimates.

In addition to the case study examples, we further note that is not possible to directly compare the trip estimates provided in the April 2013 TIA and the *Supplemental Traffic Analysis Review* for the following reasons:

- The two methodologies are fundamentally different in how they account for existing uses that are proposed to remain on the site after redevelopment occurs (the *Supplemental Traffic Analysis Review* is not reflective of the actual building area changes proposed).
    - The shopping center square footage is overestimated in the *Supplemental Traffic Analysis Review* methodology. The actual proposed shopping center square footage is approximately 190,931 square feet, not the 232,043 square feet used in the *Supplemental Traffic Analysis Review*.
- The *DKS Supplemental Traffic Analysis Review* assumed a 10% internalization reduction whereas the April 2013 TIA methodology assumed a 20% reduction. DKS offers no basis or research to support the 10% internalization assumption whereas there are multiple research studies supporting the 20% internalization reduction including the *ITE Trip Generation*. Further, their internal trip reduction did not account for the existing retail development on site.
- The *DKS Supplemental Traffic Analysis Review* assumed no trip reduction for the vacant K-mart and Jiggles uses. Data collected on-site when the original traffic counts were conducted (used in the April 2013 TIA) revealed these uses accounted for approximately 200 weekday p.m. peak hour trips (this oversight alone accounts for approximately half the difference they reported).

Because of the above discrepancies and the fundamental difference in structure of the two methodologies, a meaningful side-by-side comparison cannot be made.

ISSUE 2- SW MARTINAZZI AVENUE DRIVEWAY OPERATIONS

The *Supplemental Traffic Analysis Review* included the refined trip generation analysis and a Synchro-based operations assessment of the SW Martinazzi Avenue site driveways. Particular emphasis was made regarding the April 2013 TIA's use of two-stage gap acceptance and queuing analyses that didn't consider the interaction with adjacent upstream and downstream traffic signals.

Response #1 to the SW Martinazzi Avenue Driveway Operations Comment

Kittelson & Associates, Inc. provided a revised assessment of driveway operations along SW Martinazzi Avenue in the May 16, 2013 *Additional Nyberg Rivers Traffic Analysis* and the June 21, 2013 *Response*

Exhibit 1
Attachment L

to City of Tualatin June 3, 2013 letter (Preliminary Review Comments: Nyberg Rivers Master Plan). This revised assessment included a detailed calculation of SW Martinazzi Avenue driveway operations using field-calibrated capacity calculations. This field-calibrated data takes into consideration the two-stage gap acceptance concerns noted in the *Supplemental Traffic Analysis Review* and is a more reliable assessment of future conditions.

The comments provided in the *Supplemental Traffic Analysis Review* address the April 2013 TIA, not the subsequent detailed analyses prepared and presented responding to initial City staff-provided comments. The May and June 2013 materials cited above and provided by Kittelson & Associates, Inc. address the issues raised in the *Supplemental Traffic Analysis Review* and provide reliable site-specific data. Accordingly, we stand by our findings from the May and June 2013 supplemental letters and conclude that the SW Martinazzi Avenue/City Hall driveway can continue to operate within standards with the proposed project.

Response #2 to the SW Martinazzi Avenue Driveway Operations Comment

The *Supplemental Traffic Analysis Review* methodology relies upon SimTraffic simulation software to produce queuing results at the site driveways to SW Martinazzi Avenue. The reported findings indicate that the site will incur extreme vehicle queue lengths during the peak time periods; however, no technical documentation of the software analysis results is provided.

Notwithstanding the reported but undocumented simulation results in the *Supplemental Traffic Analysis Review*, the findings (including a reported queue of 2,000 feet (almost ½ mile) at one driveway) are clearly not reasonable and suggest no attempt was made to calibrate the simulation model to existing conditions (a significant modeling oversight) and/or conduct a more reasonable future conditions analysis. The proposed redevelopment site has multiple driveways that provide alternative egress routes. Given most drivers naturally identify and drive routes with the least delay/shortest path, it is unreasonable to suggest the extreme vehicle queue lengths being reported in the *Supplemental Traffic Analysis Review* will ever be realized. Furthermore, the *Supplemental Traffic Analysis Review* is predicated on site trip generation estimates that we believe are <u>grossly over-estimated</u> as documented in the response to Issue #1.

Thank you for the opportunity to respond to the *Supplemental Traffic Analysis Review* comments. Please contact us with any questions you may have.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Mark Vandehey

Mark Vandehey, P.E.

Exhibit 1
Attachment L

KITTELSON & ASSOCIATES, INC.
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June 21, 2013

Project #: 12116

Christe White
Radler, White, Parks & Alexander, LLP
111 SW Columbia Street, Suite 1100
Portland, OR 97201

RE: Response to City of Tualatin June 3, 2013 letter (Preliminary Review Comments: Nyberg Rivers Master Plan)

Dear Christe,

This letter addresses the Transportation Impact Analysis comments included in the City of Tualatin's *June 3, 2013 Preliminary Review Comments: Nyberg Rivers Master Plan (MP-13-01).* Our response focuses on the City's comments regarding Central Urban Renewal District Plan (CURD) Goal 5: Transportation and specifically the Traffic Impact Analysis (TIA) comments on pages 3-5 of the City's letter. The City's comment/request for additional information is included in italics followed by our response.

TIA Comment #1

ODOT reviewed the submitted information for their facilities (I-5 and Nyberg Street). Although, the underlying model artificially limits queues and the settings do not meet ODOT standards, ODOT reran the analysis using the correct settings. Based on this analysis the proposed improvements mitigate the impact of the development on ODOT facilities (see attached comments from ODOT). City staff provides comments below on the TIA, which will require the applicant to revise the TIA. ODOT will need to review the updated TIA to confirm whether the proposed improvements still mitigate the impact of the development on ODOT facilities. Final design may indicate the need for additional right-of-way.

Response to Comment #1:

The City is correct that the signalized intersection operational analysis model used to for the TIA deviated from ODOT's Analysis Procedures Manual (APM). The changes made to the model were needed to accurately model the adaptive signal control system that operates the traffic signals that were studied along SW Tualatin-Sherwood Road. The statement "the underlying model artificially limits queues" is incorrect. The changes made to the model were implemented to more reasonably reflect queues resulting from the adaptive signal control system (adaptive traffic signal control is a relatively new technology implementation and is not currently explicitly analyzed by the model or the ODOT APM procedures).

Exhibit 1
Attachment L

ODOT has completed their independent review of the TIA and also conducted their own sensitivity analysis by applying the standard method outlined in the ODOT APM. ODOT staff concurred with the TIA findings and recommendations as it relates to ODOT facilities.

We respectfully disagree with the statement *"City staff provides comments below on the TIA, which will require the applicant to revise the TIA. ODOT will need to review the updated TIA to confirm whether the proposed improvements still mitigate the impact of the development on ODOT facilities".* The remainder of this letter addresses each of the City staff comments and provides additional information requested where appropriate. As will be evidenced by our responses herein, none of the comments provided by the City warrant revising the TIA. Further, none of the City comments warrant any change to the results presented relative to ODOT facilities reviewed in the original TIA. As such, no new comments from ODOT staff are anticipated.

TIA Comment #2

Washington County also reviewed the information and they have provided a list of conditions and measures to mitigate impacts on Nyberg Street and Tualatin Sherwood Road (please see attached comments from Washington County). City staff provided comments below on the TIA, which will require the applicant to revise the TIA. Washington County will need to review the updated TIA to confirm whether the proposed improvements still mitigate the impact of the development on Washington County facilities. Final design may indicate the need for additional right-of-way.

Response to TIA Comment #2

Similar to the response above relative to ODOT, Washington County staff conducted an independent review of the TIA and concurred with the key findings and recommendations. No changes to the TIA were requested by County staff.

Similar to our response to TIA Comment #1, none of the City comments warrant any change to the results presented relative to Washington County facilities reviewed in the original TIA. As such, no new comments from Washington County staff are anticipated.

TIA Comment #3a

The City reviewed the TIA to ensure that internal circulation is consistent with the TSP and that the new development improves traffic circulation on Martinazzi, the City's portion of Nyberg, Boones Ferry and other nearby roadways. After the Master Plan was submitted, a list of questions and concerns was sent and a meeting was held with Kittelson & Associates to review the issues. Kittelson submitted information to address some of those concerns on May 16, 2013. Even with both submittals, the City still has the following concerns with the information provided:

a) On Page 44 of the TIA submitted with the Master Plan, the applicant provides queuing analysis for Nyberg Road and the freeway. This same level of analysis is needed for Martinazzi, Boones

Ferry Road the proposed Seneca Street, Street A and the existing driveway easement from the driveway to Martinazzi. The submitted analysis should include:

i. -Existing queue storage length
ii. -Proposed queue storage length that is required for new development; and
iii. -An analysis of whether additional queue space is needed.

Response to TIA Comment #3a

The original TIA and supplemental analysis provided queuing information for key locations serving the proposed development where queuing impacts could be pronounced. Queuing data was not provided at other locations in the original TIA because it was clear from the operational evaluation conducted at these intersections that the project would have either have a negligible impact on queues or (in the case of new intersections such as the Seneca extension or Street A) the proposed design provided more than sufficient queue storage.

The intent of the information provided to City staff in our May 16, 2013 letter was to confirm for the City's benefit the project's impact to queuing at the identified intersections. The information provided in the May 16, 2013 letter confirmed the project would have either have a negligible impact on queues or (in the case of new intersections such as the Seneca extension or Street A) the proposed design provided more than sufficient queue storage.

Table 1 below presents the existing available storage at each of the study intersections along with the 95^{th} percentile queues documented in Table 3 of our May 16, 2013 letter. As confirmed once again in Table 1 below, the added traffic from the Nyberg Rivers project results in a negligible change in queuing at the study intersections.

Table 1 – 95th Percentile Queue Projections at the Study Intersections

Intersection	Movement	Estimated 95th Percentile Queue (ft) – Weekday PM Peak Hour – Background Traffic	Weekday PM Peak Hour – Total Traffic	Saturday Midday Peak Hour – Background Traffic	Saturday Midday Peak Hour – Total Traffic	Storage Length
SW Martinazzi Avenue/ SW Boones Ferry Road	NB LT	325	325	125	150	275[1]
	NB RT	250	275	150	175	275
	WB LT	350	375	150	200	150[2]
	EB RT	150	175	75	100	200
SW Martinazzi Avenue/ City Library Driveway (Driveway #4)	SB LT	75	100	25	50	275[1]
	WB LT	75	100	25	50	200
	WB RT	50	50	25	50	200
SW Martinazzi Avenue/ City Library Driveway (Driveway #4) (Assuming Driveway #6 is Closed)	SB LT	75	100	25	50	75
	WB LT	75	100	25	50	200
	WB RT	50	50	25	50	200
SW Martinazzi Avenue/ SW Seneca Street/ Potential Site Access Driveway*	SB LT	-	50	-	50	150
	SB THRT	-	125	-	75	200
	WB RT	-	100	-	75	200
	WB THLT	-	50	-	50	200
	NB THRT	-	200	-	100	225
	NB LT	-	50	-	25	75
SW Martinazzi Avenue/ Nyberg Road	SB TH	100	100	75	75	225
	NB THRT	125	150	125	125	275
	WB LT	100	100	75	75	275
	WB RT	150	150	125	125	275
SW Martinazzi Avenue/ SW Tualatin-Sherwood Road	SB THRT	350	350	225	225	325
	SB LT	250	250	175	175	275
	NB THRT	350	350	250	250	400
	EB LT	100	100	125	125	150
SW Boones Ferry Road/ Proposed Street A	NB RT	-	25	-	25	150

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound
LT = Left-Turn; TH = Through; RT = Right-Turn
* - Under the scenario that includes a Seneca Street extension into the project site
[1]Represents the distance of the two-way center left-turn lane along SW Martinazzi Avenue and Driveway #4.
[2]Represents the striped WB LT storage distance. An additional 175 feet of full width storage distance is available before the lane narrows over the Tualatin River.

Exhibit 1
Attachment L

As shown in Table 1, adequate storage length exists for all but the following movements:

- The northbound left-turn at the SW Boones Ferry Road/SW Martinazzi Avenue intersection and the southbound left-turn at the SW Martinazzi Avenue/City Library Driveway #4.
    - Both of these movements share the same 275 feet of center left-turn lane. Field observations noted that there are periods of vehicle queue overlap between these two intersections during peak time periods. This situation was described in more detail on pages 2 and 3 of the May 16, 2013 letter. The Nyberg Rivers project has a negligible impact on this existing condition.
- The westbound left-turn movement at the SW Boones Ferry Road/SW Martinazzi Avenue intersection.
    - The total available full width storage for this movement is approximately 325 feet whereas the background 95th percentile queue is 350 feet. With the proposed development, the 95th percentile queue is forecast to marginally increase by an additional 25 feet (one car length) beyond background traffic conditions. There is no opportunity to increase westbound left-turn storage at the intersection short of widening the SW Boones Ferry Road bridge. There does not appear to be any turn lane extensions [proposed in the recently adopted City Transportation System Plan.
- The 95th percentile queue on the southbound shared through/right-turn movement at the SW Martinazzi Avenue/SW Tualatin-Sherwood Road intersection is forecast to exceed the available storage by one vehicle length.
    - This condition occurs under background traffic conditions regardless of site development. The proposed development does not increase the southbound queue length.

TIA Comment #3b

b) The report assumes that very little traffic will use Martinazzi Avenue and Street A to access the development. Based on existing conditions, the City believes that is inaccurate. Most people coming from/going to the west and south will not access the site from Nyberg Street but will use Martinazzi Avenue or Boones Ferry Road. Additionally, the report does not assume truck traffic on those roadways which is inconsistent with the submitted Master Plan that shows those roadways being the main truck route. Please revise the TIA with assumptions that better match expected travel patterns.

Response to TIA Comment #3b

We disagree with the City's assertion that the assignment of trips to SW Martinazzi and Street A is inaccurate. In our professional opinion, the trips assigned to both facilities represent a reasonable estimate of travel patterns upon build-out of the proposed Nyberg Rivers project.

As documented in the August 2012 scoping memo and the April 2013 TIA, we estimated that approximately 20 percent of the new trips will come from the north via SW Boones Ferry Road or SW Upper Boones Ferry Road. All of this traffic was assigned to either SW Martinazzi or Street A. Only five percent of the new trips are estimated to come from SW Martinazzi (south of SW Tualatin Sherwood Road). Of that five percent approximately half were assumed to use SW Martinazzi south of SW Nyberg Street to enter or egress the site and approximately half would enter or egress use travel to and/from the site from SW Tualatin Sherwood Road/SW Nyberg Street.

All of the assumptions discussed above and documented in the TIA are reasonable based on existing and estimated future travel patterns and can be relied upon by the City staff as they develop their own transportation findings and recommendations for the Nyberg Rivers project.

With respect to truck traffic, truck vehicle percentages were assumed on each of the roadways based on existing truck traffic counts. Delivery vehicles to and from commercial sites typically occur outside the weekday a.m. and p.m. peak hours and thus are not expected to have any material impact on the peak hour analysis results presented in the TIA.

TIA Comment #3c

c) *The report utilizes conflicting assumptions of the driveway access on Martinazzi Avenue. Part of the evaluations assumes all three driveways remain open, yet another section assumes only one access connects to Martinazzi Avenue. The TIA needs to be consistent throughout the study. Any revisions may impact the queue length analysis listed above. Please make this change before completing the new queue length analysis.*

Response to TIA Comment #3c

As noted in the April 2013 TIA and reiterated in the supplemental information provided in the May 20, 2013 letter, the driveway assumptions for the two access scenarios on SW Martinazzi (with and without the SW Seneca Street extension) only differ relative to the treatment of the driveway immediately south of SW Seneca Street (indicated as driveway 6 in the April 2013 TIA).

With the SW Seneca Street extension it was assumed driveway 6 would be closed. Without the SW Seneca Street extension, driveway 6 was assumed to remain open because the project has would have no impact on this driveway (driveway 6 is not part of the proposed development site).

If the City desires to close driveway 6 regardless of the SW Seneca Street extension, the impact would be a small increase in traffic to the existing City Hall driveway (indicated as driveway 4 in the April 2013 TIA) on SW Martinazzi. Table 2 below shows the impact of the reassignment of traffic at driveway 4.

Table 2 - Detailed Operations of the Driveway #4 SW Martinazzi Avenue/City Library Driveway Assuming Driveway #6 is Closed (2014 Total Conditions)

	2014 Total Traffic Conditions SW Martinazzi Avenue/ City Library Driveway (Driveway #4)	2014 Total Traffic Conditions SW Martinazzi Avenue/ City Library Driveway (Driveway #4) (Assuming Driveway #6 is closed)
SB LT Movement	LOS = B	LOS = B
	Control Delay = 12.1 sec	Control Delay = 12.2 sec
	V/C = 0.26	V/C = 0.27
WB LT Movement	LOS = E	LOS = E
	Control Delay = 43.4 sec	Control Delay = 44.3 sec
	V/C = 0.35	V/C = 0.35
WB RT Movement	LOS = C	LOS = C
	Control Delay = 15.7	Control Delay = 16.4
	V/C = 0.30	V/C = 0.36

As indicated in Table 2, closure of driveway 6 will have a very small impact to driveway 4 and driveway 4 will continue to meet City standards for unsignalized intersection operations.

TIA Comment #3d

d) More information is needed on the timing of the traffic studies. It is unclear if the studies were completed when Kmart was open or closed (or both) and which data set was used.

Response to TIA Comment #3d

The traffic counts used in the April 2013 TIA were collected when Kmart was open. The majority of the information presented in the supplemental May 16, 2013 letter also relied on the traffic counts taken when Kmart was open.

The supplemental field observations and capacity estimates conducted for the City Hall driveway on SW Martinazzi (documented on pages 2 and 3 of the May 16, 2013 letter) were collected after the Kmart had closed. However, the capacity estimates presented in Tables 1 and 2 in the May 16, 2013 letter are considered reasonable as the northbound and southbound through traffic on SW Martinazzi has the most significant impact on the capacity of the turning movements at the driveway. The closure of Kmart has likely resulted in very little change to the northbound and southbound through traffic on Martinazzi (most Kmart customers using Martinazzi would have turned left in or right out of the City Hall driveway and that total demand is represented in the existing traffic counts (from the April 2013 TIA) and factored into the total traffic projections.

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TIA Comment #3e

e) The applicant's traffic consultant does not draw any conclusions on the adequacy of the existing City driveway/easement taking into account the traffic generation from the proposed development, other driveway closures, and queuing issues on Martinazzi Avenue. The applicant needs to analyze this and make a conclusion about the adequacy of the existing driveway to serve this development.

Response to TIA Comment #3e

We believe several conclusions have been presented to the City regarding the operation of the City driveway (driveway 4 in the TIA). The most substantive conclusions are as follows:

- The City driveway currently meets the City of Tualatin's Level of Service standard and will continue to meet the standard with the added traffic from Nyberg Rivers.
- There are some existing operational deficiencies that exist at the City driveway under existing conditions due to the presence of standing queues on SW Martinazzi that occasionally extend to and beyond the City Hall driveway. The analysis presented to date has demonstrated that the Nyberg Rivers development will have very little impact on this existing condition.
- An option that would eliminate the City driveway and replace it with the extension of SW Seneca Street has also been studied. Under this scenario the new SW Seneca/SW Martinazzi intersection would be signalized and would result in a significant operational improvement relative to the existing condition at the aforementioned City driveway.

None of the above conclusions suggest that the City hall driveway "must" be closed as a result of the Nyberg Rivers development as this conclusion is not supported by the traffic engineering evidence. Representatives from CenterCal remain very willing to work with the City to implement solutions that improve the operations at the driveway (including helping to implement the Seneca Street extension).

TIA Comment #3f

f) On Page 7 of the Master Plan, the applicant has indicated that the Primary Development Area will be redeveloped to support traditional shopping center related uses. The applicant has used a trip generation rate for Shopping Centers throughout the TIA. This is applied to all of the uses on the site. City staff questions if this results in a lower than expected trip generation. In informal discussions with the applicant, staff is aware that a specialty grocery tenant is proposed for Bldg. 1005, a stand-alone 45,000 fitness club is proposed for Building N-100 and a new drive-through restaurant use is proposed in Building H-100 – in addition to the applicant's proposal to retain drive-through uses on Buildings A, B, C, and a relocated F-100 (we believe that retaining drive-through uses on Bldg B is in error, as stated above). Staff believes it is inappropriate to apply a Shopping Center trip generation rate when so many of these proposed uses are auto-intensive and don't have traditional shopping center characteristics. In the revised submittal, please clarify the proposed uses for each building so that an accurate trip generation can be

Exhibit 1
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analyzed on the site. Based on our understanding of the proposed uses from informal conversations, staff believes that the following uses should analyzed separately from the Shopping Center trip generation rate:

i. The two drive-through restaurants (Buildings F-100 and H-100);
ii. The grocery store (Bldg 1005); and
iii. The 45,000 square foot stand-alone health club (N-100)
Please apply the correct trip generation rates in the revised submittal.

Response to TIA Comment #3f

We strongly disagree with the premise that the above uses should be separated from the shopping center for the purposes of the TIA. As noted in *Trip Generation, 9th Edition (published by the Institute of Transportation Engineers),* "A shopping center is an integrated group of commercial establishments that is planned, developed, owned and managed as a unit. Many shopping centers, in addition to the integrated unit of shops in one building or enclosed around a mall, include outparcels (peripheral buildings or pads located on the perimeter of the center adjacent to the streets and major access points."

Separating the higher trip generating uses from the shopping center as the City suggests and continuing to apply the shopping center trip generation rate for the lower trip generating uses (which assumes a blend of higher and lower trip generating uses) would result in an unreasonably conservative estimate of trip generation. ITE practice would then dictate application of internal trip reductions between each of the site uses to account for internal trips that are inherently addressed in the shopping center trip data. To emphasize this point, a weekday p.m. peak hour trip generation calculation was performed where all of the major site uses were separated. A summary table of these calculations is shown in Table 3 below and the detailed breakout calculations are summarized in Appendix A.

Table 3 - Nyberg Rivers Trip Generation (with uses separated)

	ITE Code	Size (sq. ft.)	Weekday PM Peak Hour		
			Total	In	Out
Existing Site Driveways[1]	-	-	945	435	510
Less Existing Library[2]	*590*	*22,123*	*(160)*	*(75)*	*(85)*
Less Existing Civic Uses[3]	*715*	*~10,000*	*(50)*	*(10)*	*(40)*
Total Existing Retail			**735**	**350**	**385**
Proposed Site[5]	820	307,000[4]	1,465	750	715
Less Existing Retail Driveway Counts			*(735)*	*(350)*	*(385)*
Sub Total			730	400	330
Less Internal Trips (20%)			*(295)*	*(150)*	*(145)*
Pass-by Trips (varies)			*(310)*	*(155)*	*(155)*
Net New Trips			**125**	**95**	**30**

Exhibit 1
Attachment L

Table 4 below compares Table 3 above with the original Trip Generation calculations in the *April 2013 Nyberg Rivers Traffic Impact Study*. The following key points can be taken from the comparison:

- Separating out the uses results in a total gross trip generation that is approximately nine percent higher during the weekday p.m. peak hour.
- However, the total driveway trips are approximately 15 percent lower when the uses are separated. The reason for the reduction is due to the assumption that 20 percent of the trips are captured internally when we separate the uses. There is no internal trip reduction for the shopping center because it is already incorporated in the trip generation rate.
- The total net new trips are substantially lower when separating out the uses. The reason for the substantial difference is related to the fact that the higher trip generating uses (banks and fast food restaurant) have a much higher pass-by rate than what is included in the shopping center rate.

Table 4 – Summary Comparison of Trip Generation Methodologies

	Trip Generation Summary from the Original April 2013 Traffic Impact Study (Weekday PM Peak Hour Trips)	Trip Generation Summary Separating All Proposed Site Uses (Weekday PM Peak Hour Trips)
Total Gross Trip Generation	1,350	1,465
Total Driveway Trips	1,350	1,170
Net New Trips	405	125

In summary, Table 4 clearly shows that separating out the site uses would result in a lower number of total driveway trips and a lower number of net new driveway trips. As such, the trip generation methodology used in the April 2013 is more conservative and provides a more robust estimate of the transportation related impacts associated with the proposed Nyberg Rivers development.

To provide further evidence that the using the ITE shopping center trip generation rate results in a reasonable yet conservative estimate of trip generation two local examples (Nyberg Woods and Bridgeport Village) were evaluated.

- In 2007 the total volume of driveway trips were counted for the three driveways serving Bridgeport Village. At the time Bridgeport Village had approximately 440,000 gross square feet of leasable retail floor area (GLA) which included a Wild Oats supermarket. The actual driveway counts revealed a total trip generation rate of 2.99 trips per thousand square feet of GLA during the weekday p.m. peak hour (4-6 p.m.). *Trip Generation, 9th Edition* suggests a 440,000 square foot shopping center would result in a trip generation rate of approximately 3.67 trips per thousand square feet of GLA evaluation, which is approximately 20 percent higher than the actual trip generation rate. On a Saturday peak hour the actual trip rate was found to be approximately 25 percent less than the ITE Shopping Center trip generation rate.

Exhibit 1
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- Nyberg Woods (directly across the site from I-5) includes approximately 207,000 gross square feet of leasable floor area (GLA). Actual traffic counts were collected in 2012 which revealed a total trip generation rate of 3.74 trips per thousand square feet of GLA during the weekday p.m. peak hour (4-6 p.m.). *Trip Generation, 9th Edition* suggests a 207,000 square foot shopping center would result in a trip generation rate of approximately 4.71 trips per thousand square feet of GLA evaluation, which, similar to Bridgeport Village is approximately 20 percent higher than the actual trip generation rate. On a Saturday peak hour the actual trip rate was found to be approximately 7 percent lower than the ITE Shopping Center trip generation rate.

Based on these two local retail centers and the mix of uses they reflect, we remain confident that use of the ITE shopping center data is not only appropriate, but likely represents a conservative (overestimates) the impact of the proposed development.

We trust this local trip generation data helps City staff to confirm the reasonableness of applying the Shopping Center trip generation rate for the proposed Nyberg Rivers project.

Thank you for the opportunity to respond to staffs questions and comments. We would be happy to further discuss these or other issues as needed and look forward to finalizing the on- and off-site mitigation needs associated with the project.

If you have any questions, please contact us.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Mark Vandehey, P.E.

Exhibit 1
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Appendix A Detailed Trip Generation Calculations

Nyberg Rivers Calculated Trip Generation Values for Weekday PM Peak, Including Existing Development

Land Use	ITE Code	Size (SF)	Discount Rate	Total Trips	Trips In	Trips Out
Sporting Goods Superstore				185	89	96
Internal Trips	861	110,093	0.2	37	18	19
Pass-by Trips			0	0	0	0
Net New Trips				148	71	77
Furniture Store				10	5	5
Internal Trips	890	21,750	0.2	2	1	1
Pass-by Trips			0.53	4	2	2
Net New Trips				4	2	2
Specialty Retail				182	80	102
Internal Trips	826	66,777	0.2	36	16	20
Pass-by Trips			0	0	0	0
Net New Trips				145	64	81
Drive-in Bank				230	115	115
Internal Trips	912	9,485	0.2	46	23	23
Pass-by Trips			0.47	87	43	43
Net New Trips				98	49	49
Fast-Food Restaurant with Drive-Through Window				262	136	126
Internal Trips	934	8,026	0.2	52	27	25
Pass-by Trips			0.5	101	50	50
Net New Trips				109	59	50
High-Turnover Sit-Down Restaurant				121	73	48
Internal Trips	932	12,297	0.2	24	15	10
Pass-by Trips			0.43	33	17	17
Net New Trips				64	41	22
New Seasons Grocery Store				318	162	156
Internal Trips	850	33,572	0.2	64	32	31
Pass-by Trips			0.36	90	45	45
Net New Trips				165	85	80
Health/Fitness Club				159	91	68
Internal Trips	492	45,000	0.2	32	18	14
Pass-by Trips			0	0	0	0
Net New Trips				127	72	55
	Total SF	307,000	**Total Net New Trips**	859	443	416

Summary of Nyberg Rivers Calculated Trip Generation Values for Weekday PM Peak					
Land Use	**ITE Code**	**Size (SF)**	**Total Trips**	**Trips In**	**Trips Out**
Existing Site					
Existing Site Driveways	-	-	945	435	510
Less Existing Library	590	22,123	160	75	85
Less Existing Civic Uses	715	~10,000	50	10	40
Total Existing Retail			**735**	**350**	**385**
Future Site					
Future Site Driveways (sporting goods superstore, furniture store, specialty retail, drive-in bank, fast-food restaurant, sit-down restaurant, supermarket, health/fitness club)	861, 890, 826, 912, 934, 932, 850, 492	307,000	1467	750	717
Less Existing Driveway Counts			735	350	385
Sub-Total			732	400	332
Less Total Internal Trips			293	150	143
Less Total Pass-by Trips			314	157	157
Total Net New Trips			124	93	31

Exhibit 1
Attachment L

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

July 30, 2013

Project #: 12116

Christe White
Radler, White, Parks & Alexander, LLP
111 SW Columbia Street, Suite 1100
Portland, OR 97062

RE: Response to Mackenzie Nyberg Rivers Transportation Review Letter

This letter addresses the transportation issues identified in the July 22, 2013 letter from Brent Ahrend to Bob Durgan. Each of the Mackenzie comments are italicized followed by our response.

Comment: *A corridor analysis should be provided to replicate the effects of adjacent intersections on delay and vehicle queues.*

Response: We disagree. The Kittelson analysis conducted in the April 2013 TIA and supplemental material reasonably estimate the traffic impacts associated with the Nyberg Rivers proposed development plan. The operations analysis conducted at the study intersections was performed using Synchro and SimTraffic. For the SW Tualatin-Sherwood Road corridor which operates under an adaptive signal control, these programs are sufficient at capturing and assessing the effects of traffic interaction between adjacent intersections.

At the intersection where the project is anticipated to have the most significant impact (SW Nyberg Road/SW Tualatin-Sherwood/Fred Meyer/Site driveway), field observations confirmed that deterministic queuing estimates presented in the TIA are reasonable and can be relied upon for future operational and design considerations.

Comment: *Effects of WES rail crossings should be addressed (it has been ignored in the analysis), notably for queue spillback to other intersections.*

Response: We disagree. First, it should be noted that the Nyberg Rivers project is forecast to have an insignificant impact to the SW Boones Ferry/SW Tualatin-Sherwood Road intersection (less than two percent increase in traffic and less than one vehicle per signal cycle on any approach). Regardless, during the 4 to 5 times per peak hour WES pre-empts the eastbound and westbound movements, additional green time is allocated to the north-south through movements on SW Boones Ferry Road. Depending on when the pre-emption occurs, additional green time is then provided to the east-west through movements in the subsequent signal phase to attempt to compensate for lost green time in the previous phase. As a result of WES, the average control delay results shown at this intersection for all conditions (existing, background and total) may be slightly underestimated for some movements and slightly overestimated for others. Under any scenario, the intersection meets or exceeds Washington County's operating standards.

Comment: *Signal timing parameters need to be adjusted, specifically to address the longer travel times for eastbound traffic which must stop behind the rail crossing.*

Response: Detailed signal timing parameters may provide an added level of precision to the operational assessment of the SW Tualatin-Sherwood Road/SW Boones Ferry Road intersection. This level of additional analysis is clearly not warranted given the minimal impacts that the proposed Nyberg Rivers project is forecast to have. The project is projected to add approximately 20 vehicles to this eastbound through movement during the weekday p.m. peak hour which is less than one vehicle every signal cycle. Overall the project will result in less than a 2 percent increase in traffic at this intersection. This impact by any traffic engineering standard can be considered insignificant and is well below an impact level that would be perceived by anyone who regularly travels through the intersection.

Comment: *Trucks have been observed slowing at the rail crossing, which will impact available capacity. This should be accounted for in the analysis.*

Response: As noted previously, we believe this added level of precision in the analysis is unwarranted given the project's insignificant impact to the SW Tualatin-Sherwood Road/SW Boones Ferry Road intersection and the fact that the capacity impact of trucks is already reflected in the analysis methodology. No evidence has been offered to suggest that the "observed slowing" would result in a greater capacity impact than is already reflected in the analysis methodology.

Comment: *Traffic counts should include those vehicles arriving at the back of a queue, not just those making it through the intersection at peak times (HCM 2010 requires this in congested corridors).*

Response: The traffic count issue described above only applies to situations where demand exceeds capacity over the entire analysis period. There is no evidence to suggest that the demand exceeds capacity over the entire study period for the study intersections on SW Tualatin-Sherwood Road. Occasional cycle failures do occur as is common on high volume arterials similar to SW Tualatin-Sherwood Road. To the extent there is some residual demand from one peak 15 minute interval it will be captured in the next 15 minute interval. The volumes used in the TIA are an adequate representation of the demand for the peak hours that were studied.

Thank you for the opportunity to respond to the Mackenzie comments. Please contact us with any questions you may have.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Exhibit 1
Attachment L

Mark Vandehey, P.E.

Exhibit 1
Attachment L

Morgan Holen & ASSOCIATES LLC
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Nyberg Rivers – Tualatin, Oregon
Tree Assessment Report
September 5, 2013

MHA1324

Purpose

This Tree Assessment Report for the Nyberg Rivers project site in Tualatin, Oregon, is provided pursuant to City of Tualatin Development Code Chapter 34. This report describes the existing trees located on the project site, as well as recommendations for tree removal, retention, and protection during construction. This report is based on observations made by International Society of Arboriculture (ISA) Certified Arborist Morgan Holen (PN-6145A) during a site visit conducted on July 29, 2013. A complete description of individual trees is provided in the enclosed tree inventory data.

Scope of Work and Limitations

Morgan Holen & Associates, LLC, was contracted by Cardno to collect tree inventory data for individual trees measuring eight inches and larger in diameter and to develop an arborist report and tree plan for the project. The site is planned for commercial redevelopment. A site plan was provided by Cardno illustrating the location of existing trees and potential construction impacts; the required Tree Preservation Site Plan is enclosed.

Visual Tree Assessment (VTA) was performed on individual trees located across the site. The enclosed tree inventory data and site plan demonstrate that all trees on site were physically identified; additionally, existing trees were identified in the field with aluminum tags corresponding with tree identification numbers provided in the tree inventory data and illustrated on the site plan. VTA is the standard process developed by the ISA whereby the inspector visually assesses the tree from a distance and up close, looking for defect symptoms and evaluating overall condition and vitality of individual trees. Trees were evaluated in terms of general condition and potential construction impacts. Following the inventory fieldwork, we coordinated with Cardno to discuss and finalize treatment recommendations.

The client may choose to accept or disregard the recommendations contained herein, or seek additional advice. Neither this author nor Morgan Holen & Associates, LLC, have assumed any responsibility for liability associated with the trees on or adjacent to this site.

General Description

The Nyberg Rivers project site is heavily developed with existing commercial buildings and asphalt parking lots. In all, 607 individual trees are included in the inventory and shown on the site plan. However, 59 (10%) trees measured less than eight inches in diameter, the City's threshold diameter for regulated trees. Therefore, 548 (90%) non-exempt trees measuring eight inches and larger were inventoried, representing 41 different tree species. A complete description of individual trees is provided in the enclosed tree inventory data.

Except for the relatively natural area in the northeast portion of the site, the trees were primarily planted for landscaping purposes and include a variety of species and trees in variable condition. The trees located within parking lot islands and directly adjacent to buildings are in mostly moderate to poor condition; common defects include sunscald, stem decay, and crown dieback. Many of these trees appeared with inadequate soil volume and drought stress.

Exhibit 1
Attachment M

The oaks (*Quercus* spp.) and Douglas-firs (*Pseudotsuga menziesii*) are the most prominent trees on the site, but also exhibit variable condition. Many of the oaks have not received regular maintenance over time and have broad crowns and numerous low-lying branches, and some of the Douglas-firs appear with defects that increase their potential for failure including codominant stems with included bark.

Black locust (*Robinia pseudoacacia*), English hawthorn (*Crataegus monogyna*), English holly (*Ilex aquifolium*), European white birch (*Betula pendula*), Norway maple (*Acer platanoides*), sweet cherry (*Prunus avium*), and tree-of-heaven (*Ailanthus altissima*) are widely accepted as being invasive tree species in our region and account for approximately 18-percent of the non-exempt inventoried trees. Invasive species are broadly defined as species that were introduced by humans to locations outside of their native range that spread and persist over large areas, outcompeting native species. Invasive species negatively impact natural ecosystems by displacing native species, reducing biological diversity and interfering with natural succession.

Individual trees were rated in terms of general condition as either poor, fair, or good; none of the inventoried trees were noted as excellent or remarkable. Of the 548 non-exempt trees, 101 (18%) appeared in poor condition, 293 (54%) appeared in fair condition, and 154 (28%) appeared in good condition. A summary of the number of non-exempt inventoried trees by species and general condition rating is provided in table 1 below.

Table 1. Count of Non-Exempt Inventoried Trees by Species and Condition – Nyberg Rivers, Tualatin.

Common Name	Species Name	Poor	Fair	Good	Total	%
Apple	*Malus spp.*	1			**1**	0.2%
Austrian pine	*Pinus nigra*	2		1	**3**	0.5%
bigleaf maple	*Acer macrophyllum*	9	56	5	**70**	12.8%
black cottonwood	*Populus trichocarpa*	1	1		**2**	0.4%
black locust	*Robinia pseudoacacia*	7			**7**	1.3%
copper beech	*Fagus sylvatica*			3	**3**	0.5%
deodar cedar	*Cedrus deodara*			1	**1**	0.2%
Dogwood	*Cornus spp.*		3		**3**	0.5%
Douglas-fir	*Pseudotsuga menziesii*		75	98	**173**	31.6%
English hawthorn	*Crataegus monogyna*	9	5		**14**	2.6%
English holly	*Ilex aquifolium*		1		**1**	0.2%
English walnut	*Juglans regia*	1			**1**	0.2%
European white	*Betula pendula*	6	1		**7**	1.3%
flowering cherry	*Prunus spp.*	18	6		**24**	4.4%
flowering pear	*Pyrus spp.*	3	4	2	**9**	1.6%
flowering plum	*Prunus spp.*		1		**1**	0.2%
giant sequoia	*Sequoiadendron giganteum*		1	1	**2**	0.4%
grand fir	*Abies grandis*	1	3	1	**5**	0.9%
hornbeam	*Ostrya virginiana*			6	**6**	1.1%
Japanese maple	*Acer japonica*		1	1	**2**	0.4%
lodgepole pine	*Pinus contorta*	1	9		**10**	1.8%
magnolia	*Magnolia spp.*			1	**1**	0.2%
Norway maple	*Acer platanoides*	4	26	6	**36**	6.6%

Common Name	Species Name	Poor	Fair	Good	Total	%
Oregon ash	*Fraxinus latifolia*		31		**31**	5.7%
Oregon white oak	*Quercus garryana*		4	3	**7**	1.3%
Pacific yew	*Taxus brevifolia*		1		**1**	0.2%
pin oak	*Quercus palustris*	6	2		**8**	1.5%
ponderosa pine	*Pinus ponderosa*		1	1	**2**	0.4%
red alder	*Alnus rubra*		8		**8**	1.5%
red maple	*Acer rubrum*	3	12	2	**17**	3.1%
red oak	*Quercus rubra*	2	9	4	**15**	2.7%
scarlet oak	*Quercus coccinea*	2	4	4	**10**	1.8%
Scots pine	*Pinus sylvestris*	2	2		**4**	0.7%
Scouler's willow	*Salix scouleriana*	1			**1**	0.2%
silk tree	*Albizia julibrissin*		1		**1**	0.2%
spruce	*Abies spp.*		1		**1**	0.2%
sugar maple	*Acer saccharum*		1	2	**3**	0.5%
sweet cherry	*Prunus avium*	22	7	2	**31**	5.7%
sweetgum	*Liquidambar styraciflua*		1		**1**	0.2%
tree-of-heaven	*Ailanthus altissima*		1		**1**	0.2%
western redcedar	*Thuja plicata*		14	10	**24**	4.4%
Total		**101**	**293**	**154**	**548**	**100%**
Percent of Total		**18%**	**54%**	**28%**	**100%**	

Tree Plan Recommendations
Prior to preparation of this report we have reviewed and considered the approval criteria identified in the Tualatin Development Code Section 34.230. Section 34.230 requires a detailed justification for proposed tree removal. The enclosed tree inventory data and this written report, prepared on September 5, 2013, address all of the relevant criteria.

As provided in the enclosed tree inventory data, individual trees recommended for removal were assigned a reason for removal (shown for each tree to be removed under “criteria” in the tree inventory data table) based on the removal criteria as follows:

Criteria for Tree Removal per TDC 34.230:

- **D1** – Diseased and the disease threatens the structural integrity of the tree;
- **D2** – Diseased and the disease permanently and severely diminishes the aesthetic value of the tree; or
- **D3** – Diseased and the continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or aesthetic value.
- **H** – Hazardous.
- **C** – Construction necessitates tree removal.

None of the 548 non-exempt inventoried trees are remarkable and based on the general condition of existing trees and the proposed site plan which necessitates significant grading, 287 (52%) trees are recommended for removal and 261 (48%) trees are recommended for preservation. Of the 287 non-exempt inventoried trees planned for removal, four are recommended for removal solely because of hazardous condition and 283 require removal for the purposes of construction; removal of these trees is necessary in order to construct the proposed improvements. In addition, 11 of the trees recommended for removal for construction are diseased and the disease threatens the structural integrity of the tree (D1), one tree is diseased and the disease permanently and severely diminishes the aesthetic value of the tree (D2), and 23 of these trees are hazardous and present a danger of failure (H). Thus, 35 of the trees to be removed are diseased and/or hazardous. Note that D3 was not utilized as a justification for tree removal. Table 2 provides a summary of the number of trees to be removed based on the criteria.

Table 2. Count of Non-Exempt Inventoried Trees by Removal Criteria – Nyberg Rivers, Tualatin.

Criteria for Tree Removal*	Number of Trees	%
C	252	87.8%
C and D1	8	2.8%
C, D1, and H	3	1.0%
C, D2, and H	1	0.3%
C and H	19	6.6%
H	4	1.4%
Total	**287**	**100%**

*Refer to definitions provided on the previous page.

Trees recommended for preservation will be retained in their relatively natural condition along the northern boundary of the project site and in a relatively natural grove in the northeast portion of the site and along the I-5 frontage. Based on the overall condition of the grove and proximity to proposed construction impacts, these trees are the most suitable trees for preservation on the site and are recommended for retention intact as an undisturbed group. Specifications for tree protection are provided in the next section.

Tree Protection Standards

The trees recommended for preservation will need special consideration to assure their protection during construction. We highly recommend a preconstruction meeting with the owner, contractors, and project arborist to review tree protection measures and address questions or concerns on site. Tree protection measures include:

- **Fencing.** Trees to remain on site shall be protected by installation of tree protection fencing to prevent injury to tree trunks or roots, or soil compaction within the root protection area, which generally coincides with tree driplines. Fences shall be 6-foot high steel on concrete blocks or orange plastic construction fencing on metal stakes. The project arborist shall determine the exact location and type of tree protection fencing. Trees located more than 30-feet from construction activity shall not require fencing.
- **Tree Protection Zone.** Without authorization from the Project Arborist, none of the following shall occur beneath the dripline of any protected tree:
    1. Grade change or cut and fill;
    2. New impervious surfaces;
    3. Utility or drainage field placement;
    4. Staging or storage of materials and equipment; or
    5. Vehicle maneuvering.

Root protection zones may be entered for tasks like surveying, measuring, and, sampling. Fences must be closed upon completion of these tasks.

- **Removal and Pruning.** Trees to be removed shall be clearly identified in the field with tree marking paint or by other means, and inspected and verified by the project arborist prior to site clearing. The need for pruning is not anticipated, but the project arborist shall help identify whether pruning is necessary once trees recommended for removal have been removed and the site is staked and prepared for construction. Tree removal and pruning shall be performed by a Qualified Tree Service.
- **Quality Assurance.** The project arborist shall supervise proper execution of this plan during construction and will be available on-call. It is the developer's responsibility to coordinate with the project arborist as needed.
- **Final Report.** After the project has been completed, the project arborist shall provide a final report that describes the measures needed to maintain and protect the remaining trees.

Please contact us if you have questions or need any additional information. Thank you for choosing Morgan Holen & Associates, LLC, to provide consulting arborist services for the Nyberg Rivers project.

Thank you,
Morgan Holen & Associates, LLC

Morgan E. Holen

Morgan E. Holen, Owner
ISA Certified Arborist, PN-6145A
ISA Tree Risk Assessment Qualified
Forest Biologist

Enclosures: MHA1324 Nyberg Rivers – Tree Inventory Data 7-29-13
Nyberg Rivers Tree Preservation Site Plan

Morgan Holen & Associates, LLC

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
500	Douglas-fir	*Pseudotsuga menziesii*	20	good			no	
501	Douglas-fir	*Pseudotsuga menziesii*	9	fair			no	
502	Douglas-fir	*Pseudotsuga menziesii*	32	good			no	
503	Douglas-fir	*Pseudotsuga menziesii*	18	fair	dead - snag		no	
505	grand fir	*Abies grandis*	16	fair			no	
506	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
508	bigleaf maple	*Acer macrophyllum*	20	good			no	
509	bigleaf maple	*Acer macrophyllum*	20	good			no	
511	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
512	bigleaf maple	*Acer macrophyllum*	8	fair			no	
513	Douglas-fir	*Pseudotsuga menziesii*	25	good			no	
514	Douglas-fir	*Pseudotsuga menziesii*	20	good			no	
515	Douglas-fir	*Pseudotsuga menziesii*	3*17	fair			no	
516	Douglas-fir	*Pseudotsuga menziesii*	17	good			no	
518	western redcedar	*Thuja plicata*	12	good			no	
519	western redcedar	*Thuja plicata*	14	good			no	
520	bigleaf maple	*Acer macrophyllum*	18	fair	extensive basal decay - meander path away from tree for safety		no	
521	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
522	western redcedar	*Thuja plicata*	9	good			no	
523	bigleaf maple	*Acer macrophyllum*	22	good			no	
527	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
528	Douglas-fir	*Pseudotsuga menziesii*	17	good			no	
529	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
530	Oregon ash	*Fraxinus latifolia*	16	fair			no	
531	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
532	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
533	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
534	red alder	*Alnus rubra*	12	fair			no	
535	western redcedar	*Thuja plicata*	12	good			no	

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No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
536	Douglas-fir	*Pseudotsuga menziesii*	12	good			no	
537	Oregon ash	*Fraxinus latifolia*	12	fair			no	
538	bigleaf maple	*Acer macrophyllum*	9	fair			no	
539	western redcedar	*Thuja plicata*	8	fair			no	
540	western redcedar	*Thuja plicata*	18	fair			no	
541	Douglas-fir	*Pseudotsuga menziesii*	20	good			no	
542	Douglas-fir	*Pseudotsuga menziesii*	20	good			no	
543	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
544	Douglas-fir	*Pseudotsuga menziesii*	11	fair			no	
545	western redcedar	*Thuja plicata*	15	good			no	
546	Douglas-fir	*Pseudotsuga menziesii*	17	good			no	
547	grand fir	*Abies grandis*	8	fair			no	
548	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
549	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
550	Douglas-fir	*Pseudotsuga menziesii*	9	fair			no	
551	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
552	Douglas-fir	*Pseudotsuga menziesii*	16	good			no	
553	Douglas-fir	*Pseudotsuga menziesii*	16	good			no	
554	Douglas-fir	*Pseudotsuga menziesii*	16	good			no	
555	Douglas-fir	*Pseudotsuga menziesii*	9	fair			no	
556	sweet cherry	*Prunus avium*	10	good			no	
557	Douglas-fir	*Pseudotsuga menziesii*	16	good			no	
558	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
559	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
561	Douglas-fir	*Pseudotsuga menziesii*	11	good			no	
562	Douglas-fir	*Pseudotsuga menziesii*	19	good			no	
563	Douglas-fir	*Pseudotsuga menziesii*	24	good			no	
564	western redcedar	*Thuja plicata*	18	good			no	
565	Douglas-fir	*Pseudotsuga menziesii*	14	good			no	
566	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	

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Exhibit 1
Attachment M

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
567	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
568	Douglas-fir	*Pseudotsuga menziesii*	9	fair			no	
569	Douglas-fir	*Pseudotsuga menziesii*	34	good			no	
570	western redcedar	*Thuja plicata*	8	fair			no	
571	western redcedar	*Thuja plicata*	8	fair			no	
572	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
573	western redcedar	*Thuja plicata*	8	fair			no	
574	Douglas-fir	*Pseudotsuga menziesii*	12	fair			no	
575	western redcedar	*Thuja plicata*	18	fair			no	
576	Oregon ash	*Fraxinus latifolia*	10	fair			no	
577	Oregon ash	*Fraxinus latifolia*	10	fair			no	
578	western redcedar	*Thuja plicata*	12	fair			no	
579	western redcedar	*Thuja plicata*	9	fair			no	
580	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
581	Douglas-fir	*Pseudotsuga menziesii*	28	good			no	
582	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
583	western redcedar	*Thuja plicata*	18	fair			no	
584	Douglas-fir	*Pseudotsuga menziesii*	20	good			no	
585	western redcedar	*Thuja plicata*	10	good			no	
586	Douglas-fir	*Pseudotsuga menziesii*	9	fair			no	
587	Douglas-fir	*Pseudotsuga menziesii*	17	good			no	
588	western redcedar	*Thuja plicata*	10	fair			no	
589	Douglas-fir	*Pseudotsuga menziesii*	10	fair			no	
590	Douglas-fir	*Pseudotsuga menziesii*	16	good			no	
591	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
592	Douglas-fir	*Pseudotsuga menziesii*	10	fair			no	
593	Douglas-fir	*Pseudotsuga menziesii*	12	fair			no	
594	Douglas-fir	*Pseudotsuga menziesii*	10	fair			no	
595	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
596	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
597	western redcedar	*Thuja plicata*	12	good			no	
597b	western redcedar	*Thuja plicata*	20	good	located 28-ft north of tree 597		no	
598	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
599	Douglas-fir	*Pseudotsuga menziesii*	28	good			no	
600	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
601	dogwood	*Cornus spp.*	8	fair			no	
602	red alder	*Alnus rubra*	12	fair			no	
603	red alder	*Alnus rubra*	10	fair			no	
604	Oregon ash	*Fraxinus latifolia*	10	fair			no	
605	bigleaf maple	*Acer macrophyllum*	3*8	fair			no	
606	bigleaf maple	*Acer macrophyllum*	2*8	fair			no	
607	bigleaf maple	*Acer macrophyllum*	8	fair			no	
608	bigleaf maple	*Acer macrophyllum*	2*10	fair			no	
609	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
610	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
611	Douglas-fir	*Pseudotsuga menziesii*	14	fair			no	
612	Douglas-fir	*Pseudotsuga menziesii*	16	good			no	
613	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
614	Douglas-fir	*Pseudotsuga menziesii*	12	fair			no	
615	Douglas-fir	*Pseudotsuga menziesii*	13	fair			no	
616	Douglas-fir	*Pseudotsuga menziesii*	24	good			no	
617	Douglas-fir	*Pseudotsuga menziesii*	19	good			no	
618	western redcedar	*Thuja plicata*	17	good			no	
619	Douglas-fir	*Pseudotsuga menziesii*	36	good			no	
620	Douglas-fir	*Pseudotsuga menziesii*	24	good			no	
621	Douglas-fir	*Pseudotsuga menziesii*	30	good			no	
622	Douglas-fir	*Pseudotsuga menziesii*	30	good			no	
623	Douglas-fir	*Pseudotsuga menziesii*	22	good			no	
624	Pacific yew	*Taxus brevifolia*	8	fair			no	
625	Douglas-fir	*Pseudotsuga menziesii*	17	good			no	

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No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
626	Douglas-fir	*Pseudotsuga menziesii*	10	fair			no	
626b	Douglas-fir	*Pseudotsuga menziesii*	8	fair	located 20-ft 230-degrees from 626		no	
627	bigleaf maple	*Acer macrophyllum*	16	good			no	
628	Douglas-fir	*Pseudotsuga menziesii*	34	good			no	
629	Douglas-fir	*Pseudotsuga menziesii*	22	good			no	
639	Douglas-fir	*Pseudotsuga menziesii*	15	good			no	
641	sweet cherry	*Prunus avium*	16	good			no	
642	Douglas-fir	*Pseudotsuga menziesii*	16	good			no	
643	grand fir	*Abies grandis*	10	good			no	
644	grand fir	*Abies grandis*	8	fair			no	
645	Douglas-fir	*Pseudotsuga menziesii*	25	good			no	
646	Douglas-fir	*Pseudotsuga menziesii*	21	good			no	
647	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
648	Douglas-fir	*Pseudotsuga menziesii*	22	good			no	
649	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
650	Douglas-fir	*Pseudotsuga menziesii*	18	good			no	
651	Douglas-fir	*Pseudotsuga menziesii*	17	good			no	
652	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
653	Douglas-fir	*Pseudotsuga menziesii*	12	fair			no	
654	Douglas-fir	*Pseudotsuga menziesii*	17	fair			no	
655	Douglas-fir	*Pseudotsuga menziesii*	17	fair			no	
656	Douglas-fir	*Pseudotsuga menziesii*	8	fair			no	
657	Douglas-fir	*Pseudotsuga menziesii*	22	good			no	
658	bigleaf maple	*Acer macrophyllum*	10	fair			no	
659	bigleaf maple	*Acer macrophyllum*	8	fair			no	
660	bigleaf maple	*Acer macrophyllum*	2*12	fair			no	
661	bigleaf maple	*Acer macrophyllum*	10	fair			no	
663	bigleaf maple	*Acer macrophyllum*	21,2*16	fair	trees 663-665 are 1 tree; tip dieback		yes	C
666	bigleaf maple	*Acer macrophyllum*	10	fair	intermediate crown class		yes	C
667	bigleaf maple	*Acer macrophyllum*	13	fair	broken branches, branch decay		yes	C

Exhibit 1
Attachment M

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
673	bigleaf maple	*Acer macrophyllum*	32	fair			no	
674	bigleaf maple	*Acer macrophyllum*	2*10	fair			no	
675	bigleaf maple	*Acer macrophyllum*	8	fair			no	
676	Douglas-fir	*Pseudotsuga menziesii*	26	fair			no	
678	Douglas-fir	*Pseudotsuga menziesii*	21	fair			no	
679	Douglas-fir	*Pseudotsuga menziesii*	13	fair			no	
680	Douglas-fir	*Pseudotsuga menziesii*	15	fair			no	
681	Douglas-fir	*Pseudotsuga menziesii*	20	fair			no	
682	bigleaf maple	*Acer macrophyllum*	10	fair			no	
683	bigleaf maple	*Acer macrophyllum*	2*8	fair			no	
684	bigleaf maple	*Acer macrophyllum*	2*10	fair			no	
687	Douglas-fir	*Pseudotsuga menziesii*	17	fair	dead - habitat value, no target potential		no	
688	Douglas-fir	*Pseudotsuga menziesii*	10	fair	thin crown		no	
689	Douglas-fir	*Pseudotsuga menziesii*	18	fair	thin crown		no	
690	bigleaf maple	*Acer macrophyllum*	8	fair			no	
695	sweet cherry	*Prunus avium*	13	poor	invasive species		yes	C
697	Douglas-fir	*Pseudotsuga menziesii*	22	good			yes	C
697b	Oregon white oak	*Quercus garryana*	12	good	located 24' 220-degrees from 697		yes	C
698	Douglas-fir	*Pseudotsuga menziesii*	14	fair	ivy infestation		yes	C
699	Douglas-fir	*Pseudotsuga menziesii*	14	fair	ivy infestation		yes	C
700	Douglas-fir	*Pseudotsuga menziesii*	10	fair	ivy infestation		yes	C
701	Douglas-fir	*Pseudotsuga menziesii*	34	good	ivy infestation		yes	C
702	Douglas-fir	*Pseudotsuga menziesii*	16	fair	ivy infestation		yes	C
703	Douglas-fir	*Pseudotsuga menziesii*	9	fair	ivy infestation		yes	C
705	Douglas-fir	*Pseudotsuga menziesii*	20	good			yes	C
706	Douglas-fir	*Pseudotsuga menziesii*	24	good			no	
707	Douglas-fir	*Pseudotsuga menziesii*	17	good			yes	C
708	Douglas-fir	*Pseudotsuga menziesii*	34	good			yes	C
709	Douglas-fir	*Pseudotsuga menziesii*	17	good			yes	C
711	Douglas-fir	*Pseudotsuga menziesii*	30	good			no	

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No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
712	dogwood	*Cornus spp.*	8	fair	ivy infestation		yes	C
713	bigleaf maple	*Acer macrophyllum*	13	fair	ivy infestation		yes	C
715	Douglas-fir	*Pseudotsuga menziesii*	28	good			yes	C
716	Douglas-fir	*Pseudotsuga menziesii*	9	fair			yes	C
717	bigleaf maple	*Acer macrophyllum*	10	fair			yes	C
718	Douglas-fir	*Pseudotsuga menziesii*	13	fair			yes	C
719	Douglas-fir	*Pseudotsuga menziesii*	10	fair			yes	C
720	Douglas-fir	*Pseudotsuga menziesii*	24	good			yes	C
721	Douglas-fir	*Pseudotsuga menziesii*	26	good			yes	C
722	Douglas-fir	*Pseudotsuga menziesii*	10	fair			yes	C
723	Douglas-fir	*Pseudotsuga menziesii*	10	fair			yes	C
724	Douglas-fir	*Pseudotsuga menziesii*	28	good			yes	C
725	Douglas-fir	*Pseudotsuga menziesii*	30	good			yes	C
726	bigleaf maple	*Acer macrophyllum*	10	fair			yes	C
727	Douglas-fir	*Pseudotsuga menziesii*	12	fair			yes	C
728	Douglas-fir	*Pseudotsuga menziesii*	9	fair			yes	C
728b	bigleaf maple	*Acer macrophyllum*	14	fair	located 22' west of 728		yes	C
729	English hawthorn	*Crataegus monogyna*	12	fair	invasive species		yes	C
730	Douglas-fir	*Pseudotsuga menziesii*	11	fair			yes	C
731	bigleaf maple	*Acer macrophyllum*	12	fair	dead branches		yes	C
732	Douglas-fir	*Pseudotsuga menziesii*	11	fair			yes	C
733	Douglas-fir	*Pseudotsuga menziesii*	16	fair			yes	C
734	Douglas-fir	*Pseudotsuga menziesii*	10	fair			yes	C
735	bigleaf maple	*Acer macrophyllum*	10	fair			yes	C
736	Douglas-fir	*Pseudotsuga menziesii*	12	fair			yes	C
737	bigleaf maple	*Acer macrophyllum*	8	fair			yes	C
738	bigleaf maple	*Acer macrophyllum*	8	fair			yes	C
739	Douglas-fir	*Pseudotsuga menziesii*	12	fair			yes	C
740	bigleaf maple	*Acer macrophyllum*	8	fair			yes	C
741	Douglas-fir	*Pseudotsuga menziesii*	22	good			yes	C

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No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
742	Douglas-fir	*Pseudotsuga menziesii*	20	good			yes	C
743	grand fir	*Abies grandis*	8	poor			yes	C
744	Douglas-fir	*Pseudotsuga menziesii*	22	good			yes	C
745	bigleaf maple	*Acer macrophyllum*	12	fair			yes	C
746	English holly	*Ilex aquifolium*	8	fair	invasive species		yes	C
747	bigleaf maple	*Acer macrophyllum*	20	fair			no	
748	Douglas-fir	*Pseudotsuga menziesii*	38	good			no	
749	bigleaf maple	*Acer macrophyllum*	18	fair			no	
750	bigleaf maple	*Acer macrophyllum*	16	fair			no	
751	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
752	Douglas-fir	*Pseudotsuga menziesii*	10	fair			no	
753	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
754	bigleaf maple	*Acer macrophyllum*	10	fair			no	
755	bigleaf maple	*Acer macrophyllum*	8	fair			no	
756	bigleaf maple	*Acer macrophyllum*	10	fair			no	
757	bigleaf maple	*Acer macrophyllum*	2*8	fair			no	
758	Douglas-fir	*Pseudotsuga menziesii*	24	good			no	
759	Douglas-fir	*Pseudotsuga menziesii*	10	fair			no	
760	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
761	bigleaf maple	*Acer macrophyllum*	12	fair			no	
762	Douglas-fir	*Pseudotsuga menziesii*	12	fair			no	
763	bigleaf maple	*Acer macrophyllum*	11	fair			no	
764	Douglas-fir	*Pseudotsuga menziesii*	11	fair			no	
765	Douglas-fir	*Pseudotsuga menziesii*	42	good			no	
785	English hawthorn	*Crataegus monogyna*	4*12	fair	invasive species		no	
786	English hawthorn	*Crataegus monogyna*	2*8	fair	invasive species		no	
787	bigleaf maple	*Acer macrophyllum*	9	fair			no	
788	Oregon white oak	*Quercus garryana*	14	fair			no	
789	bigleaf maple	*Acer macrophyllum*	2*10	fair			no	
790	bigleaf maple	*Acer macrophyllum*	2*8	fair			no	

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No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
791	bigleaf maple	*Acer macrophyllum*	8	fair			no	
792	bigleaf maple	*Acer macrophyllum*	8	fair			no	
793	bigleaf maple	*Acer macrophyllum*	8	fair			no	
794	bigleaf maple	*Acer macrophyllum*	11	fair			no	
795	bigleaf maple	*Acer macrophyllum*	12	fair			no	
796	bigleaf maple	*Acer macrophyllum*	12	fair			no	
844	Douglas-fir	*Pseudotsuga menziesii*	17	good	existing hardscape to south		yes	C
845	Douglas-fir	*Pseudotsuga menziesii*	17	good	existing hardscape to south		yes	C
847	Douglas-fir	*Pseudotsuga menziesii*	24	good	existing hardscape to south		yes	C
848	Douglas-fir	*Pseudotsuga menziesii*	19	good	existing hardscape to south		yes	C
849	Douglas-fir	*Pseudotsuga menziesii*	18	fair	codominant stems with included bark		yes	C, H
850	Douglas-fir	*Pseudotsuga menziesii*	22	good	only suitable for retention in group		yes	C
851	sweet cherry	*Prunus avium*	2*10	poor	invasive species		yes	C
852	sweet cherry	*Prunus avium*	9	poor	invasive species		yes	C
853	pin oak	*Quercus palustris*	8	poor			yes	C
854	pin oak	*Quercus palustris*	8	poor			yes	C
855	English hawthorn	*Crataegus monogyna*	3*8	poor	invasive species		yes	C
856	red oak	*Quercus rubra*	3*10	fair	twig dieback, thin crown		yes	C
874	English hawthorn	*Crataegus monogyna*	8	fair			yes	C
875	Douglas-fir	*Pseudotsuga menziesii*	12	fair			yes	C
876	Douglas-fir	*Pseudotsuga menziesii*	12	fair			yes	C
877	Douglas-fir	*Pseudotsuga menziesii*	28	good			yes	C
878	Douglas-fir	*Pseudotsuga menziesii*	25	good			yes	C
879	Oregon white oak	*Quercus garryana*	8	good			yes	C
880	Douglas-fir	*Pseudotsuga menziesii*	18	good			yes	C
881	Oregon white oak	*Quercus garryana*	10	fair			yes	C
882	Scouler's willow	*Salix scouleriana*	2*8	poor			yes	C
884	Douglas-fir	*Pseudotsuga menziesii*	30	good			yes	C
885	English hawthorn	*Crataegus monogyna*	8	poor	invasive species		yes	C
886	English hawthorn	*Crataegus monogyna*	8	poor	invasive species		yes	C

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
887	sweet cherry	*Prunus avium*	2*8	poor	invasive species		yes	C
888	sweet cherry	*Prunus avium*	8	poor	invasive species		yes	C
889	Oregon white oak	*Quercus garryana*	8	good			yes	C
890	sweet cherry	*Prunus avium*	2*10	poor	invasive species		yes	C
891	English hawthorn	*Crataegus monogyna*	2*8	poor	invasive species		yes	C
892	sweet cherry	*Prunus avium*	8	poor	invasive species		yes	C
901	hornbeam	*Ostrya virginiana*	10	good			yes	C
902	hornbeam	*Ostrya virginiana*	5*8	good			yes	C
903	hornbeam	*Ostrya virginiana*	2*8	good			yes	C
904	hornbeam	*Ostrya virginiana*	3*8	good			yes	C
904b	hornbeam	*Ostrya virginiana*	3*8	good	located north of 904		yes	C
904c	hornbeam	*Ostrya virginiana*	3*8	good	located north of 904b		yes	C
905	red oak	*Quercus rubra*	12	poor	decline; dead branches, branch decay		yes	C
906	Douglas-fir	*Pseudotsuga menziesii*	8	fair	young, vigorous; one-sided		yes	C
907	European white birch	*Betula pendula*	3*10	fair	invasive species, poor structure, ivy		yes	C
908	Japanese maple	*Acer japonica*	3*8	good	some stem decay		yes	C
909	Douglas-fir	*Pseudotsuga menziesii*	21	fair	codom, included bark, sap flow		yes	C, H
910	red oak	*Quercus rubra*	13	good	low branch structure		yes	C
911	Douglas-fir	*Pseudotsuga menziesii*	18	good	codom - appears stable		yes	C
912	red oak	*Quercus rubra*	19	good	dead branches		yes	C
913	red oak	*Quercus rubra*	24	good	dead branches		yes	C
914	sweet cherry	*Prunus avium*	14	fair	invasive species		yes	C
915	red oak	*Quercus rubra*	28	good	unable to evaluate base		yes	C
916	scarlet oak	*Quercus coccinea*	3*11	good			yes	C
917	scarlet oak	*Quercus coccinea*	22	good	low branches		yes	C
918	scarlet oak	*Quercus coccinea*	17	good	low branches		yes	C
919	scarlet oak	*Quercus coccinea*	18	good	low branches		yes	C
920	sweet cherry	*Prunus avium*	3*10	poor	ivy infestation; invasive species		yes	C
921	sweet cherry	*Prunus avium*	10	poor	ivy infestation; invasive species		yes	C
922	sweet cherry	*Prunus avium*	12	poor	ivy infestation; invasive species		yes	C

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
923	sweet cherry	*Prunus avium*	8	poor	ivy infestation; invasive species		yes	C
924	sweet cherry	*Prunus avium*	8	poor	ivy infestation; invasive species		yes	C
925	sweet cherry	*Prunus avium*	2*8	poor	ivy infestation; invasive species		yes	C
926	sweet cherry	*Prunus avium*	2*10	poor	ivy infestation; invasive species		yes	C
927	sweet cherry	*Prunus avium*	8	poor	ivy infestation; invasive species		yes	C
928	sweet cherry	*Prunus avium*	8	fair	ivy infestation; invasive species		no	
929	sweet cherry	*Prunus avium*	2*12	fair	ivy infestation; invasive species		no	
930	sweet cherry	*Prunus avium*	9	poor	ivy infestation; invasive species		yes	C
931	sweet cherry	*Prunus avium*	12	poor	ivy infestation; invasive species		yes	C
932	sweet cherry	*Prunus avium*	10	fair	invasive species		no	
933	sweet cherry	*Prunus avium*	12	fair	invasive species		no	
936	Oregon white oak	*Quercus garryana*	12	fair			no	
937	Oregon white oak	*Quercus garryana*	12	fair			no	
938	bigleaf maple	*Acer macrophyllum*	12	fair			no	
939	Douglas-fir	*Pseudotsuga menziesii*	26	good			no	
940	bigleaf maple	*Acer macrophyllum*	10	fair	not accessible		no	
941	bigleaf maple	*Acer macrophyllum*	12	fair	not accessible		no	
942	bigleaf maple	*Acer macrophyllum*	10	fair	not accessible		no	
943	red alder	*Alnus rubra*	3*8	fair	not accessible		no	
944	red alder	*Alnus rubra*	2*8	fair	not accessible		no	
945	red alder	*Alnus rubra*	2*8	fair	not accessible		no	
946	Oregon ash	*Fraxinus latifolia*	10	fair	not accessible		no	
947	Oregon ash	*Fraxinus latifolia*	8	fair	not accessible		no	
948	Oregon ash	*Fraxinus latifolia*	10	fair	not accessible		no	
949	Oregon ash	*Fraxinus latifolia*	8	fair	not accessible		no	
950	Oregon ash	*Fraxinus latifolia*	8	fair	not accessible		no	
951	Oregon ash	*Fraxinus latifolia*	10	fair	not accessible		no	
952	Oregon ash	*Fraxinus latifolia*	8	fair	not accessible		no	
953	Oregon ash	*Fraxinus latifolia*	8	fair	not accessible		no	
954	Oregon ash	*Fraxinus latifolia*	12	fair	not accessible		no	

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No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
955	red alder	*Alnus rubra*	10	fair	not accessible		no	
956	red alder	*Alnus rubra*	8	fair	not accessible		no	
957	western redcedar	*Thuja plicata*	16	fair	not accessible		no	
958	Oregon ash	*Fraxinus latifolia*	8	fair	not accessible		no	
959	Oregon ash	*Fraxinus latifolia*	14	fair	not accessible		no	
960	Oregon ash	*Fraxinus latifolia*	10	fair	not accessible		no	
961	Oregon ash	*Fraxinus latifolia*	12	fair	not accessible		no	
962	Oregon ash	*Fraxinus latifolia*	16	fair	not accessible		no	
963	Oregon ash	*Fraxinus latifolia*	20	fair	not accessible		no	
964	Oregon ash	*Fraxinus latifolia*	8	fair	not accessible		no	
965	Oregon ash	*Fraxinus latifolia*	12	fair	not accessible		no	
966	sweet cherry	*Prunus avium*	3*8	fair	invasive species		no	
967	Oregon ash	*Fraxinus latifolia*	2*9	fair	poor structure		no	
968	Oregon ash	*Fraxinus latifolia*	8	fair	poor structure		no	
969	Oregon ash	*Fraxinus latifolia*	12	fair	poor structure		no	
1008	red oak	*Quercus rubra*	2*14	fair	codom at 1'; some branch decay		yes	C
1011	scarlet oak	*Quercus coccinea*	12	fair	twig dieback, some branch decay		yes	C
1012	pin oak	*Quercus palustris*	12	poor	dead top		yes	C, H
1020	pin oak	*Quercus palustris*	12	fair	hollows with decay; dieback		yes	C, H
1029	red oak	*Quercus rubra*	12	fair	twig dieback		yes	C
1030	pin oak	*Quercus palustris*	12	poor	dead branches, branch decay		yes	C
1167	pin oak	*Quercus palustris*	15	fair	twig dieback		yes	C
1230	scarlet oak	*Quercus coccinea*	16	poor	dieback, thin crown, chlorotic		yes	C
1231	scarlet oak	*Quercus coccinea*	12	poor	dead branches, decline		yes	C
1292	scarlet oak	*Quercus coccinea*	14	fair	recent branch failure; poor structure		yes	C, H
1293	pin oak	*Quercus palustris*	14	poor	dead top, branch dieback		yes	C
1302	pin oak	*Quercus palustris*	14	poor	dead top, branch dieback		yes	C
1305	red oak	*Quercus rubra*	14	poor	dead leader, branch dieback		yes	C
1318	scarlet oak	*Quercus coccinea*	16	fair	poor branch distribution; dieback		yes	C
1319	scarlet oak	*Quercus coccinea*	16	fair	some dieback		yes	C

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1352	red maple	*Acer rubrum*	6	fair		yes	yes	C
1360	red maple	*Acer rubrum*	6	fair		yes	yes	C
1365	red maple	*Acer rubrum*	6	poor	sunscald, chlorotic, poor vigor	yes	yes	C
1369	red maple	*Acer rubrum*	6	fair	forked top with included bark	yes	yes	C
1379	lodgepole pine	*Pinus contorta*	3*12	fair	codom at base; sequoia pitch moth		yes	C, D1
1400	red maple	*Acer rubrum*	10	fair	moderate vigor; chlorotic		yes	C
2181	black cottonwood	*Populus trichocarpa*	42	fair	multiple leaders; species limitations		yes	C, H
2192	black cottonwood	*Populus trichocarpa*	4*12	poor	poor structure; species limitations		yes	C
2198	European white birch	*Betula pendula*	3*13	poor	dead		yes	C
2203	Norway maple	*Acer platanoides*	10	good	invasive species		no	
2215	Norway maple	*Acer platanoides*	10	poor	sunscald, decay, ants; invasive species		yes	C, D1
2275	bigleaf maple	*Acer macrophyllum*	18	poor			yes	C
2276	sweet cherry	*Prunus avium*	18	poor	invasive species		yes	C
2277	sweet cherry	*Prunus avium*	12	poor	invasive species		yes	C
2278	Oregon ash	*Fraxinus latifolia*	8	fair			yes	C
2279	sweet cherry	*Prunus avium*	5*8	poor	invasive species		yes	C
2280	sweet cherry	*Prunus avium*	14	poor	invasive species		yes	C
2282	sweet cherry	*Prunus avium*	10	poor	invasive species		yes	C
2284	Oregon ash	*Fraxinus latifolia*	8	fair			yes	C
2285	Oregon ash	*Fraxinus latifolia*	18	fair			yes	C
2286	Oregon ash	*Fraxinus latifolia*	10	fair	extensive ivy infestation		yes	C
2287	sweet cherry	*Prunus avium*	8	fair	invasive species		yes	C
2288	Oregon ash	*Fraxinus latifolia*	8	fair			yes	C
2289	bigleaf maple	*Acer macrophyllum*	18	good			yes	C
2290	bigleaf maple	*Acer macrophyllum*	7*12	fair			yes	C
2292	Oregon ash	*Fraxinus latifolia*	12	fair			yes	C
2293	tree-of-heaven	*Ailanthus altissima*	15	fair	invasive species; poor structure		yes	C
2294	bigleaf maple	*Acer macrophyllum*	3*14	poor	poor structure; dead branches		yes	C
2295	bigleaf maple	*Acer macrophyllum*	3*14	poor	poor structure, codom stems		yes	C
2296	bigleaf maple	*Acer macrophyllum*	2*12	poor	extensive ivy infestation, thin crown		yes	C

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
2297	bigleaf maple	*Acer macrophyllum*	18	poor	extensive ivy infestation, thin crown		yes	C
2298	bigleaf maple	*Acer macrophyllum*	12	poor	extensive ivy infestation, thin crown		yes	C
2299	bigleaf maple	*Acer macrophyllum*	8	poor	extensive ivy infestation, thin crown		yes	C
2300	bigleaf maple	*Acer macrophyllum*	8	poor	extensive ivy infestation, thin crown		yes	C
2301	English hawthorn	*Crataegus monogyna*	12	poor	invasive species; ivy infestation		yes	C
2302	bigleaf maple	*Acer macrophyllum*	12	poor	top dieback, decay		yes	C
2303	English hawthorn	*Crataegus monogyna*	8	fair	invasive species		yes	C
2304	lodgepole pine	*Pinus contorta*	10	fair	sequoia pitch moth		yes	C
2305	English hawthorn	*Crataegus monogyna*	12	poor	invasive species; overtopped		yes	C
2379	lodgepole pine	*Pinus contorta*	4*8	fair	codom at base; sequoia pitch moth		yes	C
2382	red maple	*Acer rubrum*	6	poor	sunscald, decay, dead branches	yes	yes	C, D1
2407	red maple	*Acer rubrum*	3	poor	severe sunscald, mostly dead	yes	yes	C, D1
2414	red maple	*Acer rubrum*	4	poor	thin crown, chlorotic	yes	yes	C
2420	red maple	*Acer rubrum*	5	fair	sunscald	yes	yes	C
2434	red maple	*Acer rubrum*	8	poor	sunscald 0-5'; codom		yes	C, D1
2462	red maple	*Acer rubrum*	8	fair	moderate vigor		yes	C
2527	red maple	*Acer rubrum*	10	poor	sunscald, stem decay, dieback		yes	C, D1
2533	red maple	*Acer rubrum*	6	poor	decay, included bark	yes	yes	C
2544	red maple	*Acer rubrum*	6	fair	multiple leaders	yes	yes	C
2548	red maple	*Acer rubrum*	6	poor	sunscald, decay, dead branches	yes	yes	C, D1
2553	red maple	*Acer rubrum*	6	poor	sunscald, decay in codom juncture	yes	yes	C, D1
2677	red maple	*Acer rubrum*	4	fair	stem decay	yes	yes	C
2702	red maple	*Acer rubrum*	2*6	fair	stem decay		yes	C
2731	Norway maple	*Acer platanoides*	8	poor	invasive species; stem & branch decay		yes	C, D1, H
2743	Norway maple	*Acer platanoides*	8	fair	invasive species; poor crown structure		yes	C
2747	Norway maple	*Acer platanoides*	6	poor	invasive species; dead leader & branches	yes	yes	C
2753	Norway maple	*Acer platanoides*	8	fair	invasive species		yes	C
2766	Norway maple	*Acer platanoides*	8	fair	invasive species		yes	C
2807	flowering plum	*Prunus spp.*	2	good		yes	yes	C
2829	flowering plum	*Prunus spp.*	6	good		yes	yes	C

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
2950	Norway maple	*Acer platanoides*	2	good	invasive species	yes	yes	C
2954	Norway maple	*Acer platanoides*	12	fair	invasive species; some branch decay		yes	C
2974	flowering cherry	*Prunus spp.*	3	good		yes	yes	C
2979	Norway maple	*Acer platanoides*	12	good			yes	C
2993	Norway maple	*Acer platanoides*	8	fair	broken branches		yes	C
3069	red maple	*Acer rubrum*	4*4	fair	poor vigor		yes	C
3160	red maple	*Acer rubrum*	4	good		yes	yes	C
3205	red maple	*Acer rubrum*	3	good		yes	yes	C
3206	red maple	*Acer rubrum*	3	good		yes	yes	C
3212	red maple	*Acer rubrum*	3	good		yes	yes	C
3309	red maple	*Acer rubrum*	3	good		yes	yes	C
3310	red maple	*Acer rubrum*	3	good		yes	yes	C
3315	red maple	*Acer rubrum*	3	good	sunscald	yes	yes	C
3318	red maple	*Acer rubrum*	3	fair	sunscald	yes	yes	C
3322	red maple	*Acer rubrum*	3	good		yes	yes	C
3413	red maple	*Acer rubrum*	10	fair	decay in codom juncture		yes	C, D1, H
3417	red maple	*Acer rubrum*	10	fair	sunscald, included bark		yes	C
3436	red maple	*Acer rubrum*	10	fair	sunscald, included bark		yes	C
3443	red maple	*Acer rubrum*	10	poor	hollow with decay; poor structure		yes	C, D1
3445	red maple	*Acer rubrum*	10	good	multiple attachments		yes	C
3610	Norway maple	*Acer platanoides*	12	good	invasive species		yes	C
3634	Norway maple	*Acer platanoides*	10	fair	invasive species; branch decay, dieback		yes	C
3643	Norway maple	*Acer platanoides*	3	poor	invasive species; sunscald, decay	yes	yes	C
3652	Norway maple	*Acer platanoides*	8	fair	invasive species; dead branches		yes	C
3739	spruce	*Abies spp.*	6	fair	against existing building	yes	no	
3826	Amur maple	*Acer ginnala*	3	poor	severe basal & stem decay	yes	yes	C, D1
3841	Norway maple	*Acer platanoides*	14	fair	invasive species; branch dieback		no	
3990	Norway maple	*Acer platanoides*	14	fair			no	

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
4035	Norway maple	*Acer platanoides*	14	fair			no	
4052	Norway maple	*Acer platanoides*	12	good	invasive species		yes	C
4054	Norway maple	*Acer platanoides*	10	good	invasive species		yes	C
4072	Norway maple	*Acer platanoides*	12	poor	invasive species; sunscald, lean		yes	C, D1, H
4083	flowering pear	*Pyrus spp.*	10	fair	thin crown		no	
4084	flowering pear	*Pyrus spp.*	12	fair	thin crown		no	
4085	Norway maple	*Acer platanoides*	12	fair	invasive species; thin crown		yes	C
4203	red maple	*Acer rubrum*	10	good	one-sided to building		yes	C
4222	Norway maple	*Acer platanoides*	3	fair	invasive species; sunscald, basal decay	yes	yes	C, D1
4223	red maple	*Acer rubrum*	3	poor	severe sunscald; dead branches	yes	yes	C, D1
4282	red maple	*Acer rubrum*	4	fair	one-sided to building	yes	yes	C
4286	red maple	*Acer rubrum*	2	poor	severe sunscald; dead branches	yes	yes	C
4411	flowering pear	*Pyrus spp.*	14	poor	dieback; codom with included bark		yes	C, H
4456	flowering pear	*Pyrus spp.*	8	poor	dieback; lean to parking lot		yes	C, H
4483	Douglas-fir	*Pseudotsuga menziesii*	26	good	few dead branches		yes	C
4484	Douglas-fir	*Pseudotsuga menziesii*	12	fair	one-sided crown; young tree		yes	C
4492	Douglas-fir	*Pseudotsuga menziesii*	22	fair	pruned high; only sustainable in group		yes	C
4493	Douglas-fir	*Pseudotsuga menziesii*	24	fair	pruned high; only sustainable in group		yes	C
4495	Douglas-fir	*Pseudotsuga menziesii*	24	fair	pruned high; only sustainable in group		yes	C
4496	Douglas-fir	*Pseudotsuga menziesii*	16	fair	small, high live crown; re-evaluate following adjacent tree removal		no	
4497	Douglas-fir	*Pseudotsuga menziesii*	26	fair	pruned high; only sustainable in group		no	
4510	lodgepole pine	*Pinus contorta*	24	fair	asymmetrical crown; sequoia pitch moth		no	
4511	flowering pear	*Pyrus spp.*	14	poor	mostly dead		no	
4516	lodgepole pine	*Pinus contorta*	15	fair	poor structure; sequoia pitch moth		no	
4516b	lodgepole pine	*Pinus contorta*	15	fair	poor structure; sequoia pitch moth		no	
4531	Norway maple	*Acer platanoides*	8	fair	invasive species; dieback		yes	C
4546	Norway maple	*Acer platanoides*	6	poor	invasive species; dead leader	yes	yes	C
4556	Norway maple	*Acer platanoides*	8	poor	invasive species; extensive decay column		yes	C, D1
4556b	Norway maple	*Acer platanoides*	4	poor	located 37' north of 4556	yes	yes	C

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
4583	Norway maple	*Acer platanoides*	8	fair	invasive species; dead branches		yes	C
4618	red maple	*Acer rubrum*	3*6	fair	poor vigor		yes	C
4682	red maple	*Acer rubrum*	3*6	fair	stem & branch decay		yes	C, D1
4730	red maple	*Acer rubrum*	6	fair	sunscald	yes	yes	C
4787	red maple	*Acer rubrum*	10	fair	multiple leaders; moderate vigor		yes	C
4854	red maple	*Acer rubrum*	12	fair	some branch decay		yes	C
4915	Norway maple	*Acer platanoides*	3	poor	invasive species; sunscald, basal decay	yes	yes	C, D1
4924	Norway maple	*Acer platanoides*	3	fair	invasive species; sunscald 0-4'	yes	yes	C, D1
5022	Austrian pine	*Pinus nigra*	14	poor	poor structure, unnatural lean		yes	C, H
5023	Austrian pine	*Pinus nigra*	12	poor	poor structure, unnatural lean		yes	C, H
5093	red maple	*Acer rubrum*	16	fair			no	
5186	Norway maple	*Acer platanoides*	12	fair			yes	C
5190	Norway maple	*Acer platanoides*	14	fair			no	
5211	Norway maple	*Acer platanoides*	14	fair			no	
5219	Norway maple	*Acer platanoides*	16	fair			no	
5228	Norway maple	*Acer platanoides*	16	fair			no	
5234	Norway maple	*Acer platanoides*	16	fair			no	
5321	English hawthorn	*Crataegus monogyna*	6*12	poor	invasive species		yes	C
5324	English hawthorn	*Crataegus monogyna*	3*12	poor	invasive species		yes	C
5326	English hawthorn	*Crataegus monogyna*	8	poor	invasive species		yes	C
5438	Norway maple	*Acer platanoides*	12	fair	prune to remove dead wood		no	
5598	flowering cherry	*Prunus spp.*	8	fair	dead branches; moderate vigor		yes	C
5692	black locust	*Robinia pseudoacacia*	2*8	poor	invasive species, decay, dead branches		yes	H
5693	black locust	*Robinia pseudoacacia*	2*18	poor	invasive species, decay, dead branches		yes	H
5695	black locust	*Robinia pseudoacacia*	18	poor	invasive species, decay, dead branches		yes	H
5696	black locust	*Robinia pseudoacacia*	18	poor	invasive species, decay, dead branches		yes	H
5735	bigleaf maple	*Acer macrophyllum*	3*8	fair			no	
5823	lodgepole pine	*Pinus contorta*	12	fair			no	
5824	lodgepole pine	*Pinus contorta*	10	poor			no	
6000	sugar maple	*Acer saccharum*	16	fair	top dieback		yes	C

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
6315	red maple	*Acer rubrum*	3	good		yes	yes	C
6446	zelkova	*Zelkova spp.*	4	fair	needs supplemental watering	yes	yes	C
6458	zelkova	*Zelkova spp.*	4	fair	needs supplemental watering	yes	yes	C
6468	zelkova	*Zelkova spp.*	4	fair	needs supplemental watering	yes	yes	C
6479	zelkova	*Zelkova spp.*	4	poor	severe sunscald, dead top	yes	yes	C, D1
6489	zelkova	*Zelkova spp.*	4	fair		yes	yes	C
6503	zelkova	*Zelkova spp.*	4	poor	sunscald, stem decay	yes	yes	C, D1
6522	red oak	*Quercus rubra*	26	fair	one-sided crown; history of branch failure		yes	C
6523	red oak	*Quercus rubra*	19	fair	hollow with slime flux; crown asymmetry		yes	C, D1
6524	red oak	*Quercus rubra*	29	fair	large leaders, crown asymmetry		yes	C
6524b	Douglas-fir	*Pseudotsuga menziesii*	30	good	located 30' north of 6524		yes	C
6524c	deodar cedar	*Cedrus deodara*	36	good	located 20' east of 6524b		yes	C
6525	ponderosa pine	*Pinus ponderosa*	2*18	fair			yes	C
6526	ponderosa pine	*Pinus ponderosa*	2*26	good			yes	C
6527	European white birch	*Betula pendula*	16	poor	dead; invasive species		yes	C, H
6528	copper beech	*Fagus sylvatica*	14	good	overcrowded		yes	C
6529	European white birch	*Betula pendula*	18	poor	dead top; invasive species		yes	C, H
6530	copper beech	*Fagus sylvatica*	28	good	needs soil aeration & seasonal irrigation		yes	C
6531	copper beech	*Fagus sylvatica*	34	good	needs soil aeration & seasonal irrigation		yes	C
6542	flowering cherry	*Prunus spp.*	6*6	fair			yes	C
6543	flowering cherry	*Prunus spp.*	6*6	fair			yes	C
6544	flowering cherry	*Prunus spp.*	2*8	fair			yes	C
6547	flowering cherry	*Prunus spp.*	5*6	fair			yes	C
6548	flowering cherry	*Prunus spp.*	3*6	fair			yes	C
6549	flowering cherry	*Prunus spp.*	3*6	poor	dead branches, branch decay		yes	C
6550	flowering cherry	*Prunus spp.*	4*6	poor	dead branches, branch decay		yes	C
6556	flowering cherry	*Prunus spp.*	3*6	poor	mostly dead		yes	C
6557	flowering cherry	*Prunus spp.*	4*6	poor	dead branches, branch decay		yes	C
6558	flowering cherry	*Prunus spp.*	6	poor	dead	yes	yes	C
6559	flowering cherry	*Prunus spp.*	3*6	poor	dead & broken branches, branch decay		yes	C

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Morgan Holen & ASSOCIATES LLC

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
6560	flowering cherry	*Prunus spp.*	2*6	poor	dead & broken branches, branch decay		yes	C
6563	flowering cherry	*Prunus spp.*	3*6	poor	dead & broken branches, branch decay		yes	C
6564	flowering cherry	*Prunus spp.*	3*6	poor	dead & broken branches, branch decay		yes	C
6566	red oak	*Quercus rubra*	24	fair	history of large branch failure; small hollow		yes	C
6567	Austrian pine	*Pinus nigra*	40	good			yes	C
6570	magnolia	*Magnolia spp.*	20	good	ivy infestation		yes	C
6571	sweetgum	*Liquidambar styraciflua*	24	fair	moderate vigor		yes	C
6579	Norway maple	*Acer platanoides*	2*19	good	invasive species; codom at 1'; ivy infestation		yes	C
6582	red oak	*Quercus rubra*	22	fair	twig dieback; one-sided crown		yes	C
6583	giant sequoia	*Sequoiadendron giganteum*	29	fair	ivy infestation; crown asymmetry		yes	C
6584	Douglas-fir	*Pseudotsuga menziesii*	22	fair			yes	C
6585	western redcedar	*Thuja plicata*	2*16	fair	ivy		yes	C
6586	silk tree	*Albizia julibrissin*	2*15	fair	extensive ivy infestation		yes	C
6587	Douglas-fir	*Pseudotsuga menziesii*	29	fair	ivy infestation; heavy cone production		yes	C
6588	western redcedar	*Thuja plicata*	18	fair	forked top; crown asymmetry		yes	C
6602	apple	*Malus spp.*	2*12	poor	decay		yes	C
6603	spruce	*Abies spp.*	18	fair	old broken top		yes	C
6605	English walnut	*Juglans regia*	40	poor	decrepit		yes	C, H
6609	dogwood	*Cornus* spp.	12	fair			yes	C
6610	lodgepole pine	*Pinus contorta*	17	fair			yes	C
6629	giant sequoia	*Sequoiadendron giganteum*	38	good	ivy at base; inadequate soil volume		yes	C
6631	Scots pine	*Pinus sylvestris*	14	poor	dead		yes	C, H
6632	flowering cherry	*Prunus spp.*	12	poor	not well maintained		yes	C
6633	flowering cherry	*Prunus spp.*	10	poor	not well maintained		yes	C
6634	flowering cherry	*Prunus spp.*	10	poor	not well maintained		yes	C
6635	flowering cherry	*Prunus spp.*	10	poor	not well maintained		yes	C
6636	flowering cherry	*Prunus spp.*	10	poor	not well maintained		yes	C
6637	flowering cherry	*Prunus spp.*	10	poor	not well maintained		yes	C
6638	flowering cherry	*Prunus spp.*	10	poor	not well maintained		yes	C
6639	flowering cherry	*Prunus spp.*	10	poor	not well maintained		yes	C

Consulting Arborists and Urban Forest Management
3 Monroe Parkway, Suite P220, Lake Oswego, OR 97035
morgan.holen@comcast.net | 971.409.9354

Exhibit 1
Attachment M

Morgan Holen & Associates, LLC

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
6640	flowering cherry	*Prunus spp.*	6	poor	not well maintained	yes	yes	C
6641	flowering cherry	*Prunus spp.*	8	poor	not well maintained		yes	C
6642	flowering cherry	*Prunus spp.*	12	poor	not well maintained		yes	C
6664	Norway maple	*Acer platanoides*	2*14	fair	invasive; codom at 1'; less than 1' to building		yes	C
6693	Scots pine	*Pinus sylvestris*	12	fair			yes	C
6714	Japanese maple	*Acer japonica*	3*6	fair	one-sided to building; some decay		yes	C
6813	Norway maple	*Acer platanoides*	14	fair	invasive species; codom at 6', ivy infestation		yes	C
6818	Norway maple	*Acer platanoides*	16	fair	invasive species; codom at 5', ivy infestation		yes	C
6824	Norway maple	*Acer platanoides*	18	fair	invasive species; codom at 5', included bark		yes	C
6828	Norway maple	*Acer platanoides*	15	fair	invasive species; codom at 5'		yes	C
6833	Norway maple	*Acer platanoides*	17	fair	invasive species; multiple attachments at 5'		yes	C
6893	Scots pine	*Pinus sylvestris*	24	poor	chlorotic, poor structure, ivy infestation		yes	C, H
6895	Scots pine	*Pinus sylvestris*	19	fair	forked top		yes	C
6896	European white birch	*Betula pendula*	2*16	poor	dead; invasive species		yes	C, H
6901	European white birch	*Betula pendula*	10	poor	invasive species; ivy infestation		yes	C
7052	bigleaf maple	*Acer macrophyllum*	18	fair			no	
7242	lodgepole pine	*Pinus contorta*	10	fair	sequoia pitch moth		no	
7524	sugar maple	*Acer saccharum*	18	good			yes	C
7597	zelkova	*Zelkova spp.*	3	fair	branch decay, poor crown structure	yes	yes	C, D1
7670	western redcedar	*Thuja plicata*	6	fair	coniferous	yes	no	
7673	western redcedar	*Thuja plicata*	6	fair	coniferous	yes	no	
7675	western redcedar	*Thuja plicata*	6	fair	coniferous	yes	no	
7676	western redcedar	*Thuja plicata*	6	fair	coniferous	yes	no	
7677	western redcedar	*Thuja plicata*	5	fair	coniferous	yes	no	
7678	western redcedar	*Thuja plicata*	8	fair	coniferous		no	
7679	western redcedar	*Thuja plicata*	4	fair	coniferous	yes	no	
7815	sugar maple	*Acer saccharum*	16	good			no	
7833	flowering plum	*Prunus spp.*	3*8	fair	multiple attachments		no	
7923	flowering pear	*Pyrus spp.*	8	fair			no	
7954	black locust	*Robinia pseudoacacia*	30	poor	invasive species; decay, dead branches		yes	C, H

Consulting Arborists and Urban Forest Management
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Exhibit 1
Attachment M

Morgan Holen & Associates, LLC

No.	Common Name	Species Name	DBH[1]	Condition	Comments	Exempt[2]	Remove	Criteria[3]
7957	black locust	*Robinia pseudoacacia*	2*28	poor	invasive species; decay, dead branches		yes	C, H
7963	European white birch	*Betula pendula*	18	poor	invasive species; bronze birch borer		yes	C, D2, H
7966	red oak	*Quercus rubra*	10	fair	aphids		yes	C
7983	black locust	*Robinia pseudoacacia*	10	poor	invasive species; decay, dead branches		yes	C, H
8001	flowering pear	*Pyrus spp.*	3	fair	moderate lean to street	yes	yes	C
8002	flowering pear	*Pyrus spp.*	3	good		yes	no	
8035	flowering pear	*Pyrus spp.*	4	good		yes	no	
8080	flowering pear	*Pyrus spp.*	8	good			yes	C
8089	flowering pear	*Pyrus spp.*	3	good		yes	yes	C
8093	flowering pear	*Pyrus spp.*	8	fair	minor lean to street		yes	C
8099	flowering pear	*Pyrus spp.*	8	good			no	

[1]**DBH** is tree diameter measured at 4.5-feet above the ground level, in inches.

[2]**Exempt** identifies trees measuring less than eight inches in diameter.

[3]**Criteria** provides justification for the proposed tree removal (per TDC 34.230):

- **D1:** Diseased and the disease threatens the structural integrity of the tree;
- **D2:** Diseased and the disease permanently and severely diminishes the aesthetic value of the tree; or
- **D3:** Diseased and the continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or aestl
- H: Hazardous.
- **C:** Construction necessitates tree removal.

Consulting Arborists and Urban Forest Management
3 Monroe Parkway, Suite P220, Lake Oswego, OR 97035
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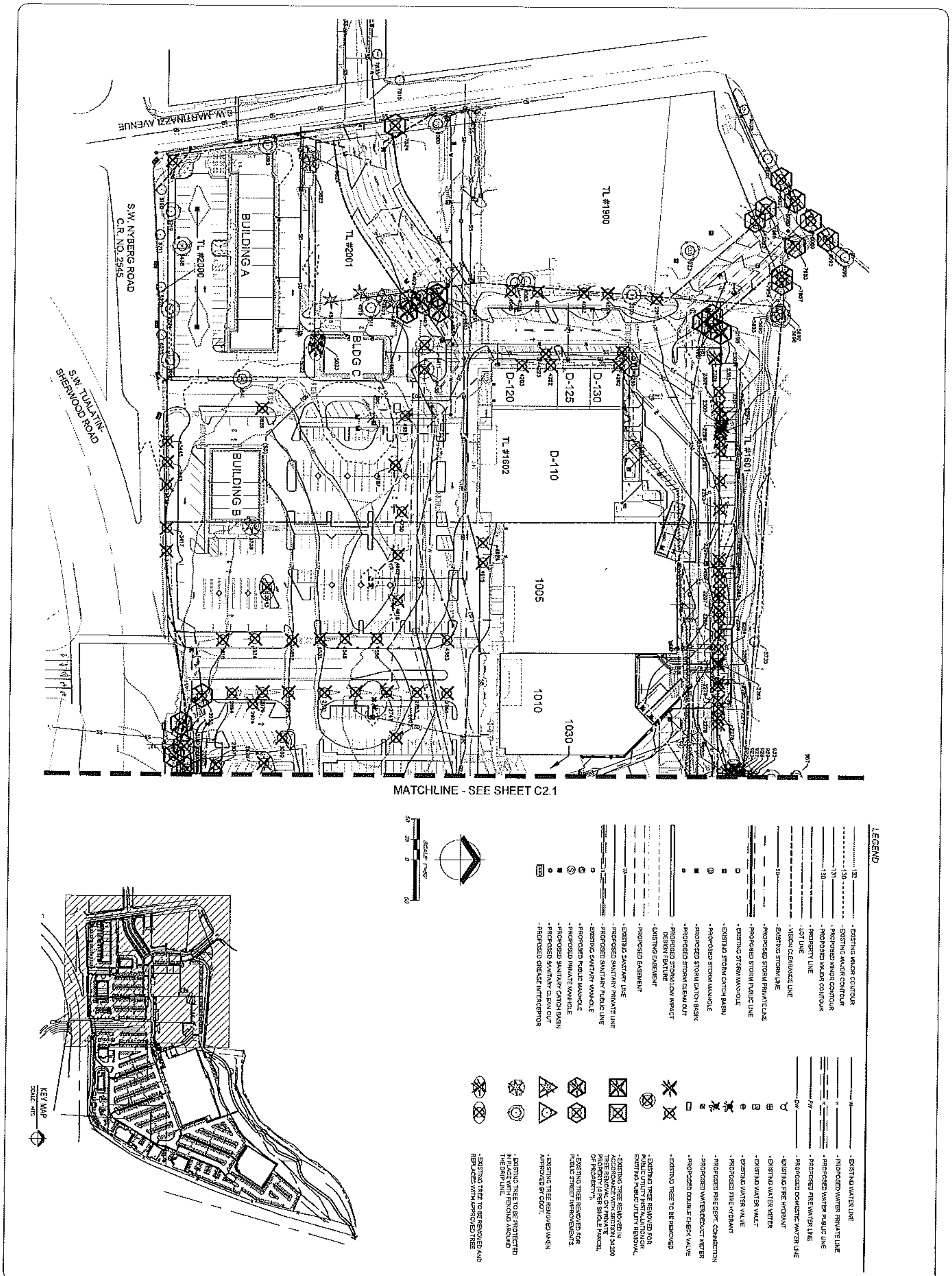
Exhibit 1
Attachment M



TREE PRESERVATION SITE PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

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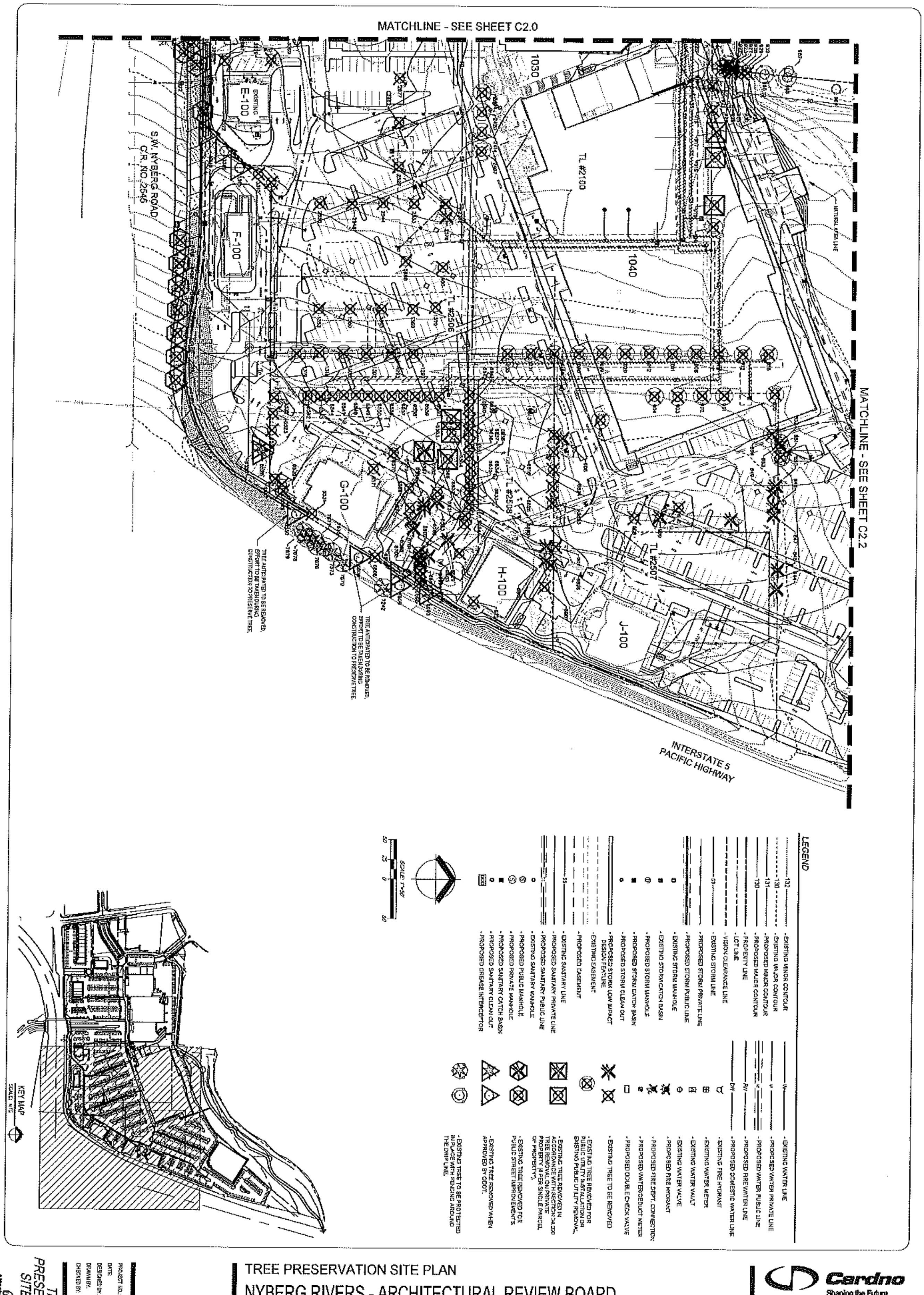
PROJECT NO.: 2110313
DATE: 080813
DESIGNED BY: RAK/KGB
DRAWN BY: BCF
CHECKED BY: JRG

TREE PRESERVATION SITE PLAN
Attachment M



TREE PRESERVATION SITE PLAN

NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD

CENTERCAL PROPERTIES, LLC.

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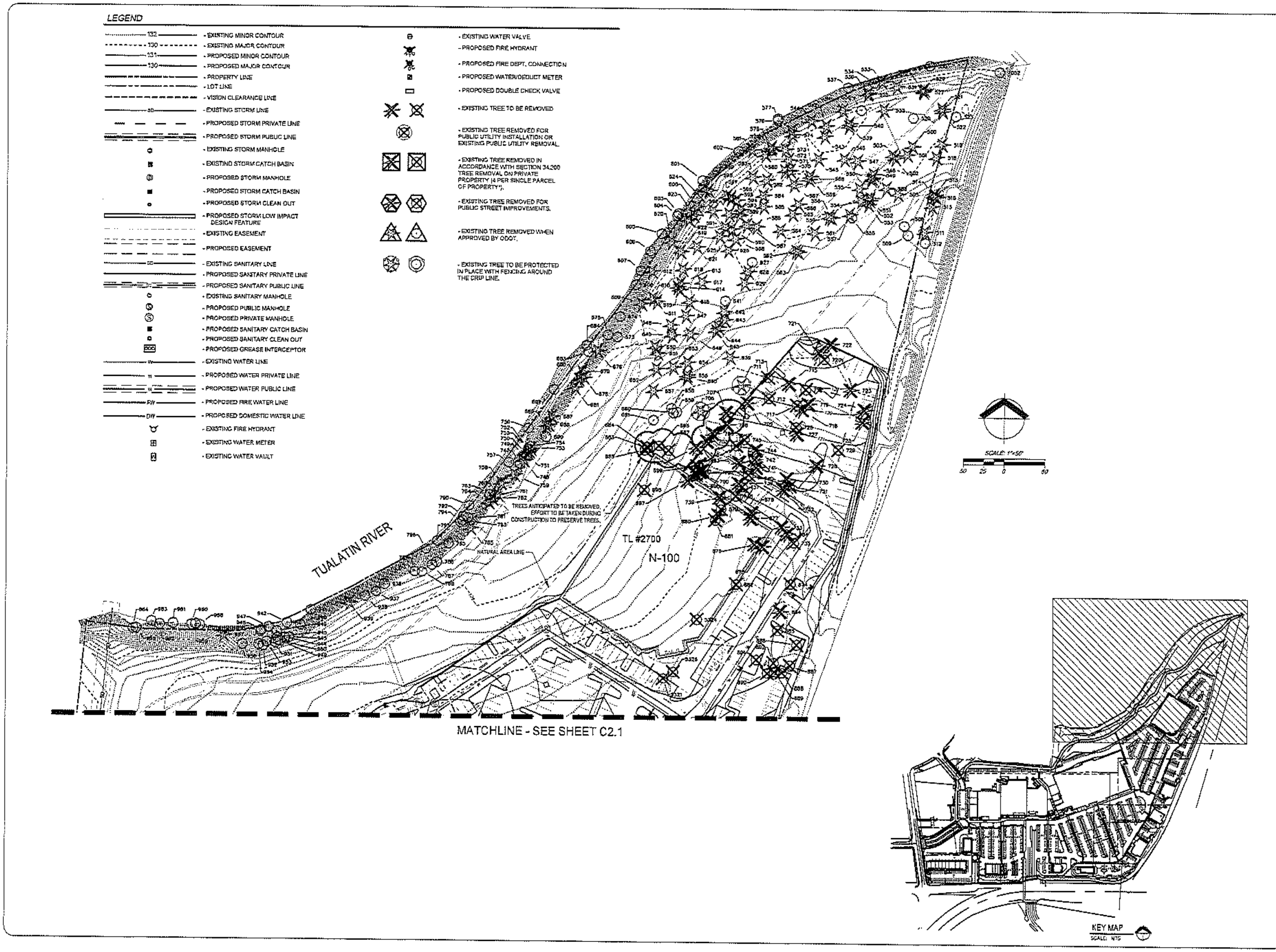
PROJECT NO.:	2100316
DATE:	
DESIGNED BY:	RHHKOO
DRAWN BY:	BOF
CHECKED BY:	JRS

TREE PRESERVATION SITE PLAN

C2.1

Attachment M



TREE PRESERVATION SITE PLAN
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CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

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PROJECT NO.:	2110316
DATE:	05/28/13
DESIGNED BY:	RHH/KDO
DRAWN BY:	BDF
CHECKED BY:	JRS

TREE PRESERVATION SITE PLAN
C2.2
Attachment M

MEMORANDUM

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Portland, Oregon 97221
USA

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Fax (503) 419-2600

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To: City of Tualatin

From: Atalia Raskin, PE
Water Resource Project Engineer

Date: September 6, 2013

Project: Nyberg Rivers
Cardno#: 21198310
Re: Nyberg Rivers Architectural Review Board – Stormwater Analysis

This memorandum will discuss the water quality systems being proposed as part of the Nyberg Rivers development. Treatment facilities were designed to City of Tualatin and Clean Water Services (CWS) standards. The stormwater management approach, as described below, is intended to meet these requirements and provide a high level of treatment for the proposed development.

Project Overview

The Nyberg Rivers project is located on the northwest corner of Interstate 5 (I-5) and SW Nyberg Street, in Tualatin, Oregon. The site currently contains a shopping center and a large parking lot. The proposed redevelopment will include the construction of several new retail buildings. Additionally, the project includes frontage improvements to SW Nyberg Street and the construction of Street "A" and SW Seneca Street east of SW Martinazzi Avenue.

Water Quality

Water quality will be accomplished through Contech StormFilters. Contech StormFilters are an approved method of treatment by CWS and are able to remove suspended sediment, metals, oils and total nutrients.

Pre-treatment

Additionally, the site plan was reviewed for opportunities to install green infrastructure as pre-treatment facilities. Green infrastructure features (green features) are landscaped reservoirs that collect stormwater runoff through vegetation and soil media. They may also provide pollutant reduction and flow attenuation to reduce hydraulic impacts from urban developments on downstream rivers. The proposed green features are not required to meet a pollutant reduction or flow attenuation standard.

The proposed green features, as described below, do not meet the sizing requirements of CWS's, but will provide a water quality and flow reduction benefit as the site plan allows. All generated runoff from impervious areas will flow through a Contech StormFilter facility for treatment.

Green Features

Two styles of green features are proposed; sloped planters and rain gardens. Sloped planters are linear landscaped reservoirs with slopes of 1 to 1.5%, widths of 3 to 5 feet, check dams, and vertical side walls. The proposed rain garden is a depressed basin with 4 to1 side slopes. Overflows will be provided for water depths greater than 3 inches. A perforated pipe surrounded by gravel will collect the treated stormwater and convey it to a Contech StormFilter facility. The green feature section is listed below:

- Freeboard Depth: 3 inches
- Maximum Treatment Water Depth: 3 inches
- Growing Media Depth: 18 inches
- Gravel Depth: 6 inches

1.57 acres (68,200 sq.-ft) of impervious area will flow into a proposed green feature before being treated by a Contech StormFilter. These areas are hatched on the attached Water Quality Map.

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Treatment

Design Standards

The proposed water quality facilities were designed per City of Tualatin and Clean Water Services standards. The proposed facilities were designed using a rainfall depth of 0.36" over a 4-hour period with a return period of 96-hours as outlined in section 4.05.06 of the *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in June of 2007 and updated in 2009.

Per Section 4.05.6 of the design manual, the water quality volume and flow rate are calculated according to the equations below:

$$\text{Water Quality Volume (cu.-ft)} = \frac{0.36\text{ (in)} \times \text{Area (sq.-ft)}}{12\text{ (in/ft)}} \qquad \text{Water Quality Flow} = \frac{\text{WQV (cu.-ft)}}{14{,}400}$$

Mechanical Treatment

Clean Water Services requires pre-treatment prior to proposed water quality facilities. Trapped Catch Basins are an approved pretreatment facility and will provide pretreatment for the site, when not flowing to a green feature.

Contech StormFilter catch basins, manholes and vaults are the selected water quality facilities. These facilities were selected for their ability to integrate into the existing and proposed site plan. Each StormFilter system will have the standard cartridge size with an 18-inch drop and have a treatment capacity of 0.033 cfs (15 gpm). The maximum bypass flow is 1.80 cfs; an internal bypass structure will be provided as needed. Peak diversion (PD) vaults have an internal baffle to divert flows higher than the water quality storm.

Table 1-1 lists the number of cartridges within each system. Sixteen facilities will provide treatment to the required surface area. Facilities SDMH#P7-WQ and SDMH#P9-WQ will be public stormwater treatment facilities.

Table 1-1 Mechanical Water Quality Facilities

Facility	Basin #	Impervious Area (sf)	Water Quality Flow Rate (cfs)	Quantity of Cartridges	Facility Type
SDMH#A1-WQ	A	63,426	0.13	4.0	Manhole
SDVT#B1-WQ	B/C	220,734	0.46	14.0	8x11 PD Vault
SDVT#D1-WQ	D	215,227	0.45	14.0	8x11 PD Vault
SDMH#E1-WQ	E	30,107	0.06	2.0	Manhole
SDMH#F1-WQ	F	28,871	0.06	2.0	Manhole
SDCB#G1-WQ	G1	4,070	0.01	1.0	Catch Basin
SDCB#G2-WQ	G2	10,516	0.02	1.0	Catch Basin
SDVT#H1-WQ	H	219,685	0.46	14.0	8x11 PD Vault
SDTD#A1-WQ	I	28,798	0.06	2.0	Catch Basin
SDMH#J1-WQ	J	32,138	0.07	3.0	Manhole
SDCB#K1-WQ	K	21,026	0.04	2.0	Catch Basin
SDCB#N1-WQ	N1	8,073	0.02	1.0	Catch Basin
SDCB#N2-WQ	N2	12,991	0.03	1.0	Catch Basin
SDMH#M1-WQ	M	81,949	0.17	6.0	Manhole
SDMH#P7-WQ	P1	15,095	0.03	1.0	Manhole
SDMH#P9-WQ	P2	24,888	0.05	2.0	Manhole
Total	-	1,017,594	2.12	-	-

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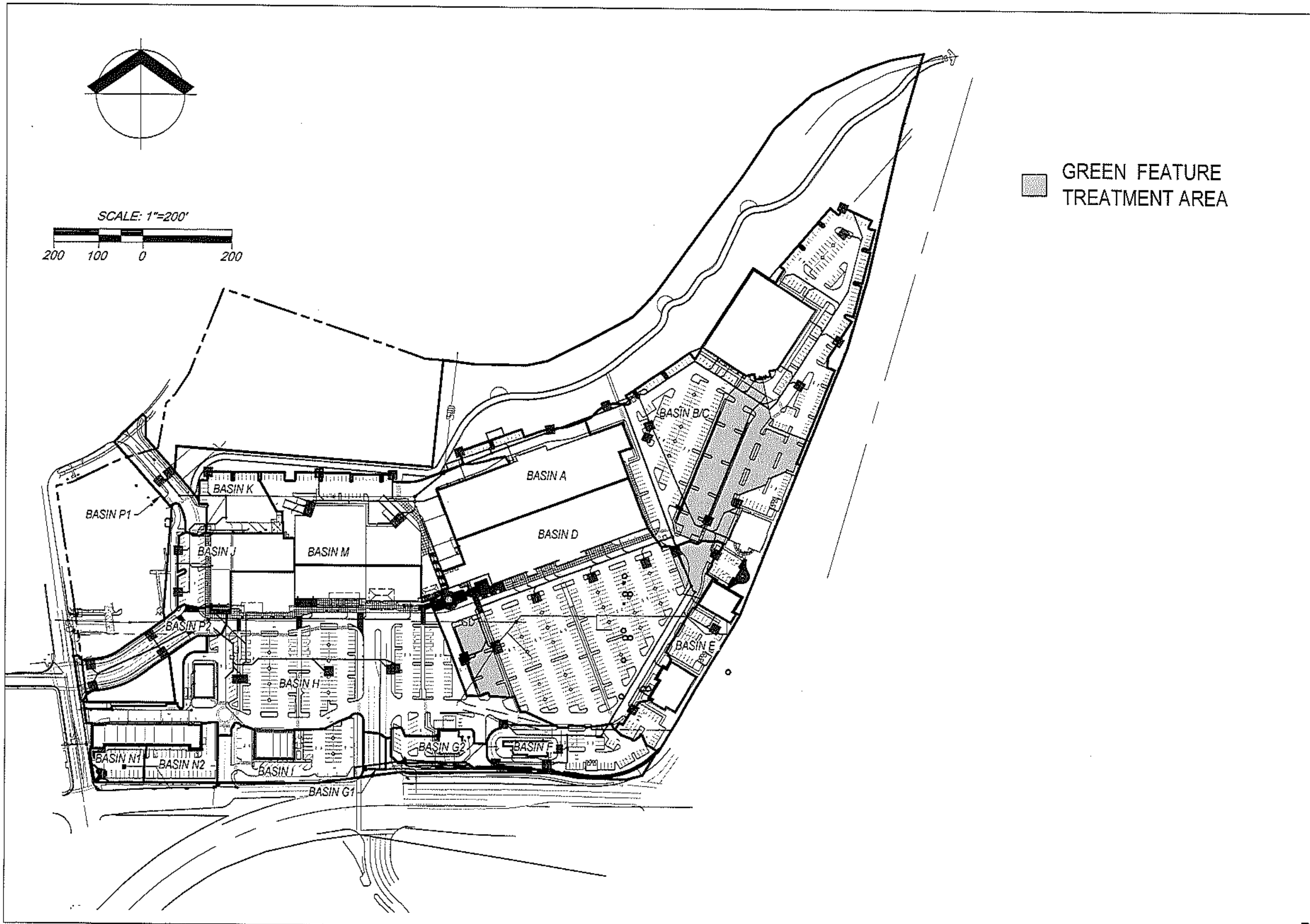
Conclusion

In conclusion, the proposed stormwater management system will meet the requirements of the City of Tualatin and Clean Water Services design standards. Contech StormFilters will provide water quality treatment and follow Clean Water Services' *Design and Construction Standards for Sanitary Sewer and Surface Water Management* issued in June of 2007 and updated in 2009.

Attachments: Exhibit 1 – Water Quality Map



PROJECT NO.	21198310
DATE:	09/06/2013
BY:	ASR
EXHIBIT:	1

WATER QUALITY BASIN MAP
NYBERG RIVERS

CENTERCAL PROPERTIES, LLC.
Tualatin, Oregon

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Exhibit 1
Attachment N

Nyberg Rivers

Tualatin, Oregon

An Application For:

Architectural Review Board

Deemed complete October 31, 2013

Developer
Centercal Properties, LLC
7455 SW Bridgeport Road, Suite 205
Tigard, Oregon 97224
Phone: 503 968-8940

Civil Engineering, Landscape Architecture, Survey, and Land Use Planning
Cardno
5415 SW Westgate Drive, Suite 100
Portland, Oregon 97221

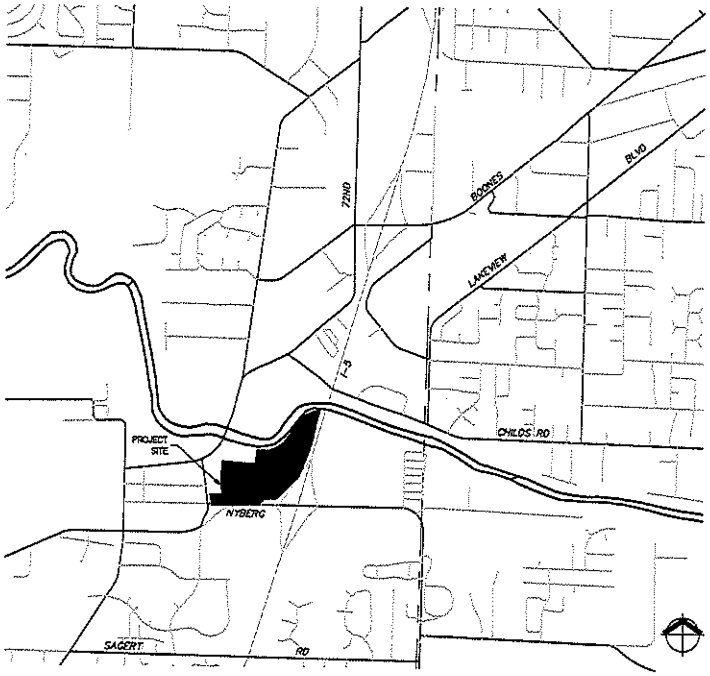
Architect
Mulvanny G2
18200 Von Karman Avenue, Suite 910
Irvine, California 92612
Phone: 949-705-0700

Transportation
Kittelson and Associates
610 SW Alder, Suite 700
Portland, Oregon 97205
Phone: 503-228-5230

Geotechnical
GeoDesign
15575 SW Sequoia Parking, Suite 100
Portland, Oregon 97224
Phone: 503-968-8787

Photometrics
Musgrove Engineering PA
234 S. Whisperwood Way
Boise, Idaho 83709
Phone: 208-384-0585

Exhibit 1
Attachment O-1



Vicinity Map
Not to Scale

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Deemed complete October 31, 2013

Nyberg Rivers

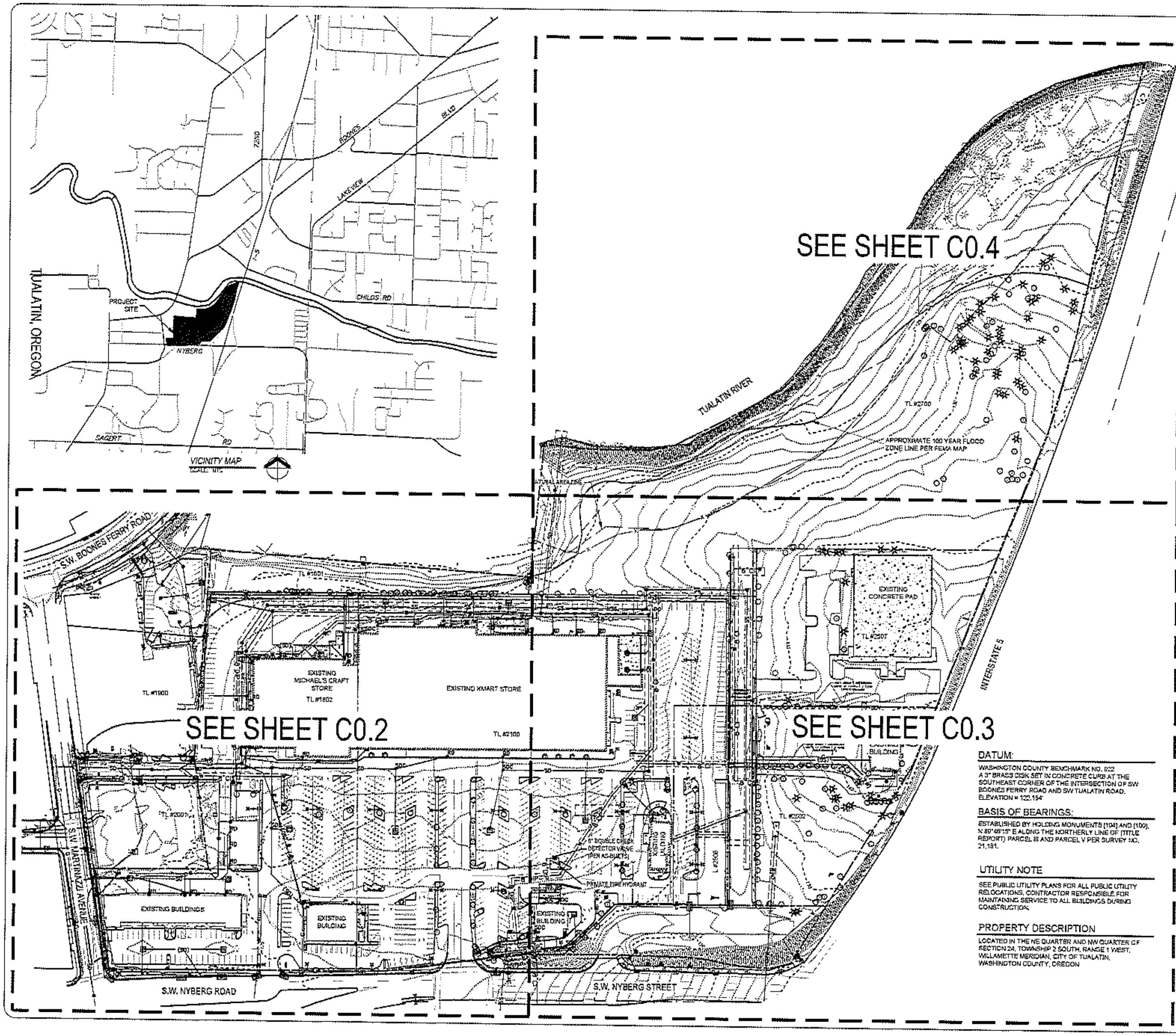
Tualatin, Oregon

An Application For:
Architectural Review Board

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503) 232-1987).

OREGON UTILITY
NOTIFICATION CENTER
1-800-332-2344

CALL BEFORE YOU DIG



DATUM:

WASHINGTON COUNTY BENCHMARK NO. 022
A 3" BRASS DISK SET IN CONCRETE CURB AT THE SOUTHEAST CORNER OF THE INTERSECTION OF SW BOONES FERRY ROAD AND SW TUALATIN ROAD.
ELEVATION = 122.154'

BASIS OF BEARINGS:

ESTABLISHED BY HOLDING MONUMENTS [104] AND [100], N 89°48'15" E ALONG THE NORTHERLY LINE OF (TITLE REPORT) PARCEL III AND PARCEL V PER SURVEY NO. 21,191.

UTILITY NOTE

SEE PUBLIC UTILITY PLANS FOR ALL PUBLIC UTILITY RELOCATIONS. CONTRACTOR RESPONSIBLE FOR MAINTAINING SERVICE TO ALL BUILDINGS DURING CONSTRUCTION.

PROPERTY DESCRIPTION

LOCATED IN THE NE QUARTER AND NW QUARTER OF SECTION 24, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF TUALATIN, WASHINGTON COUNTY, OREGON

LEGEND:

- EXISTING BOUNDARY LINE
- EXISTING RIGHT-OF-WAY LINE
- SECTIONAL LINE
- EASEMENT LINE
- SETBACK LINE
- BUILDING OVERHANG LINE
- FENCE LINE, TYPE AS NOTED
- UNDERGROUND WATER LINE
- UNDERGROUND IRRIGATION LINE
- SANITARY SEWER LINE
- STORM DRAINAGE LINE
- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND TELEPHONE LINE
- OVERHEAD WIRE
- UNDERGROUND GAS LINE
- UNDERGROUND CABLE TV LINE
- BUILDING FACE
- EXISTING CONCRETE SURFACE
- GAS VALVE
- GAS METER
- TELEPHONE RISER
- TELEPHONE MANHOLE
- CONIFEROUS TREE
- DECIDUOUS TREE
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- CATCH BASIN
- STORM DRAIN MANHOLE
- RD ROOF DRAIN
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- POST INDICATOR VALVE
- UNDERGROUND WATER VAULT
- WATER VALVE
- WATER METER BOX
- SPRINKLER VALVE
- GROUND LIGHT
- STREET LIGHT (COBRA ARM)
- SHOEBOX LIGHT (SINGLE)
- ACORN/GLOBE LIGHT
- ELECTRIC METER
- TRANSFORMER
- PARKING BUMPER
- TRAFFIC SIGNAL POLE
- SIGNAL JUNCTION BOX
- UNKNOWN CLEANOUT
- UNKNOWN MANHOLE
- BOLLARD
- GATE POST
- MAILBOX
- SIGN

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CENTERCAL PROPERTIES, LLC

OVERALL EXISTING CONDITIONS
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.

PROJECT NO.:	2119312
DATE:	11/06/13
DESIGNED BY:	RMW/KDB
DRAWN BY:	BCF
CHECKED BY:	JRS

OVERALL EXIST CONDITIONS
C0.0
Exhibit 1
Attachment D-3

STRUCTURE TABLE:

1	SANITARY SEWER MANHOLE RIM = 132.74' 8"PVC(SW) = 126.14' 8"PVC(S) = 125.63' (NO FLOW) 8"PVC(N) = 125.40'
2	SANITARY SEWER MANHOLE RIM = 131.02' 6"PVC(E) = 124.05' 8"PVC(S) = 123.62' 8"PVC(W) = 123.00'
3	SANITARY SEWER MANHOLE RIM = 128.15' 8"PVC(N) = 122.90' 8"PVC(E) = 122.01' 8"PVC(S) = 122.61'
4	SANITARY SEWER MANHOLE RIM = 127.10' 8"PVC(N) = 122.71' 8"PVC(W) = 122.63'
5	SANITARY SEWER MANHOLE RIM = 126.60' 8"PVC(E) = 121.44' 8"PVC(W) = 121.38'
6	SANITARY SEWER MANHOLE RIM = 125.10' 8"PVC(E) = 118.54' 8"PVC(SW) = 118.49'
7	SANITARY SEWER MANHOLE RIM = 125.84' 8"PVC(NE) = 118.90' 8"PVC(S) = 118.84'
8	SANITARY SEWER MANHOLE RIM = 126.60' 8"STEEL(N) = 122.70' 8"PVC(N) = 117.98' 8"PVC(SE) = 118.28' 8"PVC(W) = 117.89'
9	SANITARY SEWER MANHOLE RIM = 123.07' 8"PVC(N) = 116.59' 8"PVC(E) = 116.57' 6"PVC(S) = 116.67'
10	SANITARY SEWER MANHOLE RIM = 123.45' 8"PVC(N) = 119.88' 8"PVC(S) = 119.82'
11	SANITARY SEWER MANHOLE RIM = 124.21' 8"PVC(N) = 115.21' 8"PVC(E) = 114.87' 8"PVC(W) = 114.86' FLOWLINE = 114.89'

1	IE 10"CMP = 127.70'
2	CATCH BASIN RIM = 130.52' 6"CONC(S) = 128.87'
3	CATCH BASIN RIM = 131.56' 6"CONC(S) = 130.00' FULL OF DIRT
4	STORM DRAINAGE MANHOLE RIM = 127.47' 18"CONC(S) = 117.83' 18"CONC(W) = 117.70'
5	CATCH BASIN TRAPPED INLET RIM = 127.35' OUT WEST
5A	CATCH BASIN TRAPPED INLET RIM = 127.15' OUT EAST
6	STORM DRAINAGE MANHOLE RIM = 126.08' 15"CONC(W) = 110.00' 18"CONC(N) = 110.53'
7	CATCH BASIN TRAPPED INLET RIM = 126.01' OUT SOUTH
8	STORM DRAINAGE MANHOLE RIM = 127.37' 18"CONC(E) = 115.35' 24"CONC(W) = 114.48' 24"CONC(N) = 114.44'
9	IE 18" CMP = 103.68'
10	CATCH BASIN TRAPPED INLET RIM = 125.41' OUT SOUTH
10A	CATCH BASIN TRAPPED INLET RIM = 124.16' OUT EAST
11	STORM DRAINAGE MANHOLE RIM = 127.15' 24"CONC(W) = 115.08' 24"CONC(E) = 115.00'
12	CATCH BASIN TRAPPED INLET RIM = 125.28' OUT SOUTH
13	STORM DRAINAGE MANHOLE RIM = 125.29' 8"CONC(S) = 110.81' 18"CONC(SW) = 116.72' 24"CONC(E) = 116.50'
14	CATCH BASIN TRAPPED INLET RIM = 124.56' OUT NORTH
15	STORM DRAINAGE MANHOLE RIM = 126.29' 18"CONC(S) = 116.93' 18"CONC(NE) = 116.89'
16	CATCH BASIN TRAPPED INLET RIM = 121.82' OUT WEST
17	CATCH BASIN TRAPPED INLET RIM = 124.00' OUT EAST
18	STORM DRAINAGE MANHOLE RIM = 127.23' 18"CONC(S) = 117.29' 12"CONC(W) = 117.24' 18"CONC(N) = 117.19'
19	STORM DRAINAGE MANHOLE RIM = 127.06' 18"CONC(E) = 117.63' 18"CONC(W) = 117.62' 18"CONC(N) = 117.34'
20	STORM DRAINAGE MANHOLE RIM = 127.86' 18"CONC(E) = 117.52' 15"CONC(S) = 117.51' 18"CONC(W) = 117.45'
21	CATCH BASIN TRAPPED INLET RIM = 124.61' OUT WEST
22	CATCH BASIN TRAPPED INLET RIM = 124.89' OUT WEST
23	STORM DRAINAGE MANHOLE RIM = 124.32' 12"PVC(N) = 118.55' 15"CONC(E) = 118.11' W/ PLUG 12"PVC(S) = 119.32' 15"CONC(W) = 118.11' W/ PLUG
24	CATCH BASIN TRAPPED INLET RIM = 123.60' OUT NORTH
25	CATCH BASIN TRAPPED INLET RIM = 123.65' OUT WEST
26	CATCH BASIN TRAPPED INLET RIM = 123.74' OUT SOUTHWEST
27	CATCH BASIN TRAPPED INLET RIM = 122.75' OUT EAST
28	CATCH BASIN TRAPPED INLET RIM = 122.40' OUT EAST
29	STORM DRAINAGE MANHOLE RIM = 123.25' 12"CONC(NE) = 119.04' 18"CONC(E) = 118.30' 12"CMP(SE) = 118.85' 8"CMP(W) = 119.44'
30	CATCH BASIN RIM = 122.85' 12"CMP(NW) = 120.03' SUMP = 120.60'
31	CATCH BASIN TRAPPED INLET RIM = 123.82' OUT WEST
32	CATCH BASIN TRAPPED INLET RIM = 123.75' OUT WEST
33	CATCH BASIN RIM = 122.73' 12"CMP(NW) = 120.46' 8"CMP(W) = 120.48' SUMP = 120.33'
34	CATCH BASIN RIM = 123.27' 12"CONC(SW) = 121.77' 8"IRON PIPE(E) = 121.72' SUMP = 121.67'
35	CATCH BASIN TRAPPED INLET RIM = 123.55' OUT EAST
36	CATCH BASIN TRAPPED INLET RIM = 123.45' OUT WEST
37	CATCH BASIN RIM = 123.56' 8"IRON PIPE(E) = 122.18' SUMP = 122.18'
38	CATCH BASIN RIM = 123.66' 8"IRON PIPE(E/W) = 121.91' SUMP = 121.91'
39	CATCH BASIN RIM = 123.60' 8"IRON PIPE(W) = 121.71' 12"CMP(E) = 122.68' 12"CPP(S) = 121.63' SUMP = 121.93'
40	CATCH BASIN RIM = 124.23' 12"CMP(W) = 123.02' SUMP = 122.93'
41	CATCH BASIN RIM = 126.79' 12"CONC(E) = 124.10' SUMP = 123.04'
42	CATCH BASIN RIM = 127.58' 12"CONC(N) = 124.48' 12"CONC(W) = 123.94' 12"CONC(S) = 123.89'
43	IE 12"CMP = 124.08'
44	CATCH BASIN TRAPPED INLET RIM = 127.70' OUT SOUTHWEST
45	CATCH BASIN TRAPPED INLET RIM = 127.67' OUT EAST
46	CATCH BASIN TRAPPED INLET RIM = 129.66' OUT SOUTH
47	CATCH BASIN TRAPPED INLET RIM = 125.54' OUT NORTH
48	CATCH BASIN TRAPPED INLET RIM = 124.72' OUT NORTH
49	CATCH BASIN TRAPPED INLET RIM = 124.51' OUT NORTH
50	CATCH BASIN TRAPPED INLET RIM = 123.67' OUT WEST
51	STORM DRAINAGE MANHOLE RIM = 132.70 12"CONC(NE) = 125.00' 12"CONC(SE) = 124.92' 12"CONC(W) = 124.02'
52	DITCH INLET RIM = 128.54' 12"CONC(SW) = 126.36' SUMP = 124.72'
53	CATCH BASIN RIM = 137.89' 12"CONC(NW) = 133.33' 12"CONC(E) = 133.28'
54	CATCH BASIN RIM = 144.85' 12"CONC(W) = 140.50'
55	CATCH BASIN TRAPPED INLET RIM = 140.60' SUMP = 138.12'
56	IE 4" PVC = 131.86'
57	CATCH BASIN TRAPPED INLET RIM = 135.02' SUMP = 132.45'
58	CATCH BASIN TRAPPED INLET RIM = 134.84' SUMP = 132.18'
59	STORM DRAINAGE MANHOLE RIM = 121.54' 30"CONC.(S) = 111.29' 30"CONC.(N) = 111.22'

LEGEND:

- EXISTING BOUNDARY LINE
- EXISTING RIGHT-OF-WAY LINE
- SECTIONAL LINE
- EASEMENT LINE
- SETBACK LINE
- BUILDING OVERHANG LINE
- FENCE LINE, TYPE AS NOTED
- UNDERGROUND WATER LINE
- UNDERGROUND IRRIGATION LINE
- SANITARY SEWER LINE
- STORM DRAINAGE LINE
- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND TELEPHONE LINE
- OVERHEAD WIRE
- UNDERGROUND GAS LINE
- UNDERGROUND CABLE TV LINE
- BUILDING FACE
- TREE/VEGETATION LINE
- EXISTING ASPHALT SURFACE
- EXISTING CONCRETE SURFACE
- GAS VALVE
- GAS METER
- TELEPHONE RISER
- TELEPHONE MANHOLE
- CONIFEROUS TREE
- DECIDUOUS TREE

- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- CATCH BASIN
- STORM DRAIN MANHOLE
- RD · ROOF DRAIN
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- POST INDICATOR VALVE
- UNDERGROUND WATER VAULT
- WATER VALVE
- WATER METER BOX
- SPRINKLER VALVE
- GROUND LIGHT
- STREET LIGHT (COBRA ARM)
- SHOEBOX LIGHT (SINGLE)
- ACORN/GLOBE LIGHT
- ELECTRIC METER
- TRANSFORMER
- PARKING BUMPER
- TRAFFIC SIGNAL POLE
- SIGNAL JUNCTION BOX
- UNKNOWN CLEANOUT
- UNKNOWN MANHOLE
- BOLLARD
- GATE POST
- MAILBOX
- SIGN

DATUM:

WASHINGTON COUNTY BENCHMARK NO. 622
A 3" BRASS DISK SET IN CONCRETE CURB AT THE SOUTHEAST CORNER OF THE INTERSECTION OF SW BOONES FERRY ROAD AND SW TUALATIN ROAD.
ELEVATION = 122.154'

BASIS OF BEARINGS:

ESTABLISHED BY HOLDING MONUMENTS [104] AND [100], N 89°40'15" E ALONG THE NORTHERLY LINE OF (TITLE REPORT) PARCEL III AND PARCEL V PER SURVEY NO. 21,181.

UTILITY NOTE

SEE PUBLIC UTILITY PLANS FOR ALL PUBLIC UTILITY RELOCATIONS. CONTRACTOR RESPONSIBLE FOR MAINTAINING SERVICE TO ALL BUILDINGS DURING CONSTRUCTION.

PROPERTY DESCRIPTION

LOCATED IN THE NE QUARTER AND NW QUARTER OF SECTION 24, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF TUALATIN, WASHINGTON COUNTY, OREGON

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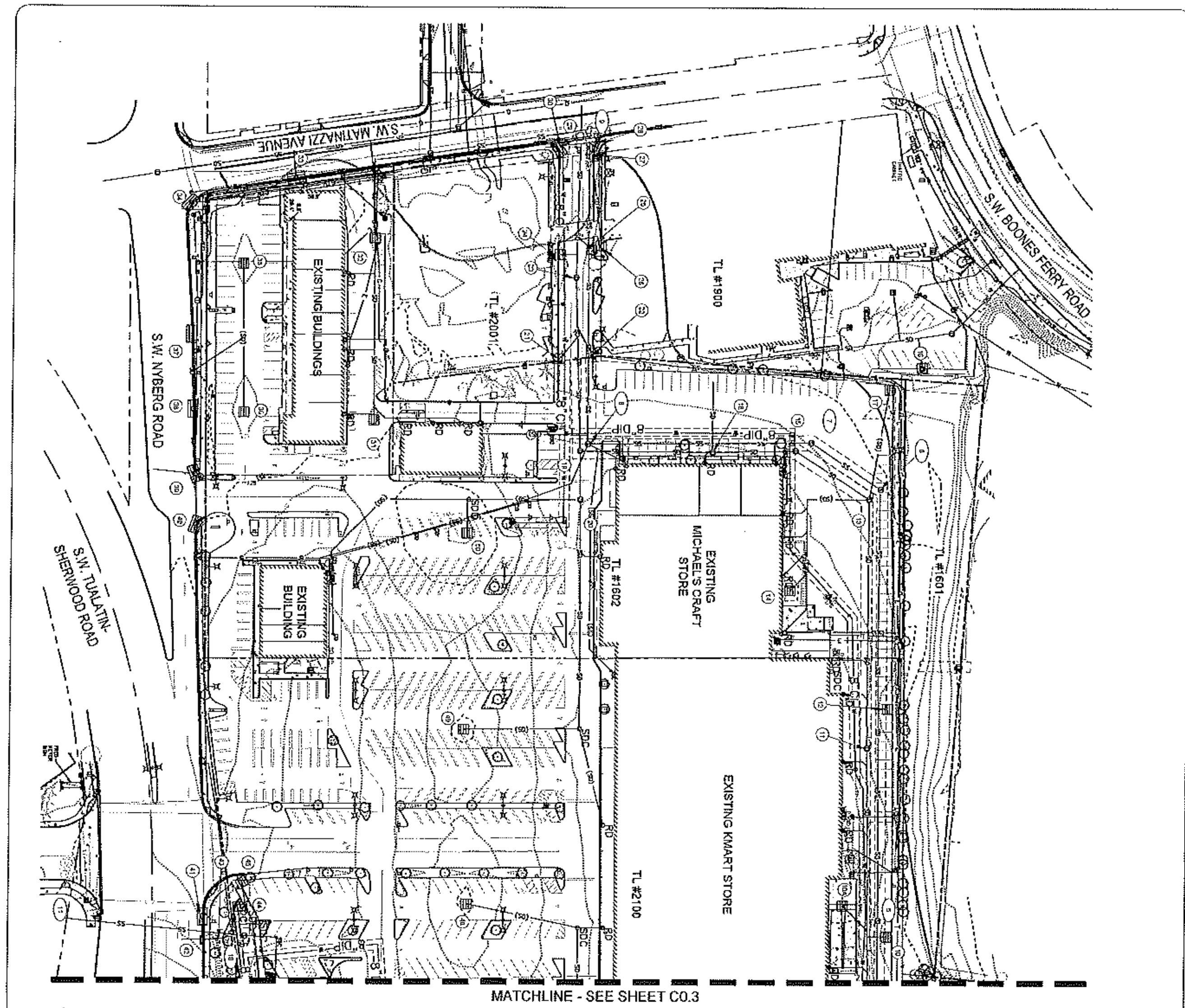
CENTERCAL PROPERTIES, LLC

EXISTING CONDITIONS
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO:	21198310
DATE:	11/05/12
DESIGNED BY:	RHH/KDB
DRAWN BY:	BCF
CHECKED BY:	JRG

EXISTING CONDITIONS

C0.1
Exhibit 1
Attachment 0-3



EXISTING CONDITIONS

NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD

CENTERCAL PROPERTIES, LLC.

TUALATIN, OREGON

CENTERCAL

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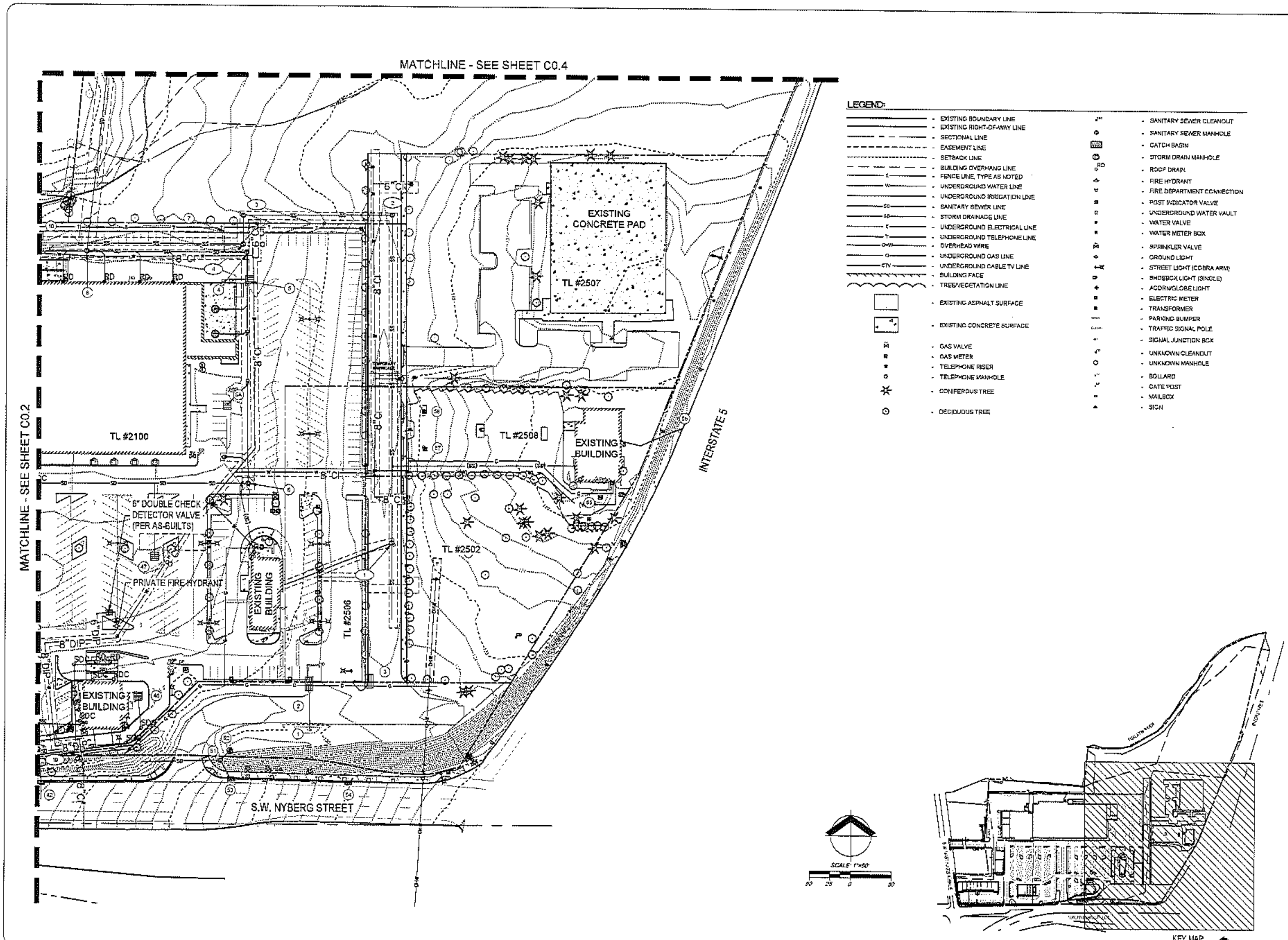
EXISTING CONDITIONS

C0.2
Exhibit 1
Attachment 0-3



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CENTERCAL PROPERTIES, LLC

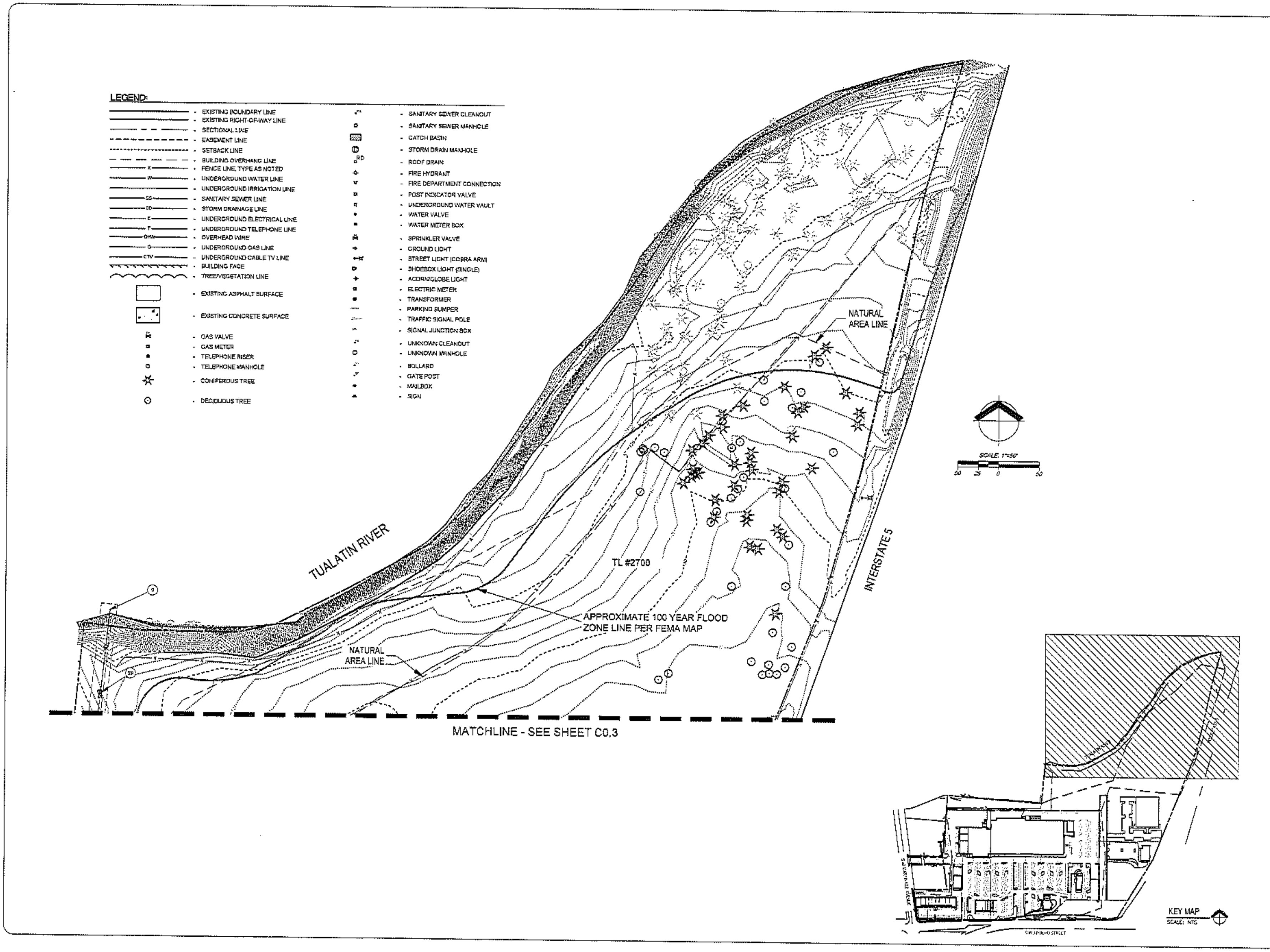
EXISTING CONDITIONS
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21190310
DATE:	12/18/13
DESIGNED BY:	RHK/KCD
DRAWN BY:	BCF
CHECKED BY:	JRS

EXISTING CONDITIONS

C0.3

Exhibit 1
Attachment O-3



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CENTERCAL PROPERTIES, LLC

EXISTING CONDITIONS
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.	2130210
DATE:	12/06/13
DESIGNED BY:	RHH/KDB
DRAWN BY:	BCF
CHECKED BY:	JRS

EXISTING CONDITIONS

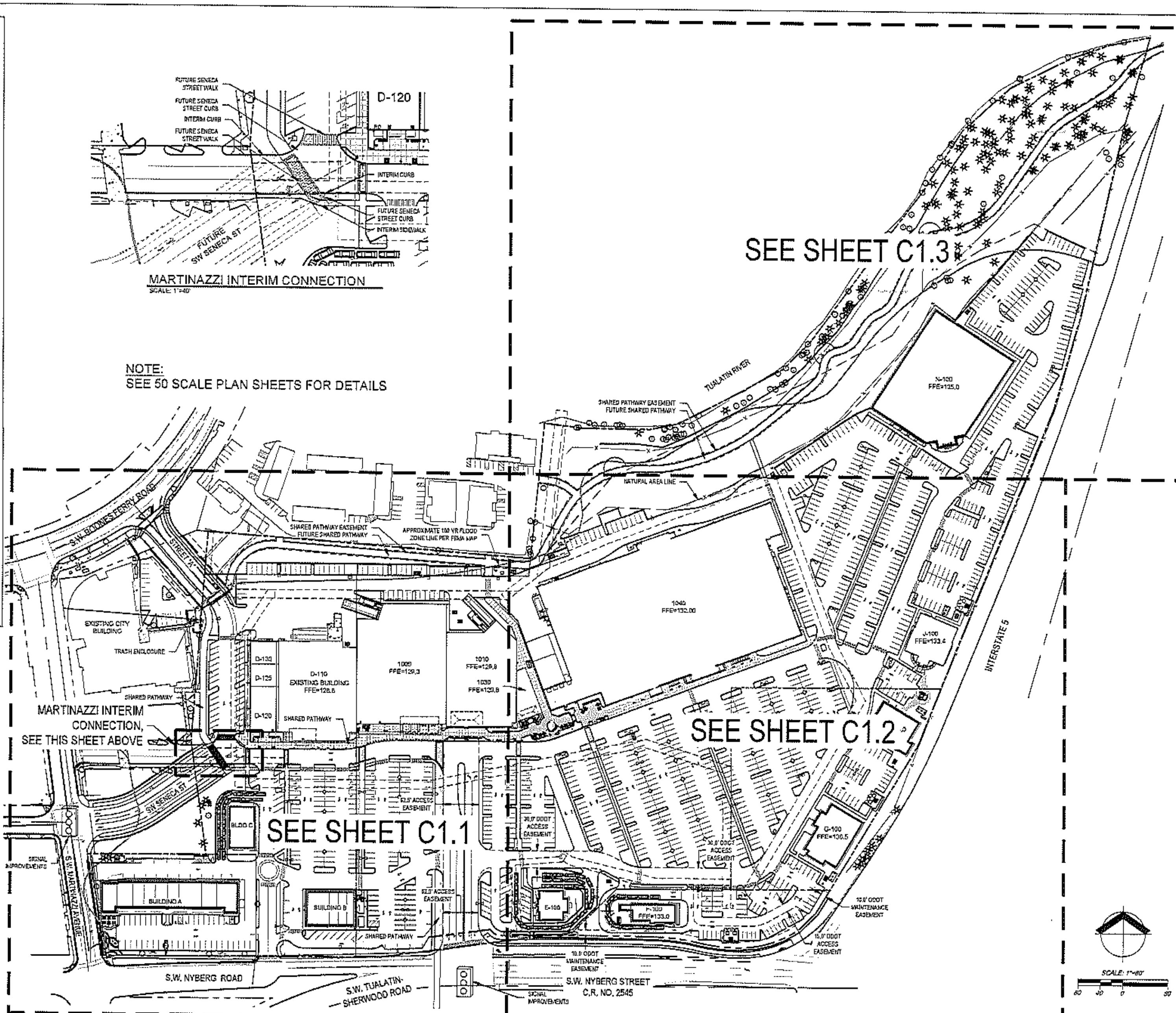
C0.4

Exhibit 1
Attachment O-3

PROJECT SUMMARY:

SITE AREA	
DEVELOPMENT AREA:	31.75 ACRES
CONSERVATION AREA:	5.33 ACRES
SITE NET AREA:	26.42 ACRES
REQUIRED LANDSCAPE AREA: 15% /	4.76 ACRES
NATURAL AREA 5.33 ACRES	
PLANTED AREA 3.73 ACRES	
HARDSCAPE AREA 1.83 ACRES	
PROPOSED LANDSCAPE AREA:	10.89 ACRES
PARKING LOT LANDSCAPING AREA:	1.61 ACRES
EXISTING/PROPOSED PARKING AREA:	4.96 ACRES
PROPOSED ASPHALT AREA:	14.40 ACRES
FLOOR AREA RATIO: 0.21	
TENANTS BUILDING AREA:	
1005 RETAIL	33,572 SF
1010 RETAIL	21,750 SF
BLDG A	12,500 SF
BLDG B	5,850 SF
BLDG C PAD	3,950 SF
BLDG D	32,459 SF
1030 RETAIL	2,900 SF
1040 RETAIL	110,093 SF
PAD E-100	3,172 SF
PAD F-100	3,374 SF
G-100 RESTAURANT	7,500 SF
H-100 RESTAURANT	6,000 SF
J-100 RESTAURANT	5,797 SF
N-100 HEALTH CLUB	45,000 SF
OVERALL TENANTS BUILDING SF:	**293,919 SF**
TENANTS BUILDING PERIMETER (IF DIFFERENT FROM ABOVE)	
1040 RETAIL PERIMETER	105,909 SF
N-100 HEALTH CLUB PERIMETER	36,730 SF
OVERALL TENANTS BUILDING PER. SF:	**281,445 SF**
STANDARD PARKING STALLS (9'x19'):	1038 STALLS
COMPACT PARKING STALLS (7.7'x16'):	228 STALLS
A.D.A. PARKING STALLS (9'x19'):	50 STALLS
OVERALL PROVIDED STALLS:	**1,316 STALLS**
OVERALL PARKING RATIO: 4.48/1000	

NOTES:
(1) PROJECT AREA INCLUDES PARCELS AND ADJACENT OREGON DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY AREA ALONG NYBERG ROAD. TOTAL PROJECT AREA ASSUMES ACQUISITION OF EXCESS, ADJACENT RIGHT-OF-WAY.
(2) PROJECT AREA DOES NOT INCLUDE THE RESULTING LAND AREAS FROM THE NEW SENECA STREET EXTENSION AND RELOCATION OF THE CITY BUILDING.
(3) BUILDING AREAS PROVIDED BY CENTERCAL.
(4) PARKING LOT LANDSCAPING AREA IS COMPOSED OF PLANTED AREA AND HARDSCAPE AREA.



OVERALL SITE PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

CENTERCAL PROPERTIES, LLC

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5415 SW WESTGATE DR, STE 100, PORTLAND, OR 97221
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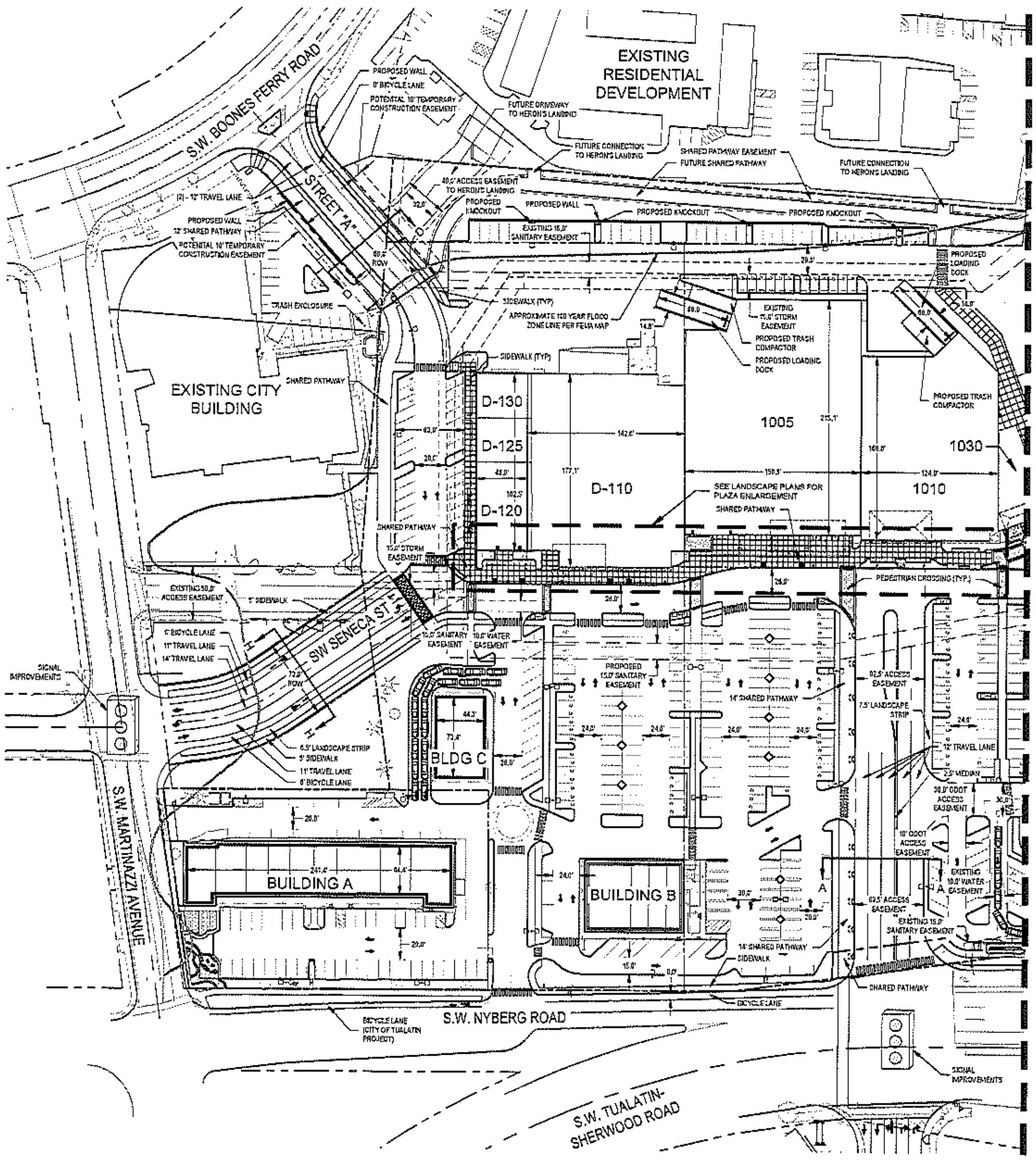
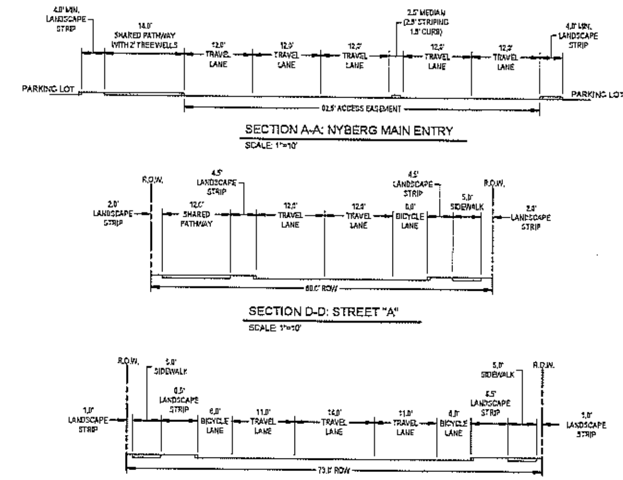
PROJECT NO.:	2119010
DATE:	11/04/13
DESIGNED BY:	RHH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRG

OVERALL SITE PLAN
C1.0
Exhibit 1
Attachment D-3



LEGEND

- PROPERTY LINE
- LOT LINE
- PROPOSED BUILDING LINE
- PROPOSED WALL LINE
- PROPOSED CURB LINE
- PROPOSED COMPACT STALL
- PROPOSED ADA STALL
- PROPOSED CROSSWALK STRIPING
- PROPOSED TRASH ENCLOSURE
- EXISTING TREE
- PROPOSED LIGHT POLES

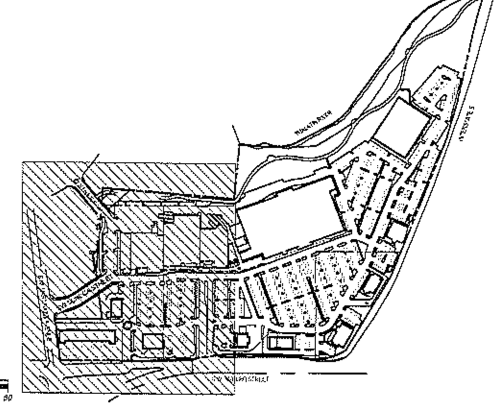


SECTION A-A: NYBERG MAIN ENTRY
SCALE: 1"=10'

SECTION D-D: STREET "A"
SCALE: 1"=10'

SECTION H-H: SENECA STREET
SCALE: 1"=10'

*SEE ARB PLANNING BOOK SUBMITTAL FOR LOCATION AND DETAIL OF SECTIONS B-B, C-C, E-E, F-F, AND G-G.



KEY MAP
SCALE: NTS

SCALE: 1"=50'

SITE PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

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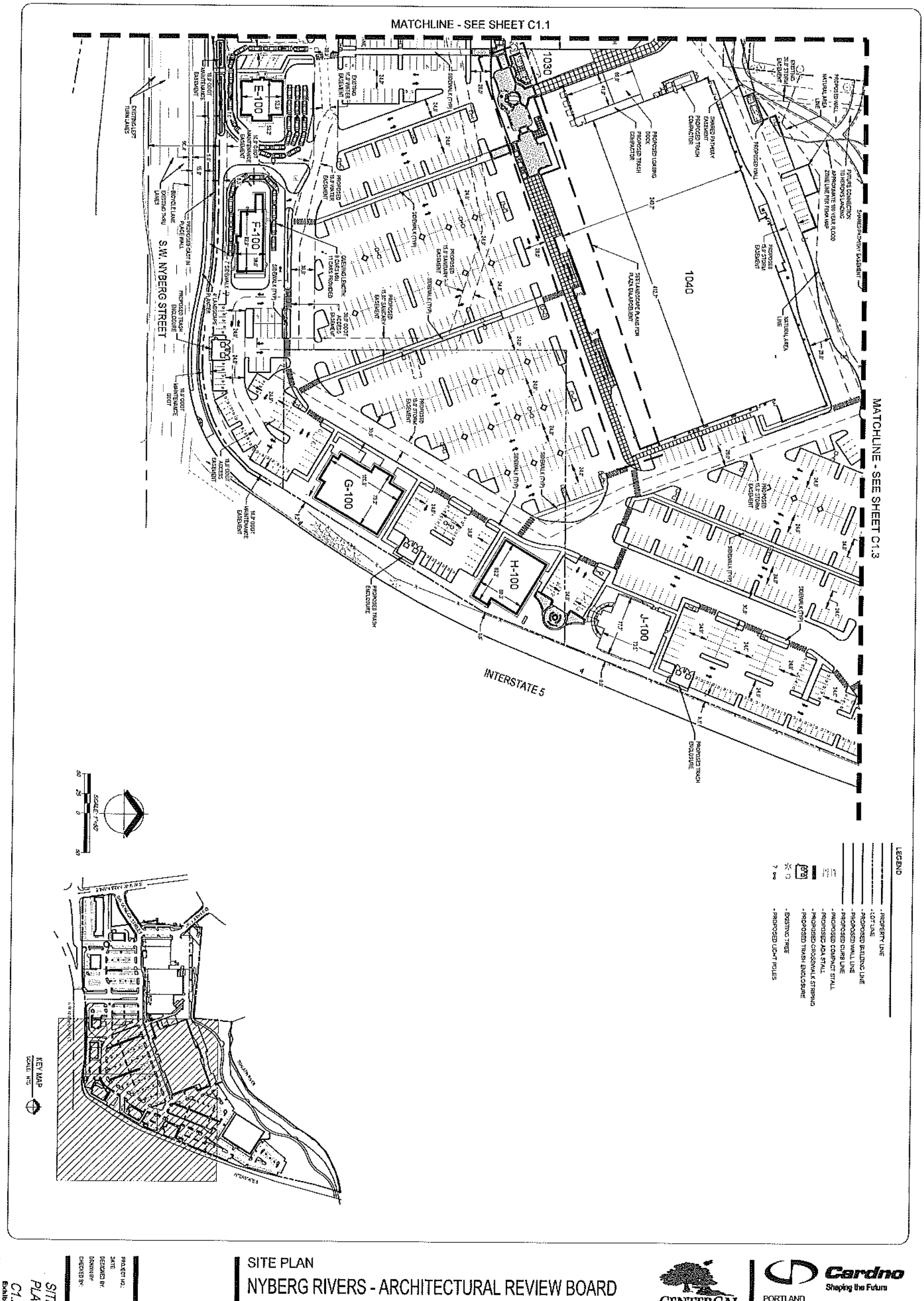
CENTERCAL PROPERTIES, LLC

PROJECT NO.:	21108310
DATE:	11/06/13
DESIGNED BY:	RHH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRC

SITE PLAN
C1.1
Exhibit 1
Attachment O-3



SITE PLAN

NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD

CENTERCAL PROPERTIES, LLC.

TUALATIN, OREGON

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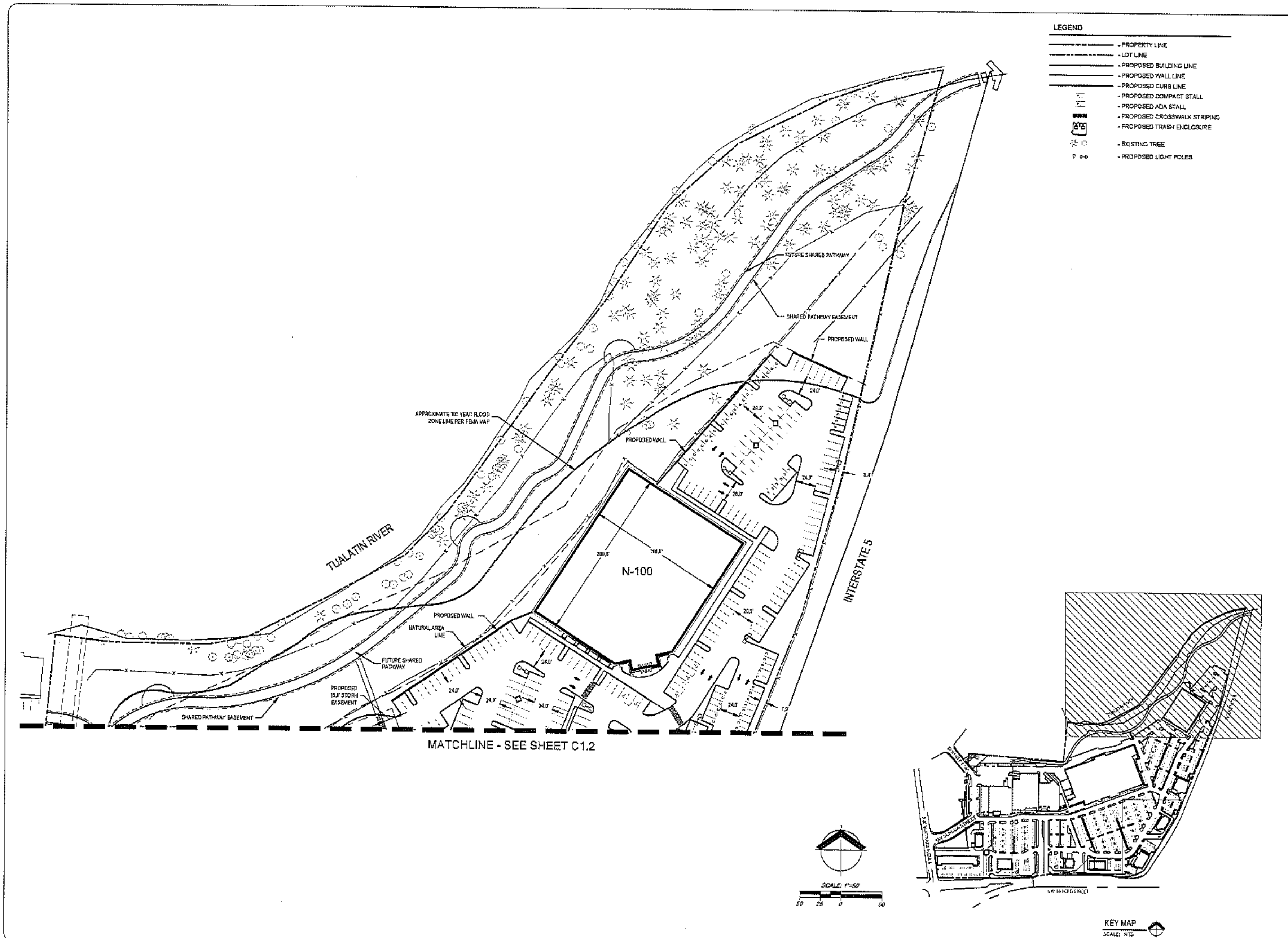
TEL: (503) 419-2500 FAX (503) 419-2600

PROJECT NO.:	2100010
DATE:	11/6/13
DESIGNED BY:	RHHADD
DRAWN BY:	BCF
CHECKED BY:	JRS

SITE PLAN

C1.2

Exhibit 1
Attachment 0-3



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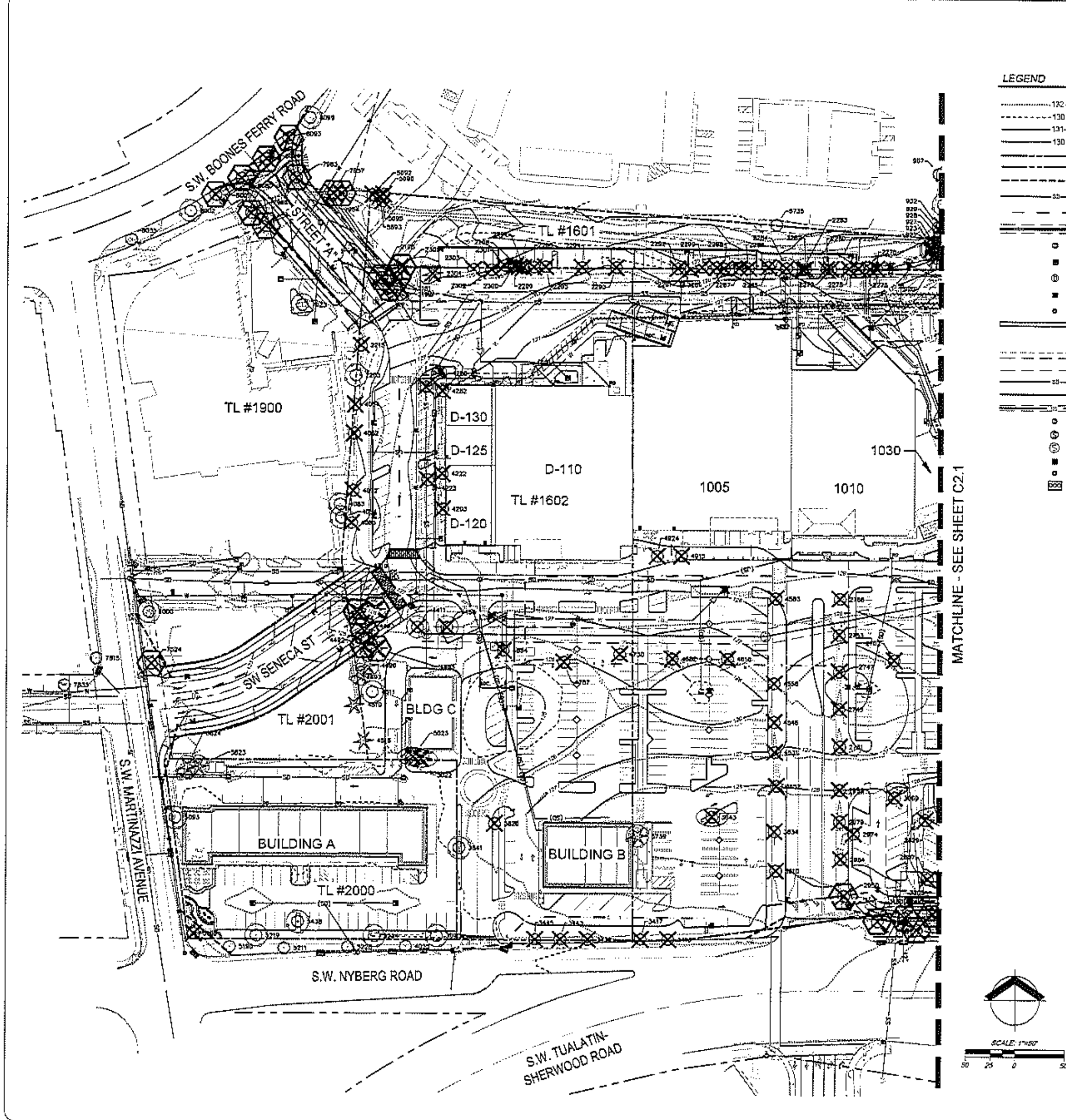
SITE PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

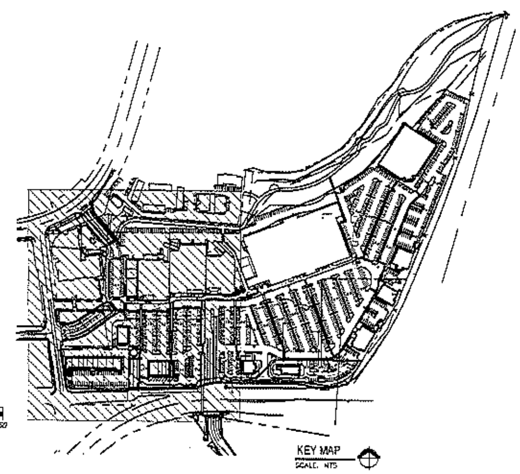
PROJECT NO.:	2119231D
DATE:	11/06/13
DESIGNED BY:	RH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRS

SITE PLAN
C1.3
Exhibit 1
Attachment O-3



LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPERTY LINE
- LOT LINE
- VISION CLEARANCE LINE
- EXISTING STORM LINE
- PROPOSED STORM PRIVATE LINE
- PROPOSED STORM PUBLIC LINE
- EXISTING STORM MANHOLE
- EXISTING STORM CATCH BASIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCH BASIN
- PROPOSED STORM CLEAN OUT
- PROPOSED STORM LOW IMPACT DESIGN FEATURE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- EXISTING SANITARY LINE
- PROPOSED SANITARY PRIVATE LINE
- PROPOSED SANITARY PUBLIC LINE
- EXISTING SANITARY MANHOLE
- PROPOSED PUBLIC MANHOLE
- PROPOSED PRIVATE MANHOLE
- PROPOSED SANITARY CATCH BASIN
- PROPOSED SANITARY CLEAN OUT
- PROPOSED GREASE INTERCEPTOR
- EXISTING WATER LINE
- PROPOSED WATER PRIVATE LINE
- PROPOSED WATER PUBLIC LINE
- PROPOSED FIRE WATER LINE
- PROPOSED DOMESTIC WATER LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VAULT
- EXISTING WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FIRE DEPT. CONNECTION
- PROPOSED WATER/DEDUCT METER
- PROPOSED DOUBLE CHECK VALVE
- EXISTING TREE TO BE REMOVED
- EXISTING TREE REMOVED FOR PUBLIC UTILITY INSTALLATION OR EXISTING PUBLIC UTILITY REMOVAL
- EXISTING TREE REMOVED IN ACCORDANCE WITH SECTION 34.203 TREE REMOVAL ON PRIVATE PROPERTY (4 PER SINGLE PARCEL OF PROPERTY).
- EXISTING TREE REMOVED FOR PUBLIC STREET IMPROVEMENTS.
- EXISTING TREE REMOVED WHEN APPROVED BY ODOT.
- EXISTING TREE TO BE PROTECTED IN PLACE WITH FENCING AROUND THE DRIP LINE.
- EXISTING TREE TO BE REMOVED AND REPLACED WITH APPROVED TREE



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CENTERCAL PROPERTIES, LLC

TREE PRESERVATION SITE PLAN

NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD

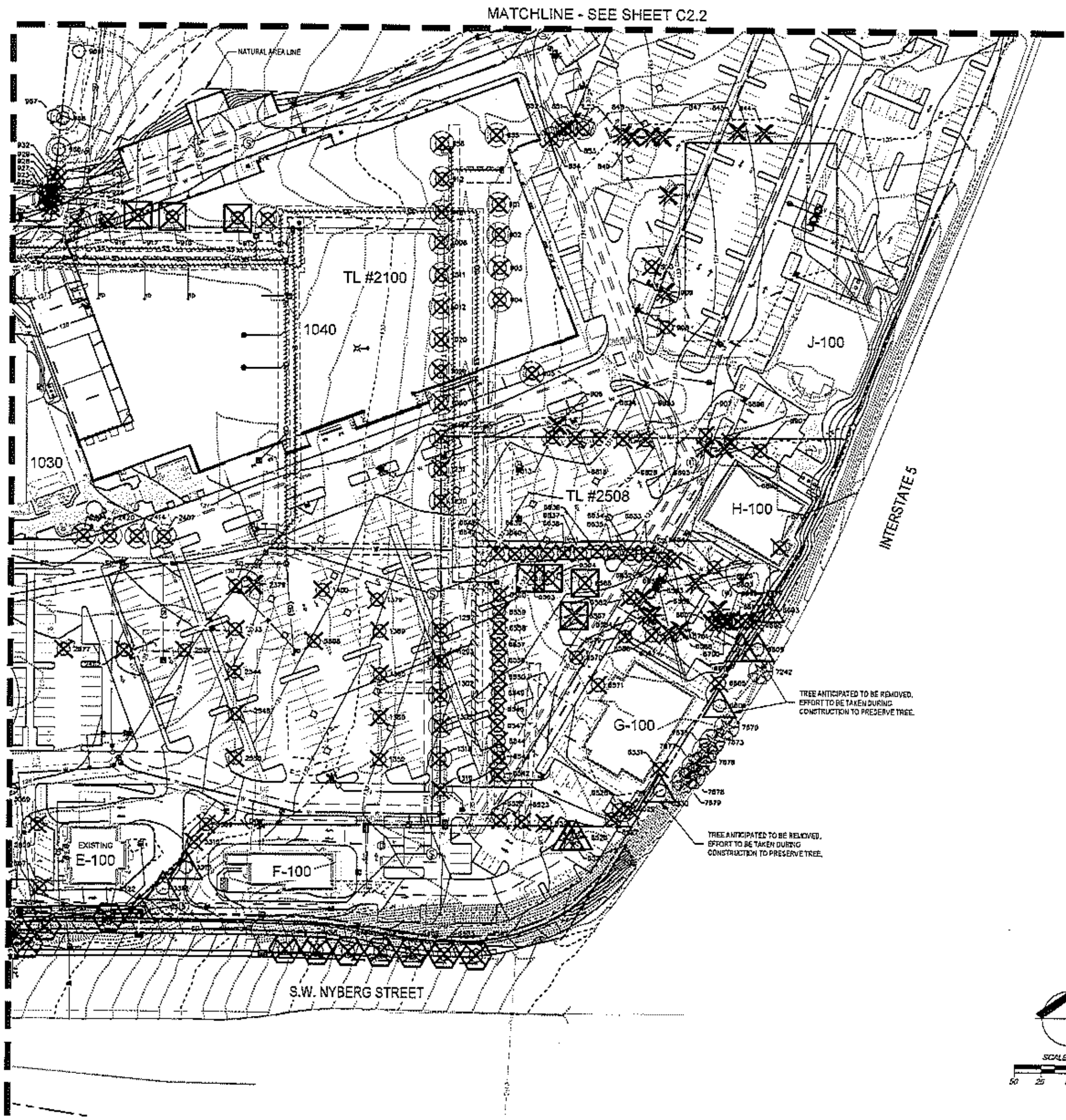
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21190310
DATE:	11/05/13
DESIGNED BY:	RHH/KDO
DRAWN BY:	BCF
CHECKED BY:	JRS

TREE PRESERVATION SITE PLAN

C2.0

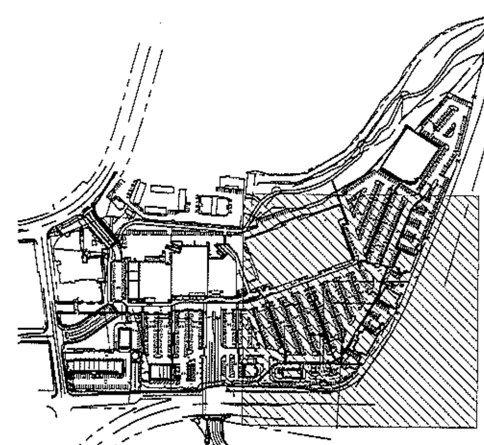
Exhibit 1
Attachment O-3



SCALE: 1"=50'

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPERTY LINE
- LOT LINE
- VISION CLEARANCE LINE
- EXISTING STORM LINE
- PROPOSED STORM PRIVATE LINE
- PROPOSED STORM PUBLIC LINE
- EXISTING STORM MANHOLE
- EXISTING STORM CATCH BASIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCH BASIN
- PROPOSED STORM CLEAN OUT
- PROPOSED STORM LOW IMPACT DESIGN FEATURE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- EXISTING SANITARY LINE
- PROPOSED SANITARY PRIVATE LINE
- PROPOSED SANITARY PUBLIC LINE
- EXISTING SANITARY MANHOLE
- PROPOSED PUBLIC MANHOLE
- PROPOSED PRIVATE MANHOLE
- PROPOSED SANITARY CATCH BASIN
- PROPOSED SANITARY CLEAN OUT
- PROPOSED GREASE INTERCEPTOR
- EXISTING WATER LINE
- PROPOSED WATER PRIVATE LINE
- PROPOSED WATER PUBLIC LINE
- PROPOSED FIRE WATER LINE
- PROPOSED DOMESTIC WATER LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VAULT
- EXISTING WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FIRE DEPT. CONNECTION
- PROPOSED WATER/DEDUCT METER
- PROPOSED DOUBLE CHECK VALVE
- EXISTING TREE TO BE REMOVED
- EXISTING TREE REMOVED FOR PUBLIC UTILITY INSTALLATION OR EXISTING PUBLIC UTILITY REMOVAL.
- EXISTING TREE REMOVED IN ACCORDANCE WITH SECTION 34.200 TREE REMOVAL ON PRIVATE PROPERTY (4 PER SINGLE PARCEL OF PROPERTY").
- EXISTING TREE REMOVED FOR PUBLIC STREET IMPROVEMENTS.
- EXISTING TREE REMOVED WHEN APPROVED BY ODOT.
- EXISTING TREE TO BE PROTECTED IN PLACE WITH FENCING AROUND THE DRIP LINE.



KEY MAP
SCALE: NTS

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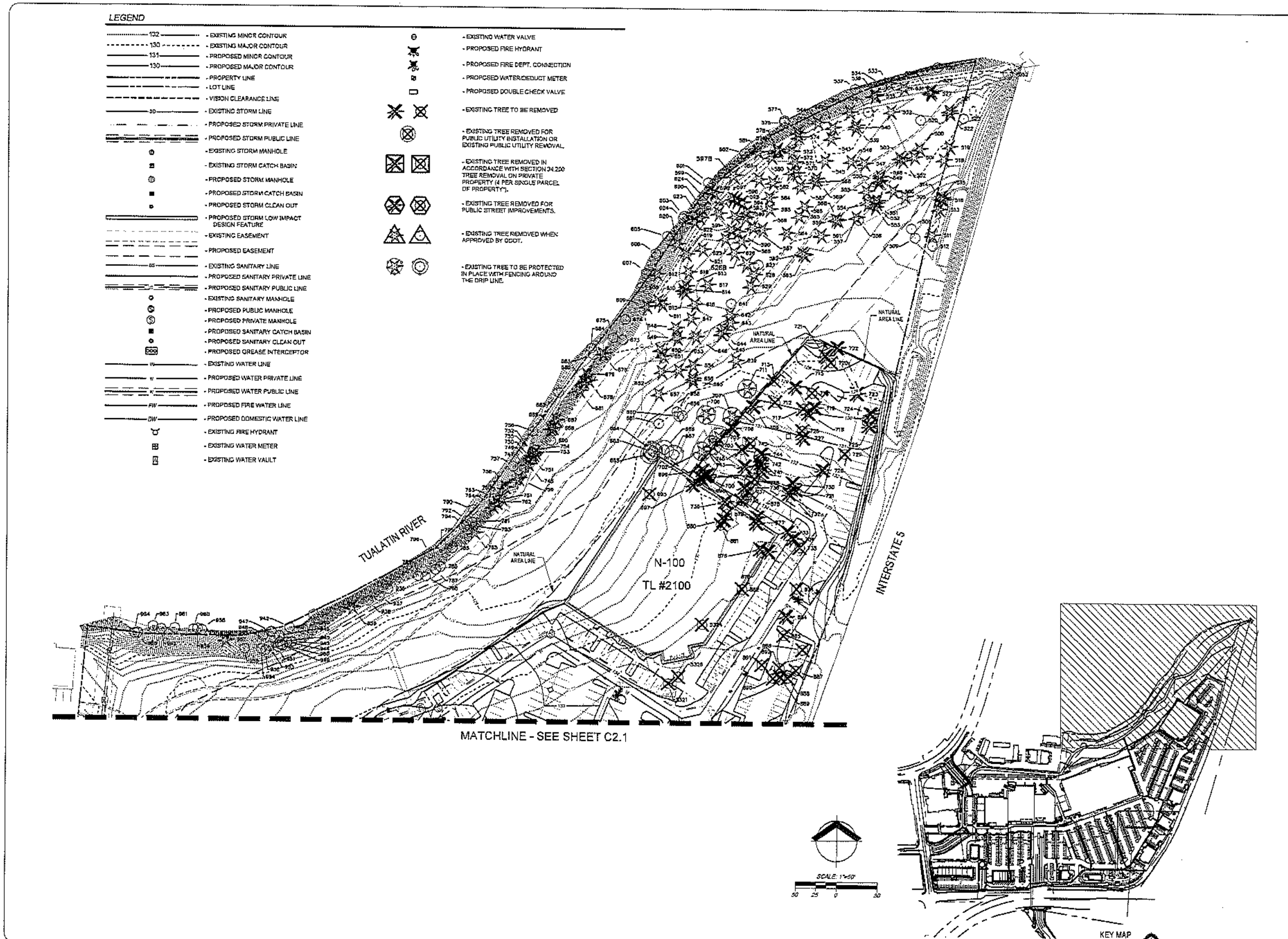
TREE PRESERVATION SITE PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21198310
DATE:	11/22/13
DESIGNED BY:	RHH/KDB
DRAWN BY:	BCF
CHECKED BY:	JRS

TREE PRESERVATION SITE PLAN

Exhibit 1
Attachment O-3



TREE PRESERVATION SITE PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

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CENTERCAL PROPERTIES, LLC

PROJECT NO.:	21100310
DATE:	11/04/13
DESIGNED BY:	RHH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRG

TREE PRESERVATION SITE PLAN
C2.2
Exhibit 1
Attachment D-3

No.	Common Name	Species Name	DBH1	Condition	Comments	Exempt2	Prune	Remove	Criteria3
500	Douglas Fir	*Pseudotsuga menziesii*	20	good				no	
501	Douglas Fir	*Pseudotsuga menziesii*	9	fair				no	
502	Douglas Fir	*Pseudotsuga menziesii*	32	good				no	
503	Douglas Fir	*Pseudotsuga menziesii*	18	fair	dead - snag			no	
505	Grand Fir	*Abies grandis*	16	fair				no	
506	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
508	Bigleaf Maple	*Acer macrophyllum*	20	good				no	
509	Bigleaf Maple	*Acer macrophyllum*	20	good				no	
511	Douglas Fir	*Pseudotsuga menziesii*	26	good				no	
512	Bigleaf Maple	*Acer macrophyllum*	8	fair				no	
513	Douglas Fir	*Pseudotsuga menziesii*	25	good				no	
514	Douglas Fir	*Pseudotsuga menziesii*	20	good				no	
515	Douglas Fir	*Pseudotsuga menziesii*	3*17	fair				no	
516	Douglas Fir	*Pseudotsuga menziesii*	17	good				no	
518	Western Red Cedar	*Thuja plicata*	12	good				no	
519	Western Red Cedar	*Thuja plicata*	14	good				no	
520	Bigleaf Maple	*Acer macrophyllum*	18	fair	extensive basal decay - meander path away from tree for safety			no	
521	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
522	Western Red Cedar	*Thuja plicata*	9	good				no	
523	Bigleaf Maple	*Acer macrophyllum*	22	good				no	
527	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
528	Douglas Fir	*Pseudotsuga menziesii*	17	good				no	
529	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
530	Oregon Ash	*Fraxinus latifolia*	16	fair				no	
531	Douglas Fir	*Pseudotsuga menziesii*	26	good				no	
532	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
533	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
534	Red Alder	*Alnus rubra*	12	fair				no	
535	Western Red Cedar	*Thuja plicata*	12	good				no	
536	Douglas Fir	*Pseudotsuga menziesii*	12	good				no	
537	Oregon Ash	*Fraxinus latifolia*	12	fair				no	
538	Bigleaf Maple	*Acer macrophyllum*	9	fair				no	
539	Western Red Cedar	*Thuja plicata*	8	fair				no	
540	Western Red Cedar	*Thuja plicata*	18	fair				no	
541	Douglas Fir	*Pseudotsuga menziesii*	20	good				no	
542	Douglas Fir	*Pseudotsuga menziesii*	20	good				no	
543	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
544	Douglas Fir	*Pseudotsuga menziesii*	11	fair				no	
545	Western Red Cedar	*Thuja plicata*	15	good				no	
546	Douglas Fir	*Pseudotsuga menziesii*	17	good				no	
547	Grand Fir	*Abies grandis*	8	fair				no	
548	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
549	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
550	Douglas Fir	*Pseudotsuga menziesii*	9	fair				no	
551	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
552	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
553	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
554	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
555	Douglas Fir	*Pseudotsuga menziesii*	9	fair				no	
556	Sweet Cherry	*Prunus avium*	10	good				no	
557	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
558	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
559	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
561	Douglas Fir	*Pseudotsuga menziesii*	11	good				no	
562	Douglas Fir	*Pseudotsuga menziesii*	19	good				no	
563	Douglas Fir	*Pseudotsuga menziesii*	24	good				no	
564	Western Red Cedar	*Thuja plicata*	18	good				no	
565	Douglas Fir	*Pseudotsuga menziesii*	14	good				no	
566	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
567	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
568	Douglas Fir	*Pseudotsuga menziesii*	9	fair				no	
569	Douglas Fir	*Pseudotsuga menziesii*	34	good				no	
570	Western Red Cedar	*Thuja plicata*	8	fair				no	
571	Western Red Cedar	*Thuja plicata*	8	fair				no	
572	Douglas Fir	*Pseudotsuga menziesii*	26	good				no	
573	Western Red Cedar	*Thuja plicata*	8	fair				no	
574	Douglas Fir	*Pseudotsuga menziesii*	12	fair				no	
575	Western Red Cedar	*Thuja plicata*	18	fair				no	
576	Oregon Ash	*Fraxinus latifolia*	10	fair				no	
577	Oregon Ash	*Fraxinus latifolia*	10	fair				no	
578	Western Red Cedar	*Thuja plicata*	12	fair				no	
579	Western Red Cedar	*Thuja plicata*	9	fair				no	
580	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
581	Douglas Fir	*Pseudotsuga menziesii*	28	good				no	
582	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
583	Western Red Cedar	*Thuja plicata*	18	fair				no	
584	Douglas Fir	*Pseudotsuga menziesii*	20	good				no	
585	Western Red Cedar	*Thuja plicata*	10	good				no	
586	Douglas Fir	*Pseudotsuga menziesii*	9	fair				no	
587	Douglas Fir	*Pseudotsuga menziesii*	17	good				no	
588	Western Red Cedar	*Thuja plicata*	10	fair				no	
589	Douglas Fir	*Pseudotsuga menziesii*	10	fair				no	
590	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
591	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
592	Douglas Fir	*Pseudotsuga menziesii*	10	fair				no	
593	Douglas Fir	*Pseudotsuga menziesii*	12	fair				no	
594	Douglas Fir	*Pseudotsuga menziesii*	10	fair				no	
595	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
596	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
597	Western Red Cedar	*Thuja plicata*	12	good				no	
597b	Western Red Cedar	*Thuja plicata*	20	good	located 28-ft north of tree 597			no	
598	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
599	Douglas Fir	*Pseudotsuga menziesii*	28	good				no	
600	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
601	Dogwood	*Cornus spp.*	8	fair				no	
602	Red Alder	*Alnus rubra*	12	fair				no	
603	Red Alder	*Alnus rubra*	10	fair				no	
604	Oregon Ash	*Fraxinus latifolia*	10	fair				no	
605	Bigleaf Maple	*Acer macrophyllum*	3*8	fair				no	
606	Bigleaf Maple	*Acer macrophyllum*	2*8	fair				no	
607	Bigleaf Maple	*Acer macrophyllum*	8	fair				no	
608	Bigleaf Maple	*Acer macrophyllum*	2*10	fair				no	
609	Douglas Fir	*Pseudotsuga menziesii*	26	good				no	
610	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	
611	Douglas Fir	*Pseudotsuga menziesii*	14	fair				no	
612	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
613	Douglas Fir	*Pseudotsuga menziesii*	18	good				no	

No.	Common Name	Species Name	DBH1	Condition	Comments	Exempt2	Prune	Remove	Criteria3
614	Douglas Fir	*Pseudotsuga menziesii*	12	fair				no	
615	Douglas Fir	*Pseudotsuga menziesii*	13	fair				no	
616	Douglas Fir	*Pseudotsuga menziesii*	24	good				no	
617	Douglas Fir	*Pseudotsuga menziesii*	19	good				no	
618	Western Red Cedar	*Thuja plicata*	17	good				no	
619	Douglas Fir	*Pseudotsuga menziesii*	36	good				no	
620	Douglas Fir	*Pseudotsuga menziesii*	24	good				no	
621	Douglas Fir	*Pseudotsuga menziesii*	30	good				no	
622	Douglas Fir	*Pseudotsuga menziesii*	30	good				no	
623	Douglas Fir	*Pseudotsuga menziesii*	22	good				no	
624	Pacific Yew	*Taxus brevifolia*	6	fair				no	
625	Douglas Fir	*Pseudotsuga menziesii*	17	good				no	
626	Douglas Fir	*Pseudotsuga menziesii*	10	fair				no	
626b	Douglas Fir	*Pseudotsuga menziesii*	8	fair	located 20-ft 230-degrees from 626			no	
627	Bigleaf Maple	*Acer macrophyllum*	16	good				no	
628	Douglas Fir	*Pseudotsuga menziesii*	24	good				no	
629	Douglas Fir	*Pseudotsuga menziesii*	22	good				no	
639	Douglas Fir	*Pseudotsuga menziesii*	15	good				no	
641	Sweet Cherry	*Prunus avium*	16	good				no	
642	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
643	Grand Fir	*Abies grandis*	30	good				no	
644	Grand Fir	*Abies grandis*	8	fair				no	
645	Douglas Fir	*Pseudotsuga menziesii*	25	good				no	
646	Douglas Fir	*Pseudotsuga menziesii*	21	good				no	
647	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
648	Douglas Fir	*Pseudotsuga menziesii*	22	good				no	
649	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
650	Douglas Fir	*Pseudotsuga menziesii*	16	good				no	
651	Douglas Fir	*Pseudotsuga menziesii*	17	good				no	
652	Douglas Fir	*Pseudotsuga menziesii*	26	good				no	
653	Douglas Fir	*Pseudotsuga menziesii*	12	fair				no	
654	Douglas Fir	*Pseudotsuga menziesii*	17	fair				no	
655	Douglas Fir	*Pseudotsuga menziesii*	17	fair				no	
656	Douglas Fir	*Pseudotsuga menziesii*	8	fair				no	
657	Douglas Fir	*Pseudotsuga menziesii*	22	good				no	
658	Bigleaf Maple	*Acer macrophyllum*	20	fair				no	
659	Bigleaf Maple	*Acer macrophyllum*	8	fair				no	
660	Bigleaf Maple	*Acer macrophyllum*	2*12	fair				no	
661	Bigleaf Maple	*Acer macrophyllum*	10	fair				no	
663	Bigleaf Maple	*Acer macrophyllum*	21,2*16	fair	trees 663-665 are 1 tree; tip dieback			no	
666	Bigleaf Maple	*Acer macrophyllum*	10	fair	intermediate crown class			no	
667	Bigleaf Maple	*Acer macrophyllum*	13	fair	broken branches, branch decay			no	
673	Bigleaf Maple	*Acer macrophyllum*	32	fair				no	
674	Bigleaf Maple	*Acer macrophyllum*	2*10	fair				no	
675	Bigleaf Maple	*Acer macrophyllum*	8	fair				no	
676	Douglas Fir	*Pseudotsuga menziesii*	26	fair				no	
678	Douglas Fir	*Pseudotsuga menziesii*	21	fair				no	
679	Douglas Fir	*Pseudotsuga menziesii*	13	fair				no	
680	Douglas Fir	*Pseudotsuga menziesii*	15	fair				no	
681	Douglas Fir	*Pseudotsuga menziesii*	20	fair				no	
682	Bigleaf Maple	*Acer macrophyllum*	10	fair				no	
683	Bigleaf Maple	*Acer macrophyllum*	2*8	fair				no	
684	Bigleaf Maple	*Acer macrophyllum*	2*10	fair				no	
687	Douglas Fir	*Pseudotsuga menziesii*	17	fair	dead - habitat value, no target potential			no	
688	Douglas Fir	*Pseudotsuga menziesii*	10	fair	thin crown			no	
689	Douglas Fir	*Pseudotsuga menziesii*	18	fair	thin crown			no	
690	Bigleaf Maple	*Acer macrophyllum*	8	fair				no	
695	Sweet Cherry	*Prunus avium*	13	poor	invasive species			yes	C
697	Douglas Fir	*Pseudotsuga menziesii*	22	good				yes	C
697b	Oregon White Oak	*Quercus garryana*	12	good	located 24' 220-degrees from 697			yes	C
698	Douglas Fir	*Pseudotsuga menziesii*	14	fair	ivy infestation			yes	C
699	Douglas Fir	*Pseudotsuga menziesii*	14	fair	ivy infestation			yes	C
700	Douglas Fir	*Pseudotsuga menziesii*	10	fair	ivy infestation			yes	C
701	Douglas Fir	*Pseudotsuga menziesii*	34	good	ivy infestation			yes	C
702	Douglas Fir	*Pseudotsuga menziesii*	16	fair	ivy infestation			no	
703	Douglas Fir	*Pseudotsuga menziesii*	9	fair	ivy infestation			no	
705	Douglas Fir	*Pseudotsuga menziesii*	20	good				no	
706	Douglas Fir	*Pseudotsuga menziesii*	24	good				no	
707	Douglas Fir	*Pseudotsuga menziesii*	17	good				no	
708	Douglas Fir	*Pseudotsuga menziesii*	34	good				yes	C
709	Douglas Fir	*Pseudotsuga menziesii*	17	good				yes	C
711	Douglas Fir	*Pseudotsuga menziesii*	30	good				no	
712	Dogwood	*Cornus spp.*	8	fair	ivy infestation			yes	C
713	Bigleaf Maple	*Acer macrophyllum*	13	fair	ivy infestation			yes	C
715	Douglas Fir	*Pseudotsuga menziesii*	28	good				yes	C
716	Douglas Fir	*Pseudotsuga menziesii*	9	fair				yes	C
717	Bigleaf Maple	*Acer macrophyllum*	10	fair				yes	C
718	Douglas Fir	*Pseudotsuga menziesii*	13	fair				yes	C
719	Douglas Fir	*Pseudotsuga menziesii*	10	fair				yes	C
720	Douglas Fir	*Pseudotsuga menziesii*	24	good				yes	C
721	Douglas Fir	*Pseudotsuga menziesii*	26	good				yes	C
722	Douglas Fir	*Pseudotsuga menziesii*	10	fair				yes	C
723	Douglas Fir	*Pseudotsuga menziesii*	10	fair				yes	C
724	Douglas Fir	*Pseudotsuga menziesii*	28	good				yes	C
725	Douglas Fir	*Pseudotsuga menziesii*	30	good				yes	C
726	Bigleaf Maple	*Acer macrophyllum*	10	fair				yes	C
727	Douglas Fir	*Pseudotsuga menziesii*	12	fair				yes	C
728	Douglas Fir	*Pseudotsuga menziesii*	9	fair				yes	C
728b	Bigleaf Maple	*Acer macrophyllum*	14	fair	located 22' west of 728			yes	C
729	English Hawthorn	*Crataegus monogyna*	12	fair	invasive species			yes	C
730	Douglas Fir	*Pseudotsuga menziesii*	11	fair				yes	C
731	Bigleaf Maple	*Acer macrophyllum*	12	fair	dead branches			yes	C
732	Douglas Fir	*Pseudotsuga menziesii*	11	fair				yes	C
733	Douglas Fir	*Pseudotsuga menziesii*	16	fair				yes	C
734	Douglas Fir	*Pseudotsuga menziesii*	10	fair				yes	C
735	Bigleaf Maple	*Acer macrophyllum*	10	fair				yes	C
736	Douglas Fir	*Pseudotsuga menziesii*	12	fair				yes	C
737	Bigleaf Maple	*Acer macrophyllum*	8	fair				yes	C
738	Bigleaf Maple	*Acer macrophyllum*	6	fair				yes	C
739	Douglas Fir	*Pseudotsuga menziesii*	12	fair				yes	C
740	Bigleaf Maple	*Acer macrophyllum*	8	fair				yes	C
741	Douglas Fir	*Pseudotsuga menziesii*	22	good				yes	C
742	Douglas Fir	*Pseudotsuga menziesii*	20	good				yes	C
743	Grand Fir	*Abies grandis*	8	poor				yes	C
744	Douglas Fir	*Pseudotsuga menziesii*	22	good				yes	C
745	Bigleaf Maple	*Acer macrophyllum*	12	fair				yes	C
746	English Holly	*Ilex aquifolium*	8	fair	invasive species			yes	C
747	Bigleaf Maple	*Acer macrophyllum*	20	fair				no	
748	Douglas Fir	*Pseudotsuga menziesii*	38	good				no	

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CENTERCAL PROPERTIES, LLC

TREE PRESERVATION SITE PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	2119031
DATE:	11/06/13
DESIGNED BY:	RHN/KDD
DRAWN BY:	BCF
CHECKED BY:	JRS

TREE PRESERVATION SITE PLAN
C2.3
Exhibit 1
Attachment D-3

No.	Common Name	Species Name	DBH1	Condition	Comments	Exempt2	Prune	Remove	Criteria3
749	Bigleaf Maple	Acer macrophyllum	18	fair				no	
750	Bigleaf Maple	Acer macrophyllum	16	fair				no	
751	Douglas Fir	Pseudotsuga menziesii	26	good				no	
752	Douglas Fir	Pseudotsuga menziesii	10	fair				no	
753	Douglas Fir	Pseudotsuga menziesii	26	good				no	
754	Bigleaf Maple	Acer macrophyllum	10	fair				no	
755	Bigleaf Maple	Acer macrophyllum	8	fair				no	
756	Bigleaf Maple	Acer macrophyllum	10	fair				no	
757	Bigleaf Maple	Acer macrophyllum	2*8	fair				no	
758	Douglas Fir	Pseudotsuga menziesii	24	good				no	
759	Douglas Fir	Pseudotsuga menziesii	10	fair				no	
760	Douglas Fir	Pseudotsuga menziesii	26	good				no	
761	Bigleaf Maple	Acer macrophyllum	12	fair				no	
762	Douglas Fir	Pseudotsuga menziesii	12	fair				no	
763	Bigleaf Maple	Acer macrophyllum	11	fair				no	
764	Douglas Fir	Pseudotsuga menziesii	11	fair				no	
765	Douglas Fir	Pseudotsuga menziesii	42	good				no	
785	English Hawthorn	Crataegus monogyna	4*12	fair	invasive species			no	
786	English Hawthorn	Crataegus monogyna	2*8	fair	invasive species			no	
787	Bigleaf Maple	Acer macrophyllum	9	fair				no	
788	Oregon White Oak	Quercus garryana	14	fair				no	
789	Bigleaf Maple	Acer macrophyllum	2*10	fair				no	
790	Bigleaf Maple	Acer macrophyllum	2*8	fair				no	
791	Bigleaf Maple	Acer macrophyllum	8	fair				no	
792	Bigleaf Maple	Acer macrophyllum	8	fair				no	
793	Bigleaf Maple	Acer macrophyllum	8	fair				no	
794	Bigleaf Maple	Acer macrophyllum	11	fair				no	
795	Bigleaf Maple	Acer macrophyllum	12	fair				no	
796	Bigleaf Maple	Acer macrophyllum	12	fair				no	
844	Douglas Fir	Pseudotsuga menziesii	17	good	existing hardscape to south			yes	C
845	Douglas Fir	Pseudotsuga menziesii	17	good	existing hardscape to south			yes	C
847	Douglas Fir	Pseudotsuga menziesii	24	good	existing hardscape to south			yes	C
848	Douglas Fir	Pseudotsuga menziesii	19	good	existing hardscape to south			yes	C
849	Douglas Fir	Pseudotsuga menziesii	18	fair	codominance/multi stems with included bark			yes	C, H
850	Douglas Fir	Pseudotsuga menziesii	22	good	only suitable for retention in group			yes	C
851	Sweet Cherry	Prunus avium	2*10	poor	invasive species			yes	C
852	Sweet Cherry	Prunus avium	9	poor	invasive species			yes	C
853	Pin Oad	Quercus palustris	9	poor				yes	C
854	Pin Oad	Quercus palustris	8	poor				yes	C
855	English Hawthorn	Crataegus monogyna	3*8	poor	invasive species			yes	C
856	Red Oad	Quercus rubra	3*10	fair	twig dieback, thin crown			yes	C
874	English Hawthorn	Crataegus monogyna	8	fair				yes	C
875	Douglas Fir	Pseudotsuga menziesii	12	fair				yes	C
876	Douglas Fir	Pseudotsuga menziesii	12	fair				yes	C
877	Douglas Fir	Pseudotsuga menziesii	28	good				yes	C
878	Douglas Fir	Pseudotsuga menziesii	25	good				yes	C
879	Oregon White Oak	Quercus garryana	8	good				yes	C
880	Douglas Fir	Pseudotsuga menziesii	16	good				yes	C
881	Oregon White Oak	Quercus garryana	10	fair				yes	C
882	Scouler's Willow	Salix scouleriana	2*8	poor				yes	C
884	Douglas Fir	Pseudotsuga menziesii	30	good				yes	C
885	English Hawthorn	Crataegus monogyna	8	poor	invasive species			yes	C
886	English Hawthorn	Crataegus monogyna	8	poor	invasive species			yes	C
887	Sweet Cherry	Prunus avium	2*8	poor	invasive species			yes	C
888	Sweet Cherry	Prunus avium	8	poor	invasive species			yes	C
889	Oregon White Oak	Quercus garryana	8	good				yes	C
890	Sweet Cherry	Prunus avium	2*10	poor	invasive species			yes	C
891	English Hawthorn	Crataegus monogyna	2*8	poor	invasive species			yes	C
892	Sweet Cherry	Prunus avium	8	poor	invasive species			yes	C
901	Hornbeam	Ostrya virginiana	10	good				yes	C
902	Hornbeam	Ostrya virginiana	5*8	good				yes	C
903	Hornbeam	Ostrya virginiana	2*6	good				yes	C
904	Hornbeam	Ostrya virginiana	3*8	good				yes	C
904b	Hornbeam	Ostrya virginiana	3*6	good	located north of 904			yes	C
904c	Hornbeam	Ostrya virginiana	3*8	good	located north of 904b			yes	C
905	Red Oad	Quercus rubra	12	poor	decline; dead branches, branch decay			yes	C
906	Douglas Fir	Pseudotsuga menziesii	8	fair	young, vigorous; one-sided			yes	C
907	European White Birch	Betula pendula	3*10	fair	invasive species, poor structure, ivy			yes	C
908	Japanese Maple	Acer japonica	3*8	good	some stem decay			yes	C
909	Douglas Fir	Pseudotsuga menziesii	21	fair	codominance, included bark, sap flow			yes	C, H
910	Red Oad	Quercus rubra	13	good	low branch structure			yes	C
911	Douglas Fir	Pseudotsuga menziesii	18	good	codominance - appears stable			yes	C
912	Red Oad	Quercus rubra	19	good	dead branches			yes	C
913	Red Oad	Quercus rubra	24	good	dead branches			yes	C
914	Sweet Cherry	Prunus avium	24	fair	invasive species			yes	C
915	Red Oad	Quercus rubra	28	good	unable to evaluate base			yes	C
916	Scarlet Oak	Quercus coccinea	3*11	good				yes	C
917	Scarlet Oak	Quercus coccinea	22	good	low branches			yes	C
918	Scarlet Oak	Quercus coccinea	17	good	low branches			yes	C
919	Scarlet Oak	Quercus coccinea	18	good	low branches			yes	C
920	Sweet Cherry	Prunus avium	3*10	poor	ivy infestation; invasive species			yes	C
921	Sweet Cherry	Prunus avium	10	poor	ivy infestation; invasive species			yes	C
922	Sweet Cherry	Prunus avium	12	poor	ivy infestation; invasive species			yes	C
923	Sweet Cherry	Prunus avium	8	poor	ivy infestation; invasive species			yes	C
924	Sweet Cherry	Prunus avium	8	poor	ivy infestation; invasive species			yes	C
925	Sweet Cherry	Prunus avium	2*8	poor	ivy infestation; invasive species			yes	C
926	Sweet Cherry	Prunus avium	2*10	poor	ivy infestation; invasive species			yes	C
927	Sweet Cherry	Prunus avium	8	poor	ivy infestation; invasive species			yes	C
928	Sweet Cherry	Prunus avium	8	fair	ivy infestation; invasive species			no	
929	Sweet Cherry	Prunus avium	2*12	fair	ivy infestation; invasive species			no	
930	Sweet Cherry	Prunus avium	9	poor	ivy infestation; invasive species			no	
931	Sweet Cherry	Prunus avium	12	poor	ivy infestation; invasive species			yes	C
932	Sweet Cherry	Prunus avium	10	fair	invasive species			yes	C
933	Sweet Cherry	Prunus avium	12	fair	invasive species			no	
936	Oregon White Oak	Quercus garryana	12	fair				no	
937	Oregon White Oak	Quercus garryana	12	fair				no	
938	Bigleaf Maple	Acer macrophyllum	12	fair				no	
939	Douglas Fir	Pseudotsuga menziesii	26	good				no	
940	Bigleaf Maple	Acer macrophyllum	10	fair	not accessible			no	
941	Bigleaf Maple	Acer macrophyllum	12	fair	not accessible			no	
942	Bigleaf Maple	Acer macrophyllum	10	fair	not accessible			no	
943	Red Alder	Alnus rubra	3*8	fair	not accessible			no	
944	Red Alder	Alnus rubra	2*8	fair	not accessible			no	
945	Red Alder	Alnus rubra	2*8	fair	not accessible			no	
946	Oregon Ash	Fraxinus latifolia	10	fair	not accessible			no	
947	Oregon Ash	Fraxinus latifolia	8	fair	not accessible			no	
948	Oregon Ash	Fraxinus latifolia	10	fair	not accessible			no	
949	Oregon Ash	Fraxinus latifolia	8	fair	not accessible			no	

No.	Common Name	Species Name	DBH1	Condition	Comments	Exempt2	Prune	Remove	Criteria3
950	Oregon Ash	Fraxinus latifolia	8	fair	not accessible			no	
951	Oregon Ash	Fraxinus latifolia	10	fair	not accessible			no	
952	Oregon Ash	Fraxinus latifolia	8	fair	not accessible			no	
953	Oregon Ash	Fraxinus latifolia	8	fair	not accessible			no	
954	Oregon Ash	Fraxinus latifolia	12	fair	not accessible			no	
955	Red Alder	Alnus rubra	10	fair	not accessible			no	
956	Red Alder	Alnus rubra	8	fair	not accessible			no	
957	Western Red Cedar	Thuja plicata	16	fair	not accessible			no	
958	Oregon Ash	Fraxinus latifolia	8	fair	not accessible			no	
959	Oregon Ash	Fraxinus latifolia	14	fair	not accessible			no	
960	Oregon Ash	Fraxinus latifolia	10	fair	not accessible			no	
961	Oregon Ash	Fraxinus latifolia	12	fair	not accessible			no	
962	Oregon Ash	Fraxinus latifolia	16	fair	not accessible			no	
963	Oregon Ash	Fraxinus latifolia	20	fair	not accessible			no	
964	Oregon Ash	Fraxinus latifolia	8	fair	not accessible			no	
965	Oregon Ash	Fraxinus latifolia	12	fair	not accessible			no	
966	Sweet Cherry	Prunus avium	3*8	fair	invasive species			no	
967	Oregon Ash	Fraxinus latifolia	2*9	fair	poor structure			no	
968	Oregon Ash	Fraxinus latifolia	8	fair	poor structure			no	
969	Oregon Ash	Fraxinus latifolia	12	fair	poor structure			no	
1008	Red Oad	Quercus rubra	2*14	fair	codominance at 1'; some branch decay			yes	C
1011	Scarlet Oak	Quercus coccinea	12	fair	twig dieback, some branch decay			yes	C
1012	Pin Oad	Quercus palustris	12	poor	dead top			yes	C
1020	Pin Oad	Quercus palustris	12	fair	hollows with decay; dieback			yes	C, H
1029	Red Oad	Quercus rubra	12	fair	twig dieback			yes	C, H
1030	Pin Oad	Quercus palustris	12	poor	dead branches, branch decay			yes	C
1167	Pin Oad	Quercus palustris	15	fair	twig dieback			yes	C
1230	Scarlet Oak	Quercus coccinea	16	poor	dieback, thin crown, chlorotic			yes	C
1231	Scarlet Oak	Quercus coccinea	12	poor	dead branches, decline			yes	C
1292	Scarlet Oak	Quercus coccinea	14	fair	recent branch failure; poor structure			yes	C, H
1293	Pin Oad	Quercus palustris	14	poor	dead top, branch dieback			yes	C
1302	Pin Oad	Quercus palustris	14	poor	dead top, branch dieback			yes	C
1305	Red Oad	Quercus rubra	14	poor	dead leader, branch dieback			yes	C
1318	Scarlet Oak	Quercus coccinea	16	fair	poor branch distribution; dieback			yes	C
1319	Scarlet Oak	Quercus coccinea	16	fair	some dieback			yes	C
1352	Red Maple	Acer rubrum	6	fair				yes	C
1360	Red Maple	Acer rubrum	6	fair		yes		yes	C
1365	Red Maple	Acer rubrum	6	poor	sunscald, chlorotic, poor vigor	yes		yes	C
1369	Red Maple	Acer rubrum	6	fair	forked top with included bark	yes		yes	C
1379	Lodgepole Pine	Pinus contorta	3*12	fair	codominance at base; sequoia pitch moth			yes	C, D1
1400	Red Maple	Acer rubrum	10	fair	moderate vigor; chlorotic			yes	C
2181	Black Cottonwood	Populus trichocarpa	42	fair	multiple leaders; species limitations			yes	C, H
2192	Black Cottonwood	Populus trichocarpa	4*12	poor	poor structure; species limitations			yes	C
2198	European White Birch	Betula pendula	3*13	poor	dead			yes	C
2203	Norway Maple	Acer platanoides	10	good	invasive species			no	
2215	Norway Maple	Acer platanoides	10	poor	sunscald, decay, ants; invasive species			yes	C, D1
2275	Bigleaf Maple	Acer macrophyllum	18	poor				yes	C
2276	Sweet Cherry	Prunus avium	18	poor	invasive species			yes	C
2277	Sweet Cherry	Prunus avium	12	poor	invasive species			yes	C
2278	Oregon Ash	Fraxinus latifolia	8	fair				yes	C
2279	Sweet Cherry	Prunus avium	5*8	poor	invasive species			yes	C
2280	Sweet Cherry	Prunus avium	14	poor	invasive species			yes	C
2282	Sweet Cherry	Prunus avium	10	poor	invasive species			yes	C
2284	Oregon Ash	Fraxinus latifolia	8	fair				yes	C
2285	Oregon Ash	Fraxinus latifolia	18	fair				yes	C
2286	Oregon Ash	Fraxinus latifolia	10	fair	extensive ivy infestation			yes	C
2287	Sweet Cherry	Prunus avium	8	fair	invasive species			yes	C
2288	Oregon Ash	Fraxinus latifolia	8	fair				yes	C
2289	Bigleaf Maple	Acer macrophyllum	18	good				yes	C
2290	Bigleaf Maple	Acer macrophyllum	7*12	fair				yes	C
2292	Oregon Ash	Fraxinus latifolia	12	fair				yes	C
2293	Tree-Of-Heaven	Ailanthus altissima	15	fair	invasive species; poor structure			yes	C
2294	Bigleaf Maple	Acer macrophyllum	3*14	poor	poor structure; dead branches			yes	C
2295	Bigleaf Maple	Acer macrophyllum	3*14	poor	poor structure, codominance stems			yes	C
2296	Bigleaf Maple	Acer macrophyllum	2*12	poor	extensive ivy infestation, thin crown			yes	C
2297	Bigleaf Maple	Acer macrophyllum	18	poor	extensive ivy infestation, thin crown			yes	C
2298	Bigleaf Maple	Acer macrophyllum	12	poor	extensive ivy infestation, thin crown			yes	C
2299	Bigleaf Maple	Acer macrophyllum	8	poor	extensive ivy infestation, thin crown			yes	C
2300	Bigleaf Maple	Acer macrophyllum	8	poor	extensive ivy infestation, thin crown			yes	C
2301	English Hawthorn	Crataegus monogyna	12	poor	invasive species; ivy infestation			yes	C
2302	Bigleaf Maple	Acer macrophyllum	12	poor	top dieback, decay			yes	C
2303	English Hawthorn	Crataegus monogyna	8	fair	invasive species			yes	C
2304	Lodgepole Pine	Pinus contorta	10	fair	sequoia pitch moth			yes	C
2305	English Hawthorn	Crataegus monogyna	12	poor	invasive species; overtopped			yes	C
2379	Lodgepole Pine	Pinus contorta	4*8	fair	codominance at base; sequoia pitch moth			yes	C
2382	Red Maple	Acer rubrum	6	poor	sunscald, decay, dead branches	yes		yes	C, D1
2407	Red Maple	Acer rubrum	3	poor	severe sunscald, mostly dead	yes		yes	C, D1
2414	Red Maple	Acer rubrum	4	poor	thin crown, chlorotic	yes		yes	C
2420	Red Maple	Acer rubrum	5	fair	sunscald	yes		yes	C
2434	Red Maple	Acer rubrum	8	poor	sunscald 0-5'; codominance			yes	C, D1
2462	Red Maple	Acer rubrum	8	fair	moderate vigor			yes	C
2527	Red Maple	Acer rubrum	10	poor	sunscald, stem decay, dieback			yes	C, D1
2533	Red Maple	Acer rubrum	6	poor	decay, included bark	yes		yes	C
2544	Red Maple	Acer rubrum	6	fair	multiple leaders	yes		yes	C
2548	Red Maple	Acer rubrum	6	poor	sunscald, decay, dead branches	yes		yes	C, D1
2553	Red Maple	Acer rubrum	6	poor	sunscald, decay in codominance juncture	yes		yes	C, D1
2677	Red Maple	Acer rubrum	4	fair	stem decay	yes		yes	C
2702	Red Maple	Acer rubrum	2*6	fair	stem decay			yes	C
2731	Norway Maple	Acer platanoides	8	poor	invasive species; stem & branch decay			yes	C, D1, H
2743	Norway Maple	Acer platanoides	8	fair	invasive species; poor crown structure			yes	C
2747	Norway Maple	Acer platanoides	6	poor	invasive species; dead leader & branches	yes		yes	C
2753	Norway Maple	Acer platanoides	8	fair	invasive species			yes	C
2766	Norway Maple	Acer platanoides	8	fair	invasive species			yes	C
2807	Flowering Plum	Prunus spp.	2	good		yes		yes	C
2829	Flowering Plum	Prunus spp.	6	good		yes		yes	C
2950	Norway Maple	Acer platanoides	2	good	invasive species	yes		yes	C
2954	Norway Maple	Acer platanoides	12	fair	invasive species; some branch decay			yes	C
2974	Flowering Cherry	Prunus spp.	3	good		yes		yes	C
2979	Norway Maple	Acer platanoides	12	good				yes	C
2993	Norway Maple	Acer platanoides	8	fair	broken branches			yes	C
3069	Red Maple	Acer rubrum	4*4	fair	poor vigor			yes	C
3160	Red Maple	Acer rubrum	4	good		yes		yes	C
3205	Red Maple	Acer rubrum	3	good		yes		yes	C
3206	Red Maple	Acer rubrum	3	good		yes		yes	C
3212	Red Maple	Acer rubrum	3	good		yes		yes	C
3309	Red Maple	Acer rubrum	3	good		yes		yes	C
3310	Red Maple	Acer rubrum	3	good		yes		yes	C
3315	Red Maple	Acer rubrum	3	good	sunscald	yes		yes	C

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CENTERCAL PROPERTIES, LLC

TREE PRESERVATION SITE PLAN

NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD

CENTERCAL PROPERTIES, LLC.

TUALATIN, OREGON

PROJECT NO.: 21190312
DATE: 11/06/13
DESIGNED BY: RHH/KDD
DRAWN BY: BCF
CHECKED BY: JRS

TREE PRESERVATION SITE PLAN

C2.4

Exhibit 1
Attachment 0-3

No.	Common Name	Species Name	DBH1	Condition	Comments	Exempt2	Prune	Remove	Criteria3
3318	Red Maple	*Acer rubrum*	3	fair	sunscald	yes		yes	C
3322	Red Maple	*Acer rubrum*	3	good		yes		yes	C
3413	Red Maple	*Acer rubrum*	10	fair	decay in codominance juncture			yes	C, D1, H
3417	Red Maple	*Acer rubrum*	10	fair	sunscald, included bark			yes	C
3436	Red Maple	*Acer rubrum*	10	fair	sunscald, included bark			yes	C
3443	Red Maple	*Acer rubrum*	10	poor	hollow with decay; poor structure			yes	C, D1
3445	Red Maple	*Acer rubrum*	10	good	multiple attachments			yes	C
3610	Norway Maple	*Acer platanoides*	12	good	invasive species			yes	C
3634	Norway Maple	*Acer platanoides*	10	fair	invasive species; branch decay, dieback			yes	C
3643	Norway Maple	*Acer platanoides*	3	poor	invasive species; sunscald, decay	yes		yes	C
3652	Norway Maple	*Acer platanoides*	8	fair	invasive species; dead branches			yes	C
3739	Spruce	*Abies spp.*	6	fair	against existing building	yes		no	
3826	Amur maple	*Acer ginnala*	3	poor	severe basal & stem decay	yes		yes	C, D1
3841	Norway Maple	*Acer platanoides*	14	fair	invasive species; branch dieback			no	
3990	Norway Maple	*Acer platanoides*	14	fair				no	
4035	Norway Maple	*Acer platanoides*	14	fair				no	
4052	Norway Maple	*Acer platanoides*	12	good	invasive species			yes	C
4054	Norway Maple	*Acer platanoides*	10	good	invasive species			yes	C
4072	Norway Maple	*Acer platanoides*	12	poor	invasive species; sunscald, lean			yes	C, D1, H
4083	Flowering Pear	*Pyrus spp.*	10	fair	thin crown			no	
4084	Flowering Pear	*Pyrus spp.*	12	fair	thin crown			no	
4085	Norway Maple	*Acer platanoides*	12	fair	invasive species; thin crown			yes	C
4203	Red Maple	*Acer rubrum*	10	good	one-sided to building			yes	C
4222	Norway Maple	*Acer platanoides*	3	fair	invasive species; sunscald, basal decay	yes		yes	C, D1
4223	Red Maple	*Acer rubrum*	3	poor	severe sunscald; dead branches	yes		yes	C, D1
4282	Red Maple	*Acer rubrum*	4	fair	one-sided to building	yes		yes	C
4286	Red Maple	*Acer rubrum*	2	poor	severe sunscald; dead branches	yes		yes	C
4411	Flowering Pear	*Pyrus spp.*	14	poor	dieback; codominance with included bark			yes	C, H
4456	Flowering Pear	*Pyrus spp.*	8	poor	dieback; lean to parking lot			yes	C, H
4483	Douglas Fir	*Pseudotsuga menziesii*	26	good	few dead branches			yes	C
4484	Douglas Fir	*Pseudotsuga menziesii*	22	fair	one-sided crown; young tree			yes	C
4492	Douglas Fir	*Pseudotsuga menziesii*	22	fair	pruned high; only sustainable in group			yes	C
4493	Douglas Fir	*Pseudotsuga menziesii*	24	fair	pruned high; only sustainable in group			yes	C
4495	Douglas Fir	*Pseudotsuga menziesii*	24	fair	pruned high; only sustainable in group			yes	C
4496	Douglas Fir	*Pseudotsuga menziesii*	16	fair	small, high live crown; re-evaluate following adjacent tree removal			no	
4497	Douglas Fir	*Pseudotsuga menziesii*	28	fair	pruned high; only sustainable in group			no	
4510	Lodgepole Pine	*Pinus contorta*	24	fair	asymmetrical crown; sequoia pitch moth			no	
4511	Flowering Pear	*Pyrus spp.*	14	poor	mostly dead			no	
4516	Lodgepole Pine	*Pinus contorta*	15	fair	poor structure; sequoia pitch moth			no	
4516b	Lodgepole Pine	*Pinus contorta*	15	fair	poor structure; sequoia pitch moth			no	
4531	Norway Maple	*Acer platanoides*	8	fair	invasive species; dieback			yes	C
4546	Norway Maple	*Acer platanoides*	6	poor	invasive species; dead leader	yes		yes	C
4556	Norway Maple	*Acer platanoides*	8	poor	invasive species; extensive decay column			yes	C, D1
4556b	Norway Maple	*Acer platanoides*	4	poor	located 37' north of 4556	yes		yes	C
4583	Norway Maple	*Acer platanoides*	8	fair	invasive species; dead branches			yes	C
4618	Red Maple	*Acer rubrum*	3*6	fair	poor vigor			yes	C
4682	Red Maple	*Acer rubrum*	3*6	fair	stem & branch decay			yes	C, D1
4730	Red Maple	*Acer rubrum*	6	fair	sunscald	yes		yes	C
4787	Red Maple	*Acer rubrum*	10	fair	multiple leaders; moderate vigor			yes	C
4854	Red Maple	*Acer rubrum*	12	fair	some branch decay			yes	C
4915	Norway Maple	*Acer platanoides*	3	poor	invasive species; sunscald, basal decay	yes		yes	C, D1
4924	Norway Maple	*Acer platanoides*	3	fair	invasive species; sunscald 0-4'	yes		yes	C, D1
5022	Austrian Pine	*Pinus nigra*	14	poor	poor structure, unnatural lean			yes	C, H
5023	Austrian Pine	*Pinus nigra*	12	poor	poor structure, unnatural lean			yes	C, H
5093	Red Maple	*Acer rubrum*	16	fair				no	
5186	Norway Maple	*Acer platanoides*	12	fair				yes	C
5190	Norway Maple	*Acer platanoides*	14	fair				no	
5212	Norway Maple	*Acer platanoides*	14	fair				no	
5219	Norway Maple	*Acer platanoides*	16	fair				no	
5228	Norway Maple	*Acer platanoides*	16	fair				no	
5234	Norway Maple	*Acer platanoides*	16	fair				no	
5321	English Hawthorn	*Crataegus monogyna*	6*12	poor	invasive species			yes	C
5324	English Hawthorn	*Crataegus monogyna*	3*12	poor	invasive species			yes	C
5326	English Hawthorn	*Crataegus monogyna*	8	poor	invasive species			yes	C
5436	Norway Maple	*Acer platanoides*	12	fair	prune to remove dead wood			no	
5598	Flowering Cherry	*Prunus spp.*	8	fair	dead branches; moderate vigor			yes	C
5692	Black Locust	*Robinia pseudoacacia*	2*8	poor	invasive species, decay, dead branches			yes	H
5693	Black Locust	*Robinia pseudoacacia*	2*18	poor	invasive species, decay, dead branches			yes	H
5695	Black Locust	*Robinia pseudoacacia*	18	poor	invasive species, decay, dead branches			yes	H
5696	Black Locust	*Robinia pseudoacacia*	18	poor	invasive species, decay, dead branches			yes	H
5735	Bigleaf Maple	*Acer macrophyllum*	3*8	fair				no	
5823	Lodgepole Pine	*Pinus contorta*	12	fair				no	
5824	Lodgepole Pine	*Pinus contorta*	10	poor				no	
6000	Sugar Maple	*Acer saccharum*	16	fair	top dieback			yes	C
6315	Red Maple	*Acer rubrum*	3	good		yes		yes	C
6446	Zelkova	*Zelkova spp.*	4	fair	needs supplemental watering	yes		yes	C
6458	Zelkova	*Zelkova spp.*	4	fair	needs supplemental watering	yes		yes	C
6468	Zelkova	*Zelkova spp.*	4	fair	needs supplemental watering	yes		yes	C
6479	Zelkova	*Zelkova spp.*	4	poor	severe sunscald, dead top	yes		yes	C, D1
6489	Zelkova	*Zelkova spp.*	4	fair		yes		yes	C
6503	Zelkova	*Zelkova spp.*	4	poor	sunscald, stem decay	yes		yes	C
6522	Red Oak	*Quercus rubra*	26	fair	one-sided crown; history of branch failure			yes	C, D1
6523	Red Oak	*Quercus rubra*	19	fair	hollow with slime flux; crown asymmetry			yes	C
6524	Red Oak	*Quercus rubra*	20	fair	large leaders, crown asymmetry			yes	C, D1
6524b	Douglas Fir	*Pseudotsuga menziesii*	30	good	located 30' north of 6524			yes	C
6524c	Deodar Cedar	*Cedrus deodara*	36	good	located 20' east of 6524b			yes	C
6525	Ponderosa Pine	*Pinus ponderosa*	2*18	fair				yes	C
6526	Ponderosa Pine	*Pinus ponderosa*	2*26	good				yes	C
6527	European White Birch	*Betula pendula*	10	poor	dead; invasive species			yes	C, H
6528	Copper Beech	*Fagus sylvatica*	14	good	overcrowded			yes	C
6529	European White Birch	*Betula pendula*	18	poor	dead top; invasive species			yes	C, H
6530	Copper Beech	*Fagus sylvatica*	28	good	needs soil aeration & seasonal irrigation			yes	C
6531	Copper Beech	*Fagus sylvatica*	34	good	needs soil aeration & seasonal irrigation			yes	C
6542	Flowering Cherry	*Prunus spp.*	6*6	fair				yes	C
6543	Flowering Cherry	*Prunus spp.*	6*6	fair				yes	C
6544	Flowering Cherry	*Prunus spp.*	2*8	fair				yes	C
6547	Flowering Cherry	*Prunus spp.*	5*6	fair				yes	C
6548	Flowering Cherry	*Prunus spp.*	3*6	fair				yes	C
6549	Flowering Cherry	*Prunus spp.*	3*6	poor	dead branches, branch decay			yes	C
6550	Flowering Cherry	*Prunus spp.*	4*6	poor	dead branches, branch decay			yes	C
6556	Flowering Cherry	*Prunus spp.*	3*6	poor	mostly dead			yes	C
6557	Flowering Cherry	*Prunus spp.*	4*6	poor	dead branches, branch decay			yes	C
6558	Flowering Cherry	*Prunus spp.*	6	poor	dead	yes		yes	C
6559	Flowering Cherry	*Prunus spp.*	3*6	poor	dead & broken branches, branch decay			yes	C
6560	Flowering Cherry	*Prunus spp.*	3*6	poor	dead & broken branches, branch decay			yes	C
6563	Flowering Cherry	*Prunus spp.*	3*6	poor	dead & broken branches, branch decay			yes	C
6564	Flowering Cherry	*Prunus spp.*	3*6	poor	dead & broken branches, branch decay			yes	C

No.	Common Name	Species Name	DBH1	Condition	Comments	Exempt2	Prune	Remove	Criteria3
6566	Red Oak	*Quercus rubra*	24	fair	history of large branch failure; small hollow			yes	C
6567	Austrian Pine	*Pinus nigra*	40	good				yes	C
6570	Magnolia	*Magnolia spp.*	20	good	ivy infestation			yes	C
6571	Sweetgum	*Liquidambar styraciflua*	24	fair	moderate vigor			yes	C
6579	Norway Maple	*Acer platanoides*	2*19	good	invasive species; codominance at 1'; ivy infestation			yes	C
6582	Red Oak	*Quercus rubra*	22	fair	twig dieback; one-sided crown			yes	C
6583	Giant Sequoia	*Sequoiadendron giganteum*	29	fair	ivy infestation; crown asymmetry			yes	C
6584	Douglas Fir	*Pseudotsuga menziesii*	22	fair				yes	C
6585	Western Red Cedar	*Thuja plicata*	2*16	fair	ivy			yes	C
6586	Silk Tree	*Albizia julibrissin*	2*15	fair	extensive ivy infestation			yes	C
6587	Douglas Fir	*Pseudotsuga menziesii*	29	fair	ivy infestation; heavy cone production			yes	C
6588	Western Red Cedar	*Thuja plicata*	18	fair	forked top; crown asymmetry			yes	C
6602	Apple	*Malus spp.*	2*12	poor	decay			yes	C
6603	Spruce	*Abies spp.*	18	fair	old broken top			yes	C
6605	English walnut	*Juglans regia*	40	poor	decrepit			yes	C
6609	Dogwood	*Cornus spp.*	12	fair				yes	C, H
6610	Lodgepole Pine	*Pinus contorta*	17	fair				yes	C
6629	Giant Sequoia	*Sequoiadendron giganteum*	38	good	ivy at base; inadequate soil volume			yes	C
6631	Scots Pine	*Pinus sylvestris*	14	poor	dead			yes	C
6632	Flowering Cherry	*Prunus spp.*	12	poor	not well maintained			yes	C, H
6633	Flowering Cherry	*Prunus spp.*	10	poor	not well maintained			yes	C
6634	Flowering Cherry	*Prunus spp.*	10	poor	not well maintained			yes	C
6635	Flowering Cherry	*Prunus spp.*	10	poor	not well maintained			yes	C
6636	Flowering Cherry	*Prunus spp.*	10	poor	not well maintained			yes	C
6637	Flowering Cherry	*Prunus spp.*	10	poor	not well maintained			yes	C
6638	Flowering Cherry	*Prunus spp.*	10	poor	not well maintained			yes	C
6639	Flowering Cherry	*Prunus spp.*	10	poor	not well maintained			yes	C
6640	Flowering Cherry	*Prunus spp.*	6	poor	not well maintained	yes		yes	C
6641	Flowering Cherry	*Prunus spp.*	8	poor	not well maintained			yes	C
6642	Flowering Cherry	*Prunus spp.*	12	poor	not well maintained			yes	C
6664	Norway Maple	*Acer platanoides*	2*14	fair	invasive; codominance at 1'; less than 1' to building			yes	C
6693	Scots Pine	*Pinus sylvestris*	12	fair				yes	C
6714	Japanese Maple	*Acer japonica*	3*6	fair	one-sided to building; some decay			yes	C
6813	Norway Maple	*Acer platanoides*	14	fair	invasive species; codominance at 6', ivy infestation			yes	C
6818	Norway Maple	*Acer platanoides*	16	fair	invasive species; codominance at 5', ivy infestation			yes	C
6824	Norway Maple	*Acer platanoides*	18	fair	invasive species; codominance at 5', included bark			yes	C
6828	Norway Maple	*Acer platanoides*	15	fair	invasive species; codominance at 5'			yes	C
6833	Norway Maple	*Acer platanoides*	17	fair	invasive species; multiple attachments at 5'			yes	C
6893	Scots Pine	*Pinus sylvestris*	24	poor	chlorotic, poor structure, ivy infestation			yes	C, H
6895	Scots Pine	*Pinus sylvestris*	19	fair	forked top			yes	C
6896	European White Birch	*Betula pendula*	2*16	poor	dead; invasive species			yes	C, H
6901	European White Birch	*Betula pendula*	10	poor	invasive species; ivy infestation			yes	C
7052	Bigleaf Maple	*Acer macrophyllum*	18	fair				no	
7242	Lodgepole Pine	*Pinus contorta*	10	fair	sequoia pitch moth			no	
7524	Sugar Maple	*Acer saccharum*	18	good				yes	C
7597	Zelkova	*Zelkova spp.*	3	fair	branch decay, poor crown structure	yes		yes	C, D1
7670	Western Red Cedar	*Thuja plicata*	6	fair	coniferous	yes		no	
7673	Western Red Cedar	*Thuja plicata*	6	fair	coniferous	yes		no	
7675	Western Red Cedar	*Thuja plicata*	6	fair	coniferous	yes		no	
7676	Western Red Cedar	*Thuja plicata*	6	fair	coniferous	yes		no	
7677	Western Red Cedar	*Thuja plicata*	5	fair	coniferous	yes		no	
7678	Western Red Cedar	*Thuja plicata*	8	fair	coniferous			no	
7679	Western Red Cedar	*Thuja plicata*	4	fair	coniferous	yes		no	
7815	Sugar Maple	*Acer saccharum*	16	good				no	
7833	Flowering Plum	*Prunus spp.*	3*8	fair	multiple attachments			no	
7923	Flowering Pear	*Pyrus spp.*	8	fair				no	
7954	Black Locust	*Robinia pseudoacacia*	30	poor	invasive species; decay, dead branches			yes	C, H
7957	Black Locust	*Robinia pseudoacacia*	2*28	poor	invasive species; decay, dead branches			yes	C, H
7963	European White Birch	*Betula pendula*	18	poor	invasive species; bronze birch borer			yes	C, D2, H
7966	Red Oak	*Quercus rubra*	10	fair	aphids			yes	C
7983	Black Locust	*Robinia pseudoacacia*	10	poor	invasive species; decay, dead branches			yes	C, H
8001	Flowering Pear	*Pyrus spp.*	3	fair	moderate lean to street	yes		yes	C
8002	Flowering Pear	*Pyrus spp.*	3	good		yes		no	
8035	Flowering Pear	*Pyrus spp.*	4	good		yes		no	
[illegible]	Flowering Pear	*Pyrus spp.*	[illegible]	good				[illegible]	[illegible]

[1] DBH is tree diameter measured at 4.5' above ground level, in inches.
[2] Exempt identifies trees measuring less than 8" in diameter.
[3] Criteria provides justification for the proposed tree removal (per TDC 34.230):
- D1: Diseased and the disease threatens the structural integrity of the tree;
- D2: Diseased and the disease permanently and severely diminishes the aesthetic value of the tree; or
- D3: Diseased and the continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or aesthetic value.
- H: Hazardous.
- C: Construction necessitates tree removal.

TREE PRESERVATION SITE PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

CENTERCAL PROPERTIES, LLC

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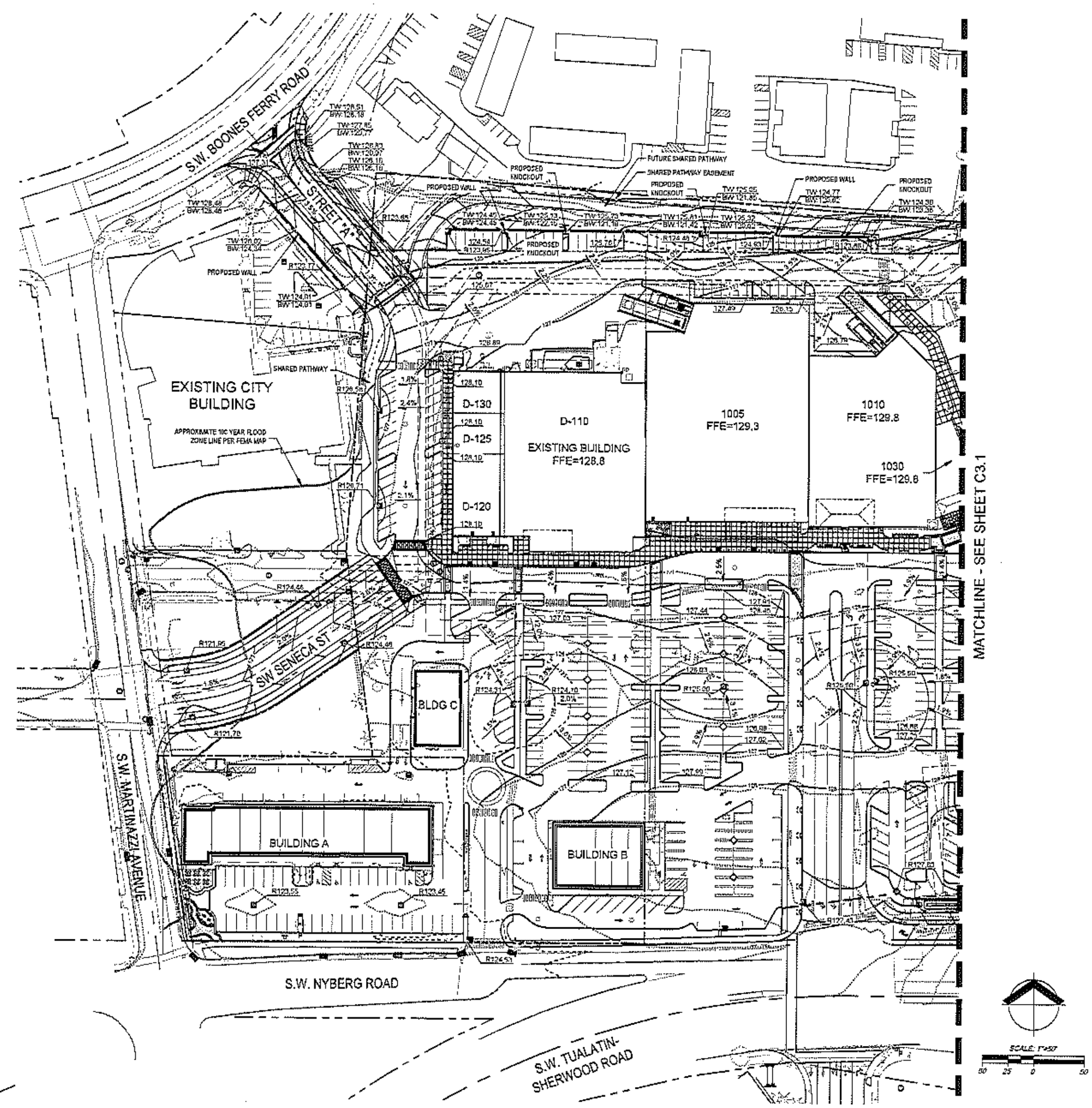
www.cardno.com

PROJECT NO: 2159210
DATE: 11/06/13
DESIGNED BY: RHH/KDB
DRAWN BY: BCF
CHECKED BY: JRS

TREE PRESERVATION SITE PLAN
C2.5
Exhibit 1
Attachment 0-3



LEGEND

- PROPOSED BUILDING LINE
- EXISTING BOUNDARY LINE
- PROPOSED LOT LINES
- 132 — EXISTING MINOR CONTOUR
- 130 — EXISTING MAJOR CONTOUR
- 131 — PROPOSED MINOR CONTOUR
- 130 — PROPOSED MAJOR CONTOUR
- PROPOSED WALL
- TW:130.50 / BW:128.50 — PROPOSED TOP OF WALL, BOTTOM OF WALL
- 130.50 — PROPOSED SPOT SHOT
- R:130.50 — PROPOSED RIM SHOT
- ■ — PROPOSED STORM CATCHBASIN

GRADING AND EROSION CONTROL NOTES

ALL ADA STALLS AND AREAS TO BE GRADED AT 2% MAX IN ALL DIRECTIONS.

POSITIVE DRAINAGE TO BE MAINTAINED AWAY FROM BUILDINGS AT ALL TIMES.

ALL PROPOSED GRADES TO MATCH INTO EXISTING GRADES ON SURROUNDING STREETS, PROPERTIES, AND SENSITIVE AREAS.

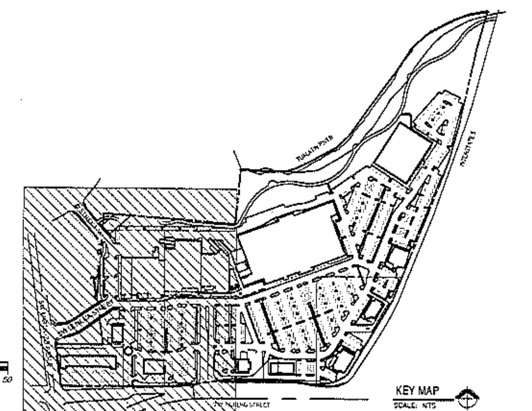
INSTALL INLET SEDIMENT PROTECTION ON ALL EXISTING AND NEW INLETS WHEN INSTALLED. INLET SEDIMENT PROTECTION TO BE MAINTAINED FOR THE DURATION OF ALL CONSTRUCTION ACTIVITIES.

SEDIMENT FENCE TO BE PLACED AND MAINTAINED DURING ALL CONSTRUCTION ACTIVITIES TO PREVENT SEDIMENT LADEN WATER FROM LEAVING THE SITE.

ALL ADDITIONAL EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, ALL FACILITIES TO BE UPGRADED AS NEEDED FOR STORM EVENTS.

ALL EROSION AND SEDIMENT CONTROL FACILITIES WILL BE CONSTRUCTED PRIOR TO ANY CLEARING AND GRADING ACTIVITIES.

EXISTING TREES TO BE PROTECTED OR RETAINED SHALL BE FENCED AROUND THE DRIP LINE WITH CHAIN LINK OR OTHER STURDY FENCING DURING CONSTRUCTION.



KEY MAP
SCALE: NTS

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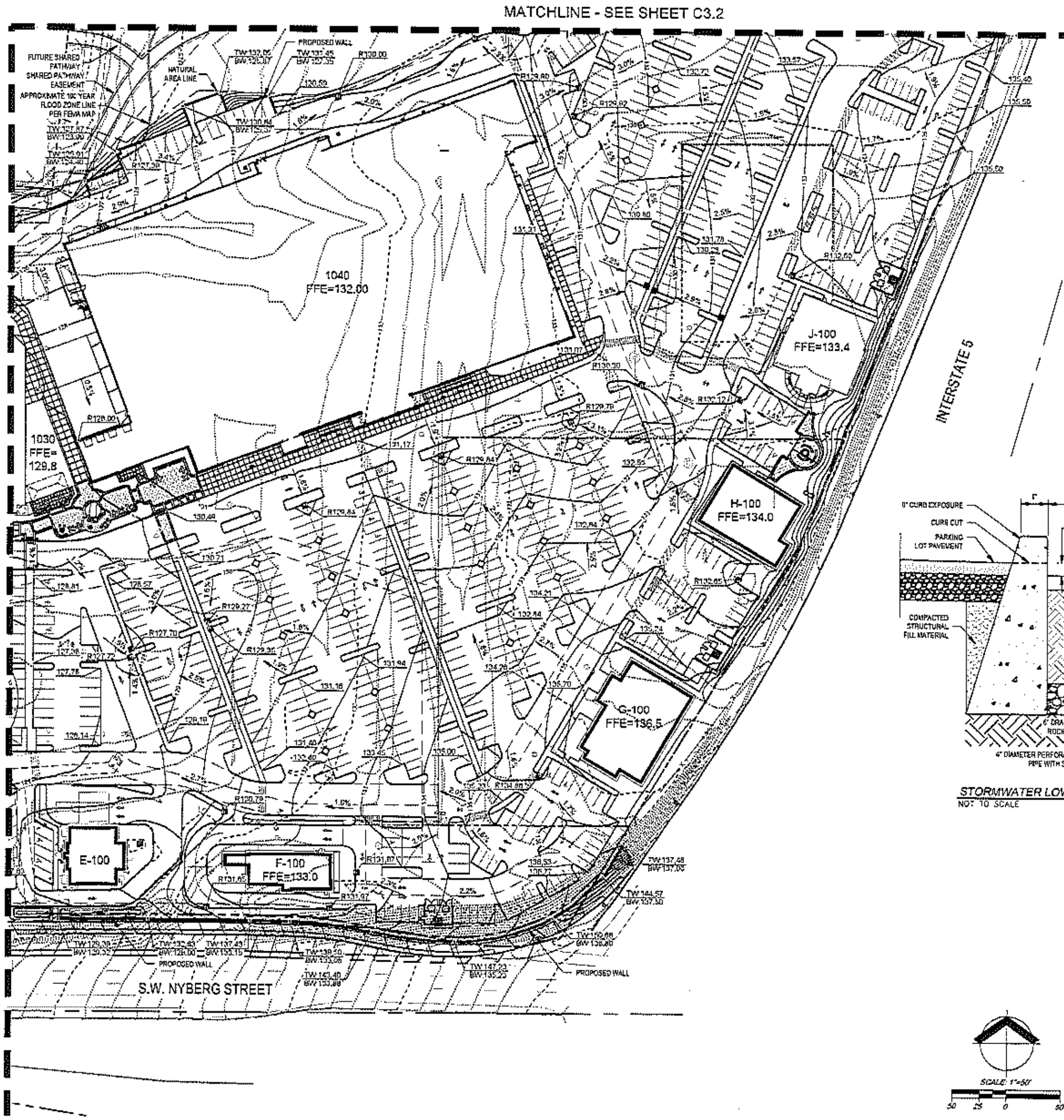
CENTERCAL PROPERTIES, LLC

GRADING PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	[illegible]
DATE:	[illegible]
DESIGNED BY:	RHH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRG

GRADING PLAN

C3.0
Exhibit 1
Attachment O-3



LEGEND

- PROPOSED BUILDING LINE
- EXISTING BOUNDARY LINE
- PROPOSED LOT LINES
- 132 — EXISTING MINOR CONTOUR
- 130 — EXISTING MAJOR CONTOUR
- 131 — PROPOSED MINOR CONTOUR
- 130 — PROPOSED MAJOR CONTOUR
- PROPOSED WALL
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- 130.50 — PROPOSED SPOT SHOT
- R:120.50 — PROPOSED RIM SHOT
- PROPOSED STORM CATCHBASIN

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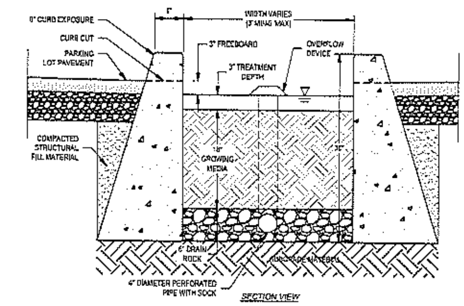
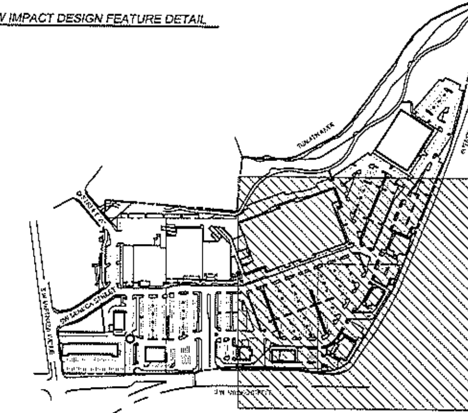


STORMWATER LOW IMPACT DESIGN FEATURE DETAIL
NOT TO SCALE

SCALE: 1"=50'



KEY MAP
SCALE: NTS

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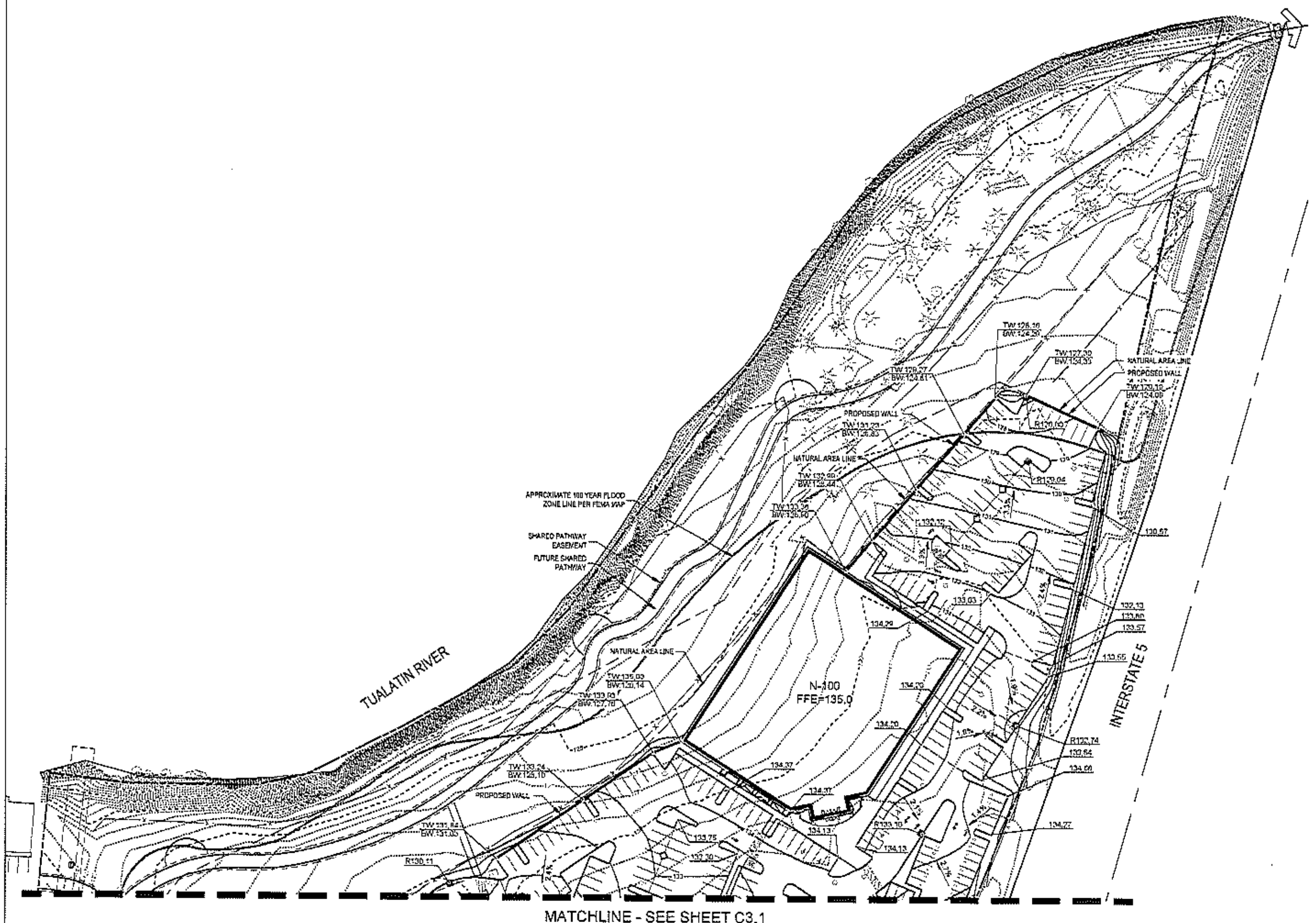
GRADING PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.	2116210
DATE:	11/06/13
DESIGNED BY:	PHH/KDB
DRAWN BY:	BCF
CHECKED BY:	JRS

GRADING PLAN
C3.1
Exhibit 1
Attachment 0-3



LEGEND

- PROPOSED BUILDING LINE
- EXISTING BOUNDARY LINE
- PROPOSED LOT LINES
- 132 — EXISTING MINOR CONTOUR
- 130 — EXISTING MAJOR CONTOUR
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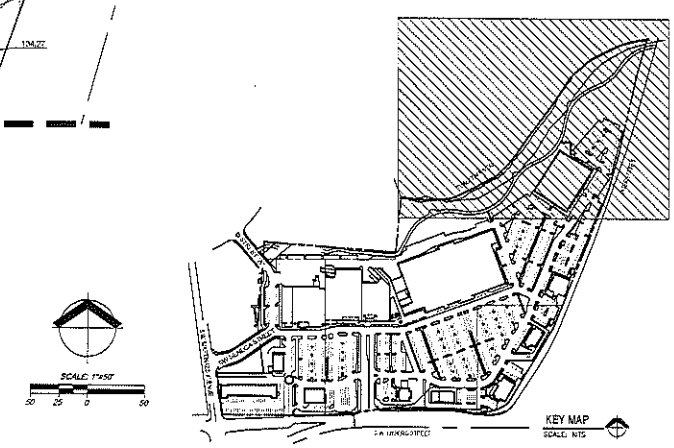
SCALE: 1"=50'



KEY MAP
SCALE: NTS

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CENTERCAL PROPERTIES, LLC

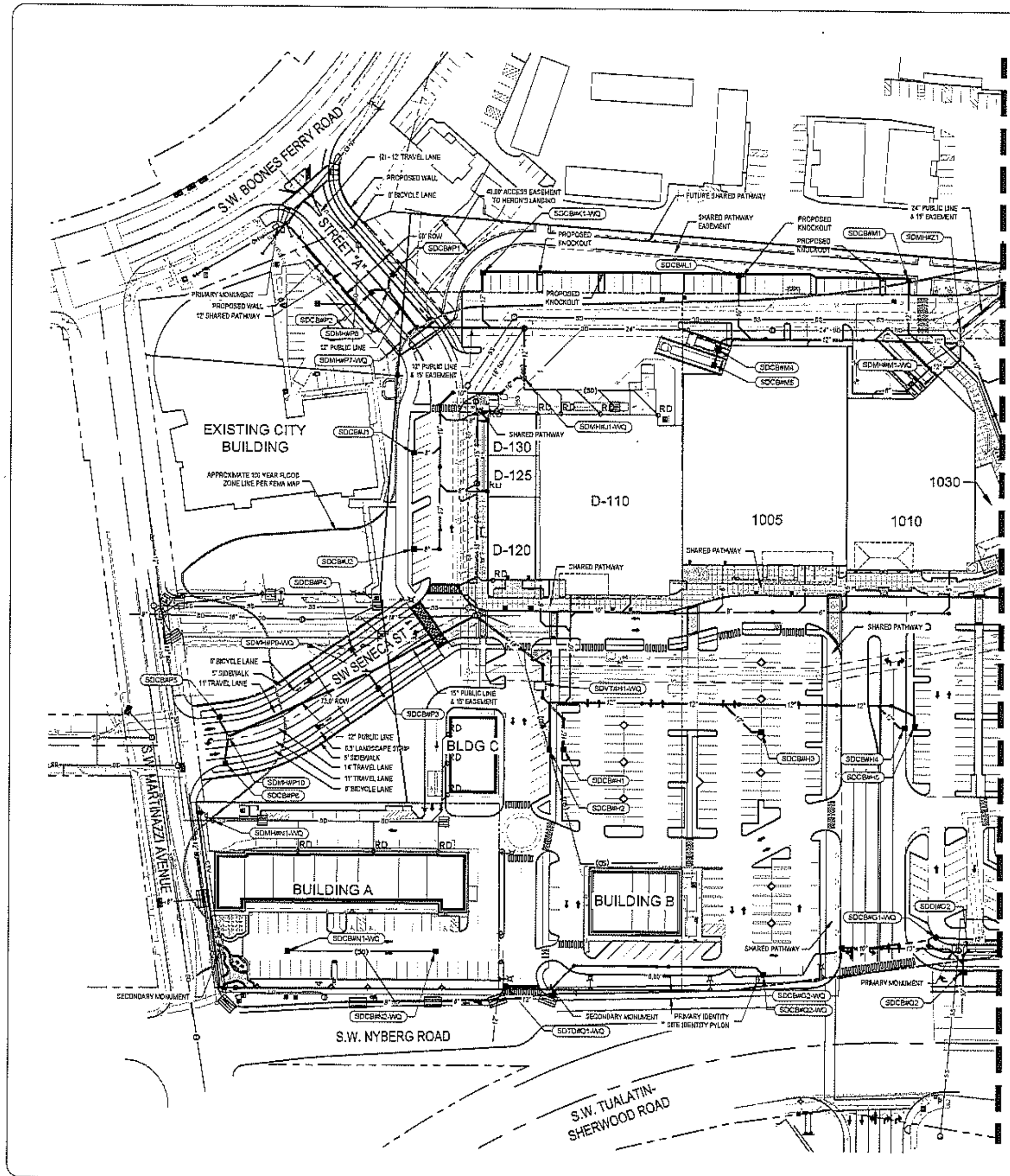
GRADING PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.	2119S310
DATE:	11/06/13
DESIGNED BY:	RHH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRS

GRADING PLAN

C3.2

Exhibit 1
Attachment O-3



LEGEND

- PROPERTY LINE
- LOT LINE
- EXISTING STORM LINE
- PROPOSED STORM PRIVATE LINE
- PROPOSED STORM PUBLIC LINE
- EXISTING STORM MANHOLE
- EXISTING STORM CATCH BASIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCH BASIN
- PROPOSED STORM CLEAN OUT
- EXISTING STORM EASEMENT
- PROPOSED STORM EASEMENT
- EXISTING VACATED EASEMENT

STORM STRUCTURE MANHOLE/VAULT TABLE

SDMH#J1-WQ
48" WATER QUALITY MH
3 STANDARD CARTRIDGES MANHOLE
RIM: 120.57
IE IN (12"S) = 118.08
IE IN (12"W) = 119.03
IE OUT (12"N) = 117.83

SDMH#M1-WQ
72" WATER QUALITY MH
6 STANDARD CARTRIDGES MANHOLE
RIM: 125.85
IE IN (12"W) = 118.08
IE IN (10"SE) = 118.68
IE IN (12"S) = 118.68
IE OUT (12"N) = 116.38

SDMH#N1-WQ
48" WATER QUALITY MH
2 STANDARD CARTRIDGES MANHOLE
RIM: 124.24

SDMH#P7-WQ
48" MANHOLE
RIM: 124.85
IE IN (12"SW) = 118.10
IE OUT (12"E) = 117.06

SDMH#P8
48" MANHOLE
RIM: 124.03
IE IN (12"W) = 118.58
IE IN (12"N) = 118.58
IE OUT (12"SE) = 118.38

SDMH#P9-WQ - 2 CARTRIDGES
48" MANHOLE
RIM: 124.63
IE IN (15"SW) = 118.76
IE IN (10"NW) = 120.90
IE IN (10"SE) = 120.90
IE OUT (15"NE) = 118.58

SDMH#P10
48" MANHOLE
RIM: 122.25
IE IN (12"S) = 119.50
IE IN (12"NW) = 119.56
IE OUT (15"NE) = 119.36

SDMH#Z1
72" MANHOLE
RIM: 125.52
IE IN (8"N) = 118.81
IE IN (24"W) = 114.61
IE IN (12"S) = 115.25
IE OUT (24"NE) = 114.56

SDVT#H1-WQ - 14 CARTRIDGES
RIM: 125.50
IE IN (18"S) = 120.56
IE OUT (10"N) = 118.26

STORM STRUCTURE CATCHBASIN TABLE

SDCB#G1-WQ - 1 CARTRIDGE
RIM: 127.63
IE IN (10"E) = 125.37
IE OUT (10"W) = 125.33

SDCB#G2-WQ - 1 CARTRIDGE
RIM: 127.44
IE OUT (10"E) = 125.00

SDCB#G2
RIM: 127.27
IE IN (10"N) = 123.91
IE OUT (10"S) = 123.81

SDCB#H1
RIM: 124.16
IE OUT (10"N) = 121.17

SDCB#H2
RIM: 124.35
IE OUT (10"N) = 121.28

SDCB#H3
RIM: 125.00
IE OUT (12"W) = 121.85

SDCB#H4
RIM: 125.30
IE OUT (12"W) = 122.64

SDCB#H5
RIM: 125.50
IE OUT (12"N) = 122.71

SDCB#J1
RIM: 126.02
IE OUT (8"E) = 122.47

SDCB#J2
RIM: 123.72
IE OUT (8"E) = 121.14

SDCB#K1-WQ - 2 CARTRIDGES
RIM: 123.65
IE OUT (12"S) = 120.44

SDCB#L1
RIM: 124.48
IE OUT (10"S) = 121.47

SDCB#M1
RIM: 123.30
IE OUT (12"S) = 120.74

SDCB#M4
RIM: 125.37
IE IN (12"S) = 122.11
IE OUT (12"N) = 121.11

SDCB#M5
RIM: 125.37
IE OUT (12"N) = 121.20

SDCB#N1-WQ - 1 CARTRIDGE
RIM: 123.55
IE OUT (8"E) = 121.85

SDCB#N2-WQ - 1 CARTRIDGE
RIM: 123.45
IE OUT (8"W) = 121.15

SDCB#P1
RIM: 123.57
IE OUT (12"SW) = 119.74

SDCB#P2
RIM: 123.70
IE OUT (12"NE) = 118.74

SDCB#P3
RIM: 124.45
IE OUT (10"NW) = 121.45

SDCB#P4
RIM: 124.44
IE OUT (10"SE) = 121.45

SDCB#P5
RIM: 121.84
IE OUT (12"S) = 119.47

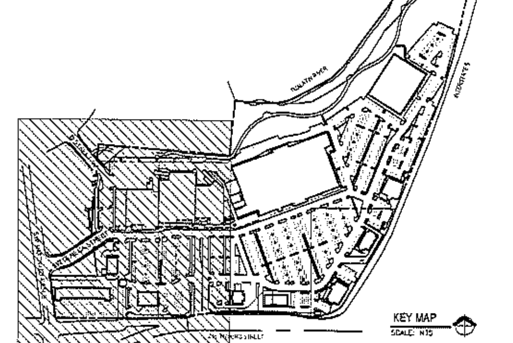
SDCB#P6
RIM: 121.76
IE OUT (12"N) = 118.69

SDCB#Q2-WQ - 1 CARTRIDGE
RIM: 126.62
IE OUT (10"NW) = 124.32

SDCB#R1
RIM: 124.54
IE IN (10"N) = 122.34
IE OUT (10"W) = 122.24

SDCB#Q2
RIM: 126.08
IE OUT (10"SW) = 124.20

SDTD#Q1-WQ - 1 CARTRIDGE
RIM: 124.55
IE IN (6"E) = 122.28
IE OUT (10"SW) = 122.25



KEY MAP
SCALE: NTS

STORM SEWER PLAN (PUBLIC FACILITIES PLAN)
NYBERG RIVERS ARCHITECTURAL REVIEW BOARD

CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

CENTERCAL PROPERTIES, LLC

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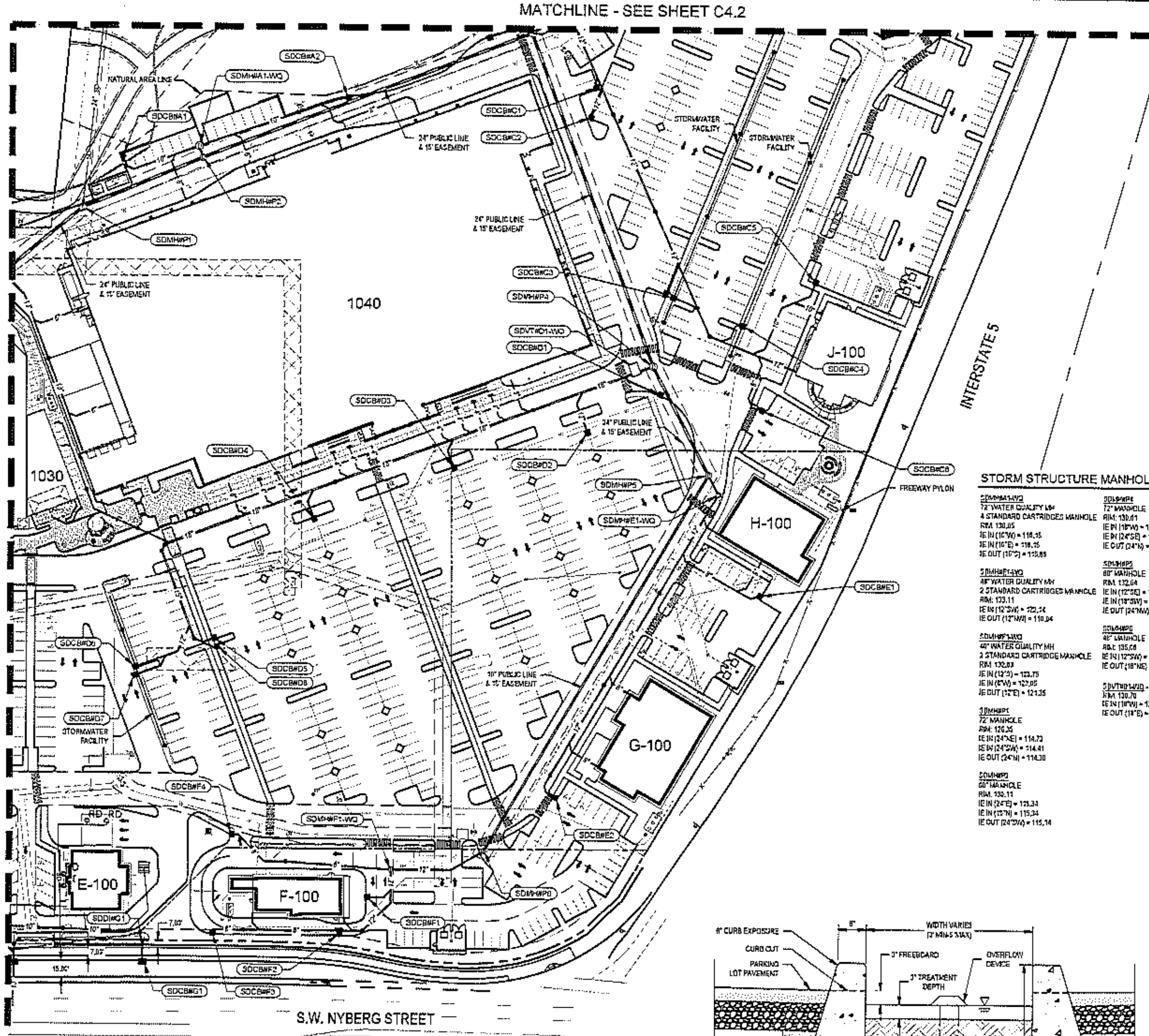
PROJECT NO:	21190310
DATE:	11/06/13
DESIGNED BY:	RHH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRG

STORM SEWER
(PUBLIC FACILITIES)

C4.0

Exhibit 1
Attachment D-3



LEGEND

- PROPERTY LINE
- LOT LINE
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- PROPOSED STORM PRIVATE LINE
- PROPOSED STORM PUBLIC LINE
- EXISTING STORM MANHOLE
- EXISTING STORM CATCH BASIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCH BASIN
- PROPOSED STORM CLEAN OUT
- EXISTING STORM EASEMENT
- PROPOSED STORM EASEMENT
- EXISTING VACATED EASEMENT
- PROPOSED STORMWATER LID FACILITY

STORM STRUCTURE MANHOLE/VAULT TABLE

SDMH#A1-WQ
72" WATER QUALITY MH
4 STANDARD CARTRIDGES MANHOLE
RIM: 130.05
IE IN (10"W) = 118.35
IE IN (10"E) = 118.35
IE OUT (10"S) = 115.85

SDMH#E1-WQ
48" WATER QUALITY MH
2 STANDARD CARTRIDGES MANHOLE
RIM: 133.11
IE IN (12"SW) = 122.24
IE OUT (12"NW) = 119.94

SDMH#F1-WQ
48" WATER QUALITY MH
2 STANDARD CARTRIDGE MANHOLE
RIM: 132.03
IE IN (12"S) = 123.75
IE IN (8"W) = 122.05
IE OUT (12"E) = 121.35

SDMH#P1
72" MANHOLE
RIM: 120.35
IE IN (24"NE) = 114.73
IE IN (24"SW) = 114.41
IE OUT (24"N) = 114.30

SDMH#P2
60" MANHOLE
RIM: 130.11
IE IN (24"E) = 115.34
IE IN (12"N) = 115.34
IE OUT (24"SW) = 115.14

SDMH#P4
72" MANHOLE
RIM: 130.01
IE IN (18"W) = 118.13
IE IN (24"SE) = 118.13
IE OUT (24"N) = 117.93

SDMH#P5
60" MANHOLE
RIM: 132.04
IE IN (12"SE) = 118.64
IE IN (18"SW) = 118.77
IE OUT (24"NW) = 118.57

SDMH#P6
48" MANHOLE
RIM: 135.08
IE IN (12"SW) = 120.58
IE OUT (18"NE) = 120.38

SDVT#D1-WQ - 14 CARTRIDGES
RIM: 130.70
IE IN (18"W) = 120.40
IE OUT (18"E) = 119.90

STORM STRUCTURE CATCHBASIN TABLE

SDCB#A1
RIM: 127.42
IE OUT (10"S) = 123.29

SDCB#A2
RIM: 130.03
IE OUT (10"W) = 126.60

SDCB#C1
RIM: 129.63
IE OUT (12"N) = 123.34

SDCB#C2
RIM: 129.52
IE OUT (12"N) = 125.00

SDCB#C3
RIM: 129.44
IE IN (4"N) = 127.02
IE IN (4"S) = 127.52
IE OUT (8"W) = 126.02

SDCB#C4
RIM: 131.29
IE IN (4"S) = -4.44
IE IN (4"N) = -4.50
IE OUT (8"W) = 128.92

SDCB#C5
RIM: 132.62
IE OUT (10"S) = 129.55

SDCB#F4
RIM: 130.80
IE OUT (8"E) = 126.08

SDCB#G1
RIM: 129.63
IE OUT (10"N) = 126.63

SDDI#G1
RIM: 130.94
IE IN (10"S) = 127.00

SDCB#C6
RIM: 132.13
IE OUT (8"W) = 128.28

SDCB#D1
RIM: 130.30
IE OUT (8"SW) = 127.73

SDCB#D2
RIM: 129.78
IE OUT (12"N) = 126.06

SDCB#D3
RIM: 129.84
IE OUT (12"N) = 126.35

SDCB#D4
RIM: 129.85
IE IN (12"N) = 125.91

SDCB#D5
RIM: 129.27
IE OUT (12"W) = 125.27

SDCB#D6
RIM: 127.72
IE IN (4"N) = 125.28
IE IN (4"S) = 125.28
IE OUT (12"E) = 125.08

SDCB#D7
RIM: 127.73
IE OUT (12"E) = 123.40

SDCB#D8
RIM: 129.35
IE OUT (12"W) = 125.35

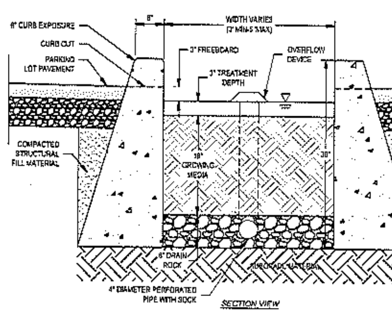
SDCB#E1
RIM: 132.00
IE OUT (8"W) = 128.56

SDCB#E2
RIM: 134.00
IE OUT (8"NW) = 129.50

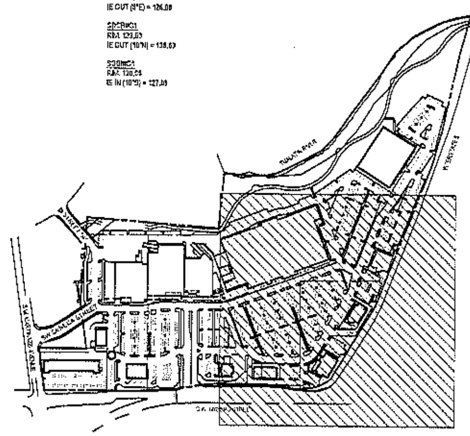
SDCB#F1
RIM: 132.05
IE OUT (8"S) = 127.93

SDCB#F2
RIM: 132.01
IE OUT (8"N) = 128.53

SDCB#F3
RIM: 131.08
IE OUT (8"N) = 127.02



STORMWATER LOW IMPACT DESIGN FEATURE DETAIL
NOT TO SCALE



KEY MAP
SCALE: NTS

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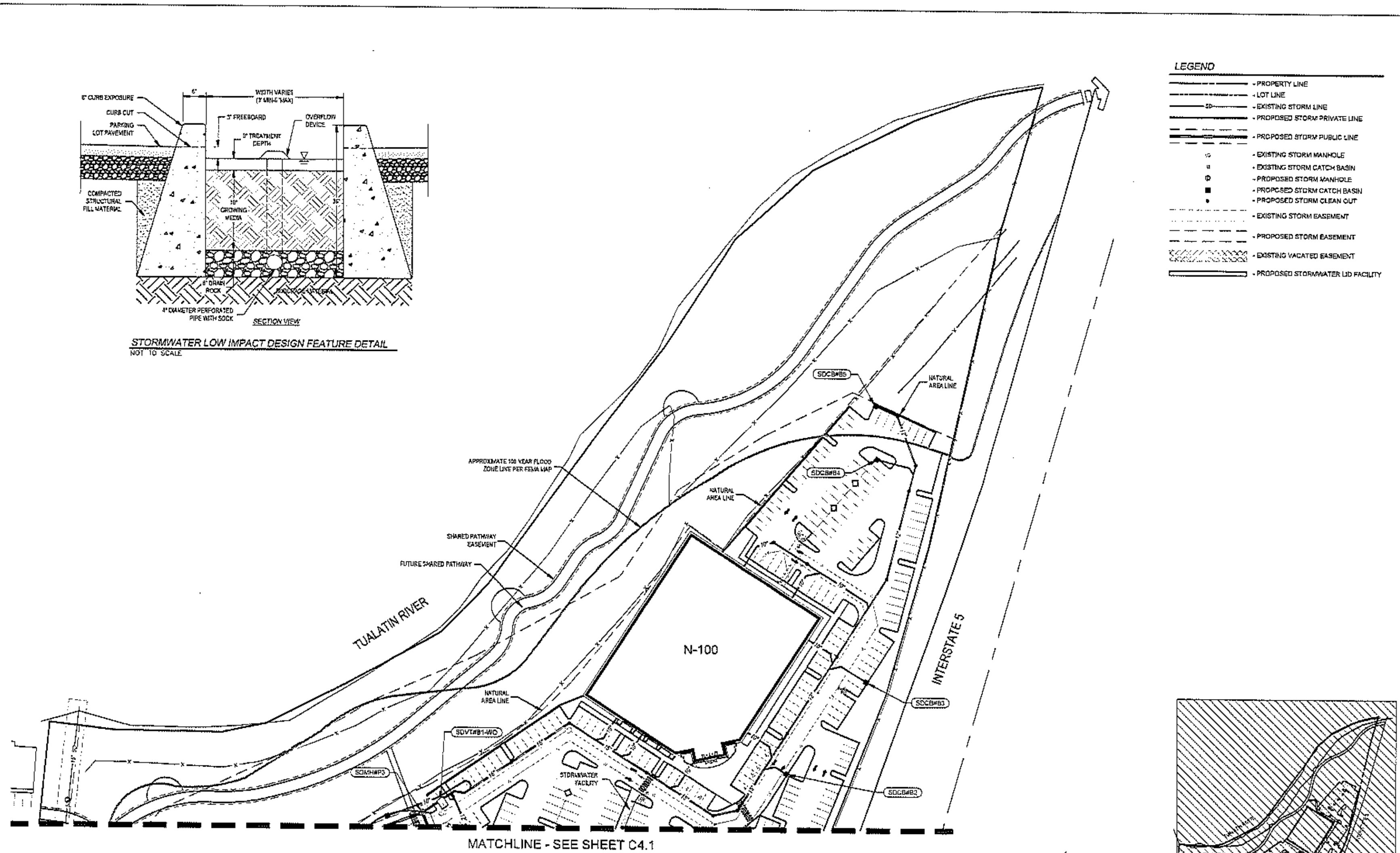
STORM SEWER PLAN (PUBLIC FACILITIES PLAN)
NYBERG RIVERS ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21108310
DATE:	11/06/13
DESIGNED BY:	RHHADO
DRAWN BY:	BCF
CHECKED BY:	JRS

STORM SEWER (PUBLIC FACILITIES)
C4.1
Exhibit 1
Attachment O-3



STORM STRUCTURE MANHOLE/VAULT TABLE

SDMH#P3
72" MANHOLE
RIM: 130.87
IE IN (18"NE) = 116.05
IE IN (24"S) = 116.05
IE OUT (24"W) = 115.45

SDVT#B1-WQ - 14 CARTRIDGES
RIM: 133.25
IE IN (18"NE) = 119.00
IE OUT (18"W) = 117.04

STORM STRUCTURE CATCHBASIN TABLE

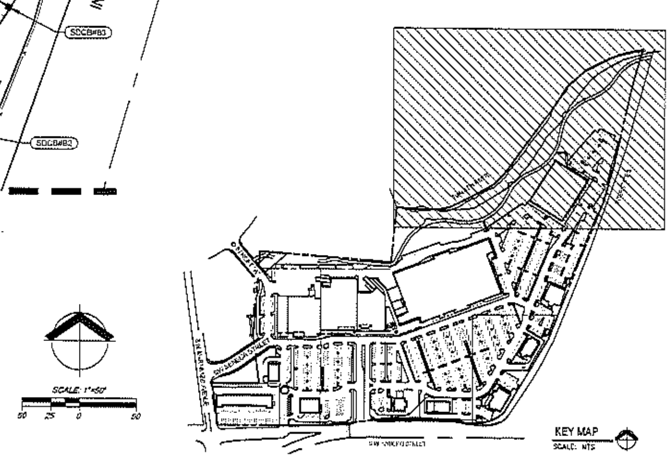
SDCB#B1
RIM: 130.10
IE OUT (12"E) = 126.40

SDCB#B2
RIM: 133.09
IE OUT (12"NW) = 128.87

SDCB#B3
RIM: 132.74
IE OUT (8"NW) = 129.56

SDCB#B4
RIM: 129.09
IE OUT (8"E) = 125.42

SDCB#B5
RIM: 130.64
IE OUT (12"SE) = 124.44



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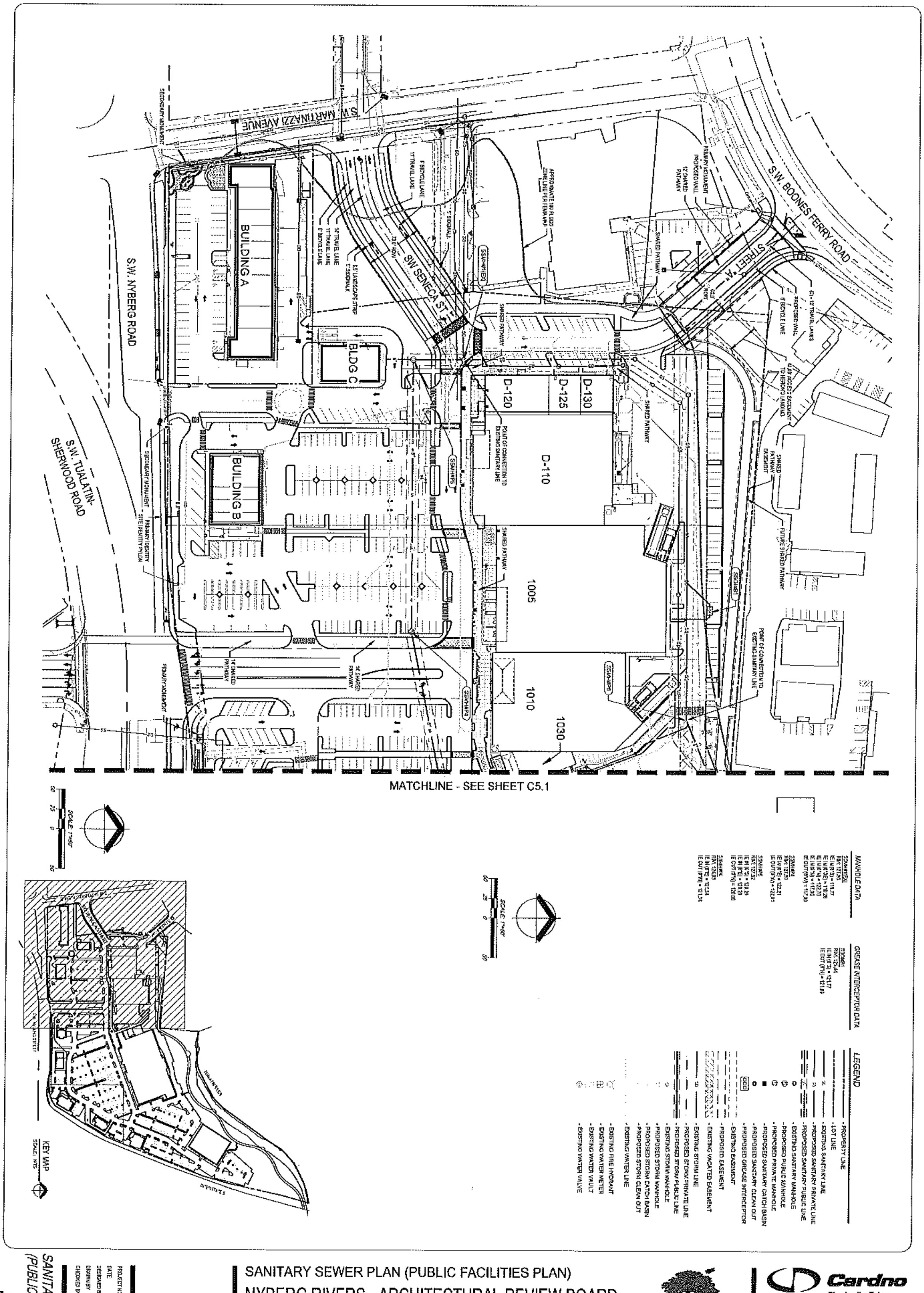
STORM SEWER PLAN (PUBLIC FACILITIES PLAN)
NYBERG RIVERS ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21156310
DATE:	11/06/13
DESIGNED BY:	RHH/KCD
DRAWN BY:	BCF
CHECKED BY:	JRS

STORM SEWER
(PUBLIC FACILITIES)

C4.2
Exhibit 1
Attachment 0-3



SANITARY SEWER PLAN (PUBLIC FACILITIES PLAN)

NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD

CENTERCAL PROPERTIES, LLC.

TUALATIN, OREGON

CENTERCAL

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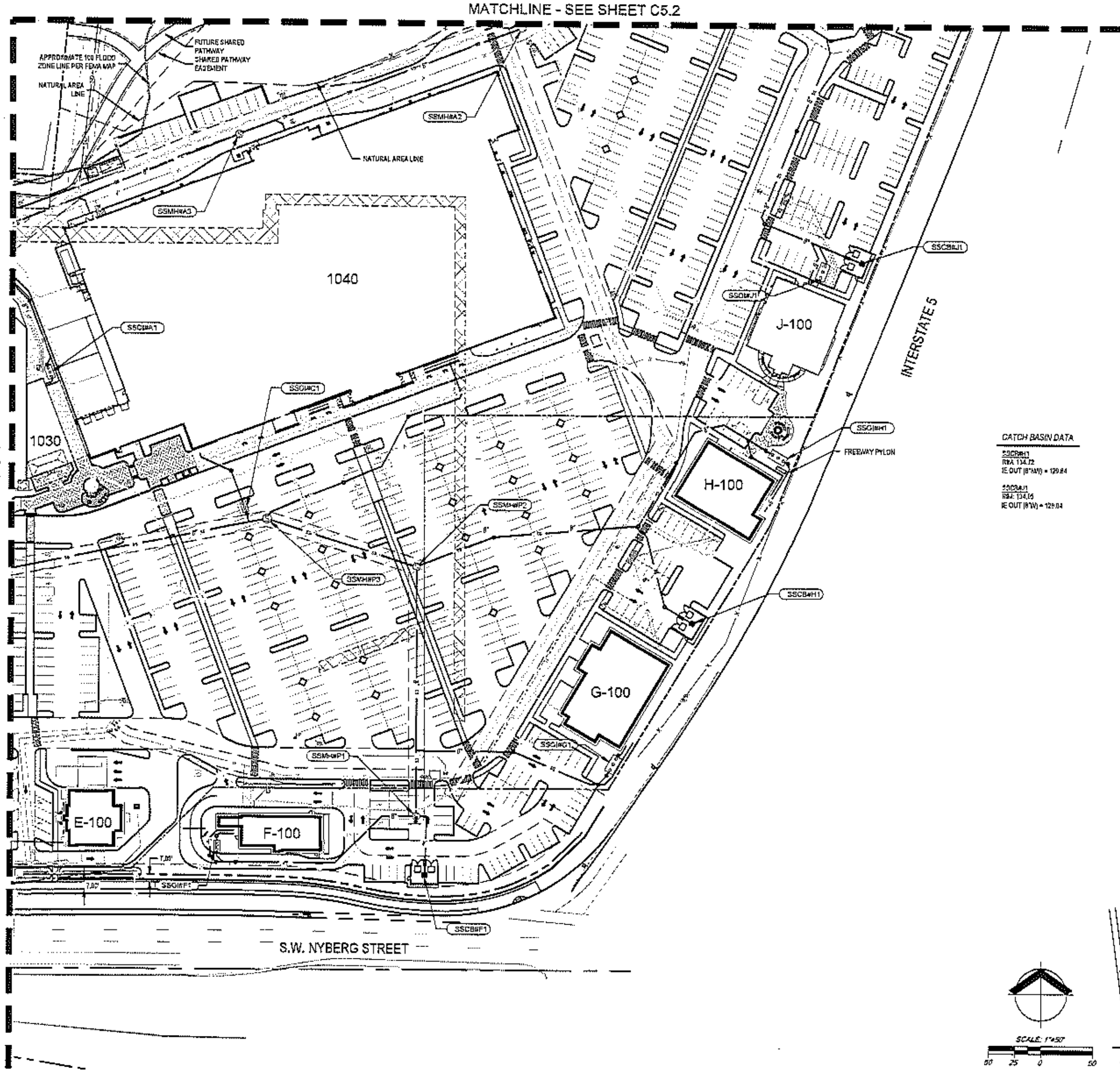
PROJECT NO.:	2118010
DATE:	11/30/10
DESIGNED BY:	RRH/BDD
DRAWN BY:	BCF
CHECKED BY:	JRG

SANITARY SEWER (PUBLIC FACILITIES)

C5.0

Exhibit 1
Attachment O-3



SCALE: 1"=50'

50 25 0 50

LEGEND

- PROPERTY LINE
- LOT LINE
- EXISTING SANITARY LINE
- PROPOSED SANITARY PRIVATE LINE
- PROPOSED SANITARY PUBLIC LINE
- EXISTING SANITARY MANHOLE
- PROPOSED PUBLIC MANHOLE
- PROPOSED PRIVATE MANHOLE
- PROPOSED SANITARY CATCH BASIN
- PROPOSED SANITARY CLEAN OUT
- PROPOSED GREASE INTERCEPTOR
- EXISTING EASEMENT
- PROPOSED EASEMENT
- EXISTING VACATED EASEMENT
- EXISTING STORM LINE
- PROPOSED STORM PRIVATE LINE
- PROPOSED STORM PUBLIC LINE
- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCH BASIN
- PROPOSED STORM CLEAN OUT
- EXISTING WATER LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VAULT
- EXISTING WATER VALVE

CATCH BASIN DATA

SSCB#H1
RIM: 134.72
IE OUT (8"NW) = 129.84

SSCB#J1
RIM: 134.05
IE OUT (8"W) = 129.04

MANHOLE DATA

SSMH#A2
RIM: 130.97
IE IN (8"NE) = 124.91
IE OUT (8"W) = 124.71

SSMH#A3
RIM: 131.24
IE IN (8"E) = 123.25
IE OUT (8"W) = 123.05

SSMH#P1
RIM: 133.75
IE IN (8"E) = 120.73
IE IN (8"W) = 120.73
IE OUT (8"N) = 120.53

SSMH#P2
RIM: 132.30
IE IN (8"E) = 125.32
IE IN (8"S) = 125.32
IE OUT (8"W) = 125.12

SSMH#P3
RIM: 130.19
IE IN (8"E) = 124.36
IE IN (8"NE) = 124.36
IE OUT (8"W) = 124.16

GREASE INTERCEPTOR DATA

SSGI#A1
RIM: 130.53
IE IN (6"SE) = 125.34
IE OUT (6"NW) = 125.26

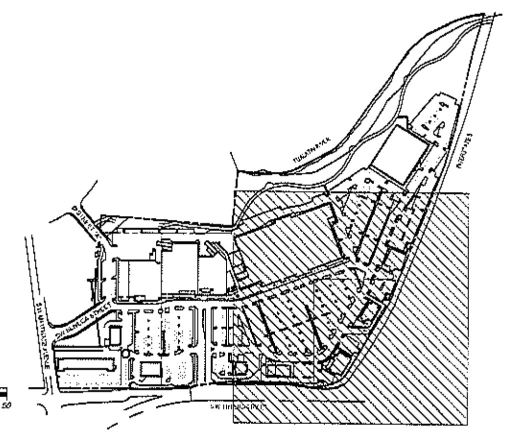
SSGI#C1
RIM: 130.30
IE IN (4"NW) = 125.57
IE OUT (4"SE) = 125.45

SSGI#F1
RIM: 132.31
IE IN (4"N) = 128.23
IE OUT (4"S) = 128.20

SSGI#G1
RIM: 130.37
IE IN (4"NE) = 130.30
IE OUT (6"SW) = 130.24

SSGI#H1
RIM: 134.65
IE IN (6"SE) = 127.70
IE OUT (6"NW) = 127.62

SSGI#J1
RIM: 133.14
IE IN (6"S) = 128.50
IE OUT (6"N) = 128.50



KEY MAP
SCALE: NTS

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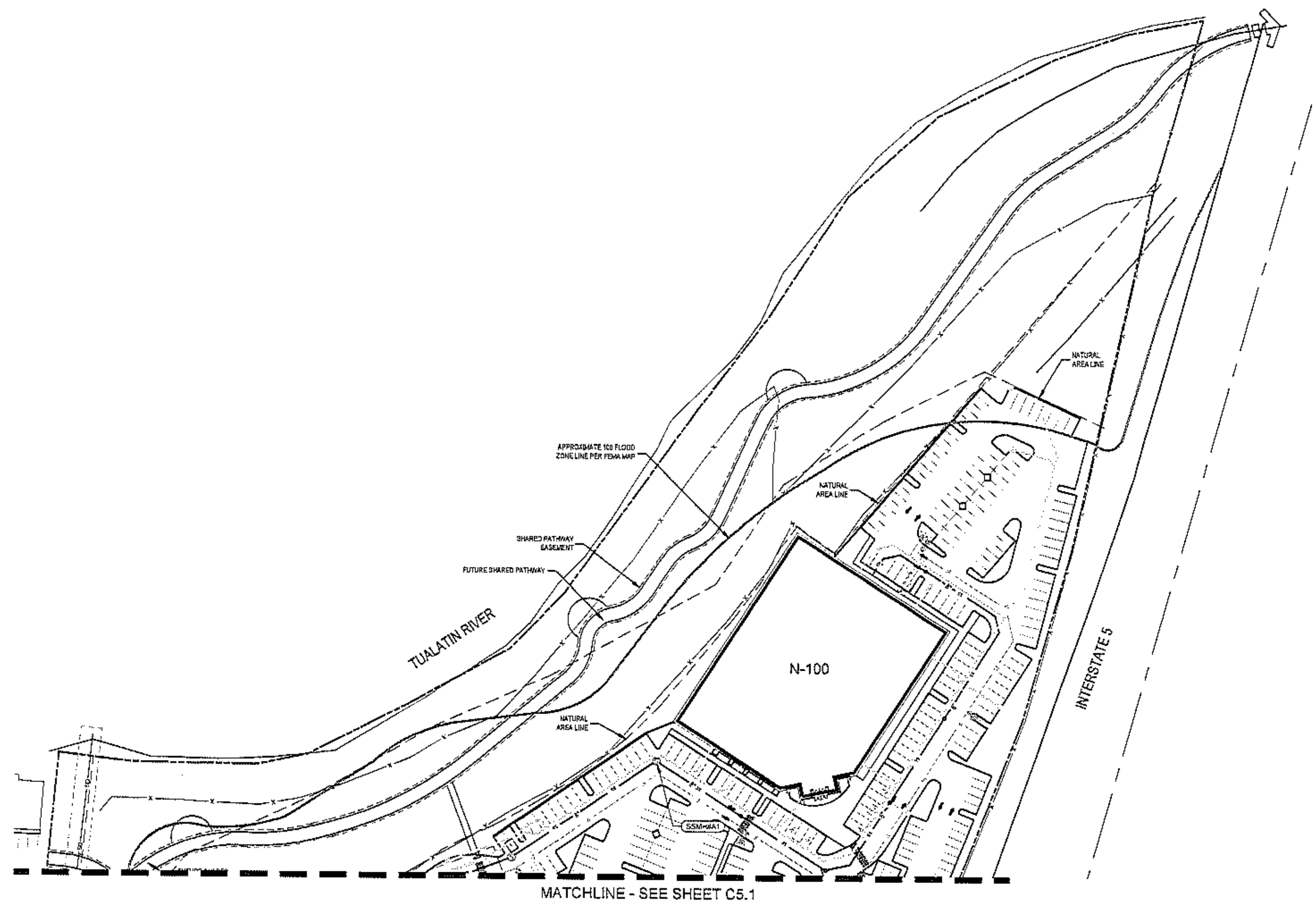
CENTERCAL PROPERTIES, LLC

SANITARY SEWER PLAN (PUBLIC FACILITIES PLAN)
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	2119021?
DATE:	11/06/13
DESIGNED BY:	RHH/KDB
DRAWN BY:	RCF
CHECKED BY:	JRS

SANITARY SEWER
(PUBLIC FACILITIES)
C5.1
Exhibit 1
Attachment 0-3

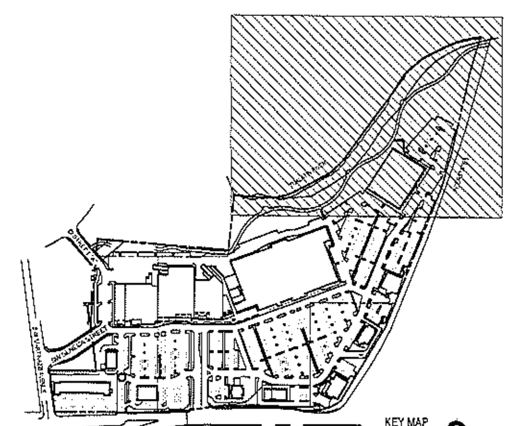


LEGEND

- PROPERTY LINE
- LOT LINE
- EXISTING SANITARY LINE
- PROPOSED SANITARY PRIVATE LINE
- PROPOSED SANITARY PUBLIC LINE
- EXISTING SANITARY MANHOLE
- PROPOSED PUBLIC MANHOLE
- PROPOSED PRIVATE MANHOLE
- PROPOSED SANITARY CATCH BASIN
- PROPOSED SANITARY CLEAN OUT
- PROPOSED GREASE INTERCEPTOR
- EXISTING EASEMENT
- PROPOSED EASEMENT
- EXISTING VACATED EASEMENT
- EXISTING STORM LINE
- PROPOSED STORM PRIVATE LINE
- PROPOSED STORM PUBLIC LINE
- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCH BASIN
- PROPOSED STORM CLEAN OUT
- EXISTING WATER LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VAULT
- EXISTING WATER VALVE

MANHOLE DATA

SSMH#A1
RIM: 133.73
IE OUT (8"SE) = 125.93
IE OUT (8"SW) = 125.73



KEY MAP
SCALE: NTS

SANITARY SEWER PLAN (PUBLIC FACILITIES PLAN)
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

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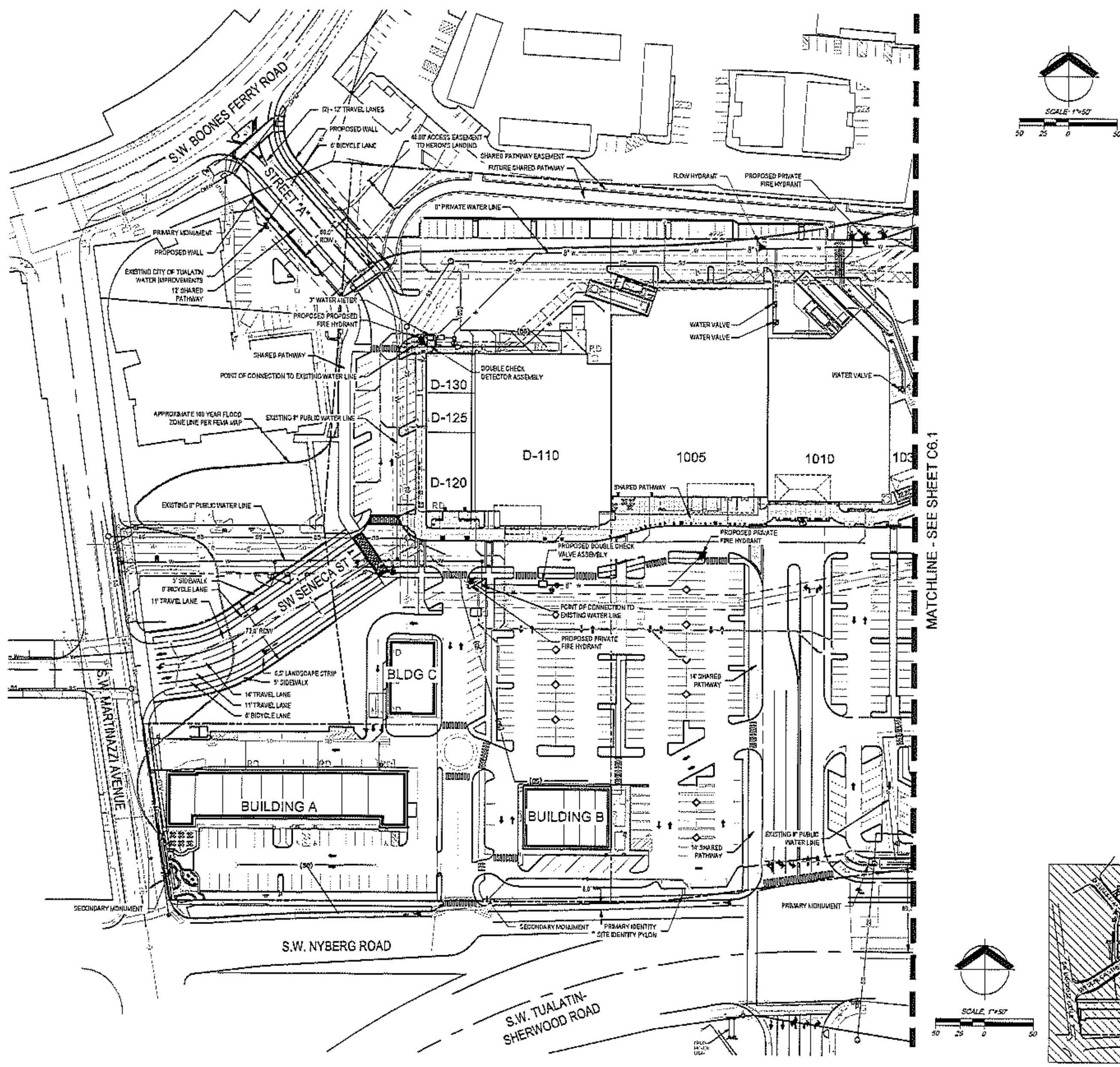
PROJECT NO.	21192310
DATE:	11/06/13
DESIGNED BY:	RHH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRS

SANITARY SEWER
(PUBLIC FACILITIES)

C5.2
Exhibit 1
Attachment O-3



LEGEND

- PROPERTY LINE
- LOT LINE
- EXISTING WATER LINE
- PROPOSED WATER PRIVATE LINE
- PROPOSED WATER PUBLIC LINE
- PROPOSED FIRE WATER LINE
- PROPOSED DOMESTIC WATER LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VAULT
- EXISTING WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FIRE DEPT. CONNECTION
- PROPOSED WATER METER/DEDUCT METER
- PROPOSED DOUBLE CHECK VALVE
- EXISTING WATER EASEMENT
- PROPOSED WATER EASEMENT
- EXISTING VACATED EASEMENT
- EXISTING FIRE FLOW HYDRANT

WATER GENERAL NOTES:

1. ALL DOMESTIC WATER METERS AND DEDUCT WATER METERS SHALL BE RESIZED PER BUILDINGS PROJECTED WATER USAGE.
2. ALL DOMESTIC WATER LINES TO BE METERED AND BACKFLOWS TO BE PROVIDED INSIDE THE BUILDING.
3. ALL FIRE DEPARTMENT CONNECTIONS WILL BE WITHIN 100' OF A FIRE HYDRANT.
4. ALL FIRELINE BACKFLOW TO BE PROVIDED INSIDE THE BUILDING.

EXISTING FIRE FLOW TEST DATA:

TEST DATE: 3/18/2013

STATIC HYDRANT: NYBERG ROAD (SEE PLAN LOCATION)

FLOW HYDRANT: NYBERG ROAD (SEE PLAN LOCATIONS)

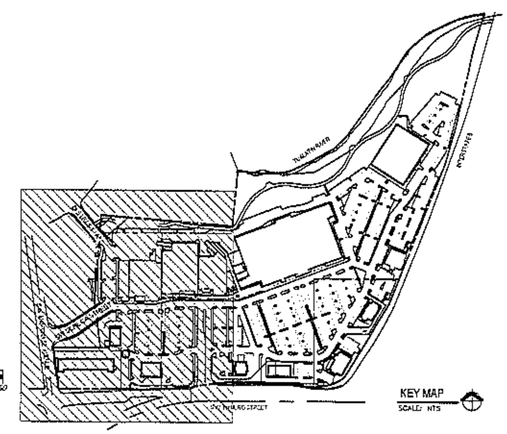
STATIC PRESSURE = 70 PSI

RESIDUAL PRESSURE = 66 PSI

FLOW = 940 GPM

PRESSURE = 20 PSI

AVAILABLE FLOW = 3712 GPM



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CENTERCAL PROPERTIES, LLC

WATER SYSTEM PLAN (PUBLIC FACILITIES PLAN)

NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD

CENTERCAL PROPERTIES, LLC.

TUALATIN, OREGON

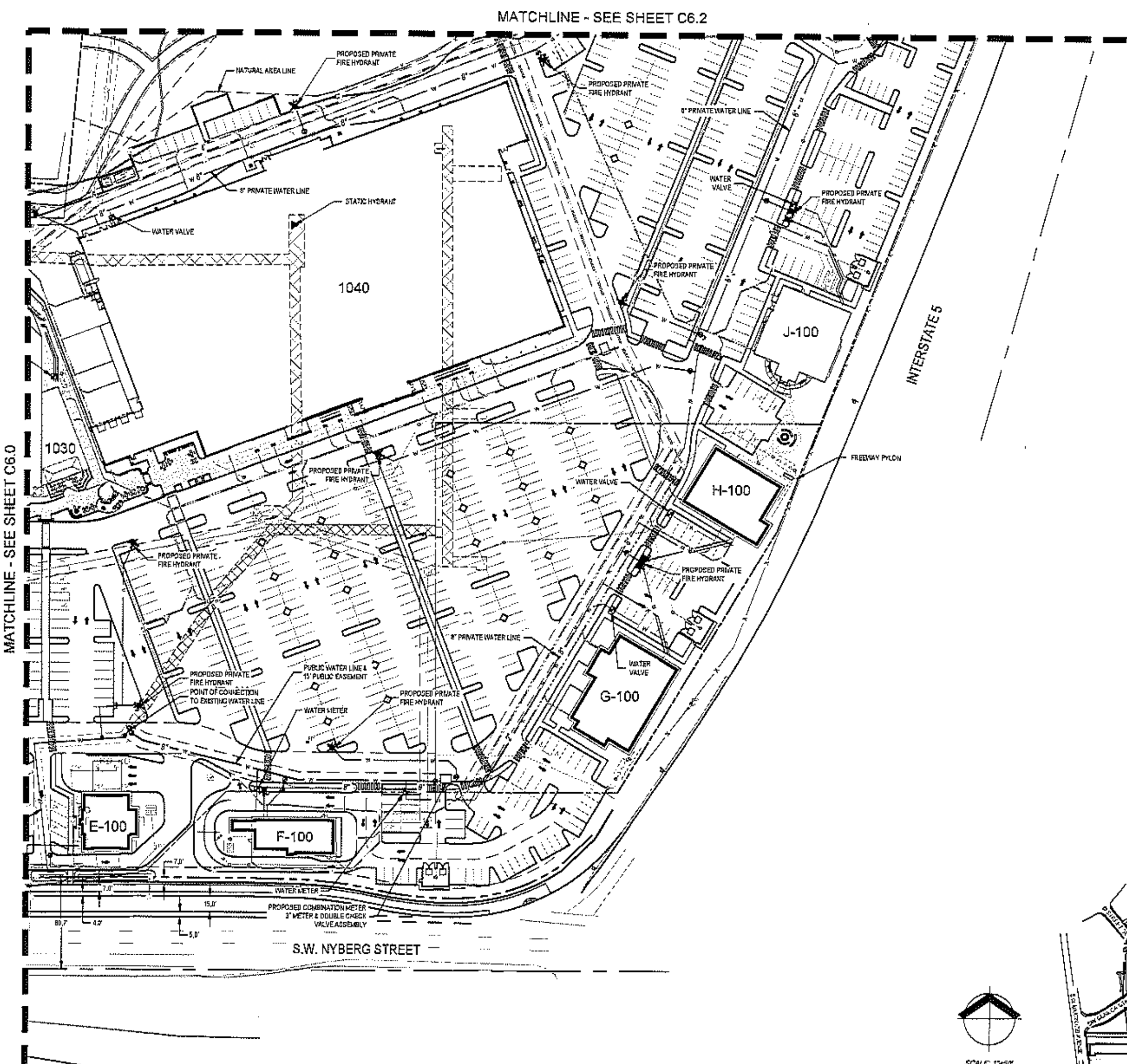
PROJECT NO.	[illegible]
DATE:	[illegible]
DESIGNED BY:	RHH/KDD
DRAWN BY:	BCF
CHECKED BY:	JRS

WATER SYSTEM (PUBLIC FACILITIES)

C6.0

Exhibit 1

Attachment D-3



LEGEND

- PROPERTY LINE
- LOT LINE
- EXISTING WATER LINE
- PROPOSED WATER PRIVATE LINE
- PROPOSED WATER PUBLIC LINE
- PROPOSED FIRE WATER LINE
- PROPOSED DOMESTIC WATER LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VAULT
- EXISTING WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FIRE DEPT. CONNECTION
- PROPOSED WATER METER/DEDUCT METER
- PROPOSED DOUBLE CHECK VALVE
- EXISTING WATER EASEMENT
- PROPOSED WATER EASEMENT
- EXISTING VACATED EASEMENT
- EXISTING FIRE FLOW HYDRANT

WATER GENERAL NOTES:

1. ALL DOMESTIC WATER METERS AND DEDUCT WATER METERS SHALL BE RESIZED PER BUILDINGS PROJECTED WATER USAGE.
2. ALL DOMESTIC WATER LINES TO BE METERED AND BACKFLOWS TO BE PROVIDED INSIDE THE BUILDING.
3. ALL FIRE DEPARTMENT CONNECTIONS WILL BE WITHIN 100' OF A FIRE HYDRANT.
4. ALL FIRELINE BACKFLOW TO BE PROVIDED INSIDE THE BUILDING.

EXISTING FIRE FLOW TEST DATA:

TEST DATE: 3/19/2013

STATIC HYDRANT: NYBERG ROAD (SEE PLAN LOCATION)

FLOW HYDRANT: NYBERG ROAD (SEE PLAN LOCATIONS)

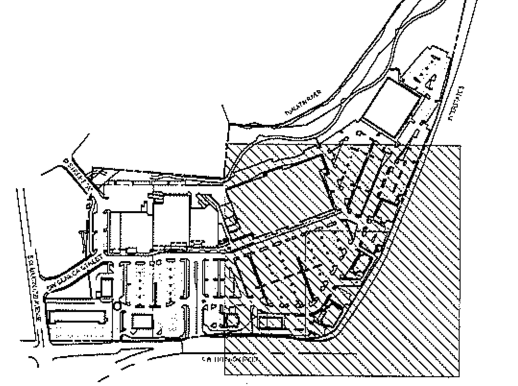
STATIC PRESSURE = 70 PSI

RESIDUAL PRESSURE = 66 PSI

FLOW = 940 GPM

PRESSURE = 20 PSI

AVAILABLE FLOW = 3712 GPM



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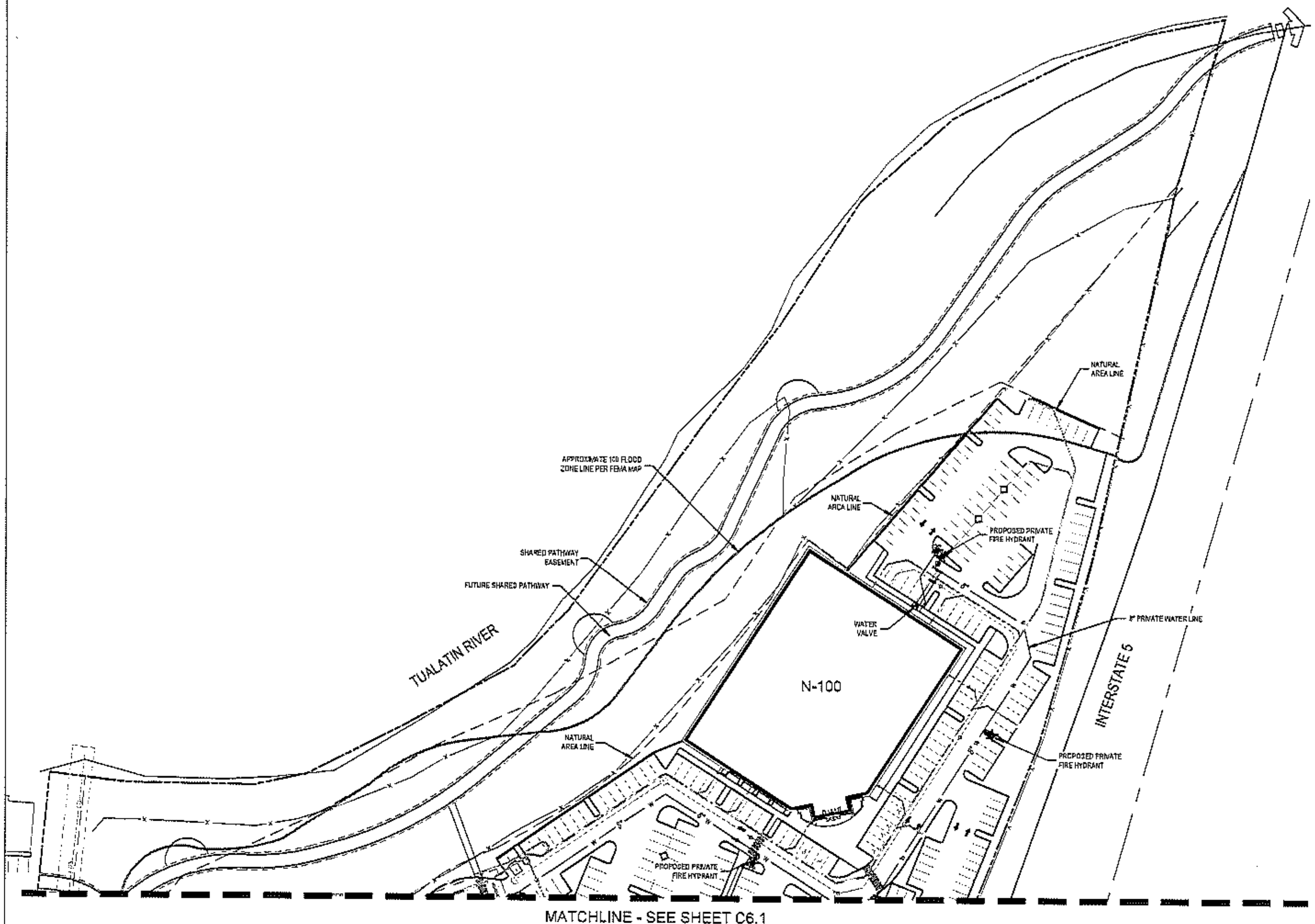
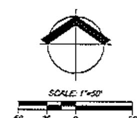
WATER SYSTEM PLAN (PUBLIC FACILITIES PLAN)
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

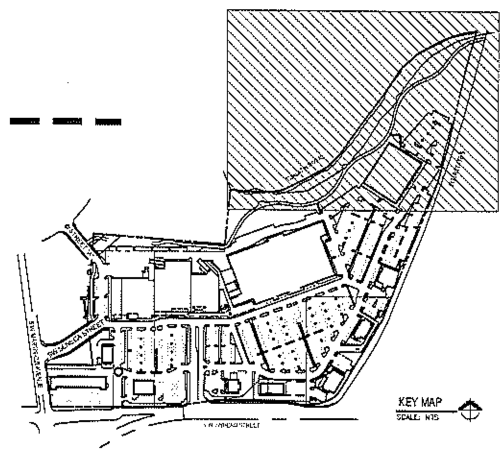
PROJECT NO.:	21100010
DATE:	11/06/13
DESIGNED BY:	RHH/ADD
DRAWN BY:	BCF
CHECKED BY:	JRS

WATER SYSTEM
(PUBLIC FACILITIES)

C6.1
Exhibit 1
Attachment O-3







LEGEND

- PROPERTY LINE
- LOT LINE
- EXISTING WATER LINE
- PROPOSED WATER PRIVATE LINE
- PROPOSED WATER PUBLIC LINE
- PROPOSED FIRE WATER LINE
- PROPOSED DOMESTIC WATER LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VAULT
- EXISTING WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FIRE DEPT. CONNECTION
- PROPOSED WATER METER/DEDUCT METER
- PROPOSED DOUBLE CHECK VALVE
- EXISTING WATER EASEMENT
- PROPOSED WATER EASEMENT
- EXISTING VACATED EASEMENT
- EXISTING FIRE FLOW HYDRANT

WATER GENERAL NOTES:

1. ALL DOMESTIC WATER METERS AND DEDUCT WATER METERS SHALL BE RESIZED PER BUILDINGS PROJECTED WATER USAGE.
2. ALL DOMESTIC WATER LINES TO BE METERED AND BACKFLOWS TO BE PROVIDED INSIDE THE BUILDING.
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4. ALL FIRELINE BACKFLOW TO BE PROVIDED INSIDE THE BUILDING.

EXISTING FIRE FLOW TEST DATA:

TEST DATE: 3/18/2013

STATIC HYDRANT: NYBERG ROAD (SEE PLAN LOCATION)

FLOW HYDRANT: NYBERG ROAD (SEE PLAN LOCATIONS)

STATIC PRESSURE = 70 PSI

RESIDUAL PRESSURE = 68 PSI

FLOW = 949 GPM

PRESSURE = 20 PSI

AVAILABLE FLOW = 3712 GPM

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CENTERCAL PROPERTIES, LLC

WATER SYSTEM PLAN (PUBLIC FACILITIES PLAN)
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	2115031
DATE:	11/06/13
DESIGNED BY:	RHNADD
DRAWN BY:	BCF
CHECKED BY:	JRS

WATER SYSTEM
(PUBLIC FACILITIES)

C6.2
Exhibit 1
Attachment 0-3

Exhibit 1
Attachment O-4

TUALATIN RIVER - LANDSCAPE PLANT MATERIALS

TREES ITEM	SIZE	QTY
QUERCUS GARRYANA / OREGON WHITE OAK	2" CAL. B&B AS SHOWN	17
ACER FREEMANII 'ARMSTRONG' / ARMSTRONG MAPLE	2" CAL. B&B AS SHOWN	33
CRATAEGUS DOUGLASII / WESTERN HAWTHORN	2" CAL. B&B AS SHOWN	7
BETULA PAPYRIFERA / PAPER BIRCH	2" CAL./ SINGLE AS SHOWN	51
QUERCUS COCCINEA / SCARLET OAK	2" CAL. B&B AS SHOWN	5
FRAXINUS PENNSYLVANICA 'MARSHALL' / MARSHALL ASH	2" CAL. B&B AS SHOWN	31
CORNUS NUTTALLII / WESTERN DOGWOOD	2" CAL. B&B AS SHOWN	6
ACER GRISEUM / PAPERBARK MAPLE	2" CAL. B&B AS SHOWN	18
THUJA PLICATA / WESTERN RED CEDAR	6' HT. / B&B AS SHOWN	7
PSEUDOTSUGA MENZIESII / DOUGLAS FIR	6' HT. / B&B AS SHOWN	8
TSUGA HETEROPHYLLA / WESTERN HEMLOCK	6' HT. / B&B AS SHOWN	7
ACER CIRCINATUM / VINE MAPLE	6' HT. / MULTI-STEM	33
EXISTING DECIDUOUS TREE TO REMAIN		
EXISTING EVERGREEN TREE TO REMAIN		

CENTRAL OREGON - LANDSCAPE PLANT MATERIALS

COAST RANGE - LANDSCAPE PLANT MATERIALS

LANDSCAPING CALCULATIONS:

	SQUARE FEET	ACRES
TOTAL AREA OF SITE	1,383,033.0	31.75
TOTAL AREA OF DEVELOPMENT (SITE - NATURAL AREA)	1,150,858.2	26.42
REQUIRED LANDSCAPING (15%)	207,454.5	4.76
PROPOSED LANDSCAPE AREA	474,482.8	10.89
NATURAL AREA	232,174.8	5.33
PLANTED AREA	162,393.0	3.73
HARDSCAPE AREA	79,914.0	1.83
TOTAL PARKING STALLS = 1,316		
REQ. PARKING LOT LANDSCAPE (25 SF / STALL)	32,900.0	0.76
PARKING LOT LANDSCAPE AREA	70,001.0	
PLANTED AREA	53,404.0	1.23
HARDSCAPE AREA	16,597.0	0.38

TREE MATURITY NOTES:

TREES DELIVERED TO THE SITE WILL RANGE FROM 10-20' AT THE TIME OF INSTALLATION, DEPENDING ON SPECIES. TREES WILL VARY IN GROWTH RATE AND FORM DURING THE ESTABLISHMENT PERIOD AND SHOULD TAKE APPROXIMATELY 10-15 YEARS FOR ALL PARKING LOT SPECIES TO REACH THE REQUIRED MINIMUM MATURE HEIGHT OF 30 FEET.

TREES WILL REACH THE 60% MATURE HEIGHT (20' HT.) WITHIN 5 YEARS OF PLANTING, PER TDC SECTION 73.380(7)(a-e).

TREES IN DIAMONDS WILL BE MONITORED ANNUALLY FOR PROPER GROWTH AND ESTABLISHMENT.

IF TREES DO NOT MEET THE PERFORMANCE REQUIREMENT, THEN APPLICANT, ITS SUCCESSORS AND ASSIGNS, MUST REMEDY THE FAILURE. SUCH REMEDY SHALL BE UP TO AND INCLUDING REBUILDING THE PLANTING AREA SOILS AND PLANT MATERIAL.

SEE SHEET L1.10 FOR ROOT BARRIER AND 5'x5' DIAMOND PLANTER DETAILS. SEE SHEET L1.11 FOR SCALED SECTIONS OF THE 2'-6"x2'-6" AND ALTERNATE 5'x5' TREE WELL PLANTERS.

GENERAL NOTES: LANDSCAPE PLANTING PLAN

1. CONTRACTOR TO VERIFY WITH OWNER AND UTILITY COMPANIES THE LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION, TO DETERMINE IN THE FIELD THE ACTUAL LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL CALL UTILITY PROTECTION SERVICE 72 HOURS PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO VERIFY LIMITS OF WORK BEFORE STARTING AND EXAMINE FINISH SURFACE, GRADES, TOPSOIL QUALITY AND DEPTH. DO NOT START ANY WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
3. CONTRACTOR TO REPORT ALL DAMAGES TO EXISTING CONDITIONS AND INCONSISTENCIES WITH PLANS IN WRITING TO THE LANDSCAPE ARCHITECT.
4. REMOVE EXISTING WEEDS FROM PROJECT SITE PRIOR TO THE ADDITION OF ORGANIC AMENDMENTS AND FERTILIZER. APPLY PRE-EMERGENTS TO CLEARED SOIL AREAS. APPLY SOIL AMENDMENTS AND FERTILIZERS PER THE RECOMMENDATIONS OF THE INTENDED SOIL'S LAB ANALYSIS.
5. ALL TREE AND SHRUB PLANT MASSES TO BE CONTAINED WITHIN A BED OF BARK MULCH. INSTALL A UNIFORM 3" LAYER OF BARK MULCH. DO NOT INSTALL MULCH IN ANY WATER QUALITY SWALES OR ON SLOPES OF FACILITIES BELOW THE TOP OF BANK.
6. SHOVEL CUT BED EDGE TO BE NO LESS THAN 12" AND NO MORE THAN 18" FROM OUTER EDGE OF PLANT MATERIAL BRANCHING. WHERE GROUND-COVER OCCURS, CUT EDGE TO LIMITS OF THE PLANTED AREA SHOWN.
7. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IN ALL LANDSCAPE PLANTING AREAS. ENSURE SOIL MOUNDING DOES NOT ADVERSELY AFFECT BUILDING OR PARKING LOT DRAINAGE SYSTEMS.
8. CONTRACTOR TO FINE GRADE AND ROCK-HOUND LANDSCAPE AREAS PRIOR TO PLANTING, TO PROVIDE A SMOOTH AND CONTINUAL SURFACE, FREE OF IRREGULARITIES (BUMPS OR DEPRESSIONS) & EXTRANEOUS MATERIAL OR DEBRIS.
9. QUANTITIES SHOWN ARE INTENDED TO ASSIST CONTRACTOR IN EVALUATING THEIR OWN TAKE OFFS AND ARE NOT GUARANTEED AS ACCURATE REPRESENTATIONS OF FINAL QUANTITIES OR MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BID QUANTITIES AS REQUIRED BY THE PLANS AND SPECIFICATIONS. IF THERE IS A DISCREPANCY BETWEEN THE NUMBER LABELED ON THE PLANT LEGEND AND THE QUANTITY OF GRAPHIC SYMBOLS SHOWN, THE GRAPHIC SYMBOL QUANTITY SHALL GOVERN.
10. COORDINATE LANDSCAPE INSTALLATION WITH INSTALLATION OF UNDERGROUND SPRINKLER AND DRAINAGE SYSTEMS.
11. CONTRACTOR SHALL NOT REMOVE ANY EXISTING TREES DURING CONSTRUCTION WITHOUT THE EXPRESS WRITTEN CONSENT OF THE LANDSCAPE ARCHITECT. EXISTING VEGETATION TO REMAIN SHALL BE PROTECTED AS DIRECTED BY THE LANDSCAPE ARCHITECT. SEE TREE PROTECTION NOTES FOR ADDITIONAL INFORMATION.
12. WHEN PROPOSED TREE LOCATIONS OCCUR UNDER EXISTING OVERHEAD UTILITIES OR CONFLICT WITH EXISTING TREE CANOPIES, NOTIFY LANDSCAPE ARCHITECT IN WRITING, REQUESTING ADJUSTMENT TO TREE LOCATIONS.
13. INSTALLATION CONTRACTOR SHALL MAINTAIN TREES, SHRUBS, LAWNS AND OTHER PLANTS FOR A PERIOD OF ONE YEAR (365 DAYS) UNLESS OTHERWISE DIRECTED BY THE OWNER. THE LANDSCAPE MAINTENANCE PERIOD BEGINS IMMEDIATELY AFTER INSTALLATION AND WRITTEN NOTIFICATION TO THE OWNER AND LANDSCAPE ARCHITECT. THE TREES IN DIAMOND PLANTERS WILL BE MONITORED ANNUALLY IN NOVEMBER BY A CERTIFIED ARBORIST FOR THE 5 YEAR PERFORMANCE PERIOD.
14. TOPSOIL SHALL BE TESTED BY A QUALIFIED SOIL TESTING LAB AND LAB RESULTS FORWARDED TO THE LANDSCAPE ARCHITECT FOR REVIEW AND ACCEPTANCE PRIOR TO PURCHASE. SOIL TESTS SHALL ANALYZE FOR LANDSCAPE SUITABILITY; MEASURING MACRO- & MICRO-NUTRIENTS, pH, AND SOIL CLASSIFICATION (i.e. SANDY LOAM). BACKFILL MATERIAL FOR PLANTING AREAS SHALL CONTAIN APPROVED TOPSOIL FINE GRADE COMPOST, TOPSOIL, FERTILIZER PER SOIL ANALYSIS RECOMMENDATIONS.
15. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER. THESE ITEMS MAY BE REQUIRED TO BE REPLACED WITH PLANT MATERIALS THAT ARE IN COMPLIANCE WITH THE DRAWINGS.
16. CONTRACTOR SHALL BE RESPONSIBLE TO SECURE ALL PLANT MATERIAL IN THE SIZE SPECIFIED ON PLAN PRIOR TO INSTALLATION. IN THE EVENT THE PLANT MATERIAL IS NOT AVAILABLE IN THE SIZE SPECIFIED, THE CONTRACTOR SHALL SUBMIT TO THE OWNERS' REPRESENTATIVE, AND THE LANDSCAPE ARCHITECT, A WRITTEN ESTIMATE TO INCREASE PLANT MATERIAL (AND INSTALL) THE NEXT AVAILABLE CONTAINER SIZE PLANT (I.E. 4" POT TO ONE GALLON CONTAINER, 2" CALIPER TREE TO 2.5" CALIPER).
17. CONTRACTOR SHALL BE RESPONSIBLE TO IMPLEMENT BEST MANAGEMENT PRACTICES TO STABILIZE ALL SLOPES 3:1 OR GREATER AND PREVENT EROSION OR MOVEMENT OF SOIL FROM SLOPES. THIS COULD INCLUDE, BUT NOT LIMITED TO, EROSION CONTROL FABRIC, STAKING, NETTING, AND STRAW WATTLES. SUBMIT METHOD OF SLOPE STABILIZATION TO LANDSCAPE ARCHITECT FOR REVIEW AND WRITTEN APPROVAL 30 DAYS PRIOR TO IMPLEMENTATION.
18. PRIOR TO MOBILIZATION THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT, IN WRITING, IF IT IS BELIEVED THE PLANT MATERIAL IDENTIFIED ON THE PLAN MAY NOT BE SUITABLE FOR THE SITE OR MAY DIE. SUBSTITUTION REQUESTS WILL BE GRANTED BY THE LANDSCAPE ARCHITECT PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. IF NOTIFICATION IS NOT GIVEN TO THE LANDSCAPE ARCHITECT ALL PLANTING WHICH FAILS TO GROW (EXCEPT FOR ANY DEFECTS RESULTING FROM LACK OF ADEQUATE MAINTENANCE AS DETERMINED BY THE OWNER, NEGLECT OR VANDALISM) SHALL BE REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE. (LIMIT ONE REPLACEMENT PLANT)
19. NOTIFY THE LANDSCAPE ARCHITECT IN WRITING PRIOR TO PLANTING WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, POOR PLANTING SOIL, ADVERSE DRAINAGE CONDITIONS, OR OBSTRUCTIONS.
20. PLANTING RESTRICTIONS - PLANTING IS NOT PERMITTED DURING THE FOLLOWING CONDITIONS, UNLESS OTHERWISE APPROVED IN WRITING:
A. COLD WEATHER: LESS THAN 32 DEGREES FAHRENHEIT
B. HOT WEATHER: GREATER THAN 90 DEGREES FAHRENHEIT
C. WET WEATHER: SATURATED SOIL
D. WINDY WEATHER. WIND VELOCITIES GREATER THAN 25 M.P.H.

TOPSOIL NOTES:

1. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AN ALTERNATE NUMBER IN THE BASE BID TO FURNISH AND INSTALL A 6" LAYER OF AMENDED TOPSOIL IN ALL LANDSCAPE BEDS AND SEEDED AREAS UNLESS OTHERWISE NOTED. AMENDED TOPSOIL SHALL INCLUDE ALL NECESSARY FERTILIZERS, ORGANIC AND INORGANIC AMENDMENTS, BASED ON INDUSTRY STANDARDS FOR EXCEPTIONAL PLANT DEVELOPMENT.
2. UPON BEING AWARDED THE CONTRACT, THE GENERAL CONTRACTOR SHALL COORDINATE WITH A STATE LICENSED SOIL LABORATORY AND THE LANDSCAPE ARCHITECT, TO DETERMINE THE SUITABILITY AND AVAILABILITY OF THE EXISTING SITE TOPSOIL. THE CONTRACTOR SHALL SEND THE TOPSOIL TO A SOIL LABORATORY FOR ANALYSIS STATING THAT THE TOPSOIL BE ANALYZED FOR A LANDSCAPE CROP. AFTER RECEIVING RECOMMENDATIONS FROM THE SOILS EXPERT FORWARD A COPY TO THE OWNERS REPRESENTATIVE AT WHICH TIME A DECISION WILL BE MADE BY THE OWNER AS TO WHETHER OR NOT THE EXISTING ON-SITE STOCKPILE WILL BE USED FOR THE PROJECT.
3. IF THE EXISTING TOPSOIL IS TO BE USED THE CONTRACTOR SHALL ADD THE RECOMMENDED AMENDMENTS AND FERTILIZERS AS STATED IN THE SOILS ANALYSIS ALONG WITH ADDITIONAL AMENDMENTS AND FERTILIZERS LISTED IN NOTE #6 AND #7 BELOW.
4. IN THE EVENT THE EXISTING ON-SITE TOPSOIL IS OF POOR QUALITY (AS DETERMINED BY THE SOIL ANALYSIS) OR IS UNAVAILABLE FOR USE, THE OWNER'S REPRESENTATIVE WILL MAKE A DECISION AS TO WHETHER OR NOT THE NUMBER FOR IMPORTING 6" OF AMENDED IMPORTED TOPSOIL WILL BE ADDED TO THE SIGNED CONTRACT AGREEMENT.
5. IF AMENDED IMPORTED TOPSOIL IS TO BE USED, THE GENERAL CONTRACTOR WILL BE NOTIFIED IN WRITING BY THE OWNER'S REPRESENTATIVE AND THE CONTRACT MODIFIED ACCORDINGLY. TOPSOIL SHALL BE OBTAINED FROM NATURALLY WELL-DRAINED SITES WHERE TOPSOIL OCCURS AT LEAST 4 INCHES DEEP. DO NOT OBTAIN FROM BOGS OR MARSHES. IMPORTED TOPSOIL TO COMPLY WITH ASTM D 5268, WITH A PH RANGE OF 5.5 TO 7.0, FREE OF STONES 1 INCH OR LARGER IN ANY DIMENSION, AND ANY OTHER EXTRANEOUS MATERIALS (ROCKS, STICKS, RUBBISH, SOD) HARMFUL TO PLANT GROWTH. AN ADDITIONAL SOILS ANALYSIS WILL BE REQUIRED FOR THE IMPORTED TOPSOIL.
6. AMENDED IMPORTED TOPSOIL SHALL INCLUDE ALL NECESSARY FERTILIZER AND AMENDMENTS PER THE SOIL ANALYSIS RECOMMENDATIONS. TOPSOIL ANALYSIS SHALL STATE ORGANIC MATTER, INORGANIC MATTER (SILT, CLAY AND SAND), DELETERIOUS MATERIAL, PH, MINERAL AND PLANT-NUTRIENT CONTENT. IN ADDITION THE REPORT SHALL ALSO STATE RECOMMENDED QUANTITIES (BY PERCENTAGE OF WEIGHT I.E. 2 LBS OF 15-15-15 PER 1000SF) OF NITROGEN, PHOSPHORUS AND POTASH, NUTRIENTS AND ANY LIMESTONE, ALUMINUM SULFATE, OR OTHER SOIL AMENDMENTS TO BE ADDED TO PRODUCE A SATISFACTORY AMENDED TOPSOIL. FURNISH REPORT AND RECOMMENDATIONS TO LANDSCAPE ARCHITECT FOR REVIEW AND WRITTEN APPROVAL 30 DAYS PRIOR TO MOBILIZATION.
7. IN ADDITION TO THE SOILS ANALYSIS RECOMMENDATIONS THE LANDSCAPE CONTRACTOR SHALL ADD 1 PART (1" LAYER) OF APPROVED HUMUS MATERIAL TO 2 PARTS AMENDED TOPSOIL. SUBMIT CUT SHEET OF HUMUS MATERIAL (CERTIFIED FINE COMPOSTED YARD DEBRIS) TO LANDSCAPE ARCHITECT FOR REVIEW AND WRITTEN APPROVAL PRIOR TO MIXING. HUMUS IS AVAILABLE AT MCFARLAND'S (503) 659-4240 OR APPROVED EQUAL.
8. PRIOR TO PLACEMENT OF TOPSOIL SCARIFY AND LOOSEN SUBGRADE OF PLANTING BED AREA TO A MINIMUM DEPTH OF 6 INCHES. REMOVE STONES LARGER THAN 1" IN ANY DIMENSION AND STICKS, ROOTS, RUBBISH AND OTHER EXTRANEOUS MATERIALS. REMOVE WEEDS FROM EXISTING SUBGRADE AND TREAT WITH NECESSARY HERBICIDE TO PREVENT WEED GROWTH. SPREAD HALF OF THE AMENDED TOPSOIL MIXTURE AND WORK INTO TOP OF LOOSEN SUBGRADE TO CREATE A TRANSITION LAYER. PLACE REMAINING HALF OF THE PLANTING SOIL MIXTURE TO THE DEPTH REQUIRED TO MEET THICKNESS, GRADES AND ELEVATIONS SHOWN, AFTER LIGHT ROLLING AND NATURAL SETTLEMENT.
9. WITHIN TREE WELLS, REMOVE EXISTING SOIL AND OTHER DEBRIS, TO A MINIMUM DEPTH OF 3'-0" AND REPLACE WITH AMENDED TOPSOIL. ADD ADDITIONAL SOIL AS REQUIRED PER DETAILS AND NOTES.
10. THE CONTRACTOR SHALL SUBMIT TO THE LANDSCAPE ARCHITECT, SHIPPING TICKETS FOR IMPORTED TOP SOIL AND HUMUS MATERIAL, 60 DAYS PRIOR TO INSTALLATION FOR REVIEW AND WRITTEN APPROVAL.

TREE PROTECTION NOTES:

EXISTING TREE PROTECTION

1. PROVIDE TEMPORARY FENCING, BARRICADES, AND GUARDS AS NECESSARY OR REQUIRED TO PROTECT TREES WHICH ARE TO REMAIN FROM DAMAGE ABOVE AND BELOW GRADE, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. CLEARLY DESIGNATE TREE PROTECTION ZONE TO BE CLEAR OF ANY PERSONNEL OR VEHICULAR MOVEMENT.
   A. TREES IDENTIFIED FOR RETENTION SHALL BE MARKED WITH YELLOW FLAGGING TAPE AND PROTECTED BY BARRIER FENCING PLACED NO LESS THAN 10 HORIZONTAL FEET FROM THE OUTSIDE EDGE OF THE TRUNK IN ALL DIRECTIONS OR BENEATH THE TREE DRIPLINE, WHICHEVER IS GREATER. CLUSTERS OF TREES MAY BE PROTECTED BY CONTINUOUS FENCING FOLLOWING THE SAME GUIDELINES.
   B. REQUIRED FENCING SHALL BE A MINIMUM OF SIX FEET TALL, SUPPORTED WITH METAL POSTS PLACED NO FARTHER THAN 10 FEET ON CENTER, SET 24 INCHES (MIN.) INTO GRADE (AVOID DAMAGING ROOTS). FENCING FABRIC SHALL BE CHAIN-LINK OR RED VINYL MESH, AND SHOULD BE INSTALLED FLUSH WITH THE INITIAL UNDISTURBED GRADE. SECURE TOP AND BOTTOM OF FENCING WITH TENSION WIRE SECURED TO POSTS.
   C. NO CONSTRUCTION ACTIVITY SHALL OCCUR WITHIN THE TREE PROTECTION ZONE, INCLUDING, BUT NOT LIMITED TO, DUMPING OR STORAGE OF MATERIALS SUCH AS BUILDING SUPPLIES, SOIL WASTE ITEMS, EQUIPMENT, OR PARKED VEHICLES.
2. PROTECT ROOT SYSTEMS OF TREES TO REMAIN FROM FLOODING, EROSION, OR EXCESSIVE WETTING RESULTING FROM DEWATERING OPERATIONS AND COMPACTION. DO NOT STORE CONSTRUCTION MATERIALS OR PERMIT VEHICLES TO DRIVE OR PARK WITHIN THE DRIP LINE AREA OF ANY TREE TO REMAIN. PROTECT ALL PLANT GROWTH, INCLUDING ROOT SYSTEMS OF TREES, FROM THE DUMPING OF REFUSE OR CHEMICALLY INJURIOUS MATERIAL OR LIQUIDS, AND CONTINUAL PUDDLING OF RUNNING WATER. PROTECT AGAINST UNAUTHORIZED CUTTING, BREAKING, OR SKINNING OF ROOTS AND BRANCHES, SKINNING, AND BRUISING OF BARK. DO NOT ALLOW FIRES ON SITE.
3. MAINTAIN PROTECTION FEATURES THROUGHOUT THE CONSTRUCTION PROCESS. IMMEDIATELY REPAIR ANY ALTERATION TO PROTECTION MEASURES BY CONSTRUCTION PROCESS. AFFECT ALTERATIONS TO PROTECTION MEASURES IMMEDIATELY UPON DIRECTION OF OWNER'S REPRESENTATIVE. MONITOR MAINTENANCE MEASURES DAILY.
4. DO NOT CHANGE THE EXISTING GRADE BENEATH DRIPLINE OF TREES TO REMAIN.
5. ALL EXCAVATION REQUIRED TO OCCUR WITHIN THE DRIPLINE OF ANY EXISTING TREE SHALL BE RESTRICTED TO MANUAL LABOR. THE USE OF TRENCHERS, AUGERS, BACKHOES, TRACTORS OR ANY OTHER TYPE OF MACHINERY/POWER EQUIPMENT IS PROHIBITED.

PRUNING OF EXISTING TREES

1. WHERE PRUNING APPEARS NECESSARY, REVIEW CONDITIONS WITH ARBORIST OR OWNER'S REPRESENTATIVE BEFORE PROCEEDING AND COMPLY WITH HIGHER DIRECTIVES. ALL TREE PRUNING OR ROOT CUTTING SHALL BE PERFORMED WITH STERILE SHARP PRUNING INSTRUMENTS; DO NOT BREAK, CHOP OR TEAR. ALL ROOTS 2 INCHES IN DIAMETER OR GREATER THAT REQUIRE PRUNING, SHALL BE DONE BY A STATE-CERTIFIED ARBORIST. NO PRUNING SHALL OCCUR WITHOUT THE EXPLICIT APPROVAL OF THE ARBORIST OR OWNER'S REPRESENTATIVE.

TRANSPLANTING

1. VERIFY AND IDENTIFY EXISTING TREES TO BE TRANSPLANTED. VERIFY ACCESS AND SCHEDULING FOR TRANSPLANTING ACTIVITIES, AND OBTAIN SCHEDULING APPROVAL PRIOR TO COMMENCEMENT OF TRANSPLANTING ACTIVITIES.
2. PRIOR TO TRANSPLANTING, SPRAY TREES WITH ANTI-DESICCATION EMULSION-TYPE FILM-FORMING AGENT, "DOWAX" BY DOW CHEMICAL CO., "WILT-PRUF" BY NURSERY SPECIALTY PRODUCTS INC., "DWAX" BY PLANT PRODUCTS INC., OR APPROVED EQUAL. PRIOR TO DIGGING WITH TWO SEPARATE APPLICATIONS 48 HOURS APART. USE A POWER SPRAYER TO PROVIDE AN ADEQUATE FILM OVER TRUNKS, BRANCHES, STEMS, TWIGS, AND FOLIAGE. ANTI-DESICCANT MUST BE DRY PRIOR TO RELOCATION.
3. DEEPLY IRRIGATE SUBJECT PLANTS 24 HOURS PRIOR TO DIGGING.
4. DIG, BALL AND BURLAP, AS PER HORTICULTURAL SPECIFICATIONS FOR RESPECTIVE TYPES, AND MOVE TO DESIGNATED PLANT STORAGE AREA FOR HEALING-IN OF MATERIALS UNTIL FINAL PLANTING AREAS ARE PREPARED TO RECEIVE PLANTS.
5. MAINTAIN PLANTS IN STORAGE AREAS BY BRACING PLANTS IN VERTICAL POSITIONS AND SETTING BALLS IN AN ENCLOSED BERM OF TOPSOIL OR BARK MULCH. COVER AND PROTECT FROM ELEMENTS BY HORTICULTURALLY APPROPRIATE METHODS, WHILE IN STORAGE, PLANTS ARE TO BE MAINTAINED AND IRRIGATED BY THE CONTRACTOR.
6. MOVE TO FINAL LOCATIONS SHOWN ON THE DRAWINGS AND PLANT IN ACCORDANCE WITH PLANTING DETAILS. RE-BURLAP PLANT BALLS IF NECESSARY BEFORE FINAL TRANSPLANTING OPERATIONS.
7. PRIOR TO TRANSPLANTING OPERATIONS, THE OWNER'S REPRESENTATIVE SHALL INFORM THE CONTRACTOR OF THE EXTENT OF THE CONTRACTOR'S CONTRACTUAL OBLIGATIONS IN REGARDS TO THE TRANSPLANTING WARRANTY.

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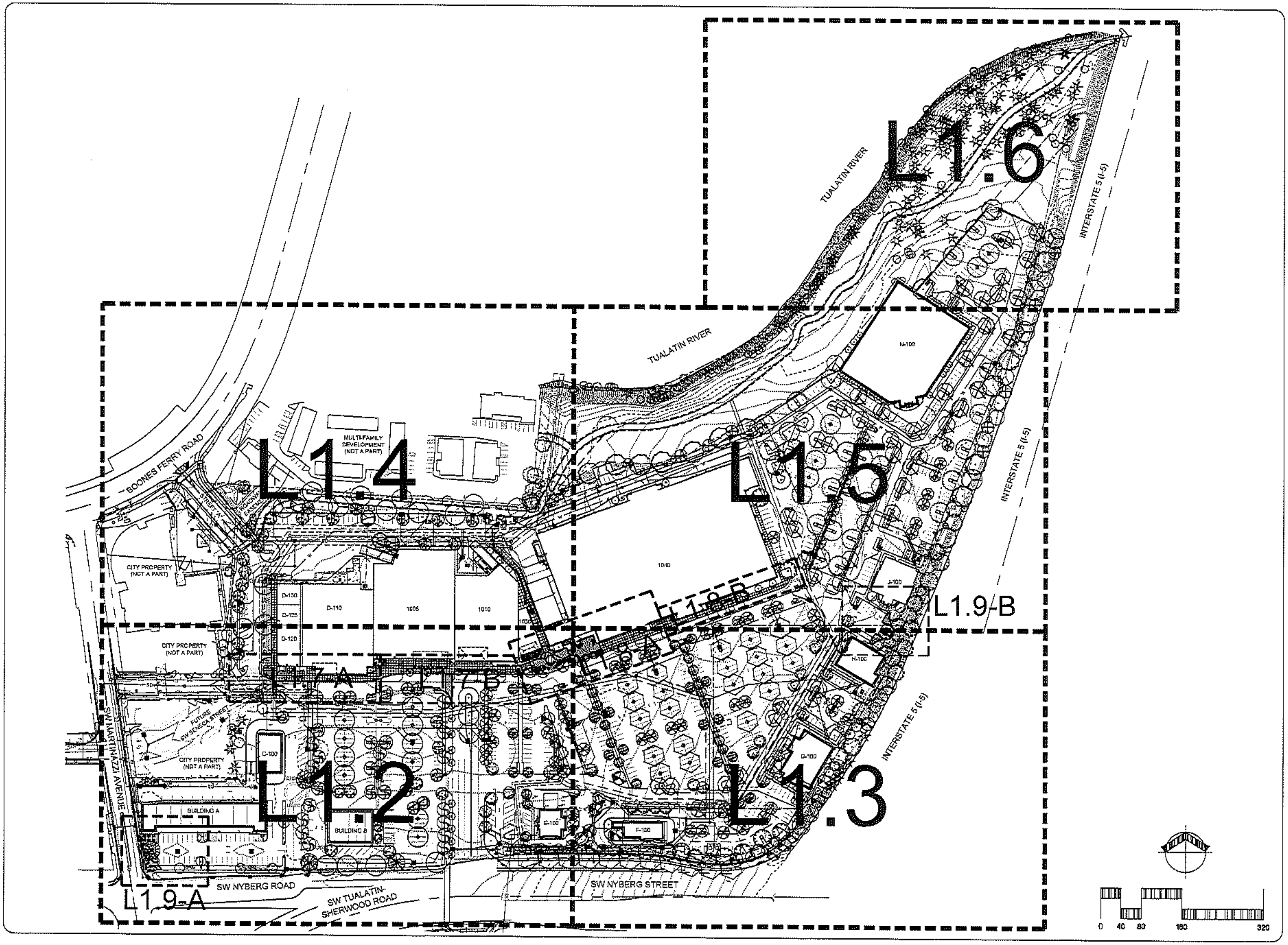
LANDSCAPE PLANTING LEGENDS AND NOTES
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	2119831?
DATE:	11/06/2013
DESIGNED BY:	PEG
DRAWN BY:	PEG
CHECKED BY:	JRG

PLANTING LEGEND & NOTES
L1.0

Exhibit 1
Attachment D-4



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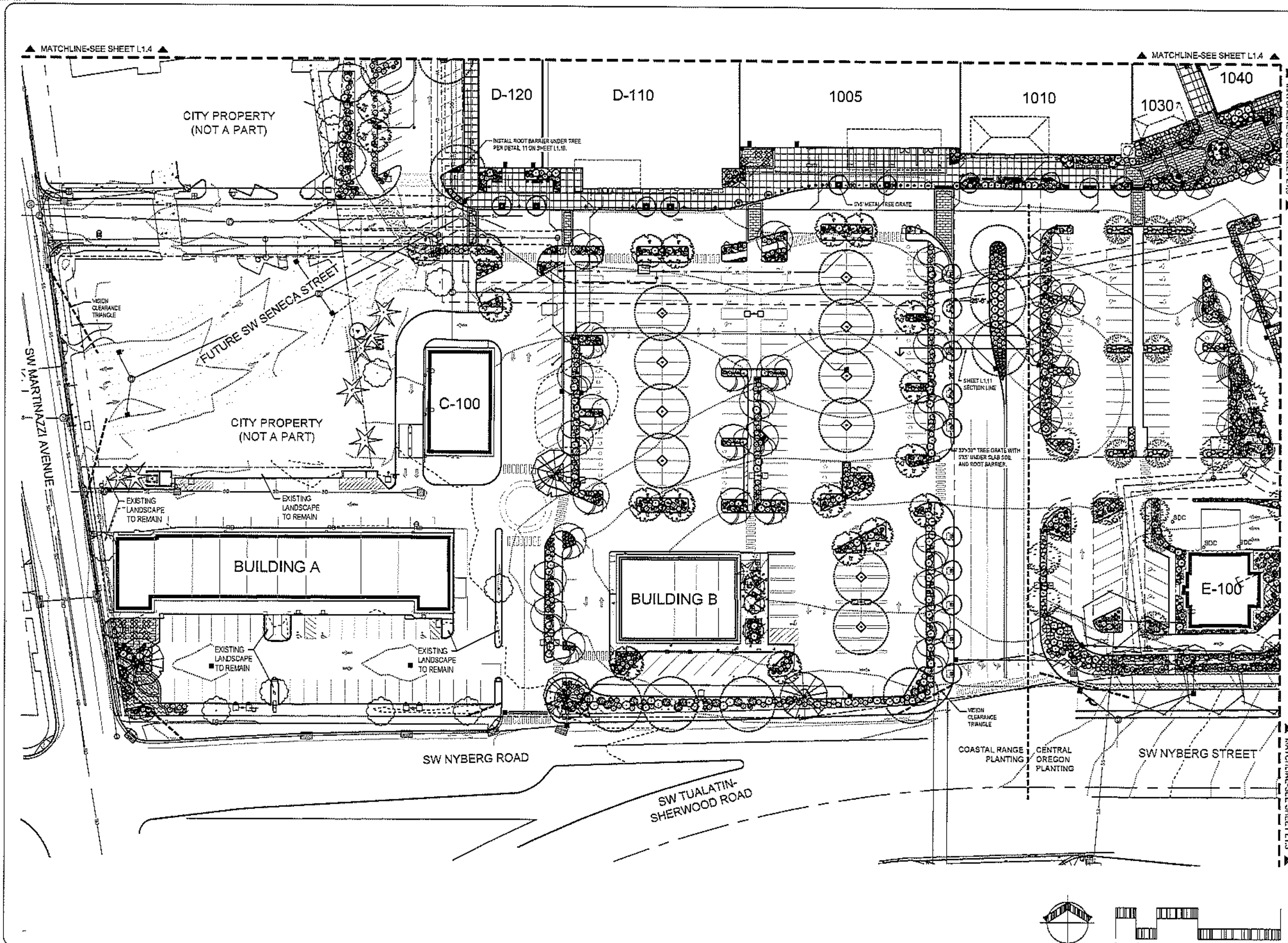
LANDSCAPE PLANTING PLAN - OVERALL
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	2118921B
DATE:	11/06/2013
DESIGNED BY:	PEG
DRAWN BY:	PEG
CHECKED BY:	JRC

PLANTING PLAN - OVERALL
L1.1

Exhibit 1
Attachment O-4



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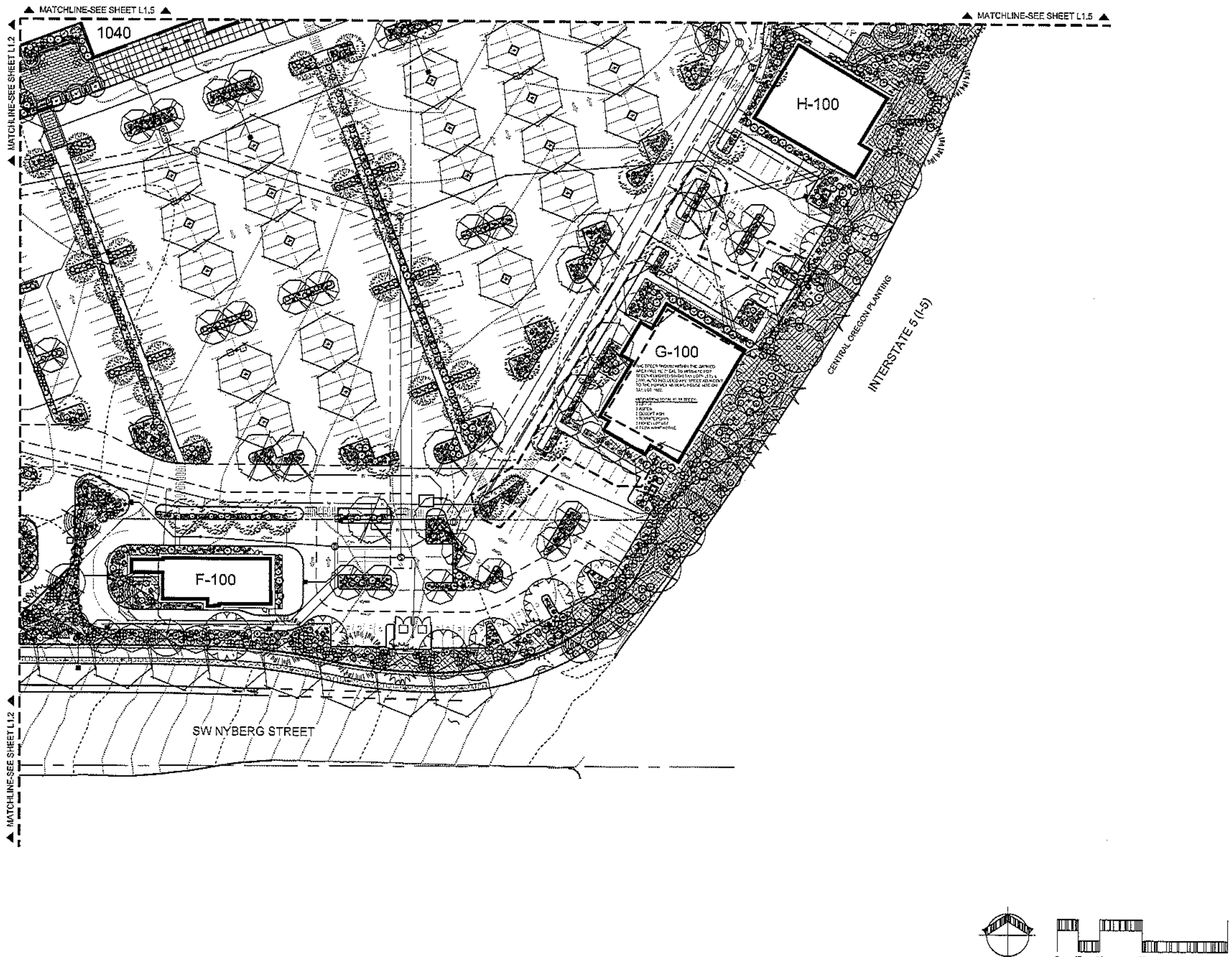
LANDSCAPE PLANTING PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21108310
DATE:	11/05/2013
DESIGNED BY:	PEG
DRAWN BY:	PEG
CHECKED BY:	JRS

PLANTING PLAN
L1.2

Exhibit 1
Attachment D-4



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LANDSCAPE PLANTING PLAN
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PROJECT NO.:	21100310
DATE:	11/26/2013
DESIGNED BY:	PEG
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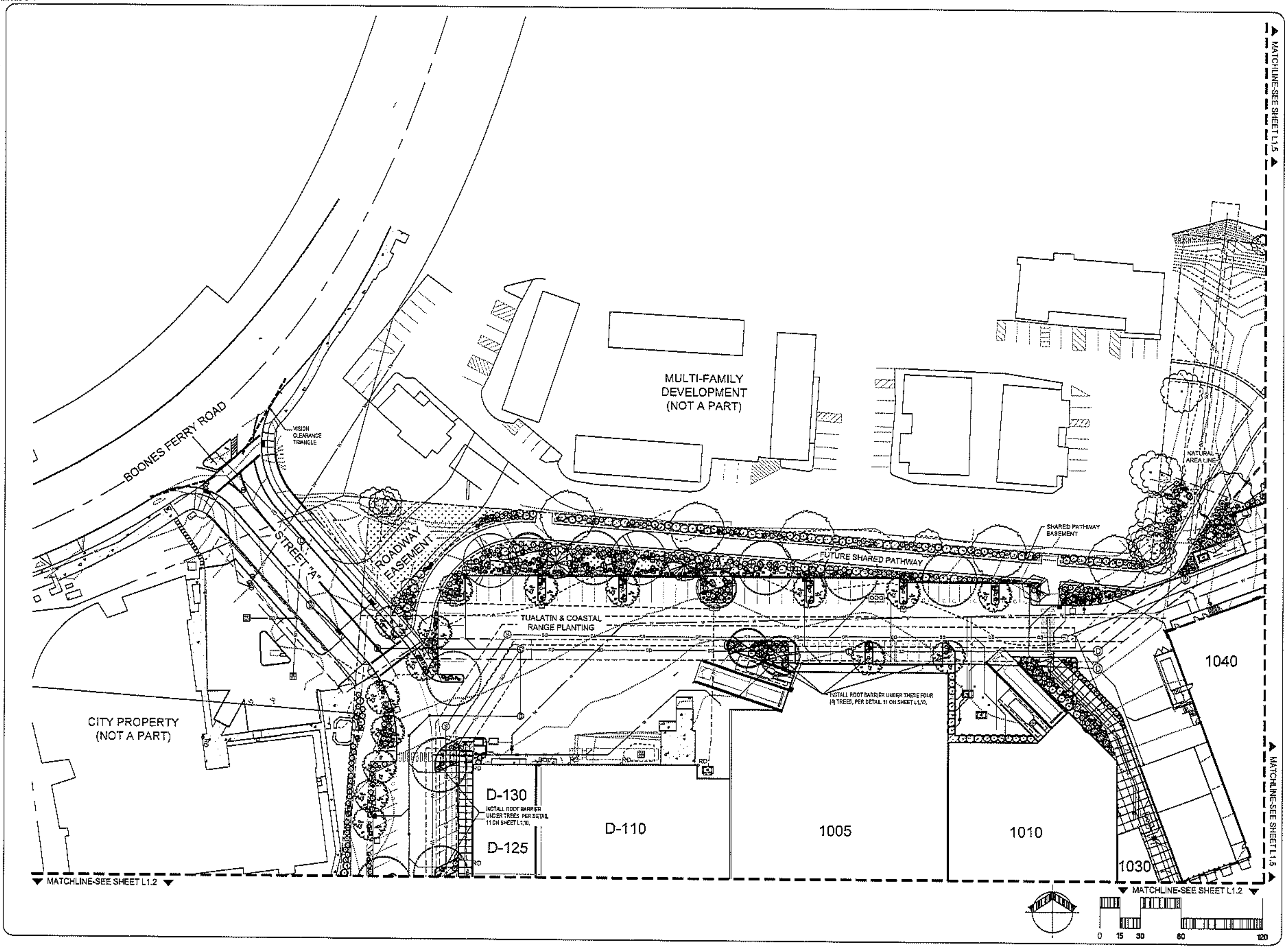
PLANTING PLAN
L1.3

Exhibit 1
Attachment O-4



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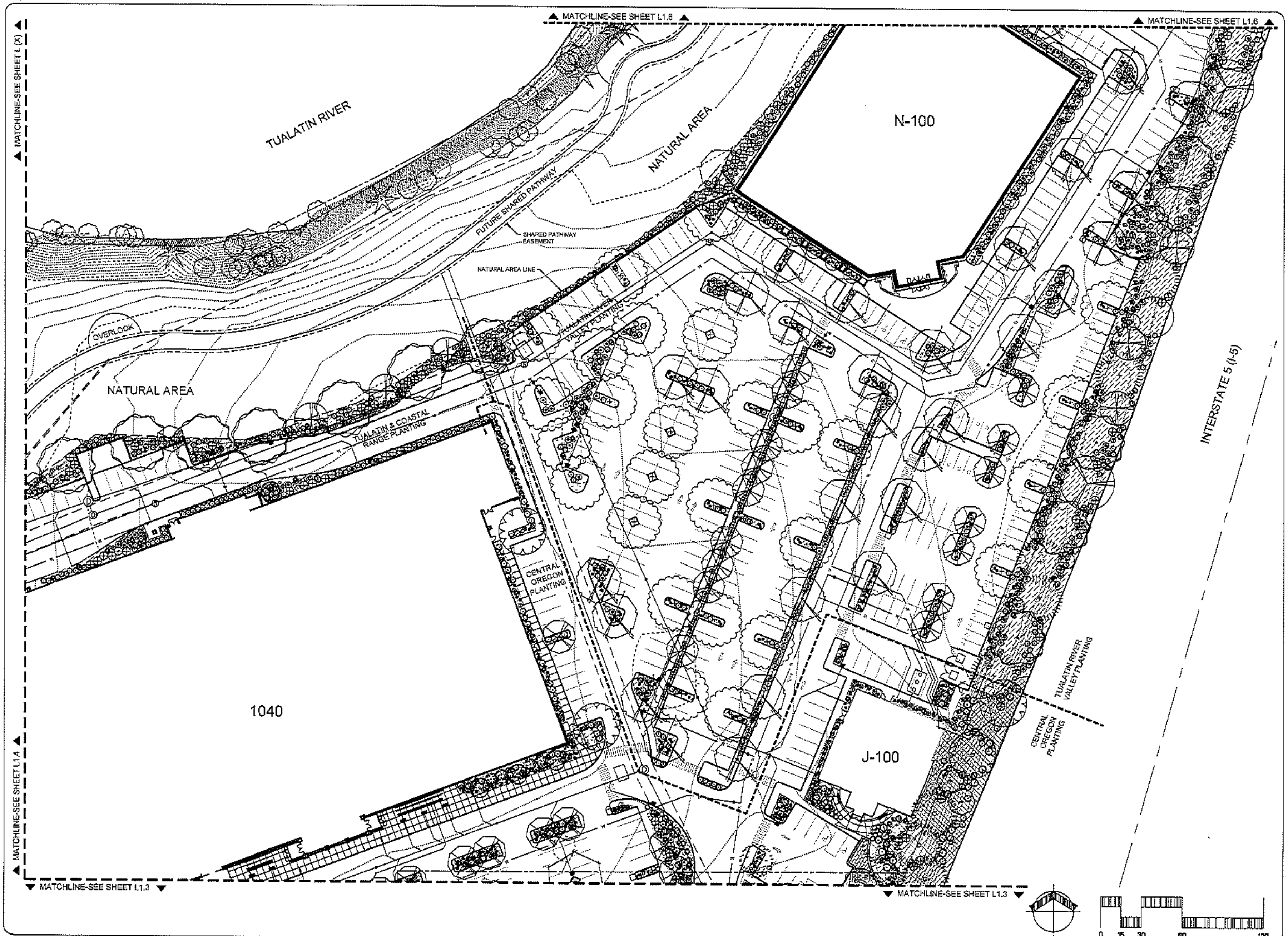
PLANTING PLAN
L1.4

Exhibit 1
Attachment D-4



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LANDSCAPE PLANTING PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	[illegible]
DATE:	11/05/2013
DESIGNED BY:	PEG
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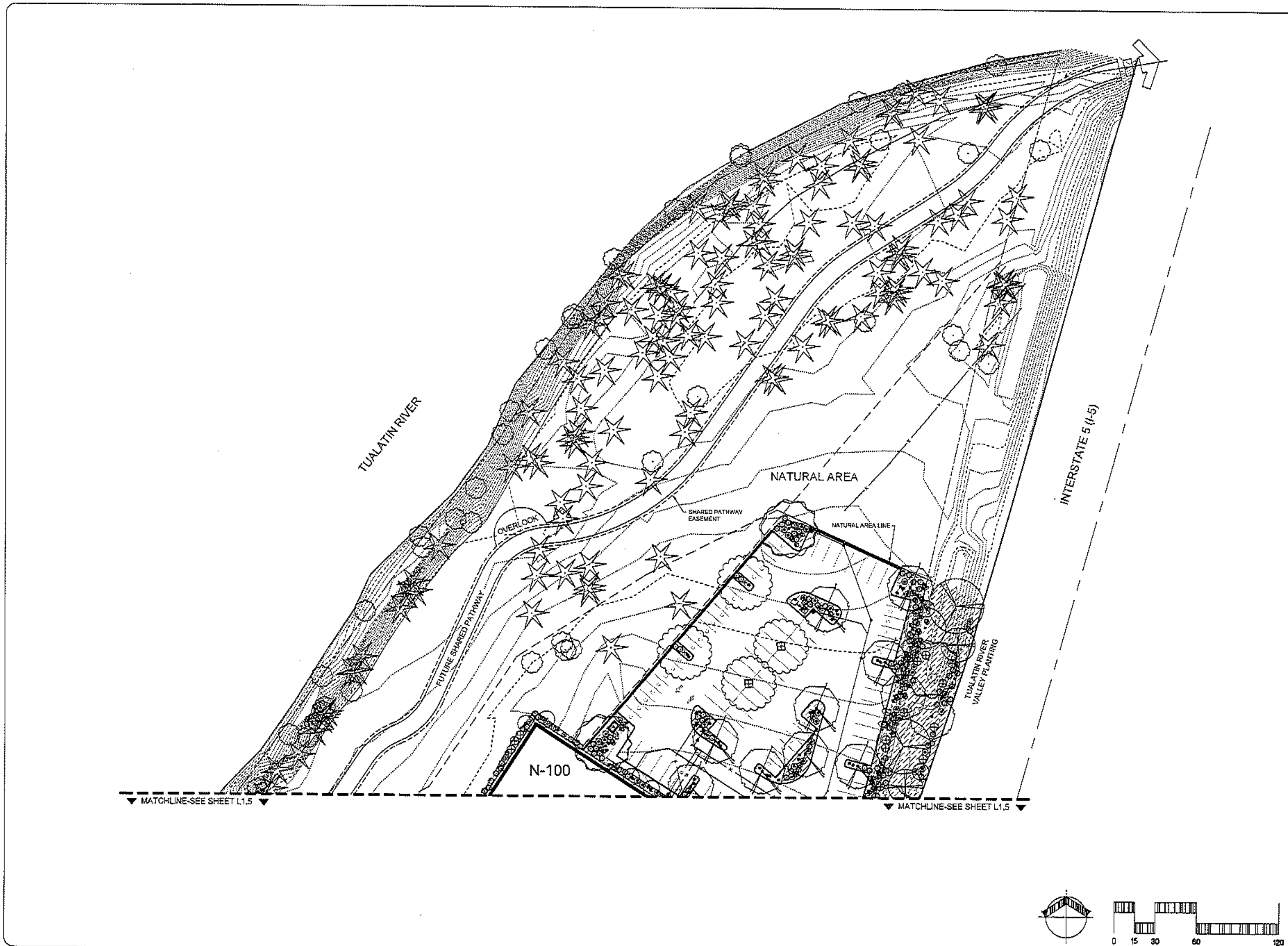
PLANTING PLAN
L1.5

Exhibit 1
Attachment O-4



LANDSCAPE PLANTING PLAN
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PROJECT NO.:	2118831[illegible]
DATE:	11/05/2012
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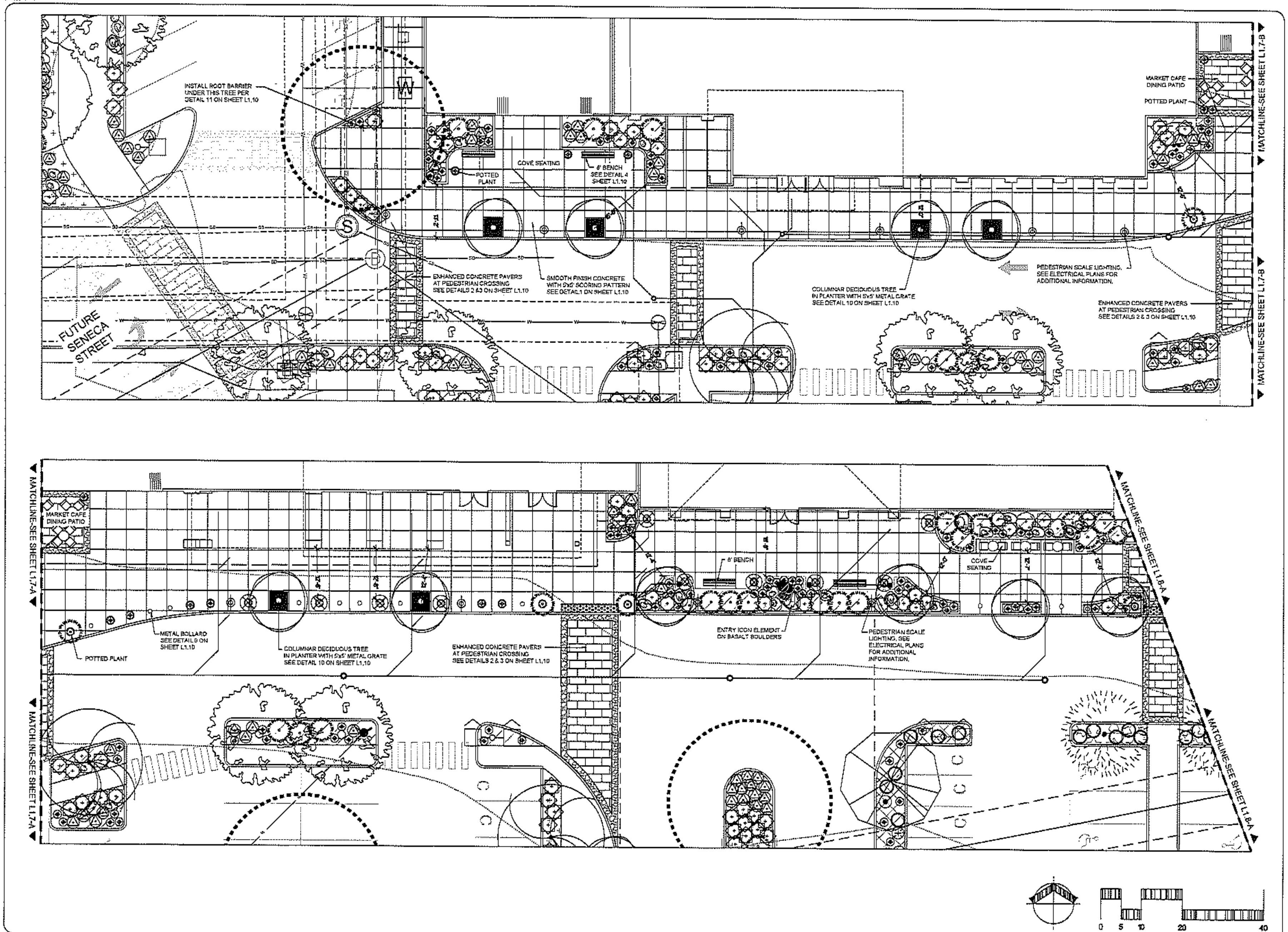
PLANTING PLAN
L1.6

Exhibit 1
Attachment D-4



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LANDSCAPE ENLARGEMENT PLAN
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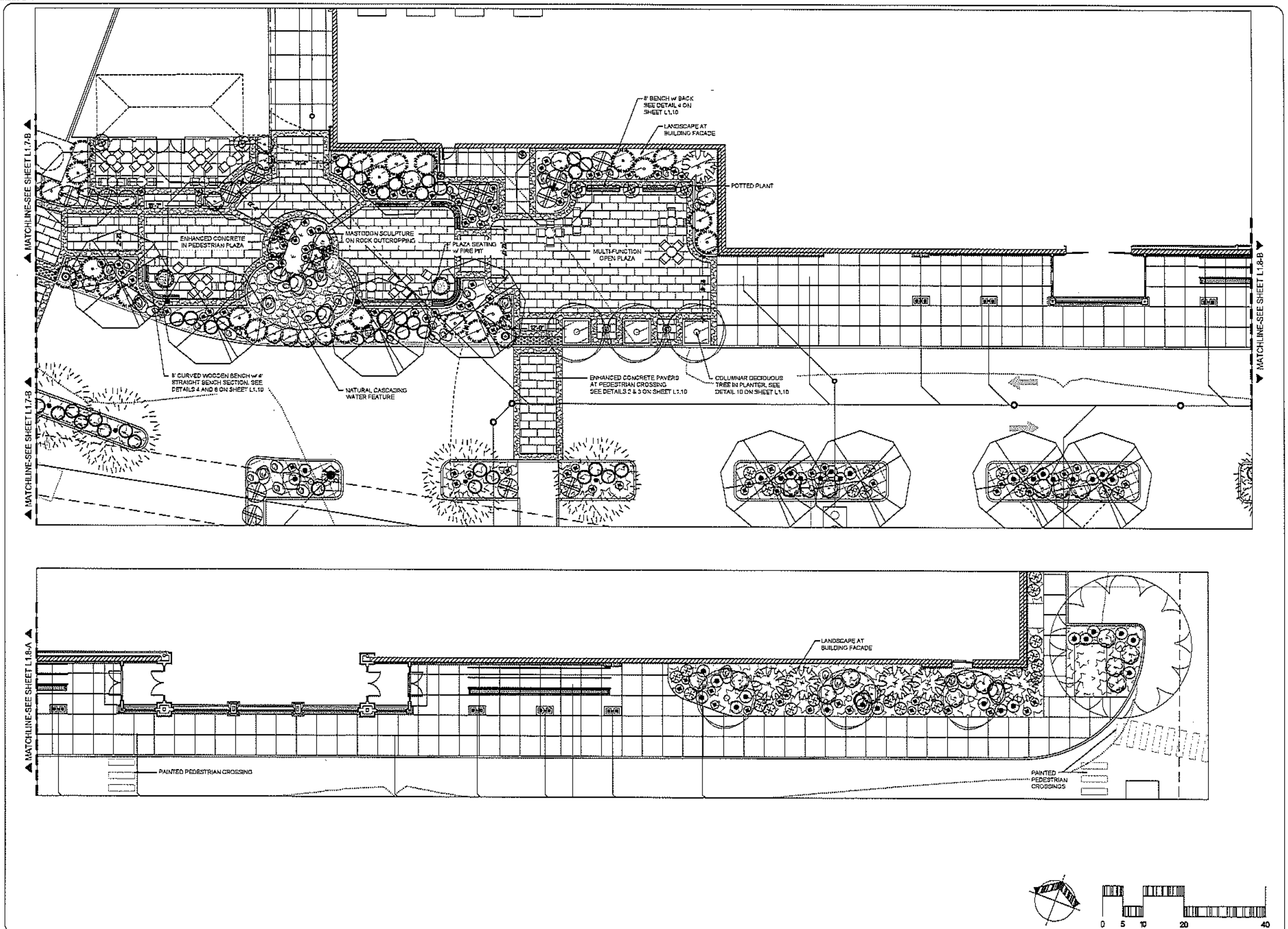
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	2118931 0
DATE:	11/05/2010
DESIGNED BY:	PEO
DRAWN BY:	PEO
CHECKED BY:	JRS

ENLARGEMENT PLAN
L1.7

Exhibit 1
Attachment D-4



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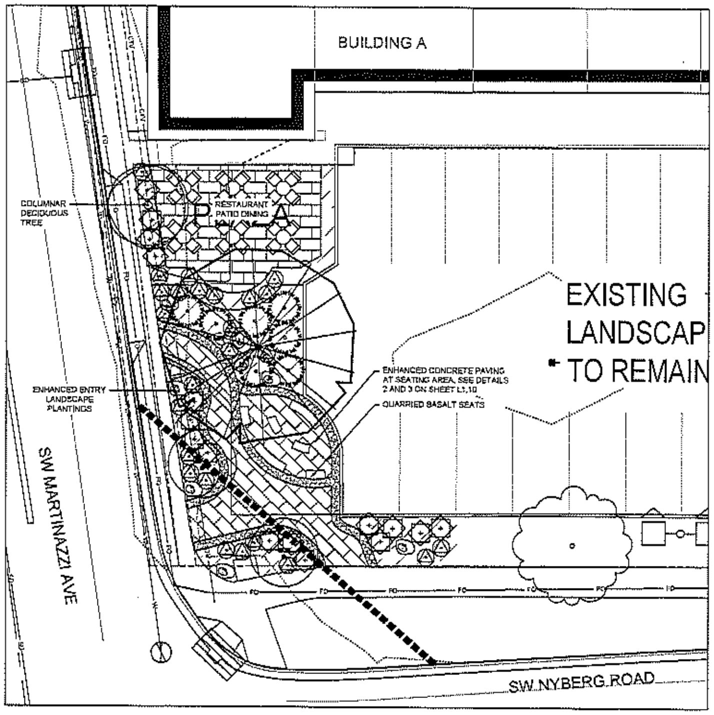
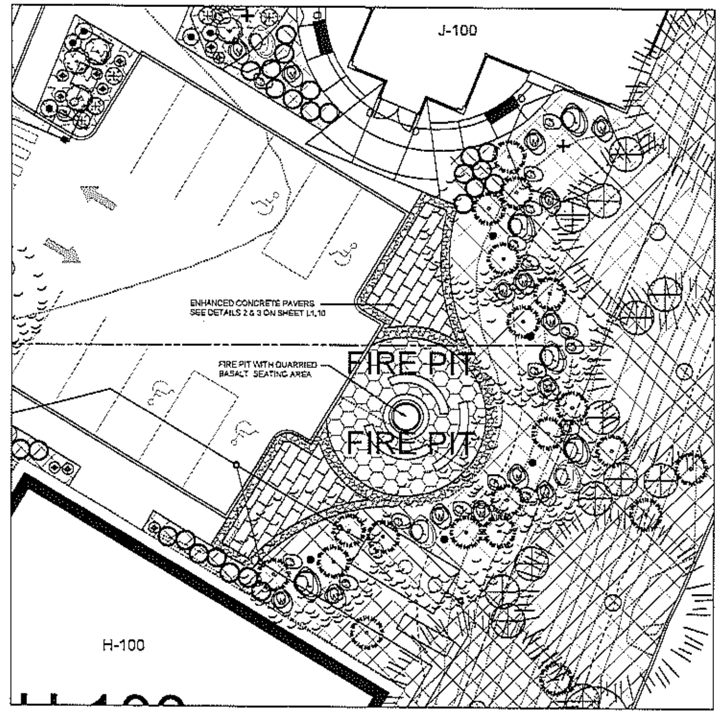
LANDSCAPE ENLARGEMENT PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

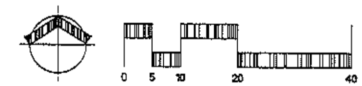
PROJECT NO.:	21108710
DATE:	11/06/2013
DESIGNED BY:	PEG
DRAWN BY:	PEG
CHECKED BY:	JRS

ENLARGEMENT PLAN
L1.8

Exhibit 1
Attachment D-4







LANDSCAPE ENLARGEMENT PLAN
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

CENTERCAL

Cardno Shaping the Future
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5415 SW WESTGATE DR, STE 100, PORTLAND, OR 97221
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PROJECT NO.:	21150310
DATE:	11/06/2013
DESIGNED BY:	PEG
DRAWN BY:	PEG
CHECKED BY:	JRS

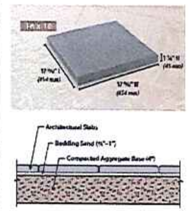
ENLARGEMENT PLAN
L1.9

Exhibit 1
Attachment 0-4

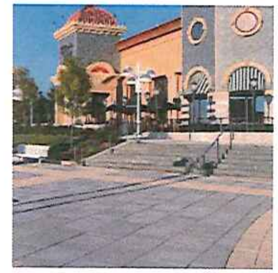
HARDSCAPE PAVING

1 STANDARD CONCRETE w/ POLISHED FINISH NOT TO SCALE

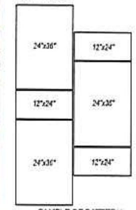
TRIM PAVER:
MANUFACTURER: MUTUAL MATERIALS
MODEL: PRESTIGE ARCHITECTURAL SLAB
SIZE: 18" x 18" SQUARE
COLOR: VANCOUVER BAY (GRAY)



2 18" ARCHITECTURAL SLAB - TRIM PAVER NOT TO SCALE



MAIN PAVER:
MANUFACTURER: HANOVER ARCHITECTURAL PRODUCTS
MODEL: PREST PAVERS
SIZE: 24"x36" & 12"x24" RECTANGLE
COLOR: CREAM
FINISH: TUDOR



SAMPLE OF PATTERN

3 24"x36" & 12"x24" ARCHITECTURAL SLAB PAVERS NOT TO SCALE

SITE FURNISHINGS

BENCH:
MANUFACTURER: SITECRAFT
MODEL: BKB (STRAIGHT w/ BACK)
SIZE: 8' LENGTH
STYLE: IPE WOOD
MOUNTING: SURFACE

4 8' STANDARD WOODEN BENCH NOT TO SCALE

BENCH:
MANUFACTURER: SITECRAFT
MODEL: BKF (STRAIGHT w/o BACK)
SIZE: 8' LENGTH
STYLE: IPE WOOD
MOUNTING: SURFACE

5 8' STANDARD WOODEN BENCH w/o BACK NOT TO SCALE

BENCH:
MANUFACTURER: SITECRAFT
MODEL: YB (CIRCULAR w/ BACK)
SIZE: 8' LENGTH
STYLE: IPE WOOD
MOUNTING: SURFACE

6 8' CURVED WOODEN BENCH NOT TO SCALE

TRASH RECEPTACLE:
MANUFACTURER: FAIRWEATHER SF
MODEL: TR-2
TOP: SPUN FLAT
TOP COLOR: BLACK POWDERCOAT
SIDE SLAT TYPE: IPE WOOD (SHOWN)
MOUNTING: SURFACE

7 TRASH RECEPTACLE NOT TO SCALE

ASH URN:
MANUFACTURER: FAIRWEATHER SF
MODEL: AU2
SIZE: 32" H x 14-1/4" W (AT TOP)
STYLE: IPE WOOD
MOUNTING: SURFACE

8 ASH URNS NOT TO SCALE

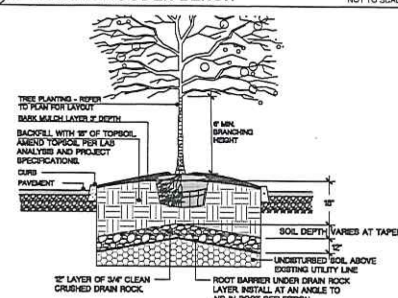
BOLLARD:
MANUFACTURER: FAIRWEATHER SF
MODEL: CB-F
SIZE: 42" H x 12" BASE
STYLE: BLACK POWDER COAT
MOUNTING: SURFACE

9 BOLLARD NOT TO SCALE

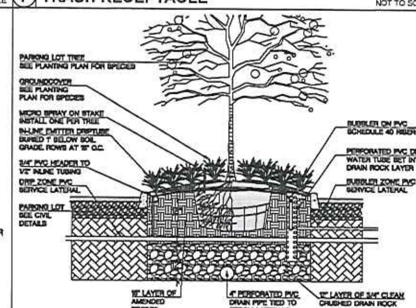
METAL TREE GRATE:
MANUFACTURER: FAIRWEATHER SF
MODEL: STA 60 (5'x5' SQUARE)
SIZE: 60" x 60" (2 PIECES)

METAL TREE GRATE:
MANUFACTURER: NEENAH FOUNDRY
MODEL: AVENUE COLLECTION R-8704
SIZE: 30" x 30" (2 PIECES)

10 METAL TREE GRATES NOT TO SCALE



11 ROOT BARRIER UNDER PLANTER ISLAND NOT TO SCALE



12 5'x5' PLANTER DIAMOND w/ IRRIGATION NOT TO SCALE

Cardno
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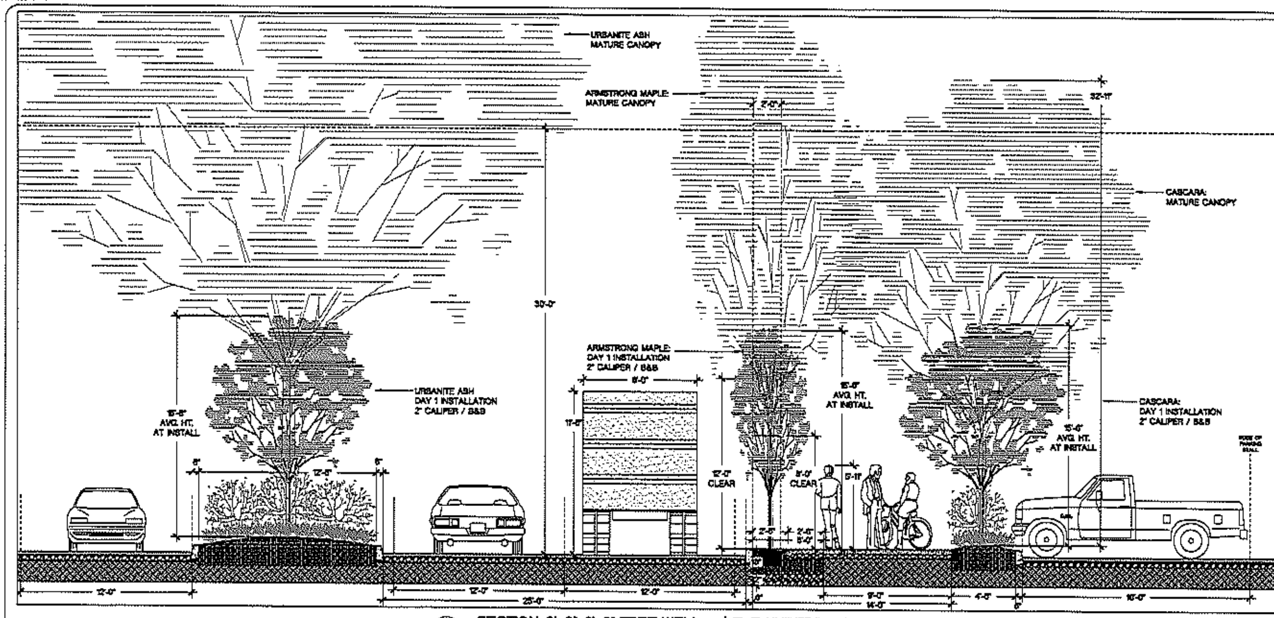
CENTERCAL PROPERTIES, LLC

LANDSCAPE MATERIALS PHOTOBOARD & PLANTER DETAILS
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

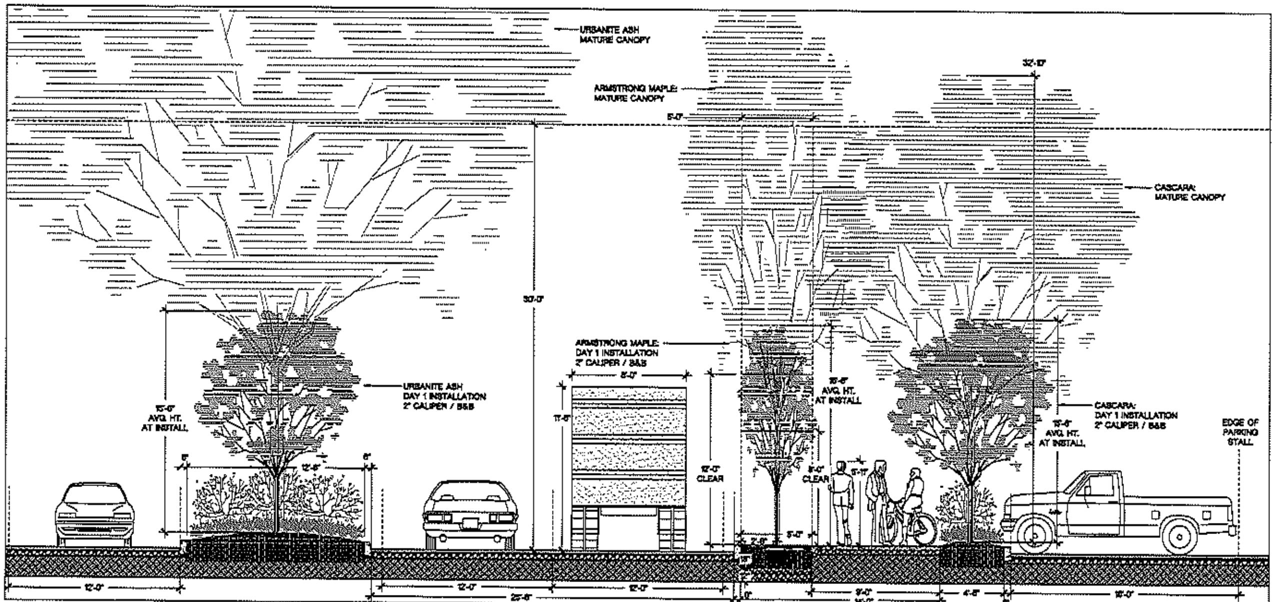
PROJECT NO.:	21199318
DATE:	11/06/2013
DESIGNED BY:	PEG
DRAWN BY:	PEG
CHECKED BY:	JRS

PHOTOBOARD & DETAILS
L1.10

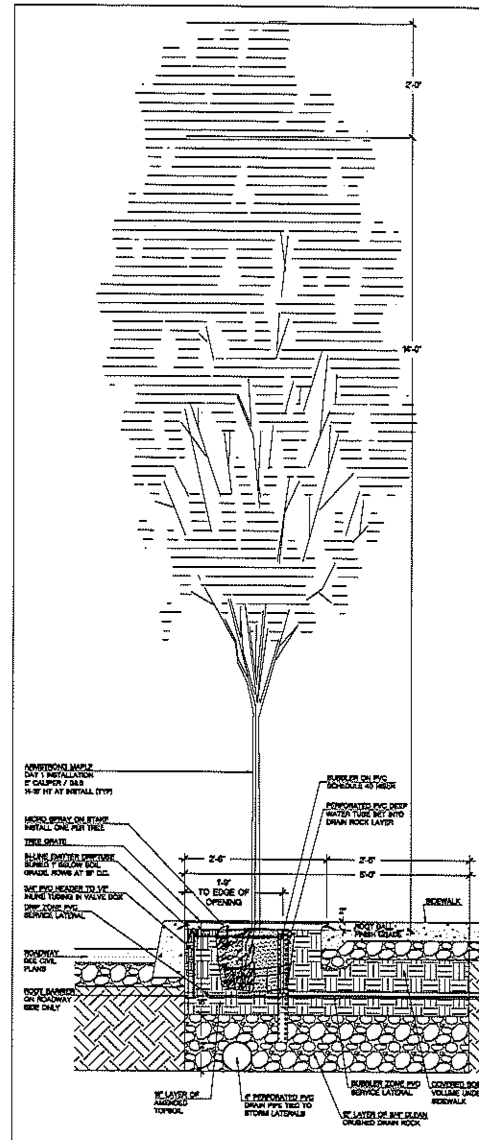
Exhibit 1
Attachment 0-4



1 SECTION: 2'-6"x2'-6" TREE WELL w/ 5'x5' UNDERSLAB SOIL
SCALE: 1" = 4'-0"



2 SECTION: 5'x5' TREE WELL - ALTERNATE OPTION
SCALE: 1" = 4'-0"



3 DETAIL: 2'-6"x2'-6" TREE WELL
SCALE: 1" = 1'-0"

LANDSCAPE SECTIONS AND DETAIL
NYBERG RIVERS - ARCHITECTURAL REVIEW BOARD
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

CENTERCAL

Cardno
Shaping the Future
PORTLAND

PROJECT NO.:	21100310
DATE:	11/00/2013
DESIGNED BY:	PEG
DRAWN BY:	PEG
CHECKED BY:	JRS

SECTIONS
& DETAILS
L1.11

LUMINAIRE LOCATIONS

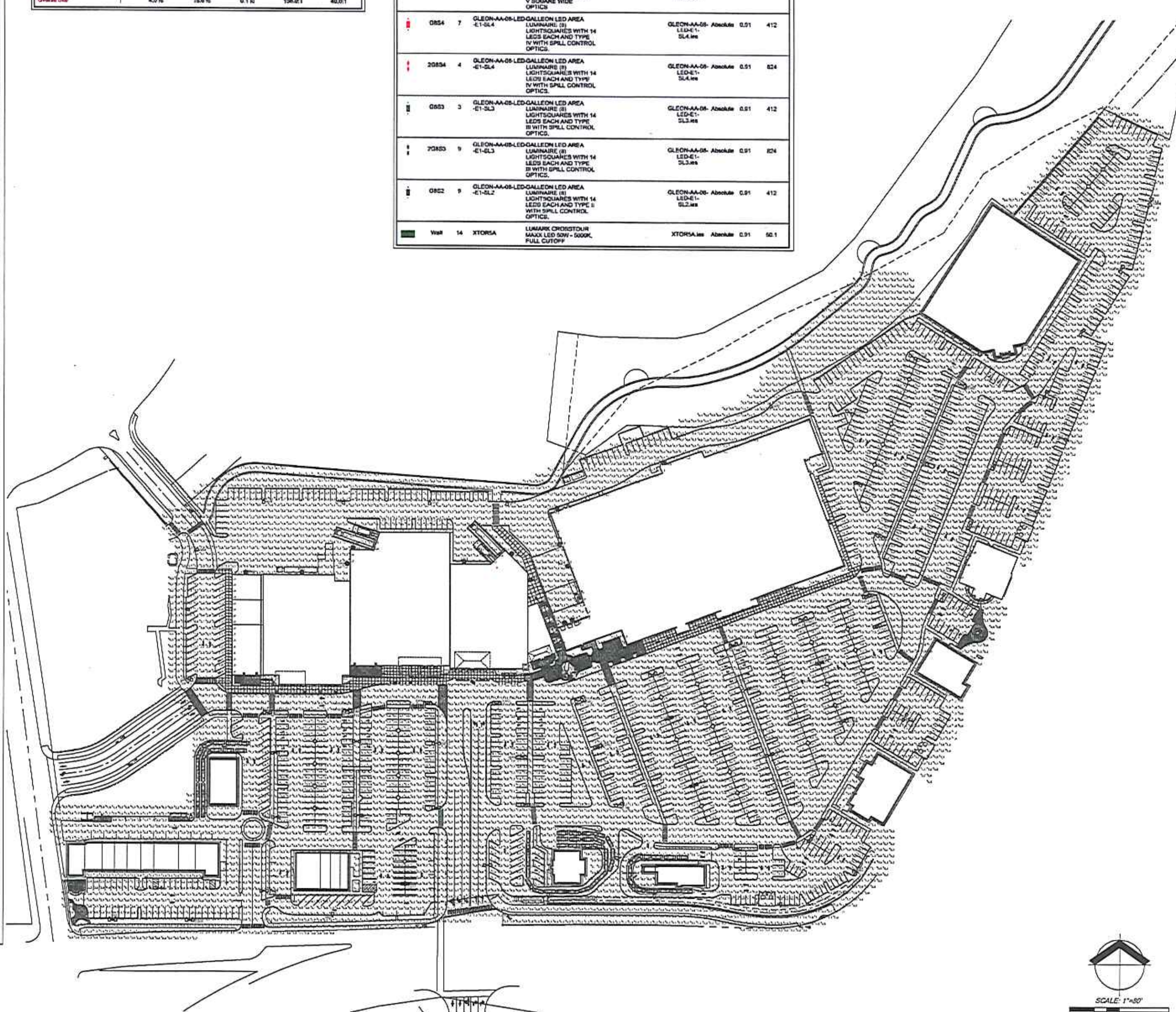
No.	Label	Location X	Location Y	Location Z	MH	Orientation	Tilt	Aim X	Aim Y	Aim Z
1	G8S4	635874.8	52869.2	27.5	27.5	180.0	0.0	635874.8	52867.4	0.0
2	G8S3	636127.0	52931.0	27.5	27.5	162.9	0.0	636127.5	52929.3	0.0
3	G8S4	635607.4	52877.2	27.5	27.5	182.5	0.0	635607.3	52875.4	0.0
4	G8S4	635737.7	52875.7	27.5	27.5	182.2	0.0	635737.6	52874.0	0.0
5	G8S4	636010.4	52879.6	27.5	27.5	181.0	0.0	636010.3	52877.8	0.0
6	2G15W	636553.8	52996.8	27.5	27.5	118.0	0.0			
7	G8S2	636278.8	52961.0	27.5	27.5	162.9	0.0	636279.3	52959.4	0.0
8	G8S2	636425.6	53006.7	27.5	27.5	162.9	0.0	636426.1	53005.0	0.0
9	2G15W	636650.1	53081.7	27.5	27.5	118.0	0.0			
10	2G15W	636564.7	52872.4	27.5	27.5	118.0	0.0			
11	2G15W	636601.2	52784.8	27.5	27.5	118.0	0.0			
12	2G15W	636669.0	52906.6	27.5	27.5	118.0	0.0			
13	2G15W	636726.5	53031.6	27.5	27.5	118.0	0.0			
14	2G15W	636785.6	52806.6	27.5	27.5	24.7	0.0			
15	2G15W	636738.1	52802.2	27.5	27.5	24.7	0.0			
16	2G15W	636693.1	52692.0	27.5	27.5	24.7	0.0			
17	G8S2	636852.7	52818.4	27.5	27.5	-68.2	0.0	636851.1	52819.1	0.0
18	G8S2	636906.3	52935.4	27.5	27.5	-68.2	0.0	636903.7	52936.1	0.0
19	2G15W	636867.5	53014.4	27.5	27.5	24.7	0.0			
20	2G15W	636933.1	53109.1	27.5	27.5	24.7	0.0			
21	2G8S4	637008.2	53205.2	27.5	27.5	24.7	0.0			
22	2G8S4	637060.3	53316.6	27.5	27.5	24.7	0.0			
23	2G15W	636908.6	53316.2	27.5	27.5	-54.1	0.0			
24	2G15W	636994.5	53406.6	27.5	27.5	-64.1	0.0			
25	2G15W	636626.1	52493.0	27.5	27.5	24.7	0.0			
26	2G15W	636520.9	52500.5	27.5	27.5	71.5	0.0			
27	2G15W	636590.5	52644.2	27.5	27.5	71.5	0.0			
28	2G15W	636492.6	52586.7	27.5	27.5	71.5	0.0			
29	2G15W	636360.8	52540.8	27.5	27.5	71.5	0.0			
30	2G15W	636254.7	52395.7	27.5	27.5	71.5	0.0			
31	2G15W	636248.1	52504.3	27.5	27.5	71.5	0.0			
32	2G15W	636130.8	52461.6	27.5	27.5	71.5	0.0			
33	2G15W	636161.8	52369.3	27.5	27.5	71.5	0.0			
34	2G15W	636014.1	52371.8	27.5	27.5	90.9	0.0			
35	2G15W	636015.4	52448.2	27.5	27.5	90.9	0.0			
36	2G15W	636650.8	52473.6	27.5	27.5	90.0	0.0			
37	2G15W	636877.9	52375.7	27.5	27.5	90.0	0.0			
38	2G15W	636405.5	52441.4	27.5	27.5	71.5	0.0			
39	2G15W	636480.1	52311.6	27.5	27.5	31.1	0.0			
40	G8S2	636554.2	52265.6	27.5	27.5	-68.2	0.0	636552.6	52266.3	0.0
41	G8S2	636440.5	52184.8	27.5	27.5	2.8	0.0	636440.6	52186.6	0.0
42	G8S2	636211.2	52207.8	27.5	27.5	2.8	0.0	636211.3	52209.6	0.0
43	2G15W	636361.0	52287.6	27.5	27.5	90.0	0.0			
44	G8S2	636045.9	52220.4	27.5	27.5	2.8	0.0	636045.9	52222.1	0.0
45	2G15W	635948.7	52271.0	27.5	27.5	90.9	0.0			
46	2G15W	635814.9	52250.0	27.5	27.5	90.9	0.0			
47	2G15W	636742.7	52363.2	27.5	27.5	90.9	0.0			
48	2G15W	635810.3	52363.1	27.5	27.5	90.9	0.0			
49	2G15W	635587.6	52246.0	27.5	27.5	90.0	0.0			
50	2G15W	636744.5	52473.4	27.5	27.5	90.9	0.0			
51	2G15W	635613.6	52465.5	27.5	27.5	90.9	0.0			
52	G8S2	635699.3	52201.2	27.5	27.5	2.8	0.0	635699.4	52203.0	0.0
53	G15W	636161.0	52272.3	27.5	27.5	270.0	0.0	636159.0	52272.3	0.0
54	2G8S4	636486.8	52202.1	27.5	27.5	90.0	0.0			
55	2G8S4	635343.8	52204.5	27.5	27.5	90.0	0.0			
56	G8S3	635329.1	52375.1	27.5	27.5	180.9	0.0	635329.1	52373.4	0.0
57	G8S3	635475.8	52365.7	27.5	27.5	180.9	0.0	635475.8	52363.9	0.0
58	2G8S3	635601.7	52531.3	27.5	27.5	90.0	0.0			
59	2G8S3	635732.6	52528.8	27.5	27.5	90.0	0.0			
60	2G8S3	635863.6	52638.3	27.5	27.5	90.0	0.0			
61	2G8S3	635973.1	52536.3	27.5	27.5	90.0	0.0			
62	2G8S3	636111.1	52538.5	27.5	27.5	72.7	0.0			
63	2G8S3	636233.1	52550.4	27.5	27.5	72.7	0.0			
64	2G8S3	636364.1	52619.6	27.5	27.5	72.7	0.0			
65	2G8S3	636468.0	52659.0	27.5	27.5	72.7	0.0			
66	2G8S3	636574.1	52692.6	27.5	27.5	72.7	0.0			
67	G8S4	635477.4	52586.5	27.5	27.5	90.0	0.0	635479.1	52586.5	0.0
68	G8S4	635474.8	52696.0	27.5	27.5	90.0	0.0	635476.6	52696.0	0.0
69	G8S4	635491.4	52793.2	27.5	27.5	79.9	0.0	635493.1	52793.5	0.0
70	Wall	635585.1	52756.6	12.0	12.0	1.4	0.0	635585.1	52756.6	0.0
71	Wall	635675.4	52753.5	12.0	12.0	1.4	0.0	635675.4	52753.5	0.0
72	Wall	635743.1	52769.8	12.0	12.0	-88.6	0.0	635743.1	52769.8	0.0
73	Wall	635753.2	52792.1	12.0	12.0	1.4	0.0	635753.2	52792.1	0.0
74	Wall	635934.1	52763.1	12.0	12.0	1.4	0.0	635934.1	52763.1	0.0
75	Wall	636012.4	52764.2	12.0	12.0	48.2	0.0	636012.4	52764.2	0.0
76	Wall	636029.1	52722.6	12.0	12.0	91.8	0.0	636029.1	52722.6	0.0
77	Wall	636115.4	52696.6	12.0	12.0	262.9	0.0	636115.4	52696.6	0.0
78	Wall	636096.1	52664.4	12.0	12.0	-19.1	0.0	636096.1	52664.4	0.0
79	Wall	636066.3	52668.2	12.0	12.0	-19.1	0.0	636066.3	52668.2	0.0
80	Wall	636082.2	52794.7	12.0	12.0	262.9	0.0	636082.2	52794.7	0.0
81	Wall	636084.3	52847.3	12.0	12.0	-18.6	0.0	636084.3	52847.3	0.0
82	Wall	636249.9	52914.4	12.0	12.0	-18.6	0.0	636249.9	52914.4	0.0
83	Wall	636096.9	52747.9	12.0	12.0	262.9	0.0	636096.9	52747.9	0.0

STATISTICS

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Front Parking - Cabela's	|	5.0 fc	12.8 fc	2.5 fc	5.1:1	2.0:1
Front Parking - Micheals/4 Seasons/Homegoods	+	5.0 fc	8.2 fc	3.2 fc	2.6:1	1.6:1
Main Drive Aisle - Cabela's	+	7.9 fc	13.0 fc	4.5 fc	2.9:1	1.8:1
Main Drive Aisle - Micheals/4 Seasons/Homegoods	+	8.2 fc	13.6 fc	3.7 fc	3.7:1	2.2:1
Overall Site	|	4.0 fc	15.6 fc	0.1 fc	156.0:1	40.0:1

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	G15W	1	GLEON-AA-10-LED-E1-5WQ	GALLEON LED AREA LUMINAIRE (10) LIGHTSQUARES WITH 14 LEDS EACH AND TYPE V SQUARE WIDE OPTICS		GLEON-AA-10-LED-E1-5WQ.ies	Absolute	0.91	515
	2G15W	38	GLEON-AA-10-LED-E1-5WQ	GALLEON LED AREA LUMINAIRE (10) LIGHTSQUARES WITH 14 LEDS EACH AND TYPE V SQUARE WIDE OPTICS		GLEON-AA-10-LED-E1-5WQ.ies	Absolute	0.91	1030
	G8S4	7	GLEON-AA-08-LED-E1-SL4	GALLEON LED AREA LUMINAIRE (8) LIGHTSQUARES WITH 14 LEDS EACH AND TYPE IV WITH SPILL CONTROL OPTICS.		GLEON-AA-08-LED-E1-SL4.ies	Absolute	0.91	412
	2G8S4	4	GLEON-AA-08-LED-E1-SL4	GALLEON LED AREA LUMINAIRE (8) LIGHTSQUARES WITH 14 LEDS EACH AND TYPE IV WITH SPILL CONTROL OPTICS.		GLEON-AA-08-LED-E1-SL4.ies	Absolute	0.91	824
	G8S3	3	GLEON-AA-08-LED-E1-SL3	GALLEON LED AREA LUMINAIRE (8) LIGHTSQUARES WITH 14 LEDS EACH AND TYPE III WITH SPILL CONTROL OPTICS.		GLEON-AA-08-LED-E1-SL3.ies	Absolute	0.91	412
	2G8S3	9	GLEON-AA-08-LED-E1-SL3	GALLEON LED AREA LUMINAIRE (8) LIGHTSQUARES WITH 14 LEDS EACH AND TYPE III WITH SPILL CONTROL OPTICS.		GLEON-AA-08-LED-E1-SL3.ies	Absolute	0.91	824
	G8S2	9	GLEON-AA-08-LED-E1-SL2	GALLEON LED AREA LUMINAIRE (8) LIGHTSQUARES WITH 14 LEDS EACH AND TYPE II WITH SPILL CONTROL OPTICS.		GLEON-AA-08-LED-E1-SL2.ies	Absolute	0.91	412
	Wall	14	XTOR5A	LUMARK CROSSTOUR MAXX LED 50W - 5000K, FULL CUTOFF		XTOR5A.ies	Absolute	0.91	50.1



TASKER ELECTRICAL CONSTRUCTION
1998 W. JARVIS CT.
MERIDIAN, IDAHO 83642
PHONE: (360) 518-5699

MUSGROVE ENGINEERING, P.A.

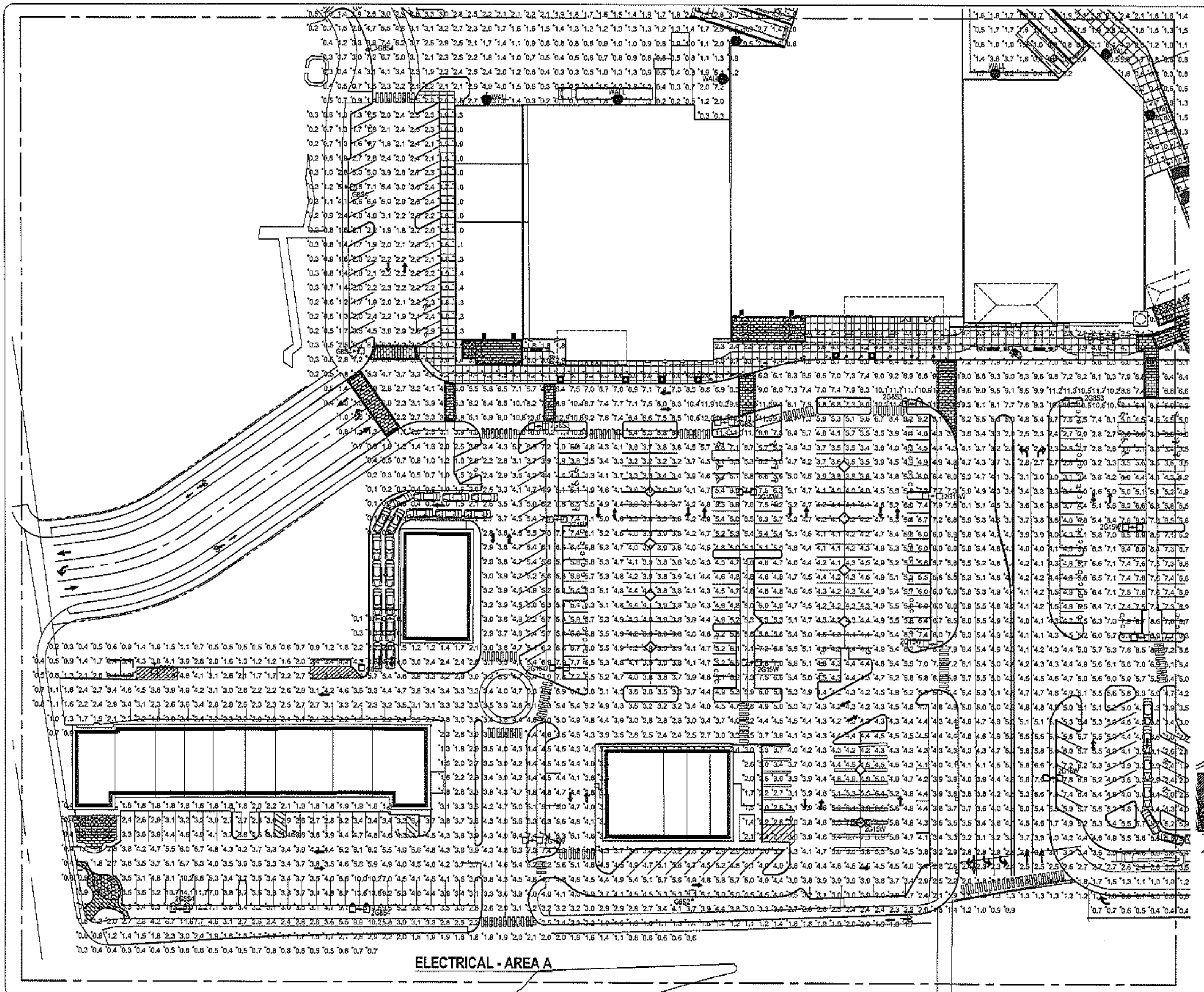
CENTERCAL PROPERTIES, LLC

ELECTRICAL SITE PLAN
NYBERG RIVERS AR
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.: 21180319
DATE: 09/02/13
DESIGNED BY: KEL
DRAWN BY: RAM
CHECKED BY: KEL

PHOTOMETRIC OVERALL

E-1
Exhibit 1
Attachment O-5



MUSGROVE ENGINEERING, P.A.

CENTERCAL PROPERTIES, LLC

ELECTRICAL SITE PLAN

NYBERG RIVERS AR

CENTERCAL PROPERTIES, LLC.

TUALATIN, OREGON

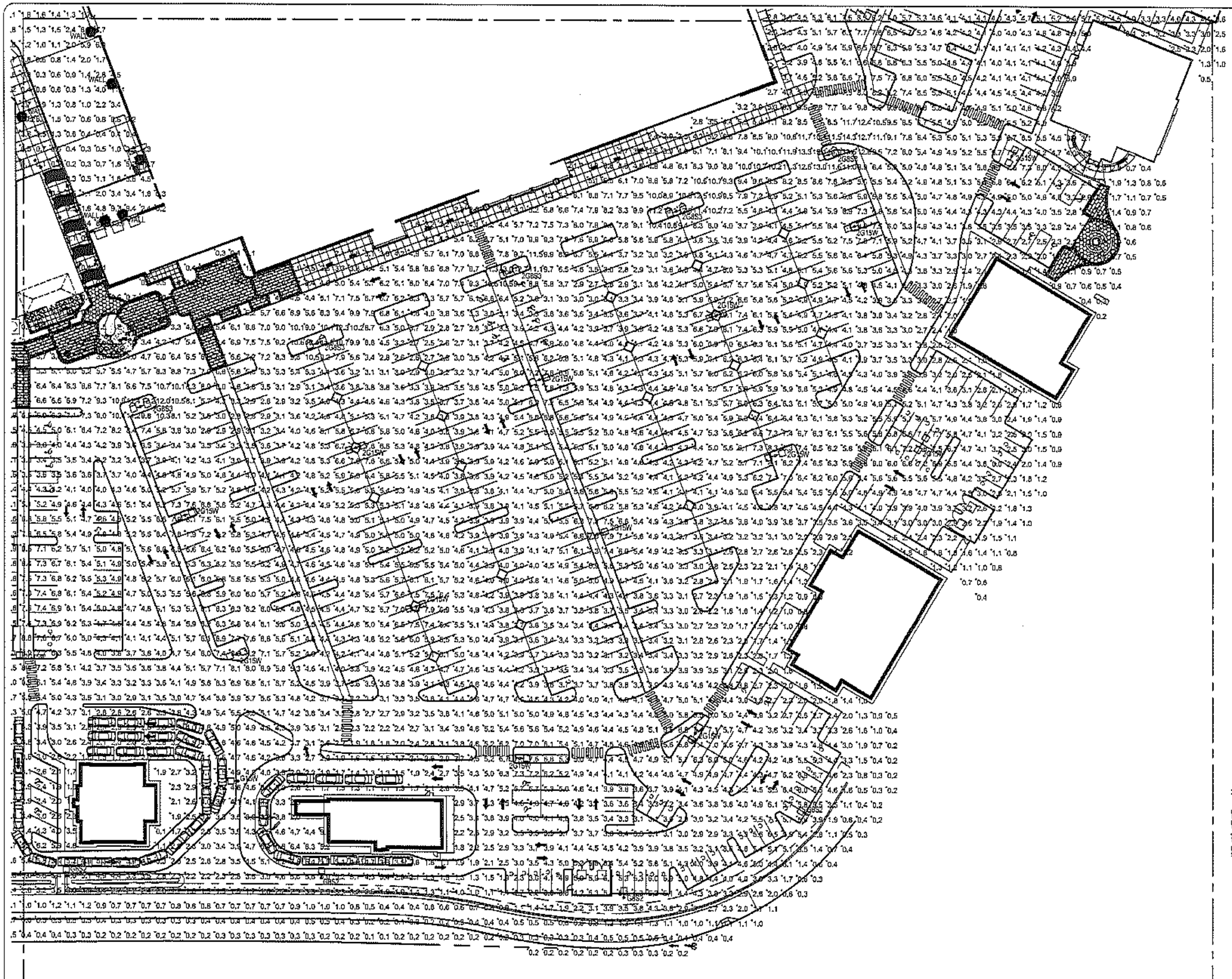
PROJECT NO.	2119831B
DATE:	
DESIGNED BY:	KEL
DRAWN BY:	RAM
CHECKED BY:	KEL

PHOTOMETRIC AREA A

E-2

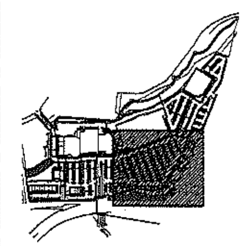
Exhibit 1

Attachment D-5



ELECTRICAL - AREA B

TASKER ELECTRICAL CONSTRUCTION
1998 W. JARVIS CT.
MERIDIAN, IDAHO 83642
PHONE: (360) 518-5699



KEY PLAN

SCALE: 1"=30'

ELECTRICAL SITE PLAN
NYBERG RIVERS AR
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

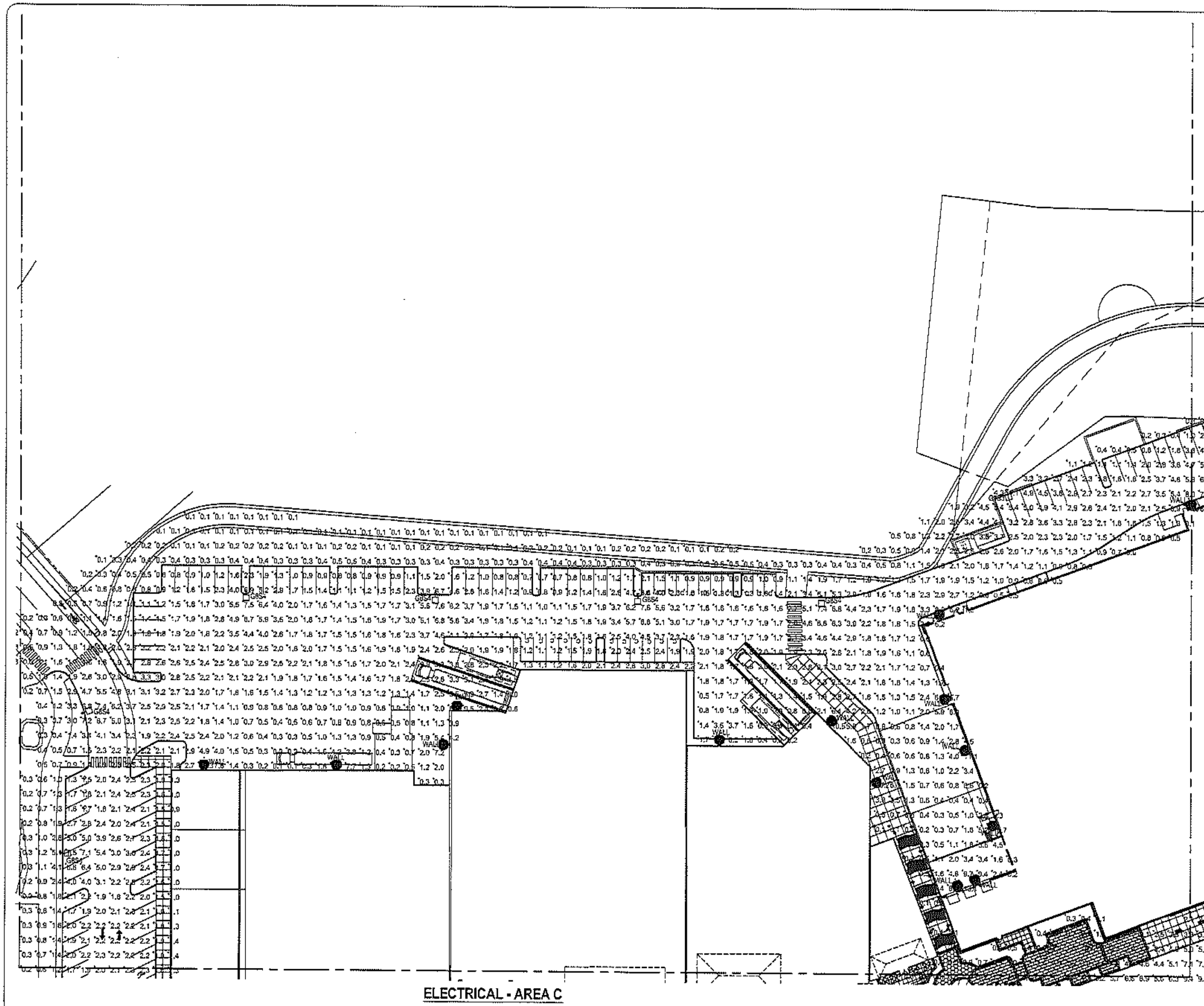
CENTERCAL PROPERTIES, LLC

MUSGROVE ENGINEERING, P.A.

PHOTOMETRIC AREA B

E-3

Exhibit 1
Attachment O-5



TASKER ELECTRICAL CONSTRUCTION

1998 W. JARVIS CT.
MERIDIAN, IDAHO 83642
PHONE: (360) 518-5699

MUSGROVE ENGINEERING, P.A.

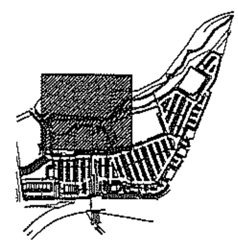
CENTERCAL PROPERTIES, LLC

ELECTRICAL SITE PLAN

NYBERG RIVERS AR

CENTERCAL PROPERTIES, LLC.

TUALATIN, OREGON



KEY PLAN

PROJECT NO.:	21180010
DATE:	09/12/13
DESIGNED BY:	KEL
DRAWN BY:	RAM
CHECKED BY:	KEL

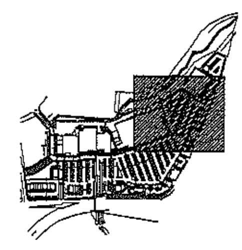
SCALE: 1"=30'

PHOTOMETRIC AREA C

E-4

Exhibit 1
Attachment O-5

TASKER ELECTRICAL CONSTRUCTION
1998 W. JARVIS CT.
MERIDIAN, IDAHO 83642
PHONE: (360) 518-5699



KEY PLAN

SCALE: 1"=30'

MUSGROVE ENGINEERING, P.A.

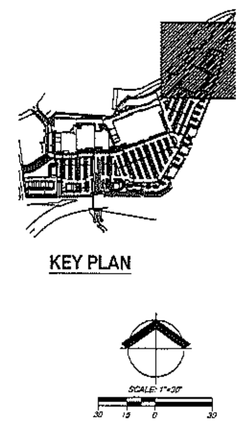
CENTERCAL PROPERTIES, LLC

ELECTRICAL SITE PLAN
NYBERG RIVERS AR
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21198316
DATE:	08/08/12
DESIGNED BY:	KEL
DRAWN BY:	RAM
CHECKED BY:	KEL

PHOTOMETRIC AREA D

E-5
Exhibit 1
Attachment 0-5



TASKER ELECTRICAL CONSTRUCTION
1998 W. JARVIS CT.
MERIDIAN, IDAHO 83642
PHONE: (360) 518-5699

MUSGROVE ENGINEERING, P.A.

CENTERCAL PROPERTIES, LLC

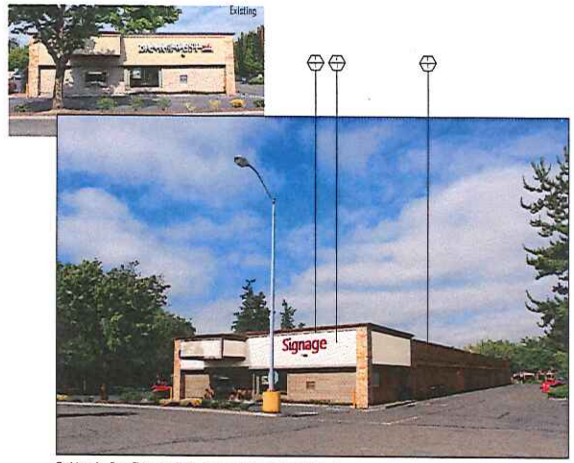
ELECTRICAL SITE PLAN
NYBERG RIVERS AR
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.	21150316
DATE:	09/18/13
DESIGNED BY:	KEL
DRAWN BY:	RAM
CHECKED BY:	KEL

PHOTOMETRIC AREA E

E-6
Exhibit 1
Attachment O-5

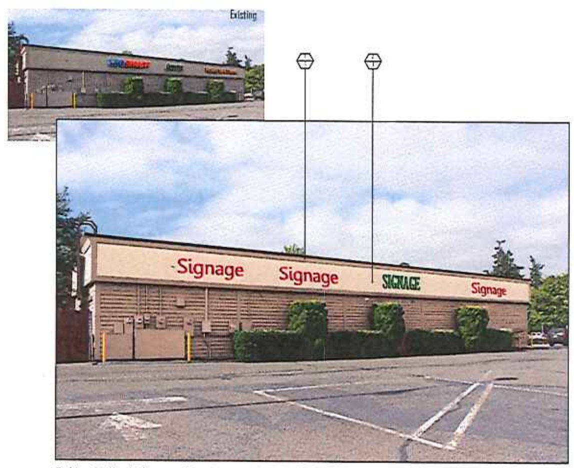
Building A - South Elevation (A1) - Proposed New Paint & Signage



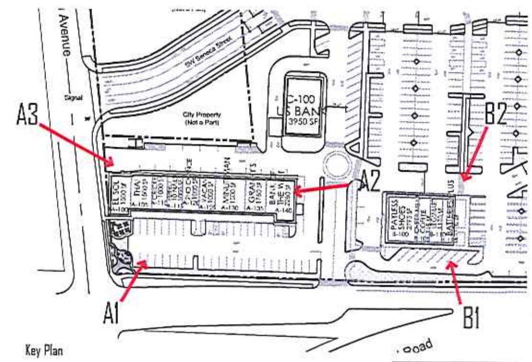
Building A - East Elevation (A2) - Proposed New Paint & Signage

Building A - North Elevation (A3) - Proposed New Paint & Signage

Building B - South Elevation (B1) - Proposed New Paint & Signage



Building B - North Elevation (B2) - Proposed New Paint & Signage



Key Plan

	MATERIALS
A	PLASTER
B	BRICK VENEER
C	PRECAST CONCRETE
D	WOOD FRAMING
E	FABRIC CANOPY
F	EXISTING
G	ALUMINUM STOREFRONT
H	TONGUE AND GROOVE SIDING
I	SLATE TILE ROOF
J	STONE VENEER

	COLOR / FINISHES
1	DAKOTA LAND
2	MOHAVE BLEND
3	LINEN WHITE
4	WALNUT STAIN
5	ONIONSKIN
6	DARK BRONZE
7	EARTH
8	NEW SEASONS

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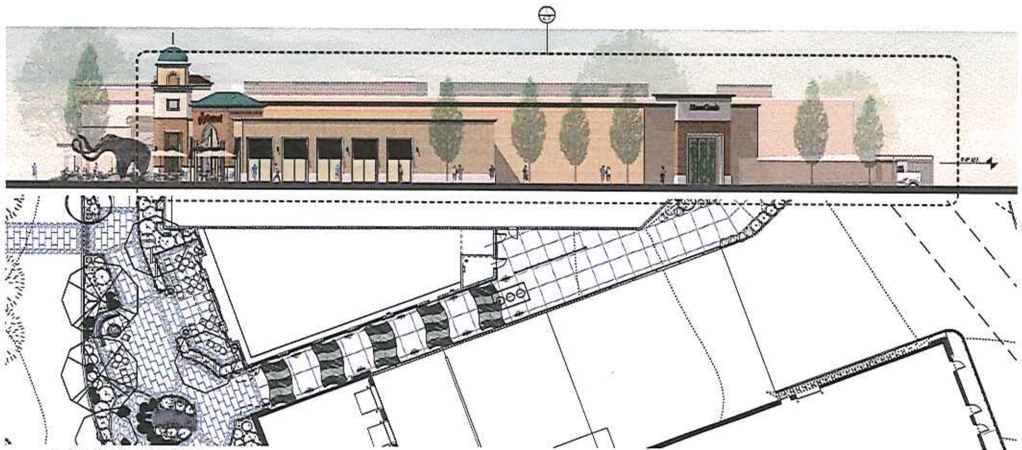
CENTERCAL PROPERTIES, LLC
MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

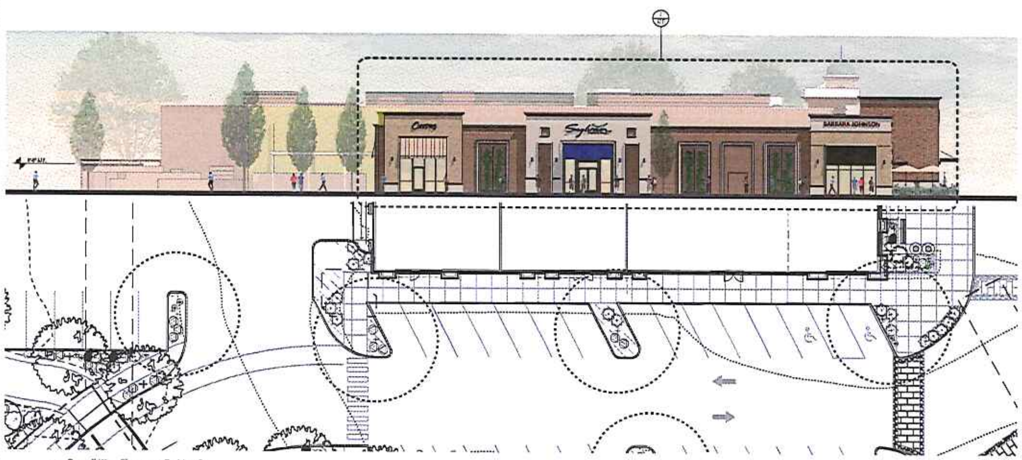
PROJECT NO.:	21158310
DATE:	10.28.2013
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX

BUILDINGS A & B
COLORED ELEVATIONS
A1.10

Exhibit 1
Attachment O-6



① Overall East Elevation - Building D
Scale: 1'-0" = 20'-0"



② Overall West Elevation - Building D
Scale: 1'-0" = 20'-0"

Paint / Plaster / CMU
Color - Glidden Professional
#20YY Dakota Land

Paint / Plaster / CMU
Color - Glidden Professional
#00YY Onionskin

Paint / Plaster / Precast Concrete
Color - Glidden Professional
#50YY Linen White

Paint
Color - New Seasons Green

Brick Veneer
Finish - Mohave Blend

Stone Veneer
Finish - Earth

Tongue & Groove Siding
Finish - Walnut Stain

Slate Tile Roof

③ Materials

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MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TULATIN, OREGON

PROJECT NO.:	21196310
DATE:	10.28.2013
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX

OVERALL BUILDIGN D
COLORED ELEVATIONS
A2.10b

Exhibit 1
Attachment O-6

Exhibit 1
Attachment O-6

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MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21198319
DATE:	10.28.2013
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX

OVERALL BUILDIGN D
STREET PERSPECTIVES
A2.10c

① South Elevation
Scale: 1/8" = 1'-0"

② West Elevation
Scale: 1/8" = 1'-0"

③ North Elevation
Scale: 1/8" = 1'-0"

	MATERIALS
A	PLASTER
B	BRICK VENEER
C	PRECAST CONCRETE
D	WOOD FRAMING
E	FABRIC AWNING
F	EXISTING
G	ALUMINUM STOREFRONT
H	TONGUE AND GROOVE SIDING
I	SLATE TILE ROOF
J	STONE VENEER
K	MECH. SCREEN BEYOND
L	COVERED BIKE PARKING
M	CANOPY
N	SPLIT FACE BLOCK

	COLOR / FINISHES
1	DAKOTA LAND
2	MOHAVE BLEND
3	LINEN WHITE
4	WALNUT STAIN
5	ONIONSKIN
6	DARK BRONZE
7	EARTH
8	NEW SEASONS

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MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21198310
DATE:	09.20.2013
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX

ENLARGED BUILDING D
COLORED ELEVATIONS
A2.11

Exhibit 1
Attachment O-6

① South Elevation
Scale: 1/8" = 1'-0"

② North Elevation
Scale: 1/8" = 1'-0"

	MATERIALS
A	PLASTER
B	BRICK VENEER
C	PRECAST CONCRETE
D	WOOD FRAMING
E	FABRIC AWNING
F	EXISTING
G	ALUMINUM STOREFRONT
H	TONGUE AND GROOVE SIDING
I	SLATE TILE ROOF
J	STONE VENEER
K	MECH. SCREEN BEYOND
L	COVERED BIKE PARKING
M	CANOPY
N	SPLIT FACE BLOCK

	COLOR / FINISHES
1	DAKOTA LAND
2	MOHAVE BLEND
3	LINEN WHITE
4	WALNUT STAIN
5	ONIONSKIN
6	DARK BRONZE
7	EARTH
8	NEW SEASONS

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MULVANNY G2 ARCHITECTURE

SHEET PLAN

NYBERG RIVERS ARB

CENTERCAL PROPERTIES, LLC.

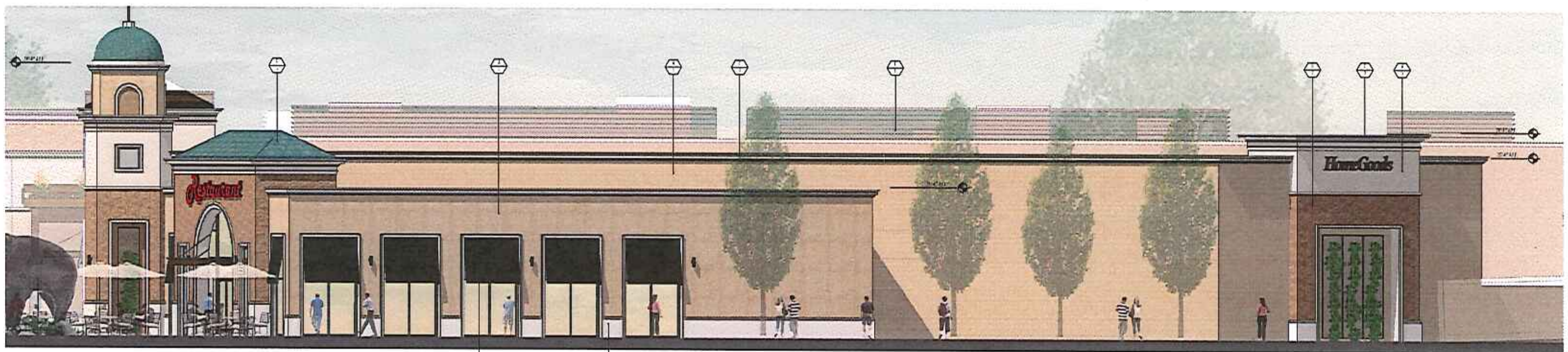
TUALATIN, OREGON

PROJECT NO.:	21198310
DATE:	09.20.2013
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX

ENLARGED BUILDIGN D
COLORED ELEVATIONS
A2.12

Exhibit 1
Attachment O-6

① South Elevation
Scale: 1/8" = 1'-0"



② East Elevation
Scale: 1/8" = 1'-0"

③ North Elevation
Scale: 1/8" = 1'-0"

	MATERIALS
A	PLASTER
B	BRICK VENEER
C	PRECAST CONCRETE
D	WOOD FRAMING
E	FABRIC AWNING
F	EXISTING
G	ALUMINUM STOREFRONT
H	TONGUE AND GROOVE SIDING
I	SLATE TILE ROOF
J	STONE VENEER
K	MECH. SCREEN BEYOND
L	COVERED BIKE PARKING
M	CANOPY
N	SPLIT FACE BLOCK

	COLOR / FINISHES
1	DAKOTA LAND
2	MOHAVE BLEND
3	LINEN WHITE
4	WALNUT STAIN
5	ONIONSKIN
6	DARK BRONZE
7	EARTH
8	NEW SEASONS

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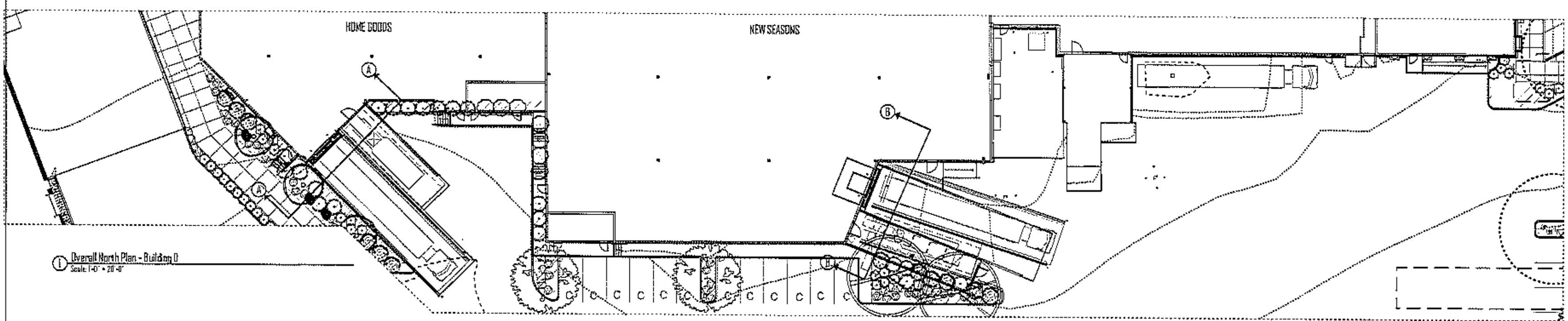
MULVANNY G2 ARCHITECTURE

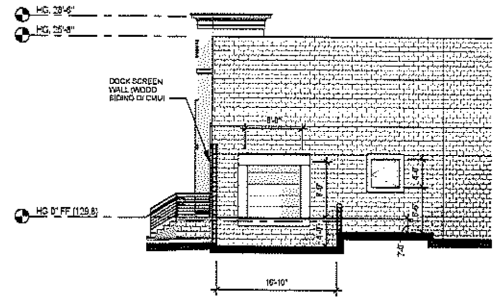
SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21108310
DATE:	08.20.2013
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX

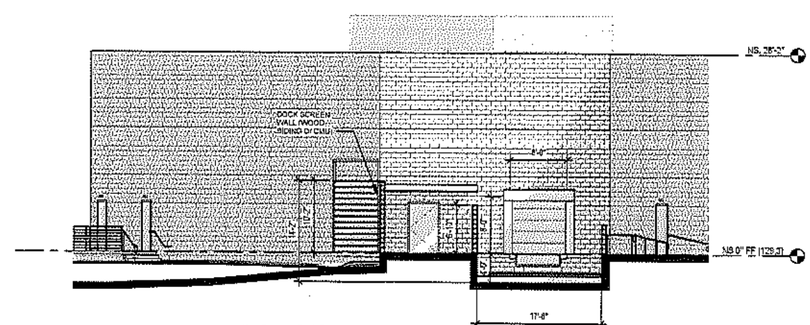
ENLARGED BUILDING D
COLORED ELEVATIONS
A2.13



1 Overall North Plan - Building D
Scale: 1'-0" = 20'-0"



A Home Goods Dock Section
Scale: 1/8" = 1'-0"



B New Seasons Dock Section
Scale: 1/8" = 1'-0"

Exhibit 1
Attachment O-6

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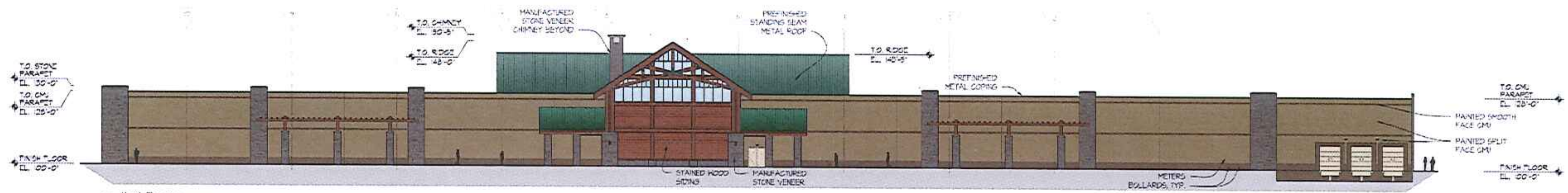
MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

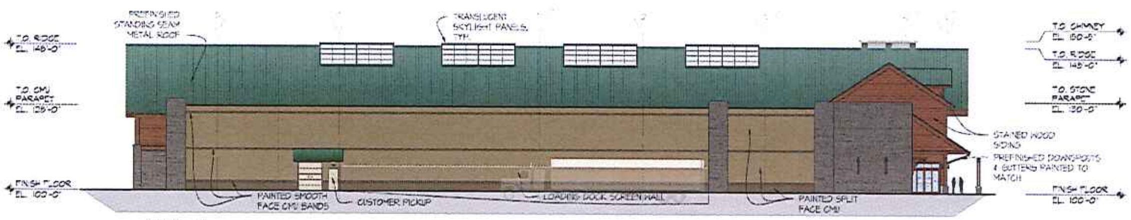
PROJECT NO.:	2116310
DATE:	12.28.2012
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX

LOADING DOCKS SECTIONS
A2.14

① South Elevation
scale: 1'-0" = 1/16"



② North Elevation
scale: 1'-0" = 1/16"



③ West Elevation
scale: 1'-0" = 1/16"

④ East Elevation
scale: 1'-0" = 1/16"

Cabela's
WORLD'S FOREMOST OUTFITTER

HBA
HOLLAND BASHAM ARCHITECTS

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MULVANNY G2
ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21196310
DATE:	07/09/13
DESIGNED BY:	10.28.2013
DRAWN BY:	XXX
CHECKED BY:	XXX

BUILDING E
COLORED ELEVATIONS
A3.10a

1 INTERSECTION OF NYBERG STREET & I-5 OFF-RAMP

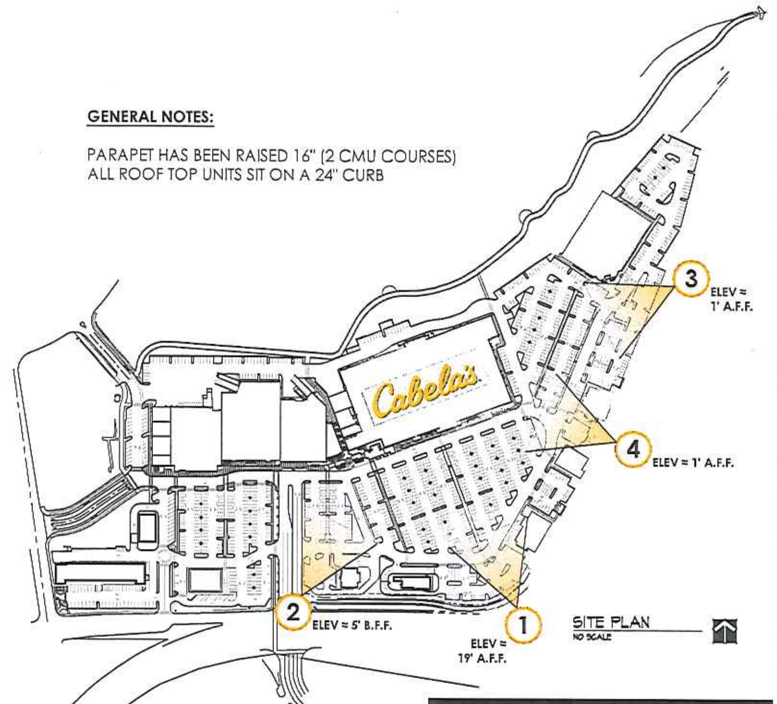
2 MAIN DEVELOPMENT ENTRANCE

3 INTERSTATE-5 OFF-RAMP #1

4 INTERSTATE-5 OFF-RAMP #2

GENERAL NOTES:

PARAPET HAS BEEN RAISED 16" (2 CMU COURSES)
ALL ROOF TOP UNITS SIT ON A 24" CURB



SITE PLAN
NO SCALE

RTU STUDY | 16" RAISED PARAPET

Cabela's
WORLD'S FOREMOST OUTFITTER

CABELA'S RETAIL | ROOF TOP UNIT SIGHTLINE STUDY | TUALATIN, OR

HBA HOLLAND BASHAM ARCHITECTS

10/17/13
P# 12511.1

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MULVANNY G2 ARCHITECTURE

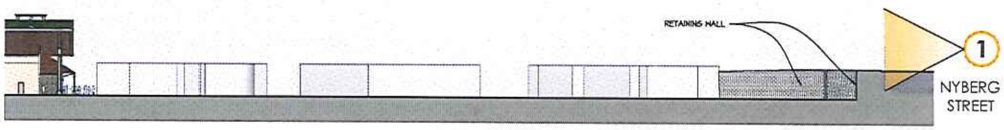
SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21195310
DATE:	07/09/13
DESIGNED BY:	10.28.2013
DRAWN BY:	XXX
CHECKED BY:	XXX

BUILDING E
RTU SIGHTLINE STUDY
A3.10b

Exhibit 1
Attachment O-6

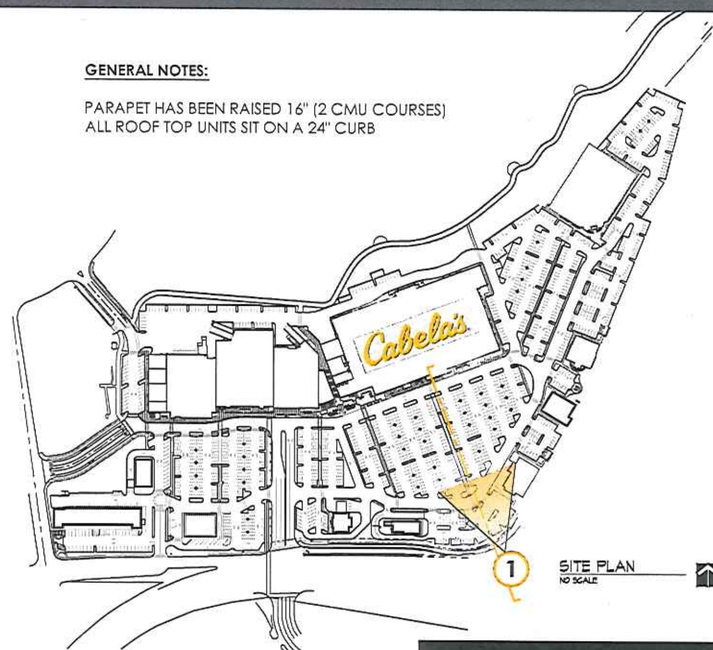
1 **INTERSECTION OF NYBERG STREET & I-5 OFF-RAMP:**
TAKEN FROM A CAR'S VIEW AT A POINT 19'-0" A.F.F. OF CABELA'S RETAIL STORE



SITE SECTION
NO SCALE

GENERAL NOTES:

PARAPET HAS BEEN RAISED 16" (2 CMU COURSES)
ALL ROOF TOP UNITS SIT ON A 24" CURB



SITE PLAN
NO SCALE

CABELA'S RETAIL | PRELIMINARY DRAWINGS TUALATIN, OR

Cabela's
World's Foremost Outfitter

HBA
HOLLAND BASHAM ARCHITECTS

09/23/13
P# 12511.1

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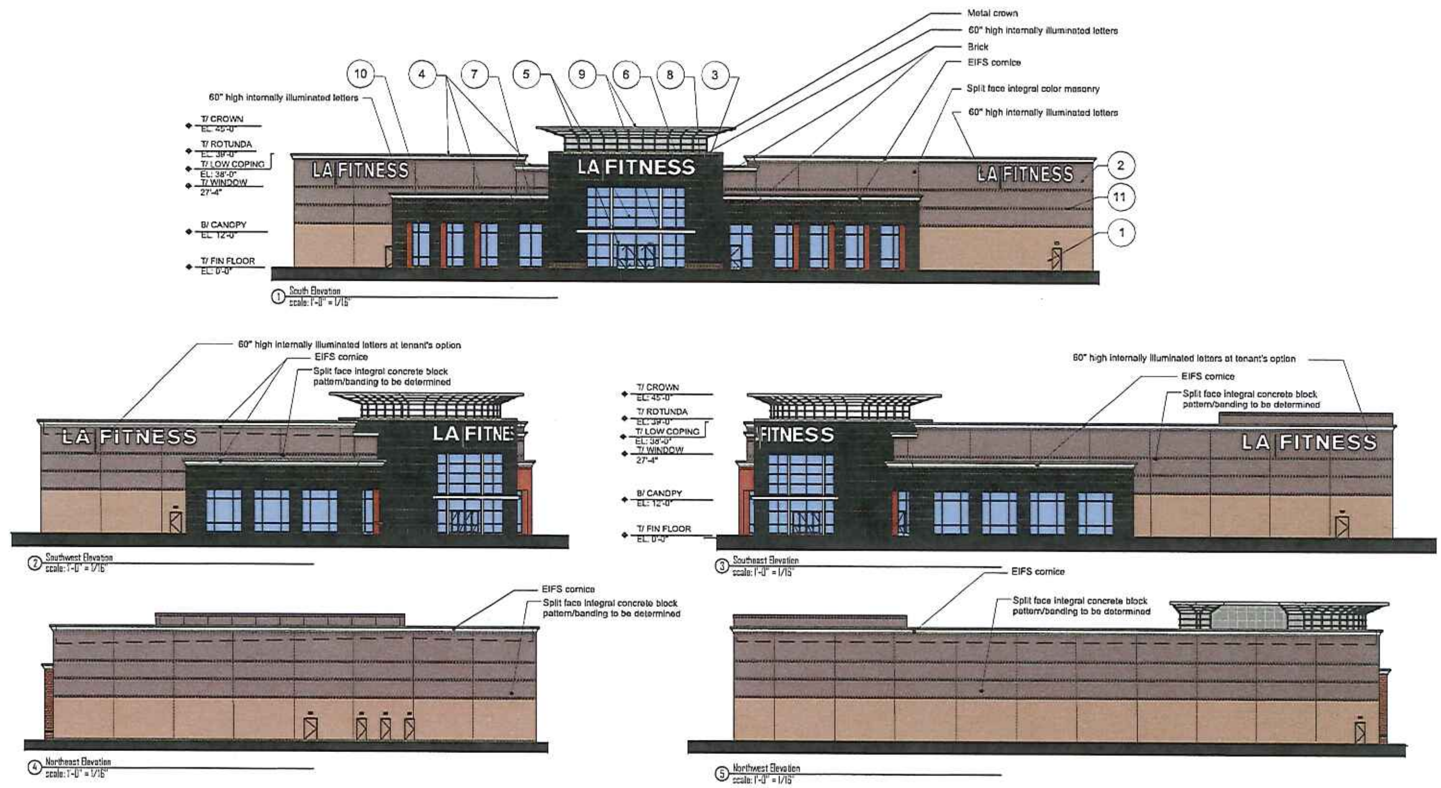
MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	2119B310
DATE:	07/09/13
DESIGNED BY:	10.28.2013
DRAWN BY:	XXX
CHECKED BY:	XXX

BUILDING E
RTU SIHGTLINE STUDY
A3.10c



Color Legend

1. Concrete Masonry Unit- Mutual Materials- Split Face- Mesa Tan
2. Concrete Masonry Unit - Mutual Materials- Split Face - Mountain Brown
3. Brick - Accent coursing at rotunda and lintels - Watsontown Brick - Color: M2 Houston KT Type 8
4. EFIS Cornice - Match ICI Paints - #1863 - Sawn White
5. Storefront & Entry Doors - Anodized finished aluminum at storefront, panels and entry doors
6. Pre-Finished Metal Coping - ICI Paints - #1769- Creme Brulee
7. Brick - Field brick at arcades, accent at rotunda - Watsontown Brick - Color: Hudson KT Type 8
8. Brick - Field brick at rotunda and inset brick at accent band - Watsontown Brick - Color: Scarsdale KT Type 7
9. Metal Entry Crown & Metal Canopy - Match ICI Paints - #2010 - Snowfield
10. Light Fixture - Dark oil-rubbend bronze - Kim Lighting fixture WFS74
11. Concrete Masonry Unit - Mutual Materials - Ground Face - Mountain Brown

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MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21166310
DATE:	07/09/13
DESIGNED BY:	10.28.2013
DRAWN BY:	XXX
CHECKED BY:	XXX

BUILDING F
COLORED ELEVATIONS
A4.10

Exhibit 1
Attachment O-6

① Northwest Elevation
scale: 1'-0" = 1/8"

② Southwest Elevation
scale: 1'-0" = 1/8"

③ Southeast Elevation
scale: 1'-0" = 1/8"

④ Northeast Elevation
scale: 1'-0" = 1/8"

AMERICAN SLATE
CHERRY BLOSSOM
16"x16" TILE VENEER
TOWER AND PILASTERS

AMERICAN SLATE
GOLDEN MIGRATION
SPLIT FACE TYPE
COLOR: GREYS AND TANS
WAINSCOT

STUCCO
DUNN-EDWARDS
COLOR: ARABIAN RED
MAIN BUILDING FIELD

CORONADO STONE
CHISTLED CREAM
WAINSCOT CAP

COLOR: BLACK
METAL CANOPIES

CORNICE
DUNN EDWARDS
COLOR: DARK CHOCOLATE

wd PARTNERS

Exhibit 1
Attachment O-6

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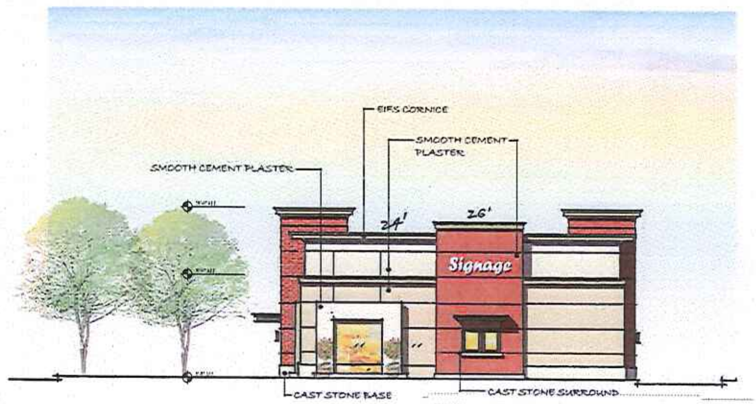
MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21198310
DATE:	07/09/13
DESIGNED BY:	10.28.2013
DRAWN BY:	XXX
CHECKED BY:	XXX

BUILDING J
COLORED ELEVATIONS
A5.10

1 North Elevation
scale: 1'-0" = 1/8"



2 West Elevation
scale: 1'-0" = 1/8"

3 South Elevation
scale: 1'-0" = 1/8"

4 East Elevation
scale: 1'-0" = 1/8"

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CENTERCAL PROPERTIES, LLC

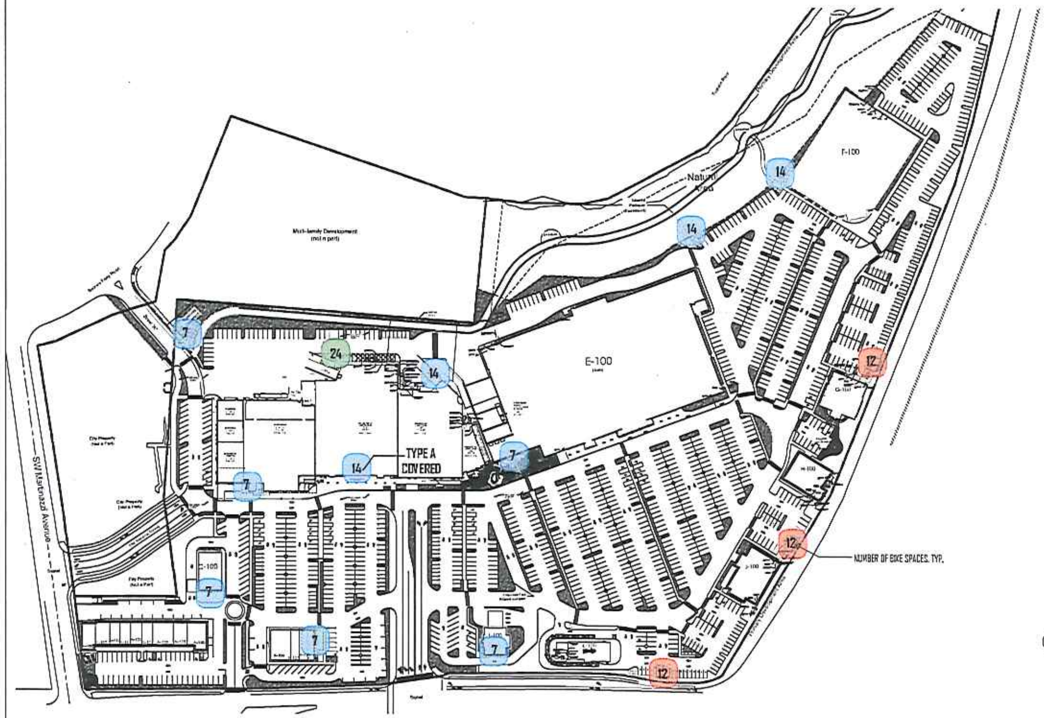
MULVANNY G2
ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21198310
DATE:	07/09/13
DESIGNED BY:	10.28.2013
DRAWN BY:	XXX
CHECKED BY:	XXX

BUILDING K
COLORED ELEVATIONS
A6.10

Exhibit 1
Attachment O-6

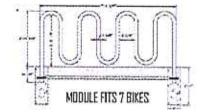


LEGEND	TYPE OF BIKE RACK
(blue)	BIKE RACK A - FITS 7 BIKES PER MODULE
(orange)	TRASH ENCLOSURE B WITH HANGING BIKES - FITS 12 BIKES
(green)	BIKE ENCLOSURE C - FITS 24 BIKES

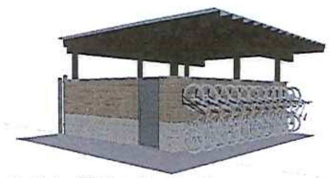
	REQUIRED	PROVIDED	RACK TYPE/QTY
OVERALL BICYCLE PARKING	147 SPACES	151 SPACES	(94) TYPE A, (36) TYPE B, (24) TYPE C
COVERED BICYCLE PARKING	74 SPACES (50% OF OVERALL)	74 SPACES	(14) TYPE A, (36) TYPE B, (24) TYPE C
UNCOVERED BICYCLE PARKING	NO SPECIFIC REQUIREMENTS	77 SPACES	(77) TYPE A

BIKE PARKING REQUIRED : 0.50 space per 1,000 sq. ft. of gross floor area 50 % COVERED

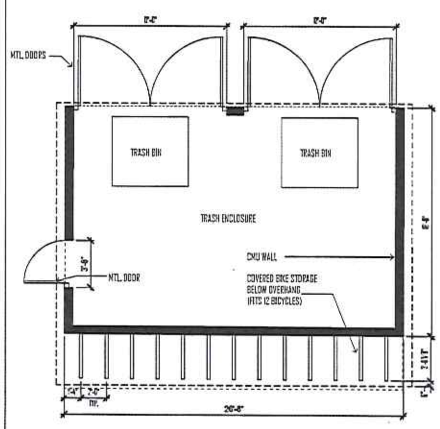
293,919 SF / 1000 * 0.50 = 146.95 OR 147 REQ'D (147 * 0.5 = 74 REQ'D COVERED)



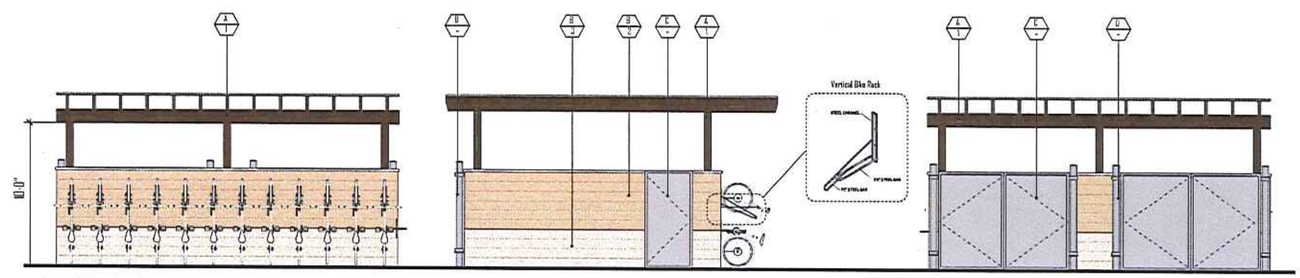
① Bike Rack A



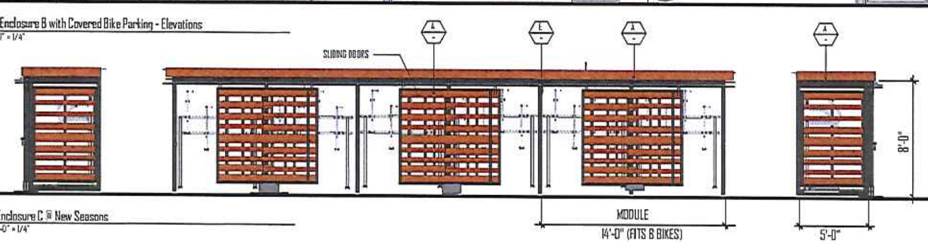
② Trash Enclosure B with Hanging Bikes - Perspective



③ Trash Enclosure Plan
Scale: 1'-0" = 1/4"



④ Trash Enclosure B with Covered Bike Parking - Elevations
Scale: 1'-0" = 1/4"



⑤ Bike Enclosure C @ New Seasons
Scale: 1'-0" = 1/4"

	MATERIALS
A	WOOD FRAMING
B	CMU
C	MTL. DOOR
D	BOLLARD
E	MTL. FRAMING

	COLOR/FINISH
1	WALNUT STAIN
2	DAKOTA LAND
3	LINENE WHITE

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CENTERCAL PROPERTIES, LLC
MULVANNY G2 ARCHITECTURE

SHEET PLAN
NYBERG RIVERS ARB
CENTERCAL PROPERTIES, LLC.
TUALATIN, OREGON

PROJECT NO.:	21198310
DATE:	10.28.2013
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX

TRASH ENCLOSURES AND BIKE PARKING
A7.10

Exhibit 1
Attachment O-6

City of Tualatin

CITY ENGINEER'S PUBLIC FACILITIES FINDINGS & RECOMMENDED DECISION

** APPROVAL WITH CONDITIONS **

December 20, 2013

Case #:	AR-13-07
Project:	Nyberg Rivers Shopping Center
Location:	7455 - 7925 SW Nyberg Road (Tax Map 2S1 24 A, Tax Lots 1601, 1602, 1900, 2502, 2506, 2507, 2508, and 2700; Tax Map 2S1 24B, Tax Lots 2000, 2001, and 2100)
Applicant:	Michael Kirk, CenterCal (503-968-8940) Michael Cerbone, Cardno (503-419-2500)
Property Owners:	Tuala Northwest, LLC, Dean McBale, George A. Gill, and ODOT

INTRODUCTION

Center Cal, LLC proposes developing an approximately 300,000 square foot shopping center on 31.91 acres of the old Kmart shopping center site. The shopping center includes a Cabela's, New Seasons, Michael's, Home Goods, LA Fitness, BJ's Restaurant, Barbara Johnson s, and a Wendy's. There are some additional tenant spots and pads that have yet to be determined. This includes the former Sylvan Learning Center, the former Curves, pad G-100, and pad H-100.

The redevelopment site is generally bounded by the Tualatin River to the north, SW Nyberg Street to the south, Interstate 5 to the east, and SW Martinazzi Avenue to the west.

The plan designations on the subject site are Office Commercial (CO), Center Commercial (CC), and High Density Residential (RH).

On August 26, 2013 the City Council voted unanimously to approve the Nyberg Rivers Master Plan and Conditional Use Permit with Resolution 5163-13 and 5164-13 respectively.

A neighborhood meeting was held by the applicant on August 8, 2013. One member of the public attended. Questions about timeline and procedure were answered. No concerns were raised. Staff mailed out notice of this ARB public hearing on November 5, 2013 and has received one letter of comment from surrounding property owners and the public. This comment is addressed in Section O of this staff report.

Exhibit 2

PUBLIC FACILITIES RECOMMENDATION

The following are the Public Facilities findings for AR 13-07, Nyberg Rivers. All references are to sections in the Tualatin Development Code (TDC) or Tualatin Municipal Code (TMC) unless otherwise noted.

TDC 74.120 ...No work shall be undertaken on any public improvement until after the construction plans have been approved by the City Engineer and a Public Works Permit issued and the required fees paid.

TDC 74.140 (1) All the public improvements required under this chapter shall be completed and accepted by the City prior to issuance of a Certificate of Occupancy.

TDC 74.330 Utility Easements

(1) Utility easements for water, sanitary sewer and storm drainage facilities, telephone, television cable, gas, electric lines and other public utilities shall be granted to the City.

(4) ...For both on-site and off-site easement areas, a utility easement shall be granted to the City; Building Permits shall not be issued for the development prior to acceptance of the easement by the City.

(5) The width of the public utility easement shall meet the requirements of the Public Works Construction Code.

TMC 4-1.010 This development is subject to all applicable building code requirements and all applicable building and development fees.

FINDINGS

These comments are a result of site investigation and review of the 3rd revision of submitted plan sheets received October 23, 2013:

1. Fire and Life Safety:

   TMC 4-2.010 (1) Every application for a building permit and accompanying plans shall be submitted to the Building Division for review of water used for fire protection, the approximate location and size of hydrants to be connected, and the provisions for access and egress for firefighting equipment. If upon such review it is determined that the fire protection facilities are not required or that they are adequately provided for in the plans, the Fire and Life Safety Reviewer shall recommend approval to the City Building Official.

   The submitted plans show an existing public fire hydrant at the northwest corner of building D-130 that is incorrectly labeled as proposed. Additionally there are twelve proposed private fire hydrants: five north of buildings 1010, 1040, F-100, G-100, & N-100, five south of buildings D-110, 1005, 1030, 1040, & N-100, and two east of building 1040. The private fire hydrants are located behind an appropriate backflow device. This is acceptable. The applicant will need to submit revised plans that show the existing public fire hydrant at the northwest corner of building D-130 labeled as public.

During the review of Building Permits the Building Official may determine that additional fire protection devices may be necessary upon recommendation of Tualatin Valley Fire & Rescue (TVF&R). The applicant will need to submit plans that comply with fire protection requirements as determined through the Building Division and Tualatin Valley Fire & Rescue (TVF&R).

Prior to issuance of a Public Works Permit:
- The applicant shall submit revised plans that show the existing public fire hydrant at the northwest corner of building D-130 labeled as public.

Prior to issuance of a Building Permit:
- The applicant shall submit plans that comply with fire protection requirements as determined through the Building Division and Tualatin Valley Fire & Rescue (TVF&R).

2. Transportation:
TDC 11.610 Transportation Goals and Objectives (2) (e) For development applications, including, but not limited to subdivisions and architectural reviews, a LOS of at least D and E are encouraged for signalized and unsignalized intersections, respectively.

TDC 73.400 (5)...a sidewalk shall be constructed along all street frontage, prior to use or occupancy of the building or structure proposed for said property. The sidewalks required by this section shall be constructed to City standards,...

TDC 74.420 (6) All required street improvements shall include curbs, sidewalks, storm drainage, streetlights, street signs, street trees, and, where designated, bikeways and transit facilities.

TDC 75.060 Existing Driveways and Street Intersections (2) The City Engineer may restrict existing driveways and street intersections to right-in and right-out by construction of raised median barriers or other means.

TDC 74.120 ...No work shall be undertaken on any public improvement until after the construction plans have been approved by the City Engineer and a Public Works Permit issued and the required fees paid.

TDC 74.140 (1) All the public improvements required under this chapter shall be completed and accepted by the City prior to issuance of a Certificate of Occupancy.

The applicant included a Transportation Impact Analysis by Kittelson & Associates dated April 2013 along with additional supporting information that match submittals provided for evaluation of Master Plan MP 13-01, Nyberg Rivers. Evaluation of MP 13-01 included traffic studies and additional supporting information from both the applicant's traffic engineer, Kittelson & Associates, and one hired by the City, DKS Associates. The City Council adopted Resolution 5163-13 as part of the master plan process. This resolution identified and approved street cross-sections for the Nyberg Rivers development to be required in this Architectural Review. These cross-sections include SW Seneca Street, SW Nyberg Street, and the Loop Road.

After reviewing the applicant's traffic impact analysis, DKS compiled a list of recommended street improvements. These recommendations consider the original Traffic Impact Analysis submitted by the applicant (April 2013), and subsequent options presented by their traffic engineer about how the shopping center might connect to SW Martinazzi Avenue. The recommendations are:

SW Boones Ferry Road

SW Boones Ferry Road is a City of Tualatin facility and designated as a Major Arterial from the intersection of SW Martinazzi Avenue to SW Lower Boones Ferry Road. Full construction of SW Boones Ferry Road to City standards would require 98 feet of right-of-way and include four 12-foot travel lanes, one 14-foot center turn lane, two 6-foot bike lanes, two 6-foot planters with street trees and street lights, and two 6-foot bike lanes. Existing right-of-way varies between approximately 98 and 180 feet with improvements that include two 12-foot travel lanes, a 14-foot center turn lane, two 6-foot bike lanes, a curb tight 6-foot sidewalk on the north, a 8-foot planter strip with curb, streetlights, and street trees on the south, and a 6-foot sidewalk on the south. This is acceptable.

Street "A" is a proposed right-in/right-out intersection on the south side and to the east of the City offices. Due to SW Boones Ferry Road's superelevation, this intersection will need a median on the north side of the eastbound travel lane to restrict westbound traffic from turning south. The plans do not show a median. The applicant will need to submit revised plans for SW Boones Ferry Road that include a median on the north side of the eastbound travel lane in order to restrict Street "A" to right-in/right-out movement, for review and approval. The applicant will need to construct SW Boones Ferry Road that include a median on the north side of the eastbound travel lane in order to restrict Street "A" to right-in/right-out movement as part of the Public Works Permit.

A crosswalk is correctly shown at the intersection of SW Boones Ferry Road with Street "A". Due to the potential high pedestrian traffic a higher degree of demarcation of the crosswalk is needed that includes material that is visually different and possibly raised. The applicant will need to submit revised plans that show a crosswalk at the intersection of SW Boones Ferry Road and Street "A" that includes material that is visually different and possibly raised, for review and approval. The applicant will need to construct a crosswalk at the intersection of SW Boones Ferry Road and Street "A" that includes material that is visually different and possibly raised.

SW Martinazzi Avenue & SW Seneca Street

SW Martinazzi Avenue is a City of Tualatin facility and designated as a Minor Arterial from SW Boones Ferry Road to SW Tualatin-Sherwood Road. Full construction of SW Martinazzi Avenue to City standards would require 74 feet of right-of-way and include two 12-foot travel lanes, one 14-foot center turn lane, two 6-foot bike lanes, two 6-foot planters with street trees and street lights, two 6-foot bike lanes, and two 6-foot sidewalks. Currently there is approximately 55-feet of right-of-way with improvements that include two 11- to 12–foot travel lanes, one 11- to 12–foot center turn lane, medians near SW Boones Ferry Road and SW Nyberg Street, 4- to 5-foot bike lanes, 5- to 5.5-foot curb tight sidewalks. This is acceptable.

SW Seneca Street to the east of SW Martinazzi Avenue is a City of Tualatin facility and designated as a Minor Collector. The City Council adopted Resolution 5163-13 which requires a public road with a 90-foot cross-section that includes two 12-foot travel lanes, one 14-foot center turn lane, two 6-foot bike lanes, two 8-foot parking strips, two 6-foot planter strips with curbs, streetlights, and street trees, and two 6-foot sidewalks. The plans show a potential 73-foot cross-section including two 11-foot travel lanes, a 14-foot center turn lane, two 6-foot bike lanes, two 6.5-foot planter strips, and two 5-foot sidewalks with an additional 1-foot landscape strip for SW Seneca Street extending east from a signalized intersection at SW Martinazzi Avenue and connecting to their development. The City Engineer has determined that the on-street parking should not be included in the cross-section as it is inconsistent with the character of the neighborhood, would cause conflicts with queues, and create concerns for public safety in an active pedestrian area. The applicant will need to submit revised plans that show SW Seneca Street from SW Martinazzi Avenue connecting to the Nyberg Rivers site for construction up to the requirements stated in Resolution 5163-13, without on-street parking, with signalization at SW Seneca Street & SW Martinazzi Avenue, for review and approval.

Kittelson and Associates conducted an analysis of the existing driveway easement to determine whether it would continue to operate at an acceptable level of service with full build-out of the proposed development. Their conclusion was that the driveway would continue to meet City of Tualatin operating standards (Level of Service E) for the minor street left turn movements at build-out of the proposed development. This analysis was documented in the information submitted to the City as a part of the Architectural Review submittal. The Kittelson analysis was supplemented with a November 22, 2013 letter which documents the benefit of the addition of Street A in reducing both existing volumes at the City driveway on Martinazzi.

DKS reviewed the Transportation Impact Analysis (TIA) and additional information submitted by Kittelson & Associates and had a different conclusion. Their analysis of the data indicates that the results are impacted by the assumption of a two-stage or a one-stage crossing for westbound left turns leaving the site. DKS concludes that when this location is analyzed as a one-stage crossing it will not meet City of Tualatin operating standards (Level of Service F). As a result of conflicting evidence, the applicant has voluntarily provided Seneca Street improvements on the submitted plans because of the belief that the development will be better serviced with the improvements. Therefore, the applicant proposes and the City accepts the following condition of approval: If the applicant obtains the right-of-way for the Seneca Street extension and traffic signal by April 1, 2014, the applicant will design and construct the Seneca Street extension along with a new signal at the SW Martinazzi Avenue/SW Seneca Street intersection per the Public Works Construction Code under a public works permit or if the applicant is unable to obtain the right-of-way by April 1, 2014, the applicant will provide a fee in lieu of the Seneca Street construction to the City in the amount of $360,000, which accounts for the applicant's share of the improvements.

A private access easement, Washington County recorded document 8295, Book 773, Page 873, exists over City owned TLID 2S124B001900 for the benefit of property owners. With construction of the east extension of SW Seneca Street, this easement is no longer needed and creates an unnecessary burden over TLID 2S124B001900. If the east extension of SW Seneca Street is constructed, the applicant will need to extinguish the private access easement, Washington County recorded document 8295, Book 773, Page 873, exists over City owned TLID 2S124B001900.

<u>SW Nyberg Road</u>
SW Nyberg Road from I-5 to SW Tualatin Sherwood Road is an ODOT facility and designated by the City of Tualatin as a Major Arterial. The existing cross-section on the north side adjacent to this development from SW Tualatin-Sherwood Road to SW 75th Avenue includes two left turn lanes, three travel lanes, a curb tight sidewalk, and a varying planter strip with street trees. The existing cross-section on the north side adjacent to this development from SW 75th Avenue to I-5 includes three travel lanes, a bike lane, and a curb tight sidewalk with tree wells. The City Council adopted Resolution 5163-13 which requires a public road with no changes to the existing west and east-bound turn lanes, but addition of a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a minimum of 12-feet for bike and pedestrian use, and a 2-foot landscape strip and a retaining wall with a hand rail.

Oregon Department of Transportation (ODOT) submitted an ODOT Response to Local Land Use Notification dated October 21, 2013. ODOT states that

- the site plan dated 9/16/13 as well as Exhibit A G-G Nyberg Rd I-5 to Eastern Entrance adequately reflect ODOT requirements including the maintenance access easements needed by ODOT and the frontage improvements on Nyberg Rd. Nyberg Rd improvements include: a 5 ft bike lane, a 15 ft right turn lane, a 4ft planter strip, a 7 ft sidewalk, a 2 ft landscape buffer, and a retaining wall with a handrail. No dedication of right-of-way to ODOT is needed for these improvements. It is our understanding that the lot lines are being adjusted. The applicant shall obtain an ODOT Permit for construction of the bike lane, right turn lane, planter strip, sidewalk, landscape buffer, retaining wall and drainage within the state highway right of way.
- Applicant shall enter into a Cooperative Improvement Agreement with ODOT to address ODOT permit requirements, providing graffiti removal and maintenance of the retaining wall including and the transfer of ownership of the improvement to ODOT.
- Record a 15ft maintenance easement adjacent to the retaining wall and a maintenance vehicle access easement through the development with ODOT.
- Tree placement and design shall be consistent with the ODOT Highway Design Manual or a design exception shall be obtained. The types of trees are to be approved by ODOT.
- ODOT has provided a response dated October 21, 2013 confirming the acceptability of the cross-section and closure of SW 75th Avenue and that no additional right-of-way is needed. The applicant will need to submit a copy of the ODOT Permit.

Washington County submitted responses dated May 21, 2013 and May 29, 2013. These are the same responses they submitted for the Master Plan MP-13-01, Nyberg Rivers.

Washington County requires issuance of a Facility Permit for construction of improvements within their right-of-way including a westbound right-turn lane at SW Nyberg Road, two southbound left-turn lanes and a shared through/right-turn lane from the site's access on SW Nyberg Road and two inbound receiving lanes with associated signal improvements to the intersection of SW Nyberg Road and the main site intersection. The applicant will need to submit a copy of the Washington County Facility Permit.

The plans show the addition of a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip prior to a hand rail on top of a retaining wall. Additionally, SW 75th Avenue's access to SW Nyberg Street is closed. This cross-section is acceptable. The applicant will submit a copy of the ODOT Permit and Washington County Facility Permit for construction of SW Nyberg Street from I-5 to SW Tualatin Sherwood Road to add a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip prior to a hand rail on top of a retaining wall and close SW 75th Avenue's access. The applicant will need to construct SW Nyberg Street from I-5 to SW Tualatin Sherwood Road to add a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip and a retaining wall with a hand rail on top and close SW 75th Avenue's access.

SW Nyberg Street

SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road is a City of Tualatin facility and designated as a Minor Collector. Currently 55 feet of right-of-way exist with improvements that include two 11–foot travel lanes, a 5-foot planter, and a 5–foot sidewalk. The City Council adopted Resolution 5163-13 which requires a public road with two 11-foot westbound travel lanes, a 6-foot bike lane, a 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees. The plans show a two 11-foot westbound travel lanes, a 6-foot bike lane, a 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with the resolution. This cross-section is acceptable. The applicant will need to submit final plans for SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road that include two 11-foot westbound travel lanes, a 6-foot bike lane, a varied width 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with Resolution 5163-13, for review and approval. The applicant will need to construct SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road that include two 11-foot westbound travel lanes, a 6-foot bike lane, a varied width 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with Resolution 5163-13.

The plans show along the section of SW Nyberg Street south of building B, portions of the public curb tight sidewalk and all of the planter strip on private property. Public streets need to be within right-of-way or public easement. The applicant is proposing to include the sidewalk within a public easement while maintaining the planter strip on private property. The City Engineer finds this acceptable. The applicant will need to grant a public sidewalk easement from right-of-way to back of sidewalk adjacent to SW Nyberg Street.

The Loop Road

The Loop Road is a City of Tualatin facility designated as a Minor Collector that connects SW Nyberg Street to SW Boones Ferry Road and SW Seneca Street over this development site.

The City Council adopted Resolution 5163-13 which requires a public road with varying cross-sections as detailed below.

From the SW Nyberg Street main intersection north to the south side of building 1010 the cross-section is to include three 12-foot southbound travel lanes consisting of two southbound left turn lanes and a shared through/right turn lane from the site's access onto SW Nyberg Street, two inbound receiving northbound 12-foot travel lanes, a center median consisting of an 18-inch concrete median with striping on both sides for a total of 2.5-feet, a 4 to 7-foot planter strip on the east side with curb, streetlights, and trees, a 4-foot planter on the west side with curb, streetlights adjacent to the travel lanes, and groundcover and shrubs with a 14-foot shared path with tree wells, and associated signal improvements at the main entrance. The plans show travel lanes, median, and an east planter strip that meets the requirements. The plans show on the west side a 4-foot planter adjacent to the parking lot with streetlights and a 14-foot shared path with 2'x2' tree wells adjacent to the travel lanes. The City Engineer has determined that placement of the planter strip adjacent to the parking lot instead of the travel lanes is acceptable as the tree wells provide a similar vegetative buffer. The submitted 2'x2' tree well specification is inadequate to provide healthy canopied trees with adequate root spread that won't potentially damage walkways. The applicant will need to submit revised plans for the Loop Road from the SW Nyberg Street main intersection north to the south side of building 1010 that includes the City's standard 5'x5' tree wells within the 14-foot wide shared path, for review and approval. The applicant will need to construct Loop Road from the SW Nyberg Street main intersection north to the south side of building 1010 that includes the City's standard 5'x5' tree wells.

From the south side of building 1010 west to the south side of building D-120 the cross-section is to include two 12- to 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side. The plans show a cross-section that meets the requirement that includes 13-foot travel lanes. This cross-section is acceptable. The applicant will need to submit final plans from the south side of building 1010 west to the south side of building D-120 that include two 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side, for review and approval. The applicant will need to construct a cross-section from the south side of building 1010 west to the south side of building D-120 that include two 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side.

Along the west side of buildings D-120, D-125, and D-130 the cross-section is to include two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side with tree wells, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side. The plans show a cross-section that meets this requirement with the exception of tree wells on the east side. The City Engineer finds that the trees provided in the parking buffer strips provide adequate canopy without the inclusion of tree wells. This cross-section is acceptable. The applicant will need to submit final plans that show along the west side of buildings D-120, D-125, and D-130 two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side, trees planted in the parking buffers, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side, for review and approval. The applicant will need to construct along the west side of buildings D-120, D-125, and D-130 two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side, trees planted in the parking buffers, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side.

North of building D-130 the Loop Road is identified as Street "A" and the cross-section is to include two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road that will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side. The plans reflect this cross-section. This cross-section is acceptable. The applicant will need to submit final plans that show two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road that will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side. The applicant will need to construct two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road that will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side.

North of building D-130 the greenway trail ends with a crosswalk across Street "A". Due to the potential high pedestrian traffic interacting with the traffic using Street "A" a higher degree of demarcation of the crosswalk is needed that includes a raised material. The applicant will need to submit revised plans that show a raised crosswalk at the intersection of the greenway trail and Street "A", for review and approval. The applicant will need to construct a raised crosswalk at the intersection of the greenway trail and Street "A.

In this singular instance, instead of dedication of right-of-way for the Loop Road over its entirety, the City Engineer has allowed the dedication of a public access easement over the entire cross-section, construction and inspection of the entire cross-section to Public Works Construction Code standards, and a maintenance agreement for performance to City standards. The Public Works Construction Code standards include, but are not limited to: travel lanes, medians, curbs and gutters, planter strips, street trees and tree wells, 24-inch root barriers for any tree near public sidewalks, streets, or utility lines in easements, sidewalks, illumination, signage, striping, crosswalks, and raised crosswalks. The applicant will need to obtain a Public Works Permit for all cross-sections of the Loop Road. The applicant will need to grant a maintenance agreement to City standards for all cross-sections of the Loop Road.

No speed bumps or humps are proposed. Speed bumps or humps are not to be constructed as it would restrict flow of vehicles along the public access easement acting as the Loop Road. This is acceptable.

The plans only show a 62.5-foot access easement over the travel lanes of the portion of the Loop Road from the SW Nyberg Street main site intersection to south of building 1010. The public access easement is needed over all cross-sections of the Loop Road. The applicant will need to grant a public access easement over all cross-sections of the Loop Road.

Street "A" is not an approved street name. Street names need to be chosen from the approved street name list or otherwise approved by the City Engineer as a Pioneer name. The applicant will need to submit revised plans that show an approved street name in place of Street "A", for review and approval.

No work shall be undertaken on any public improvement until after the construction plans have been approved by the City Engineer and a Public Works Permit issued and the required fees paid. The applicant has not obtained all Public Works and Water Quality Permits. The applicant will need to obtain all Public Works and Water Quality Permits needed for this development.

All the public improvements required under this chapter shall be completed and accepted by the City prior to issuance of a Certificate of Occupancy. The applicant has not completed all public improvements. The applicant will need to complete all the public improvements and private water quality facilities and have them accepted by the City.

Prior to issuance of a Public Works Permit:

- *The applicant shall submit revised plans of SW Boones Ferry Road that include a median on the north side of the eastbound travel lane in order to restrict Street "A" to right-in/right-out movement, for review and approval.*
- *The applicant shall submit revised plans that show a crosswalk at the intersection of SW Boones Ferry Road and Street "A" that includes material that is visually different and possibly raised, for review and approval.*
- *The applicant shall submit revised plans that show SW Seneca Street from SW Martinazzi Avenue connecting to the Nyberg Rivers site for construction up to the requirements stated in Resolution 5163-13, without on-street parking, with signalization at SW Seneca Street & SW Martinazzi Avenue, for review and approval.*
- *The applicant shall submit a copy of the ODOT Permit and Washington County Facility Permit for construction of SW Nyberg Street from I-5 to SW Tualatin Sherwood Road to add a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip and a retaining wall with a hand rail on top and close SW 75th Avenue's access.*
- *The applicant shall submit final plans for SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road that include two 11-foot westbound travel lanes, a 6-foot bike lane, a varied width 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with Resolution 5163-13, for review and approval.*

- *The applicant shall grant a public sidewalk easement from right-of-way to back of sidewalk adjacent to SW Nyberg Street.*
- *The applicant shall submit revised plans for the Loop Road from the SW Nyberg Street main intersection north to the south side of building 1010 that includes the City's standard 5'x5' tree wells within the 14-foot wide shared path, for review and approval.*
- *The applicant shall submit final plans from the south side of building 1010 west to the south side of building D-120 that include two 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side, for review and approval.*
- *The applicant shall submit final plans that show along the west side of buildings D-120, D-125, and D-130 two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side, trees planted in the parking buffers, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side, for review and approval.*
- *The applicant shall submit final plans that show two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road that will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side.*
- *The applicant shall submit revised plans that show a raised crosswalk at the intersection of the greenway trail and Street "A", for review and approval.*
- *The applicant shall grant a maintenance agreement to City standards for all cross-sections of the Loop Road.*
- *The applicant shall grant a public access easement over all cross-sections of the Loop Road.*
- *The applicant shall submit revised plans that show an approved street name in place of Street "A", for review and approval.*

Prior to Issuance of a Building Permit:
- *The applicant shall obtain all Public Works and Water Quality Permits needed for this development.*
- *The applicant shall obtain a Public Works Permit for all cross-sections of the Loop Road.*

Prior to Issuance of a Certificate of Occupancy:
- *The applicant shall construct SW Boones Ferry Road that include a median on the north side of the eastbound travel lane in order to restrict Street "A" to right-in/right-out movement as part of the Public Works Permit.*
- *The applicant shall construct a crosswalk at the intersection of SW Boones Ferry Road and Street "A" that includes material that is visually different and possibly raised.*
- *If the applicant obtains the right-of-way for the Seneca Street extension and traffic signal by April 1, 2014, the applicant will design and construct the Seneca Street extension along with a new signal at the SW Martinazzi Avenue/SW Seneca Street intersection per the Public Works Construction Code under a public works permit or if the applicant is unable to obtain the right-of-way by April 1, 2014, the applicant will provide a fee in lieu of the Seneca Street construction to the City in the amount of $360,000, which accounts for the applicant's share of the improvements.*
- *If the east extension of SW Seneca Street is constructed, the applicant shall extinguish the private access easement, Washington County recorded document 8295, Book 773, Page 873, exists over City owned TLID 2S124B001900.*

- *The applicant shall construct SW Nyberg Street from I-5 to SW Tualatin Sherwood Road to add a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip prior to a hand rail on top of a retaining wall and close SW 75th Avenue's access.*
- *The applicant shall construct SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road that include two 11-foot westbound travel lanes, a 6-foot bike lane, a varied width 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with Resolution 5163-13.*
- *The applicant shall construct Loop Road from the SW Nyberg Street main intersection north to the south side of building 1010 that includes the City's standard 5'x5' tree wells within the 14-foot wide shared path.*
- *The applicant shall construct a cross-section from the south side of building 1010 west to the south side of building D-120 that include two 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side.*
- *The applicant shall construct along the west side of buildings D-120, D-125, and D-130 two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side, trees planted in the parking buffers, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side.*
- *The applicant shall construct two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side.*
- *The applicant shall construct a raised crosswalk at the intersection of the greenway trail and Street "A.*
- *The applicant shall complete all the public improvements and private water quality facilities and have them accepted by the City.*

3. Access:
TDC 73.400 Access
(2) Owners of two or more uses, structures or parcels of land may agree to utilize jointly the same ingress and egress when the combined ingress and egress of both uses, structures, or parcels of land satisfies their combined requirements as designated in this code; provided that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases or contracts to establish joint use.
(11) Minimum Access Requirements for Commercial, Public and Semi-Public Uses. If 1-99 parking spaces are required, only one access is required. If 100-249 parking spaces are required, two accesses are required. Ingress and egress shall not be less than 32 feet wide for the first 50 feet from the right-of-way and 24 feet thereafter.
(12) Minimum Access Requirements for Industrial Uses. If 1-250 parking spaces are required, only one access is required. Ingress and egress shall not be less than 36 feet wide for the first 50 feet from the right-of-way and 24 feet thereafter.
(14) (a) Unless otherwise herein provided, maximum driveway widths shall not exceed 40 feet.

(15) Distance between Driveways and Intersections. Distances listed shall be measured from the stop bar at the intersection. (a) At the intersection of collector or arterial streets, driveways shall be located a minimum of 150 feet from the intersection.

On the west side of Street "A" the plans show a 24-foot wide access to the City back parking lot approximately 140 feet from the intersection of SW Boones Ferry Road & Street "A". The distance from the intersection is less than 150 feet, but is acceptable due to existing improvements. The minimum width for this access is 32 feet, 8 feet more than shown. The applicant will need to submit revised plans that show a 32-foot wide access to the City's back parking lot approximately 140 feet south of SW Boones Ferry Road without requiring relocation of existing structures, for review and approval.

On the east side of Street "A" the plans show a 40-foot private access easement with 24-foot wide driveway cut for a future driveway to Heron's Landing Apartments. The City Council adopted Resolution 5163-13 requirements include the 40-foot private access easement for Heron's Landing opposite the City parking lot access. This private access easement and driveway cut is slightly offset from the access to the City parking lot and only 110 feet away from the intersection of SW Boones Ferry Road, a Major Arterial. The driveway cut needs to be a minimum of 32 feet wide, 8 feet more than shown, and be located opposite the City's parking lot access, therefore as far as reasonable from the intersection of SW Boones Ferry Road & Street "A", for review and approval. The construction of the driveway cut is not needed at this time. The applicant will need to submit revised plans that show the Heron's Landing Apartments driveway cut to be a minimum of 32-feet wide with associated 40- foot private access easement and located opposite the City parking lot access approximately 140 feet south of SW Boones Ferry Road, for review and approval. The applicant will need to submit a copy of the private access easement allowing Heron's Landing Apartments access to Street "A", for review and approval.

Access will be needed from each remaining lot to public right-of-way or the public access easement acting as the Loop Road. Buildings E-100 and F-100 are shown to be on a future lot purchased through ODOT surplus to the east of the main entry. Buildings G-100 and H-100 are both shown on a lot is east of the main entry and north of the future ODOT lot. No access is shown to either of these lots. Both of these lots need private access easements to SW Nyberg Road. There will be a median restricting turning movements for the entire segment of the public access easement acting as the Loop Road from SW Nyberg Street to south of building 1010. In order to have full access both in and out of the main entry access at SW Nyberg Road traffic will have to circulate through the east parking area to reach the north end of this segment. The applicant will need to submit revised plans that show private access easements for the lots with buildings E-100, F-100, G-100, and H-100 to allow circulation from the intersection of the public access easement acting as the Loop Road from SW Nyberg Street through the east parking area to south of building 1010, for review and approval. The applicant will need to submit copies of the recorded documents that show private access easements for the lots with buildings E-100, F-100, G-100, and H-100 to allow circulation from the intersection of the public access easement acting as the Loop Road from SW Nyberg Street through the east parking area to south of building 1010, for review and approval.

The applicant is proposing closure of two existing accesses to SW Martinazzi Avenue, just north of SW Nyberg Street, to two accesses to SW Martinazzi Avenue from TLID 2S124B002000 at the northeast corner of SW Martinazzi Avenue & SW Nyberg Street. As all existing direct access to public right-of-way would then be closed, private access to a public street would then be to the east through TLID 2S124B001602 and then south to SW Nyberg Road through a private access easement. The applicant will need to submit a copy of the private access easement from TLID 2S124B002000 through TLID 2S124B001602 to a public right-of-way, for review and approval.

Prior to issuance of a Public Works Permit:

- *The applicant shall submit revised plans that show a 32-foot wide access to the City's back parking lot approximately 140 feet south of SW Boones Ferry Road without requiring relocation of existing structures, for review and approval.*
- *The applicant shall submit revised plans that show the Heron's Landing Apartments driveway cut to be a minimum of 32-feet wide with associated 40- foot private access easement and located opposite the City parking lot access approximately 140 feet south of SW Boones Ferry Road, for review and approval.*
- *The applicant shall submit a copy of the private access easement allowing Heron's Landing Apartments access to Street "A", for review and approval.*
- *The applicant shall submit revised plans that show private access easements for the lots with buildings E-100, F-100, G-100, and H-100 to allow circulation from the intersection of the public access easement acting as the Loop Road from SW Nyberg Street through the east parking area to south of building 1010, for review and approval.*
- *The applicant shall submit copies of the recorded documents that show private access easements for the lots with buildings E-100, F-100, G-100, and H-100 to allow circulation from the intersection of the public access easement acting as the Loop Road from SW Nyberg Street through the east parking area to south of building 1010, for review and approval.*
- *The applicant shall submit a copy of the private access easement from TLID 2S124B002000 through TLID 2S124B001602 to a public right-of-way, for review and approval.*

4. Water:

TDC 74.610 (1) Water lines shall be installed to serve each property in accordance with the Public Works Construction Code. Water line construction plans shall be submitted to the City Engineer for review and approval prior to construction.

TMC 3-3.040 (2) For nonresidential uses, separate meters shall be provided for each structure.

TMC 3-3.120 (2) The owner of property to which City water is furnished for human consumption shall install in accordance with City standards an appropriate backflow prevention device on the premises where any of the following circumstances exist: (b) Where there is a fire protection service, and irrigation service or a nonresidential service connection which is two inches or larger in size;

TMC 3-3.120 (4) requires all irrigation systems to be installed with a double check valve assembly.

TDC74.610 (3) As set forth in TDC Chapter 12, Water Service, the City has three water service levels. All development applicants shall be required to connect the proposed development site to the service level in which the development site is located.

The applicant recently obtained a Public Works Permit (PWP 13-66) to relocate and modify public sanitary sewer, stormwater, and water lines throughout this development. Construction of changes allowed under PWP 13-66 are almost complete. The submitted plans reflect most of the construction of PWP 13-66, excepting some recent field changes.

The plans show existing public water lines to the west of buildings D-120, D-125, and D130, south of building D-120, west of building E-100 and north of buildings E-100 and F-100. A private water system for fire and domestic service is looped between these two public lines with additional private fire hydrants off the public water lines north of building E-100 and south of building 1005. Both ends of the private loop and the additional private fire hydrants include double check valve assemblies. A public water line is proposed from north of building E-100 west to north of building F-100. This is acceptable. The applicant will need to submit final water system plans, for review and approval. The applicant will need to construct the public water system.

The plans show a 15-foot wide public water line easement over proposed public water lines. This is acceptable. The applicant will need to grant a 15-foot wide public water line easement over proposed public water lines.

The City will need access to the public water line for routine maintenance. No access easements are shown. The applicant will need to submit revised plans that show access easements to public water lines, for review and approval. The applicant will need to grant an access easement to public water lines.

The plans do not show private water line easements over the private looped water system serving all lots. Private water line easements are needed to assure the ability of all lots to obtain fire and domestic water service. The applicant will need to submit copies of private water line easements.

Private water lines are shown across public utility easements, some crossing at angles or changing direction within the easement. Private lines crossing public easements should be minimized and only cross perpendicular to public lines. The applicant will need to submit revised plans that minimize private water lines crossing public utility easements and only cross perpendicular to the public lines, for review and approval.

Trees are shown within public water line easements. Trees need to be located outside public water line easements. The applicant will need to submit revised plans that show trees located outside public water line easements, for review and approval.

Note: Any trees within 10 feet of a public water line will need a 24-inch deep, 10-foot long root barrier centered on the tree trunk at the edge of the public water easement.

Note: This site is located in service level 'A' and the proposed connection to the public system is within this service level. The 'A' water service level has unique operating characteristics. It needs to be noted that flow tests need to be performed, or calculated, under summertime conditions.

Note: Private water pumps may be needed for domestic use or required for fire systems.

With SW Seneca Street construction, the public water line south of the City Offices will need to be relocated to within SW Seneca Street. The plans do not show this relocation. The applicant will need to submit revised plans that show the public water line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

Irrigation for plantings maintained by the City along I-5 and in the median of SW Tualatin-Sherwood Road are served by a line south of Wendy's that crosses ODOT property north of SW Nyberg Road. With the reconstruction of SW Nyberg Road and proposed development, the irrigation line will be affected. The applicant will need to submit revised plans that show a public irrigation line to the irrigation system serving the City maintained plantings along I-5 and in the median of SW Tualatin-Sherwood with associated water meter and backflow prevention, for review and approval. The applicant will need to construct a public irrigation line to the irrigation system serving the City maintained plantings along I-5 with associated water meter and backflow prevention.

Prior to issuance of a Public Works Permit:
- *The applicant shall submit final water system plans, for review and approval.*
- *The applicant shall grant a 15-foot wide public water line easement over proposed public water lines.*
- *The applicant shall submit revised plans that show access easements to public water lines, for review and approval.*
- *The applicant shall grant an access easement to public water lines.*
- *The applicant shall submit copies of private water line easements.*
- *The applicant shall submit revised plans that minimize private water lines crossing public utility easements and only cross perpendicular to the public lines, for review and approval.*
- *The applicant shall submit revised plans that show trees located outside public water line easements, for review and approval.*
- *The applicant shall submit revised plans that show the public water line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.*
- *The applicant shall construct a public irrigation line to the irrigation system serving the City maintained plantings along I-5 and in the median of SW Tualatin-Sherwood with associated water meter and backflow prevention.*

Prior to issuance of a Certificate of Occupancy:
- *The applicant shall construct the public water system.*
- *The applicant shall construct a public irrigation line to the irrigation system serving the City maintained plantings along I-5 and in the median of SW Tualatin-Sherwood with associated water meter and backflow prevention.*
- *The applicant shall complete all the public water improvements and have them accepted by the City.*

5. Sanitary Sewer:

TDC 74.620 (1) Sanitary sewer lines shall be installed to serve each property in accordance with the Public Works Construction Code. Sanitary sewer construction plans and calculations shall be submitted to the City Engineer for review and approval prior to construction.

TDC 74.330 Utility Easements (1) Utility easements for water, sanitary sewer and storm drainage facilities, telephone, television cable, gas, electric lines and other public utilities shall be granted to the City.

The applicant recently obtained a Public Works Permit (PWP 13-66) to relocate and modify public sanitary sewer, stormwater, and water lines throughout this development. Construction of changes allowed under PWP 13-66 are almost complete. The submitted plans reflect most of the construction of PWP 13-6, excepting some recent field changes.

The plans show existing public sanitary sewer lines to the west of buildings D-120, D-125, and D130, north of buildings D-130, D110, 100, and 1010, and south of building E-100. A proposed public sanitary sewer line is shown from north of building C east to south of building 1040 then south to west of building F-100. This is acceptable. The applicant will need to submit sanitary sewer system plans, for review and approval. The applicant will need to construct the public sanitary sewer system.

The plans show a 15-foot wide public sanitary sewer line easement over proposed public water lines. This is acceptable. The applicant will need to grant a 15-foot wide public sanitary sewer line easement over proposed public water lines.

The City will need access to the public sanitary sewer manholes for routine maintenance. No access easements are shown. The applicant will need to submit revised plans that show access easements to public sanitary sewer manholes, for review and approval. The applicant will need to grant an access easement to public sanitary sewer manholes.

North of building 1005 one private sanitary sewer line crosses public easements multiple times to locate a grease interceptor within parking spaces. The building has a second lateral directly connecting to the public sanitary sewer line. Both laterals connect cross public easements at angles less than perpendicular. Private lines crossing public easements should be minimized and only cross perpendicular to public lines. The applicant will need to submit revised plans that minimize private sanitary sewer lines crossing public utility easements and only cross perpendicular to the public lines, for review and approval.

Trees are shown within public sanitary sewer line easements. Trees need to be located outside public sanitary sewer line easements. The applicant will need to submit revised plans that show trees located outside public sanitary sewer line easements, for review and approval.

Note: Any trees within 10 feet of a public sanitary sewer line will need a 24-inch deep, 10-foot long root barrier centered on the tree trunk at the edge of the public sanitary sewer easement.

With SW Seneca Street construction, the public sanitary sewer line south of the City Offices will need to be relocated to within SW Seneca Street. The plans do not show this relocation. The applicant will need to submit revised plans that show the public sanitary sewer line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

Prior to issuance of a Public Works Permit:

- *The applicant shall submit sanitary sewer system plans, for review and approval.*
- *The applicant shall grant a 15-foot wide public sanitary sewer line easement over proposed public water lines.*
- *The applicant shall submit revised plans that show access easements to public sanitary sewer manholes, for review and approval.*
- *The applicant shall grant an access easement to public sanitary sewer manholes.*
- *The applicant shall submit revised plans that minimize private sanitary sewer lines crossing public utility easements and only cross perpendicular to the public lines, for review and approval.*
- *The applicant shall submit revised plans that show trees located outside public sanitary sewer line easements, for review and approval.*
- *The applicant shall submit revised plans that show the public sanitary sewer line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.*

Prior to issuance of a Certificate of Occupancy:

- *The applicant shall construct the public sanitary sewer system.*
- *The applicant shall complete all the public sanitary sewer improvements and have them accepted by the City.*

6. Storm Drainage & Water Quality:

TDC 74.630 Storm Drainage System

(1) Storm drainage lines shall be installed to serve each property in accordance with City standards. Storm drainage construction plans and calculations shall be submitted to the City Engineer for review and approval prior to construction.

(2) The storm drainage calculations shall confirm that adequate capacity exists to serve the site. The discharge from the development shall be analyzed in accordance with the City's Storm and Surface Water Regulations (TMC 3-5).

TDC 74.650 Water Quality, Storm Water Detention and Erosion Control

(2) On all other development applications, prior to issuance of any building permit, the applicant shall arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from Clean Water Services.

(3) For on-site private and regional non-residential public facilities, the applicant shall submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the City, for the water quality facility for the City's review and approval. The applicant shall submit an erosion control plan prior to

issuance of a Public Works Permit. No construction or disturbing of the site shall occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City.

TMC 3-5-220 Criteria for Requiring On-Site Detention to be Constructed.
(1) There is an identified downstream deficiency, as defined in TMC 3-5.210, and detention rather than conveyance system enlargement is determined to be the more effective solution.
(2) There is an identified regional detention site within the boundary of the development.

TMC 3-5-330 Permit Required. Except as provided in TMC 3-5.310, no person shall cause any change to improved or unimproved real property that will, or is likely to, increase the rate or quantity of run-off or pollution from the site without first obtaining a permit from the City and following the conditions of the permit.

TMC 3-5-380 Criteria for Granting Exemptions to Construction of On-Site Water Quality Facilities. A regional public facility may be constructed to serve private non-residential development provided:
(1) The facility serves more than one lot; and
(2) All owners sign a stormwater facility agreement; and
(3) Treatment accommodates reasonable worst case impervious area for full build-out, stormwater equivalent to existing or proposed roof area is privately treated in LIDA facilities, and any detention occurs on each lot.

The applicant recently obtained a Public Works Permit (PWP 13-66) to relocate and modify public sanitary sewer, stormwater, and water lines throughout this development. Construction of changes allowed under PWP 13-66 are almost complete. The submitted plans reflect most of the construction of PWP 13-66, excepting some recent field changes.

The plans show existing public stormwater lines to the west of buildings D-120, D-125, and D130, north of buildings D-130, D110, 100, 1010 and 1040, west of building 1040, and east of buildings H-100 and G-100. A proposed public stormwater facility treating SW Nyberg Street is shown and south of building E-100 partially within right-of-way with the rest within a public stormwater easement. The facility is shown over a public water line easement. The facility needs to be outside of the public water line easement. The applicant will need to submit revised stormwater system plans that include the public stormwater treatment facility within a public stormwater easement outside of the public water line easement, for review and approval. The applicant will need to grant a public stormwater facility easement for the public stormwater facility. The applicant will need to construct the public stormwater system.

Private stormwater lines are shown across and catch basins within public utility easements, some crossing at angles or changing direction within the easement. Private lines crossing public easements should be minimized and only cross perpendicular to public lines and private facilities and structures should be located outside of public easements. The applicant will need to submit revised plans that minimize private stormwater lines crossing public utility easements and only cross perpendicular to the public lines and private facilities and structures located outside of public easements, for review and approval.

Private stormwater treatment for the entire site's impervious area is accommodated within a system of filter vaults scattered throughout the site. This is acceptable. One filter vault and connecting private stormwater line treating runoff for the private access easement acting as the Loop Road is shown within SW Nyberg Street right-of-way. Private treatment facilities and lines need to be on private property. The applicant will need to submit revised plans that show all private stormwater treatment facilities and lines including the filter vault at the intersection of the private access easement acting as the Loop Road is shown within SW Nyberg Street to be located on private property, for review and approval.

The applicant has provided preliminary stormwater calculations that indicate that adequate treatment is provided. Final stormwater treatment and conveyance calculations are needed to show that the entire system is adequate. The applicant will need to submit final public and private stormwater treatment and conveyance calculations, for review and approval. The applicant will need to submit a copy of a recorded Private stormwater maintenance agreement, for review and approval.

South of building 1030 and east of building 1040 a total of three LIDA planters are shown within parking landscaping. These LIDA planters are in excess of the required treatment. This is acceptable. The applicant will need to submit final plans that show three LIDA planters within parking landscaping south of building 1030 and east of building 1040, for review and approval.

South of building 1040 a LIDA rain garden is shown within parking lot landscaping over a public stormwater line and easement. These LIDA rain garden is in excess of the required treatment. No infiltration, treatment facilities or private piping are allowed over public stormwater easements. The applicant will need to submit revised plans that do not show the LIDA rain garden over public easements, for review and approval.

The ODOT Response to Local Land Use Notification dated October 21, 2013 correctly states "The city has also agreed to maintaining the stormwater relating to the ODOT drainage via an existing ODOT/Washington County IGA for the signalized intersection on Nyberg Rd." Operations' maintenance crews need access to the public stormwater facility and manholes for routine maintenance. No access easements are shown. The applicant will need to submit revised plans that show access easements to the public stormwater facility and manholes, for review and approval. The applicant will need to grant a public access easement to the public stormwater facility and manholes.

Trees are shown within public stormwater line easements. Trees need to be located outside public stormwater line easements. The applicant will need to submit revised plans that show trees located outside public stormwater line easements, for review and approval.

Note: Any trees within 10 feet of a public stormwater line will need a 24-inch deep, 10-foot long root barrier centered on the tree trunk at the edge of the public stormwater easement.

The parking lot north of the City offices is shown to be reconfigured in order to construct Street "A". The existing public stormwater system is shown to be partially reconfigured, but is not connected to any public stormwater line. The applicant needs to submit revised plans that include a complete and connected stormwater treatment and conveyance system for the parking lot north of the City offices, for review and approval.

The plans show mechanical filters treating the public Street "A" and future SW Seneca Street. As existing public treatment of adjacent public lots lack adequate capacity, redeveloping the existing system to connect and treat the new impervious area would be impractical, and the additional impervious area is small, this is acceptable. The applicant will need to submit final plans that show mechanical filters treating the public Street "A" and future SW Seneca Street, for review and approval.

The City will need access to the public stormwater manholes for routine maintenance. No access easements are shown. The applicant will need to submit revised plans that show access easements to public stormwater manholes, for review and approval. The applicant will need to grant an access easement to public stormwater manholes.

With SW Seneca Street construction, the public stormwater line south of the City Offices will need to be relocated to within SW Seneca Street. The plans do not show this relocation. The applicant will need to submit revised plans that show the public stormwater line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

Prior to issuance of a Water Quality Permit:

- *The applicant shall grant a public stormwater facility easement for the public stormwater facility.*
- *The applicant shall submit revised plans that show all private stormwater treatment facilities and lines including the filter vault at the intersection of the private access easement acting as the Loop Road is shown within SW Nyberg Street to be located on private property, for review and approval.*
- *The applicant shall submit final plans that show three LIDA planters within parking landscaping south of building 1030 and east of building 1040, for review and approval.*
- *The applicant shall submit revised plans that do not show the LIDA rain garden over public easements, for review and approval.*
- *The applicant shall submit revised plans that show access easements to the public stormwater facility and manholes, for review and approval.*
- *The applicant shall grant a public access easement to the public stormwater facility and manholes.*
- *The applicant shall submit revised plans that include a complete and connected stormwater treatment and conveyance system for the parking lot north of the City offices, for review and approval.*
- *The applicant shall submit final plans that show mechanical filters treating the public Street "A" and future SW Seneca Street, for review and approval.*

Prior to issuance of a Public Works Permit:

- *The applicant shall submit revised stormwater system plans that include the public stormwater treatment facility within a public stormwater easement outside of the public water line easement, for review and approval.*

- *The applicant shall submit revised plans that minimize private stormwater lines crossing public utility easements and only cross perpendicular to the public lines and private facilities and structures located outside of public easements, for review and approval.*
- *The applicant shall submit revised plans that show trees located outside public stormwater line easements, for review and approval.*
- *The applicant shall submit revised plans that show access easements to public stormwater manholes, for review and approval.*
- *The applicant shall grant an access easement to public stormwater manholes.*
- *The applicant shall submit revised plans that show the public stormwater line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.*

Prior to issuance of a Certificate of Occupancy:
- *The applicant shall construct the public stormwater system.*
- *The applicant shall complete all the public stormwater improvements and have them accepted by the City.*

7. <u>Grading</u>:
TDC 74.640 (1) Development sites shall be graded to minimize the impact of storm water runoff onto adjacent properties and to allow adjacent properties to drain as they did before the new development. (2) A development applicant shall submit a grading plan showing that all lots in all portions of the development will be served by gravity drainage from the building crawl spaces; and that this development will not affect the drainage on adjacent properties. The City Engineer may require the applicant to remove all excess materials from the development site.

The submitted plans appear to minimize the impact of stormwater runoff to adjacent properties and allow adjacent properties to drain as they did before the development. This requirement is met.

8. <u>Erosion Control</u>:
TDC 74.650 (3) ..the applicant shall submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site shall occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City. In order to reduce the amount of sediment discharged into the public storm system, erosion control measures are required during construction. If the site is over 1 acre in size a NPDES Erosion Control Permit is required.

If the development's disturbed area during construction is between 1 and 5 acres in size, a 1200-CN NPDES Erosion Control Permit is required. If it is over 5 acres, a 1200-C NPDES Erosion Control Permit is required. The proposed disturbed area of the development site is a total of approximately 31.91 acres. A NPDES Erosion Control Permit is required. The applicant has obtained a 1200-C for a portion of the site that included demolition of two buildings, construction of PWP 13-66, and grading for the future Cabela's building. The applicant will need to submit an amended 1200-C for the remainder of the site, for review and approval.

A City of Tualatin erosion control permit is required if there is construction or disturbing of the site. The applicant has obtained a City of Tualatin erosion control permit for a portion of the site. An erosion control permit needs to include all areas to be disturbed. The applicant will need to obtain a City of Tualatin erosion control permit that includes the entire site area to be disturbed.

Note: Both the City of Tualatin erosion control permit and 1200-C need to reflect the balanced cut and fill of the floodplain.

Prior to issuance of a Building Permit:

- *The applicant shall obtain a City of Tualatin erosion control permit that includes the entire site area to be disturbed.*
- *The applicant shall submit an amended 1200-C for the remainder of the site, for review and approval.*

9. Stormwater Connection Permit:

TDC 74.650 Water Quality, Storm Water Detention and Erosion Control (2) On all other development applications, prior to issuance of any building permit, the applicant shall arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from the Unified Sewerage Agency.

The applicant has submitted a CWS Service Provider Letter (SPL) indicating that Sensitive Areas exist on-site. In the SPL the applicant has received an initial response indicating that their proposed development meets CWS requirements. CWS has submitted a Memorandum dated October 17, 2013, with review comments.

CWS will indicate final approval of activities relating to wetlands & buffers after final permit plans are submitted prior to issuance of associated permits. Any vegetated corridor mitigation required in the SPL will need to be included in the Water Quality Permit. The applicant will need to submit final plans that comply with the Service Provider Letter and CWS Memorandum comments, for review and approval. The applicant will need to obtain a Stormwater Connection Permit.

Prior to the issuance of a Water Quality Permit:

- *The applicant shall submit final plans that comply with the Service Provider Letter conditions and Clean Water Services Memorandum comments, for review and approval.*
- *The applicant shall obtain a Stormwater Connection Permit.*

10. Floodplain District:

TDC 70.110 Development Permit Required.

A development permit shall be obtained before construction or development begins within any area of special flood hazard established by TDC 70.050. The permit shall be for all structures, including manufactured homes, as set forth in the "Definitions," and for all other development, including fill and other activities, also as set forth in the "Definitions."

This site includes zones "A10" and "B" floodplain based on FEMA FIRM 410227 0002 D, dated February 19, 1987. A revision to the FIRM is in process that is expected to be adopted by FEMA. While not officially approved by FEMA for insurance purposes, as responsible managers of the local floodplain the best known information will be used. This revision shows the Base Flood Elevation for this area varies from 129.8 feet on the north side of SW Boones Ferry Road, 128.1 west of SW Martinazzi Avenue, 129.3 feet along the east side of TLID 2S124B001500, 127.9 feet near the midpoint of TLID 2S124A002700, and 126.8 feet on the west side of I-5 based on the NAVD 1988 datum. To convert the NAVD datum to the NGVD 1929 within Tualatin subtract 3.52 feet. A Flood Hazard Area Development Permit (FHADP) is required.

Balanced cut and fill is required. Additionally, Resolution 5163-13 which approved the master plan reiterates no increase in the 100-Year Floodplain associated with improvements to public "Street A" and SW Seneca Street. The submitted narrative indicates that balanced cut and fill will be performed. This is acceptable.

The FHADP requires a 1st survey (that shows existing conditions) prior to a building permit, a 2nd survey (that shows the finished floor elevation at least one foot above the base flood elevation) prior to a framing inspection, and a 3rd survey (that shows the as-built finished floor elevation at least one foot above the base flood elevation) prior to occupancy.

The applicant has not obtained a FHADP. The applicant has not submitted any surveys. The applicant will need to submit a completed FHADP application and a 1st survey prior to issuance of a building permit. The applicant will need to submit a 2nd survey prior to a framing inspection. The applicant will need to submit a 3rd survey prior to a certificate of occupancy.

Prior to issuance of a Building Permit:

- *Prior to a Framing Inspection:*
- *The applicant shall submit a 2nd survey.*

Prior to issuance of a Certificate of Occupancy:

- *The applicant shall submit a 3rd survey.*

11. Natural Resource Protection Overlay District (NRPO):

72.020(1) (1) The designated significant natural resources are the Greenways and Natural Areas on Map 72-1, which shows the general location of the NRPO District. The general locations of Other Natural Areas are shown on the Recreation Resources Map (Figure 3-4) of the Parks and Recreation Master Plan.

72.030 Greenways.

(1) Greenways can exhibit diverse characteristics. Those along the Tualatin River and Hedges, Nyberg and Saum Creeks can be natural in some sections and have pedestrian and bike paths in other sections. Greenways in built-up areas such as in subdivisions are typically landscaped with lawn and often include concrete pedestrian/bike paths.

(2) Riverbank Greenway (NRPO-GR).

(a) Except as provided in Subsection (b), the NRPO District along the south bank of the Tualatin River, beginning at the City's western Urban Growth Boundary (UGB) and extending to the City' s eastern UGB, and along the north bank of the Tualatin River from the northwest corner of Tax Lot 1007 to the southeast corner of Tax Lot 1006, Washington County Tax Map 2S1 24B, shall have a width as measured from a line 40 feet inland from the top of the bank extending to the middle of the river. The top of the bank shall be where the landform called "the bank" changes from a generally up-slope feature to a generally flat feature. The NRPO District shall automatically apply to property annexed to the City, except as provided for in Appendix G to the Parks and Recreation Master Plan.

(b) For the area 300 feet east and west of the I-5 right-of-way as shown on Map 72-1, the NRPO District on the south bank of the Tualatin River shall have a width as measured from a line 75 feet in-land from the top of the bank extending to the middle of the river.

72.060(1) Except as provided in Subsection (2), no building, structure, grading, excavation, placement of fill, vegetation removal, impervious surface, use, activity or other development shall occur within Riverbank, Creek and Other Greenways, and Wetland and Open Space Natural Areas.

72.060(2) The following uses, activities and types of development are permitted within Riverbank, Creek and Other Greenways, and Wetland and Open Space Natural Areas provided they are designed to minimize intrusion into riparian areas:

(a) Public bicycle or pedestrian ways, subject to the provisions of TDC 72.070.

(b) Public streets, including bridges, when part of a City approved transportation plan, and public utility facilities, when part of a City approved plan and provided appropriate restoration is completed.

(c) Except in Wetland Natural Areas, private driveways and pedestrian ways when necessary to afford access between portions of private property that may be bisected by a Greenway or Open Space Natural Area.

(d) Except in Creek Greenways and Wetland Natural Areas, outdoor seating for a restaurant within the Central Urban Renewal District, but outside of any sensitive area or its vegetated corridor.

(e) Public parks and recreational facilities including, but not limited to, boat ramps, benches, interpretive stations, trash receptacles and directional signage, when part of a City-approved Greenway or Natural Area enhancement plan.

(f) Landscaping, when part of a landscape plan approved through the Architectural Review process. City initiated landscape projects are exempt from the Architectural Review process. Landscaping in Greenways and Natural Areas shall comply with the approved Plant List in the Parks and Recreation Master Plan. When appropriate, technical advice shall be obtained from the Oregon Department of Fish and Wildlife, U.S. Soil Conservation Service, or similar agency, to ensure the proposed landscaping will enhance the preservation of any existing fish or wildlife habitats in the vicinity.

(g) Wildlife protection and enhancement, including the removal of non-native vegetation and replacement with native plant species.

(h) Except in Wetland Natural Areas, public boating facilities, irrigation pumps, water-related and water-dependent uses including the removal of vegetation necessary for the development of water-related and water-dependent uses, and replacement of existing structures with structures in the same location that do not disturb additional riparian surface.
(i) In Wetland Natural Areas, perimeter mowing and other cutting necessary for hazard prevention.

72.060(3) The City may, through the subdivision, conditional use, architectural review, or other development approval process, attach appropriate conditions to approval of a development permit. Such conditions may include, but are not limited to:
(a) Use of Greenways and Natural Areas for storm drainage purposes;
(b) Location of approved landscaping, pedestrian and bike access areas, and other non-building uses and activities in Greenways and Natural Areas;
(c) Setback of proposed buildings, parking lots, and loading areas away from the Greenway and Natural Area boundary.

72.110 Easements for Pedestrian and Bicycle Access. In any portion of the NRPO District, the City may, through the subdivision, partition, conditional use, architectural review, or other applicable development approval process, require that easements for pedestrian and bicycle access and maintenance uses be granted as a condition of approval when said easements are necessary to achieve the purposes of the Parks and Recreation Master Plan, Greenways Development Plan, or Bikeways Plan.

74.310 Greenway, Natural Area, Bike, and Pedestrian Path Dedications and Easements.
(1) Areas dedicated to the City for Greenway or Natural Area purposes or easements or dedications for bike and pedestrian facilities during the development application process shall be surveyed, staked and marked with a City approved boundary marker prior to acceptance by the City.

The plans show a proposed greenway trail easement extending from Street "A" east to I-5 meandering south of Heron's Landing Apartments and the Tualatin River and north of the proposed development. No construction of trails, viewing areas, or associated water quality treatment is proposed. The trail easement includes two connections to the south side of Heron's Landing Apartments plus one to the east side and one to the proposed development north of building 1010. The abovementioned trails include a 16-foot easement that allow for future construction of a cross section of 12-foot wide path with additional 2-feet on either side for LIDA water quality treatment. This easement width is acceptable. The plans show a trail connection north of building 1040 to the development that is 6-feet wide without an easement. A 16-foot wide easement for a 12-foot wide path with additional 2-feet on either side for LIDA water quality treatment is needed. The applicant will need to submit revised plans that show a trail connection from the development north of building 1040 that includes a 16-foot wide greenway trail easement that that allow for future construction of a cross section of a 12-foot wide path with additional 2-feet on either side for LIDA water quality treatment, for review and approval.

A greenway trail connection to the west along the Tualatin River is shown. This is acceptable. The relation to the top of bank is not indicated. In order to connect to the west the trail needs to be within 40-feet of the top of bank. The applicant will need to submit revised plans that show the greenway trail connection to the west along the Tualatin River within 40-feet of the top of bank, for review and approval.

A greenway trail connection to the east along the Tualatin River is shown. This is acceptable.
On the west side of I-5 at the Tualatin River to access future north (south of shared pathway at locations shown on Exhibit M (Transportation Plant) in the Master Plan set. This is not shown on the submitted plans. The applicant will need to submit revised plans that show a greenway trail connection on the west side of I-5 at the Tualatin River to access future north (south of shared pathway at locations shown on Exhibit M (Transportation Plant) in the Master Plan set, for review and approval.

Three greenway trail viewing areas are shown north of the greenway trail north of buildings 1040 and N-100. No construction of the viewing areas or associated water quality treatment is proposed. No easements are shown for the viewing areas. The greenway trail easement needs to include all public areas including viewing areas. The applicant will need to submit revised plans that show a greenway trail easement over the three future viewing areas north of building 1040 and N-100, for review and approval.

The greenway trail, viewing areas, and associated water quality treatment areas are not proposed for construction at this time. Locations of the greenway trail and viewing areas are approved during evaluation, obtaining a Clean Water Services Service Provider Letter, and approval of construction plans. No Clean Water Services Service Provider Letter was submitted to assure a location for construction. To assure that the greenway trail can be constructed within the area north of this development an easement will need to be provided that could allow for the trail to be located either within the area south of Heron's Landing Apartments and the Tualatin River and north of the development or for a specific approved location with an associated Clean Water Services Service Provider Letter. The applicant will need to grant an easement to allow for the trail to be located either within the area south of Heron's Landing Apartments and the Tualatin River and north of the development or for a specific approved location as shown with an associated Clean Water Services Service Provider Letter.

The greenway trail connects to SW Nyberg Road via a 14-foot public shared pathway between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road. This is acceptable. The applicant will need to submit final plans that show a 14-foot public shared pathway from the greenway trail between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road, for review and approval. The applicant will need to grant a 14-foot easement for a public shared pathway from the greenway trail between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road.

Prior to issuance of a Building Permit:

- *The applicant shall submit revised plans that show a trail connection from the development north of building 1040 that includes a 16-foot wide greenway trail easement that that allow for future construction of a cross section of a 12-foot wide path with additional 2-feet on either side for LIDA water quality treatment, for review and approval.*
- *The applicant shall submit revised plans that show the greenway trail connection to the west along the Tualatin River within 40-feet of the top of bank, for review and approval.*
- *The applicant shall submit revised plans that show a greenway trail connection on the west side of I-5 at the Tualatin River to access future north (south of shared pathway at locations shown on Exhibit M (Transportation Plant) in the Master Plan set, for review and approval.*
- *The applicant shall submit revised plans that show a greenway trail easement over the three future viewing areas north of building 1040 and N-100, for review and approval.*
- *The applicant shall grant an easement to allow for the trail to be located either within the area south of Heron's Landing Apartments and the Tualatin River and north of the development or for a specific approved location as shown with an associated Clean Water Services Service Provider Letter.*
- *The applicant shall submit final plans that show a 14-foot public shared pathway from the greenway trail between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road, for review and approval.*
- *The applicant shall grant a 14-foot easement for a public shared pathway from the greenway trail between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road.*

12. Public Comment

The public comment period for the public facilities portion of this decision was from December 3 to December 17, 2013. Comments related to the public facilities review were submitted:

- Seth J. King, Perkins Coie, Comment Letter, dated December 3, 2013
- Christe White, Rebuttal to Perkins Coie Letter, dated December 9, 2013
- Jan Giunta, Comments Regarding Public Facilities Decision, December 17, 2013
- Seth J. King, Perkins Coie, Comment Letter, dated December 17, 2013

Aspects of the letters that can have a response within the Public Facilities Decision are in the comments below followed by relevant sections of code.

Resolution 5163-13 approved Master Plan 13-01, Nyberg Rivers. This master plan creates the ability to allow development to occur in the direction of the plan. The master plan doesn't create a requirement for development to occur in any specific timeframe.

Seth King's letter dated December 3, 2013 stated:

- The Application does not comply with the Project Master Plan.
  The City Council approved the Project Master Plan, subject to a finding that the Seneca Street extension between the Project and SW Martinazzi Avenue, including a signal at SW Martinazzi Avenue, was a "needed" transportation improvement.
- The Project does not satisfy TDC 74.140 or TDC 74.420(8) because there is no requirement or assurance that the Seneca Street extension will be constructed prior to issuance of a certificate of occupancy for the Project.

The Public Facilities Report and Decision implements this condition by requiring SW Seneca Street to be constructed. However, per TDC 74.430, the City Engineer has the ability to modify the conditions in certain instances. Construction of SW Seneca Street would require demolition of the existing Council Building. City Council has not made a determination as to the timing of Council Building demolition. Even if the applicant had not proposed the fee-in-lieu condition, pursuant to TDC 74.430, the City would have imposed this condition. The City Engineer has the authority to modify a condition to eliminate impractical or detrimental results. Requiring the Seneca extension against the wishes of the City Council if the City Council decides not to demolish the Council building is both impractical and detrimental. Therefore, modifying the condition to allow for a fee-in-lieu if City Council decides not to demolish the Council building is a proper modification to eliminate an impractical and detrimental result.

- The Master Plan itself is deficient and on appeal to the Land Use Board of Appeals ("LUBA") and thus cannot provide a factual base to support approval of the Application.

Seth King argues that the master plan is on appeal and therefore all subsequent decisions that rely on the master plan must be in effect "stayed" until the resolution of that appeal. The City Council granted the Master Plan approval. Just because the decision has been appealed to LUBA, there are no grounds within the TDC that would support Mr. King's request for a local stay on the decision.

- Because Applicant does not own or control the ODOT Parcel, Applicant cannot demonstrate that it is feasible to complete the development as proposed. Further, Applicant has not demonstrated that it is feasible to complete the development in compliance with applicable standards if the ODOT Parcel is removed.

The City agrees that ODOT has consented to the construction of said improvements to the current ODOT right-of-way. The improvements are required to be constructed prior to issuance of a certificate of occupancy.

Christe White's Rebuttal Letter states in part:

- Mr. King argues that Seneca Street must be built before occupancy to meet the master plan conditions of approval. This is not correct. The master plan proceedings reviewed traffic reports from 3 experts, reaching different conclusions based on differing assumptions and methodologies. The applicant's traffic consultant, Kittelson and Associates concluded that the Seneca Street extension was not needed to maintain an acceptable level of service at the Seneca Street driveway. DKS disagreed with this conclusion. Kittelson rebutted the DKS Report in the master plan hearing before the City Council as well as part of the written record for the Master Plan proceedings. The City concluded in the master plan:

> "Based on a review of all of the traffic evidence in the record, the City finds that the best operation and functional transportation environment is achieved with a signalized extension of Seneca Street and the closure of the driveways south of City Hall and south of the Council Building."
> (Master Plan Decision at page 11)

The Public Facilities Report and Decision implements this condition by establishing the timing of construction. If the applicant obtains the right-of-way before April 1, 2014, Seneca will be constructed with the Nyberg Rivers project; if it is not, CenterCal will contribute to the improvement consistent with the City's finding on optimal operations.

Lastly, under TDC 74.430, the City Engineer has the authority to modify conditions of approval where the condition or the timing of the condition is detrimental to the City's interests. If the City is not prepared to make a decision on the City facilities within the Seneca Street extension by April 1, 2014, forcing such a decision may be detrimental to the City's interest. Thus, permitting a fee in lieu of the construction equally implements the condition while protecting the City's timing interests.

Further, under TDC 74.410(5) the City Engineer is specifically permitted to require the applicant to participate in the funding of future off-site street extensions, particularly here where the applicant has volunteered such a condition to address the City's timing concerns with the Seneca Street extension. For these reasons, we ask the ARB to reject the arguments presented by Mr. King on Seneca Street.

The City agrees with the sections provided by the applicant above on this issue.

- Mr. King argues that the master plan is on appeal and therefore all subsequent decisions that rely on the master plan must be in effect "stayed" until the resolution of that appeal sometime next year.

  There are two problems with this request. First, the TDC does not have this authority. In fact the code requires only that the applicant seek and obtain City approval of a master plan in a master plan area before proceeding with the ARB review. The applicant sought and obtained that approval before proceeding with the ARB.

  Mr. King has not filed for or obtained a stay of the master plan before the Land Use Board of Appeals. To do so, he would have to demonstrate:

  (1) (a) A colorable claim of error in the land use decision or limited land use decision under review; and

  (b) That the petitioner will suffer irreparable injury if the stay is not granted.

Exhibit 2

(2) If the board grants a stay of a quasi judicial land use decision or limited land use decision approving a specific development of land, it shall require the petitioner requesting the stay to give an undertaking in the amount of $5,000. The undertaking shall be in addition to the filing fee and deposit for costs required under ORS 197.830 (9). ORS 197.845.

Given the traffic evidence in the record and the distance of Mr. King's client from the Seneca Street extension, it is highly unlikely one would be able to prove irreparable injury to Mr. King's client or a colorable claim of error.

Thus there are no grounds within the TDC that would support Mr. King's request for a local stay on the decision.

The City agrees with the sections provided by the applicant above on this issue.

- The record adequately demonstrates that the applicant can meet the condition of approval that requires the applicant to construct the Nyberg Road improvements. The area of improvement is currently owned by ODOT. As the record demonstrates, ODOT consented to the application, approved the design for the additional turn lanes, bike lane and pedestrian improvements and consented to the closure of 75th Avenue. The ODOT right-of-way at issue is not subject to the open bidding process. ODOT is currently having the right-of-way appraised and the applicant and ODOT are scheduled to close on the transaction by the end of 2013 or the first month of 2014. The facts demonstrate that it is very feasible to implement the Nyberg Road improvements and such improvements will be constructed prior to the final certificate of occupancy of the center.

  The City is permitted to impose reasonable conditions of approval for off-site improvements. Here the condition is both reasonable and feasible to implement. It is the applicant's burden to demonstrate compliance with the condition, which the applicant will do before the certificate of occupancy is issued.

The City agrees that ODOT has consented to the construction of said improvements to the current ODOT right-of-way. The improvements are required to be constructed prior to issuance of a certificate of occupancy.

Jan Giunta letter dated December 17, 2013 included four areas of concern:

- Jan Giunta requested to not include on-street parking within the SW Seneca Street cross-section. Requirements for development are created within the land use decision. Within the land use decision the City Engineer has opportunity to review proposed development and create requirements to mitigate impacts of the development. This enables requirements to be shaped more appropriately for nonstandard situations. One such decision was to not include on-street parking within the SW Seneca Street cross-section as it is inconsistent with the character of the neighborhood, would cause conflicts with queues, and create concerns for public safety in an active area.

- Jan Giunta requested that the SW Seneca Street extension obtain the designation of a "No Truck" route. The applicant has indicated that SW Seneca Street will not be used for truck traffic.

- Jan Giunta requested that the crosswalk across SW Seneca Street be raised and lighted. The details of construction will be finalized within the Public Works Permit submittal in accordance with the Public Works Construction Code. Raised crosswalks are allowed under Public Works Construction Code. The possibility of lighting the crosswalk will be evaluated.

- Jan Giunta requested clarification as to the crosswalk planned in the area of SW Boones Ferry Road and SW Street "A" and was concerned that it would cross SW Boones Ferry Road. No crosswalks are proposed or required for construction to cross over SW Boones Ferry Road at the intersection with SW Street "A". The crosswalk shown on the plan and required for construction is to cross over the entrance of SW Street "A" south of SW Boones Ferry Road as shown on the submitted plans.

Seth King's letter dated December 17, 2013 included these areas of concern:

- The application does not comply with the Project Master Plan. The City Council approved the Project Master Plan, subject to a finding that the Seneca Street extension was a needed transportation improvement.
- The project does not satisfy TDC 74.140 or TDC 74.420(8) because there is no requirement or assurance that the Seneca Street extension will be constructed prior to issuance of a certificate of occupancy for the Project.

The Public Facilities Report and Decision implements the conditions of the Master Plan by requiring SW Seneca Street to be constructed.

74.420 Street Improvements.
(16) The City Engineer may determine that, although concurrent construction and placement of the improvements in (14) and (15) of this section, either individually or collectively, are impractical at the time of development, the improvements will be necessary at some future date. In such a case, the applicant shall sign a written agreement guaranteeing future performance by the applicant and any successors in interest of the property being developed. The agreement shall be subject to the City's approval.

74.430 Streets, Modifications of Requirements in Cases of Unusual Conditions.
When, in the opinion of the City Engineer, the construction of street improvements in accordance with TDC 74.420 would result in the creation of a hazard, or would be impractical, or would be detrimental to the City, the City Engineer may modify the scope of the required improvement to eliminate such hazardous, impractical, or detrimental results. Examples of conditions requiring modifications to improvement requirements include but are not limited to horizontal alignment, vertical alignment, significant stands of trees, fish and wildlife habitat areas, the amount of traffic generated by the proposed development, timing of the development or other conditions creating hazards for

pedestrian, bicycle or motor vehicle traffic. The City Engineer may determine that, although an improvement may be impractical at the time of development, it will be necessary at some future date. In such cases, a written agreement guaranteeing future performance by the applicant in installing the required improvements must be signed by the applicant and approved by the City.

Construction of SW Seneca Street would require demolition of the existing Council Building. City Council has not made a determination as to the timing of Council Building demolition. Even if the applicant had not proposed the fee-in-lieu condition, pursuant to TDC 74.430, the City would have imposed this condition. The City Engineer has the authority to modify a condition to eliminate impractical or detrimental results. Requiring the Seneca extension against the wishes of the City Council if the City Council decides not to demolish the Council building is both impractical and detrimental. Therefore, modifying the condition to allow for a fee-in-lieu if City Council decides not to demolish the Council building is a proper modification to eliminate an impractical and detrimental result.

- The Master Plan itself is deficient and on appeal to the Land Use Board of Appeals and thus cannot provide a factual base to support approval of the Application.

Seth King argues that the master plan is on appeal and therefore all subsequent decisions that rely on the master plan must be in effect "stayed" until the resolution of that appeal. There are two problems with this request. First, the TDC contains no such authority. In fact the code requires only that the applicant obtain City approval of a master plan in a master plan area before proceeding with the review. The applicant received City approval of the Master Plan. Additionally, Seth King has not filed for or obtained a stay of the master plan before the Land Use Board of Appeals. Thus there are no grounds within the TDC that would support Mr. King's request for a local stay on the decision.

- Because Applicant does not own or control the ODOT parcel, Applicant cannot demonstrate that it is feasible to complete the development as proposed. Further, the Applicant has not demonstrated that it is feasible to complete the development in compliance with applicable standards if the ODOT parcel is removed.

The City is permitted to impose reasonable conditions of approval for off-site improvements. Here the condition is both reasonable and feasible to implement. The record and application demonstrates that the applicant can meet the condition of approval to construct the SW Nyberg Road improvements. As the record demonstrates, ODOT consented to the application, approved the design for the additional turn improvements and consented to the closure of SW 75th Avenue. The facts demonstrate that it is very feasible to implement SW Nyberg Road improvements and such improvements will be constructed prior to a certificate of occupancy of the center. It is the applicant's burden to demonstrate compliance with the condition, which the applicant will do before the certificate of occupancy is issued.

- The extension of Street A does not obviate the need for the Seneca Street extension.

The City agrees with Mr. King that Street A does not alleviate the need to construct SW Seneca Street.

- Zian will be adversely affected by the Project.

He notes that traffic traveling between I-5 and Zian's property must travel through the same interchange and some of the same intersections that the project's traffic must travel through. The applicant is mitigating the impacts of the traffic generated by their development with improvements to Tualatin-Sherwood Road between I-5 and the site entrance along with the other required transportation improvements. With these improvements, the intersections will operate at an acceptable level of service. In fact, the Level of Service will not decrease over background conditions.

PUBLIC FACILITIES REQUIREMENTS

The following are the Public Facilities requirements for AR 13-07, Nyberg Rivers:

PRIOR TO ISSUANCE OF A WATER QUALITY PERMIT:

PFR-1 The applicant shall grant a public stormwater facility easement for the public stormwater facility.

PFR-2 The applicant shall submit revised plans that show all private stormwater treatment facilities and lines including the filter vault at the intersection of the private access easement acting as the Loop Road is shown within SW Nyberg Street to be located on private property, for review and approval.

PFR-3 The applicant shall submit final plans that show three LIDA planters within parking landscaping south of building 1030 and east of building 1040, for review and approval.

PFR-4 The applicant shall submit revised plans that do not show the LIDA rain garden over public easements, for review and approval.

PFR-5 The applicant shall submit revised plans that show access easements to the public stormwater facility and manholes, for review and approval.

PFR-6 The applicant shall grant a public access easement to the public stormwater facility and manholes.

PFR-7 The applicant shall submit revised plans that include a complete and connected stormwater treatment and conveyance system for the parking lot north of the City offices, for review and approval.

PFR-8 The applicant shall submit final plans that show mechanical filters treating the public Street "A" and future SW Seneca Street, for review and approval.

PFR-9 The applicant shall submit final plans that comply with the Service Provider Letter conditions and Clean Water Services Memorandum comments, for review and approval.

PFR-10 The applicant shall obtain a Stormwater Connection Permit.

PRIOR TO ISSUANCE OF A PUBLIC WORKS PERMIT:

PFR-11 The applicant shall submit revised plans that show the existing public fire hydrant at the northwest corner of building D-130 labeled as public.

PFR-12 The applicant shall submit revised plans of SW Boones Ferry Road that include a median on the north side of the eastbound travel lane in order to restrict Street "A" to right-in/right-out movement, for review and approval.

PFR-13 The applicant shall submit revised plans that show a crosswalk at the intersection of SW Boones Ferry Road and Street "A" that includes material that is visually different and possibly raised, for review and approval.

PFR-14 The applicant shall submit revised plans that show SW Seneca Street from SW Martinazzi Avenue connecting to the Nyberg Rivers site for construction up to the requirements stated in Resolution 5163-13, without on-street parking, with signalization at SW Seneca Street & SW Martinazzi Avenue, for review and approval.

PFR-15 The applicant shall submit a copy of the ODOT Permit and Washington County Facility Permit for construction of SW Nyberg Street from I-5 to SW Tualatin Sherwood Road to add a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip and a retaining wall with a hand rail on top and close SW 75th Avenue's access.

PFR-16 The applicant shall submit final plans for SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road that include two 11-foot westbound travel lanes, a 6-foot bike lane, a varied width 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with Resolution 5163-13, for review and approval.

PFR-17 The applicant shall grant a public sidewalk easement from right-of-way to back of sidewalk adjacent to SW Nyberg Street.

PFR-18 The applicant shall submit revised plans for the Loop Road from the SW Nyberg Street main intersection north to the south side of building 1010 that includes the City's standard 5'x5' tree wells within the 14-foot wide shared path, for review and approval.

PFR-19 The applicant shall submit final plans from the south side of building 1010 west to the south side of building D-120 that include two 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side, for review and approval.

PFR-20 The applicant shall submit final plans that show along the west side of buildings D-120, D-125, and D-130 two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side, trees planted in the parking buffers, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side, for review and approval.

PFR-21 The applicant shall submit final plans that show two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road that will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side.

PFR-22 The applicant shall submit revised plans that show a raised crosswalk at the intersection of the greenway trail and Street "A", for review and approval.

PFR-23 The applicant shall grant a maintenance agreement to City standards for all cross-sections of the Loop Road.

PFR-24 The applicant shall grant a public access easement over all cross-sections of the Loop Road.

PFR-25 The applicant shall submit revised plans that show an approved street name in place of Street "A", for review and approval.

PFR-26 The applicant shall submit revised plans that show a 32-foot wide access to the City's back parking lot approximately 140 feet south of SW Boones Ferry Road without requiring relocation of existing structures, for review and approval.

PFR-27 The applicant shall submit revised plans that show the Heron's Landing Apartments driveway cut to be a minimum of 32-feet wide with associated 40- foot private access easement and located opposite the City parking lot access approximately 140 feet south of SW Boones Ferry Road, for review and approval.

PFR-28 The applicant shall submit a copy of the private access easement allowing Heron's Landing Apartments access to Street "A", for review and approval.

PFR-29 The applicant shall submit revised plans that show private access easements for the lots with buildings E-100, F-100, G-100, and H-100 to allow circulation from the intersection of the public access easement acting as the Loop Road from SW Nyberg Street through the east parking area to south of building 1010, for review and approval.

PFR-30 The applicant shall submit copies of the recorded documents that show private access easements for the lots with buildings E-100, F-100, G-100, and H-100 to allow circulation from the intersection of the public access easement acting as the Loop Road from SW Nyberg Street through the east parking area to south of building 1010, for review and approval.

PFR-31 The applicant shall submit a copy of the private access easement from TLID 2S124B002000 through TLID 2S124B001602 to a public right-of-way, for review and approval.

PFR-32 The applicant shall submit final water system plans, for review and approval.

PFR-33 The applicant shall grant a 15-foot wide public water line easement over proposed public water lines.

PFR-34 The applicant shall submit revised plans that show access easements to public water lines, for review and approval.

PFR-35 The applicant shall grant an access easement to public water lines.

PFR-36 The applicant shall submit copies of private water line easements.

PFR-37 The applicant shall submit revised plans that minimize private water lines crossing public utility easements and only cross perpendicular to the public lines, for review and approval.

PFR-38 The applicant shall submit revised plans that show trees located outside public water line easements, for review and approval.

PFR-39 The applicant shall submit revised plans that show the public water line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

PFR-40 The applicant shall construct a public irrigation line to the irrigation system serving the City maintained plantings along I-5 and in the median of SW Tualatin-Sherwood with associated water meter and backflow prevention.

PFR-41 The applicant shall submit sanitary sewer system plans, for review and approval.

PFR-42 The applicant shall grant a 15-foot wide public sanitary sewer line easement over proposed public water lines.

PFR-43 The applicant shall submit revised plans that show access easements to public sanitary sewer manholes, for review and approval.

PFR-44 The applicant shall grant an access easement to public sanitary sewer manholes.

PFR-45 The applicant shall submit revised plans that minimize private sanitary sewer lines crossing public utility easements and only cross perpendicular to the public lines, for review and approval.

PFR-46 The applicant shall submit revised plans that show trees located outside public sanitary sewer line easements, for review and approval.

PFR-47 The applicant shall submit revised plans that show the public sanitary sewer line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

PFR-48 The applicant shall submit revised stormwater system plans that include the public stormwater treatment facility within a public stormwater easement outside of the public water line easement, for review and approval.

PFR-49 The applicant shall submit revised plans that minimize private stormwater lines crossing public utility easements and only cross perpendicular to the public lines and private facilities and structures located outside of public easements, for review and approval.

PFR-50 The applicant shall submit revised plans that show trees located outside public stormwater line easements, for review and approval.

PFR-51 The applicant shall submit revised plans that show access easements to public stormwater manholes, for review and approval.

PFR-52 The applicant shall grant an access easement to public stormwater manholes.

PFR-53 The applicant shall submit revised plans that show the public stormwater line south of the City Offices will need to be relocated to within SW Seneca Street, for review and approval.

PRIOR TO ISSUANCE OF A BUILDING PERMIT:

PFR-54 The applicant shall submit plans that comply with fire protection requirements as determined through the Building Division and Tualatin Valley Fire & Rescue (TVF&R).

PFR-55 The applicant shall obtain all Public Works and Water Quality Permits needed for this development.

PFR-56 The applicant shall obtain a Public Works Permit for all cross-sections of the Loop Road.

PFR-57 The applicant shall obtain a City of Tualatin erosion control permit that includes the entire site area to be disturbed.

PFR-58 The applicant shall submit an amended 1200-C for the remainder of the site, for review and approval.

PFR-59 The applicant shall submit a completed FHADP application with a plan showing the balanced cut and fill and a 1st survey.

PFR-60 The applicant shall submit revised plans that show a trail connection from the development north of building 1040 that includes a 16-foot wide greenway trail easement that that allow for future construction of a cross section of a 12-foot wide path with additional 2-feet on either side for LIDA water quality treatment, for review and approval.

PFR-61 The applicant shall submit revised plans that show the greenway trail connection to the west along the Tualatin River within 40-feet of the top of bank, for review and approval.

PFR-62 The applicant shall submit revised plans that show a greenway trail connection on the west side of I-5 at the Tualatin River to access future north (south of shared pathway at locations shown on Exhibit M (Transportation Plant) in the Master Plan set, for review and approval.

PFR-63 The applicant shall submit revised plans that show a greenway trail easement over the three future viewing areas north of building 1040 and N-100, for review and approval.

PFR-64 The applicant shall grant an easement to allow for the trail to be located either within the area south of Heron's Landing Apartments and the Tualatin River and north of the development or for a specific approved location as shown with an associated Clean Water Services Service Provider Letter.

PFR-65 The applicant shall submit final plans that show a 14-foot public shared pathway from the greenway trail between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road, for review and approval.

PFR-66 The applicant shall grant a 14-foot easement for a public shared pathway from the greenway trail between buildings 1010 & 1030 and 1040 that connects to the public access easement acting as the Loop Road.

PRIOR TO A FRAMING INSPECTION:

PFR-67 The applicant shall submit a 2nd survey for the Flood Hazard Area Development Permit.

PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY:

PFR-68 The applicant shall construct SW Boones Ferry Road that include a median on the north side of the eastbound travel lane in order to restrict Street "A" to right-in/right-out movement as part of the Public Works Permit.

PFR-69 The applicant shall construct a crosswalk at the intersection of SW Boones Ferry Road and Street "A" that includes material that is visually different and possibly raised.

PFR-70 If the applicant obtains the right-of-way for the Seneca Street extension and traffic signal by April 1, 2014, the applicant will design and construct the Seneca Street extension along with a new signal at the SW Martinazzi Avenue/SW Seneca Street intersection per the Public Works Construction Code under a public works permit or if the applicant is unable to obtain the right-of-way by April 1, 2014, the applicant will provide a fee in lieu of the Seneca Street construction to the City in the amount of $360,000, which accounts for the applicant's share of the improvements.

PFR-71 If the east extension of SW Seneca Street is constructed, the applicant will need to extinguish the private access easement, Washington County recorded document 8295, Book 773, Page 873, exists over City owned TLID 2S124B001900.

PFR-72 The applicant shall construct SW Nyberg Street from I-5 to SW Tualatin Sherwood Road to add a 5-foot bike lane, a 15-foot westbound right-turn lane, a 4-foot planter strip with curb, streetlights, and trees, a 7-foot sidewalk, and a 2-foot landscape strip prior to a hand rail on top of a retaining wall and close SW 75th Avenue's access.

PFR-73 The applicant shall construct SW Nyberg Street from SW Martinazzi Avenue to SW Tualatin-Sherwood Road that include two 11-foot westbound travel lanes, a 6-foot bike lane, a varied width 5- to 6-foot curb tight sidewalk with streetlights, and a varied width 4- to 6-foot planter strip with trees in compliance with Resolution 5163-13.

PFR-74 The applicant shall construct Loop Road from the SW Nyberg Street main intersection north to the south side of building 1010 that includes the City's standard 5'x5' tree wells within the 14-foot wide shared path.

PFR-75 The applicant shall construct a cross-section from the south side of building 1010 west to the south side of building D-120 that include two 13-foot travel lanes, a 12-foot pedestrian walkway on the north side with tree wells, a 6-foot planter and 5-foot sidewalk on the south side.

PFR-76 The applicant shall construct along the west side of buildings D-120, D-125, and D-130 two 14-foot travel lanes, two 17.5-foot angled parking aisles, a 10-foot wide pedestrian walkway on the east side, trees planted in the parking buffers, a 4-foot sloped landscape area on the west side, and a 12-foot multi-use path on the west side.

PFR-77 The applicant shall construct two 12-foot travel lanes with a pork chop at the intersection of Boones Ferry Road will be mountable for emergency vehicles, 4-foot planter strips with curbs, streetlights, and trees, a 6-foot bike lane and 5-foot sidewalk on the east side, and a 12-foot multi-use path on the west side.

PFR-78 The applicant shall construct a raised crosswalk at the intersection of the greenway trail and Street "A.

PFR-79 The applicant shall complete all the public improvements and private water quality facilities and have them accepted by the City.

PFR-80 The applicant shall construct the public water system.

PFR-81 The applicant shall construct a public irrigation line to the irrigation system serving the City maintained plantings along I-5 and in the median of SW Tualatin-Sherwood with associated water meter and backflow prevention.

PFR-82 The applicant shall complete all the public water improvements and have them accepted by the City.

PFR-83 The applicant shall construct the public sanitary sewer system.

PFR-84 The applicant shall complete all the public sanitary sewer improvements and have them accepted by the City.

PFR-85 The applicant shall construct the public stormwater system.

PFR-86 The applicant shall complete all the public stormwater improvements and have them accepted by the City.

PFR-87 The applicant shall submit a 3rd survey for the Flood Hazard Area Development Permit.

APPEAL

The Public Facilities Review portion of this decision is final after the expiration of 14 calendar days from the date of this decision, unless a written appeal is received on or before 5:00 p.m., on January 3, 2014 by the Engineering Division at 18880 SW Martinazzi Avenue, Tualatin, Oregon 97062. The appeal must be signed by the appellant, contain the information required by TDC 31.078 on the City appeal form, and contain the $135 appeal filing fee. The plans and appeal forms are available at the Tualatin Library and at the City offices. Public Facilities appeals are reviewed by City Council.

Typed on behalf of the City Engineer,

Tony Doran

Tony Doran, EIT
Engineering Associate

The record includes the following which can be downloaded from the City of Tualatin's webpage or viewed at the City's Planning Counter:

1. Clean Water Services Memorandum
2. Oregon Department Of Transportation Response to Local Land Use Notification
3. Washington County Required Conditions of Approval
4. Washington County Traffic Staff Report
5. Tualatin Valley Fire and Rescue
6. City Council Resolution 5163-13
7. Kittelson & Associates Letter Dated November 25, 2013
8. Seth J. King, Perkins Coie comment letter dated December 3, 2013
9. Christie White, Rebuttal letter dated December 9, 2013
10. Jan Giunta, Comments Regarding Public Facilities Decision, December 17, 2013
11. Seth J. King, Perkins Coie comment letter dated December 17, 2013
12. ARB Submittals, 9/16/2013 – 12/10/2013
13. DKS Traffic Submittals dated December 18, 2013 and July 11, 2013

C: Christe White, White, Radler, Parks, and Alexander, LLP
Jan Giunta
Kathy Newcomb
Michael Cerbone, Cardno
Michael Kirk, Centercal Properties
Seth J. King, Perkins Coie

Exhibit 2