



# City of Tualatin

www.tualatinoregon.gov

**"NECESSARY PARTIES"  
MARKED BELOW**

## NOTICE OF APPLICATION SUBMITTAL

- ANNEXATION       CONDITIONAL USE PERMIT       PLAN TEXT AMENDMENT  
 ARCHITECTURAL REVIEW       PLAN MAP AMENDMENT       OTHER:

**CASE/FILE: AR16-0001** (Community Development Dept.: Planning Division)

<b>PROPOSAL</b>	To construct three buildings to be phased for future market demands. One will be 38,812 SF, 42,500 SF, and 45,941 SF.
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<b>PROPERTY</b>	<b>Name of Application</b>	KOCH BUILDINGS 10, 11, 12				
	<input type="checkbox"/> n/a	<b>Street Address</b>	20600 SW 115 <sup>th</sup> Ave			
		<b>Tax Map and Lot No(s).</b>	2S1 27AC 00 700			
		<b>Planning District</b>	General Manufacturing (MG)	<b>Overlays</b> <input checked="" type="checkbox"/>	<b>NRPO</b> <input type="checkbox"/>	<b>Flood Plain</b> <input type="checkbox"/>
		<b>Previous Applications</b>	SB11-01, AR12-05, AR15-05	<b>Additional Applications:</b>	<b>CIO</b>	

<b>DATES</b>	<b>Receipt of application</b>	1/19/2016	<b>Deemed Complete</b>	3/24/2016	<b>CONTACT</b>	<b>Name:</b> Rob Dehnert
	<b>Notice of application submittal</b>			3/28/2016		<b>Title:</b> Associate Planner
	<b>Project Status / Development Review meeting</b>			n/a		<b>E-mail:</b> rdehnert@ci.tualatin.or.us
	<b>Comments due for staff report</b>			4/11/2016		<b>Phone:</b> 503-691-3029
	<b>Public meeting:</b> <input type="checkbox"/> ARB <input type="checkbox"/> TPC <input checked="" type="checkbox"/> n/a					<b>Notes:</b> View application materials: www.tualatinoregon.gov/projects. TS Hwy Special Commercial Setback.
	<b>City Council (CC)</b>			<input checked="" type="checkbox"/> n/a		

### City Staff

- City Manager
- Building Official
- Chief of Police
- City Attorney
- City Engineer
- Community Dev. Director
- Community Services Director
- Economic Dev. liaison
- Engineering Associate\*
- Finance Director
- GIS technician(s)
- IS Manager
- Operations Director\*
- Parks and Recreation Coordinator
- Planning Manager
- Street/Sewer Supervisor
- Water Supervisor

### Neighboring Cities

- Durham
- King City Planning Commission
- Lake Oswego
- Rivergrove PC
- Sherwood Planning Dept.
- Tigard Community Dev. Dept.
- Wilsonville Planning Div.

### \*Paper Copies

#### Counties

- Clackamas County Dept. of Transportation and Dev.
- Washington County Dept. of Land Use and Transportation (AR's)
- Washington County LRP (Annexations)

#### Regional Government

- Metro

#### School Districts

- Lake Oswego School Dist. 7J
- Sherwood SD 88J
- Tigard-Tualatin SD 23J (TTSD)
- West Linn-Wilsonville SD 3J

#### State Agencies

- Oregon Dept. of Aviation
- Oregon Dept. of Land Conservation and Development (DLCD) (via proprietary notice)
- Oregon Dept. of State Lands: Wetlands Program
- Oregon Dept. of Transportation (ODOT) Region 1
- ODOT Maintenance Dist. 2A

- ODOT Rail Div.
- OR Dept. of Revenue

#### Utilities

- Republic Services
- Clean Water Services (CWS)
- Comcast [cable]\*
- Frontier Communications [phone]
- Northwest Natural [gas]
- Portland General Electric (PGE)
- TriMet
- Tualatin Valley Fire & Rescue (TVF&R)
- United States Postal Service (USPS) (Washington; 18850 SW Teton Ave)
- USPS (Clackamas)
- Washington County Consolidated Communications Agency (WCCCA)

#### Additional Parties

- Tualatin Citizen Involvement Organization (CIO)
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- 1.032: *Burden of Proof*
- 31.071 *Architectural Review Procedure*
- 31.074 *Architectural Review Application Review Process*
- 31.077 *Quasi-Judicial Evidentiary Hearing Procedures*
- Metro Code 3.09.045 Annexation Review Criteria*
- 32.030 *Criteria for Review of Conditional Uses*
- 33.020 *Conditions for Granting a Variance that is not a Sign or a Wireless Communication Facility*
- 33.022 *Criteria for Granting a Sign Variance*
- 33.024 *Criteria for Granting a Minor Variance*
- 33.025 *Criteria for Granting a Variance*
- 34.200 *Tree Cutting on Private Property without Architectural Review, Subdivision or Partition Approval, or Tree Removal Permit Prohibited*
- 34.210 *Application for Architectural Review, Subdivision or Partition Review, or Permit*
- 34.230 *Criteria (tree removal)*
- 35.060 *Conditions for Granting Reinstatement of Nonconforming Use*
- 36.160 *Subdivision Plan Approval*
- 36.230 *Review Process (partitioning)*
- 36.330 *Review Process (property line adjustment)*
- 37.030 *Criteria for Review (IMP)*
- 40.030 *Conditional Uses Permitted (RL)*
- 40.060 *Lot Size for Conditional Uses (RL)*
- 40.080 *Setback Requirements for Conditional Uses (RL)*
- 41.030 *Conditional Uses Permitted (RML)*
- 41.050 *Lot Size for Conditional Uses (RML)*
- 41.070 *Setback Requirements for Conditional Uses (RML)*
- 42.030 *Conditional Uses Permitted (RMH)*
- 42.050 *Lot Size for Conditional Uses (RMH)*
- 42.070 *Setback Requirements for Conditional Uses (RMH)*
- 43.030 *Conditional Uses Permitted (RH)*
- 43.060 *Lot Size for Conditional Uses (RH)*
- 43.090 *Setback Requirements for Conditional Uses (RH)*
- 44.030 *Conditional Uses Permitted (RH-HR)*
- 44.050 *Lot Size for Conditional Uses (RH-HR)*
- 44.070 *Setback Requirements for Conditional Uses (RH-HR)*
- 49.030 *Conditional Uses (IN)*
- 49.040 *Lot Size for Permitted and Conditional Uses (IN)*
- 49.060 *Setback Requirements for Conditional Uses (IN)*
- 50.020 *Permitted Uses (CO)*
- 50.030 *Central Urban Renewal Plan – Additional Permitted Uses and Conditional Uses (CO)*
- 50.040 *Conditional Uses (CO)*
- 52.030 *Conditional Uses (CR)*
- 53.050 *Conditional Uses (CC)*
- 53.055 *Central Urban Renewal Area – Conditional Uses (CC)*
- 54.030 *Conditional Uses (CG)*
- 56.030 *Conditional Uses (MC)*
- 56.045 *Lot Size for Conditional Uses (MC)*
- 57.030 *Conditional Uses (MUCOD)*
- 60.040 *Conditional Uses (ML)*
- 60.041 *Restrictions on Conditional Uses (ML)*
- 61.030 *Conditional Uses (MG)*
- 61.031 *Restrictions on Conditional Uses (MG)*
- 62.030 *Conditional Uses (MP)*
- 62.031 *Restrictions on Conditional Uses (MP)*
- 64.030 *Conditional Uses (MBP)*
- 64.050 *Lot Size for Permitted and Conditional Uses (MBP)*
- 64.065 *Setback Requirements for Conditional Uses (MBP)*
- 68.030 *Criteria for Designation of a Landmark*
- 68.060 *Demolition Criteria*
- 68.070 *Relocation Criteria*
- 68.100 *Alteration and New Construction Criteria*
- 68.110 *Alteration and New Construction Approval Process*
- 73.130 *Standards*
- 73.160 *Standards*
- 73.190 *Standards – Single-Family and Multi-Family Uses*
- 73.220 *Standards*
- 73.227 *Standards*
- 73.230 *Landscaping Standards*
- 73.300 *Landscape Standards – Multi-Family Uses*
- 73.310 *Landscape Standards – Commercial, Industrial, Public and Semi-Public Uses*
- 73.320 *Off-Street Parking Lot Landscaping Standards*
- 73.470 *Standards*
- 73.500 *Standards*

AR-16-0001

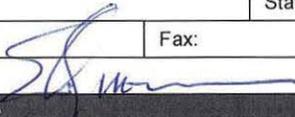
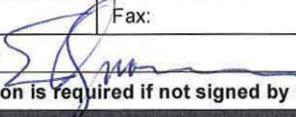
To lessen the bulk of the notice of application and to address privacy concerns, this sheet substitutes for the photocopy of the mailing labels. A copy is available upon request.



# City of Tualatin

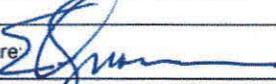
www.tualatinoregon.gov

## APPLICATION FOR ARCHITECTURAL REVIEW

<b>Direct Communication to:</b>			
Name: Mark Person		Title: Planner	
Company Name: Mackenzie			
Current address: 1515 SE Water Avenue, Suite 100			
City: Portland		State: Oregon	ZIP Code: 97214
Phone: 503-224-9560	Fax:	Email: mperson@mcknze.com	
<b>Applicant</b>			
Name: Eric Sporre		Company Name: Pacific Realty Associates, L.P.	
Address: 15350 SW Sequoia Parkway, Suite 300			
City: Portland		State: Oregon	ZIP Code: 97224
Phone: 503-603-5492	Fax:	Email: erics@pactrust.com	
Applicant's Signature: 		Date: 12-11-15	
<b>Property Owner</b>			
Name: Pacific Realty Associates, L.P., Attn: Eric Sporre			
Address: 15350 SW Sequoia Parkway, Suite 300			
City: Portland		State: Oregon	ZIP Code: 97224
Phone: 503-603-5492	Fax:	Email: erics@pactrust.com	
Property Owner's Signature: 		Date: 12-11-15	
<b>(Note: Letter of authorization is required if not signed by owner)</b>			
<b>Architect</b>			
Name: Adam Solomonson - Mackenzie			
Address: 1515 SE Water Avenue, Suite 100			
City: Portland		State: Oregon	ZIP Code: 97214
Phone: 503-224-9560	Fax:	Email: asolomonson@mcknze.com	
<b>Landscape Architect</b>			
Name: Beighley & Associates, Inc.			
Address: 12840 NW Cornell Road			
City: Portland		State: Oregon	ZIP Code: 97229
Phone: 503-643-4798	Fax:	Email:	
<b>Engineer</b>			
Name: Bob Frentress, Jr. - Mackenzie			
Address: 1515 SE Water Avenue, Suite 100			
City: Portland		State: Oregon	ZIP Code: 97214
Phone: 503-224-9560	Fax:	Email: bfrentress@mcknze.com	
<b>Project</b>			
Project Title: Koch Corporate Center Lots 10, 11 and 12			
Address: SW Tualatin Sherwood Road and 115th			
City: Tualatin		State: Oregon	ZIP Code: 97062
Brief Project Description: Architectural Review for three buildings to be phased per future market demands, proposed buildings			
Proposed Use: will be 38,812 SF, 42,500 SF and 45,941 SF as shown on the development plans included with this application.			

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 PERTY OWNER MAILING LIST IS CORRECT. I AGREE TO COMPLY WITH ALL APPLICABLE CITY AND COUNTY ORDINANCES AND STATE LAWS REGARDING BUILDING CONSTRUCTION AND LAND USE.

Applicant's Signature  Date: 12/16/15

Office Use		
Case No:	Date Received:	Received by:
Fee: Complete Review (\$115-\$5040):		Receipt No:
Application Complete as of:		ARB hearing date (if applicable):
Posting Verification:		6 copies of drawings (folded)
1 reproducible 8 1/2" X 11" vicinity map		1 reproducible 8 1/2" X 11" site, grading, LS, Public Facilities plan
Neighborhood/Developer meeting materials		

**CITY OF TUALATIN FACT SHEET**

**General**

Proposed use: Manufacturing, warehouse			
Site area:	10.3	acres	Building footprint: 127,253 sq. ft.
Development area:	10.3	acres	Paved area: 230,745 sq. ft.
	448,668	Sq. ft.	Development area coverage: 80 %

**Parking**

Spaces required (see TDC 73.400) (example: warehouse @ 0.3/1000 GFA) _____ @ _____ /1000 GFA = _____ _____ @ _____ /1000 GFA = _____ _____ @ _____ /1000 GFA = _____ Total parking required: _____ spaces Handicapped accessible = _____ Van pool = _____ Compact = (max. 35% allowed) = _____ Loading berths = _____	Spaces provided: Total parking provided: 246 spaces Standard = 233 Handicapped accessible = 13 Van pool = 13 Compact = 0 Loading berths = 46
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**Bicycles**

Covered spaces required: 4	Covered spaces provided: 6
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**Landscaping**

Landscaping required: <sup>15</sup> % of dvpt. area 67,272 Square feet	Landscaping provided: <sup>19.8</sup> % of dvpt. area 90,482 Square feet
Landscaped parking island area required: _____ % 6,150 SF	Landscaped parking island area provided: _____ % 11,471 SF

**Trash and recycling facility**

Minimum standard method: _____ square feet SEE NARRATIVE
Other method: _____ square feet

**For commercial/industrial projects only**

Total building area: 127,253 sq. ft.	2 <sup>nd</sup> floor: _____ sq. ft.
Main floor: _____ sq. ft.	3 <sup>rd</sup> floor: _____ sq. ft.
Mezzanine: _____ sq. ft.	4 <sup>th</sup> floor: _____ sq. ft.

**For residential projects only**

Number of buildings: _____	Total sq. ft. of buildings: _____ sq. ft.
Building stories: _____	

GENERAL INFORMATION	
Site Address:	N/A
Assessor's Map and Tax Lot #:	2S127AC000700
Planning District:	MG
Parcel Size:	10.49 acres
Property Owner:	PacTrust
Applicant:	PacTrust
Proposed Use:	Three industrial buildings and associated improvements

ARCHITECTURAL REVIEW DETAILS	
Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial      Industrial	
Number of parking spaces:	246
Square footage of building(s):	127,253 SF
Square footage of landscaping:	90,482 SF
Square footage of paving:	230,745 SF
Proposed density (for residential):	N/A

**For City Personnel to complete:**

Staff contact person:

**PACTRUST REALTY, INC.**

**AUTHORITY & INCUMBENCY CERTIFICATE**

The undersigned, Terry L. O'Toole, certifies that she is the duly elected and qualified Secretary of PacTrust Realty, Inc., a Delaware corporation ("Company"), and that, as such, she is authorized to execute this Certificate on behalf of the Company, which is the General Partner of Pacific Realty Associates, L.P., and she further certifies that the persons named below are duly elected, qualified and acting officers of the Company, holding on the date hereof the respective office set forth opposite his/her name:

<b>Name</b>	<b>Office</b>
Peter F. Bechen	President & Chief Executive Officer
David W. Ramus	Vice President & Chief Operating Officer
John C. Hart	Chief Financial Officer
Andrew R. Jones	Vice President
Eric A. Sporre	Vice President
John C. Wiitala	Vice President

Furthermore, each of the above officers and/or agents of the Company is authorized and empowered to execute and deliver any and all documents or other pertinent instruments related the operation and disposition of real property and improvements thereon owned by the Company.

IN WITNESS WHEREOF, the undersigned has hereunto set her hand this 6<sup>th</sup> day of April 2015.



\_\_\_\_\_  
Terry L. O'Toole  
Secretary

## ARCHITECTURAL REVIEW CERTIFICATION OF SIGN POSTING



The applicant shall provide and post a sign pursuant to Tualatin Development Code (TDC) 31.064(2). Additionally, the 18" x 24" sign must contain the application number, and the block around the word "NOTICE" must remain **primary yellow** composed of the **RGB color values Red 255, Green 255, and Blue 0**. Additionally, the potential applicant must provide a flier (or flyer) box on or near the sign and fill the box with brochures reiterating the meeting info and summarizing info about the potential project, including mention of anticipated land use application(s). Staff has a Microsoft PowerPoint 2007 template of this sign design available through the Planning Division homepage at < [www.tualatinoregon.gov/planning/land-use-application-sign-templates](http://www.tualatinoregon.gov/planning/land-use-application-sign-templates)>.

NOTE: For larger projects, the Community Development Department may require the posting of additional signs in conspicuous locations.

As the applicant for the Koch Building 10, 11 and 12  
project, I hereby certify that on this day, 1/19/2016 sign(s) was/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: William C. Wright, Jr.  
(PLEASE PRINT)

Applicant's Signature: 

Date: 1/19/2016

## Sensitive Area Pre-Screening Site Assessment

1. Jurisdiction: Tualatin

2. Property Information (example 1S234AB01400)

Tax lot ID(s): 2S127AC00700  
 Site Address: \_\_\_\_\_  
 City, State, Zip: Tualatin, Oregon, 97062  
 Nearest Cross Street: 115th

3. Owner Information

Name: Matt Oyen  
 Company: PacTrust  
 Address: 15350 SW Sequoia Parkway #300  
 City, State, Zip: Portland, OR 97224  
 Phone/Fax: 503-624-6300  
 E-Mail: \_\_\_\_\_

4. Development Activity (check all that apply)

- Addition to Single Family Residence (rooms, deck, garage)  
 Lot Line Adjustment       Minor Land Partition  
 Residential Condominium       Commercial Condominium  
 Residential Subdivision       Commercial Subdivision  
 Single Lot Commercial       Multi Lot Commercial  
 Other Architectural Review

5. Applicant Information

Name: Mark Person  
 Company: Mackenzie  
 Address: 1515 SE Water Avenue, Suite 100  
 City, State, Zip: Portland, OR 97214  
 Phone/Fax: 5032249560  
 E-Mail: mperson@mcknze.com

6. Will the project involve any off-site work?  Yes  No  Unknown

Location and description of off-site work \_\_\_\_\_

7. Additional comments or information that may be needed to understand your project \_\_\_\_\_

This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/Type Name Mark Person Print/Type Title Planner

ONLINE SUBMITTAL

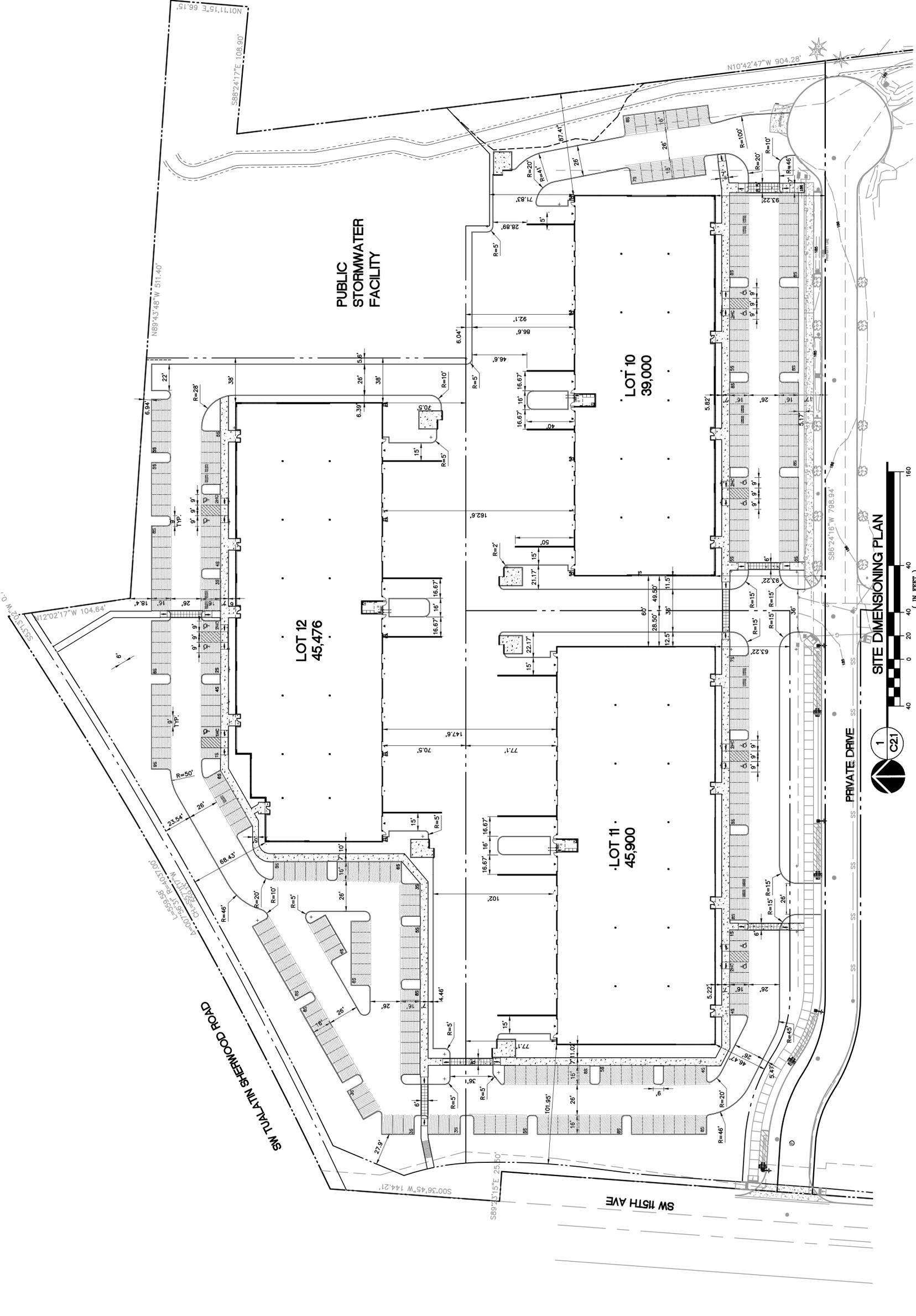
Date 12/7/2015

### FOR DISTRICT USE ONLY

- Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.  
 Based on review of the submitted materials and best available information Sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 07-20, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, State, and federal law.  
 Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 07-20, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, state and federal law.  
 This Service Provider Letter is not valid unless \_\_\_\_\_ CWS approved site plan(s) are attached.

The proposed activity does not meet the definition of development on **the lot was platted after 9/9/95 ORS 92.040(2), NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED. SEE KOCH CORPORATE CENTER NO.2 PLAT**

Reviewed by Chuck Mitchell Date 12/7/15



SITE DATA		BUILDING 10		BUILDING 11		BUILDING 12	
LOT	10	LOT	11	LOT	12	LOT	10
TOTAL IMPERVIOUS AREA	150,996 SF (3.47 AC)	128,107 SF (2.94 AC)	109,164 SF (2.50 AC, 85.0%)	169,377 SF (3.89 AC)	133,377 SF (3.06 AC, 78.7%)	45,476 SF (1.04 AC, 27.0%)	45,476 SF (1.04 AC, 27.0%)
BUILDING FOOTPRINT	39,000 SF (0.90 AC, 25.8%)	45,900 SF (1.05 AC, 35.8%)	63,264 SF (1.45 AC, 50.0%)	87,901 SF (2.02 AC, 51.9%)	39,626 SF (0.91 AC, 23.3%)	3,125 SF (0.07 AC, 0.8%)	3,125 SF (0.07 AC, 0.8%)
DRIVE AISLE/PARKING/SIDEWALK AREA	84,025 SF (1.93 AC, 55.6%)	21,443 SF (0.49 AC, 14.2%)	1,675 SF (0.04 AC, 1.3%)	39,626 SF (0.91 AC, 23.3%)	3,125 SF (0.07 AC, 0.8%)	3,125 SF (0.07 AC, 0.8%)	3,125 SF (0.07 AC, 0.8%)
PARKING LOT AREA	1,925 SF (0.04 AC, 1.3%)	3,494 SF (0.08 AC, 2.3%)	2,361 SF (0.05 AC, 1.8%)	6,815 SF (0.16 AC, 4.0%)			
REQUIRED PARKING LANDSCAPE	3,494 SF (0.08 AC, 2.3%)	27,971 SF (0.64 AC, 18.5%)	18,943 SF (0.43 AC, 15.0%)	36,000 SF (0.83 AC, 21.3%)			
PARKING LANDSCAPE AREA	27,971 SF (0.64 AC, 18.5%)	18,943 SF (0.43 AC, 15.0%)	18,943 SF (0.43 AC, 15.0%)	36,000 SF (0.83 AC, 21.3%)			
LANDSCAPE AREA	27,971 SF (0.64 AC, 18.5%)	18,943 SF (0.43 AC, 15.0%)	18,943 SF (0.43 AC, 15.0%)	36,000 SF (0.83 AC, 21.3%)			
<b>PROVIDED HANDICAP</b>	4 SPACES	4 SPACES	4 SPACES	5 SPACES	5 SPACES	5 SPACES	5 SPACES
<b>PROPOSED STANDARD</b>	73 SPACES (4 VAN/CAR POOL SPACES)	63 SPACES (4 VAN/CAR POOL SPACES)	63 SPACES (4 VAN/CAR POOL SPACES)	120 SPACES (5 VAN/CAR POOL SPACES)	120 SPACES (5 VAN/CAR POOL SPACES)	120 SPACES (5 VAN/CAR POOL SPACES)	120 SPACES (5 VAN/CAR POOL SPACES)
<b>PROPOSED COMPACT</b>	0 SPACES						
<b>TOTAL PARKING PROVIDED</b>	77 SPACES (1.97/1,000 SF)	67 SPACES (1.46/1,000 SF)	67 SPACES (1.46/1,000 SF)	125 SPACES (2.75/1,000 SF)	125 SPACES (2.75/1,000 SF)	125 SPACES (2.75/1,000 SF)	125 SPACES (2.75/1,000 SF)
<b>BICYCLE PARKING</b>	6 (4 EXTERIOR AND 2 INTERIOR SPACES)						
<b>REQUIRED PARKING</b>	19 NONE						
<b>MANUFACTURING</b>	23 SPACES						
<b>WAREHOUSE</b>	9 SPACES						
<b>TOTAL</b>	28 NONE						
<b>MINIMUM</b>	33 SPACES						
<b>MAXIMUM</b>	32 SPACES						

**PARKING DATA**

**REQUIRED PARKING**  
(BASED ON 30% MANUFACTURING AND 70% WAREHOUSE USE)

	LOT 10	LOT 11	LOT 12
MANUFACTURING	19	23	22
MINIMUM (1.6/1,000)	NONE	NONE	NONE
MAXIMUM	9	10	16
WAREHOUSE	14	17	10
MINIMUM (0.3/1,000)	9	10	16
MAXIMUM (0.5/1,000)	14	17	10

# MACKENZIE.

DESIGN DRIVEN | CLIENT FOCUSED

November 10, 2015

Re: **Koch Corporate Center Phase III – Architectural Review Application**  
*Neighborhood Meeting*  
Project Number 2140559.06

Dear Interested Party:

You are cordially invited to attend a meeting on Thursday, December 3, 2015, at 5:00 PM at the Juanita Pohl Center located at 8513 SW Tualatin Road.

The purpose of this meeting is to discuss three new industrial buildings located at SW 115th Avenue and Tualatin-Sherwood Road, more specifically on Tax Lot 700 of Tax Map 2S 1 27AC. The property owner, PacTrust, is proposing three new buildings as shown on the conceptual site plan included with this letter. Please see the attached map for reference.

The purpose of this meeting is to review preliminary plans and provide a means for the applicant/owner and surrounding property owners to meet and discuss this proposal. If you have any questions, please feel free to contact me at (503) 224-9560.

Sincerely,



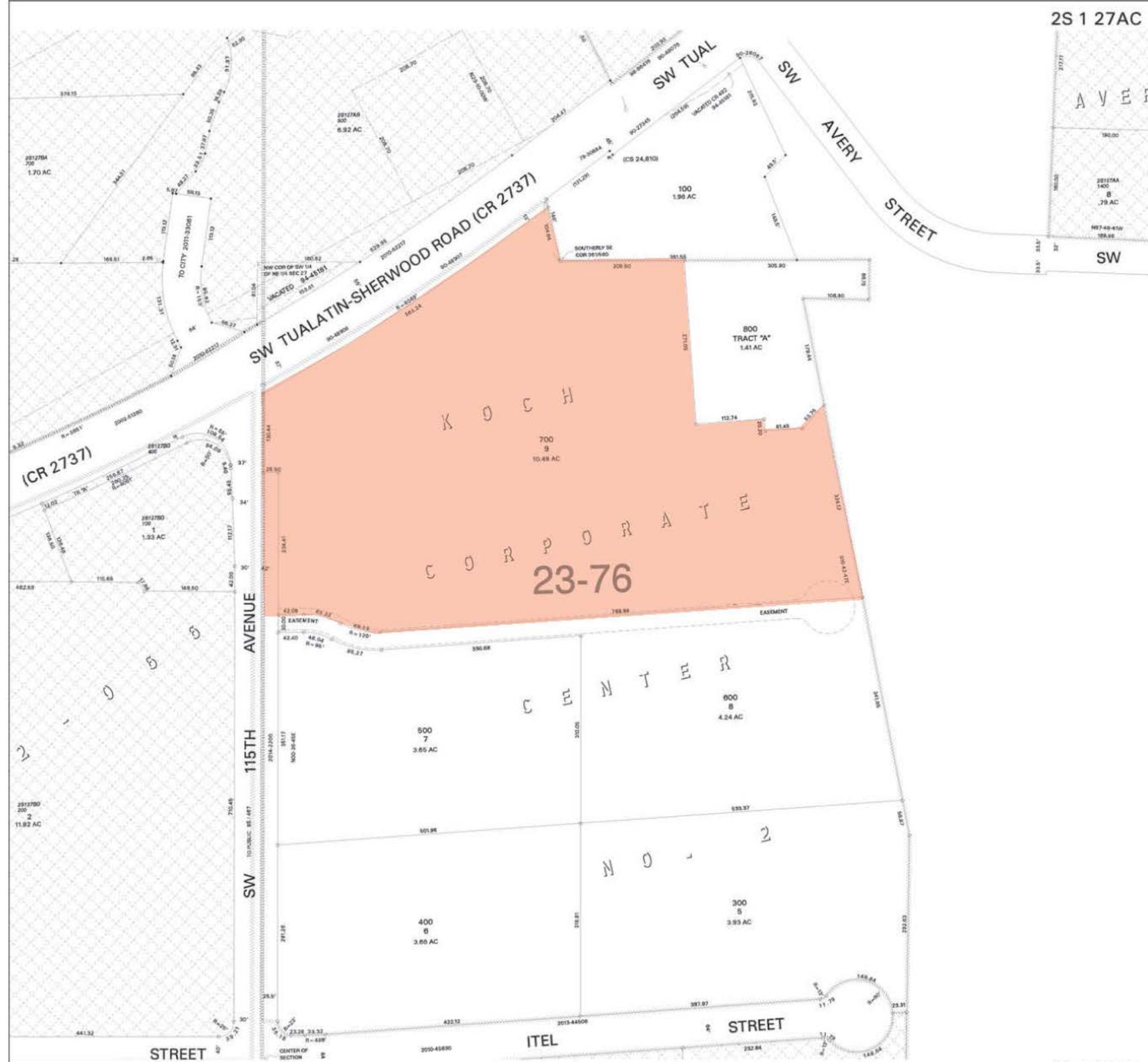
Mark Person, AICP  
Planner

Enclosures: Conceptual Site Plan  
Tax Map

c: Matt Oyen, Eric Sporre – PacTrust  
Adam Solomonson, Dennis Woods, Bob Frentress – Mackenzie

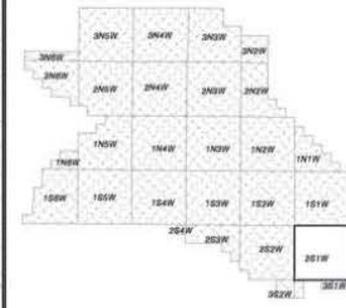


P 503.224.9560 ■ F 503.228.1285 ■ W [MCKNZE.COM](http://MCKNZE.COM) ■ RiverEast Center, 1515 SE Water Avenue, #100, Portland, OR 97214  
ARCHITECTURE ■ INTERIORS ■ STRUCTURAL ENGINEERING ■ CIVIL ENGINEERING ■ LAND USE PLANNING ■ TRANSPORTATION PLANNING ■ LANDSCAPE ARCHITECTURE  
Portland, Oregon ■ Vancouver, Washington ■ Seattle, Washington



2S 1 27AC

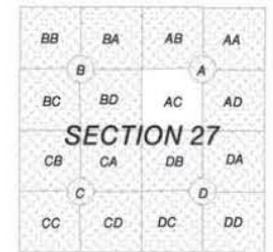
2S 1 27AC



WASHINGTON COUNTY OREGON  
SW 1/4 NE 1/4 SECTION 27 T2S R1W W.M.  
SCALE 1" = 100'

36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6
12	7	8	9	10	11	12	7
13	18	17	16	15	14	13	18
24	19	20	21	22	23	24	19
25	30	29	28	27	26	25	30
36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6

FOR ADDITIONAL MAPS VISIT OUR WEBSITE AT  
[www.co.washington.or.us](http://www.co.washington.or.us)



Cancelled Taxlots For: 2S127AC  
200,



PLOT DATE: April 25, 2014  
FOR ASSESSMENT PURPOSES  
ONLY - DO NOT RELY ON  
FOR OTHER USE

Map areas delineated by either gray shading or a cross-hatched pattern are for reference only and may not indicate the most current property boundaries. Please consult the appropriate map for the most current information.

2S 1 27AC

TUALATIN  
2S 1 27AC

# MACKENZIE. SIGN-IN SHEET

DESIGN DRIVEN | CLIENT FOCUSED

PROJECT NUMBER: 2140561.00

PROJECT NAME: Koch Lots 10, 11 and 12

SUBJECT: (Neighborhood Meeting / December 3, 2015)

Name	Address	Email	Representing
Colin Cortes	CoT		
Adam Solomonson	Mackenzie		
Mark Person	Mackenzie 1515 SE Wdr		

## MEETING NOTES

---

PROJECT NUMBER: 2140559.06                      ISSUE DATE: December 15, 2015  
PROJECT NAME: Koch 10, 11, and 12

---

RECORDED BY: Mark Person, Land Use Planner  
TO: FILE  
PRESENT: Colin Cortes – City of Tualatin  
Mark Person, Adam Solomonson – Mackenzie

**SUBJECT: Architectural Review Neighborhood Meeting (December 3, 2015)**

### INFORMATION ITEMS

The Neighborhood/Developer Meeting for Koch Buildings 10, 11 and 12 was held at the Juanita Pohl Center, located at 8513 SW Tualatin Road, Tualatin, OR 97062. The meeting was held at 5 PM on December 3, 2015. No neighbors showed up at the neighborhood meeting. The only people present at the meeting were either employees of City of Tualatin or Mackenzie. The meeting ended at 5:45 PM.

Washington County, Oregon

2007-125587

12/06/2007 03:07:12 PM

D-DW

Cnt=1 Stn=8 C PFEIFER

\$15.00 \$5.00 \$11.00 - Total = \$31.00



01193969200701255870030034

I, Richard Hobernicht, Director of Assessment and Taxation and Ex-Officio County Clerk for Washington County, Oregon, do hereby certify that the within instrument of writing was received and recorded in the book of records of said county.

*Richard Hobernicht*  
Richard Hobernicht, Director of Assessment and Taxation, Ex-Officio County Clerk



28  
15



After recording return to:  
Pacific Realty Associates, L.P.  
15350 SW Sequoia Parkway, Suite 300  
Portland, OR 97224  
Attn: General Counsel

**Grantor's Name and Address:**

PRA KOCH X, LLC  
C/o First American Exchange  
222 SW Columbia St., #400  
Portland, OR 97201

**Grantee's Name and Address:**

Pacific Realty Associates, L.P.  
15350 SW Sequoia Parkway, Suite 300  
Portland, OR 97224

**Until a change is requested all tax statements shall be sent to the following address:**

Pacific Realty Associates, L.P.  
15350 SW Sequoia Parkway, Suite 300  
Portland, OR 97224

Form No. 762 - Special Warranty Deed

**SPECIAL WARRANTY DEED**

KNOW ALL MEN BY THESE PRESENTS That **PRA KOCH X, LLC**, an Oregon limited liability company, hereinafter called grantor, for the consideration hereinafter stated, does hereby grant, bargain, sell and convey unto **Pacific Realty Associates, L.P.**, a Delaware limited partnership, hereinafter called grantee, and unto grantee's heirs, successors and assigns all of that certain real property with the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining, situated in the County of Washington, State of Oregon, described as follows, to-wit:

**LEGAL DESCRIPTION ATTACHED HERETO AS EXHIBIT "A"**

To Have and to Hold the same unto the said grantee and grantee's heirs, successors and assigns forever.

And the grantor hereby covenants to and with the said grantee and grantee's heirs, successors and assigns that said real property is free from encumbrances created or suffered thereon by grantor and that grantor will warrant and defend the same and every part and parcel thereof against the lawful claims and demands of all person claiming by, through, or under the grantor. The true and actual consideration paid for this transfer, **IS GIVEN AS PART OF AN IRC §1031 EXCHANGE OF LIKE-KIND PROPERTY.**

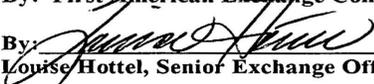
However, the actual consideration consists of or includes other property or value given or promised which is the whole consideration.

In construing this deed and where the context so requires, the singular includes the plural and all grammatical changes shall be implied to make the provisions hereto apply equally to corporations and to individuals,

In Witness Whereof, the grantor has executed this instrument this 6th day of December, 2007; if a corporate grantor, it has caused its name to be signed and seal affixed by its officers, duly authorized thereto by order of its board of directors.

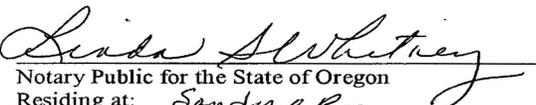
THIS INSTRUMENT WILL NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY APPROVED USES AND TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES AS DEFINED IN ORS 30.930.

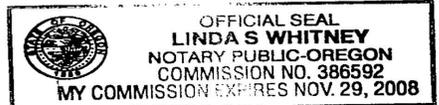
**PRA KOCH X, LLC**, an Oregon limited liability company  
By: **First American Exchange Company, LLC**, sole member

By:   
Louise Hottel, Senior Exchange Officer

State of Oregon }  
County of Multnomah } **SS:**

This instrument was acknowledged before me on December 6, 2007, by Louise Hottel, as Senior Exchange Officer of First American Exchange Company, LLC, sole member of PRA KOCH X, LLC

  
Notary Public for the State of Oregon  
Residing at: Sandy, OR  
My commission expires: 11-29-2008



FATCO. NO. 962562-351  
First American Title Accommodation  
Recording Assumes No Liability

## EXHIBIT A

### Legal Description

#### PARCEL I

Beginning South at a stake on the legal subdivision line 22.50 chains from the Northwest corner of the Southwest quarter of the Northeast quarter of Section 27, Township 2 South of Range 1 West of the Willamette Meridian, in the County of Washington and State of Oregon; and running thence North 63° East 17.93 chains to a stake from which a yellow fir tree 28 inches in diameter bears South 3-1/2° East 23 links; thence North 11° West 24 rods or so far as may be necessary to make a lot containing 10 acres; thence Westerly to a stake at an opposite point on the equal subdivision line; thence South by way of said subdivision line to the place of beginning.

ALSO, the following described real property, to-wit:

Beginning at a point 4.25 chains East of the Southwest corner of the Northwest quarter of the Southeast quarter of Section 27, Township 2 South, Range 1 West of the Willamette Meridian, in the County of Washington and State of Oregon; thence North 19.75 chains to a stake; thence North 63° East 13.18 chains to a stake; thence South 25.62-1/2 chains to a stake; thence West 11.50 chains to the place of beginning.

ALSO, the following described real property, to-wit:

Beginning 20 chains North of the quarter section corner on the South line of Section 27, Township 2 South, Range 1 West of the Willamette Meridian; thence North 17.50 chains; thence North 63° East 4.75 chains; thence South 19.75 chains; thence West 4.25 chains to the place of beginning.

#### PARCEL II

That portion of the following described property lying South of SW Tualatin-Sherwood Road:

Part of the Southwest one-quarter of the Northeast one-quarter of Section 27, Township 2 South, Range 1 West of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon, being described as follows:

Beginning at the Northwest corner of the Southwest one-quarter of the Northeast one-quarter of Section 27, Township 2 South, Range 1 West of the Willamette Meridian; thence South, along the legal subdivision line, 22.50 chains; thence North 63° East, 17.93 chains to a stake; thence North 11° West, 13.67 chains to a stake; thence East 1.65 chains; thence North 1 chain; thence West 15.15 chains to the place of beginning;

EXCEPTING THEREFROM that certain 10-acre tract described as follows:

Beginning at a stake on the legal subdivision line, 22.50 chains South from the Northwest corner of the Southwest one-quarter of the Northeast one-quarter of said Section 27; thence North 63° East, 17.93 chains to a stake from which a yellow fir tree 28 inches in diameter bears South 3°30' East, 23 links; thence North 11° West, 23 rods or so far as may be necessary to make a lot containing 10 acres; thence Westerly to a stake on the opposite point on the equal subdivision line; thence South by way of said division line to the place of beginning.

TOGETHER WITH those portions of vacated SW Tualatin-Sherwood Road inuring thereto by reason of Ordinance No. 94-46, Washington County Board of Commissioners, recorded May 9, 1994, Fee No. 94045181.

EXCEPTING THEREFROM any portions thereof lying within SW Tualatin-Sherwood Road as it now exists, including but not limited to those portions dedicated to the public for road purposes by Deed recorded September 10, 1990, Fee No. 90-48908 and by Deed recorded April 30, 2002, Fee No. 2002-051260.

20  
31

5X  
-0-

01-20100007535

This instrument filed for record by Fidelity National Title Company as an accommodation only. It has not been examined as to its execution or as to its effect upon the title.

Washington County, Oregon 2011-038795

06/27/2011 11:19:07 AM

D-DBS Cnt=1 Stn=7 K GRUNEWALD

\$20.00 \$8.00 \$11.00 \$16.00 - Total = \$51.00



01601309201100387980040041

I, Richard Hobernicht, Director of Assessment and Taxation and Ex-Officio County Clerk for Washington County, Oregon, do hereby certify that the within instrument of writing was received and recorded in the book of records of said county.

Richard Hobernicht, Director of Assessment and Taxation, Ex-Officio County Clerk



**After recording return to:**

Perkins Coie LLP  
1120 NW Couch St., 10<sup>th</sup> Floor  
Portland, OR 97209  
Attn: Andrew H. Solomon

**Until a change is requested, all tax statements shall be sent to the following address:**

No Change

Pacific Realty Associates, L.P.  
15350 SW Sequoia Pkwy.  
Suite 300  
Portland, OR 97224

The above space is reserved for recorder's use.

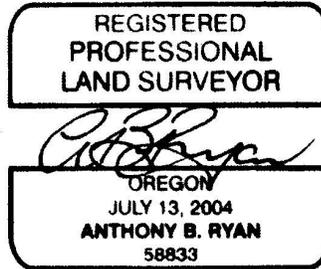
**BARGAIN AND SALE DEED**

PACIFIC REALTY ASSOCIATES, L.P., a Delaware limited partnership ("**Grantor**"), conveys to PACIFIC REALTY ASSOCIATES, L.P., a Delaware limited partnership ("**Grantee**"), that certain real property located in Washington County, Oregon and more particularly described on Exhibit A attached hereto and by this reference incorporated herein (the "**Property**").

The true and actual consideration for this transfer in terms of dollars is \$0.00, but consists of other good and valuable consideration. The purpose of this deed is to place of record the new legal description resulting from the adjustment of a property line of the Property in accordance with (i) that certain Bargain and Sale Deed for Property Line Adjustment recorded in the official records of Washington County, Oregon, on May 26, 2011 as 2011-038580 and (ii) that certain Bargain and Sale Deed for Property Line Adjustment recorded in the official records of Washington County, Oregon, on May 26, 2011 as 2011-038581

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS





6950 SW Hampton Street, Suite 170  
Tigard, OR 97223  
Phone: (503) 595-8702  
Fax: (503) 595-8705  
office@weddesurveying.com  
www.weddesurveying.net

October 19, 2010  
Job No. 4348TRACT2\_PLA6

RENEWAL DATE DEC. 31, '10

PROPERTY LINE ADJUSTMENT – TRACT 2 (Pacific Realty)

LEGAL DESCRIPTION:

EXHIBIT "A"

A portion of that tract of land described as Exhibit "A-1" in Deed to Pacific Realty Associates, L.P., a Delaware limited partnership, recorded as Document Number 2010-050158, Deed Records of Washington County, Oregon, together with a portion of that tract of land described as "Tract 2" in Deed to Powin Pacific Properties, LLC, an Oregon limited liability company, recorded as Document Number 2010-066745, said Deed Records, in the North Half of Section 27, Township 2 South, Range 1 West of the Willamette Meridian, City of Tualatin, Washington County, Oregon, the combined whole being more particularly described as follows:

Commencing at a 2 inch brass disk marking the North Quarter corner of said Section 27; thence along the North-South centerline of said Section 27, as shown on Partition Plat No. 2002-066, Washington County plat records, South 01°36'49" West, 2636.43 feet to a 5/8 inch iron rod with a yellow plastic cap marked "WRG Design, Inc." at the intersection of said North-South centerline and the East-West centerline of said Section 27; thence along said East-West centerline, South 88°31'20" East, 25.50 feet to a 5/8" iron rod with a yellow plastic cap marked "WRG Design Inc."; thence along a line parallel with and 25.50 feet Easterly of said North-South centerline, being the Easterly line of right-of-way dedication per Deed Document Number 2007-106263 South 01°36'49" West, 488.53 feet to the Point of Beginning; thence leaving said parallel line South 89°35'20" East, 1032.86 feet to the Easterly line of said Exhibit "A-1" in Deed Document Number 2010-050158; thence along said Easterly line North 02°21'48" East, 524.36 feet to a 5/8 inch iron rod with a yellow plastic cap marked "WRG Design, Inc."; thence continuing North 02°21'48" East, 335.48 feet to an angle point on said line marked by a railroad iron; thence North 09°42'43" West, 386.18 feet to a 3/4 inch iron pipe; thence North 09°42'43" West, 518.10 feet to a point; thence South 87°24'13" East, 108.90 feet to a 5/8 inch iron rod with a yellow plastic cap marked "WRG Design, Inc."; thence North 02°10'50" East, 66.00 feet to a railroad iron; thence along the Northerly line of said "Exhibit "A-1" North 88°43'16" West, 511.36 feet to the most Southerly Southeast corner of said Tract

(Tract 2 – Legal description, continued)

2 in Document Number 2010-066745; thence leaving said Northerly line and along the Easterly line of said Tract 2 North 11°03'22" West, 104.58 feet to a point on the Southerly right-of-way line of S.W. Tualatin-Sherwood Road (County Road No. 2737), 37.00 feet from centerline; thence along said Southerly right-of-way line South 54°13'25" West, 0.75 feet to the beginning of a 4037.00 foot (Tract 2 – legal description, continued)

radius curve to the right; thence along the arc of said curve 559.56 feet through a central angle of 7°56'30" (the long chord bears South 58°11'40" West, 559.12 feet) to said North-South centerline of said Section 27; thence leaving said right-of-way line and along said North-South centerline South 01°36'49" West, 1116.40 feet to the intersection of said East-West centerline; thence South 88°31'20" East, 25.50 feet to a 5/8" iron rod with a yellow plastic cap marked "WRG Design, Inc."; thence South 01°36'49" West, 488.53 feet to the Point of Beginning.

(Containing therein a combined area of 41.534 acres more or less.)

EXCEPTING THEREFROM those areas dedicated to the public for public use as recorded in Document Number 2010-045630, Washington County, Oregon Deed Records.

The basis of bearings for this description is Survey Number 31523, Washington County Survey Records.

# KOCH CORPORATE CENTER

## Tualatin, Oregon

### LEGEND

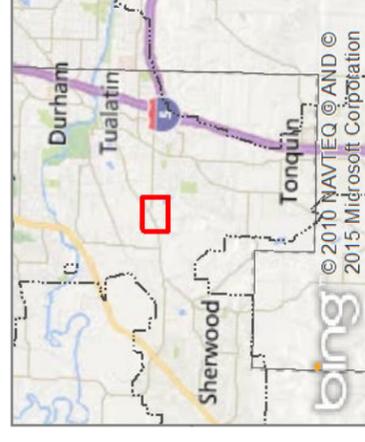
-  Site
-  Tax Lots



SOURCE DATA:  
Metro PLUS Lite Base Data,  
Aug 2014

GEOGRAPHIC PROJECTION:  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic

Date: 12/12/2015  
File: Phase III Aerial  
Map Created By: <AG> mdp/jagp  
Project No: 2130561.00 & 2140559.00



# MACKENZIE.

P 503.224.9560 • F 503.228.1285 • W MCKNZE.COM  
RiverEast Center 1515 SE Water Avenue, #100, Portland, OR 97214

Portland, Oregon • Vancouver, Washington • Seattle, Washington

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Image courtesy of USGS Earthstar



10295 SW Ridder Road, Wilsonville, OR 97070  
O: 503.570.0626 F: 503.982.9307 republicservices.com

December 15, 2015

Mark Person, AICP  
Planner  
Mackenzie Design  
RiverEast Center  
1515SE Water Ave  
Suite 100  
Portland, OR 97214

Re: Koch Buildings; #10, 11, & 12 - Trash Enclosures  
Dear Mark;

Thank you, for sending me your updated site plans and enclosure designs for these building developments in Tualatin.

My Company: Republic Services of Clackamas & Washington Counties has the franchise agreement to service this area with the City of Tualatin. We provide complete commercial waste removal and recycling services as needed on a weekly basis for this location.

It looks like the locations of the enclosures, and size of the enclosures will be fine for us to service them. Please remember to have the gates open at least 120 degrees.

Thank you Mark; for your help and concerns for our services prior to this project being developed.

Sincerely,

A handwritten signature in blue ink that reads "Frank J. Lonergan".

Frank J. Lonergan  
Operations Manager  
Republic Services Inc.



Architecture • Interiors  
Planning • Engineering

Portland, OR  
503.271.5560  
Vancouver, WA  
360.696.1819  
Seattle, WA  
206.769.8933  
www.mackenzie.com

**MACKENZIE.**  
ARCHITECTURE • INTERIORS  
PLANNING • ENGINEERING

Client  
**PacTrust**  
A PACITRUST PROPERTY

Project  
**KOCHI CORPORATE CENTER**  
LOTS 10, 11 AND 12  
20650 SW 15TH AVE.  
TUALATIN, OR 97062

MAKENZIE 2025  
ALL RIGHTS RESERVED  
THESE DRAWINGS ARE THE PROPERTY  
OF MACKENZIE AND ARE NOT TO BE USED  
OR REPRODUCED IN ANY MANNER  
WITHOUT PRIOR WRITTEN PERMISSION.

REVISIONS:  
NO. REVISION DATE  
BY THE CLOSING DATE  
BY SHEET

SHEET TITLE:  
**SITE  
DIMENSIONING  
PLAN**

DRAWN BY:  
CHECKED BY:  
SHEET:

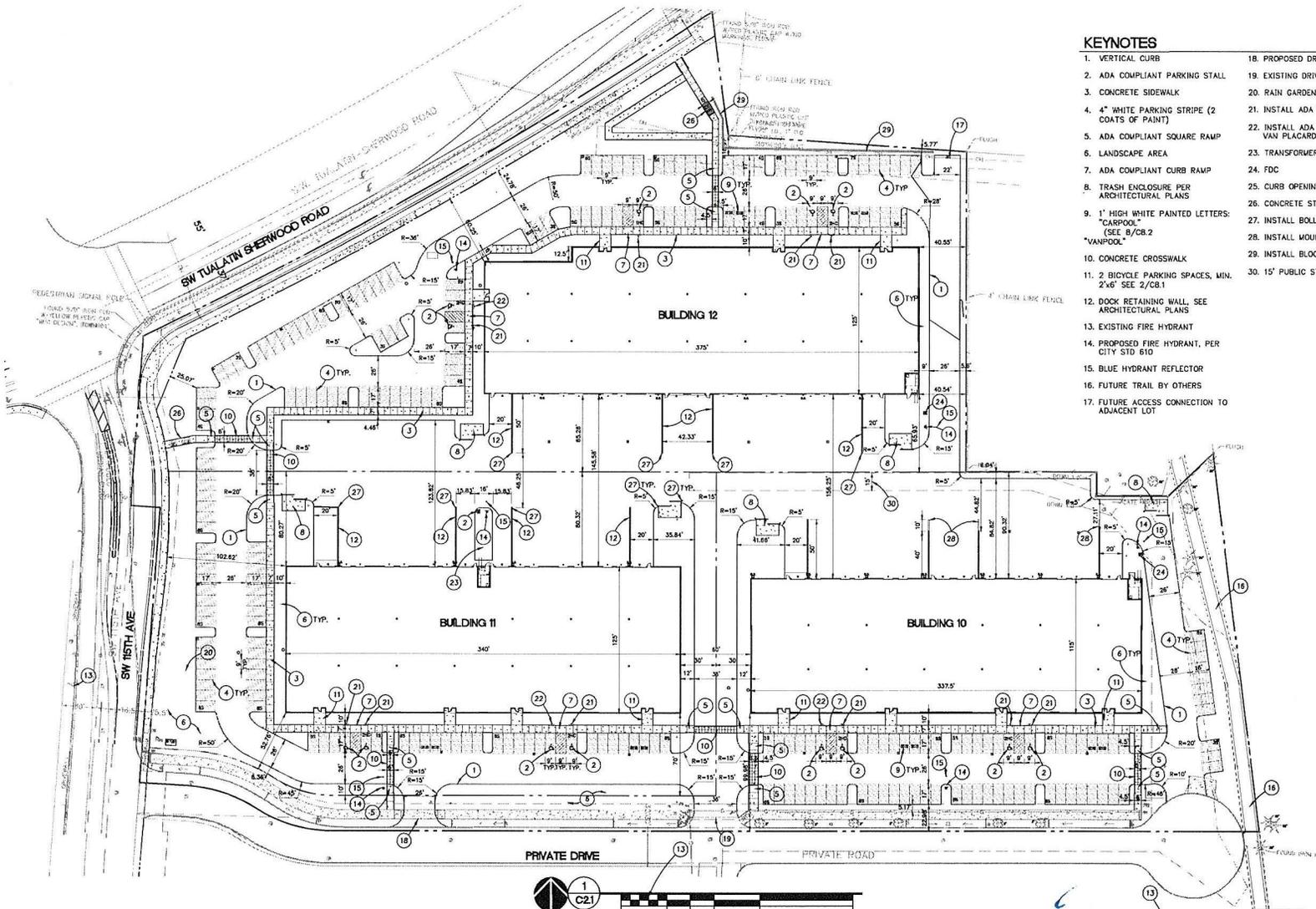
**C21**

JOB NO. 2140559.01

NOVEMBER 19, 2015  
PRELIMINARY

**KEYNOTES**

1. VERTICAL CURB
2. ADA COMPLIANT PARKING STALL
3. CONCRETE SIDEWALK
4. 4" WHITE PARKING STRIPE (2 COATS OF PAINT)
5. ADA COMPLIANT SQUARE RAMP
6. LANDSCAPE AREA
7. ADA COMPLIANT CURB RAMP
8. TRASH ENCLOSURE PER ARCHITECTURAL PLANS
9. 1" HIGH WHITE PAINTED LETTERS: "CARPOOL" (SEE 8/CB.2 "VANPOOL")
10. CONCRETE CROSSWALK
11. 2 BICYCLE PARKING SPACES, MIN. 2'x6' SEE 2/CB.1
12. DOCK RETAINING WALL, SEE ARCHITECTURAL PLANS
13. EXISTING FIRE HYDRANT
14. PROPOSED FIRE HYDRANT, PER CITY STD 610
15. BLUE HYDRANT REFLECTOR
16. FUTURE TRAIL BY OTHERS
17. FUTURE ACCESS CONNECTION TO ADJACENT LOT
18. PROPOSED DRIVEWAY
19. EXISTING DRIVEWAY
20. RAIN GARDEN LIDA FACILITY
21. INSTALL ADA COMPLIANT SIGN W/ VAN PLACARD
22. INSTALL ADA COMPLIANT SIGN W/ VAN PLACARD
23. TRANSFORMER
24. FDC
25. CURB OPENING
26. CONCRETE STAIRS
27. INSTALL BOLLARD
28. INSTALL MOUNTABLE CURB
29. INSTALL BLOCK WALL
30. 15' PUBLIC STORM EASEMENT



**SITE DATA**

BUILDING 10	
LOT	150,996 SF (3.47 AC)
TOTAL IMPERVIOUS AREA	120,798 SF (2.77 AC, 79.9%)
BUILDING FOOTPRINT	38,812 SF (0.90 AC, 25.8%)
DRIVE AISLE/PARKING/SIDEWALK AREA	81,986 SF (1.88 AC, 54.2%)
PARKING LOT AREA	21,984 SF (0.50 AC, 14.5%)
REQUIRED PARKING LANDSCAPE	1,825 SF (25 SF/STALL)
PARKING LANDSCAPE AREA	3,384 SF (0.08 AC, 2.2%)
LANDSCAPE AREA	30,198 SF (0.69 AC, 19.9%)

PROVIDED PARKING LOT 10	
PROPOSED HANDICAP	4 SPACES
PROPOSED STANDARD	69 SPACES (4 VAN/CAR POOL SPACES)
PROPOSED COMPACT	0 SPACES
TOTAL PARKING PROVIDED	73 SPACES (1,880,000 SF)
BICYCLE PARKING	6 (4 EXTERIOR AND 2 INTERIOR SPACES)

BUILDING 11	
LOT	128,107 SF (2.94 AC)
TOTAL IMPERVIOUS AREA	104,867 SF (2.41 AC, 82.3%)
BUILDING FOOTPRINT	42,500 SF (1.05 AC, 35.8%)
DRIVE AISLE/PARKING/SIDEWALK AREA	62,367 SF (1.43 AC, 48.7%)
PARKING LOT AREA	22,215 SF (0.51 AC, 17.3%)
REQUIRED PARKING LANDSCAPE	1,625 SF (25 SF/STALL)
PARKING LANDSCAPE AREA	2,295 SF (0.05 AC, 1.8%)
LANDSCAPE AREA	23,240 SF (0.52 AC, 17.7%)

PROVIDED PARKING LOT 11	
PROPOSED HANDICAP	4 SPACES
PROPOSED STANDARD	61 SPACES (4 VAN/CAR POOL SPACES)
PROPOSED COMPACT	0 SPACES
TOTAL PARKING PROVIDED	65 SPACES (1,531,000 SF)
BICYCLE PARKING	6 (4 EXTERIOR AND 2 INTERIOR SPACES)

BUILDING 12	
LOT	169,377 SF (3.89 AC)
TOTAL IMPERVIOUS AREA	132,333 SF (3.04 AC, 78.1%)
BUILDING FOOTPRINT	45,941 SF (1.05 AC, 27.1%)
DRIVE AISLE/PARKING/SIDEWALK AREA	86,392 SF (1.98 AC, 51.5%)
PARKING LOT AREA	34,821 SF (0.81 AC, 20.9%)
REQUIRED PARKING LANDSCAPE	2,725 SF (25 SF/STALL)
PARKING LANDSCAPE AREA	5,792 SF (0.13 AC, 3.4%)
LANDSCAPE AREA	37,044 SF (0.85 AC, 21.9%)

PROVIDED PARKING LOT 12	
PROPOSED HANDICAP	5 SPACES
PROPOSED STANDARD	103 SPACES (5 VAN/CAR POOL SPACES)
PROPOSED COMPACT	0 SPACES
TOTAL PARKING PROVIDED	108 SPACES (2,407,000 SF)
BICYCLE PARKING	6 (4 EXTERIOR AND 2 INTERIOR SPACES)

**PARKING DATA**

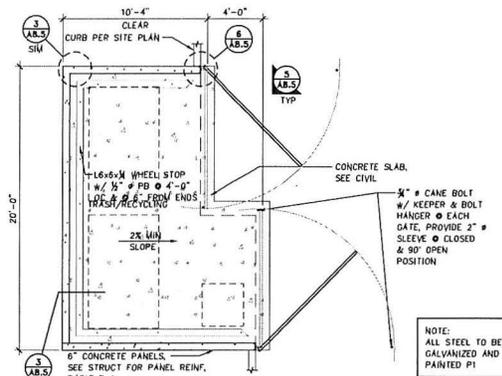
REQUIRED PARKING  
(BASED ON 30% MANUFACTURING AND 70% WAREHOUSE USE)

	LOT 10	LOT 11	LOT 12	
MANUFACTURING MINIMUM (1.8/1,000)	19	23	NONE	52 SPACES
MANUFACTURING MAXIMUM	NONE	NONE	NONE	
WAREHOUSE MINIMUM (0.3/1,000)	9	10	10	10 SPACES
WAREHOUSE MAXIMUM (0.5/1,000)	14	17	16	16 SPACES
TOTAL MINIMUM	28	33	32	32 SPACES
TOTAL MAXIMUM	NONE	NONE	NONE	

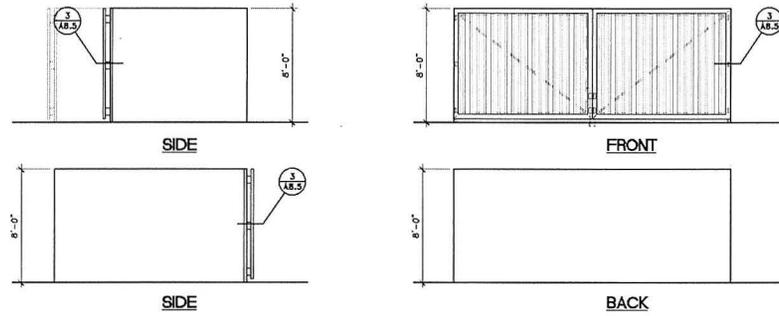
*FD Longera* 12/15/15

REVISIONS:

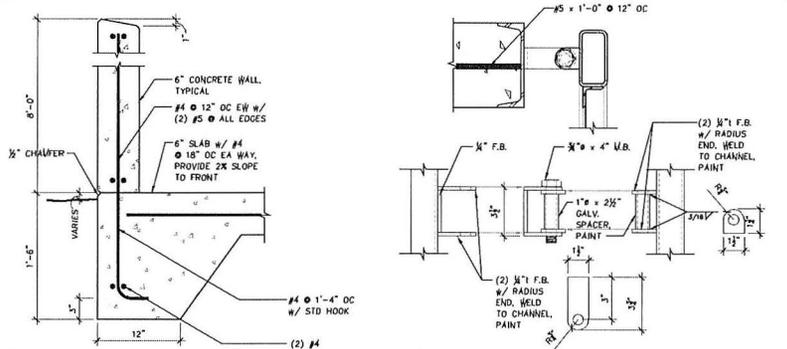
NO.	REVISION	REVISION DATE
1	11/3/15	
2	11/5/15	
3	11/16/15	
4	11/19/2015	
5	IN PROGRESS	



1 TRASH ENCLOSURE  
A8.5

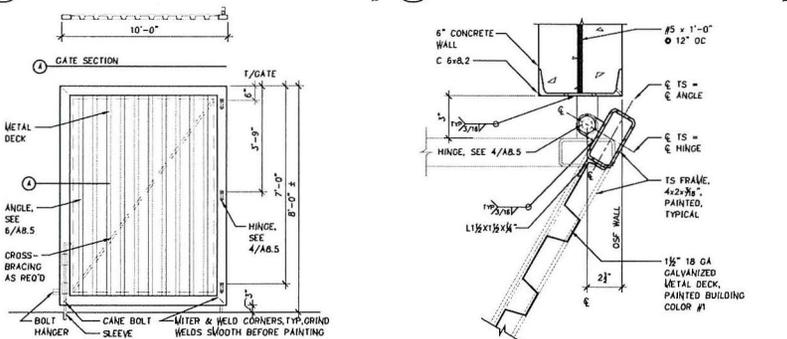


2 TRASH ENCLOSURE - ELEVATIONS  
A8.5



3 CONCRETE WALL  
A8.5

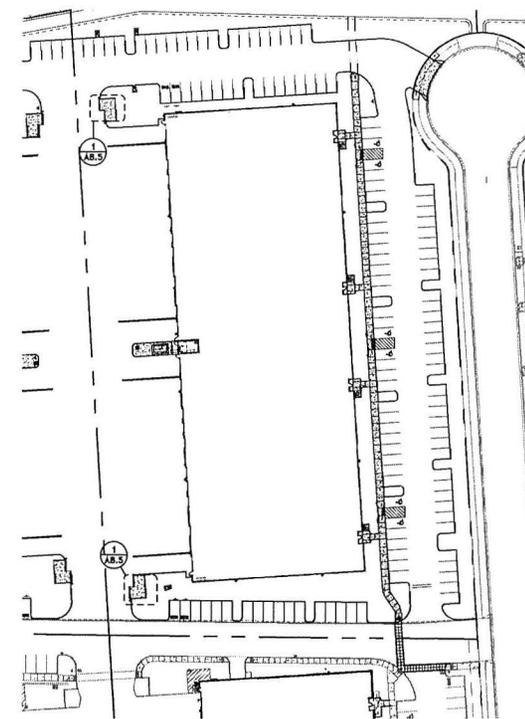
4 HINGE DETAIL  
A8.5



5 TYPICAL GATE ELEVATION  
A8.5

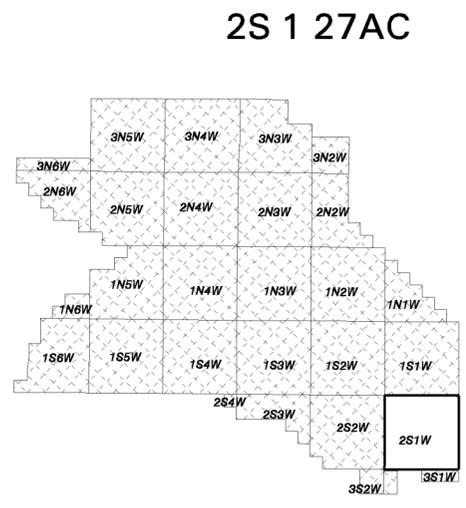
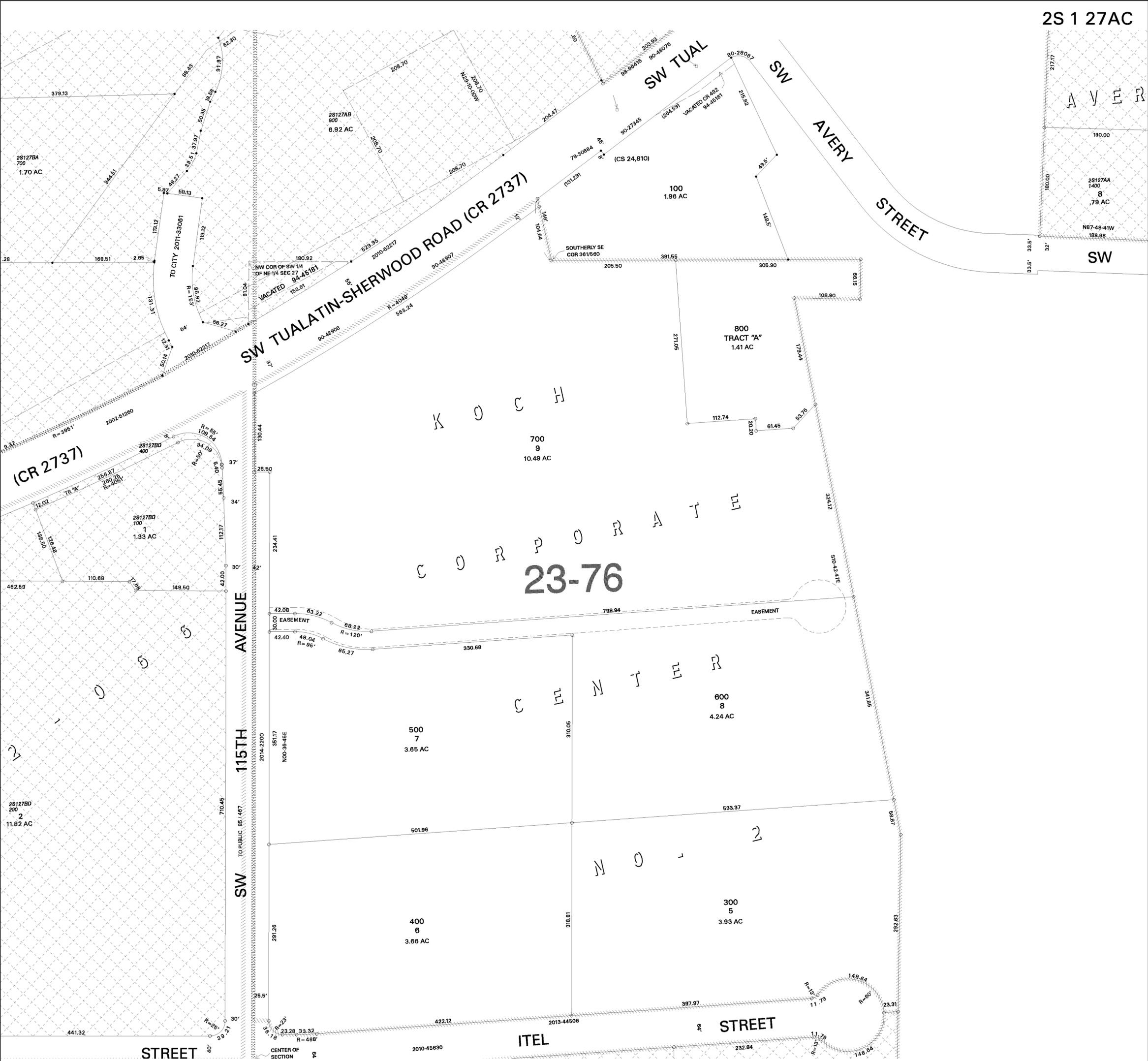
6 GATE DETAIL  
A8.5

7 SITE PLAN  
A8.5



SEE CIVIL PLAN FOR MORE INFORMATION

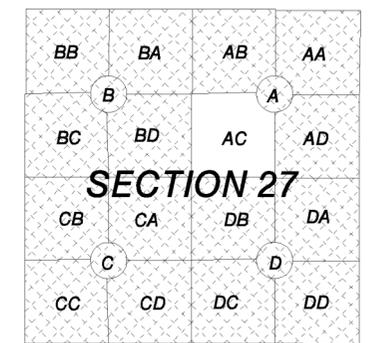
12/15/15  
FJ  
Lorenz



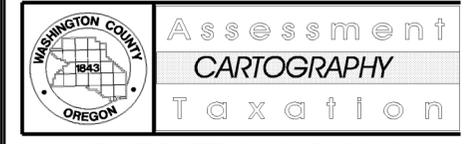
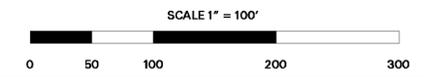
WASHINGTON COUNTY OREGON  
SW 1/4 NE 1/4 SECTION 27 T2S R1W W.M.  
SCALE 1" = 100'

36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6
12	7	8	9	10	11	12	7
13	18	17	16	15	14	13	18
24	19	20	21	22	23	24	19
25	30	29	28	27	26	25	30
36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6

FOR ADDITIONAL MAPS VISIT OUR WEBSITE AT  
[www.co.washington.or.us](http://www.co.washington.or.us)



Cancelled Taxlots For: 2S127AC  
200,



PLOT DATE: April 25, 2014  
FOR ASSESSMENT PURPOSES  
ONLY - DO NOT RELY ON  
FOR OTHER USE  
Map areas delineated by either gray shading or a cross-hatched pattern are for reference only and may not indicate the most current property boundaries. Please consult the appropriate map for the most current information.



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REVISIONS:

NO.	REVISIONS	REVISION DATE	DELTA	CLOSING DATE
1	ISSUED FOR PERMIT	1/18/16		

SHEET TITLE:  
**EXISTING  
CONDITIONS  
PLAN**

DRAWN BY:

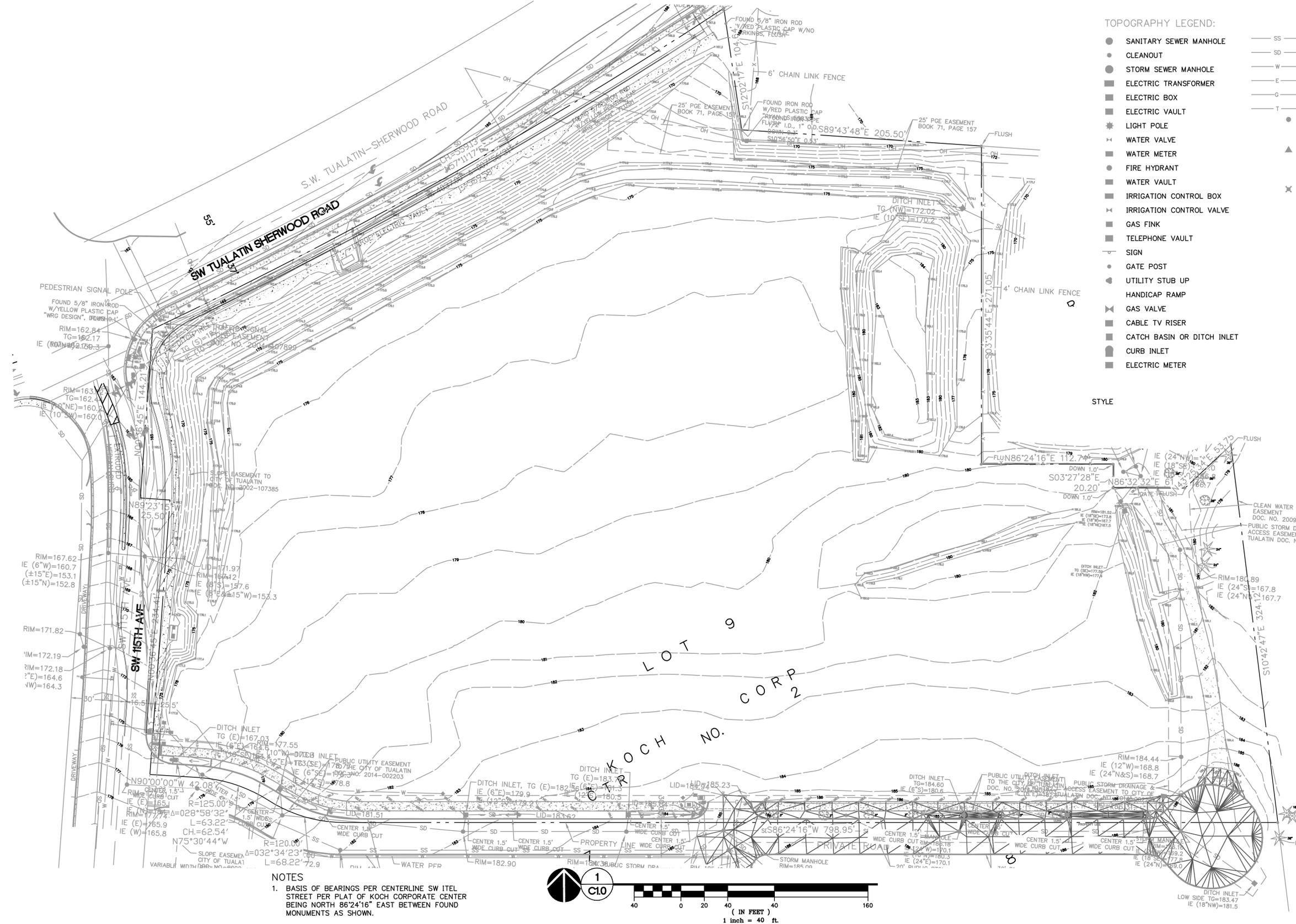
CHECKED BY:

SHEET:

## C1.0

JOB NO. **2140559.05**

SUBMITTED FOR ARCHITECTURAL REVIEW: 1/18/16



- TOPOGRAPHY LEGEND:**
- SANITARY SEWER MANHOLE
  - CLEANOUT
  - STORM SEWER MANHOLE
  - ELECTRIC TRANSFORMER
  - ELECTRIC BOX
  - ELECTRIC VAULT
  - ★ LIGHT POLE
  - ⊕ WATER VALVE
  - WATER METER
  - FIRE HYDRANT
  - WATER VAULT
  - IRRIGATION CONTROL BOX
  - ⊕ IRRIGATION CONTROL VALVE
  - GAS FINK
  - TELEPHONE VAULT
  - SIGN
  - GATE POST
  - UTILITY STUB UP
  - HANDICAP RAMP
  - ⊕ GAS VALVE
  - CABLE TV RISER
  - CATCH BASIN OR DITCH INLET
  - CURB INLET
  - ELECTRIC METER

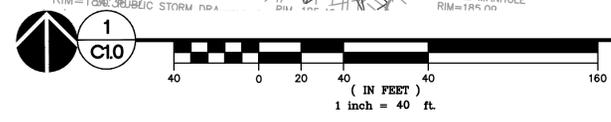
- SS — UNDERGROUND SANITARY SEWER LINE
- SD — UNDERGROUND STORM DRAIN LINE
- W — UNDERGROUND WATER LINE
- E — UNDERGROUND POWER
- G — UNDERGROUND GAS LINE
- T — UNDERGROUND TELE-COM

- FOUND 5/8" IRON ROD W/RED PLASTIC CAP "RYAN LS 58833" PER PLAT OF KOCH CORPORATE CENTER OR AS NOTED
- ▲ FOUND 5/8" IRON ROD WITH 1-1/2" ALUMINUM CAP "RYAN LS 58833" PER SN 31853 & PLAT OF KOCH CORPORATE CENTER OR AS NOTED
- ✕ FOUND 1" COPPER DISK "LS 58833" PER SN 31853 & PLAT OF KOCH CORPORATE CENTER

STYLE

**NOTES**

- BASIS OF BEARINGS PER CENTERLINE SW ITEL STREET PER PLAT OF KOCH CORPORATE CENTER BEING NORTH 86°24'16" EAST BETWEEN FOUND MONUMENTS AS SHOWN.
- ELEVATIONS ARE BASED ON WASHINGTON COUNTY BENCH MARK "WB26" BEING A 2" ALUMINUM CAP MARKED "CONSULTING ENGINEERING SERVICES" AT THE CENTERLINE INTERSECTION OF SW BYROM TER. & SW 10TH PL., ELEV.:241.738, DATUM NGVD29.
- BOUNDARY PER PLATS OF KOCH CORPORATE CENTER AND KOCH CORPORATE CENTER NO. 2. MONUMENTS SHOWN HEREON AS FOUND WERE IN AGREEMENT WITH THOSE FOUND OR SET ON SAID PLATS. BEARINGS AND DISTANCES SHOWN HEREON ARE AS MEASURED AND PER SAID PLAT.
- FIELD SURVEYED JANUARY 28, 2015 AND UPDATED TO PAD PREP SEPTEMBER 21 AND 22, 2015.
- UTILITIES IN RECENTLY GRAVELED AREA WERE GENERALLY UNTOUCHED AND REMAINED AT THE JANUARY ELEVATION AND ARE PROTRUDING ABOVE THE GRAVELED GROUND SURFACE. THE "UTILITY STUB UPS" IN THE INTERIOR OF THE SITE WERE NOT ALL RECOVERED IN SEPTEMBER.

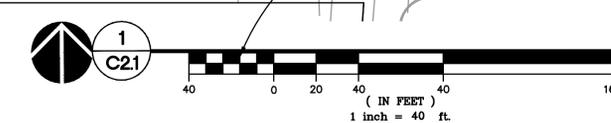
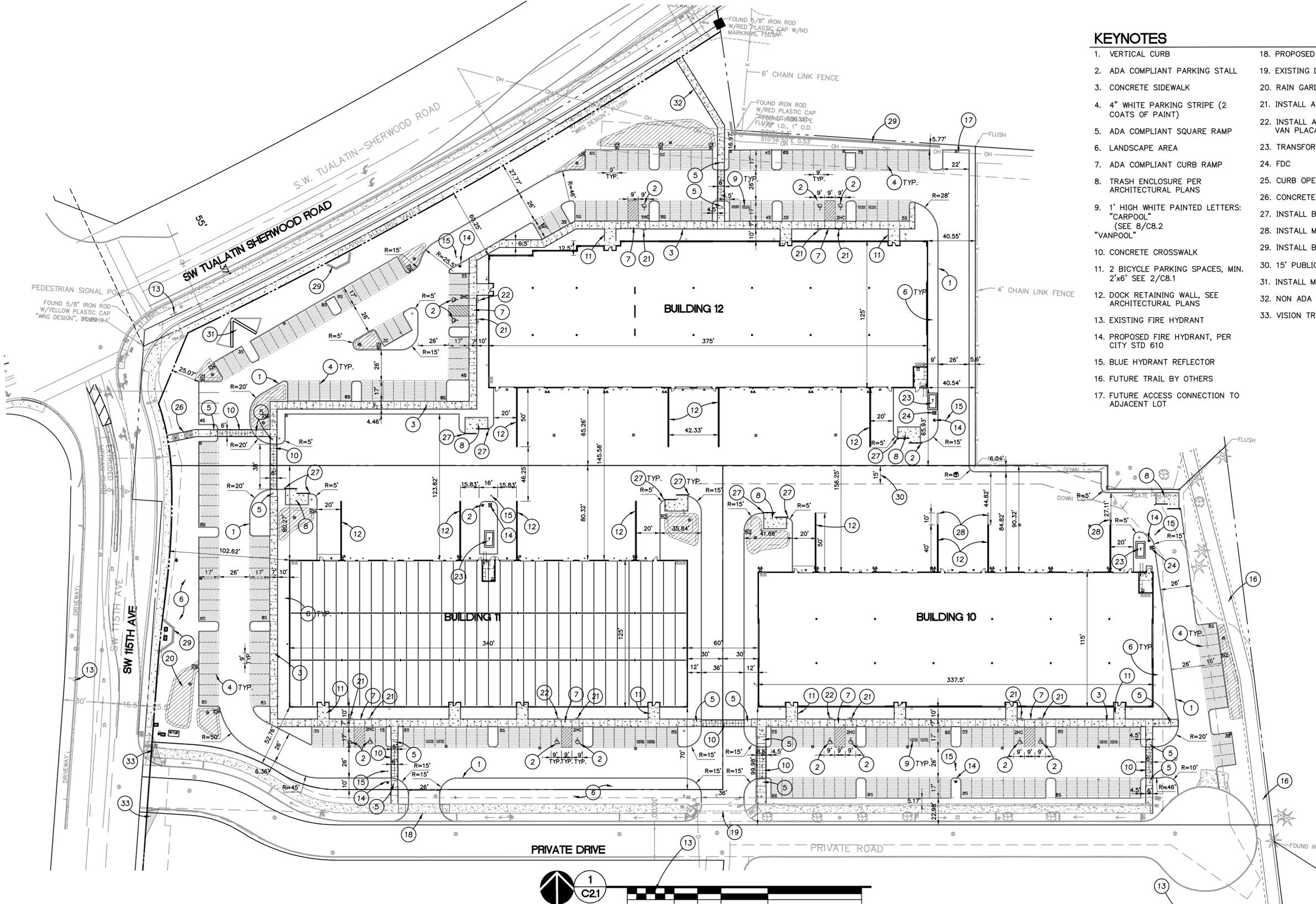


**UTILITY STATEMENT**

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN MAPPED FROM FIELD SURVEY INFORMATION, OBSERVED ABOVE GROUND EVIDENCE AND GROUND MARKINGS BY OTHERS, AND EXISTING DRAWINGS SUPPLIED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

## KEYNOTES

- VERTICAL CURB
- ADA COMPLIANT PARKING STALL
- CONCRETE SIDEWALK
- 4" WHITE PARKING STRIPE (2 COATS OF PAINT)
- ADA COMPLIANT SQUARE RAMP
- LANDSCAPE AREA
- ADA COMPLIANT CURB RAMP
- TRASH ENCLOSURE PER ARCHITECTURAL PLANS
- 1" HIGH WHITE PAINTED LETTERS: "CARPOOL" (SEE 8/C8.2 "VANPOOL")
- CONCRETE CROSSWALK
- 2 BICYCLE PARKING SPACES, MIN. 2'x6' SEE 2/C8.1
- DOCK RETAINING WALL, SEE ARCHITECTURAL PLANS
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT, PER CITY STD 610
- BLUE HYDRANT REFLECTOR
- FUTURE TRAIL BY OTHERS
- FUTURE ACCESS CONNECTION TO ADJACENT LOT
- PROPOSED DRIVEWAY
- EXISTING DRIVEWAY
- RAIN GARDEN LIDA FACILITY
- INSTALL ADA COMPLIANT SIGN
- INSTALL ADA COMPLIANT SIGN W/ VAN PLACARD
- TRANSFORMER
- FDC
- CURB OPENING
- CONCRETE STAIRS
- INSTALL BOLLARD
- INSTALL MOUNTABLE CURB
- INSTALL BLOCK WALL
- 15' PUBLIC STORM EASEMENT
- INSTALL MONUMENT SIGN
- NON ADA COMPLIANT WALKWAY
- VISION TRIANGLE



## SITE DATA

BUILDING 10	
LOT	150,999 SF (3.47 AC)
TOTAL IMPERVIOUS AREA	120,798 SF (2.77 AC, 79.9%)
BUILDING FOOTPRINT	38,812 SF (0.90 AC, 25.8%)
DRIVE AISLE/PARKING/SIDEWALK AREA	81,986 SF (1.88 AC, 54.2%)
PARKING LOT AREA	21,964 SF (0.50 AC, 14.5%)
REQUIRED PARKING LANDSCAPE	1,825 SF (25 SF/STALL)
PARKING LANDSCAPE AREA	3,384 SF (0.08 AC, 2.2%)
LANDSCAPE AREA	30,198 SF (0.69 AC, 19.9%)

PROVIDED PARKING LOT 10	
PROPOSED ADA COMPLIANT	4 SPACES
PROPOSED STANDARD	69 SPACES (4 VAN/CAR POOL SPACES)
PROPOSED COMPACT	0 SPACES
TOTAL PARKING PROVIDED	73 SPACES (1.88/1,000 SF)
BICYCLE PARKING	6 (4 EXTERIOR AND 2 INTERIOR SPACES)

BUILDING 11	
LOT	127,991 SF (2.94 AC)
TOTAL IMPERVIOUS AREA	104,867 SF (2.41 AC, 81.9%)
BUILDING FOOTPRINT	42,500 SF (1.05 AC, 33.2%)
DRIVE AISLE/PARKING/SIDEWALK AREA	62,367 SF (1.43 AC, 48.7%)
PARKING LOT AREA	22,215 SF (0.51 AC, 17.3%)
REQUIRED PARKING LANDSCAPE	1,625 SF (25 SF/STALL)
PARKING LANDSCAPE AREA	2,295 SF (0.05 AC, 1.8%)
LANDSCAPE AREA	23,240 SF (0.52 AC, 17.7%)

PROVIDED PARKING LOT 11	
PROPOSED ADA COMPLIANT	4 SPACES
PROPOSED STANDARD	61 SPACES (4 VAN/CAR POOL SPACES)
PROPOSED COMPACT	0 SPACES
TOTAL PARKING PROVIDED	65 SPACES (1.53/1,000 SF)
BICYCLE PARKING	6 (4 EXTERIOR AND 2 INTERIOR SPACES)

BUILDING 12	
LOT	169,334 SF (3.89 AC)
TOTAL IMPERVIOUS AREA	132,333 SF (3.04 AC, 78.1%)
BUILDING FOOTPRINT	45,941 SF (1.05 AC, 27.1%)
DRIVE AISLE/PARKING/SIDEWALK AREA	86,392 SF (1.98 AC, 51.5%)
PARKING LOT AREA	34,621 SF (0.81 AC, 20.9%)
REQUIRED PARKING LANDSCAPE	2,725 SF (25 SF/STALL)
PARKING LANDSCAPE AREA	5,712 SF (0.13 AC, 3.4%)
LANDSCAPE AREA	37,124 SF (0.85 AC, 21.9%)

PROVIDED PARKING LOT 12	
PROPOSED ADA COMPLIANT	5 SPACES
PROPOSED STANDARD	103 SPACES (5 VAN/CAR POOL SPACES)
PROPOSED COMPACT	0 SPACES
TOTAL PARKING PROVIDED	108 SPACES (2.40/1,000 SF)
BICYCLE PARKING	6 (4 EXTERIOR AND 2 INTERIOR SPACES)

## PARKING DATA

REQUIRED PARKING (BASED ON 30% MANUFACTURING AND 70% WAREHOUSE USE)				
	LOT 10	LOT 11	LOT 12	
MANUFACTURING				
MINIMUM (1.6/1,000)	19	23	22	SPACES
MAXIMUM	NONE	NONE	NONE	
WAREHOUSE				
MINIMUM (0.3/1,000)	9	10	10	SPACES
MAXIMUM (0.5/1,000)	14	17	16	SPACES
TOTAL				
MINIMUM	28	33	32	SPACES
MAXIMUM	NONE	NONE	NONE	



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REVISIONS:

NO.	REVISIONS	REVISION DATE	DELTA	CLOSING DATE

SHEET TITLE:  
**GRADING PLAN**

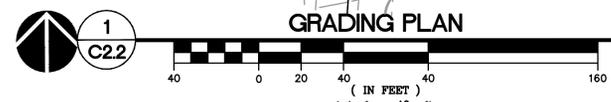
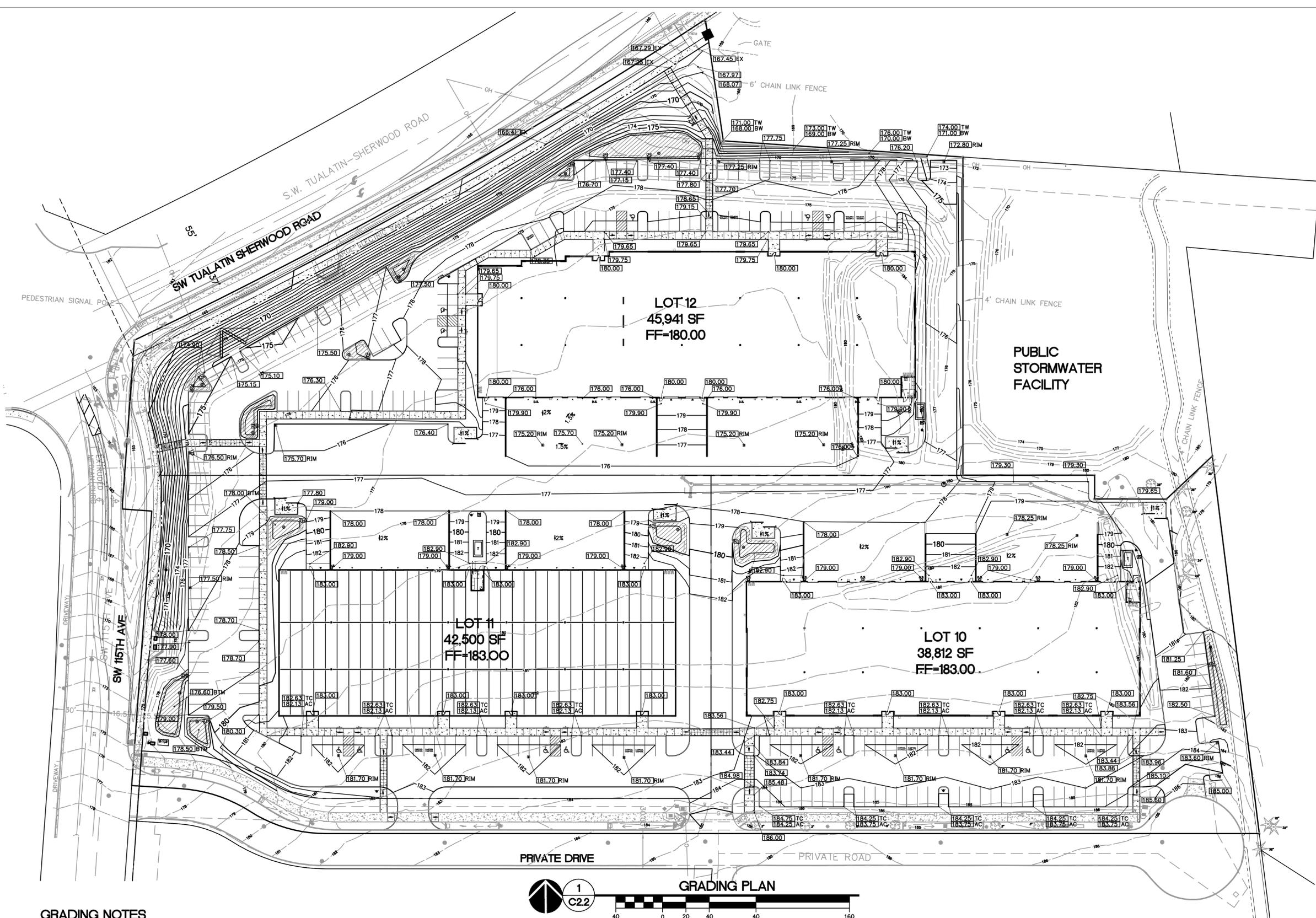
DRAWN BY: ASP

CHECKED BY: RLF

SHEET:

**C2.2**

JOB NO. **2140559.05**



**GRADING NOTES**

- ROUGH GRADING: BRING ALL FINISH GRADES TO APPROXIMATE LEVELS INDICATED. WHERE GRADES ARE NOT OTHERWISE INDICATED, FINISH GRADES ARE TO BE THE SAME AS ADJACENT SIDEWALKS, CURBS, OR THE OBVIOUS GRADE OF ADJACENT STRUCTURE. GRADE TO UNIFORM LEVELS OR SLOPES BETWEEN POINTS WHERE GRADES ARE GIVEN. ROUND OFF SURFACES, AVOID ABRUPT CHANGES IN LEVELS. ROUGH GRADE TO ALLOW FOR DEPTH OF CONCRETE SLABS, WALKS, AND THEIR BASE COURSES. GRADE FOR PAVED DRIVES AND PAVED PARKING AREAS AS INDICATED AND SPECIFIED HEREIN, AND PROVIDE FOR SURFACE DRAINAGE AS SHOWN, ALLOWING FOR THICKNESS OF SURFACING MATERIAL.  
FINISH GRADING: AT COMPLETION OF JOB AND AFTER BACKFILLING BY OTHER CRAFTS HAS BEEN COMPLETED, REFILL AND COMPACT AREAS WHICH HAVE SETTLED OR ERODED TO BRING TO FINAL GRADES. GRADING TOLERANCES:  
ROUGH GRADE AT PAVED OR LANDSCAPED AREAS: ±0.1 FT.  
FINISH GRADE PRIOR TO PLACING FINAL SURFACING: ±0.03 FT.
- EXCAVATION: EXCAVATE FOR SLABS, PAVING, AND OTHER IMPROVEMENTS TO SIZES AND LEVELS SHOWN OR REQUIRED. ALLOW FOR FORM CLEARANCE AND FOR PROPER COMPACTION OF REQUIRED BACKFILLING MATERIAL. EXCAVATOR(S) MUST COMPLY WITH O.R.S. 757.541 THROUGH 757.571; EXCAVATOR(S) SHALL

NOTIFY ALL UTILITY COMPANIES FOR LINE LOCATIONS 72 HOURS (MINIMUM) PRIOR TO START OF WORK. DAMAGE TO UTILITIES SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE. EFFECTIVE EROSION PREVENTION AND SEDIMENT CONTROL IS REQUIRED. EROSION CONTROL DEVICES MUST BE INSTALLED AND MAINTAINED MEETING THE CITY AND CLEAN WATER SERVICES REQUIREMENTS. THE GOVERNING JURISDICTION MAY, AT ANY TIME, ORDER CORRECTIVE ACTION AND STOPPAGE OF WORK TO ACCOMPLISH EFFECTIVE EROSION CONTROL.

EFFECTIVE DRAINAGE CONTROL IS REQUIRED. DRAINAGE SHALL BE CONTROLLED WITHIN THE WORK SITE AND SHALL BE SO ROUTED THAT ADJACENT PRIVATE PROPERTY, PUBLIC PROPERTY, AND THE RECEIVING SYSTEM ARE NOT ADVERSELY IMPACTED. THE GOVERNING JURISDICTION MAY, AT ANY TIME, ORDER CORRECTIVE ACTION AND STOPPAGE OF WORK TO ACCOMPLISH EFFECTIVE DRAINAGE CONTROL.

SITE LANDSCAPE AREAS TO EXCAVATED TO 12" BELOW FINISHED GRADE BY SITE WORK CONTRACTOR. ALL TOPSOIL EXCAVATED AS PART OF THIS EFFORT TO BE REMOVED FROM SITE IN ACCORDANCE WITH THE SPECIFICATIONS, ALL IMPORT TOPSOIL TO BE PLACED BY LANDSCAPE CONTRACTOR.

THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET

IS BASED ON A SURVEY BY WESTLAKE CONSULTANTS, INC., AND IS SHOWN FOR REFERENCE ONLY. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS WITH HIS OWN RESOURCES PRIOR TO START OF ANY CONSTRUCTION. CONTRACTOR TO COORDINATE GRADES AT ENTRANCE WITH ARCHITECTURAL PLANS PRIOR TO CONSTRUCTION.

2% MAXIMUM SLOPE AT ALL HANDICAP PARKING SPACES AND LANDINGS.

5% MAX LONGITUDINAL AND 2% MAX CROSS SLOPE (EXCLUDING RAMPS) AT PEDESTRIAN SIDEWALK CONNECTIONS BETWEEN PUBLIC R.O.W. AND BUILDING ENTRANCES.

IF GROUNDWATER IS PRESENT IN UTILITY TRENCH EXCAVATIONS, IT IS RECOMMENDED THAT 12"-18" OF TRENCH STABILIZATION ROCK BE PLACED AT THE BASE OF THE EXCAVATION. TRENCH STABILIZATION ROCK SHOULD MEET THE REQUIREMENTS OUTLINED IN THE 'STRUCTURAL FILL' SECTION OF THE GEOTECHNICAL REPORT AND SHOULD BE PLACED IN ONE LIFT AND COMPACTED UNTIL IT IS FIRM AND UNYIELDING. GROUNDWATER SHOULD BE PUMPED OUT OF THE TRENCH FROM A SUMP EXCAVATED BELOW THE TRENCH STABILIZATION ROCK. THE CONTRACTOR WILL BE RESPONSIBLE FOR TEMPORARY DRAINAGE OF SURFACE WATER AND GROUNDWATER AS NECESSARY TO PREVENT STANDING WATER AND/OR EROSION AT THE WORKING SURFACE.

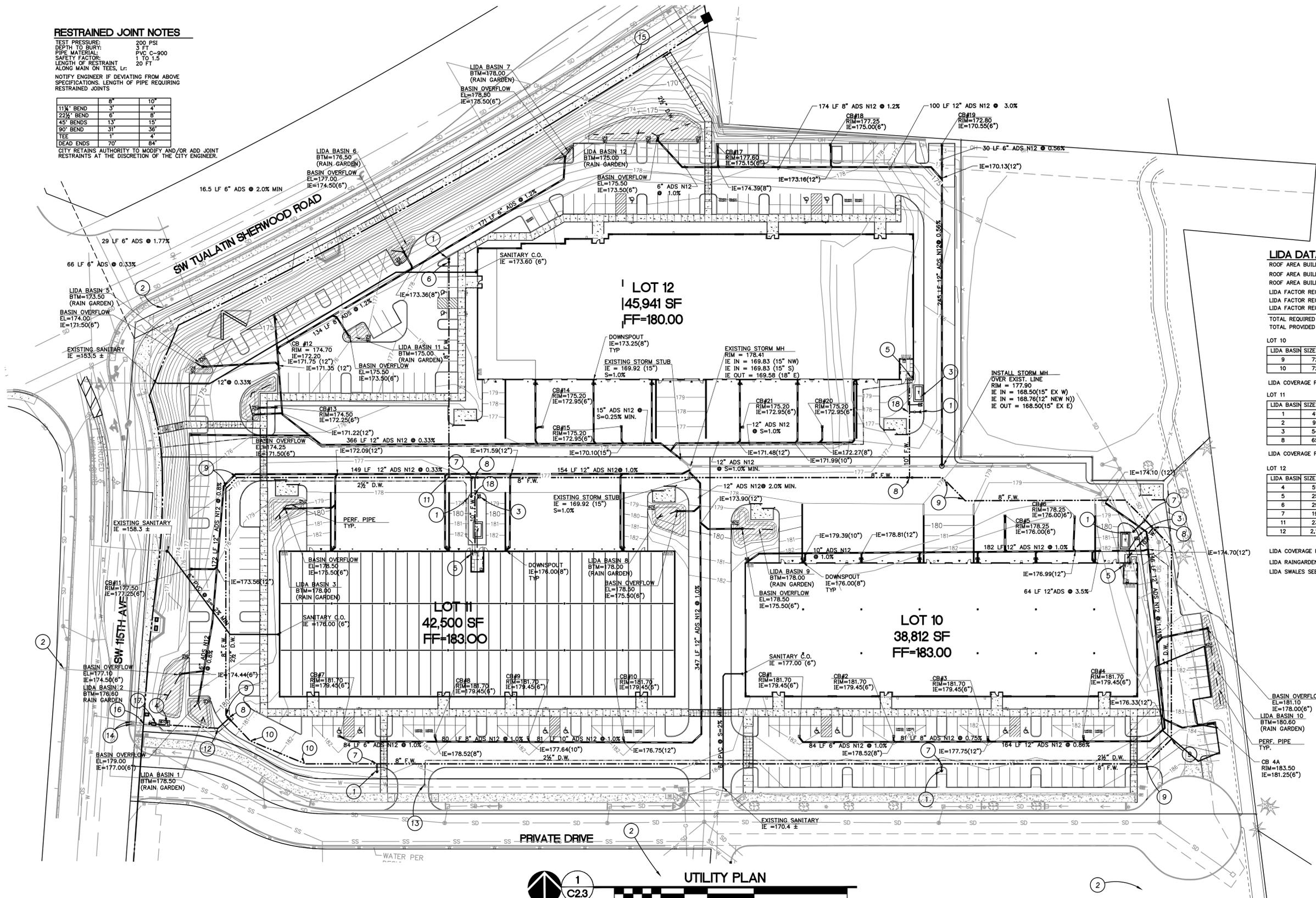
**RESTRAINED JOINT NOTES**

TEST PRESSURE: 200 PSI  
DEPTH TO BURY: 3 FT  
PIPE MATERIAL: PVC C-900  
SAFETY FACTOR: 1 TO 1.5  
LENGTH OF RESTRAINT: 20 FT  
ALONG MAIN ON TEES, L:  
NOTIFY ENGINEER IF DEVIATING FROM ABOVE SPECIFICATIONS. LENGTH OF PIPE REQUIRING RESTRAINED JOINTS

11K BEND	3'	4'
22 1/2° BEND	6'	8'
45° BENDS	13'	15'
90° BEND	31'	36'
TEE	1'	4'
DEAD ENDS	70'	84'

CITY RETAINS AUTHORITY TO MODIFY AND/OR ADD JOINT RESTRAINTS AT THE DISCRETION OF THE CITY ENGINEER.

8"	10"	
11K BEND	3'	4'
22 1/2° BEND	6'	8'
45° BENDS	13'	15'
90° BEND	31'	36'
TEE	1'	4'
DEAD ENDS	70'	84'



**LIDA DATA**

ROOF AREA BUILDING 10	=	38,812 SF
ROOF AREA BUILDING 11	=	42,500 SF
ROOF AREA BUILDING 12	=	45,941 SF
LIDA FACTOR REQ'D BLDG 10 @ 6%	=	2,329 SF
LIDA FACTOR REQ'D BLDG 11 @ 6%	=	2,550 SF
LIDA FACTOR REQ'D BLDG 12 @ 6%	=	2,765 SF
TOTAL REQUIRED TREATED AREA	=	7,635 SF
TOTAL PROVIDED	=	7,642 SF

**LOT 10**

LIDA BASIN SIZE (SF)	CONTRIBUTING AREA (SF)	LIDA FACTOR
9	720	6.8%
10	728	18.4%

**LOT 11**

LIDA BASIN SIZE (SF)	CONTRIBUTING AREA (SF)	LIDA FACTOR
1	413	14.7%
2	991	65.6%
3	542	69.1%
6	658	59.3%

**LOT 12**

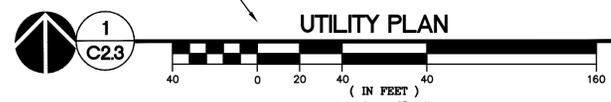
LIDA BASIN SIZE (SF)	CONTRIBUTING AREA (SF)	LIDA FACTOR
4	513	3.0%
5	252	1.6%
6	293	9.7%
7	194	3.0%
11	237	10.8%
12	2,101	37.6%

LIDA COVERAGE PROVIDED LOT 10 = 1,448 SF  
LIDA COVERAGE PROVIDED LOT 11 = 2,604 SF  
LIDA COVERAGE PROVIDED LOT 12 = 3,590 SF  
LIDA RAINGARDENS SEE 12/C8.2  
LIDA SWALES SEE 11/C8.2

**UTILITY NOTES**

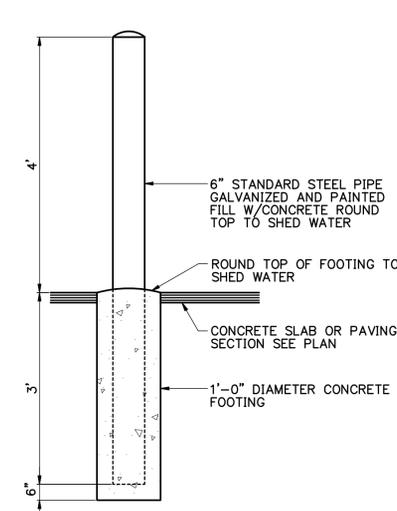
- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF TUALATIN, CLEAN WATER SERVICES, AND THE CURRENT EDITION OF THE UNIFORM PLUMBING CODE AND THE INTERNATIONAL BUILDING CODE. ALL WORK WITHIN THE PUBLIC R.O.W. REQUIRES A PUBLIC WORKS PERMIT.
- THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED FOR INSTALLATION IN THE SPACE PROVIDED. THEY DO NOT SHOW EVERY DIMENSION, COMPONENT PIECE, SECTION, JOINT OR FITTING REQUIRED TO COMPLETE THE PROJECT.
- ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH EXISTING CONDITIONS IN THE FIELD BEFORE BEGINNING UNDERGROUND. EXISTING UNDERGROUND UTILITIES LAYING WITHIN THE LIMITS OF EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING, PROVIDING SUCH IS PERMITTED BY LOCAL PUBLIC AUTHORITIES WITH JURISDICTION, BEFORE BEGINNING CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
- PROVIDE CLEANOUTS AS REQUIRED IN THE CURRENT UNIFORM PLUMBING CODE CHAPTER 7, SECTIONS 707 AND 719, AND CHAPTER 11, SECTION 1101.12. NOTE: NOT ALL REQUIRED CLEANOUTS ARE SHOWN ON THE PLANS.
- ALL STORM PIPING IS SIZED FOR A MANNING'S "N" VALUE = 0.013 ALL STORM PIPING IS DESIGNED USING CONCENTRIC PIPE TO PIPE AND WYE FITTINGS, UNLESS OTHERWISE NOTED. 12. 30 MIL LINER TO BE INSTALLED AT BOTTOM OF ALL LIDA BASINS WITHIN 10 LINEAL FEET OF FOOTING.
- SEE MECHANICAL DRAWINGS FOR UTILITIES LOCATED WITHIN THE BUILDING AND TO 5' OUTSIDE THE BUILDING.
- ALL DOWNSPOUT LEADERS TO BE 6" AT 2.0% MIN. UNLESS NOTED OTHERWISE. VERIFY LOCATION, SIZE AND DEPTH OF EXISTING UTILITIES BY POTHOLING PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF DISCREPANCIES.
- THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS BASED ON A SURVEY PREPARED BY WESTLAKE CONSULTANTS, INC. DATED JANUARY 30, 2015.
- CONTRACTOR TO PROVIDE POWER TO IRRIGATION CONTROLLER. SEE SPECIFICATIONS AND LANDSCAPE PLANS.
- SEE BUILDING PLUMBING DRAWINGS FOR PIPING WITHIN THE BUILDING AND UP TO 5' OUTSIDE THE BUILDING, INCLUDING ANY FOUNDATION DRAINAGE PIPING.
- CONTRACTOR TO MAINTAIN MINIMUM 3 FT OF COVER OVER ALL WATER LINE.

**UTILITY PLAN**

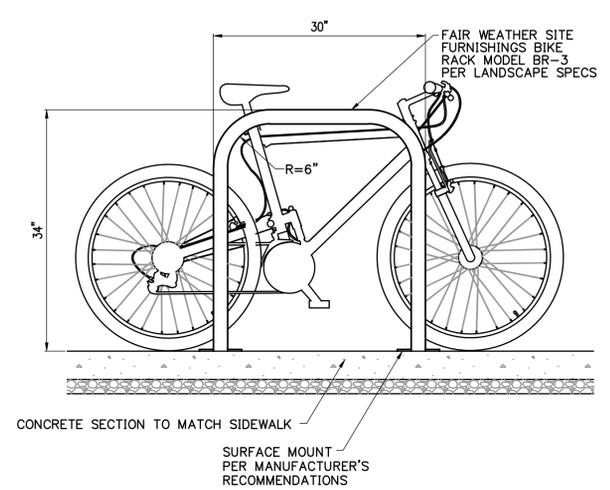


**WATERLINE KEYNOTES**

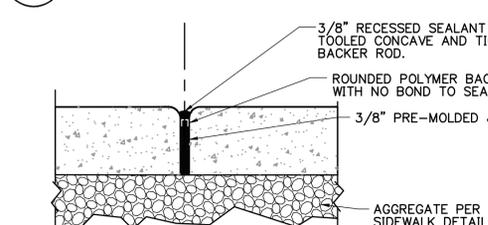
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED FDC
- PROPOSED 10" DDCV
- INSTALL 2 1/2" RP BACKFLOW IN RISER ROOM
- INSTALL 8"x6" REDUCER
- INSTALL 8"x6" TEE
- INSTALL 10" TEE (2) 10"x8" REDUCERS
- INSTALL 8" 45° BEND WITH RESTRAINT JOINTS
- INSTALL 8" 22 1/2° BEND WITH RESTRAINT JOINTS
- INSTALL 8"x8" TEE WITH RESTRAINT JOINTS
- INSTALL 10" 45° BEND WITH RESTRAINT JOINTS
- CONNECT TO AND EXTEND 2 1/2" WATERLINE TO BLDG. 10
- INSTALL 2" WATER METER IN EXISTING METER BOX
- CONTRACTOR SHALL INSTALL 2" RIGID COPPER TYPE K WATER SERVICE TO PROPOSED METER BOX AND INSTALL 2" WATER METER PER C.O.T. STANDARD PLANS
- CONNECT TO EXISTING 2 1/2" WATERLINE STUB, STUBBED 3' PAST BACK OF SIDEWALK
- REMOVE BLOWOFF AND CONNECT TO EXISTING 10" WATERLINE STUB
- INSTALL 10"x8" TEE WITH RESTRAINT JOINTS



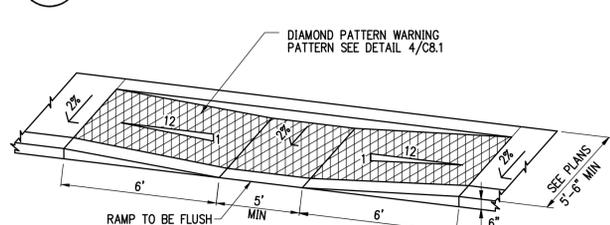
**3 6" PIPE BOLLARD**  
C8.1 N.T.S.



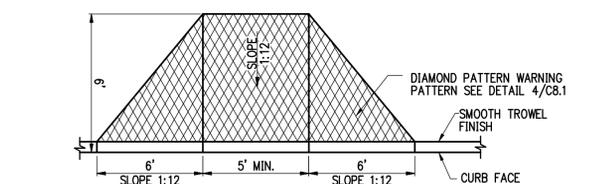
**2 BIKE RACK**  
C8.1 N.T.S.



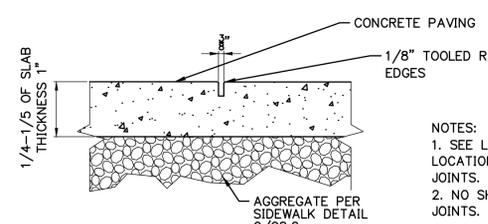
**9 EXPANSION JOINT**  
C8.1 N.T.S.



**SQUARE WING CURB RAMP**

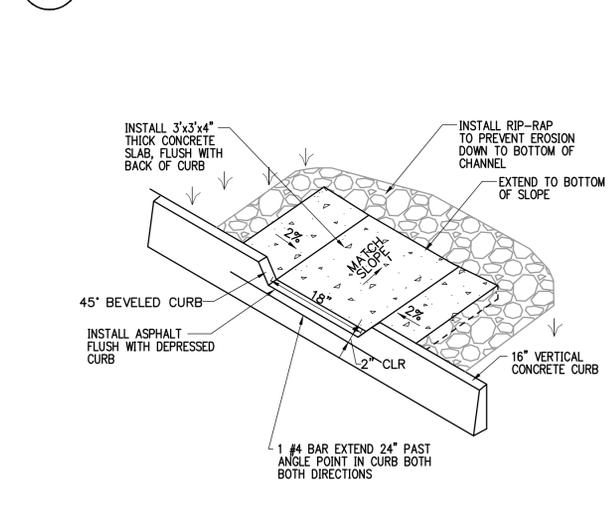


**STANDARD WING CURB RAMP**

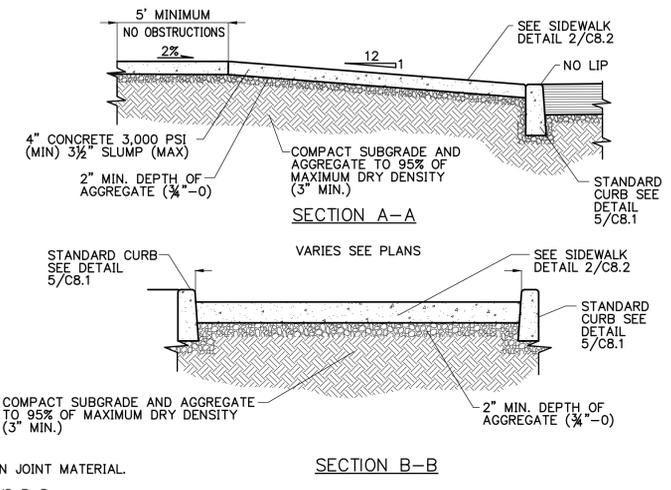


**10 CONTROL JOINT**  
C8.1 N.T.S.

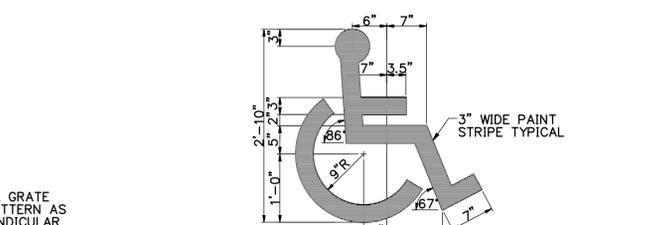
**8 ADA COMPLIANT CURB RAMP**  
C8.1 N.T.S.



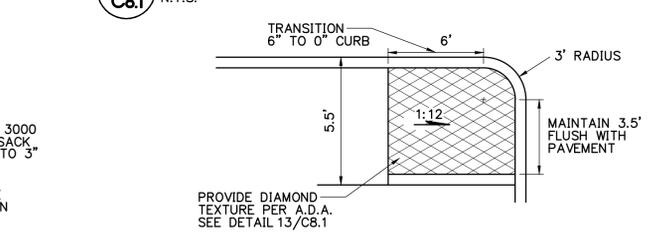
**13 CURB BREAK WITH SPASH PAD**  
C8.1 N.T.S.



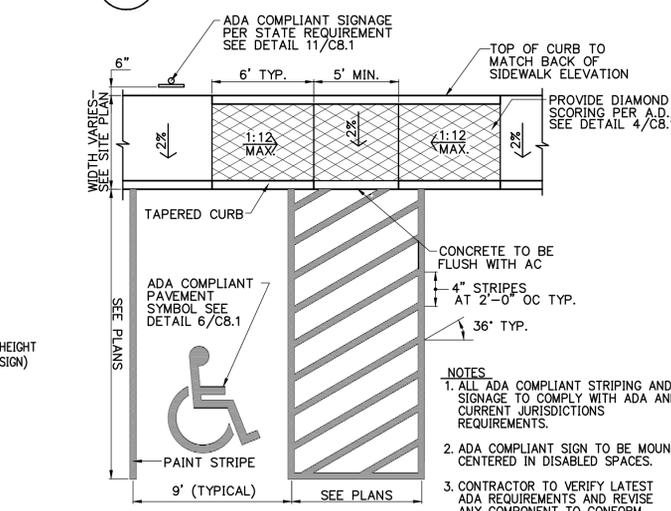
**1 ADA COMPLIANT 12:1 CURB RAMP**  
C8.1 N.T.S.



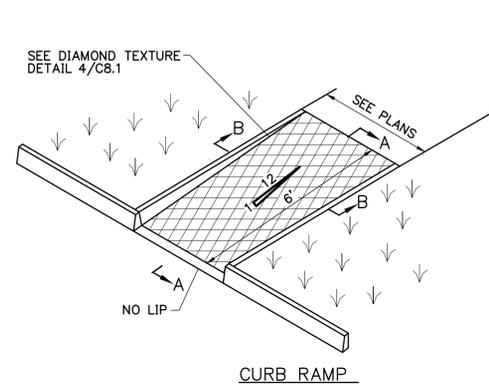
**6 ADA COMPLIANT PARKING SYMBOL**  
C8.1 N.T.S.



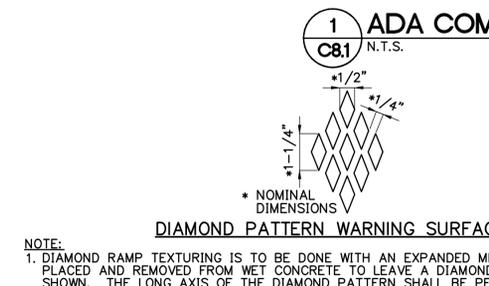
**7 ADA COMPLIANT CORNER CURB RAMP**  
C8.1 N.T.S.



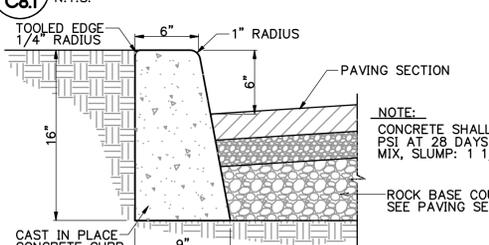
**12 ADA COMPLIANT PARKING STALL**  
C8.1 N.T.S.



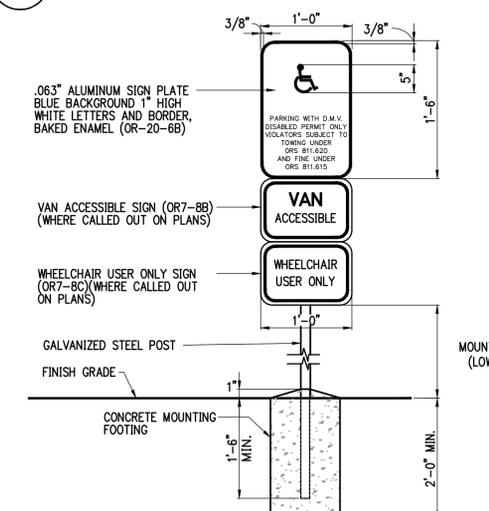
**CURB RAMP**



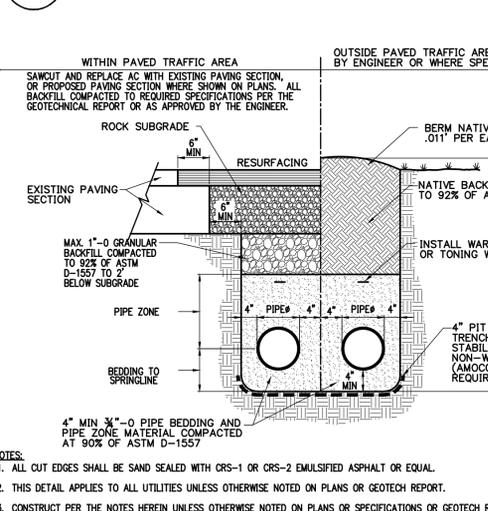
**4 ADA COMPLIANT WARNING SURFACE**  
C8.1 N.T.S.



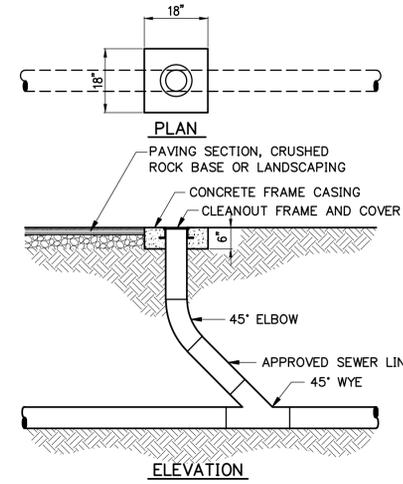
**5 CONCRETE VERTICAL CURB**  
C8.1 N.T.S.



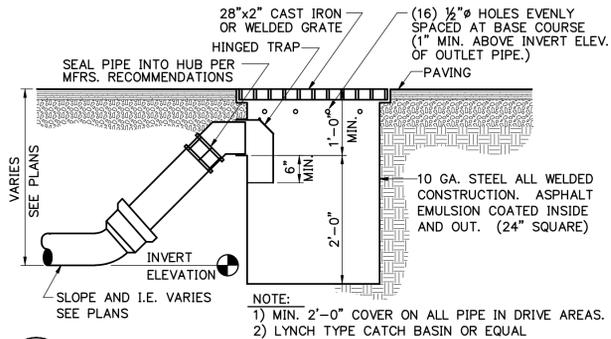
**11 ADA COMPLIANT VAN PARKING SIGN**  
C8.1 N.T.S.



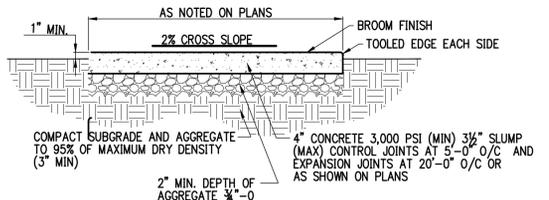
**14 UTILITY TRENCH BEDDING AND BACKFILL**  
C8.1 N.T.S.



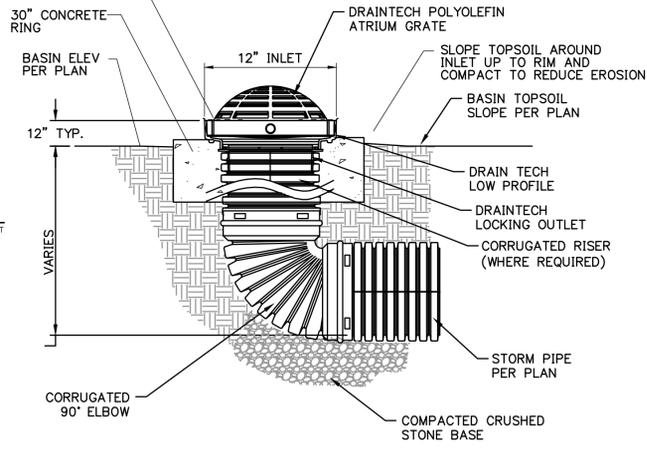
**1 CLEANOUT**  
C8.2 N.T.S.



**5 CATCH BASIN**  
C8.2 N.T.S. LYNCH STYLE

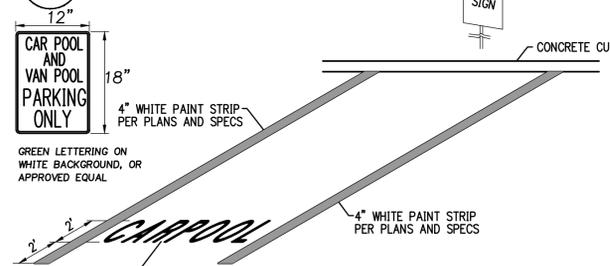


**2 CONCRETE SIDEWALK**  
C8.2 N.T.S.

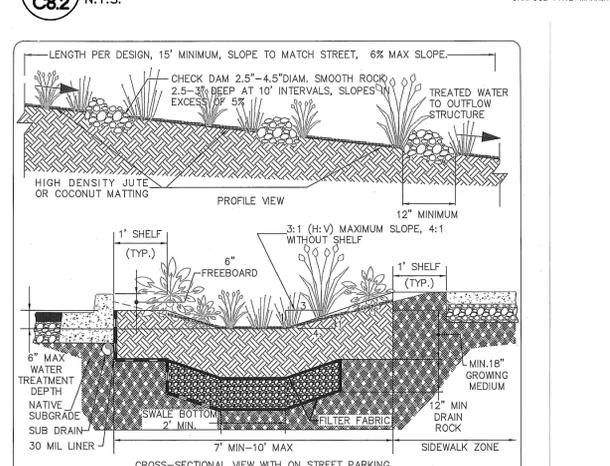


**3 MODULAR BLOCK RETAINING WALL SECT.**  
C8.2 N.T.S.

**6 WATER QUALITY OVERFLOW RISER INLET**  
C8.2 N.T.S.

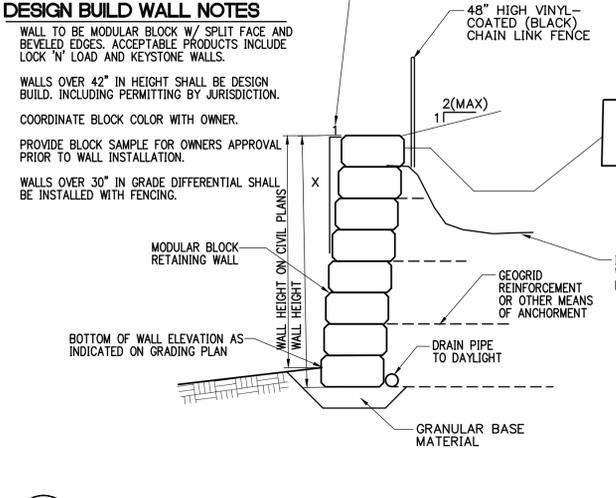


**8 CARPOOL PAVEMENT MARKING**  
C8.2 N.T.S.

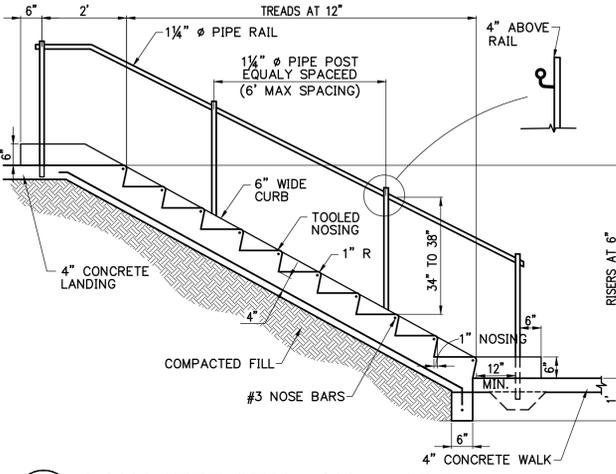


NOTES:  
1. PUBLIC WATER QUALITY SYSTEM. 1' SHELVES AND REINFORCED THICKENED SIDEWALK FREEBOARD EDGE MAY BE REQUIRED BY COUNTY.  
2. INFLOW STRUCTURE - CURB INLET, SEE MODIFIED C8-30 DETAIL.  
3. INFLOW STRUCTURE - CURB CUTOUT, SEE MODIFIED C8-30 DETAIL.  
4. OVERFLOW PIPING TO ALLOW NO MORE THAN 6" PONDING, WITH A MINIMUM OF 2" FREEBOARD, AND BE SIZED TO JURISDICTIONAL PLUMBING CODE, OR TO CONVEY THE 25 YEAR STORM.  
5. FLOW DISSIPATORS SHALL BE PLACED AS SPECIFIED ABOVE OR PER DESIGN.  
6. VEGETATION TO BE USED IN THE SWALE BOTTOM CONFORMS TO PLANTINGS APPROVED FOR THE WET MOISTURE REGIME. VEGETATION TO BE USED ALONG THE SWALE SIDE CONFORMS TO PLANTINGS APPROVED FOR THE MOST MOISTURE REGIMES.  
7. 30 MIL IMPERMEABLE LINER, OR APPROVED EQUIVALENT PER JURISDICTIONAL ROAD AUTHORITY. SUBDRAIN CONNECTS WITH STORM SEWER SYSTEM. DRAIN ROCK LAYER NOT RECOMMENDED FOR LONGITUDINAL SLOPES OF GREATER THAN 2%.

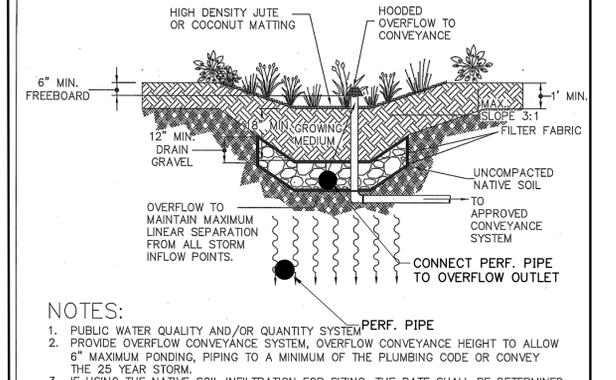
LIDA HANDBOOK | LIDA SWALE | CleanWater Services | DRAWING NUMBER 795



**3 MODULAR BLOCK RETAINING WALL SECT.**  
C8.2 N.T.S.



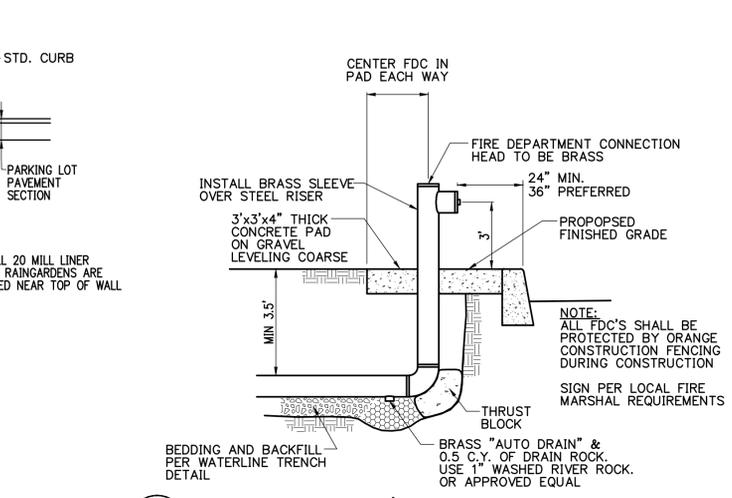
**7 CONCRETE STAIR ON GRADE**  
C8.2 N.T.S.



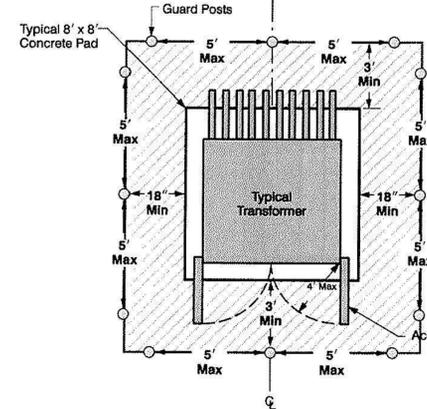
NOTES:  
1. PUBLIC WATER QUALITY AND/OR QUANTITY SYSTEM. PERF. PIPE  
2. PROVIDE OVERFLOW CONVEYANCE SYSTEM, OVERFLOW CONVEYANCE HEIGHT TO ALLOW 6" MAXIMUM PONDING, PIPING TO A MINIMUM OF THE PLUMBING CODE OR CONVEY THE 25 YEAR STORM.  
3. IF USING THE NATIVE SOIL INFILTRATION FOR SIZING, THE RATE SHALL BE DETERMINED BY ASTM STANDARD TESTING METHODS.  
4. FLOW DISSIPATORS SHOULD BE USED IF ENTRY SLOPE TO THE BASIN IS GREATER THAN 3:1. FLOW DISSIPATORS SHALL BE CONSTRUCTED OUT OF ROCK OR GRAVEL PER DESIGN FLOW VELOCITY AT ENTRY OF THE FACILITY.  
5. SEPARATION BETWEEN DRAIN GRAVEL AND GROWING MEDIUM SHALL BE APPROVED FILTER FABRIC.  
6. TREATMENT AREA SHALL HAVE HIGH DENSITY JUTE OR COCONUT MATTING OVER 18" MINIMUM OF GROWING MEDIUM OR BASE STABILIZATION METHOD AS APPROVED BY THE DISTRICT.  
7. VEGETATION TO BE USED IN WET AREAS OF THE BASIN IS PER APPENDIX "A" OF R&O 07-20 FOR THE WET MOISTURE CONDITIONS.  
8. VEGETATION TO BE USED IN OTHER AREAS OF BASIN CONFORMS TO \_\_\_\_\_ OF THIS HANDBOOK AS APPROVED BY DISTRICT.  
PROVIDE OVERFLOW PER CWS DETAIL 797 AT END OF SWALE

LIDA HANDBOOK | NON-STRUCTURAL INFILTRATION PLANTER | CleanWater Services | DRAWING NUMBER 797

**12 CLEAN WATER SERVICES DRAWING 797**  
C8.2 N.T.S.

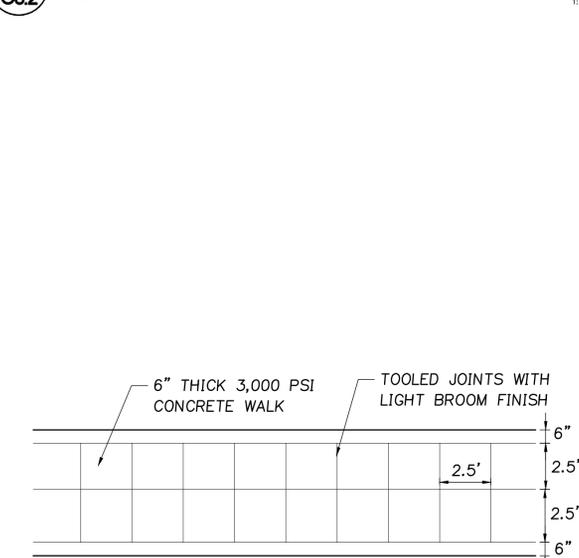


**4 FDC DETAIL W/CONCRETE PAD**  
C8.2 N.T.S.



**10 GUARD POST LOCATION REQUIREMENTS**  
C8.2 N.T.S.

**13 CONCRETE CROSS-WALK**  
C8.2 N.T.S.



**13 CONCRETE CROSS-WALK**  
C8.2 N.T.S.

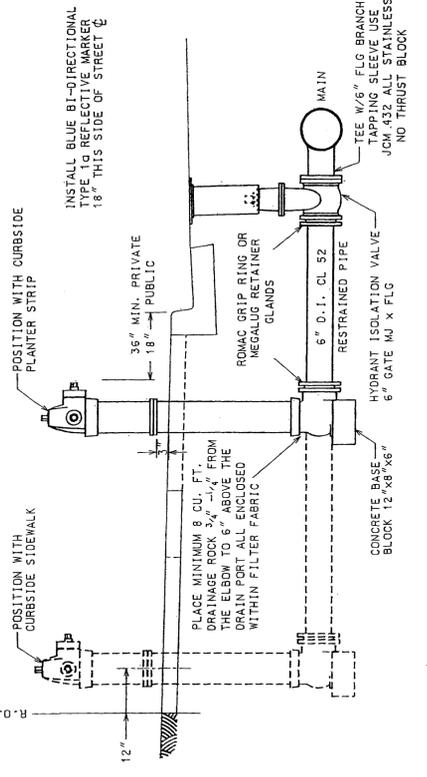
LIDA HANDBOOK | NON-STRUCTURAL INFILTRATION PLANTER | CleanWater Services | DRAWING NUMBER 797

**13 CONCRETE CROSS-WALK**  
C8.2 N.T.S.

**9 CLEAN WATER SERVICES DRAWING 402**  
C8.2 N.T.S.

**11 CLEAN WATER SERVICES DRAWING 795**  
C8.2 N.T.S.

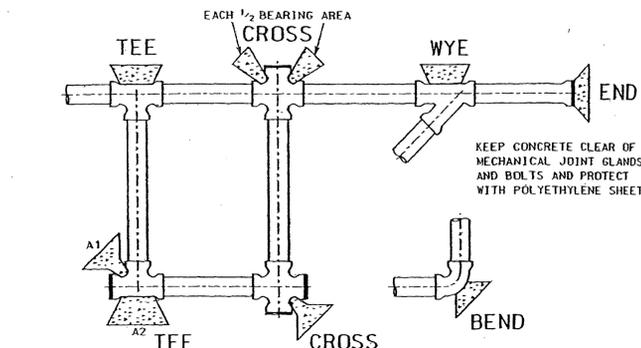
**12 CLEAN WATER SERVICES DRAWING 797**  
C8.2 N.T.S.



**NOTE:**

1. APPLY MAINS TEST PRESSURE AGAINST CLOSED MAIN VALVE IN THE HYDRANT AND NOT THROUGH THE HYDRANT. HYDRANT SHALL BE TESTED AT 150 LB/SQ. IN. (1.5 BAR) FOR 15 MINUTES. HYDRANT SHALL BE TESTED AT 150 LB/SQ. IN. (1.5 BAR) FOR 15 MINUTES. HYDRANT SHALL BE TESTED AT 150 LB/SQ. IN. (1.5 BAR) FOR 15 MINUTES.
2. MEYER SUPER CENTURY 2500S METER VALVE SHALL BE USED. MEYER SUPER CENTURY 2500S METER VALVE SHALL BE USED. MEYER SUPER CENTURY 2500S METER VALVE SHALL BE USED.
3. HYDRANT SHALL CONFORM TO AWWA C502 AND BE INSTALLED GENERALLY IN ACCORDANCE WITH AWWA MANUAL M17.

**THRUST BLOCK REQUIREMENTS AT SOIL/CONCRETE INTERFACE**

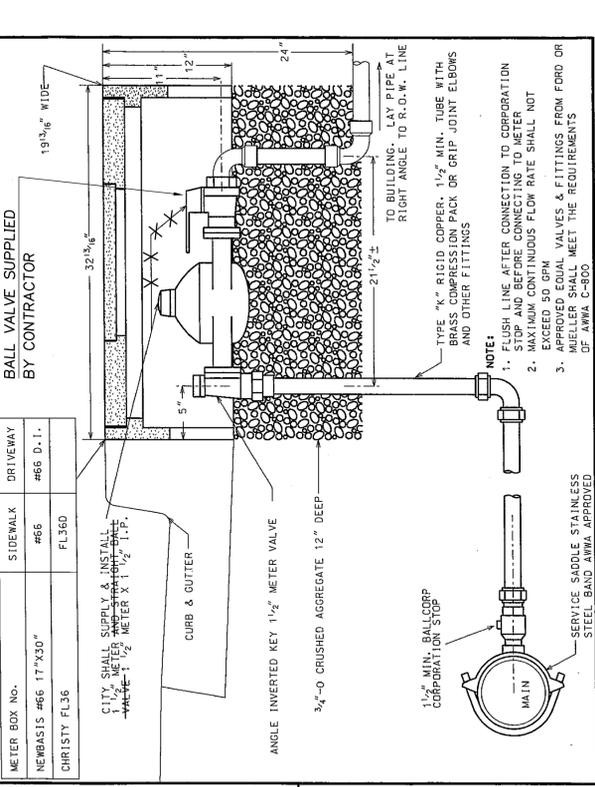


**NOTE:** THRUST BLOCKS TO BE USED ONLY WHEN CONNECTING TO AN UNKNOWN LENGTH OF PIPE OTHERWISE USE APPROVED MU RETAINER GLANDS AND RESTRAINED PIPE

FITTING SIZE INCHES	BEARING AREA SQ. FT.					
	BEND 90° CROSS TEE A1	TEE A2	TEE WYE END	BEND 45°	BEND 22.5°	BEND 11.25°
3	1.31	1.85	0.92	0.71	0.36	0.18
4	1.92	2.71	1.36	1.04	0.53	0.27
6	3.97	5.61	2.80	2.15	1.09	0.55
8	6.82	9.65	4.82	3.69	1.88	0.95
10	10.26	14.52	7.26	5.55	2.83	1.42
12	14.51	20.53	10.26	7.86	4.00	2.01
14	19.50	27.58	13.79	10.55	5.38	2.70
16	25.22	35.67	17.83	13.65	6.96	3.50
18	31.68	44.80	22.40	17.14	8.74	4.39
20	38.87	54.97	27.48	21.03	10.72	5.39
24	55.45	78.42	39.21	30.01	15.30	7.69

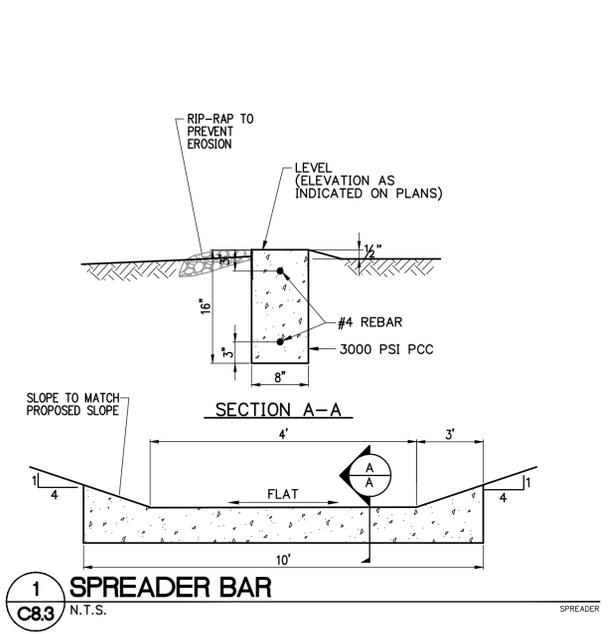
**DESIGN CRITERIA:**

1. TEST PRESSURE 150 LB/SQ. IN. CONCRETE 3300-1 1/2". AFTER POURING BLOCK DO NOT APPLY TEST PRESSURE FOR AT LEAST FIVE DAYS.
2. SAFETY FACTOR 1.5. SOIL SANDY SILY WITH BEARING STRENGTH 3,000 LB/SQ. FT.
3. CONCRETE POURED AGAINST UNDISTURBED SOIL OR SOIL COMPACTED TO AT LEAST 91% MODIFIED PROCTOR DENSITY. 1-180
4. SUBMIT BEARING AREA CALCULATIONS WITH CHANGE IN SOIL OR TEST PRESSURE



METER BOX NO.	DRIVEWAY	DRIVEWAY
NEWBASIS #66 17"x30"	#66	#66 D.I.
CHRISTY FL36	FL360	

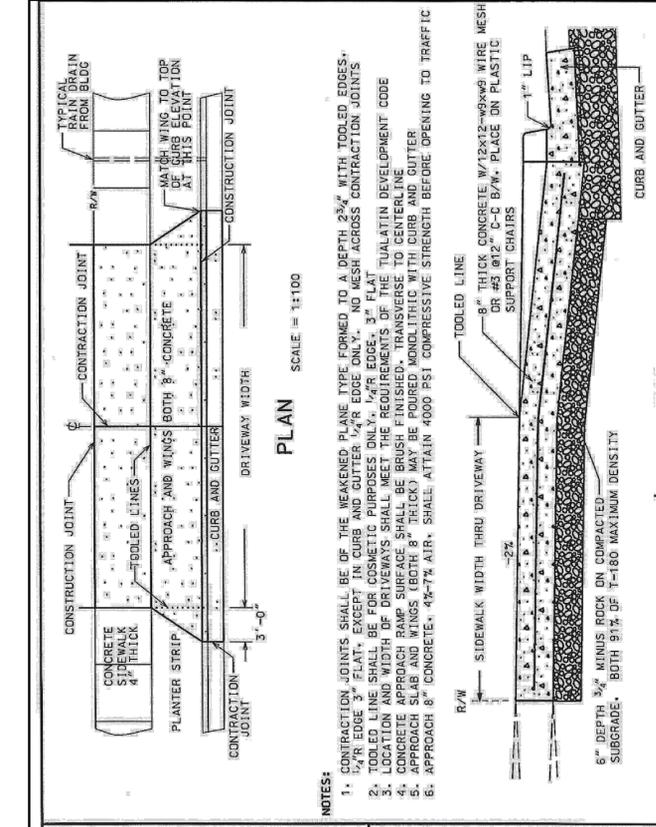
**CITY OF TUALATIN, OR WATER SERVICE**  
 1 1/2" METER  
 REVISED: 3/2008 SCALE: 1:8 DRAWN: S.N. APPROVED: K.L.H. DWG NO. 632  
 VAL ID: 3/2008



**1 SPREADER BAR**  
 C8.3 N.T.S.

**CITY OF TUALATIN, OR**  
**FIRE HYDRANT ASSEMBLY**  
 REVISED: 8/2004 SCALE: 1:25 DRAWN: D.L. DWG NO. 610  
 VAL ID: 10/2005 APPROVED: K.L.H.

**CITY OF TUALATIN, OR**  
**PIPE JOINT RESTRAINT BEARING THRUST BLOCKS**  
 DATE OF LAST REVISION: 2/2002 SCALE: NOT TO SCALE DRAWN: D.L. DWG NO. 620  
 APPROVED: K.L.H.



**CITY OF TUALATIN, OR**  
**APPROACH DRIVEWAY CURBSIDE PLANTER STRIP**  
 REVISED: 6/2004 SCALE: AS SHOWN DRAWN: D.L. DWG NO. 440  
 VAL ID: 10/2005 APPROVED: K.L.H.

**REVISIONS:**

NO.	REVISIONS	REVISION DATE

SHEET TITLE:  
**DETAIL SHEET**  
 DRAWN BY: CSR  
 CHECKED BY: RLF  
 SHEET:



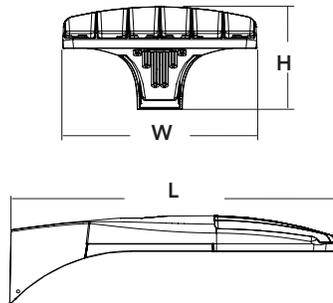
# D-Series Size 0 LED Area Luminaire



d#series

## Specifications

<b>EPA:</b>	0.8 ft <sup>2</sup> (.07 m <sup>2</sup> )
<b>Length:</b>	26" (66.0 cm)
<b>Width:</b>	13" (33.0 cm)
<b>Height:</b>	7" (17.8 cm)
<b>Weight (max):</b>	16 lbs (7.25 kg)



Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

## Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 65% and expected service life of over 100,000 hours.

## Ordering Information

**EXAMPLE: DSX0 LED 40C 1000 40K T3M MVOLT SPA DDBXD**

DSX0 LED		Drive current		Color temperature		Distribution		Voltage	Mounting		
Series	LEDs										
DSX0 LED	<b>Forward optics</b>	530	530 mA	30K	3000 K	T1S	Type I short	T5S	Type V short	MVOLT <sup>4</sup>	<b>Shipped included</b>
	20C 20 LEDs (one engine)	700	700 mA	40K	4000 K	T2S	Type II short	T5M	Type V medium	120 <sup>4</sup>	SPA Square pole mounting
	40C 40 LEDs (two engines)	1000	1000 mA (1 A) <sup>2</sup>	50K	5000 K	T2M	Type II medium	T5W	Type V wide	208 <sup>4</sup>	RPA Round pole mounting
	<b>Rotated optics<sup>1</sup></b>			AMBPC	Amber phosphor converted <sup>3</sup>	T3S	Type III short	BLC	Backlight control <sup>2</sup>	240 <sup>4</sup>	WBA Wall bracket
	30C 30 LEDs (one engine)					T3M	Type III medium	LCCO	Left corner cutoff <sup>2</sup>	277 <sup>4</sup>	SPUMBA Square pole universal mounting adaptor <sup>6</sup>
						T4M	Type IV medium	RCCO	Right corner cutoff <sup>2</sup>	347 <sup>5</sup>	RPUMBA Round pole universal mounting adaptor <sup>6</sup>
						TFTM	Forward throw medium			480 <sup>5</sup>	<b>Shipped separately<sup>7</sup></b>
						T5VS	Type V very short				KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)

Control options		Other options	Finish (required)
<b>Shipped installed</b>		<b>Shipped installed</b>	DDBXD Dark bronze
PER NEMA twist-lock receptacle only (no controls) <sup>8</sup>	PIR1FC3V Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc <sup>12</sup>	HS House-side shield <sup>16</sup>	DBLXD Black
PER5 Five-wire receptacle only (no controls) <sup>8,9</sup>	PIRH1FC3V Motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc <sup>12</sup>	SF Single fuse (120, 277, 347V) <sup>17</sup>	DNAXD Natural aluminum
PER7 Seven-wire receptacle only (no controls) <sup>8,9</sup>	BL30 Bi-level switched dimming, 30% <sup>13,14</sup>	DF Double fuse (208, 240, 480V) <sup>17</sup>	DWHXD White
DMG 0-10V dimming driver (no controls) <sup>10</sup>	BL50 Bi-level switched dimming, 50% <sup>13,14</sup>	L90 Left rotated optics <sup>1</sup>	DBTDXD Textured dark bronze
DCR Dimmable and controllable via ROAM® (no controls) <sup>11</sup>	PNMTDD3 Part night, dim till dawn <sup>15</sup>	R90 Right rotated optics <sup>1</sup>	DBL BXD Textured black
PIR Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc <sup>12</sup>	PNMT5D3 Part night, dim 5 hrs <sup>15</sup>	DDL Diffused drop lens <sup>16</sup>	DNATXD Textured natural aluminum
PIRH Motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc <sup>12</sup>	PNMT6D3 Part night, dim 6 hrs <sup>15</sup>		DWHGXD Textured white
	PNMT7D3 Part night, dim 7 hrs <sup>15</sup>		

### Accessories

Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) <sup>18</sup>
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) <sup>18</sup>
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) <sup>18</sup>
SC U	Shorting cap <sup>18</sup>
DSX0HS 20C U	House-side shield for 20 LED unit <sup>16</sup>
DSX0HS 30C U	House-side shield for 30 LED unit <sup>16</sup>
DSX0HS 40C U	House-side shield for 40 LED unit <sup>16</sup>
DSX0DDL U	Diffused drop lens (polycarbonate) <sup>16</sup>
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish) <sup>7</sup>
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) <sup>7</sup>

For more control options, visit [DTL](#) and [ROAM](#) online.

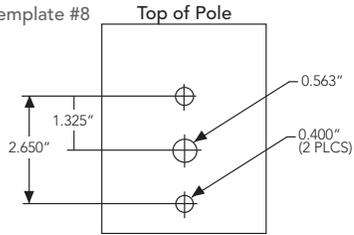
- ### NOTES
- 30 LEDs (30C option) and rotated options (L90 or R90) only available together.
  - Not available with AMBPC.
  - AMBPC only available with 530mA or 700mA.
  - MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120V, 208V, 240V or 277V options only when ordering with fusing (SF, DF options).
  - Not available with single board, 530mA product (20C 530 or 30C 530). Not available with BL30, BL50 or PNMT options.
  - Available as a separate combination accessory: PUMBA (finish) U; 1.5 G vibration load rating per ANCI C136.31.
  - Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
  - Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories.
  - If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Not available with DCR.
  - DMG option for 347V or 480V requires 1000mA.

- Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: [sales@roamservices.net](mailto:sales@roamservices.net). N/A with PIR options PER5, PER7, BL30, BL50 or PNMT options.
- PIR and PIRH1FC3V specify the [SensorSwitch SBGR-10-ODP](#) control; PIRH and PIRH1FC3V specify the [SensorSwitch SBGR-6-ODP](#) control; see [Motion Sensor Guide](#) for details. Dimming driver standard. Not available with PER5 or PER7. Ambient sensor disabled when ordered with DCR. Separate on/off required.
- Requires an additional switched circuit.
- Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7 or PNMT options.
- Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7, BL30 or BL50.
- Also available as a separate accessory; see Accessories information.
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Controls.



## Drilling

Template #8



DSXO shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

<b>DM19AS</b>	Single unit	<b>DM29AS</b>	2 at 90° *
<b>DM28AS</b>	2 at 180°	<b>DM39AS</b>	3 at 90° *
<b>DM49AS</b>	4 at 90° *	<b>DM32AS</b>	3 at 120° **

Example: SSA 20 4C DM19AS DDBXD

Visit Lithonia Lighting's **POLES CENTRAL** to see our wide selection of poles, accessories and educational tools.

\*Round pole top must be 3.25" O.D. minimum.

\*\*For round pole mounting (RPA) only.

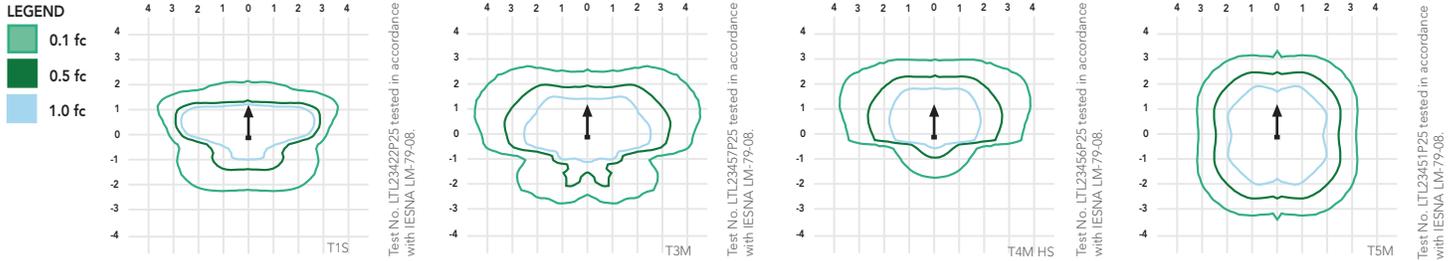
## Tenon Mounting Slipfitter\*\*

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

## Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's [D-Series Area homepage](#).

Isofootcandle plots for the DSXO LED 40C 1000 40K. Distances are in units of mounting height (20').



## Performance Data

### Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
<b>25°C</b>	<b>77°F</b>	<b>1.00</b>
30°C	86°F	1.00
40°C	104°F	0.99

### Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
20C	530	35	0.34	0.22	0.21	0.20	--	--
	700	45	0.47	0.28	0.24	0.22	0.18	0.14
	1000	72	0.76	0.45	0.39	0.36	0.36	0.26
30C	530	52	0.51	0.31	0.28	0.25	--	--
	700	70	0.72	0.43	0.37	0.34	0.25	0.19
	1000	104	1.11	0.64	0.56	0.49	0.47	0.34
40C	530	68	0.71	0.41	0.36	0.33	0.25	0.19
	700	91	0.94	0.55	0.48	0.42	0.33	0.24
	1000	138	1.45	0.84	0.73	0.64	0.69	0.50

### Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	DSXO LED 20C 1000			
	1	0.98	0.96	0.93
	DSXO LED 40C 1000			
	1	0.98	0.95	0.90
	DSXO LED 40C 700			
	1	0.99	0.99	0.99



# Performance Data

## Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																							
LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)				50K (5000 K, 70 CRI)				AMBPC (Amber Phosphor Converted)						
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
20C (20 LEDs)	530 mA	35 W	T1S	4,079	1	0	1	117	4,380	1	0	1	125	4,408	1	0	1	126	2,541	1	0	1	73
			T2S	4,206	1	0	1	120	4,516	1	0	1	129	4,544	1	0	1	130	2,589	1	0	1	74
			T2M	4,109	1	0	1	117	4,413	1	0	1	126	4,440	1	0	1	127	2,539	1	0	1	73
			T3S	4,104	1	0	1	117	4,407	1	0	1	126	4,435	1	0	1	127	2,558	1	0	1	73
			T3M	4,142	1	0	1	118	4,447	1	0	1	127	4,475	1	0	1	128	2,583	1	0	1	74
			T4M	4,198	1	0	1	120	4,508	1	0	1	129	4,536	1	0	1	130	2,570	1	0	1	73
			FTM	4,135	1	0	1	118	4,440	1	0	2	127	4,468	1	0	2	128	2,540	1	0	1	73
			T5VS	4,368	2	0	0	125	4,691	2	0	0	134	4,720	2	0	0	135	2,650	1	0	0	76
			T5S	4,401	2	0	2	126	4,725	2	0	0	135	4,755	2	0	0	136	2,690	1	0	0	77
			T5M	4,408	2	0	1	126	4,734	3	0	1	135	4,763	3	0	1	136	2,658	2	0	0	76
			T5W	4,344	3	0	1	124	4,664	3	0	1	133	4,693	3	0	1	134	2,663	2	0	1	76
			BLC	3,071	1	0	1	88	3,297	1	0	1	94	3,318	1	0	1	95					
	LCCO	2,983	1	0	1	85	3,204	1	0	1	92	3,224	1	0	1	92							
	RCCO	2,983	1	0	1	85	3,204	1	0	1	92	3,224	1	0	1	92							
	T1S	5,181	1	0	1	115	5,563	1	0	1	124	5,598	1	0	1	124	3,144	1	0	1	70		
	T2S	5,342	1	0	1	119	5,736	1	0	1	127	5,772	1	0	1	128	3,203	1	0	1	71		
	T2M	5,219	1	0	1	116	5,605	1	0	1	125	5,640	1	0	1	125	3,141	1	0	1	70		
	T3S	5,213	1	0	1	116	5,598	1	0	1	124	5,633	1	0	1	125	3,165	1	0	1	70		
	T3M	5,260	1	0	1	117	5,649	1	0	2	126	5,684	1	0	2	126	3,196	1	0	1	71		
	T4M	5,332	1	0	1	118	5,725	1	0	2	127	5,761	1	0	2	128	3,179	1	0	1	71		
	FTM	5,252	1	0	2	117	5,640	1	0	2	125	5,675	1	0	2	126	3,143	1	0	1	70		
	T5VS	5,548	2	0	0	123	5,958	2	0	0	132	5,995	2	0	0	133	3,278	2	0	0	73		
	T5S	5,589	2	0	0	124	6,002	2	0	0	133	6,039	2	0	0	134	3,328	2	0	0	74		
	T5M	5,599	3	0	1	124	6,012	3	0	1	134	6,050	3	0	1	134	3,288	2	0	1	73		
	T5W	5,517	3	0	1	123	5,924	3	0	1	132	5,961	3	0	1	132	3,295	2	0	1	73		
	BLC	3,909	1	0	1	87	4,198	1	0	1	93	4,224	1	0	1	94							
	LCCO	3,798	1	0	1	84	4,078	1	0	1	91	4,104	1	0	1	91							
	RCCO	3,798	1	0	1	84	4,078	1	0	1	91	4,104	1	0	1	91							
	T1S	7,085	1	0	1	98	7,608	2	0	2	106	7,656	2	0	2	106							
	T2S	7,305	1	0	1	101	7,845	2	0	2	109	7,894	2	0	2	110							
	T2M	7,138	1	0	2	99	7,665	2	0	2	106	7,713	2	0	2	107							
	T3S	7,129	1	0	1	99	7,656	2	0	2	106	7,704	2	0	2	107							
	T3M	7,194	1	0	2	100	7,725	2	0	2	107	7,773	2	0	2	108							
	T4M	7,292	1	0	2	101	7,830	2	0	2	109	7,879	2	0	2	109							
	FTM	7,183	1	0	2	100	7,713	1	0	2	107	7,761	1	0	2	108							
	T5VS	7,588	2	0	0	105	8,148	3	0	0	113	8,199	3	0	0	114							
T5S	7,644	2	0	0	106	8,208	2	0	0	114	8,259	2	0	0	115								
T5M	7,657	3	0	1	106	8,222	3	0	1	114	8,274	3	0	1	115								
T5W	7,545	3	0	1	105	8,102	3	0	2	113	8,153	3	0	2	113								
BLC	5,162	1	0	1	72	5,543	1	0	2	77	5,578	1	0	1	77								
LCCO	5,015	1	0	2	70	5,386	1	0	2	75	5,419	1	0	2	75								
RCCO	5,015	1	0	2	70	5,386	1	0	2	75	5,419	1	0	2	75								
T1S	7,085	1	0	1	98	7,608	2	0	2	106	7,656	2	0	2	106								
T2S	7,305	1	0	1	101	7,845	2	0	2	109	7,894	2	0	2	110								
T2M	7,138	1	0	2	99	7,665	2	0	2	106	7,713	2	0	2	107								
T3S	7,129	1	0	1	99	7,656	2	0	2	106	7,704	2	0	2	107								
T3M	7,194	1	0	2	100	7,725	2	0	2	107	7,773	2	0	2	108								
T4M	7,292	1	0	2	101	7,830	2	0	2	109	7,879	2	0	2	109								
FTM	7,183	1	0	2	100	7,713	1	0	2	107	7,761	1	0	2	108								
T5VS	7,588	2	0	0	105	8,148	3	0	0	113	8,199	3	0	0	114								
T5S	7,644	2	0	0	106	8,208	2	0	0	114	8,259	2	0	0	115								
T5M	7,657	3	0	1	106	8,222	3	0	1	114	8,274	3	0	1	115								
T5W	7,545	3	0	1	105	8,102	3	0	2	113	8,153	3	0	2	113								
BLC	5,162	1	0	1	72	5,543	1	0	2	77	5,578	1	0	1	77								
LCCO	5,015	1	0	2	70	5,386	1	0	2	75	5,419	1	0	2	75								
RCCO	5,015	1	0	2	70	5,386	1	0	2	75	5,419	1	0	2	75								

# Performance Data

## Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																							
LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
40C (40 LEDs)	530 mA	68 W	T1S	7,926	2	0	2	117	8,511	2	0	2	125	8,564	2	0	2	126	4,878	1	0	1	72
			T2S	8,172	2	0	2	120	8,775	2	0	2	129	8,830	2	0	2	130	4,969	1	0	1	73
			T2M	7,985	2	0	2	117	8,574	2	0	2	126	8,628	2	0	2	127	4,874	1	0	1	72
			T3S	7,975	1	0	2	117	8,564	2	0	2	126	8,617	2	0	2	127	4,910	1	0	1	72
			T3M	8,047	2	0	2	118	8,642	2	0	2	127	8,696	2	0	2	128	4,958	1	0	2	73
			T4M	8,157	1	0	2	120	8,759	2	0	2	129	8,813	2	0	2	130	4,932	1	0	2	73
			FTM	8,035	1	0	2	118	8,628	2	0	2	127	8,682	2	0	2	128	4,876	1	0	2	72
			T5VS	8,488	2	0	0	125	9,115	3	0	0	134	9,172	3	0	0	135	5,086	2	0	0	75
			T5S	8,550	2	0	0	126	9,182	3	0	1	135	9,239	3	0	1	136	5,163	2	0	0	76
			T5M	8,565	3	0	1	126	9,198	3	0	2	135	9,255	3	0	2	136	5,102	3	0	1	75
			T5W	8,440	3	0	2	124	9,063	3	0	2	133	9,120	3	0	2	134	5,112	3	0	1	75
			BLC	6,142	1	0	2	90	6,595	1	0	2	97	6,636	1	0	2	98					
	LCCO	5,967	1	0	2	88	6,407	1	0	2	94	6,447	1	0	2	95							
	RCCO	5,967	1	0	2	88	6,407	1	0	2	94	6,447	1	0	2	95							
	T1S	10,066	2	0	2	111	10,810	2	0	2	119	10,877	2	0	2	120	6,206	2	0	2	68		
	T2S	10,379	2	0	2	114	11,145	2	0	2	122	11,215	2	0	2	123	6,322	2	0	2	69		
	T2M	10,141	2	0	2	111	10,890	2	0	2	120	10,958	2	0	2	120	6,201	2	0	2	68		
	T3S	10,129	2	0	2	111	10,877	2	0	2	120	10,945	2	0	2	120	6,247	1	0	2	69		
	T3M	10,221	2	0	2	112	10,975	2	0	2	121	11,044	2	0	2	121	6,308	2	0	2	69		
	T4M	10,359	2	0	2	114	11,124	2	0	2	122	11,194	2	0	2	123	6,275	1	0	2	69		
	FTM	10,205	2	0	2	112	10,958	2	0	3	120	11,027	2	0	3	121	6,203	1	0	2	68		
	T5VS	10,781	3	0	0	118	11,576	3	0	1	127	11,649	3	0	1	128	6,569	2	0	0	72		
	T5S	10,860	3	0	1	119	11,662	3	0	1	128	11,734	3	0	1	129	6,569	2	0	0	72		
	T5M	10,879	3	0	2	120	11,682	3	0	2	128	11,755	3	0	2	129	6,491	3	0	1	71		
	T5W	10,719	3	0	2	118	11,511	4	0	2	126	11,583	4	0	2	127	6,504	3	0	2	71		
	BLC	7,819	1	0	2	86	8,396	1	0	2	92	8,448	1	0	2	93							
	LCCO	7,596	1	0	2	83	8,157	1	0	2	90	8,208	1	0	2	90							
	RCCO	7,596	1	0	2	83	8,157	1	0	2	90	8,208	1	0	2	90							
	T1S	13,767	2	0	2	100	14,783	3	0	3	107	14,876	3	0	3	108							
	T2S	14,194	2	0	2	103	15,242	3	0	3	110	15,338	3	0	3	111							
	T2M	13,869	2	0	2	101	14,893	3	0	3	108	14,986	3	0	3	109							
	T3S	13,852	2	0	2	100	14,875	2	0	2	108	14,968	2	0	2	108							
	T3M	13,978	2	0	2	101	15,010	3	0	3	109	15,104	3	0	3	109							
	T4M	14,168	2	0	2	103	15,214	3	0	3	110	15,309	3	0	3	111							
	FTM	13,956	2	0	3	101	14,987	2	0	3	109	15,080	2	0	3	109							
	T5VS	14,744	3	0	1	107	15,832	3	0	1	115	15,931	4	0	1	115							
T5S	14,852	3	0	1	108	15,948	3	0	1	116	16,048	3	0	1	116								
T5M	14,878	4	0	2	108	15,976	4	0	2	116	16,076	4	0	2	116								
T5W	14,660	4	0	2	106	15,742	4	0	2	114	15,840	4	0	2	115								
BLC	10,325	1	0	2	75	11,087	1	0	2	80	11,156	1	0	2	81								
LCCO	10,031	2	0	2	73	10,771	2	0	3	78	10,839	2	0	3	79								
RCCO	10,031	2	0	2	73	10,771	2	0	3	78	10,839	2	0	3	79								

# Performance Data

## L90 and R90 Rotated Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)					
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	
				30C (30 LEDs)																				
530 mA	52 W	T1S	6,130	2	0	2	118	6,583	2	0	2	127	6,624	2	0	2	127	3,841	2	0	2	74		
		T2S	6,321	2	0	2	122	6,787	2	0	2	131	6,830	3	0	3	131	3,912	2	0	2	75		
		T2M	6,176	2	0	2	119	6,632	3	0	3	128	6,673	3	0	3	128	3,837	2	0	2	74		
		T3S	6,168	2	0	2	119	6,624	3	0	3	127	6,665	3	0	3	128	3,866	2	0	2	74		
		T3M	6,224	3	0	3	120	6,684	3	0	3	129	6,726	3	0	3	129	3,904	2	0	2	75		
		T4M	6,309	3	0	3	121	6,775	3	0	3	130	6,817	3	0	3	131	3,884	2	0	2	75		
		TFTM	6,215	3	0	3	120	6,673	3	0	3	128	6,715	3	0	3	129	3,839	2	0	2	74		
		TSVS	6,565	2	0	0	126	7,050	2	0	0	136	7,094	2	0	0	136	4,005	2	0	0	77		
		T5S	6,613	2	0	0	127	7,102	2	0	0	137	7,146	2	0	0	137	4,065	2	0	0	78		
		T5M	6,625	3	0	1	127	7,114	3	0	1	137	7,159	3	0	1	138	4,017	2	0	1	77		
		TSW	6,528	3	0	1	126	7,010	3	0	2	135	7,054	3	0	2	136	4,025	3	0	1	77		
		BLC	4,747	2	0	2	91	5,098	2	0	2	98	5,130	2	0	2	99							
		LCCO	4,612	1	0	2	89	4,953	1	0	2	95	4,984	1	0	2	96							
		RCCO	4,612	1	0	2	89	4,953	1	0	2	95	4,984	1	0	2	96							
		700 mA	70 W	T1S	7,786	2	0	2	111	8,361	3	0	3	119	8,413	3	0	3	120	4,783	2	0	2	68
				T2S	8,028	2	0	2	115	8,620	3	0	3	123	8,674	3	0	3	124	4,873	2	0	2	70
				T2M	7,844	3	0	3	112	8,423	3	0	3	120	8,476	3	0	3	121	4,779	2	0	2	68
				T3S	7,834	3	0	3	112	8,413	3	0	3	120	8,465	3	0	3	121	4,815	2	0	2	69
				T3M	7,905	3	0	3	113	8,489	3	0	3	121	8,542	3	0	3	122	4,862	3	0	3	69
				T4M	8,013	3	0	3	114	8,604	3	0	3	123	8,658	3	0	3	124	4,837	3	0	3	69
TFTM	7,893			3	0	3	113	8,476	3	0	3	121	8,529	3	0	3	122	4,781	3	0	3	68		
TSVS	8,338			2	0	0	119	8,954	3	0	0	128	9,010	3	0	0	129	4,988	2	0	0	71		
T5S	8,400			2	0	0	120	9,020	3	0	1	129	9,076	3	0	1	130	5,063	2	0	0	72		
T5M	8,414			3	0	1	120	9,036	3	0	2	129	9,092	3	0	2	130	5,003	3	0	1	71		
TSW	8,291			3	0	2	118	8,903	3	0	2	127	8,959	3	0	2	128	5,013	3	0	1	72		
BLC	6,044			2	0	2	86	6,490	3	0	3	93	6,530	3	0	3	93							
LCCO	5,872			1	0	2	84	6,305	1	0	2	90	6,345	1	0	2	91							
RCCO	5,872			1	0	2	84	6,305	1	0	2	90	6,345	1	0	2	91							
1000 mA	104 W			T1S	10,648	3	0	3	102	11,434	3	0	3	110	11,506	3	0	3	111					
				T2S	10,979	3	0	3	106	11,789	3	0	3	113	11,863	3	0	3	114					
				T2M	10,727	3	0	3	103	11,519	3	0	3	111	11,591	3	0	3	111					
				T3S	10,714	3	0	3	103	11,505	3	0	3	111	11,577	3	0	3	111					
				T3M	10,812	3	0	3	104	11,610	4	0	4	112	11,682	4	0	4	112					
				T4M	10,958	3	0	3	105	11,767	3	0	3	113	11,841	3	0	3	114					
		TFTM	10,795	3	0	3	104	11,592	3	0	3	111	11,664	4	0	4	112							
		TSVS	11,404	3	0	0	110	12,245	3	0	1	118	12,322	3	0	1	118							
		T5S	11,487	3	0	1	110	12,336	3	0	1	119	12,413	3	0	1	119							
		T5M	11,508	3	0	2	111	12,357	4	0	2	119	12,434	4	0	2	120							
		TSW	11,339	4	0	2	109	12,176	4	0	2	117	12,252	4	0	2	118							
		BLC	7,981	3	0	3	77	8,570	3	0	3	82	8,624	3	0	3	83							
		LCCO	7754	1	0	2	75	8326	2	0	2	80	8378	2	0	2	81							
		RCCO	7754	1	0	2	75	8326	2	0	2	80	8378	2	0	2	81							

## FEATURES & SPECIFICATIONS

### INTENDED USE

The sleek design of the D-Series Size 0 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

### CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (0.8 ft<sup>2</sup>) for optimized pole wind loading.

### FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

### OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 4000 K (70 minimum CRI) or optional 3000 K (70 minimum CRI) or 5000 K (70 CRI) configurations. The D-Series Size 0 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

### ELECTRICAL

Light engine(s) configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L96/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of

100,000 hours with <1% failure rate. Easily serviceable 10kV or 6kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

### INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 0 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 0 utilizes the AERIS™ series pole drilling pattern. Optional terminal block, tool-less entry, and NEMA photocontrol receptacle are also available.

### LISTINGS

UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at [www.designlights.org](http://www.designlights.org) to confirm which versions are qualified.

### WARRANTY

5-year limited warranty. Complete warranty terms located at [www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx)

**Note:** Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.



# D-Series Size 2 LED Wall Luminaire



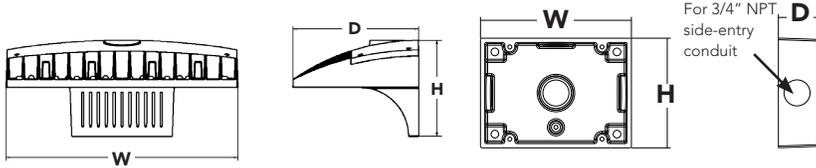
d<sup>series</sup>

## Specifications Luminaire

<b>Width:</b>	18-1/2" (47.0 cm)	<b>Weight:</b>	21 lbs (9.5 kg)
<b>Depth:</b>	10" (25.4 cm)		
<b>Height:</b>	7-5/8" (19.4 cm)		

## Back Box (BBW)

<b>Width:</b>	5-1/2" (14.0 cm)	<b>BBW Weight:</b>	1 lbs (0.5 kg)
<b>Depth:</b>	1-1/2" (3.8 cm)		
<b>Height:</b>	4" (10.2 cm)		



Catalog  
Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

## Introduction

The D-Series Wall luminaire is a stylish, fully integrated LED solution for building-mount applications. It features a sleek, modern design and is carefully engineered to provide long-lasting, energy-efficient lighting with a variety of optical and control options for customized performance.

With an expected service life of over 20 years of nighttime use and up to 76% in energy savings over comparable 400W metal halide luminaires, the D-Series Wall is a reliable, low-maintenance lighting solution that produces sites that are exceptionally illuminated.

## Ordering Information

EXAMPLE: DSXW2 LED 30C 700 40K T3M MVOLT DBBXTXD

DSXW2 LED		Drive Current		Color temperature		Distribution		Voltage	Mounting	Control Options
Series	LEDs									
DSXW2 LED	20C 20 LEDs (two engines)	350	350 mA	30K	3000 K	T2S	Type II Short	MVOLT <sup>1</sup>	<b>Shipped included</b> (blank) Surface mounting bracket	<b>Shipped installed</b> PE Photoelectric cell, button type <sup>4</sup> PER NEMA twist-lock receptacle only (no controls) DMG 0-10V dimming driver (no controls) DCR Dimmable and controllable via ROAM <sup>®</sup> (no controls) <sup>5</sup> PIRH 180° motion/ambient light sensor, 15-30' mtg ht <sup>6</sup>
		530	530 mA	40K	4000 K	T2M	Type II Medium	120 <sup>1</sup>		
30C 30 LEDs (three engines)		700	700 mA	50K	5000 K	T3S	Type III Short	208 <sup>1</sup>	<b>Shipped separately<sup>3</sup></b> BBW Surface-mounted back box (for conduit entry)	PIRH1FC3V Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc <sup>7</sup> PIRH1FC3V Motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc <sup>7</sup>
		1000	1000 mA (1 A)	AMBPC	Amber phosphor converted	T3M	Type III Medium	240 <sup>1</sup>		
						T4M	Type IV Medium	277 <sup>1</sup>		
						TFTM	Forward Throw Medium	347 <sup>2</sup>		
						ASYDF	Asymmetric diffuse	480 <sup>2</sup>		

## Other Options

## Finish (required)

<b>Shipped installed</b>	<b>Shipped separately<sup>9</sup></b>	<b>DDBXD</b> Dark bronze	<b>DSSXD</b> Sandstone	<b>DWHGXD</b> Textured white
SF Single fuse (120, 277, 347V) <sup>8</sup>	BSW Bird-deterrent spikes	<b>DBLXD</b> Black	<b>DBBXTXD</b> Textured dark bronze	<b>DSSTXD</b> Textured sandstone
DF Double fuse (208, 240, 480V) <sup>8</sup>	WG Wire guard	<b>DNAXD</b> Natural aluminum	<b>DBLBXD</b> Textured black	
HS House-side shield <sup>3</sup>	VG Vandal guard	<b>DWHXD</b> White	<b>DNATXD</b> Textured natural aluminum	
SPD Separate surge protection <sup>9</sup>				

## NOTES

- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options), or photocontrol (PE option).
- Available with 30 LED/700mA options only (DSXW2 LED 30C 700). DMG option not available.
- Also available as a separate accessory; see Accessories information.
- Photocontrol (PE) requires 120, 208, 240 or 277 voltage option. Not available with motion/ambient light sensors (PIR or PIRH).
- Specifies a ROAM<sup>®</sup> enabled luminaire with 0-10V dimming capability; PER option required. Not available with 347V, 480V or PIRH. Additional hardware and services required for ROAM<sup>®</sup> deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roomservices.net.
- Specifies the Sensor Switch SBGR-6-ODP control; see Motion Sensor Guide for details. Includes ambient light sensor. Not available with "PE" option (button type photocell) or DCR. Dimming driver standard.
- PIR and PIR1FC3V specify the Sensor Switch SBGR-10-ODP control; PIRH and PIRH1FC3V specify the Sensor Switch SBGR-6-ODP control; see Motion Sensor Guide for details. Dimming driver standard. Not available with PER5 or PER7. Ambient sensor disabled when ordered with DCR. Separate on/off required.
- Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
- See the electrical section on page 2 for more details.
- Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item.

## Accessories

Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) <sup>10</sup>
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) <sup>10</sup>
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) <sup>10</sup>
SC U	Shorting cap <sup>10</sup>
DSXWHS U	House-side shield (one per light engine)
DSXWBSW U	Bird-deterrent spikes
DSXW2WG U	Wire guard accessory
DSXW2VG U	Vandal guard accessory
DSXW2BBW DBBXD U	Back box accessory (specify finish)



## Performance Data

### Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
20C (20 LEDs)	530	36 W	T2S	3,649	1	0	1	101	3,876	1	0	1	108	3,429	1	0	1	95
			T2M	3,478	1	0	1	97	3,694	1	0	1	103	3,267	1	0	1	91
			T3S	3,609	1	0	1	100	3,833	1	0	1	106	3,390	1	0	1	94
			T3M	3,572	1	0	1	99	3,794	1	0	1	105	3,356	1	0	1	93
			T4M	3,500	1	0	2	97	3,717	1	0	2	103	3,288	1	0	1	91
			TFTM	3,638	1	0	1	101	3,864	1	0	1	107	3,418	1	0	1	95
			ASYDF	3,252	1	0	2	90	3,454	1	0	2	96	3,056	1	0	2	85
			ASDF	4,502	1	0	1	96	4,776	1	0	1	102	4,794	1	0	1	102
	700	47 W	T2M	4,290	1	0	1	91	4,552	1	0	1	97	4,569	1	0	1	97
			T3S	4,452	1	0	1	95	4,723	1	0	2	100	4,741	1	0	2	101
			T3M	4,407	1	0	2	94	4,675	1	0	2	99	4,693	1	0	2	100
			T4M	4,318	1	0	2	92	4,581	1	0	2	97	4,598	1	0	2	98
			TFTM	4,488	1	0	2	95	4,761	1	0	2	101	4,779	1	0	2	102
			ASYDF	4,012	1	0	2	85	4,257	1	0	2	91	4,273	1	0	2	91
			T2S	5,963	2	0	2	81	6,327	1	0	1	84	6,351	1	0	1	85
			T2M	5,683	2	0	2	77	6,029	1	0	2	80	6,052	1	0	2	81
	1000	74 W	T3S	5,896	1	0	2	80	6,256	1	0	2	83	6,280	1	0	2	84
			T3M	5,837	2	0	3	79	6,193	1	0	2	83	6,216	1	0	2	83
			T4M	5,719	1	0	2	77	6,067	1	0	2	81	6,090	1	0	2	81
			TFTM	5,944	1	0	2	80	6,307	1	0	2	84	6,330	1	0	2	84
			ASYDF	5,314	1	0	2	72	5,638	2	0	2	75	5,660	2	0	2	75
			T2S	4,333	1	0	1	80	5,280	1	0	1	98	5,769	1	0	1	107
			T2M	4,216	1	0	1	78	5,137	1	0	2	95	5,613	1	0	2	104
			T3S	4,279	1	0	1	79	5,214	1	0	1	97	5,696	1	0	1	105
30C (30 LEDs)	530	54 W	T3M	4,349	1	0	2	81	5,298	1	0	2	98	5,789	1	0	2	107
			T4M	4,291	1	0	1	79	5,228	1	0	2	97	5,712	1	0	2	106
			TFTM	4,287	1	0	1	79	5,223	1	0	2	97	5,707	1	0	2	106
			T2S	5,346	1	0	1	75	6,513	1	0	1	92	7,118	2	0	2	100
			T2M	5,201	1	0	2	73	6,337	2	0	2	89	6,925	2	0	2	98
			T3S	5,279	1	0	1	74	6,431	1	0	2	91	7,028	1	0	2	99
	700	71 W	T3M	5,365	1	0	2	76	6,536	1	0	2	92	7,143	2	0	3	101
			T4M	5,293	1	0	2	75	6,449	1	0	2	91	7,047	1	0	2	99
			TFTM	5,289	1	0	2	74	6,444	1	0	2	91	7,042	1	0	2	99
			T2S	7,137	2	0	2	65	8,697	2	0	2	80	9,501	2	0	2	87
			T2M	6,944	2	0	2	64	8,462	2	0	2	78	9,244	2	0	2	85
			T3S	7,047	1	0	2	65	8,588	1	0	2	79	9,381	2	0	2	86
1000	109 W	T3M	7,162	2	0	3	66	8,728	2	0	3	80	9,534	2	0	3	87	
		T4M	7,066	1	0	2	65	8,611	1	0	2	79	9,407	2	0	2	86	
		TFTM	7,060	1	0	2	65	8,604	2	0	2	79	9,399	2	0	2	86	

**Note:**

Available with phosphor-converted amber LED's (nomenclature AMBPC). These LED's produce light with 97+% >530 nm. Output can be calculated by applying a 0.7 factor to 4000 K lumen values and photometric files.

## Performance Data

### Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
<b>25°C</b>	<b>77°F</b>	<b>1.00</b>
30°C	86°F	1.00
40°C	104°F	0.98

### Electrical Load

LEDs	Drive Current (mA)	System Watts	Current (A)					
			120V	208V	240V	277V	347V	480V
20C	350	25 W	0.23	0.13	0.12	0.10	-	-
	530	36 W	0.33	0.19	0.17	0.14	-	-
	700	47 W	0.44	0.25	0.22	0.19	-	-
	1000	73 W	0.68	0.39	0.34	0.29	-	-
30C	350	36 W	0.33	0.19	0.17	0.14	-	-
	530	54 W	0.50	0.29	0.25	0.22	-	-
	700	71 W	0.66	0.38	0.33	0.28	0.23	0.16
	1000	109 W	1.01	0.58	0.50	0.44	-	-

### Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **DSXW2 LED 30C 1000** platform in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

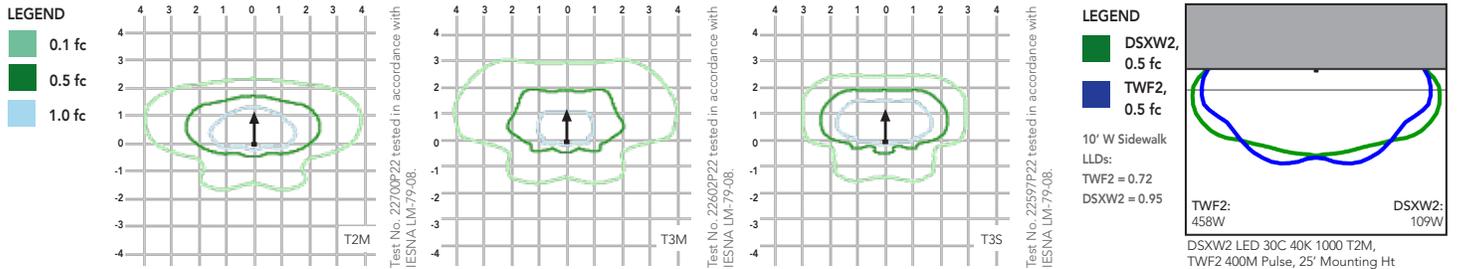
To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.95	0.92	0.87

## Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Wall Size 2 homepage.

Isofootcandle plots for the DSXW2 LED 30C 1000 40K. Distances are in units of mounting height (25').



## FEATURES & SPECIFICATIONS

### INTENDED USE

The energy savings, long life and easy-to-install design of the D-Series Wall Size 2 make it the smart choice for building-mounted doorway and pathway illumination for nearly any facility.

### CONSTRUCTION

Two-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance. The LED driver is mounted to the door to thermally isolate it from the light engines for low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65).

### FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in textured and non-textured finishes.

### OPTICS

Precision-molded proprietary acrylic lenses provide multiple photometric distributions tailored specifically to building mounted applications. Light engines are available in 3000 K (80 min. CRI), 4000 K (70 min. CRI) or 5000 K (70 CRI) configurations.

### ELECTRICAL

Light engine(s) consist of 10 high-efficacy LEDs mounted to a metal-core circuit board to maximize heat dissipation and promote long life (L87/100,000 hrs at 25°C). Class 1 electronic drivers have a power factor >90%, THD <20%, and a minimum 2.5KV surge rating. When ordering the SPD option, a separate surge protection device is installed within the luminaire which meets a minimum Category C Low (per ANSI/IEEE C62.41.2).

### INSTALLATION

Included universal mounting bracket attaches securely to any 4" round or square outlet box for quick and easy installation. Luminaire has a slotted gasket wireway and attaches to the mounting bracket via corrosion-resistant screws.

### LISTINGS

CSA certified to U.S. and Canadian standards. Rated for -40°C minimum ambient.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at [www.designlights.org](http://www.designlights.org) to confirm which versions are qualified.

### WARRANTY

Five-year limited warranty. Complete warranty terms located at [www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx).

**Note:** Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.



## MEMORANDUM

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**Date:** March 21, 2016 **TG:** 15365.00

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**To:** Tony Doran, City of Tualatin

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**From:** Mike Swenson  
Kyle Stahley

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**cc:** Mark Person, Mackenzie  
Matt Oyen, Pacific Trust Realty

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**Subject:** Koch Corporate Buildings 10, 11, 12 – Response to Incomplete Application Notice

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This memorandum responds to the *AR 16-001 Incomplete Application Notice* issued by the City of Tualatin February 18, 2016 for the Architectural Review application submitted for the proposed Koch Corporate Building 10, 11, and 12. This memorandum addresses transportation issues related to the *Koch Corporate Center Building 10, 11, 12 Transportation Impact Analysis* submitted in January 2016. The following sections describe and address the issue of incompleteness.

### Issue of Incompleteness

Item #6 of the *Incomplete Application Notice* is described as follows:

*6. Transportation Impact Analysis – We indicated that the required scope for this evaluation needed to include afternoon off peak hours for the intersection of 115th & Itel due to local businesses perceiving a problem in delay.*

### Response to Issue

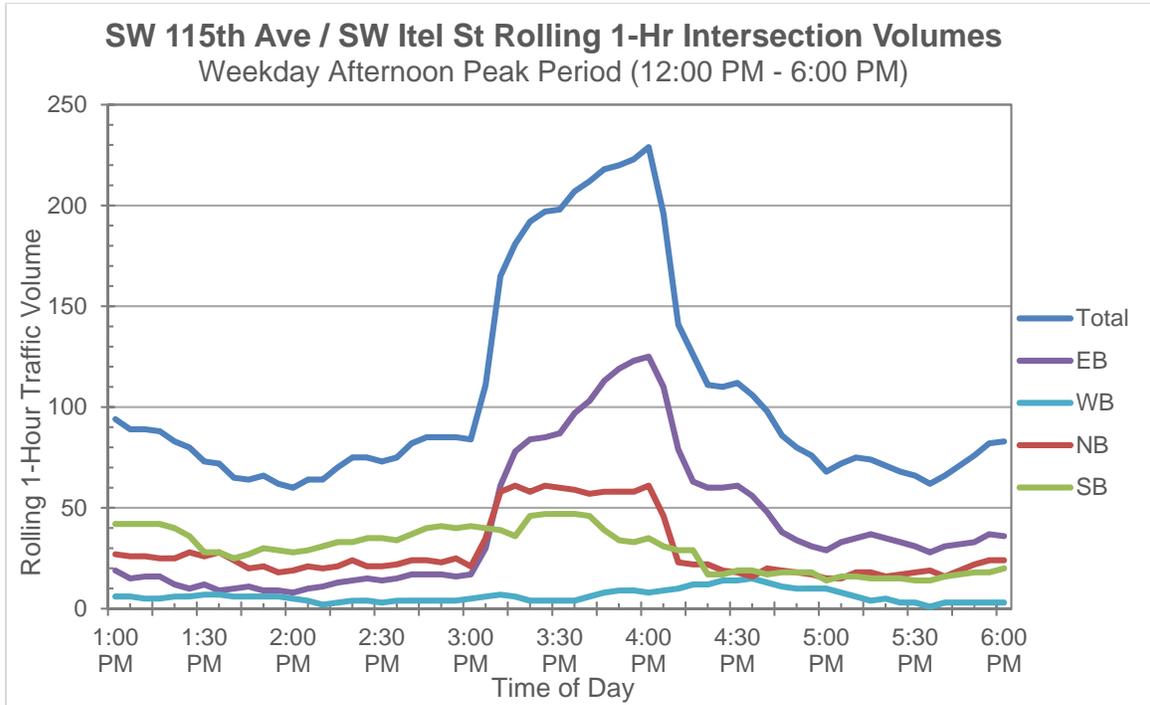
The following sections outline the existing and future traffic volumes at the SW 115th Avenue / SW Itel Street. Additionally, the intersection traffic operations are analyzed during the peak one-hour period.

#### ***Traffic Volumes***

The existing and future without- and with-project traffic volumes are discussed in the following sections.

#### **Existing Traffic Volumes**

Additional traffic counts were conducted at the 115th Avenue SW / SW Itel Street intersection in March 2016 from 12:00 p.m. to 4:00 p.m. to supplement the counts previously conducted for the *Transportation Impact Study* in September 2015 from 4:00 p.m. to 6:00 p.m. A summary of the rolling 1-hour traffic volumes at the intersection as well as along each approach are shown in Figure 1.



**Figure 1: Rolling 1-Hour Intersection Volumes**

As shown in Figure 1, the total entering intersection volumes is typically below 100 vehicles per hour. Beginning during the 2:00 – 3:00 p.m. period and extending for about 1.75 hours to the 3:45 – 4:45 p.m. period, the total intersection entering volume exceeds 100 vehicles per hour, with a maximum entering volume of 230 vehicles. The highest 15-minute period of entering vehicles occurred from 3:00 to 3:15 p.m. when approximately 124 of the 230 peak hour vehicles entered the intersection.

As shown in Figure 1, the highest volume approaches were on the eastbound and northbound approaches, which accounted for approximately 55 percent and 25 percent of the total entering volume. The characteristics of the traffic volumes at the intersection are representative of the shift times associated with the businesses located to the south of the SW 115th Avenue / SW Itel Street intersection.

### Future Traffic Volumes

Similar to the volume forecasts in the *Transportation Impact Analysis*, existing traffic volumes were increased to reflect future traffic conditions. At the SW 115th Avenue / SW Itel Street intersection, vehicles anticipated to be generated from the partially vacant Phase I and under construction Phase II of the Koch Corporate Center were added to the intersection. Since the tenants of these buildings are unknown, the trip generation developed for each of these projects during the afternoon peak hour was based on trip generation rates for the peak hour of the generator. Rates for this peak period are approximately 20 percent higher than the trip generation rate during the typical 4:00 to 6:00 p.m. weekday PM peak period. The anticipated trips were added to the existing traffic volumes to develop the future without-project weekday afternoon peak volumes. These volumes are shown in Figure 2.

Due to the location of the proposed Building 10, 11, 12 and the location of the SW 115th Avenue access to the SW Tualatin-Sherwood Highway, it is unlikely that any vehicles generated by the proposed development would use the SW 115th Avenue / SW Itel Street intersection. The with-project traffic volumes during the weekday afternoon period would be the same as the without-project traffic volumes.

### Traffic Operations

Consistent with the operations analyses conducted for the *Transportation Impact Analyses*, *Synchro 9* was used to evaluate the intersection using *Highway Capacity Manual (HCM)* (Transportation Research Board, 2000 Edition) methodology. As mentioned previously, the existing traffic count showed a majority of the afternoon peak hour traffic volumes occurring during a 15-minute period, resulting in peak hour factor of 0.46 for the intersection. With the addition of traffic volumes from the pipeline projects to develop the future without-project volumes, it was assumed that peak hour factor would remain the same. This assumption is likely conservative as future tenants of the in-process buildings could have staggered release times which would result in vehicle arrivals spreading out more uniformly during the hour and the peak hour factor would be closer to 1.0. The traffic operations analyses for future without and with-project scenarios is shown in Table 1.

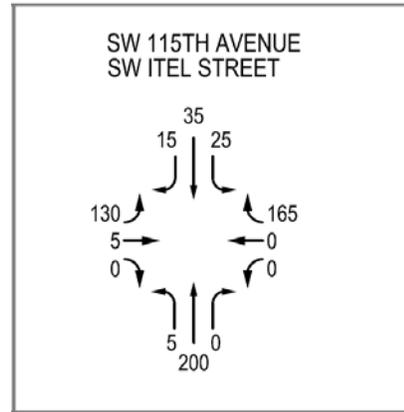


Figure 2: Future Without- and With-Project Traffic Volumes

Table 1. Weekday Afternoon Peak Hour Level of Service

Intersection	Future Without-Project			Future With-Project		
	LOS <sup>1</sup>	Delay <sup>2</sup>	WM <sup>3</sup>	LOS	Delay	WM
<b>Weekday Afternoon Peak Hour</b>						
SW 115th Ave / SW Itel St	D	29	NB	D	29	NB

1. Level of service, based on 2000 Highway Capacity Manual methodology.
2. Average delay in seconds per vehicle.
3. Worst movement reported for unsignalized intersections.

As shown in Table 1, the average vehicle delay during the future without-project weekday afternoon peak hour is 29 seconds and the Level of Service (LOS) is D. On the northbound approach, which is anticipated to have the highest volumes after the addition of in-process traffic, the average vehicle delay is anticipated to be 45 seconds. During with-project conditions, the LOS is anticipated to remain at LOS D and the average delay would remain at 29 seconds as no additional traffic volume is anticipated at the intersection with the development of Building 10, 11 and 12.

As noted previously, based on the location of the project and the anticipated trip distribution patterns, the project is not likely to impact the operations of this intersection.

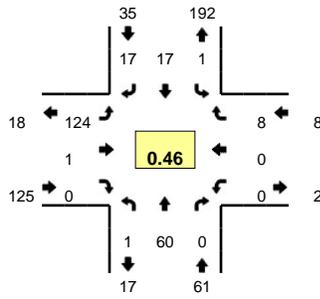


**Attachment: Weekday Afternoon Traffic Count**

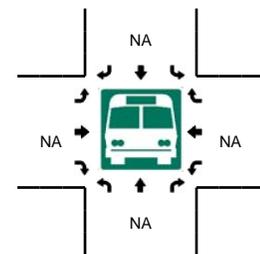
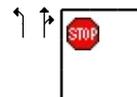
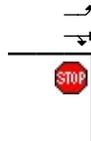
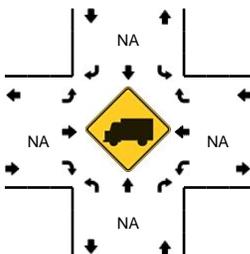
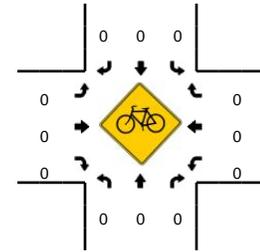
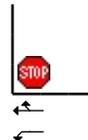
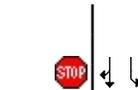
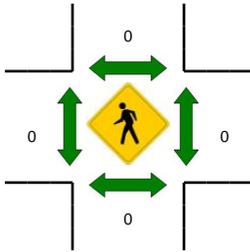
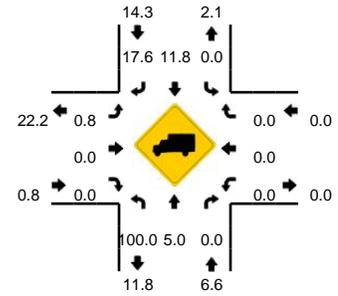


**LOCATION:** SW 115th Ave -- SW Itel St  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13736102  
**DATE:** Tue, Mar 01 2016



**Peak-Hour: 3:00 PM -- 4:00 PM**  
**Peak 15-Min: 3:00 PM -- 3:15 PM**



5-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Itel St (Eastbound)				SW Itel St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	3	0	0	0	4	1	0	3	0	0	0	0	0	0	0	11	64
2:05 PM	0	1	0	0	0	2	2	0	2	0	0	0	0	0	0	0	7	64
2:10 PM	0	1	0	0	0	2	3	0	2	0	0	0	0	0	1	0	9	70
2:15 PM	0	5	0	0	0	1	1	0	1	0	0	0	0	0	2	0	10	75
2:20 PM	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	3	75
2:25 PM	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0	0	4	73
2:30 PM	0	3	1	0	0	0	1	0	1	0	1	0	0	0	1	0	8	75
2:35 PM	0	2	0	0	0	2	1	0	3	0	0	0	0	0	0	0	8	82
2:40 PM	0	0	0	0	0	4	3	0	1	0	0	0	0	0	0	0	8	85
2:45 PM	0	1	0	0	0	3	2	0	0	0	0	0	0	0	0	0	6	85
2:50 PM	0	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	5	85
2:55 PM	0	0	0	0	0	2	1	0	1	0	0	0	0	0	1	0	5	84
3:00 PM	1	16	0	0	0	1	3	0	16	0	0	0	0	0	1	0	38	111
3:05 PM	0	24	0	0	0	1	2	0	33	0	0	0	0	0	1	0	61	165
3:10 PM	0	4	0	0	0	0	2	0	18	1	0	0	0	0	0	0	25	181
3:15 PM	0	2	0	0	0	8	4	0	7	0	0	0	0	0	0	0	21	192
3:20 PM	0	3	0	0	0	1	2	0	2	0	0	0	0	0	0	0	8	197
3:25 PM	0	1	0	0	1	0	0	0	3	0	0	0	0	0	0	0	5	198
3:30 PM	0	3	0	0	0	1	0	0	12	0	0	0	0	0	1	0	17	207
3:35 PM	0	0	0	0	0	1	1	0	9	0	0	0	0	0	2	0	13	212
3:40 PM	0	1	0	0	0	0	0	0	11	0	0	0	0	0	2	0	14	218
3:45 PM	0	1	0	0	0	0	0	0	6	0	0	0	0	0	1	0	8	220
3:50 PM	0	2	0	0	0	2	0	0	4	0	0	0	0	0	0	0	8	223
3:55 PM	0	3	0	0	0	2	3	0	3	0	0	0	0	0	0	0	11	229
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	4	176	0	0	0	8	28	0	268	4	0	0	0	0	8	0	496	
Heavy Trucks	4	0	0	0	0	4	8	0	4	0	0	0	0	0	0	0	20	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

**Attachment: Level of Service Worksheets**



HCM Unsignalized Intersection Capacity Analysis  
 3: SW Itel St & SW 115th Ave

Koch Corporate Center Phase II  
 2017 Without-Project Afternoon Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	130	5	0	0	5	165	5	200	0	25	35	15
Future Volume (vph)	130	5	0	0	5	165	5	200	0	25	35	15
Peak Hour Factor	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Hourly flow rate (vph)	283	11	0	0	11	359	11	435	0	54	76	33
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	283	11	0	370	11	435	54	109				
Volume Left (vph)	283	0	0	0	11	0	54	0				
Volume Right (vph)	0	0	0	359	0	0	0	33				
Hadj (s)	0.52	0.02	0.00	-0.68	0.62	0.12	0.74	0.03				
Departure Headway (s)	8.1	7.6	7.4	6.7	7.9	7.4	8.9	8.2				
Degree Utilization, x	0.64	0.02	0.00	0.69	0.02	0.90	0.13	0.25				
Capacity (veh/h)	412	445	900	510	437	477	376	407				
Control Delay (s)	23.4	9.6	9.2	22.2	9.9	45.5	12.1	12.7				
Approach Delay (s)	22.9		22.2		44.6		12.5					
Approach LOS	C		C		E		B					
Intersection Summary												
Delay			28.9									
Level of Service			D									
Intersection Capacity Utilization			44.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
3: SW Itel St & SW 115th Ave

Koch Corporate Center Phase II  
2017 With-Project Afternoon Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	130	5	0	0	5	165	5	200	0	25	35	15
Future Volume (vph)	130	5	0	0	5	165	5	200	0	25	35	15
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Volume Total (vph)	283	11	0	370	11	435	54	109				
Volume Left (vph)	283	0	0	0	11	0	54	0				
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Hadj (s)	0.52	0.02	0.00	-0.68	0.62	0.12	0.74	0.03				
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Approach Delay (s)	22.9		22.2		44.6		12.5					
Approach LOS	C		C		E		B					
Intersection Summary												
Delay			28.9									
Level of Service			D									
Intersection Capacity Utilization			44.9%		ICU Level of Service				A			
Analysis Period (min)			15									

# Transportation Impact Analysis

## KOCH CORPORATE CENTER BUILDINGS 10, 11, 12

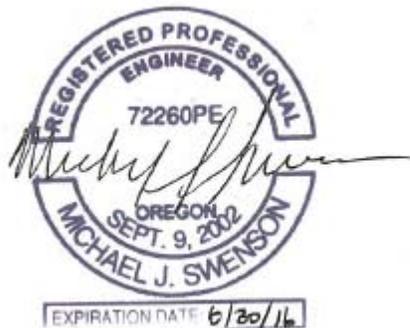
Prepared for:  
PacTrust

January 2016

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## Table of Contents

<b>Chapter 1. Frequently Asked Questions.....</b>	<b>ii</b>
<b>Chapter 2. Introduction.....</b>	<b>1</b>
Project Description.....	1
Analysis Approach and Study Area.....	1
<b>Chapter 3. Existing and Baseline Conditions .....</b>	<b>4</b>
Roadway Network.....	4
Traffic Volumes.....	5
Traffic Operations.....	8
Non-Motorized Facilities.....	9
Traffic Safety.....	9
<b>Chapter 4. Project Impacts.....</b>	<b>10</b>
Trip Generation.....	10
Trip Distribution.....	10
Traffic Volumes.....	10
Traffic Operations.....	13
<b>Chapter 5. Project Mitigation .....</b>	<b>14</b>
<b>Chapter 6. Findings and Recommendations.....</b>	<b>15</b>

## Appendix

Appendix A: Traffic Counts
Appendix B: LOS Criteria
Appendix C: LOS Worksheets
Appendix D: Collision Data

## Figures

Figure 1.	Project Site Vicinity.....	2
Figure 2.	Site Plan.....	3
Figure 3.	Existing (2015) Weekday AM and PM Peak Hour Traffic Volumes.....	6
Figure 4.	Future (2017) Without-Project Weekday AM and PM Peak Hour Traffic Volumes.....	7
Figure 5.	Weekday AM and PM Peak Hour Project Trip Distribution & Assignment.....	11
Figure 6.	Future (2017) With-Project Weekday AM and PM Peak Hour Volumes.....	12

## Tables

Table 1.	Existing and Without-Project AM and PM Peak Hour LOS Summary.....	8
Table 2.	Collision Data Summary.....	9
Table 3.	Project Trip Generation.....	10
Table 4.	Future (2017) Without-Project and With-Project LOS Summary.....	13

# Chapter 1. Frequently Asked Questions

This section provides an executive summary of the Transportation Impact Analysis through a set of frequently asked questions (FAQs).

## ***Where is the project located?***

The site is located along the southeast quadrant of the SW Tualatin-Sherwood Road / 115th Avenue SW intersection in Tualatin, Oregon.

## ***What is the project land use and trip generation?***

The project includes the construction of three light industrial buildings totaling 127,253 gross square feet. The project is estimated to generate 118 vehicle trips during the weekday AM peak hour and 124 trips during the weekday PM peak hour.

## ***What are the existing and future without-project conditions in the study area?***

The study area was defined through coordination with Washington County and the City of Tualatin and includes the intersections of SW 112th Avenue (SW Avery Street) / SW Tualatin-Sherwood Road, SW 115th Avenue / SW Tualatin-Sherwood Road, SW 115th Avenue / SW Itel Street, and SW 115th Avenue / Site Access.

For existing conditions, during both the weekday AM and PM peak hours, both intersections on SW Tualatin-Sherwood Road are anticipated to operate within the County's operational standards. After the addition of forecast background growth and pipeline project traffic, the intersections are anticipated to remain within County operational standards for both AM and PM peak hours.

The SW Itel Street intersection and Access Road on SW 115th Avenue are anticipated to meet the City of Tualatin's operational standard of LOS E during both the existing and future without-project weekday AM and PM peak hours.

## ***Would the project have any transportation impacts?***

With the addition of project related traffic, the respective operational standards for the County-controlled intersections on SW Tualatin-Sherwood Street and the City-controlled intersections on SW 115th Avenue are both met.

## ***What mitigation measures are recommended?***

No mitigation measures are recommended as all intersections are anticipated to operate within the required standards.

## Chapter 2. Introduction

This Transportation Impact Analysis (TIA) summarizes the potential transportation-related impacts associated with the proposed Koch Corporate Center – Buildings 10, 11, 12 located in the City of Tualatin. The analysis was conducted to evaluate the project's impacts on roadways and intersections within the vicinity of the site and to recommend, if necessary, mitigation measures that would reduce or otherwise offset these impacts.

### Project Description

The project site is located along the southeast quadrant of the SW 115th / SW Tualatin-Sherwood Road intersection in Tualatin, Oregon. The project's site vicinity is shown in Figure 1. The primary access to the project would be via the northernmost access road on SW 115th Avenue. Project traffic would enter and leave the site via SW 115th Avenue to SW Tualatin-Sherwood Road.

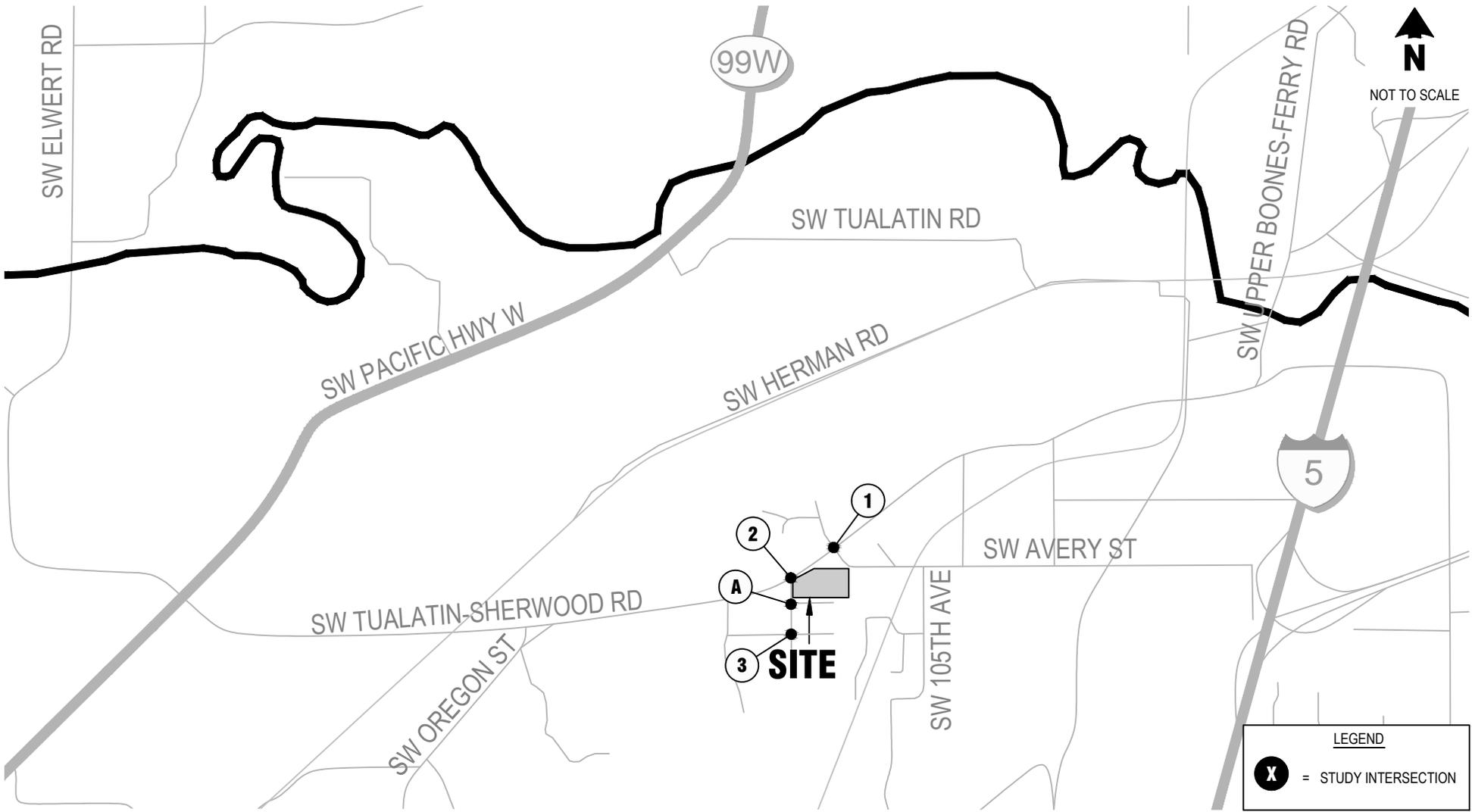
The project includes the construction of three industrial buildings totaling 127,253 gross square feet (gsf). A preliminary site plan showing the subject project and access points are included in Figure 2. The project is anticipated to be built and fully occupied by 2017.

### Analysis Approach and Study Area

The scope of this analysis was coordinated with City of Tualatin and Washington County staff and is consistent with the City's and Washington County's road standard requirements. The study area includes three intersections: SW 112th Avenue (SW Avery Street) / SW Tualatin-Sherwood Road, SW 115th Avenue / SW Tualatin-Sherwood Road, and SW 115th Avenue / Itel Street. In addition, the access road for the project on SW 115th Avenue between SW Tualatin-Sherwood Road and SW Itel Street was also studied.

The SW 112th Avenue / SW Tualatin-Sherwood Road and SW 115th Avenue / SW Tualatin-Sherwood Roads are operated and maintained by Washington County; therefore Washington County standards were used for analysis. The SW 115th Avenue / SW Itel Street intersection as well as the SW 115th Avenue / Access Road intersection are maintained by the City of Tualatin and were evaluated based on the City's intersection operation standards.

Intersection operations are evaluated for the existing, without-project and with-project weekday AM and PM peak hour conditions. Site-generated impacts are determined by comparing without- and with-project traffic conditions.



# Site Vicinity & Study Intersections

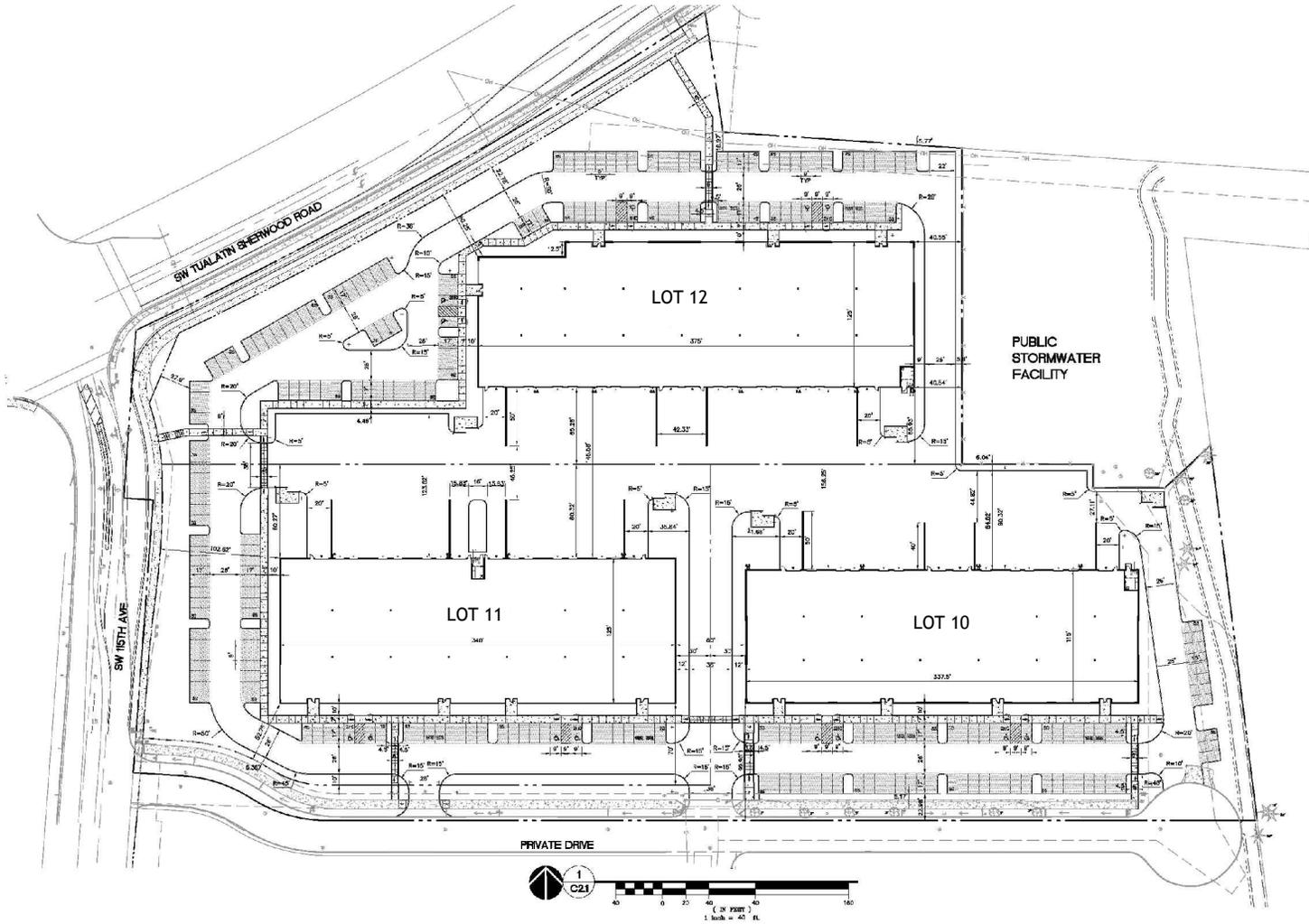
Koch Corporate Center - Buildings 10, 11, 12

FIGURE

1



NOT TO SCALE



# Site Plan

Koch Corporate Center - Buildings 10, 11, 12

## Chapter 3. Existing and Baseline Conditions

This section describes both existing conditions and 2017 without-project conditions within the identified study area. Study area characteristics are provided for the roadway network, planned improvements, existing and forecasted without-project volumes, traffic operations, and non-motorized facilities.

### Roadway Network

The primary roadways within the vicinity of the site include the following:

**SW Tualatin-Sherwood Road** is a two-lane major arterial with a posted speed limit of 45 miles per hour (mph). Traffic signals exist at major intersections near the site including SW 115th Street / SW Tualatin-Sherwood Road and SW Avery Road / SW Tualatin-Sherwood Road. Bike lanes are provided near the project site. Sidewalks are provided where development has occurred.

**SW 115th Avenue** is a two-lane local commercial industrial roadway with a posted speed limit of 25 mph. Bike lanes are provided south of the project site. Sidewalks are located where development has occurred.

**SW 112th Avenue/SW Avery Street** is a two-lane local commercial industrial roadway with a posted speed limit of 25 mph. The roadway continues as SW 112th Avenue north of SW Tualatin-Sherwood Road, and transitions to SW Avery Street south of the SW Tualatin-Sherwood Road intersection. Sidewalks are located where development has occurred. Bike lanes exist on both sides of the roadway.

**SW IteI Street** is a two-lane (with one center turn lane) commercial industrial roadway with a speed limit of 25 mph. Sidewalks are located along both sides of the entire stretch of the street.

### *Planned Improvements*

The City of Tualatin *Transportation System Plan* (February 2014) was reviewed to identify any planned improvements within the 2017 horizon year. No improvements were identified in the study area that would be constructed by the project horizon year.

One capacity improvement was identified in the City of Tualatin *Transportation System Plan* that would be constructed after the project horizon year and includes the widening of SW Avery Street to a three lane cross-section between SW Teton Avenue and SW Tualatin-Sherwood Road. The existing intersection at SW Tualatin-Sherwood / SW Avery Street already reflects this planned improvement with left turn lanes on SW Avery Street. This improvement is anticipated to be constructed in 2019.

An additional transit improvement was identified in the study area which would fund a fixed-route bus service on SW Avery Street and SW Tualatin-Sherwood Road within the next 5 to 10 years.

At the intersection 115th Avenue SW / SW Tualatin-Sherwood Road, mitigation for a previous development required the construction of a second westbound left-turn and rechannelizing the south leg to a shared through-left and right-turn lane to allow for an overlap phase. This improvement was assumed to be completed by the project horizon year and was assumed in the analysis of future without-project intersection operations.

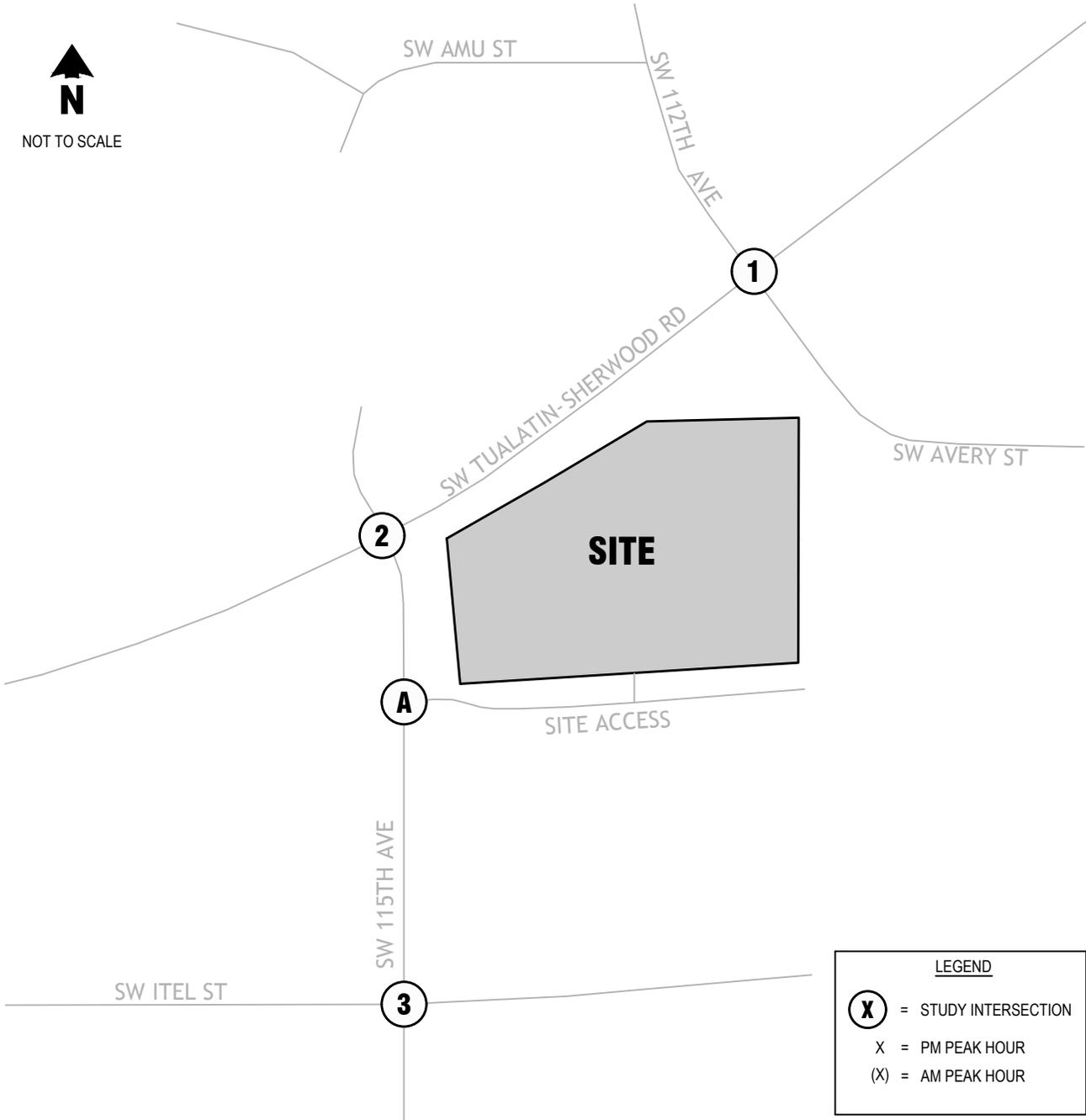
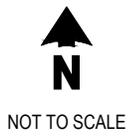
## Traffic Volumes

Weekday AM and PM peak hour traffic volumes at the study intersection were collected in September 2015. The existing weekday AM and PM peak hour traffic volumes are illustrated in Figure 3. The detailed traffic count worksheets are provided in Appendix A.

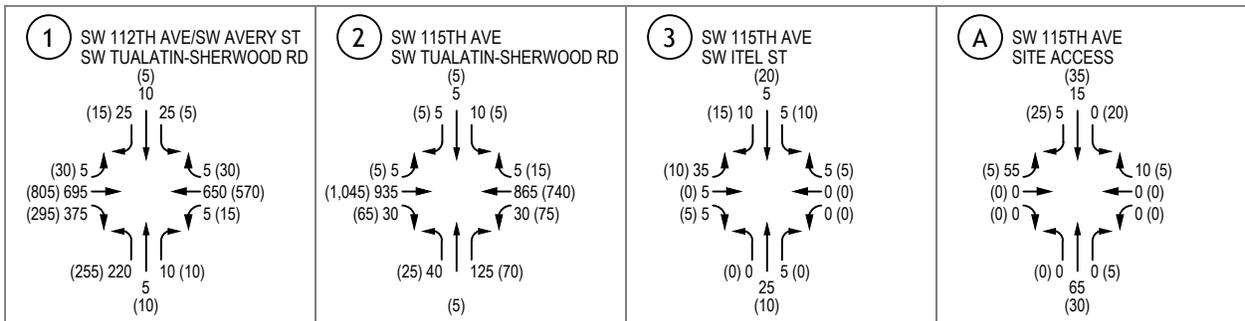
Consistent with other studies in the area, and approved by the City and County staff, an annual growth rate of 1.5 percent was utilized for estimating future without-project traffic volumes. In addition to an annual growth rate, trips from planned, in-process projects in the vicinity were included in the 2017 without-project weekday AM and PM peak hour traffic volumes. Trips from the following in-process projects were included: Hedges Business Park, Koch Corporate Center – Buildings 6 and 7, Koch Corporate Center – Buildings 1, 5, and 8.

At the time which traffic counts were conducted in September 2015, the Koch Corporate Center – Building 6 and 7 were constructed and partially occupied with 46 percent of its total space leased. Based on this, only 56 percent of the trip generation assumed in the project traffic study was added in the development of future without-project traffic volumes. The Hedges Business Park and Koch Corporate Center – Building 1, 5, and 8 were not constructed at the time of the traffic count and 100 percent of the trip generation assumed in each project's traffic study was added to the existing volumes to develop the future without-project traffic volumes.

Figure 4 illustrates the resulting 2017 without-project weekday AM and PM peak hour traffic volumes.

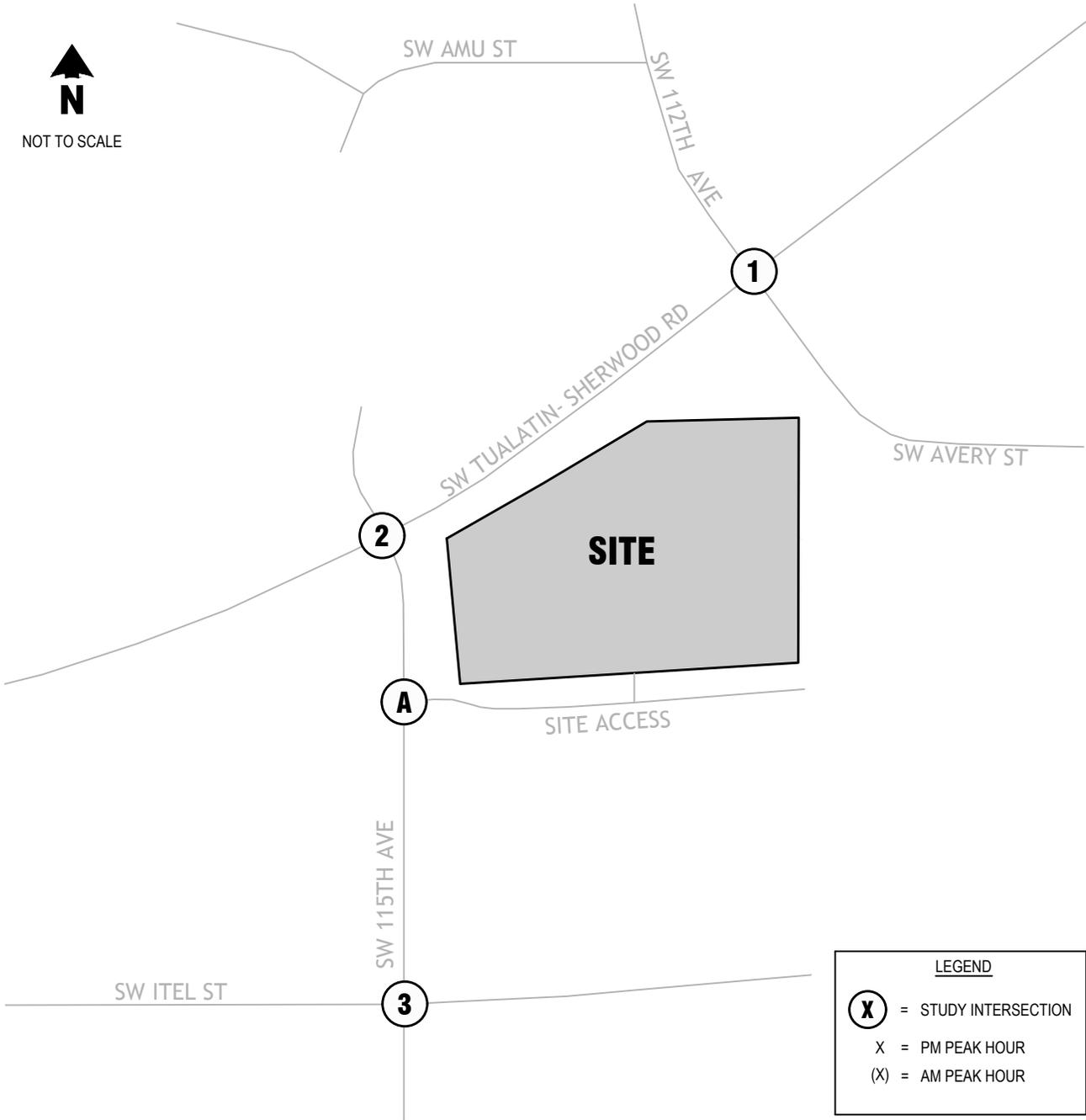


LEGEND	
<b>(X)</b>	= STUDY INTERSECTION
X	= PM PEAK HOUR
(X)	= AM PEAK HOUR

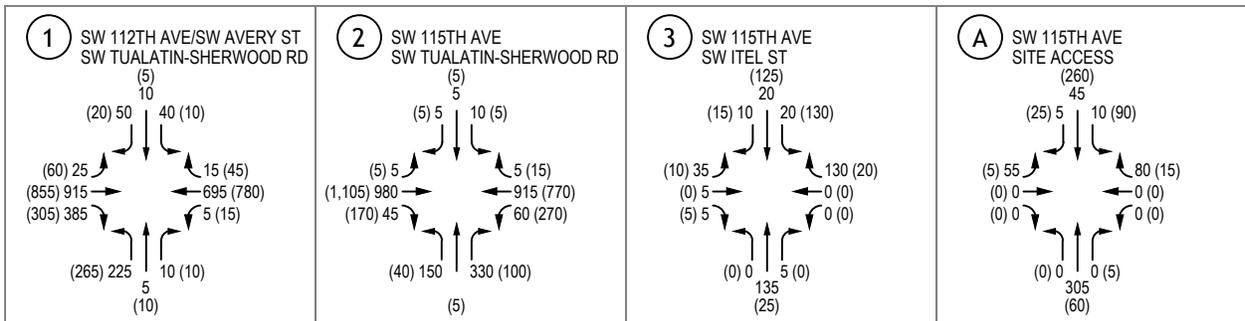


## Existing (2015) Weekday AM and PM Peak Hour Traffic Volumes

Koch Corporate Center - Buildings 10, 11, 12



LEGEND	
<b>(X)</b>	= STUDY INTERSECTION
X	= PM PEAK HOUR
(X)	= AM PEAK HOUR



Future (2017) Without-Project Weekday AM and PM Peak Hour Traffic Volumes

FIGURE

Koch Corporate Center - Buildings 10, 11, 12



## Traffic Operations

A level of service (LOS) analysis was conducted for the study area intersections for the weekday AM and PM peak hour. The signalized intersections were analyzed using *Synchro 9*. This software program provides an analysis based on methodologies presented in the *Highway Capacity Manual* (HCM) (Transportation Research Board, 2000 Edition).

LOS values range from LOS A, which indicates good operating conditions with little or no delay, to LOS F, which indicates extreme congestion and long vehicle delays. LOS is measured in terms of total average intersection delay for signalized and all-way stop-controlled intersections. A more detailed explanation of LOS criteria is provided in Appendix B.

Existing and without-project (2017) LOS results are summarized in Table 1 and LOS worksheets are provided in Appendix C. The signal timing splits and offsets were optimized during the without-project weekday AM and PM peak hour to account for the change in intersection channelization previously described.

The study intersections on SW Tualatin-Sherwood Road (#1 and #2) are under Washington County jurisdiction. Washington County has identified their operational standard as a volume-to-capacity (V/C) ratio equal to or less than 0.98 for each movement of the intersection. Since SW Tualatin-Sherwood Road is a County facility, the Washington County standard is being considered in the operations analysis. Based on discussions with County staff, the use of the peak hour volumes satisfies the first and second hour operational standards defined by the County.

The SW Itel Street intersection and Access intersection on SW 115th Avenue are maintained by the City of Tualatin. The City’s operational standard for signalized intersections is LOS D and for unsignalized intersections is LOS E or better during the study period. The SW 115th Avenue / SW Itel Street intersection is all-way stop-controlled and the SW 115th Avenue / Access Road is side-street stop-controlled.

The existing and future without-project level of service summary is shown in Table 1 for the weekday AM and PM peak hours.

**Table 1. Existing and Future (2017) Without-Project AM and PM Peak Hour LOS Summary**

Intersection	2015 Existing				2017 Without-Project			
	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup>	WM <sup>4</sup>	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup>	WM <sup>4</sup>
<b>Weekday AM Peak Hour</b>								
1. SW 112th Ave (SW Avery St) / SW Tualatin-Sherwood Rd	B	17.4	0.84	NBL	C	22.5	0.93	NBL
2. SW 115th Ave / SW Tualatin-Sherwood Rd	B	19.0	0.87	EBT	D	40.9	0.91	EBT
3. SW 115th Ave / SW Itel St	A	7.2	-	EBL	A	8.0	-	SBL
A. SW 115th Ave / Site Access	A	9.2	-	EB	B	13.2	-	EB
<b>Weekday PM Peak Hour</b>								
1. SW 112th Ave (SW Avery St) / SW Tualatin-Sherwood Rd	B	16.4	0.77	NBL	C	22.4	0.95	NBL
2. SW 115th Ave / SW Tualatin-Sherwood Rd	B	14.1	0.70	EBT	C	24.4	0.80	EBT
3. SW 115th Ave / SW Itel St	A	7.0	-	SBL	A	8.3	-	NB
A. SW 115th Ave / Site Access	A	9.1	-	EB	C	16.3	-	EB

1. Level of Service- Average vehicle delay in seconds per vehicles, reported for the overall intersection for signal-controlled and all-way stop-controlled intersections and reported for the worst movement for side-street stop-controlled intersections.  
 2. Volume-to-capacity ratio for worst movement at signalized intersections.  
 3. WM = Worst Movement or approach reported for signalized and unsignalized intersections. NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound.

As shown in Table 1, the SW 112th Avenue (SW Avery Street) / SW Tualatin-Sherwood Road and SW 115th Avenue / SW Tualatin-Sherwood Road intersections both have maximum approach V/C's less than 0.99 during the weekday AM and PM peak hours and meet the County's operational standard during existing weekday peak hour conditions.

The SW 115th Avenue / SW Itel Street intersection currently operates at LOS A during the weekday AM and PM peak hours. The SW 115th Avenue / Site Access intersection also operates at LOS A during the existing weekday AM and PM peak hours. These intersections both meet the City's operation standard for stop-controlled intersections of LOS E operations or better.

With the addition of background traffic growth and traffic anticipated from the in-process projects, all intersections are anticipated to continue to operate at or above the respective jurisdiction's operational standards.

## Non-Motorized Facilities

Non-motorized facilities exist within the study area in the form of sidewalks and bike lanes. Bike lanes are provided along SW Tualatin-Sherwood Road and SW Avery Street.

## Traffic Safety

Collision data was reviewed and summarized at the four study intersections. This includes complete data between 2012 and 2014 and is shown in Table 2. Accident data received from the Oregon Department of Transportation is shown in Appendix D.

**Table 2. Collision Data Summary**

Location	2012	2013	2014	Total Collisions	Collisions/Year <sup>1</sup>
1. SW 112th Ave (SW Avery St) / SW Tualatin-Sherwood Rd	6	3	13	22	7.3
2. SW 115th Ave / SW Tualatin-Sherwood Rd	2	3	2	7	2.3
3. SW 115th Ave / SW Itel St	0	0	0	0	0.0
A. SW 115th Ave / Site Access	0	0	0	0	0.0

1. Collisions per year based on average between 2012 and 2014.

As shown in Table 2, collisions at the intersection of SW 112th Avenue / SW Tualatin-Sherwood Road and SW 115th Avenue / SW Tualatin-Sherwood Road total approximately seven and two collisions per year, respectively. For both intersections, the collision types consisted of rear-ends or turning movements. No collisions were identified during the previous three-year study period at the SW 115th Avenue / SW Itel Street or SW 115th Avenue / Access intersection.

## Chapter 4. Project Impacts

This section of the report documents the site-generated impacts of the proposed project on the surrounding roadway network, including impacts to traffic volumes and intersection operations. Project-generated weekday AM and PM peak hour traffic volumes are estimated, distributed, and assigned to the surrounding roadway network. Future with-project traffic volumes are projected and intersection peak hour operations are evaluated. 2017 without- and with-project conditions are compared in order to identify transportation impacts associated with the project.

### Trip Generation

The following trip generation estimates were developed using rates identified in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition. The trip generation rates used for the proposed site are based on ITE Land Use #110 (General Light Industrial). Trip generation estimates for the weekday AM and PM peak hour and average daily conditions are noted in Table 3.

**Table 3. Project Trip Generation**

Land Use	Size	Rate <sup>1</sup>	Project Trips		
			Total	In	Out
<b>Light Industrial (LU # 110)</b>	127,253 gsf				
Weekday AM Peak Hour		0.92	118	104	14
Weekday PM Peak Hour		0.97	124	15	109
Weekday Daily		6.97	892	446	446

1. Trips rates from ITE Trip Generation Manual, 9th Edition.

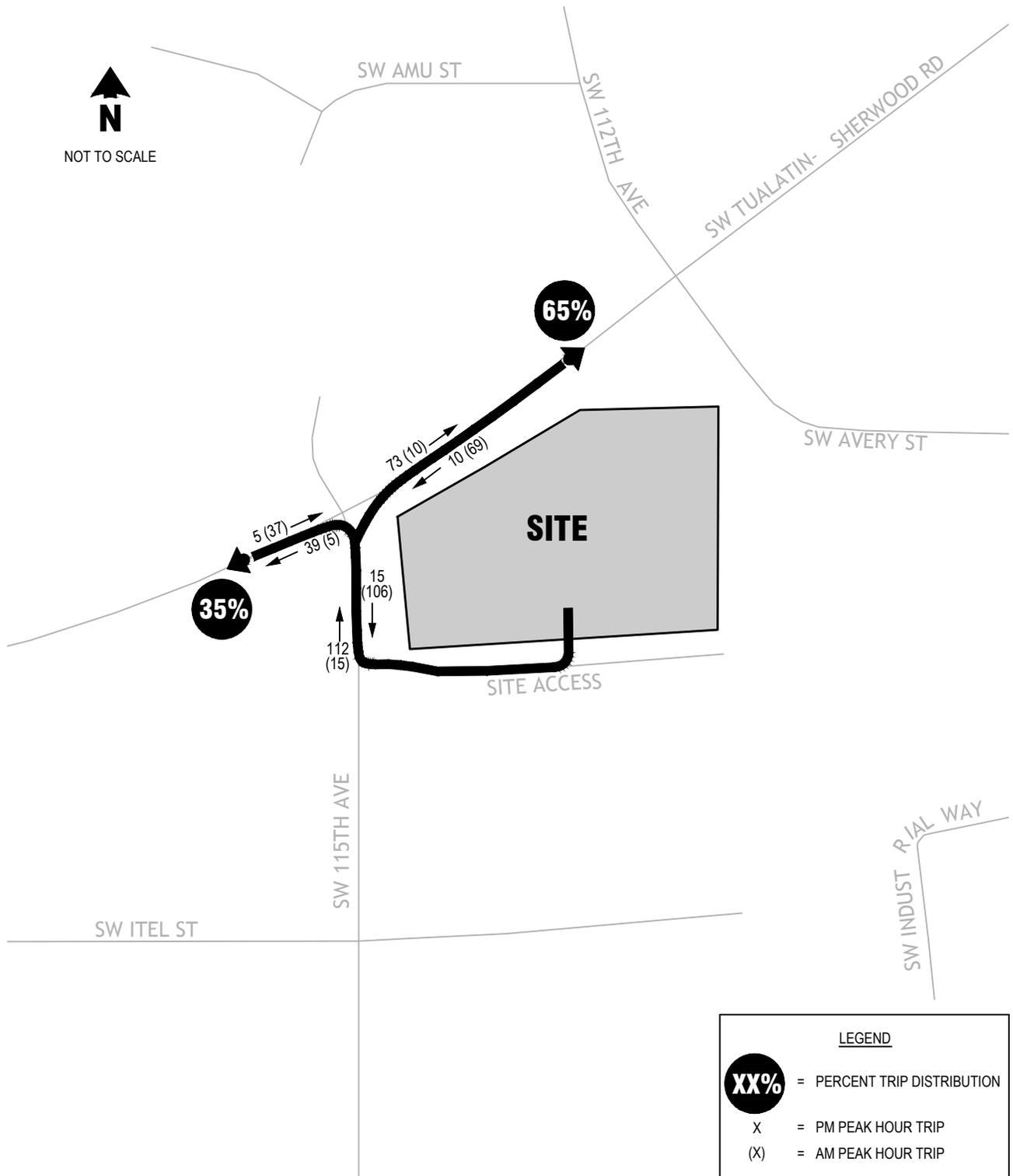
As shown in Table 3, the weekday AM and PM peak hour trip generation totals 118 and 124 vehicle trips, respectively.

### Trip Distribution

A review of the existing turning movement counts and the trip distribution from the previous traffic studies for the Koch Corporate Center was conducted to estimate the anticipated travel patterns to/from the site. In general, 35 percent of the trips are oriented to/from the west and 65 percent of the trips are oriented to/from the east. Figure 5 illustrates the trip distribution and assignment of project trips within the study area and at the study intersections for both the weekday AM and PM peak hours.

### Traffic Volumes

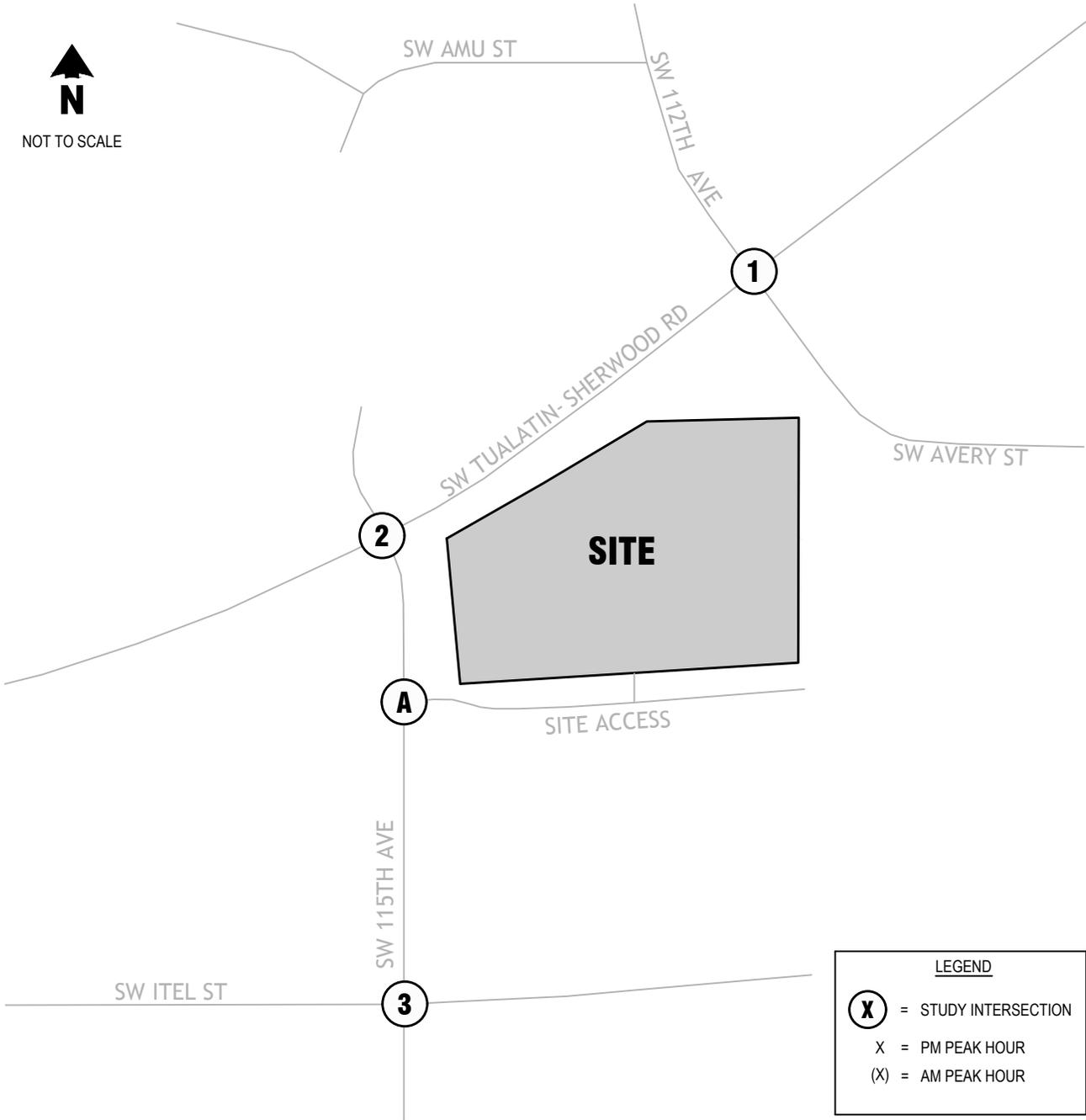
Future (2017) with-project traffic volumes were estimated by adding site-generated traffic volumes and future without-project traffic volumes. The resulting weekday AM and PM peak hour future with-project traffic volumes are illustrated in Figure 6.



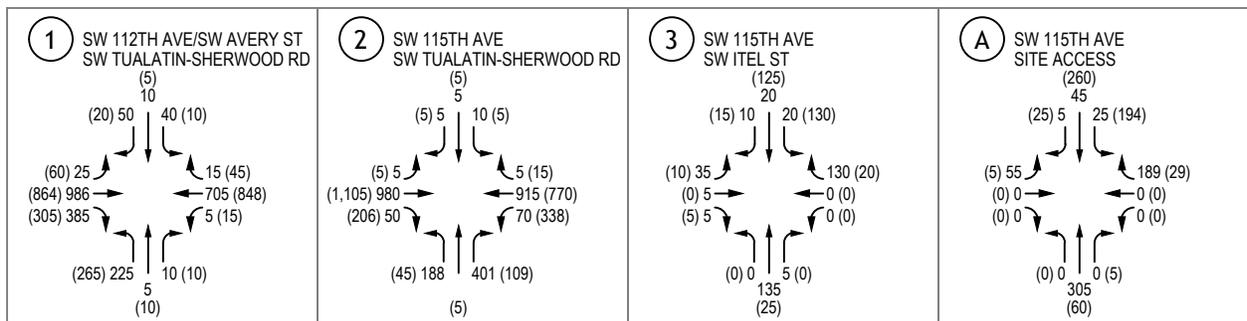
# Trip Distribution & Assignment

FIGURE

Koch Corporate Center - Buildings 10, 11, 12



LEGEND	
<b>(X)</b>	= STUDY INTERSECTION
X	= PM PEAK HOUR
(X)	= AM PEAK HOUR



Future (2017) With-Project Weekday AM and PM Peak Hour Traffic Volumes

Koch Corporate Center - Buildings 10, 11, 12



FIGURE

## Traffic Operations

The with-project analysis reflects the project impacts of the additional project related trips at the study intersections. The results of the LOS analysis are summarized in Table 4. The results of the 2017 without-project analyses have also been included for comparison. Due to the actuated operations of the two signals, the signal phase splits were optimized for the without- and with-project weekday AM and PM peak hour. Levels of service worksheets for 2017 with-project traffic conditions are included in Appendix C of this report.

**Table 4. Future (2017) Without-Project and With-Project LOS Summary**

Intersection	2017 Without-Project				2017 With-Project			
	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup>	WM <sup>4</sup>	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup>	WM <sup>4</sup>
<b>Weekday AM Peak Hour</b>								
1. SW 112th Ave (SW Avery St) / SW Tualatin-Sherwood Rd	C	22.5	0.93	NBL	C	24.1	0.95	NBL
2. SW 115th Ave / SW Tualatin-Sherwood Rd	D	40.9	0.91	EBT	D	34.1	0.98	WBL
3. SW 115th Ave / SW Itel St	A	8.0	-	SBL	A	8.1	-	SBL
A. SW 115th Ave / Site Access	B	13.2	-	EB	C	16.8	-	EBL
<b>Weekday PM Peak Hour</b>								
1. SW 112th Ave (SW Avery St) / SW Tualatin-Sherwood Rd	C	22.4	0.95	NBL	C	22.2	0.95	NBL
2. SW 115th Ave / SW Tualatin-Sherwood Rd	C	24.4	0.80	EBT	C	30.1	0.84	NB
3. SW 115th Ave / SW Itel St	A	8.3	-	NB	A	8.3	-	NB
A. SW 115th Ave / Site Access	C	16.3	-	EB	E	35.2	-	EB

1. Level of Service
2. Average vehicle delay in seconds per vehicles, reported for the overall intersection for signal-controlled and all-way stop-controlled intersections and reported for the worst movement for side-street stop-controlled intersections.
3. Volume-to-capacity ratio for the worst movement at signalized intersections
4. WM = Worst Movement reported for signalized and unsignalized intersections. NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound.

As shown in Table 4, with the addition of project related traffic, the volume-to-capacity ratio at each of the intersections is anticipated to remain at or below its respective operational threshold. With the addition of project traffic, the signalized intersections are anticipated to remain at the same LOS as the future without-project conditions. The project access on SW 115th Avenue is anticipated to operate at LOS C during the weekday AM peak hour and LOS E during the weekday PM peak hour. The worst movement at this intersection is anticipated to be the eastbound approach.

## **Chapter 5. Project Mitigation**

Each study intersection meets its respective jurisdiction's operational standard during the weekday AM and PM peak hours. No additional mitigation is required by the project.

## Chapter 6. Findings and Recommendations

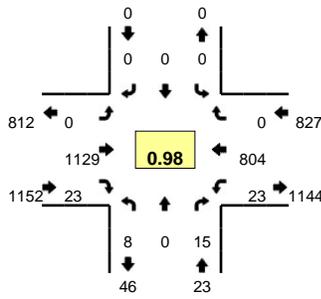
This transportation impact study summarizes the project traffic impacts of the proposed Koch Corporate Center development. The following outlines the general findings of the study.

- The project includes the construction of three industrial buildings totaling approximately 127,253 gsf.
- The project is estimated to generate 118 weekday AM peak hour trips and 139 weekday PM peak hour trips.
- With existing conditions during the weekday AM and PM peak hours, the study intersections SW Tualatin-Sherwood Road are anticipated to remain within the Washington County operational standard while the 115th Avenue SW / SW Itel Street and 115th Avenue SW / Access intersections are anticipated to meet the City of Tualatin intersection standards.
- During the future weekday AM and PM peak hours after the addition of in-process volumes and background growth, each intersection is anticipated to meet its respective operational standard. Intersection improvements planned at the 115th Avenue SW / SW Tualatin-Sherwood Road intersection were considered for this analysis.
- With the addition of project traffic, the traffic signals on Tualatin-Sherwood Road are anticipated to operate with a V/C of 0.98 or fewer on each approach. This meets the County's operational standard
- The 115th Avenue SW / SW Itel Street intersection is anticipated to operate at LOS A during the weekday AM and PM peak hours. At the 115th Avenue SW / Access, the worst movement of the intersection would be forecast to operate at LOS E. Both of these intersections meet the City's operational standard of LOS E or better.
- All study intersections are anticipated to meet their respective jurisdiction's operational standard during the weekday AM and PM peak hours. No additional mitigation is required.

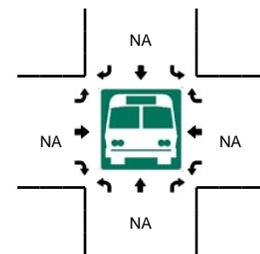
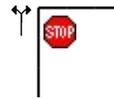
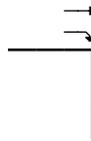
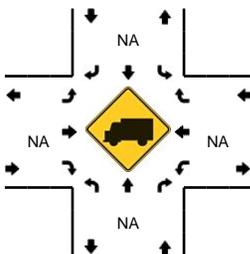
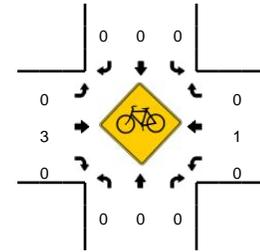
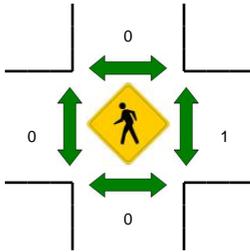
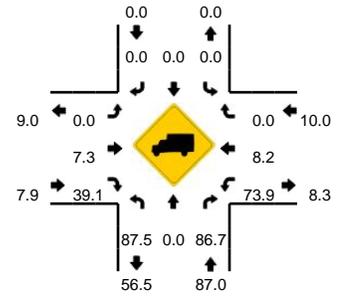


**LOCATION:** SW 120th Ave -- SW Tualatin-Sherwood Rd  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13601001  
**DATE:** Thu, Sep 24 2015



**Peak-Hour: 7:00 AM -- 8:00 AM**  
**Peak 15-Min: 7:30 AM -- 7:45 AM**

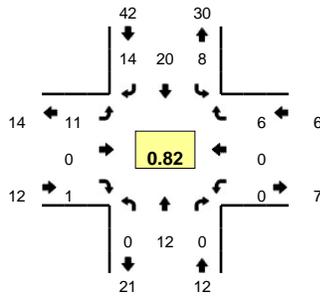


5-Min Count Period Beginning At	SW 120th Ave (Northbound)				SW 120th Ave (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	1	0	0	0	0	0	0	0	0	0	102	1	0	3	73	0	0	180	
7:05 AM	0	0	1	0	0	0	0	0	0	0	83	3	0	0	63	0	0	150	
7:10 AM	1	0	0	0	0	0	0	0	0	0	94	4	0	1	62	0	0	162	
7:15 AM	0	0	1	0	0	0	0	0	0	0	97	1	0	0	67	0	0	166	
7:20 AM	1	0	2	0	0	0	0	0	0	0	98	1	0	2	73	0	0	177	
7:25 AM	0	0	3	0	0	0	0	0	0	0	81	4	0	0	60	0	0	148	
7:30 AM	1	0	0	0	0	0	0	0	0	0	92	4	0	2	71	0	0	170	
7:35 AM	1	0	2	0	0	0	0	0	0	0	98	3	0	2	74	0	0	180	
7:40 AM	0	0	0	0	0	0	0	0	0	0	102	0	0	3	55	0	0	160	
7:45 AM	1	0	1	0	0	0	0	0	0	0	98	1	0	4	62	0	0	167	
7:50 AM	0	0	1	0	0	0	0	0	0	0	96	1	0	4	67	0	0	169	
7:55 AM	2	0	4	0	0	0	0	0	0	0	88	0	0	2	77	0	0	173	2002
8:00 AM	1	0	1	0	0	0	0	0	0	0	93	0	0	3	57	0	0	155	1977
8:05 AM	0	0	2	0	0	0	0	0	0	0	85	4	0	2	53	0	0	146	1973
8:10 AM	0	0	3	0	0	0	0	0	0	0	79	1	0	1	84	0	0	168	1979
8:15 AM	1	0	1	0	0	0	0	0	0	0	73	3	0	1	84	0	0	163	1976
8:20 AM	0	0	3	0	0	0	0	0	0	0	82	1	0	5	77	0	0	168	1967
8:25 AM	1	0	1	0	0	0	0	0	0	0	83	0	0	2	67	0	0	154	1973
8:30 AM	0	0	1	0	0	0	0	0	0	0	85	0	0	3	58	0	0	147	1950
8:35 AM	3	0	4	0	0	0	0	0	0	0	67	2	0	1	56	0	0	133	1903
8:40 AM	0	0	1	0	0	0	0	0	0	0	81	2	0	2	95	0	0	181	1924
8:45 AM	0	0	2	0	0	0	0	0	0	0	85	6	0	2	56	0	0	151	1908
8:50 AM	1	0	0	0	0	0	0	0	0	0	79	4	0	0	60	0	0	144	1883
8:55 AM	0	0	1	0	0	0	0	0	0	0	97	3	0	1	48	0	0	150	1860
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	8	0	8	0	0	0	0	0	0	1168	28	0	28	800	0	0	2040		
Heavy Trucks	8	0	4	0	0	0	0	0	0	80	8	0	16	44	0	0	160		
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4		
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1		
Railroad																			
Stopped Buses																			

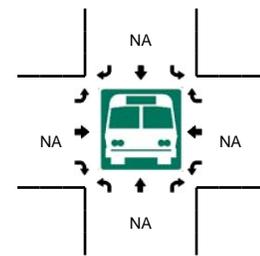
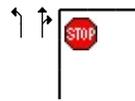
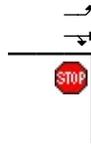
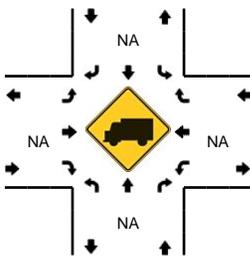
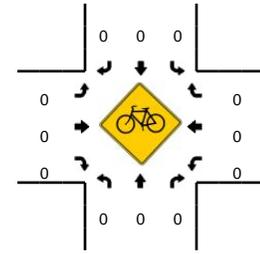
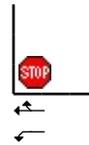
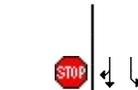
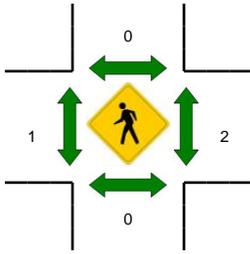
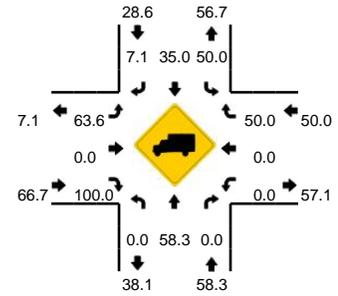
Comments:

**LOCATION:** SW 115th Ave -- SW Itel St  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13588004  
**DATE:** Thu, Sep 10 2015



**Peak-Hour: 7:50 AM -- 8:50 AM**  
**Peak 15-Min: 8:30 AM -- 8:45 AM**

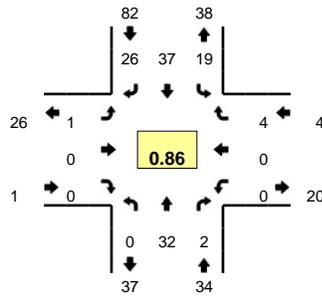


5-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Itel St (Eastbound)				SW Itel St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	1	0	0	0	1	3	0	1	0	0	0	1	0	0	0	7	
7:05 AM	0	2	0	0	0	1	3	0	0	0	0	0	0	0	0	0	6	
7:10 AM	0	2	0	0	1	2	1	0	0	0	0	0	0	0	1	0	7	
7:15 AM	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	4	
7:20 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	
7:25 AM	0	2	0	0	0	0	1	0	1	0	0	0	0	0	0	0	4	
7:30 AM	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	9	
7:35 AM	0	3	0	0	1	2	1	0	2	0	0	0	0	0	0	0	9	
7:40 AM	0	2	0	0	0	3	1	0	1	0	0	0	0	0	0	0	7	
7:45 AM	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3	
7:50 AM	0	1	0	0	2	1	0	0	2	0	0	0	0	0	0	0	6	
7:55 AM	0	1	0	0	1	0	1	0	0	0	0	0	0	0	3	0	6	70
8:00 AM	0	0	0	0	0	3	1	0	1	0	0	0	0	0	0	0	5	68
8:05 AM	0	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	5	67
8:10 AM	0	1	0	0	1	1	2	0	0	0	0	0	0	0	0	0	5	65
8:15 AM	0	0	0	0	0	1	1	0	3	0	0	0	0	0	0	0	5	66
8:20 AM	0	1	0	0	0	0	2	0	0	0	1	0	0	0	0	0	4	68
8:25 AM	0	0	0	0	1	1	1	0	3	0	0	0	0	0	1	0	7	71
8:30 AM	0	1	0	0	0	4	2	0	0	0	0	0	0	0	0	0	7	69
8:35 AM	0	2	0	0	0	1	2	0	2	0	0	0	0	0	0	0	7	67
8:40 AM	0	2	0	0	1	4	0	0	0	0	0	0	0	0	1	0	8	68
8:45 AM	0	2	0	0	0	1	2	1	0	0	0	0	0	0	1	0	7	72
8:50 AM	0	0	0	0	0	2	1	0	1	0	0	0	0	0	0	0	4	70
8:55 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	4	68
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	20	0	0	4	36	16	0	8	0	0	0	0	0	4	0	88	
Heavy Trucks	0	16	0	0	4	16	0	0	8	0	0	0	0	0	0	0	44	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

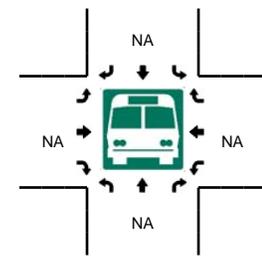
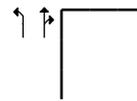
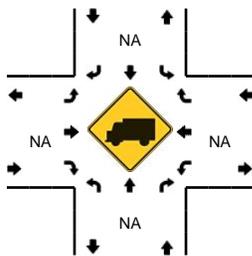
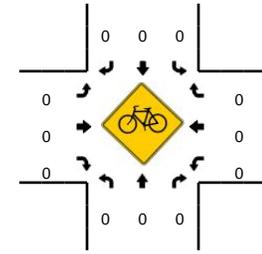
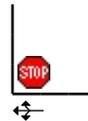
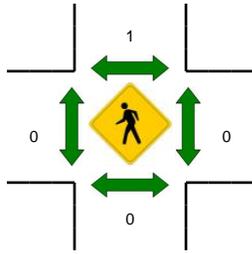
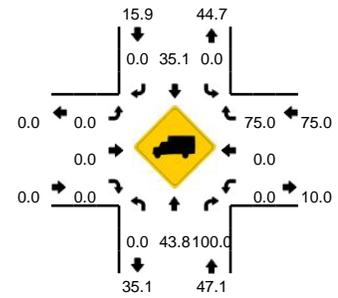
Comments:

**LOCATION:** SW 115th Ave -- Driveways  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13588003  
**DATE:** Thu, Sep 10 2015



**Peak-Hour: 7:00 AM -- 8:00 AM**  
**Peak 15-Min: 7:45 AM -- 8:00 AM**

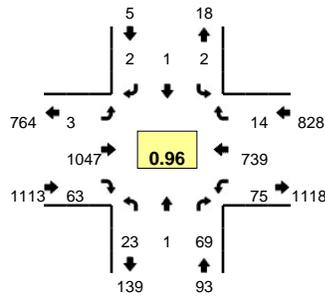


5-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				Driveways (Eastbound)				Driveways (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	3	0	0	1	4	1	0	0	0	0	0	0	0	0	0	9	
7:05 AM	0	2	0	0	4	5	4	0	0	0	0	0	0	0	1	0	16	
7:10 AM	0	2	1	0	0	3	1	1	1	0	0	0	0	0	0	0	9	
7:15 AM	0	0	0	0	1	2	2	0	0	0	0	0	0	0	1	0	6	
7:20 AM	0	1	0	0	1	1	4	0	0	0	0	0	0	0	1	0	8	
7:25 AM	0	3	0	0	3	1	4	0	0	0	0	0	0	0	0	0	11	
7:30 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	10	
7:35 AM	0	5	0	0	1	3	0	0	0	0	0	0	0	0	0	0	9	
7:40 AM	0	3	0	0	1	4	0	0	0	0	0	0	0	0	0	0	8	
7:45 AM	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	5	
7:50 AM	0	4	0	0	3	4	3	0	0	0	0	0	0	0	1	0	15	
7:55 AM	0	3	1	0	3	3	5	0	0	0	0	0	0	0	0	0	15	121
8:00 AM	0	1	0	0	1	2	4	0	1	0	0	0	0	0	0	0	9	121
8:05 AM	0	0	0	0	1	4	2	0	0	0	0	0	0	0	3	0	10	115
8:10 AM	0	2	0	0	1	4	0	0	0	0	0	0	0	0	0	0	7	113
8:15 AM	0	3	0	0	2	2	0	0	0	0	0	0	0	0	0	0	7	114
8:20 AM	0	1	0	0	1	2	1	0	0	0	0	0	0	0	0	0	5	111
8:25 AM	0	3	0	0	1	3	0	0	0	0	0	0	0	0	0	0	7	107
8:30 AM	0	2	0	0	1	6	1	1	0	0	0	0	0	0	0	0	11	108
8:35 AM	0	4	0	0	2	6	0	0	0	0	0	0	0	0	1	0	13	112
8:40 AM	0	3	0	0	0	2	0	1	0	0	0	0	0	0	0	0	6	110
8:45 AM	0	3	0	0	0	4	1	0	0	0	0	0	0	0	0	0	8	113
8:50 AM	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	5	103
8:55 AM	0	0	0	0	2	4	0	0	0	0	0	0	0	0	1	0	7	95
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	0	32	4	0	24	36	40	0	0	0	0	0	0	0	4	0	140	
Heavy Trucks	0	20	4		0	20	0		0	0	0		0	0	4		48	
Pedestrians	0				4				0				0				4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																	0	
Stopped Buses																		

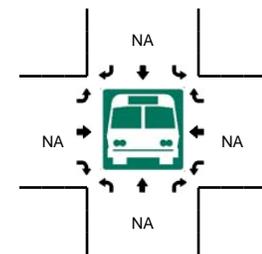
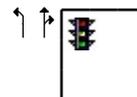
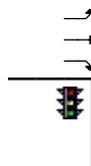
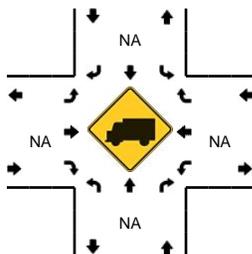
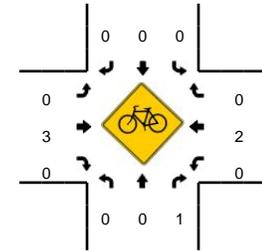
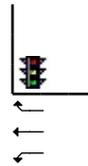
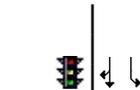
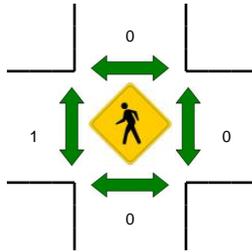
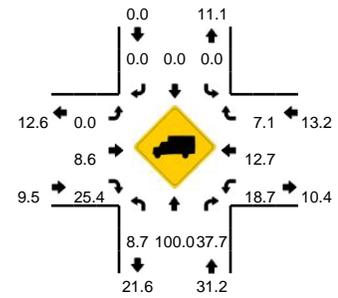
Comments:

**LOCATION:** SW 115th Ave -- SW Tualatin Sherwood Rd  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13588002  
**DATE:** Thu, Sep 10 2015



**Peak-Hour: 7:20 AM -- 8:20 AM**  
**Peak 15-Min: 7:30 AM -- 7:45 AM**

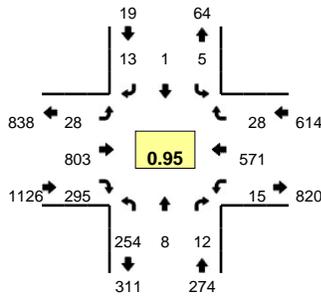


5-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Tualatin Sherwood Rd (Eastbound)				SW Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	0	6	0	0	0	0	0	0	68	6	0	6	42	0	0	129	
7:05 AM	2	0	5	0	0	0	0	0	0	71	2	0	12	73	1	0	166	
7:10 AM	3	0	4	0	0	0	0	0	0	78	9	0	5	59	1	0	159	
7:15 AM	3	0	7	0	0	0	0	0	0	82	6	0	3	62	0	0	163	
7:20 AM	1	0	5	0	0	0	0	0	0	90	5	0	5	65	0	0	171	
7:25 AM	2	0	5	0	0	0	0	0	0	73	8	0	9	64	0	0	161	
7:30 AM	1	0	6	0	0	0	0	0	0	98	2	0	4	56	1	0	168	
7:35 AM	5	0	6	0	0	0	0	0	0	93	4	0	7	72	0	0	187	
7:40 AM	3	0	6	0	0	0	0	0	0	85	8	0	6	67	0	0	175	
7:45 AM	7	0	6	0	0	0	0	0	0	85	3	0	5	47	0	0	153	
7:50 AM	1	1	6	0	0	0	0	0	1	75	7	0	9	50	2	0	152	
7:55 AM	0	0	9	0	0	0	1	0	0	86	7	0	7	63	4	0	177	1961
8:00 AM	1	0	4	0	2	0	0	0	1	89	4	0	7	72	3	0	183	2015
8:05 AM	0	0	4	0	0	0	1	0	1	101	4	0	6	45	0	0	162	2011
8:10 AM	1	0	5	0	0	1	0	0	0	85	3	0	6	78	4	0	183	2035
8:15 AM	1	0	7	0	0	0	0	0	0	87	8	0	4	60	0	0	167	2039
8:20 AM	1	0	3	0	1	0	2	0	1	82	1	0	6	54	0	0	151	2019
8:25 AM	2	0	9	0	1	0	0	0	0	78	5	0	9	50	0	0	154	2012
8:30 AM	2	0	8	0	0	0	0	0	0	76	7	0	6	55	0	0	154	1998
8:35 AM	1	0	4	0	0	0	0	0	0	104	10	0	2	70	2	0	193	2004
8:40 AM	4	0	6	0	0	0	1	0	1	84	7	0	5	74	1	0	183	2012
8:45 AM	1	0	9	0	0	0	0	0	0	82	2	0	4	53	2	0	153	2012
8:50 AM	2	0	8	0	0	0	0	0	1	66	5	0	2	53	1	0	138	1998
8:55 AM	3	0	3	0	0	0	0	0	0	56	7	0	7	46	0	0	122	1943
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	36	0	72	0	0	0	0	0	0	1104	56	0	68	780	4	0	2120	
Heavy Trucks	4	0	24	0	0	0	0	0	0	72	8	0	28	76	0	0	212	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	
Railroad																		
Stopped Buses																		

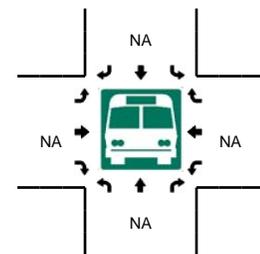
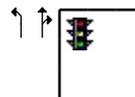
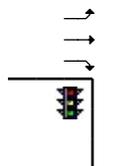
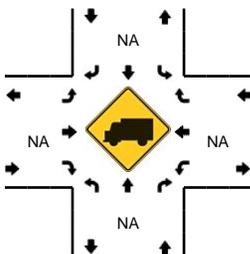
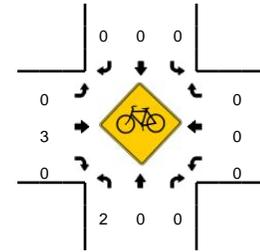
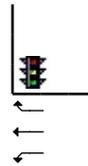
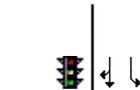
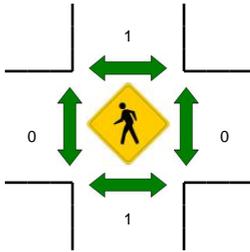
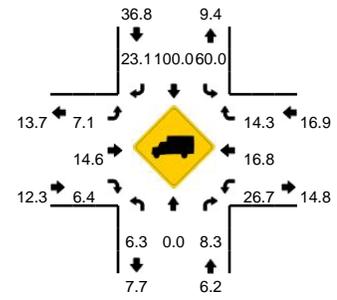
Comments:

**LOCATION:** SW 112th Ave/SW Avery St -- SW Tualatin Sherwood Rd  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13588001  
**DATE:** Thu, Sep 10 2015



**Peak-Hour: 7:20 AM -- 8:20 AM**  
**Peak 15-Min: 8:00 AM -- 8:15 AM**

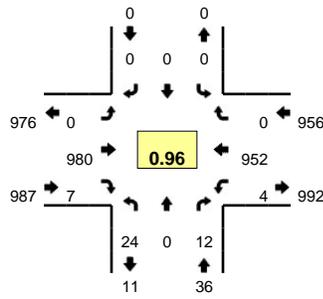


5-Min Count Period Beginning At	SW 112th Ave/SW Avery St (Northbound)				SW 112th Ave/SW Avery St (Southbound)				SW Tualatin Sherwood Rd (Eastbound)				SW Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	13	1	1	0	0	0	1	0	1	60	15	0	1	38	3	0	134	
7:05 AM	24	1	1	0	0	0	0	0	3	58	17	0	1	63	3	0	171	
7:10 AM	16	1	0	0	0	0	0	0	2	57	22	0	0	54	0	0	152	
7:15 AM	26	1	0	0	0	0	0	0	0	61	19	0	0	38	0	0	145	
7:20 AM	33	1	0	0	0	0	2	0	2	63	23	0	1	42	0	0	167	
7:25 AM	15	0	1	0	0	0	0	0	5	63	21	0	2	55	0	0	162	
7:30 AM	30	0	0	0	0	0	0	0	1	71	29	0	0	33	4	0	168	
7:35 AM	25	1	0	0	1	0	1	0	1	74	29	0	1	51	1	0	185	
7:40 AM	18	2	3	0	0	0	0	0	1	73	21	0	0	51	3	0	172	
7:45 AM	25	0	1	0	1	0	0	0	4	65	26	0	0	34	2	0	158	
7:50 AM	24	2	1	0	0	0	3	0	1	52	28	0	2	31	5	0	149	
7:55 AM	16	1	1	0	0	1	2	0	3	58	26	0	1	54	0	0	163	1926
8:00 AM	21	0	1	0	0	0	1	0	5	62	27	0	2	65	4	0	188	1980
8:05 AM	19	1	2	0	2	0	1	0	1	76	22	0	1	29	3	0	157	1966
8:10 AM	13	0	0	0	1	0	1	0	2	72	24	0	2	69	5	0	189	2003
8:15 AM	15	0	2	0	0	0	2	0	2	74	19	0	3	57	1	0	175	2033
8:20 AM	16	0	4	0	2	0	3	0	3	60	24	0	0	34	2	0	148	2014
8:25 AM	16	0	0	0	1	0	2	0	1	64	24	0	0	51	5	0	164	2016
8:30 AM	19	2	2	0	1	0	0	0	2	66	12	0	1	36	2	0	143	1991
8:35 AM	14	0	1	0	1	0	0	0	2	84	23	0	0	57	0	0	182	1988
8:40 AM	14	3	1	0	0	0	1	0	2	73	19	0	0	65	3	0	181	1997
8:45 AM	14	1	2	0	2	1	0	0	0	65	22	0	0	49	3	0	159	1998
8:50 AM	3	0	0	0	0	1	1	0	0	63	15	0	1	48	2	0	134	1983
8:55 AM	7	0	1	0	1	0	0	0	1	48	13	0	1	52	4	0	128	1948
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	212	4	12	0	12	0	12	0	32	840	292	0	20	652	48	0	2136	
Heavy Trucks	16	0	0		8	0	0		0	112	20		4	96	0		256	
Pedestrians	0				4				0	0	0		0	0	0		4	
Bicycles	1	0	0		0	0	0		0	0	0		0	0	0		1	
Railroad																		
Stopped Buses																		

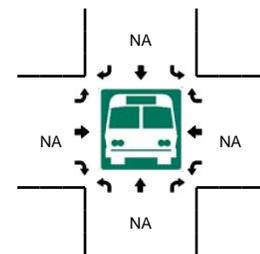
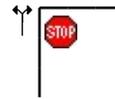
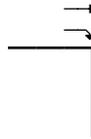
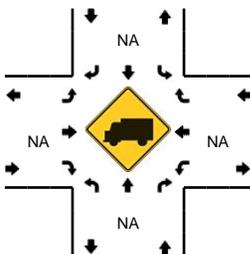
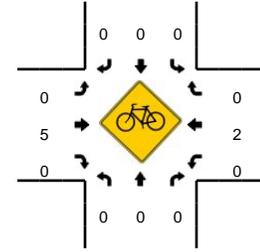
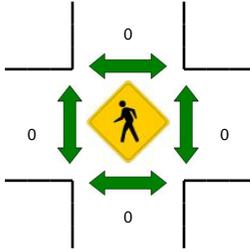
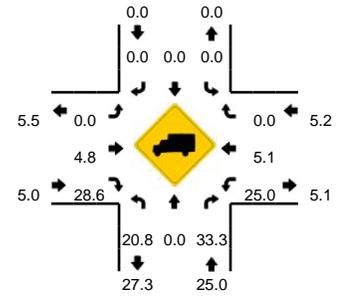
Comments:

**LOCATION:** SW 120th Ave -- SW Tualatin-Sherwood Rd  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13601002  
**DATE:** Thu, Sep 24 2015



**Peak-Hour: 4:30 PM -- 5:30 PM**  
**Peak 15-Min: 4:30 PM -- 4:45 PM**

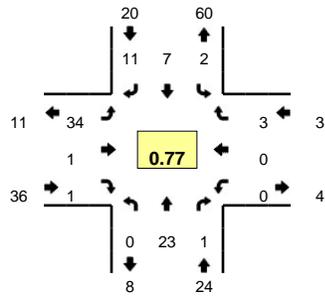


5-Min Count Period Beginning At	SW 120th Ave (Northbound)				SW 120th Ave (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	0	2	0	0	0	0	0	0	81	4	0	1	61	0	0	152	
4:05 PM	2	0	2	0	0	0	0	0	0	85	1	0	1	69	0	0	160	
4:10 PM	2	0	2	0	0	0	0	0	0	92	1	0	1	69	0	0	167	
4:15 PM	1	0	3	0	0	0	0	0	0	77	1	0	0	76	0	0	158	
4:20 PM	1	0	1	0	0	0	0	0	0	93	0	0	1	62	0	0	158	
4:25 PM	0	0	0	0	0	0	0	0	0	53	2	0	2	52	0	0	109	
4:30 PM	1	0	0	0	0	0	0	0	0	74	2	0	0	89	0	0	166	
4:35 PM	3	0	1	0	0	0	0	0	0	76	3	0	1	76	0	0	160	
4:40 PM	5	0	2	0	0	0	0	0	0	88	0	0	1	93	0	0	189	
4:45 PM	1	0	0	0	0	0	0	0	0	70	0	0	0	75	0	0	146	
4:50 PM	2	0	2	0	0	0	0	0	0	81	0	0	0	77	0	0	162	
4:55 PM	3	0	1	0	0	0	0	0	0	75	0	0	0	69	0	0	148	1875
5:00 PM	3	0	3	0	0	0	0	0	0	92	0	0	0	76	0	0	174	1897
5:05 PM	1	0	1	0	0	0	0	0	0	81	0	0	0	85	0	0	168	1905
5:10 PM	2	0	2	0	0	0	0	0	0	90	0	0	0	77	0	0	171	1909
5:15 PM	2	0	0	0	0	0	0	0	0	99	0	0	1	73	0	0	175	1926
5:20 PM	1	0	0	0	0	0	0	0	0	84	0	0	1	79	0	0	165	1933
5:25 PM	0	0	0	0	0	0	0	0	0	70	2	0	0	83	0	0	155	1979
5:30 PM	1	0	2	0	0	0	0	0	0	69	0	0	0	80	0	0	152	1965
5:35 PM	0	0	0	0	0	0	0	0	0	87	1	0	0	65	0	0	153	1958
5:40 PM	0	0	0	0	0	0	0	0	0	84	1	0	0	90	0	0	175	1944
5:45 PM	1	0	0	0	0	0	0	0	0	90	1	0	0	83	0	0	175	1973
5:50 PM	0	0	2	0	0	0	0	0	0	70	2	0	0	73	0	0	147	1958
5:55 PM	0	0	0	0	0	0	0	0	0	85	0	0	1	78	0	0	164	1974
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	36	0	12	0	0	0	0	0	0	952	20	0	8	1032	0	0	2060	
Heavy Trucks	8	0	8	0	0	0	0	0	0	72	4	0	4	60	0	0	156	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

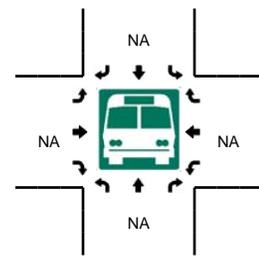
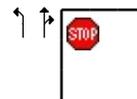
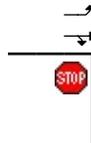
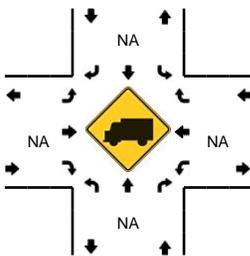
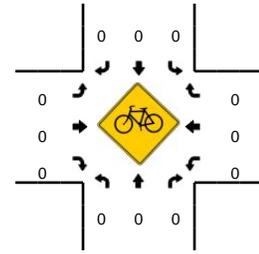
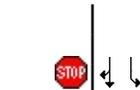
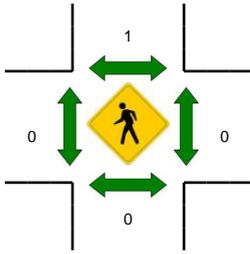
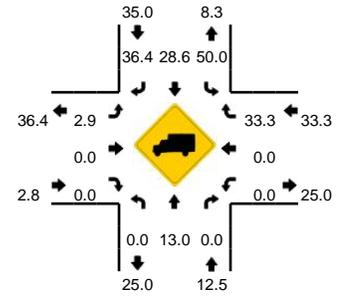
Comments:

**LOCATION:** SW 115th Ave -- SW Itel St  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13588008  
**DATE:** Thu, Sep 10 2015



**Peak-Hour: 5:00 PM -- 6:00 PM**  
**Peak 15-Min: 5:00 PM -- 5:15 PM**

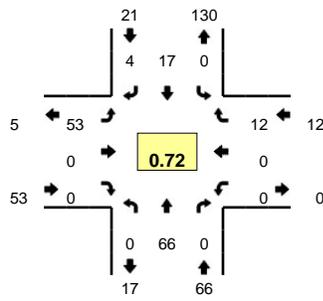


5-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Itel St (Eastbound)				SW Itel St (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
4:00 PM	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	2	0	5	
4:05 PM	0	1	0	0	1	0	0	0	2	0	0	0	0	0	0	2	0	6	
4:10 PM	0	3	0	0	2	0	0	0	3	0	0	0	0	0	2	0	0	10	
4:15 PM	0	2	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	6	
4:20 PM	0	0	0	0	1	0	2	0	2	0	0	0	0	0	2	0	0	7	
4:25 PM	0	0	0	0	2	0	1	0	4	0	0	0	0	0	0	0	0	7	
4:30 PM	0	1	0	0	0	0	1	0	7	0	0	0	0	0	2	0	0	11	
4:35 PM	0	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5	
4:40 PM	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	
4:45 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	
4:50 PM	0	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	4	
4:55 PM	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	68
5:00 PM	0	2	0	0	0	1	1	0	5	0	0	0	0	0	0	0	0	9	72
5:05 PM	0	3	1	0	0	0	1	0	3	1	0	0	0	0	0	0	0	9	75
5:10 PM	0	3	0	0	0	1	0	0	4	0	1	0	0	0	0	0	0	9	74
5:15 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	3	71
5:20 PM	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	4	68
5:25 PM	0	1	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	5	66
5:30 PM	0	2	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0	7	62
5:35 PM	0	1	0	0	1	0	1	0	4	0	0	0	0	0	2	0	0	9	66
5:40 PM	0	3	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	7	71
5:45 PM	0	3	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	7	76
5:50 PM	0	3	0	0	0	1	1	0	5	0	0	0	0	0	0	0	0	10	82
5:55 PM	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	4	83
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	32	4	0	0	8	8	0	48	4	4	0	0	0	0	0	0	108	
Heavy Trucks	0	12	0		0	0	4		4	0	0		0	0	0	0	0	20	
Pedestrians	0				0				0				0					0	
Bicycles	0				0				0				0					0	
Railroad																		0	
Stopped Buses																		0	

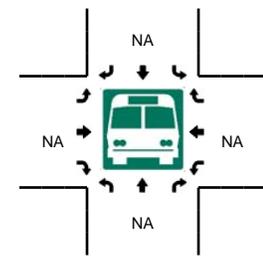
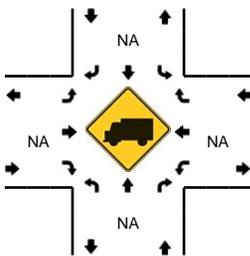
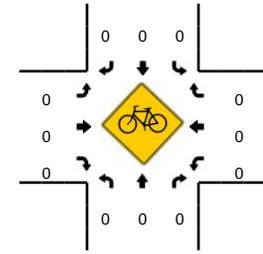
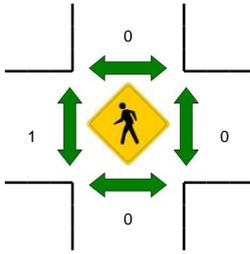
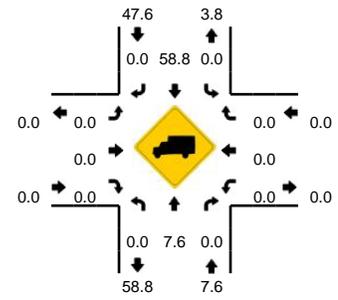
Comments:

**LOCATION:** SW 115th Ave -- Driveways  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13588007  
**DATE:** Thu, Sep 10 2015



**Peak-Hour: 5:00 PM -- 6:00 PM**  
**Peak 15-Min: 5:00 PM -- 5:15 PM**

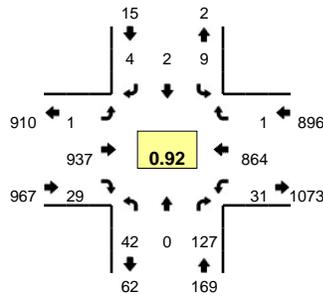


5-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				Driveways (Eastbound)				Driveways (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	10	0	0	1	0	0	0	2	0	0	0	0	0	0	0	13	
4:05 PM	0	5	0	0	0	0	0	0	3	0	0	0	0	0	4	0	12	
4:10 PM	0	4	0	0	1	0	0	0	4	0	0	0	0	0	1	0	10	
4:15 PM	0	1	0	0	0	4	0	0	2	0	0	0	0	0	1	0	8	
4:20 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6	
4:25 PM	0	3	0	0	0	0	1	0	4	0	0	0	0	0	1	0	9	
4:30 PM	0	5	0	0	0	3	0	0	4	0	0	0	0	0	2	0	14	
4:35 PM	0	4	0	0	0	0	0	0	4	0	0	0	0	0	1	0	9	
4:40 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	
4:45 PM	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	
4:50 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	2	0	6	
4:55 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	5	101
5:00 PM	0	4	0	0	0	2	1	0	5	0	0	0	0	0	6	0	18	106
5:05 PM	0	11	0	0	0	1	0	0	3	0	0	0	0	0	2	0	17	111
5:10 PM	0	8	0	0	0	0	2	0	6	0	0	0	0	0	2	0	18	119
5:15 PM	0	5	0	0	0	1	0	0	2	0	0	0	0	0	1	0	9	120
5:20 PM	0	4	0	0	0	1	1	0	5	0	0	0	0	0	0	0	11	125
5:25 PM	0	6	0	0	0	0	0	0	4	0	0	0	0	0	0	0	10	126
5:30 PM	0	4	0	0	0	2	0	0	6	0	0	0	0	0	0	0	12	124
5:35 PM	0	5	0	0	0	2	0	0	7	0	0	1	0	0	1	0	16	131
5:40 PM	0	6	0	0	0	2	0	0	8	0	0	0	0	0	0	0	16	142
5:45 PM	0	4	0	0	0	1	0	0	1	0	0	0	0	0	0	0	6	144
5:50 PM	0	6	0	0	0	3	0	0	2	0	0	0	0	0	0	0	11	149
5:55 PM	0	3	0	0	0	2	0	0	3	0	0	0	0	0	0	0	8	152
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	0	92	0	0	0	12	12	0	56	0	0	0	0	0	40	0	212	
Heavy Trucks	0	8	0	0	0	12	0	0	0	0	0	0	0	0	0	0	20	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

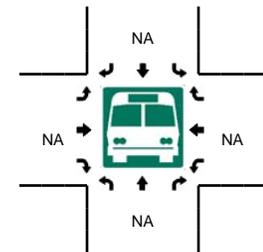
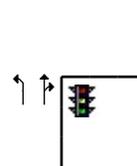
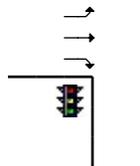
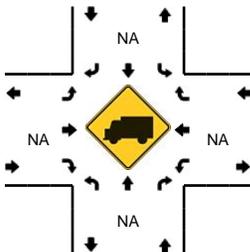
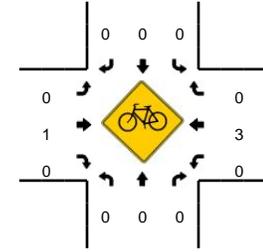
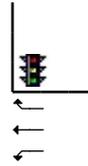
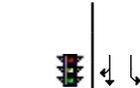
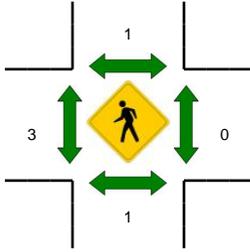
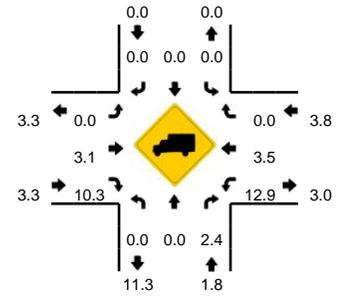
Comments:

**LOCATION:** SW 115th Ave -- SW Tualatin Sherwood Rd  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13588006  
**DATE:** Thu, Sep 10 2015



**Peak-Hour: 4:55 PM -- 5:55 PM**  
**Peak 15-Min: 5:10 PM -- 5:25 PM**

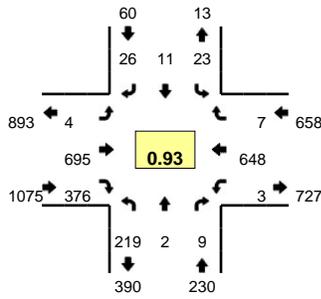


5-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Tualatin Sherwood Rd (Eastbound)				SW Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	0	12	0	0	0	1	0	1	83	1	0	2	79	0	0	184	
4:05 PM	5	0	9	0	1	0	0	0	0	89	1	0	4	65	0	0	174	
4:10 PM	6	0	6	0	0	0	1	0	0	86	0	0	3	64	2	0	168	
4:15 PM	7	0	3	0	2	0	0	0	0	90	3	0	4	81	2	0	192	
4:20 PM	3	0	6	0	0	0	0	0	0	68	0	0	3	68	0	0	148	
4:25 PM	1	0	8	0	2	0	0	0	1	73	1	0	3	72	1	0	162	
4:30 PM	8	0	8	0	0	0	0	0	0	64	2	0	5	77	1	0	165	
4:35 PM	6	0	5	0	0	0	0	0	0	78	5	0	2	64	1	0	161	
4:40 PM	4	0	7	0	2	0	0	0	0	74	5	0	4	72	0	0	168	
4:45 PM	4	0	7	0	0	0	0	0	0	79	3	0	0	79	0	0	172	
4:50 PM	2	0	11	0	1	0	0	0	0	54	7	0	1	61	0	0	137	
4:55 PM	1	0	5	0	2	0	0	0	0	80	2	0	1	78	0	0	169	2000
5:00 PM	4	0	13	0	0	0	0	0	1	83	4	0	0	67	0	0	172	1988
5:05 PM	2	0	15	0	1	0	0	0	0	66	1	0	3	79	0	0	167	1981
5:10 PM	6	0	12	0	1	0	0	0	0	87	1	0	6	73	1	0	187	2000
5:15 PM	4	0	10	0	0	1	1	0	0	81	1	0	2	88	0	0	188	1996
5:20 PM	2	0	12	0	0	0	1	0	0	93	3	0	2	71	0	0	184	2032
5:25 PM	2	0	7	0	0	0	0	0	0	67	5	0	1	65	0	0	147	2017
5:30 PM	5	0	12	0	1	1	2	0	0	80	3	0	3	65	0	0	172	2024
5:35 PM	4	0	13	0	1	0	0	0	0	72	1	0	3	69	0	0	163	2026
5:40 PM	6	0	12	0	0	0	0	0	0	81	5	0	3	74	0	0	181	2039
5:45 PM	1	0	8	0	2	0	0	0	0	65	1	0	3	63	0	0	143	2010
5:50 PM	5	0	8	0	1	0	0	0	0	82	2	0	4	72	0	0	174	2047
5:55 PM	0	0	10	0	0	0	0	0	0	76	4	0	3	64	0	0	157	2035
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	48	0	136	0	4	4	8	0	0	1044	20	0	40	928	4	0	2236	
Heavy Trucks	0	0	4		0	0	0		0	48	0		0	12	0		64	
Pedestrians	0				0	4			0	8			0	0			12	
Bicycles	0	0	0		0	0	0		0	1	0		0	1	0		2	
Railroad																		
Stopped Buses																		

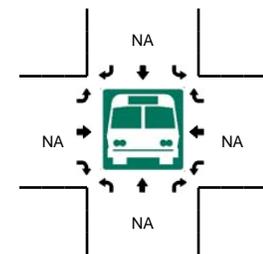
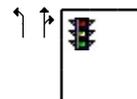
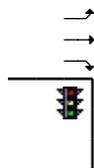
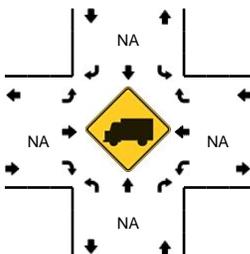
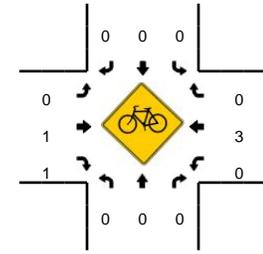
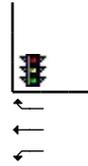
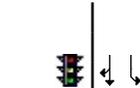
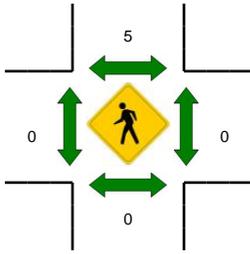
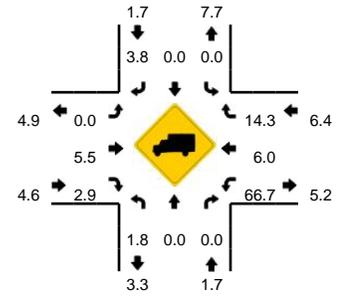
Comments:

**LOCATION:** SW 112th Ave/SW Avery St -- SW Tualatin Sherwood Rd  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 13588005  
**DATE:** Thu, Sep 10 2015



**Peak-Hour: 4:55 PM -- 5:55 PM**  
**Peak 15-Min: 5:10 PM -- 5:25 PM**



5-Min Count Period Beginning At	SW 112th Ave/SW Avery St (Northbound)				SW 112th Ave/SW Avery St (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	18	0	3	0	6	2	5	0	1	70	27	0	0	53	2	0	187	
4:05 PM	27	1	0	0	4	2	9	0	0	55	39	0	2	43	3	0	185	
4:10 PM	22	0	3	0	1	1	3	0	0	57	36	0	0	43	2	0	168	
4:15 PM	22	1	3	0	5	0	6	0	1	58	38	0	1	53	4	0	192	
4:20 PM	20	1	2	0	1	1	0	0	0	57	21	0	0	49	0	0	152	
4:25 PM	22	0	1	0	4	1	1	0	1	68	20	0	1	55	1	0	175	
4:30 PM	19	0	0	0	4	0	3	0	1	50	21	0	0	65	0	0	163	
4:35 PM	23	1	1	0	0	0	3	0	1	57	22	0	0	41	1	0	150	
4:40 PM	15	0	0	0	0	1	1	0	0	66	23	0	0	56	0	0	162	
4:45 PM	19	0	3	0	1	0	3	0	1	49	28	0	1	57	1	0	163	
4:50 PM	13	0	0	0	3	3	1	0	1	47	24	0	0	45	0	0	137	
4:55 PM	25	0	0	0	3	2	2	0	0	44	38	0	0	53	0	0	167	2001
5:00 PM	12	0	0	0	4	2	7	0	0	58	41	0	0	50	0	0	174	1988
5:05 PM	31	0	0	0	5	1	3	0	0	46	35	0	0	48	0	0	169	1972
5:10 PM	16	0	2	0	1	1	3	0	1	67	38	0	0	62	0	0	191	1995
5:15 PM	26	1	1	0	2	0	1	0	1	56	30	0	1	59	1	0	179	1982
5:20 PM	23	0	0	0	2	0	2	0	0	75	29	0	0	41	0	0	172	2002
5:25 PM	21	0	0	0	1	0	0	0	0	47	30	0	0	59	1	0	159	1986
5:30 PM	13	1	0	0	1	1	0	0	0	65	29	0	0	50	0	0	160	1983
5:35 PM	15	0	3	0	0	0	3	0	1	48	31	0	0	54	1	0	156	1989
5:40 PM	12	0	1	0	3	2	1	0	0	70	26	0	0	61	0	0	176	2003
5:45 PM	17	0	0	0	0	1	2	0	0	61	18	0	2	41	1	0	143	1983
5:50 PM	8	0	2	0	1	1	2	0	1	58	31	0	0	70	3	0	177	2023
5:55 PM	15	0	1	0	2	0	0	0	1	59	27	0	1	49	0	0	155	2011
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	260	4	12	0	20	4	24	0	8	792	388	0	4	648	4	0	2168	
Heavy Trucks	0	0	0		0	0	0		0	68	12		4	28	0		112	
Pedestrians						12				0				0			12	
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1	
Railroad																		
Stopped Buses																		

Comments:



## Highway Capacity Manual, 2000

**Signalized intersection** level of service (LOS) is defined in terms of the average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, LOS criteria are stated in terms of average delay per vehicle during a specified time period (for example, the PM peak hour). Vehicle delay is a complex measure based on many variables, including signal phasing (i.e., progression of movements through the intersection), signal cycle length, and traffic volumes with respect to intersection capacity. Table 1 shows LOS criteria for signalized intersections, as described in the *Highway Capacity Manual* (Transportation Research Board, Special Report 209, 2000).

**Table 1. Level of Service Criteria for Signalized Intersections**

Level of Service	Average Control Delay (sec/veh)	General Description (Signalized Intersections)
A	≤10	Free Flow
B	>10 - 20	Stable Flow (slight delays)
C	>20 - 35	Stable flow (acceptable delays)
D	>35 - 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 - 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report 209, 2000.

**Unsignalized intersection** LOS criteria can be further reduced into two intersection types: all-way stop-controlled and two-way stop-controlled. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements. With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way, stop-controlled intersection should be viewed with discretion. Table 2 shows LOS criteria for unsignalized intersections (both all-way and two-way, stop-controlled).

**Table 2. Level of Service Criteria for Unsignalized Intersections**

Level of Service	Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report 209, 2000.



HCM Signalized Intersection Capacity Analysis  
 1: SW Avery St/SW 112th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
 2015 Existing Weekday AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	805	295	15	570	30	255	10	10	5	5	15
Future Volume (vph)	30	805	295	15	570	30	255	10	10	5	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1611	1696	1406	1543	1624	1349	1703	1638		1318	1231	
Flt Permitted	0.35	1.00	1.00	0.21	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	601	1696	1406	347	1624	1349	1703	1638		1318	1231	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	805	295	15	570	30	255	10	10	5	5	15
RTOR Reduction (vph)	0	0	47	0	0	11	0	8	0	0	15	0
Lane Group Flow (vph)	30	805	248	15	570	19	255	12	0	5	5	0
Confl. Peds. (#/hr)	1		1	1		1						
Confl. Bikes (#/hr)			3						2			
Heavy Vehicles (%)	12%	12%	12%	17%	17%	17%	6%	6%	6%	37%	37%	37%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6		2	2		6						
Actuated Green, G (s)	77.2	75.2	75.2	77.2	74.1	74.1	21.4	23.1		1.2	2.9	
Effective Green, g (s)	77.2	75.2	75.2	77.2	74.1	74.1	21.4	23.1		1.2	2.9	
Actuated g/C Ratio	0.64	0.63	0.63	0.64	0.62	0.62	0.18	0.19		0.01	0.02	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5	3.5	1.5	1.5		1.5	1.5	
Lane Grp Cap (vph)	412	1062	881	243	1002	833	303	315		13	29	
v/s Ratio Prot	c0.00	c0.47		0.00	0.35		c0.15	0.01		0.00	c0.00	
v/s Ratio Perm	0.04		0.18	0.04		0.01						
v/c Ratio	0.07	0.76	0.28	0.06	0.57	0.02	0.84	0.04		0.38	0.18	
Uniform Delay, d1	8.9	15.9	10.2	11.7	13.5	8.9	47.7	39.4		59.0	57.4	
Progression Factor	0.37	0.31	0.13	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	3.1	0.5	0.0	2.3	0.0	18.0	0.0		6.8	1.1	
Delay (s)	3.3	8.1	1.8	11.8	15.9	8.9	65.6	39.4		65.8	58.5	
Level of Service	A	A	A	B	B	A	E	D		E	E	
Approach Delay (s)		6.3			15.4			63.7			60.0	
Approach LOS		A			B			E			E	

Intersection Summary		
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.75	B
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	71.9%	18.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

# HCM Signalized Intersection Capacity Analysis

## 2: SW 115th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
2015 Existing Weekday AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗			↖	↗	↘	↗	↘
Traffic Volume (vph)	5	1045	65	75	740	15	25	5	70	5	5	5
Future Volume (vph)	5	1045	65	75	740	15	25	5	70	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			4.5	4.0	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	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	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1641	1727	1436	1597	1676			1390	1221	1805	1738	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.75	1.00	0.95	1.00	
Satd. Flow (perm)	1641	1727	1436	1597	1676			1093	1221	1805	1738	
Peak-hour factor, PHF	1.00	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	1045	65	78	740	15	25	5	70	5	5	5
RTOR Reduction (vph)	0	0	20	0	0	0	0	0	60	0	4	0
Lane Group Flow (vph)	5	1045	45	78	755	0	0	30	10	5	6	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			3			2			1			
Heavy Vehicles (%)	10%	10%	10%	13%	13%	13%	31%	31%	31%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases			2				8		8			
Actuated Green, G (s)	1.1	83.4	83.4	10.3	92.6			7.3	17.6	1.0	12.3	
Effective Green, g (s)	1.1	83.4	83.4	10.3	92.6			7.3	17.6	1.0	12.3	
Actuated g/C Ratio	0.01	0.70	0.70	0.09	0.77			0.06	0.15	0.01	0.10	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			4.5	4.0	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5			1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	15	1200	998	137	1293			66	179	15	178	
v/s Ratio Prot	0.00	c0.60		c0.05	0.45				0.00	c0.00	0.00	
v/s Ratio Perm			0.03					c0.03	0.00			
v/c Ratio	0.33	0.87	0.05	0.57	0.58			0.45	0.06	0.33	0.03	
Uniform Delay, d1	59.1	14.1	5.8	52.7	5.7			54.4	44.1	59.2	48.5	
Progression Factor	1.00	1.00	1.00	1.07	0.73			1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	8.8	0.1	2.5	1.5			1.8	0.0	4.7	0.0	
Delay (s)	63.8	22.9	5.8	59.2	5.7			56.2	44.1	63.9	48.5	
Level of Service	E	C	A	E	A			E	D	E	D	
Approach Delay (s)		22.1			10.7			47.7			53.6	
Approach LOS		C			B			D			D	

### Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 3: SW Itel St & SW 115th Ave

Koch Corporate Center Phase II  
 2015 Existing Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	10	0	5	0	0	5	0	10	0	15	20	15
Future Volume (vph)	10	0	5	0	0	5	0	10	0	15	20	15
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	12	0	6	0	0	6	0	12	0	18	24	18
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	12	6	0	6	0	12	18	42				
Volume Left (vph)	12	0	0	0	0	0	18	0				
Volume Right (vph)	0	6	0	6	0	0	0	18				
Hadj (s)	1.64	0.44	0.00	0.15	0.00	0.99	0.99	0.19				
Departure Headway (s)	6.3	5.1	4.7	4.9	4.6	5.6	5.6	4.8				
Degree Utilization, x	0.02	0.01	0.00	0.01	0.00	0.02	0.03	0.06				
Capacity (veh/h)	549	682	900	720	900	630	631	740				
Control Delay (s)	8.3	7.0	6.5	6.7	6.4	7.5	7.5	6.9				
Approach Delay (s)	7.8		6.7		7.5		7.1					
Approach LOS	A		A		A		A					
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			21.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: SW 115th Ave & Access

Koch Corporate Center Phase II  
2015 Existing Weekday AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (veh/h)	5	0	0	0	0	5	0	30	0	20	35	25
Future Volume (Veh/h)	5	0	0	0	0	5	0	30	0	20	35	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	0	0	0	0	6	0	35	0	23	41	29
Pedestrians		1			1							1
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)												395
pX, platoon unblocked												
vC, conflicting volume	144	138	56	123	153	37	71			36		
vC1, stage 1 conf vol	102	102		36	36							
vC2, stage 2 conf vol	42	36		87	117							
vCu, unblocked vol	144	138	56	123	153	37	71			36		
tC, single (s)	7.1	6.5	6.2	7.8	7.2	7.0	4.6			4.3		
tC, 2 stage (s)	6.1	5.5		6.8	6.2							
tF (s)	3.5	4.0	3.3	4.2	4.7	4.0	2.6			2.3		
p0 queue free %	99	100	100	100	100	99	100			98		
cM capacity (veh/h)	857	772	1015	731	645	859	1286			1488		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>						
Volume Total	6	6	0	35	23	70						
Volume Left	6	0	0	0	23	0						
Volume Right	0	6	0	0	0	29						
cSH	857	859	1700	1700	1488	1700						
Volume to Capacity	0.01	0.01	0.00	0.02	0.02	0.04						
Queue Length 95th (ft)	1	1	0	0	1	0						
Control Delay (s)	9.2	9.2	0.0	0.0	7.5	0.0						
Lane LOS	A	A			A							
Approach Delay (s)	9.2	9.2	0.0		1.8							
Approach LOS	A	A										
<b>Intersection Summary</b>												
Average Delay			2.0									
Intersection Capacity Utilization			18.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis  
 1: SW Avery St/SW 112th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
 2015 Existing Weekday PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	695	375	5	650	5	220	5	10	25	10	25
Future Volume (vph)	5	695	375	5	650	5	220	5	10	25	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	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	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1768	1863	1550	1770	1863	1527	1787	1693		1752	1609	
Flt Permitted	0.32	1.00	1.00	0.29	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	589	1863	1550	539	1863	1527	1787	1693		1752	1609	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	695	375	5	650	5	220	5	10	25	10	25
RTOR Reduction (vph)	0	0	55	0	0	2	0	8	0	0	24	0
Lane Group Flow (vph)	5	695	320	5	650	3	220	7	0	25	11	0
Confl. Peds. (#/hr)	5						5			5		5
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	3%	3%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6		2	2		6						
Actuated Green, G (s)	78.2	77.2	77.2	78.2	77.2	77.2	19.2	20.6		2.7	4.1	
Effective Green, g (s)	78.2	77.2	77.2	78.2	77.2	77.2	19.2	20.6		2.7	4.1	
Actuated g/C Ratio	0.65	0.64	0.64	0.65	0.64	0.64	0.16	0.17		0.02	0.03	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5	3.5	1.5	1.5		1.5	1.5	
Lane Grp Cap (vph)	393	1198	997	361	1198	982	285	290		39	54	
v/s Ratio Prot	0.00	c0.37		c0.00	0.35		c0.12	0.00		0.01	c0.01	
v/s Ratio Perm	0.01		0.21	0.01		0.00						
v/c Ratio	0.01	0.58	0.32	0.01	0.54	0.00	0.77	0.02		0.64	0.20	
Uniform Delay, d1	8.8	12.2	9.6	9.2	11.7	7.6	48.3	41.3		58.2	56.4	
Progression Factor	0.47	0.48	0.31	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.6	0.7	0.0	1.8	0.0	11.2	0.0		23.8	0.7	
Delay (s)	4.1	7.5	3.6	9.2	13.5	7.7	59.5	41.3		82.0	57.0	
Level of Service	A	A	A	A	B	A	E	D		F	E	
Approach Delay (s)		6.1			13.4			58.3			67.4	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
2: SW 115th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
2015 Existing Weekday PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗			↑	↗	↖	↗	
Traffic Volume (vph)	5	935	30	30	865	5	40	0	125	10	5	5
Future Volume (vph)	5	935	30	30	865	5	40	0	125	10	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			4.5	4.0	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	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			0.99	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1845	1520	1736	1825			1754	1562	1805	1732	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.75	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1845	1520	1736	1825			1387	1562	1805	1732	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	935	30	30	865	5	40	0	125	10	5	5
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	110	0	4	0
Lane Group Flow (vph)	5	935	22	30	870	0	0	40	15	10	6	0
Confl. Peds. (#/hr)	4		4	1		1	4		1	1		4
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases			2				8		8			
Actuated Green, G (s)	1.1	86.5	86.5	5.9	91.3			8.6	14.5	1.0	13.6	
Effective Green, g (s)	1.1	86.5	86.5	5.9	91.3			8.6	14.5	1.0	13.6	
Actuated g/C Ratio	0.01	0.72	0.72	0.05	0.76			0.07	0.12	0.01	0.11	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			4.5	4.0	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5			1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	16	1329	1095	85	1388			99	188	15	196	
v/s Ratio Prot	0.00	c0.51		c0.02	c0.48				0.00	c0.01	0.00	
v/s Ratio Perm			0.01					c0.03	0.01			
v/c Ratio	0.31	0.70	0.02	0.35	0.63			0.40	0.08	0.67	0.03	
Uniform Delay, d1	59.1	9.5	4.7	55.2	6.6			53.3	46.8	59.3	47.3	
Progression Factor	1.00	1.00	1.00	0.99	0.67			1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.0	3.1	0.0	0.8	1.8			1.0	0.1	62.4	0.0	
Delay (s)	63.1	12.6	4.8	55.4	6.2			54.2	46.9	121.7	47.3	
Level of Service	E	B	A	E	A			D	D	F	D	
Approach Delay (s)		12.6			7.8			48.7			84.5	
Approach LOS		B			A			D			F	

Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 3: SW Itel St & SW 115th Ave

Koch Corporate Center Phase II  
 2015 Existing Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	35	5	5	0	0	5	0	25	5	5	5	10
Future Volume (vph)	35	5	5	0	0	5	0	25	5	5	5	10
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	45	6	6	0	0	6	0	32	6	6	6	13
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	45	12	0	6	0	38	6	19				
Volume Left (vph)	45	0	0	0	0	0	6	0				
Volume Right (vph)	0	6	0	6	0	6	0	13				
Hadj (s)	0.55	-0.30	0.00	-0.14	0.00	0.11	1.09	0.12				
Departure Headway (s)	5.2	4.4	4.7	4.6	4.7	4.8	5.8	4.8				
Degree Utilization, x	0.07	0.01	0.00	0.01	0.00	0.05	0.01	0.03				
Capacity (veh/h)	679	802	900	766	900	731	604	729				
Control Delay (s)	7.4	6.2	6.5	6.4	6.5	6.8	7.6	6.7				
Approach Delay (s)	7.1		6.4		6.8		7.0					
Approach LOS	A		A		A		A					
Intersection Summary												
Delay			7.0									
Level of Service			A									
Intersection Capacity Utilization			19.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

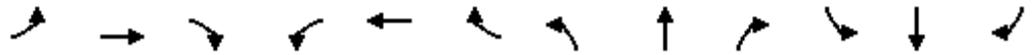
## 4: SW 115th Ave & Access

Koch Corporate Center Phase II  
2015 Existing Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	5	5	0	0	10	0	65	0	0	15	0
Future Volume (Veh/h)	55	5	5	0	0	10	0	65	0	0	15	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	76	7	7	0	0	14	0	90	0	0	21	0
Pedestrians		1						1			1	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)											395	
pX, platoon unblocked												
vC, conflicting volume	127	112	23	122	112	91	22			90		
vC1, stage 1 conf vol	22	22		90	90							
vC2, stage 2 conf vol	105	90		32	22							
vCu, unblocked vol	127	112	23	122	112	91	22			90		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.6		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.6		
p0 queue free %	91	99	99	100	100	99	100			100		
cM capacity (veh/h)	866	800	1058	886	800	971	1554			1260		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>						
Volume Total	90	14	0	90	0	21						
Volume Left	76	0	0	0	0	0						
Volume Right	7	14	0	0	0	0						
cSH	873	971	1700	1700	1700	1700						
Volume to Capacity	0.10	0.01	0.00	0.05	0.00	0.01						
Queue Length 95th (ft)	9	1	0	0	0	0						
Control Delay (s)	9.6	8.8	0.0	0.0	0.0	0.0						
Lane LOS	A	A										
Approach Delay (s)	9.6	8.8	0.0		0.0							
Approach LOS	A	A										
<b>Intersection Summary</b>												
Average Delay			4.6									
Intersection Capacity Utilization			20.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis  
 1: SW Avery St/SW 112th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
 2017 Without Proj Weekday AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗		↖	↗	
Traffic Volume (vph)	60	855	305	15	780	45	265	10	10	10	5	20
Future Volume (vph)	60	855	305	15	780	45	265	10	10	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	5.5	4.0	4.5	5.5	4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1612	1696	1406	1543	1624	1349	1703	1638		1318	1220	
Flt Permitted	0.21	1.00	1.00	0.18	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	349	1696	1406	290	1624	1349	1703	1638		1318	1220	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	855	305	15	780	45	265	10	10	10	5	20
RTOR Reduction (vph)	0	0	48	0	0	18	0	8	0	0	19	0
Lane Group Flow (vph)	60	855	257	15	780	27	265	12	0	10	6	0
Confl. Peds. (#/hr)	1		1	1		1						
Confl. Bikes (#/hr)			3						2			
Heavy Vehicles (%)	12%	12%	12%	17%	17%	17%	6%	6%	6%	37%	37%	37%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6		2	2		6						
Actuated Green, G (s)	76.4	74.4	74.4	76.4	71.5	71.5	20.1	23.7		1.4	5.0	
Effective Green, g (s)	76.4	75.4	74.4	76.4	72.5	71.5	20.1	23.7		1.4	5.0	
Actuated g/C Ratio	0.64	0.63	0.62	0.64	0.60	0.60	0.17	0.20		0.01	0.04	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5	3.5	1.5	1.5		1.5	1.5	
Lane Grp Cap (vph)	273	1065	871	205	981	803	285	323		15	50	
v/s Ratio Prot	c0.01	c0.50		0.00	0.48		c0.16	0.01		0.01	c0.00	
v/s Ratio Perm	0.13		0.18	0.05		0.02						
v/c Ratio	0.22	0.80	0.29	0.07	0.80	0.03	0.93	0.04		0.67	0.12	
Uniform Delay, d1	12.9	16.7	10.6	13.5	18.1	10.0	49.3	38.9		59.1	55.4	
Progression Factor	0.21	0.31	0.11	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.6	0.5	0.1	6.6	0.1	34.3	0.0		62.4	0.4	
Delay (s)	2.8	8.8	1.6	13.6	24.7	10.1	83.6	38.9		121.4	55.8	
Level of Service	A	A	A	B	C	B	F	D		F	E	
Approach Delay (s)		6.7			23.7			80.4			74.5	
Approach LOS		A			C			F			E	

Intersection Summary		
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.79	C
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	79.1%	17.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		D

# HCM Signalized Intersection Capacity Analysis

## 2: SW 115th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
2017 Without Proj Weekday AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1105	170	270	770	15	40	5	100	5	5	5
Future Volume (vph)	5	1105	170	270	770	15	40	5	100	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	5.5	4.0	4.5			4.5	4.0	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00			1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	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	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1641	1727	1436	3099	1676			1386	1218	1805	1738	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.74	1.00	0.95	1.00	
Satd. Flow (perm)	1641	1727	1436	3099	1676			1075	1218	1805	1738	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	1105	170	270	770	15	40	5	100	5	5	5
RTOR Reduction (vph)	0	0	28	0	0	0	0	0	86	0	4	0
Lane Group Flow (vph)	5	1105	142	270	785	0	0	45	15	5	6	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			3			2			1			
Heavy Vehicles (%)	10%	10%	10%	13%	13%	13%	31%	31%	31%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases			2				8		8			
Actuated Green, G (s)	1.0	83.5	83.5	8.0	90.5			9.4	17.4	1.1	14.5	
Effective Green, g (s)	1.0	84.5	83.5	8.0	91.5			9.4	17.4	1.1	14.5	
Actuated g/C Ratio	0.01	0.70	0.70	0.07	0.76			0.08	0.14	0.01	0.12	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			4.5	4.0	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5			1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	13	1216	999	206	1277			84	176	16	210	
v/s Ratio Prot	0.00	c0.64		c0.09	0.47				0.01	c0.00	0.00	
v/s Ratio Perm			0.10					c0.04	0.01			
v/c Ratio	0.38	0.91	0.14	1.31	0.61			0.54	0.08	0.31	0.03	
Uniform Delay, d1	59.2	14.6	6.2	56.0	6.4			53.2	44.4	59.1	46.5	
Progression Factor	1.00	1.00	1.00	0.95	1.12			1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.8	11.5	0.3	159.4	1.4			3.3	0.1	4.0	0.0	
Delay (s)	66.0	26.1	6.5	212.8	8.5			56.5	44.5	63.1	46.5	
Level of Service	E	C	A	F	A			E	D	E	D	
Approach Delay (s)		23.6			60.8			48.2			52.1	
Approach LOS		C			E			D			D	

### Intersection Summary

HCM 2000 Control Delay	40.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 3: SW Itel St & SW 115th Ave

Koch Corporate Center Phase II  
 2017 Without Proj Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	10	0	5	0	0	20	0	25	0	130	125	15
Future Volume (vph)	10	0	5	0	0	20	0	25	0	130	125	15
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	12	0	6	0	0	23	0	29	0	151	145	17
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	12	6	0	23	0	29	151	162				
Volume Left (vph)	12	0	0	0	0	0	151	0				
Volume Right (vph)	0	6	0	23	0	0	0	17				
Hadj (s)	0.67	-0.53	0.00	-0.53	0.00	0.17	0.67	0.10				
Departure Headway (s)	6.0	4.8	5.4	4.8	4.9	5.0	5.3	4.7				
Degree Utilization, x	0.02	0.01	0.00	0.03	0.00	0.04	0.22	0.21				
Capacity (veh/h)	561	697	900	696	900	694	664	748				
Control Delay (s)	8.0	6.7	7.2	6.8	6.7	7.1	8.6	7.8				
Approach Delay (s)	7.5		6.8		7.1		8.2					
Approach LOS	A		A		A		A					
Intersection Summary												
Delay			8.0									
Level of Service			A									
Intersection Capacity Utilization			28.0%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 4: SW 115th Ave & Access

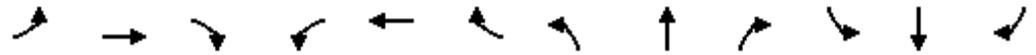
Koch Corporate Center Phase II  
2017 Without Proj Weekday AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	5	0	0	0	0	15	0	60	5	90	260	25
Future Volume (Veh/h)	5	0	0	0	0	15	0	60	5	90	260	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	6	0	0	0	0	18	0	73	6	110	317	30
Pedestrians		1			1							1
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)												395
pX, platoon unblocked												
vC, conflicting volume	645	633	333	614	645	78	348			80		
vC1, stage 1 conf vol	553	553		77	77							
vC2, stage 2 conf vol	92	80		537	568							
vCu, unblocked vol	645	633	333	614	645	78	348			80		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)	6.2	5.6		6.2	5.6							
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	99	100	100	100	100	98	100			93		
cM capacity (veh/h)	447	446	690	461	441	959	1167			1467		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>						
Volume Total	6	18	0	79	110	347						
Volume Left	6	0	0	0	110	0						
Volume Right	0	18	0	6	0	30						
cSH	447	959	1700	1700	1467	1700						
Volume to Capacity	0.01	0.02	0.00	0.05	0.07	0.20						
Queue Length 95th (ft)	1	1	0	0	6	0						
Control Delay (s)	13.2	8.8	0.0	0.0	7.7	0.0						
Lane LOS	B	A			A							
Approach Delay (s)	13.2	8.8	0.0		1.8							
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			1.9									
Intersection Capacity Utilization			26.0%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis  
 1: SW Avery St/SW 112th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
 2017 Without Proj Weekday PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	915	385	5	695	15	225	5	10	40	10	50
Future Volume (vph)	25	915	385	5	695	15	225	5	10	40	10	50
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	5.5	4.0	4.5	5.5	4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	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	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1550	1770	1863	1527	1787	1693		1752	1571	
Flt Permitted	0.28	1.00	1.00	0.17	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	523	1863	1550	311	1863	1527	1787	1693		1752	1571	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	915	385	5	695	15	225	5	10	40	10	50
RTOR Reduction (vph)	0	0	45	0	0	6	0	9	0	0	47	0
Lane Group Flow (vph)	25	915	340	5	695	9	225	6	0	40	13	0
Confl. Peds. (#/hr)	5						5			5		5
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	3%	3%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6		2	2		6						
Actuated Green, G (s)	78.9	77.9	77.9	78.9	75.8	75.8	15.9	15.0		7.6	6.7	
Effective Green, g (s)	78.9	78.9	77.9	78.9	76.8	75.8	15.9	15.0		7.6	6.7	
Actuated g/C Ratio	0.66	0.66	0.65	0.66	0.64	0.63	0.13	0.12		0.06	0.06	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5	3.5	1.5	1.5		1.5	1.5	
Lane Grp Cap (vph)	376	1224	1006	216	1192	964	236	211		110	87	
v/s Ratio Prot	c0.00	c0.49		0.00	0.37		c0.13	0.00		0.02	c0.01	
v/s Ratio Perm	0.04		0.22	0.01		0.01						
v/c Ratio	0.07	0.75	0.34	0.02	0.58	0.01	0.95	0.03		0.36	0.15	
Uniform Delay, d1	9.4	13.8	9.5	13.1	12.4	8.2	51.7	46.1		53.9	53.9	
Progression Factor	0.65	0.73	0.61	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	2.7	0.6	0.0	2.1	0.0	45.1	0.0		0.7	0.3	
Delay (s)	6.1	12.9	6.3	13.1	14.5	8.2	96.8	46.1		54.6	54.2	
Level of Service	A	B	A	B	B	A	F	D		D	D	
Approach Delay (s)		10.8			14.4			93.6			54.4	
Approach LOS		B			B			F			D	

Intersection Summary		
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.73	C
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	75.2%	ICU Level of Service
Analysis Period (min)	15	D
c Critical Lane Group		

# HCM Signalized Intersection Capacity Analysis

## 2: SW 115th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
2017 Without Proj Weekday PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	980	45	60	915	5	150	0	330	10	5	5
Future Volume (vph)	5	980	45	60	915	5	150	0	330	10	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	5.5	4.0	4.5			4.5	4.0	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	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			0.99	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1845	1520	3367	1825			1754	1557	1805	1732	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.75	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1845	1520	3367	1825			1387	1557	1805	1732	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	980	45	60	915	5	150	0	330	10	5	5
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	134	0	4	0
Lane Group Flow (vph)	5	980	30	60	920	0	0	150	196	10	6	0
Confl. Peds. (#/hr)	4		4	1		1	4		1	1		4
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases			2				8		8			
Actuated Green, G (s)	1.0	79.0	79.0	5.7	83.7			16.3	22.0	1.0	21.3	
Effective Green, g (s)	1.0	80.0	79.0	5.7	84.7			16.3	22.0	1.0	21.3	
Actuated g/C Ratio	0.01	0.67	0.66	0.05	0.71			0.14	0.18	0.01	0.18	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			4.5	4.0	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5			1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	14	1230	1000	159	1288			188	285	15	307	
v/s Ratio Prot	0.00	c0.53		0.02	0.50				c0.03	c0.01	0.00	
v/s Ratio Perm			0.02					c0.11	0.09			
v/c Ratio	0.36	0.80	0.03	0.38	0.71			0.80	0.69	0.67	0.02	
Uniform Delay, d1	59.2	14.2	7.1	55.4	10.5			50.3	45.8	59.3	40.7	
Progression Factor	1.00	1.00	1.00	0.99	0.68			1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.6	5.4	0.1	0.4	2.7			19.3	5.4	62.4	0.0	
Delay (s)	64.8	19.6	7.2	55.2	9.8			69.6	51.2	121.7	40.7	
Level of Service	E	B	A	E	A			E	D	F	D	
Approach Delay (s)		19.3			12.5			56.9			81.2	
Approach LOS		B			B			E			F	

### Intersection Summary

HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
3: SW Itel St & SW 115th Ave

Koch Corporate Center Phase II  
2017 Without Proj Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	35	5	5	0	0	130	0	135	5	20	20	10
Future Volume (vph)	35	5	5	0	0	130	0	135	5	20	20	10
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	45	6	6	0	0	169	0	175	6	26	26	13
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	45	12	0	169	0	181	26	39				
Volume Left (vph)	45	0	0	0	0	0	26	0				
Volume Right (vph)	0	6	0	169	0	6	0	13				
Hadj (s)	0.67	-0.18	0.00	-0.53	0.00	0.15	0.67	-0.06				
Departure Headway (s)	6.0	5.2	5.2	4.7	5.2	5.3	5.9	5.2				
Degree Utilization, x	0.08	0.02	0.00	0.22	0.00	0.27	0.04	0.06				
Capacity (veh/h)	562	654	900	725	900	651	571	651				
Control Delay (s)	8.3	7.1	7.0	7.8	7.0	9.0	8.0	7.3				
Approach Delay (s)	8.0		7.8		9.0		7.6					
Approach LOS	A		A		A		A					
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			35.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 4: SW 115th Ave & Access

Koch Corporate Center Phase II  
2017 Without Proj Weekday PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	55	0	0	0	0	80	0	305	0	10	45	5
Future Volume (Veh/h)	55	0	0	0	0	80	0	305	0	10	45	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	76	0	0	0	0	111	0	424	0	14	63	7
Pedestrians		1						1			1	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)											395	
pX, platoon unblocked												
vC, conflicting volume	632	520	68	516	523	425	71			424		
vC1, stage 1 conf vol	96	96		424	424							
vC2, stage 2 conf vol	536	424		92	99							
vCu, unblocked vol	632	520	68	516	523	425	71			424		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)	6.2	5.6		6.2	5.6							
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	81	100	100	100	100	82	100			99		
cM capacity (veh/h)	395	537	971	568	548	612	1479			1094		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>						
Volume Total	76	111	0	424	14	70						
Volume Left	76	0	0	0	14	0						
Volume Right	0	111	0	0	0	7						
cSH	395	612	1700	1700	1094	1700						
Volume to Capacity	0.19	0.18	0.00	0.25	0.01	0.04						
Queue Length 95th (ft)	18	16	0	0	1	0						
Control Delay (s)	16.3	12.2	0.0	0.0	8.3	0.0						
Lane LOS	C	B			A							
Approach Delay (s)	16.3	12.2	0.0		1.4							
Approach LOS	C	B										
<b>Intersection Summary</b>												
Average Delay			3.9									
Intersection Capacity Utilization			32.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis  
 1: SW Avery St/SW 112th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
 2017 With Proj Weekday AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	864	305	15	848	45	265	10	10	10	5	20
Future Volume (vph)	60	864	305	15	848	45	265	10	10	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	5.5	4.0	4.5	5.5	4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1612	1696	1406	1543	1624	1349	1703	1638		1318	1220	
Flt Permitted	0.17	1.00	1.00	0.18	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	294	1696	1406	287	1624	1349	1703	1638		1318	1220	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	864	305	15	848	45	265	10	10	10	5	20
RTOR Reduction (vph)	0	0	48	0	0	18	0	8	0	0	19	0
Lane Group Flow (vph)	60	864	257	15	848	27	265	12	0	10	6	0
Confl. Peds. (#/hr)	1		1	1		1						
Confl. Bikes (#/hr)			3						2			
Heavy Vehicles (%)	12%	12%	12%	17%	17%	17%	6%	6%	6%	37%	37%	37%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6		2	2		6						
Actuated Green, G (s)	76.9	74.9	74.9	76.9	72.9	72.9	19.6	23.2		1.4	5.0	
Effective Green, g (s)	76.9	75.9	74.9	76.9	73.9	72.9	19.6	23.2		1.4	5.0	
Actuated g/C Ratio	0.64	0.63	0.62	0.64	0.62	0.61	0.16	0.19		0.01	0.04	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5	3.5	1.5	1.5		1.5	1.5	
Lane Grp Cap (vph)	232	1072	877	204	1000	819	278	316		15	50	
v/s Ratio Prot	c0.01	0.51		0.00	c0.52		c0.16	0.01		0.01	c0.00	
v/s Ratio Perm	0.16		0.18	0.05		0.02						
v/c Ratio	0.26	0.81	0.29	0.07	0.85	0.03	0.95	0.04		0.67	0.12	
Uniform Delay, d1	14.2	16.5	10.4	13.4	18.5	9.4	49.7	39.3		59.1	55.4	
Progression Factor	0.42	0.29	0.17	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.2	0.4	0.1	8.9	0.1	40.8	0.0		62.4	0.4	
Delay (s)	6.0	8.1	2.2	13.5	27.4	9.5	90.6	39.3		121.4	55.8	
Level of Service	A	A	A	B	C	A	F	D		F	E	
Approach Delay (s)		6.5			26.3			87.0			74.5	
Approach LOS		A			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: SW 115th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
2017 With Proj Weekday AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1105	206	338	770	15	45	5	109	5	5	5
Future Volume (vph)	5	1105	206	338	770	15	45	5	109	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	5.5	4.0	4.5			4.5	4.0	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00			1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	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	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1641	1727	1436	3099	1676			1385	1221	1805	1738	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.74	1.00	0.95	1.00	
Satd. Flow (perm)	1641	1727	1436	3099	1676			1072	1221	1805	1738	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	1105	206	338	770	15	45	5	109	5	5	5
RTOR Reduction (vph)	0	0	43	0	0	0	0	0	88	0	4	0
Lane Group Flow (vph)	5	1105	163	338	785	0	0	50	21	5	6	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			3			2			1			
Heavy Vehicles (%)	10%	10%	10%	13%	13%	13%	31%	31%	31%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases			2				8		8			
Actuated Green, G (s)	1.0	77.8	77.8	13.4	90.2			9.8	23.2	1.0	14.8	
Effective Green, g (s)	1.0	78.8	77.8	13.4	91.2			9.8	23.2	1.0	14.8	
Actuated g/C Ratio	0.01	0.66	0.65	0.11	0.76			0.08	0.19	0.01	0.12	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			4.5	4.0	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5			1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	13	1134	931	346	1273			87	236	15	214	
v/s Ratio Prot	0.00	c0.64		c0.11	0.47				0.01	c0.00	0.00	
v/s Ratio Perm			0.11					c0.05	0.01			
v/c Ratio	0.38	0.97	0.17	0.98	0.62			0.57	0.09	0.33	0.03	
Uniform Delay, d1	59.2	19.6	8.4	53.1	6.5			53.1	39.7	59.2	46.3	
Progression Factor	1.00	1.00	1.00	0.98	1.03			1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.8	21.2	0.4	29.4	1.2			5.6	0.1	4.7	0.0	
Delay (s)	66.0	40.9	8.8	81.6	7.9			58.7	39.8	63.9	46.3	
Level of Service	E	D	A	F	A			E	D	E	D	
Approach Delay (s)		36.0			30.1			45.7			52.2	
Approach LOS		D			C			D			D	

### Intersection Summary

HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
3: SW Itel St & SW 115th Ave

Koch Corporate Center Phase II  
2017 With Proj Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	10	0	5	0	0	20	0	25	0	130	125	15
Future Volume (vph)	10	0	5	0	0	20	0	25	0	130	125	15
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	12	0	6	0	0	24	0	30	0	159	152	18
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	12	6	0	24	0	30	159	170				
Volume Left (vph)	12	0	0	0	0	0	159	0				
Volume Right (vph)	0	6	0	24	0	0	0	18				
Hadj (s)	0.67	-0.53	0.00	-0.53	0.00	0.17	0.67	0.10				
Departure Headway (s)	6.1	4.9	5.4	4.9	4.9	5.1	5.3	4.7				
Degree Utilization, x	0.02	0.01	0.00	0.03	0.00	0.04	0.23	0.22				
Capacity (veh/h)	556	690	900	689	900	692	664	747				
Control Delay (s)	8.0	6.7	7.2	6.8	6.7	7.1	8.7	7.9				
Approach Delay (s)	7.6		6.8		7.1		8.3					
Approach LOS	A		A		A		A					
Intersection Summary												
Delay			8.1									
Level of Service			A									
Intersection Capacity Utilization			27.8%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 4: SW 115th Ave & Access

Koch Corporate Center Phase II  
2017 With Proj Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	0	0	0	29	0	60	5	194	260	25
Future Volume (Veh/h)	5	0	0	0	0	29	0	60	5	194	260	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	0	0	0	0	34	0	70	6	226	302	29
Pedestrians		1			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)											395	
pX, platoon unblocked												
vC, conflicting volume	876	848	320	831	859	77	332			78		
vC1, stage 1 conf vol	770	770		75	75							
vC2, stage 2 conf vol	106	78		756	784							
vCu, unblocked vol	876	848	320	831	859	77	332			78		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)	6.2	5.6		6.2	5.6							
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	98	100	100	100	100	96	100			85		
cM capacity (veh/h)	310	324	701	319	322	959	1183			1469		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	6	34	0	76	226	331						
Volume Left	6	0	0	0	226	0						
Volume Right	0	34	0	6	0	29						
cSH	310	959	1700	1700	1469	1700						
Volume to Capacity	0.02	0.04	0.00	0.04	0.15	0.19						
Queue Length 95th (ft)	1	3	0	0	14	0						
Control Delay (s)	16.8	8.9	0.0	0.0	7.9	0.0						
Lane LOS	C	A			A							
Approach Delay (s)	16.8	8.9	0.0		3.2							
Approach LOS	C	A										
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization		28.5%		ICU Level of Service	A							
Analysis Period (min)		15										

HCM Signalized Intersection Capacity Analysis  
 1: SW Avery St/SW 112th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
 2017 With Proj Weekday PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	986	385	5	705	15	225	5	10	40	10	50
Future Volume (vph)	25	986	385	5	705	15	225	5	10	40	10	50
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	5.5	4.0	4.5	5.5	4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	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	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1550	1770	1863	1527	1787	1693		1752	1571	
Flt Permitted	0.27	1.00	1.00	0.13	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	510	1863	1550	235	1863	1527	1787	1693		1752	1571	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	986	385	5	705	15	225	5	10	40	10	50
RTOR Reduction (vph)	0	0	45	0	0	6	0	9	0	0	47	0
Lane Group Flow (vph)	25	986	340	5	705	9	225	6	0	40	13	0
Confl. Peds. (#/hr)	5						5			5		5
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	3%	3%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6		2	2		6						
Actuated Green, G (s)	78.7	77.7	77.7	78.7	75.6	75.6	15.9	9.2		13.6	6.9	
Effective Green, g (s)	78.7	78.7	77.7	78.7	76.6	75.6	15.9	9.2		13.6	6.9	
Actuated g/C Ratio	0.66	0.66	0.65	0.66	0.64	0.63	0.13	0.08		0.11	0.06	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5	3.5	1.5	1.5		1.5	1.5	
Lane Grp Cap (vph)	367	1221	1003	166	1189	962	236	129		198	90	
v/s Ratio Prot	c0.00	c0.53		0.00	0.38		c0.13	0.00		0.02	c0.01	
v/s Ratio Perm	0.04		0.22	0.02		0.01						
v/c Ratio	0.07	0.81	0.34	0.03	0.59	0.01	0.95	0.04		0.20	0.14	
Uniform Delay, d1	9.6	15.1	9.6	15.8	12.6	8.3	51.7	51.3		48.3	53.7	
Progression Factor	0.69	0.69	0.59	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	3.4	0.5	0.0	2.2	0.0	45.1	0.1		0.2	0.3	
Delay (s)	6.6	13.8	6.1	15.9	14.8	8.3	96.8	51.4		48.5	54.0	
Level of Service	A	B	A	B	B	A	F	D		D	D	
Approach Delay (s)		11.6			14.7			93.9			51.8	
Approach LOS		B			B			F			D	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
2: SW 115th Ave & SW Tualatin Sherwood Rd

Koch Corporate Center Phase II  
2017 With Proj Weekday PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	980	50	70	915	5	188	0	401	10	5	5
Future Volume (vph)	5	980	50	70	915	5	188	0	401	10	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	5.5	4.0	4.5			4.5	4.0	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00			1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	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			0.99	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1845	1520	3367	1825			1754	1557	1805	1732	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.75	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1845	1520	3367	1825			1387	1557	1805	1732	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	980	50	70	915	5	188	0	401	10	5	5
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	125	0	4	0
Lane Group Flow (vph)	5	980	31	70	920	0	0	188	276	10	6	0
Confl. Peds. (#/hr)	4		4	1		1	4		1	1		4
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases			2				8		8			
Actuated Green, G (s)	1.0	75.6	75.6	6.6	81.2			18.8	25.4	1.0	23.8	
Effective Green, g (s)	1.0	76.6	75.6	6.6	82.2			18.8	25.4	1.0	23.8	
Actuated g/C Ratio	0.01	0.64	0.63	0.05	0.69			0.16	0.21	0.01	0.20	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			4.5	4.0	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	3.5	1.5	3.5			1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	14	1177	957	185	1250			217	329	15	343	
v/s Ratio Prot	0.00	c0.53		0.02	0.50				c0.05	c0.01	0.00	
v/s Ratio Perm			0.02					c0.14	0.13			
v/c Ratio	0.36	0.83	0.03	0.38	0.74			0.87	0.84	0.67	0.02	
Uniform Delay, d1	59.2	16.8	8.4	54.7	12.0			49.4	45.4	59.3	38.7	
Progression Factor	1.00	1.00	1.00	0.97	0.70			1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.6	7.0	0.1	0.4	3.1			27.6	16.6	62.4	0.0	
Delay (s)	64.8	23.7	8.5	53.5	11.4			77.0	62.0	121.7	38.7	
Level of Service	E	C	A	D	B			E	E	F	D	
Approach Delay (s)		23.2			14.4			66.8			80.2	
Approach LOS		C			B			E			F	

Intersection Summary

HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
3: SW Itel St & SW 115th Ave

Koch Corporate Center Phase II  
2017 With Proj Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	35	5	5	0	0	130	0	135	5	20	20	10
Future Volume (vph)	35	5	5	0	0	130	0	135	5	20	20	10
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	45	6	6	0	0	169	0	175	6	26	26	13
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	45	12	0	169	0	181	26	39				
Volume Left (vph)	45	0	0	0	0	0	26	0				
Volume Right (vph)	0	6	0	169	0	6	0	13				
Hadj (s)	0.50	-0.35	0.00	-0.70	0.00	0.11	1.32	0.58				
Departure Headway (s)	5.9	5.0	5.3	4.6	5.1	5.3	6.6	5.8				
Degree Utilization, x	0.07	0.02	0.00	0.21	0.00	0.26	0.05	0.06				
Capacity (veh/h)	576	673	900	749	900	656	519	584				
Control Delay (s)	8.1	6.9	7.1	7.6	6.9	8.9	8.7	8.0				
Approach Delay (s)	7.9		7.6		8.9		8.3					
Approach LOS	A		A		A		A					
Intersection Summary												
Delay			8.2									
Level of Service			A									
Intersection Capacity Utilization			35.7%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 4: SW 115th Ave & Access

Koch Corporate Center Phase II  
2017 With Proj Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	0	0	0	189	0	305	0	25	45	5
Future Volume (Veh/h)	55	0	0	0	0	189	0	305	0	25	45	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	76	0	0	0	0	263	0	424	0	35	63	7
Pedestrians		1						1			1	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)											395	
pX, platoon unblocked												
vC, conflicting volume	826	562	68	558	565	425	71			424		
vC1, stage 1 conf vol	138	138		424	424							
vC2, stage 2 conf vol	688	424		134	141							
vCu, unblocked vol	826	562	68	558	565	425	71			424		
tC, single (s)	7.1	6.5	6.2	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)	6.1	5.5		6.4	5.8							
tF (s)	3.5	4.0	3.3	3.8	4.3	3.6	2.3			2.5		
p0 queue free %	61	100	100	100	100	54	100			96		
cM capacity (veh/h)	193	524	990	520	503	568	1461			979		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	76	263	0	424	35	70						
Volume Left	76	0	0	0	35	0						
Volume Right	0	263	0	0	0	7						
cSH	193	568	1700	1700	979	1700						
Volume to Capacity	0.39	0.46	0.00	0.25	0.04	0.04						
Queue Length 95th (ft)	43	61	0	0	3	0						
Control Delay (s)	35.2	16.7	0.0	0.0	8.8	0.0						
Lane LOS	E	C			A							
Approach Delay (s)	35.2	16.7	0.0		2.9							
Approach LOS	E	C										
Intersection Summary												
Average Delay			8.5									
Intersection Capacity Utilization		46.1%		ICU Level of Service	A							
Analysis Period (min)		15										



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Tualatin-Sherwood Road & SW 115th Avenue  
 January 1, 2012 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2014														
TURNING MOVEMENTS	0	2	0	2	0	3	0	2	0	1	1	2	0	0
2014 TOTAL	0	2	0	2	0	3	0	2	0	1	1	2	0	0
YEAR: 2013														
REAR-END	0	2	0	2	0	3	0	2	0	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	0	1	1	0	1	0	0
2013 TOTAL	0	3	0	3	0	5	0	2	1	3	0	3	0	0
YEAR: 2012														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2012 TOTAL	0	1	1	2	0	1	0	2	0	2	0	2	0	0
FINAL TOTAL	0	6	1	7	0	9	0	6	1	6	1	7	0	0

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Tualatin-Sherwood Road & SW 112th Avenue/SW Avery Street  
 January 1, 2012 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2014														
ANGLE	0	1	0	1	0	5	0	1	0	0	1	1	0	0
REAR-END	0	9	3	12	0	20	0	6	5	11	1	12	0	0
2014 TOTAL	0	10	3	13	0	25	0	7	5	11	2	13	0	0
YEAR: 2013														
REAR-END	0	1	0	1	0	3	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2013 TOTAL	0	1	2	3	0	3	0	3	0	3	0	3	0	0
YEAR: 2012														
REAR-END	0	2	4	6	0	8	0	4	1	6	0	6	0	0
2012 TOTAL	0	2	4	6	0	8	0	4	1	6	0	6	0	0
FINAL TOTAL	0	13	9	22	0	36	0	14	6	20	2	22	0	0

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW 120th Avenue  
 January 1, 2012 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
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YEAR:

TOTAL

FINAL TOTAL

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW 115th Avenue  
 January 1, 2012 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2014														
TURNING MOVEMENTS	0	2	0	2	0	3	0	2	0	1	1	2	0	0
2014 TOTAL	0	2	0	2	0	3	0	2	0	1	1	2	0	0
YEAR: 2013														
REAR-END	0	1	0	1	0	2	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	0	1	1	0	1	0	0
2013 TOTAL	0	2	0	2	0	4	0	1	1	2	0	2	0	0
YEAR: 2012														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2012 TOTAL	0	1	1	2	0	1	0	2	0	2	0	2	0	0
FINAL TOTAL	0	5	1	6	0	8	0	5	1	5	1	6	0	0

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*

# MACKENZIE.

DESIGN DRIVEN | CLIENT FOCUSED

January 18, 2016 (**Revised March 14, 2016**)

City of Tualatin  
Attention: Engineering Department  
18880 SW Martinazzi Avenue  
Tualatin, OR 97062-7092

Re: **Koch Buildings 10, 11, and 12**  
*Public Facilities Narrative*  
Project Number 2140559.06

Dear Tualatin Engineering:

An application for Architectural Review (AR) was filed by PacTrust to build an approximately 127,253 square foot industrial flex use across three separate buildings. The development area consists of approximately 10 acres. The development will include an easement for public bike and pedestrian use for the future Tonquin Trail.

Pacific Realty Associates, LP (PacTrust), represented by Eric Sporre, proposes to develop the site with three buildings. The property is currently undeveloped, but public improvements have been constructed with previous phases of the development. The applicant requests to develop it into three speculative multi-tenant industrial park buildings totaling 127,253 square feet with related site improvements.

The site is bounded by another developed Koch expansion to the south, SW 115th Avenue to the west, Tualatin-Sherwood Road to the north, and developed industrial private properties to the east.

The applicant had a scoping meeting on October 15, 2015. The neighborhood/developer meeting was held on December 3, 2015.

The following are the Public Facilities findings for AR 15-05, Koch Corporate Center Expansion (in italics, with our comments following). 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.*



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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.*

**Response:** There are four existing fire hydrants near the site, two public and two private. The two public fire hydrants are located to the west, along SW 115th Avenue. The two private fire hydrants are located to the south, along the private drive. Six onsite fire hydrants are proposed surrounding Buildings 10, 11, and 12 as shown on the development plans. The applicant will 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.*

**Response:** A transportation impact analysis (TIA) has been completed for the site. Table 4 within the TIA shows future LOS levels both with and without the proposed development. All proposed intersections will maintain an LOS of at least D or E.

*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,...*

**Response:** Under previous permits, the applicant has constructed SW 115th Avenue and associated sidewalks to the west and the private road to the south. All street lights and luminaries have been installed in accordance with the Public Works Construction Code.

*TDC 74.210 Minimum Street Right-of-Way Widths*

**Response:** Under previous permits, the applicant has designed, permitted and constructed SW 115th Avenue to the west and the private street to the south.

*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 74.425 Street Design Standards*

**Response:** Under previous permits, the applicant has designed, permitted, and constructed portions of SW 115th Avenue south of the private street along the site's frontage. Improvements for SW 115th Avenue north of the private street and along Tualatin-Sherwood Road have been designed and permitted. The construction of these improvements will begin this spring/summer.

Tualatin-Sherwood Road is a two-lane major arterial. Two left-hand turn lanes will be constructed on Tualatin-Sherwood westbound as shown on the development plans. The improvements will include widening comprised of new curb, gutter, sidewalk, and bike lanes. SW 115th Avenue is a two-lane local commercial industrial roadway; bike lanes and sidewalks will be extended to Tualatin-Sherwood will be included as shown on the development plans.

*TDC 74.430 Streets, Modifications of Requirements in Cases of Unusual Conditions.*

**Response:** No modifications to standards in cases of unusual conditions are proposed as part of this development. Streets will meet or exceed City of Tualatin and Washington County Standards.

*TDC 74.440 Streets, Traffic Study Required*

**Response:** A traffic study has been prepared by a professional engineer and is included with this Architectural Review application.

*TDC 74.450 Bikeways and Pedestrian Paths*

**Response:** Under previous permits, the applicant has designed, permitted, and constructed bike lanes and pedestrian paths along the sites frontage of SW 115th Avenue up to the private drive. Plans have been submitted and approved for the continuation of the bike lanes and pedestrian paths between the private drive and Tualatin-Sherwood Road. Improvements to Tualatin-Sherwood Road have also been permitted under a separate application. Improvements along the site's frontage of Tualatin-Sherwood Road include a bike lane and pedestrian improvements as shown on the development plans. These improvements will be constructed this spring/summer.

*TDC 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 streets on the proposed development prior to issuance of a Public Works Permit.*

**Response:** Under previous permits, the applicant has constructed SW 115th Avenue and associated sidewalks to the west and the private road to the south. All street lights and luminaries have been installed in accordance with the Public Works Construction Code.

*TDC 74.475 Street Names.*

- (1) *No street name shall be used which will duplicate or be confused with the names of existing streets in the Counties of Washington or Clackamas, except for extensions of existing streets. Street names and numbers shall conform to the established pattern in the surrounding area.*
- (2) *The City Engineer shall maintain the approved list of street names from which the applicant may choose. Prior to the creation of any street, the street name shall be approved by the City Engineer.*

**Response:** Under previous permit, the applicant has constructed and been given approval for the street names adjacent to the site. No new street names are proposed as part of this application.

*TDC 74.480 Street Signs.*

- (1) *Street name signs shall be installed at all street intersections in accordance with standards adopted by the City.*
- (2) *Stop signs and other traffic control signs (speed limit, dead-end, etc.) may be required by the City.*
- (3) *Prior to approval of the final subdivision or partition plat, the applicant shall pay the City a non-refundable fee equal to the cost of the purchase and installation of street signs, traffic control signs and street name signs. The location, placement, and cost of the signs shall be determined by the City. [Ord.. 1192-05, 7/24/05]*

**Response:** Under previous permit, the applicant has constructed and been given approval for the street names and other traffic control signs adjacent to the site. No new street signs are proposed as part of this application.



*TDC 74.485 Street Trees*

- (1) Prior to approval of a residential subdivision or partition final plat, the applicant shall pay the City a non-refundable fee equal to the cost of the purchase and installation of street trees. The location, placement, and cost of the trees shall be determined by the City. This sum shall be calculated on the interior and exterior streets as indicated on the final subdivision or partition plat.*
- (2) In nonresidential subdivisions and partitions street trees shall be planted by the owners of the individual lots as development occurs.*
- (3) The Street Tree Ordinance specifies the species of tree which is to be planted and the spacing between trees. [Ord. 1192-05, 7/25/05]*

**Response:** Under previous permit, the applicant has shown street trees along the County's Tualatin Sherwood Road improvements. Street trees will be installed along SW 115th and will be designed and installed as part of the development of lots 10, 11, and 12.

*TDC 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.*

**Response:** All proposed utilities will be placed underground in accordance with this requirement. Surface-mounted transformers will be placed internal to the development, screened from adjacent right-of-way.

*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.*

**Response:** Buildings 10, 11, and 12 will access the private drive to the south. No access is proposed to either Tualatin-Sherwood Road to the north or SW 115th Avenue to the west. No restriction of existing driveways is anticipated as a part of this application.

*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.*

**Response:** The applicant understands this condition. No work shall be undertaken on any public improvement until after approval has been granted and fees are paid. Prior to occupancy, all public improvements will be completed and accepted.

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.*

- (10) *Minimum access requirements for residential uses: (b) Ingress and egress for multi-family residential uses shall not be less than the following:...for 50-499 parking spaces a minimum of one 32-foot wide access or two 24-foot wide accesses are required.*
- (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.*

**Response:** All three proposed buildings will access the Private Drive to the south of the site through one of three driveways. The driveway south of Building 11 toward SW 115th Avenue is 26 feet in width. The driveway between Buildings 10 and 11 is 36 feet in width. The driveway at the east end of the Private Drive is 36 feet in width. There are 246 proposed parking spaces and three accesses are proposed.

#### *TDC 75.120 Existing Streets*

##### *(4) Tualatin-Sherwood Road*

**Response:** No access is proposed to Tualatin-Sherwood Road to the north of the site. Access for the three buildings will be provided via the existing private drive to the south through one of three driveways.

#### 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.*

**Response:** A 10" fire water line will connect to the existing waterline stub adjacent to SW 115th Avenue and will be looped through the site as shown on Sheet C2.3 as an 8" line. Domestic water service for Buildings 10, 11 and 12 will connect to the existing 2.5" water service via a stub in SW 115th Avenue. . No extension of services is proposed as part of this development. Adjacent development to the south will be served by water from SW 115th Avenue and Itel Street. Property to the east is developed and served via either SW Avery Street or SW Industrial Way.

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.*

**Response:** Sanitary sewer for each building will be provided via existing stubs in adjacent right-of-way and private drives. Building 10 will connect to an existing sanitary sewer stub within the private drive to the south. Building 11 and Building 12 will connect to existing sanitary sewer stubs within 115th as shown on Sheet C2.3.

*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.*

**Response:** Utility easements for water, sanitary sewer and storm drainage facilities, telephone, television cable, gas, electrical lines and other public utilities will be granted to the City as needed. A 10" public utility easement has been granted along SW 115th as part of previous development.

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).*

**Response:** Stormwater and water quality for each building and associated impervious surface will be accommodated with a combination of LIDA basins and the regional stormwater facility as shown on Sheet C2.3. Stormwater from roof drains, parking areas, and LIDA basins will be collected and routed to the designed and approved public 15" storm line north of Building 10. This public storm line will be constructed prior to AR approval. Preliminary stormwater calculations are included with the Architectural Review application.

*TDC 74.650 Water Quality, Stormwater 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 stormwater 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.*

**Response:** Stormwater and water quality for each building and associated impervious surface will be accommodated with a combination of LIDA basins and the regional stormwater facility as shown on Sheet C2.3. Stormwater from roof drains, parking areas, and LIDA basins will be collected and routed to the designed and approved public 15" storm line north of Building 10. This public storm line will be constructed prior to AR approval. Preliminary stormwater calculations are included with the Architectural Review application.

7. *Grading:*

*TDC 74.640 (1) Development sites shall be graded to minimize the impact of stormwater 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.*

**Response:** The proposed grading plan minimizes the impact of stormwater runoff to adjacent properties and allows adjacent properties to drain as they did before the development.

8. *Erosion Control:*

*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.*

**Response:** There is an existing 1200C permit for the entire Koch Development. The applicant will update the existing 1200C permit to accommodate the proposed development.

9. *Stormwater Connection Permit:*

*TDC 74.650 Water Quality, Stormwater 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 stormwater 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.*

**Response:** A CWS Service Provider Letter (SPL) indicating that no site assessment or service provider letter is required is included with the Architectural Review application.

City of Tualatin  
Koch Buildings 10, 11, and 12  
Project Number 2140559.06  
January 18, 2016 (Revised March 14, 2016)  
Page 8

If you have any questions regarding this application, please feel free to contact Bob Frentress, Jr. or myself at 503-224-9560.

Sincerely,



Mark Person, AICP  
Planner

c: Matt Oyen - PacTrust  
Bob Frentress, Adam Solomonson – Mackenzie

M.

# MACKENZIE.

DESIGN DRIVEN | CLIENT FOCUSED

January 18, 2016

City of Tualatin  
Attention: Engineering Department  
18880 SW Martinazzi Avenue  
Tualatin, OR 97062-7092

Re: **Koch Buildings 10, 11, and 12**  
*Public Facilities Narrative*  
Project Number 2140559.06

Dear Tualatin Engineering:

An application for Architectural Review (AR) was filed by PacTrust to build an approximately 127,253 square foot industrial flex use across three separate buildings. The development area consists of approximately 10 acres. The development will include an easement for public bike and pedestrian use for the future Tonquin Trail.

Pacific Realty Associates, LP (PacTrust), represented by Eric Sporre, proposes to develop the site with three buildings. The property is currently undeveloped, but public improvements have been constructed with previous phases of the development. The applicant requests to develop it into three speculative multi-tenant industrial park buildings totaling 127,253 square feet with related site improvements.

The site is bounded by another developed Koch expansion to the south, SW 115th Avenue to the west, Tualatin-Sherwood Road to the north, and developed industrial private properties to the east.

The applicant had a scoping meeting on October 15, 2015. The neighborhood/developer meeting was held on December 3, 2015.

The following are the Public Facilities findings for AR 15-05, Koch Corporate Center Expansion (in italics, with our comments following). 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.*



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*TMC 4-1.010 This development is subject to all applicable building code requirements and all applicable building and development fees.*

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.*

**Response:** There are four existing fire hydrants near the site, two public and two private. The two public fire hydrants are located to the west, along SW 115th Avenue. The two private fire hydrants are located to the south, along the private drive. Six onsite fire hydrants are proposed surrounding Buildings 10, 11, and 12 as shown on the development plans. The applicant will 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 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.*

*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.*

**Response:** Under previous permits, the applicant has constructed SW 115th Avenue to the west and the private road to the south. Sidewalks will be constructed prior to occupancy in accordance with this section. A Transportation Impact Analysis is included with the Architectural Review application.

3. Access:

*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.*
- (10) *Minimum access requirements for residential uses: (b) Ingress and egress for multi-family residential uses shall not be less than the following:...for 50-499 parking spaces a minimum of one 32-foot wide access or two 24-foot wide accesses are required.*
- (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.*

**Response:** All three proposed buildings will access the Private Drive to the south of the site through one of three driveways. The driveway south of Building 11 toward SW 115th Avenue is 26 feet in width. The driveway between Buildings 10 and 11 is 36 feet in width. The driveway at the east end of the Private Drive is 36 feet in width. There are 246 proposed parking spaces and three accesses are proposed.

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.*

**Response:** A 10" fire water line will connect to the existing waterline stub adjacent to SW 115th Avenue and will be looped through the site as shown on Sheet C2.3 as an 8" line. Domestic water service for Buildings 10 and 11 will connect to the existing 2.5" water service via a stub in SW 115th Avenue. Water service to Building 12 will be provided by a 2.5" service from Tualatin Sherwood Road to the north.

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.*

**Response:** Sanitary sewer for each building will be provided via existing stubs in adjacent right-of-way and private drives. Building 10 will connect to an existing sanitary sewer stub within the private drive to the south. Building 11 and Building 12 will connect to existing sanitary sewer stubs within 115th as shown on Sheet C2.3.

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, Stormwater 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 stormwater 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.*

**Response:** Stormwater and water quality for each building and associated impervious surface will be accommodated with a combination of LIDA basins and the regional stormwater facility as shown on Sheet C2.3. Stormwater from roof drains, parking areas, and LIDA basins will be collected and routed to the designed and approved public 15" storm line north of Building 10. This public storm line will be constructed prior to AR approval. Preliminary stormwater calculations are included with the Architectural Review application.

7. *Grading:*

*TDC 74.640 (1) Development sites shall be graded to minimize the impact of stormwater 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.*

**Response:** The proposed grading plan minimizes the impact of stormwater runoff to adjacent properties and allows adjacent properties to drain as they did before the development.

8. *Erosion Control:*

*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.*

**Response:** There is an existing 1200C permit for the entire Koch Development. The applicant will update the existing 1200C permit to accommodate the proposed development.

9. *Stormwater Connection Permit:*

*TDC 74.650 Water Quality, Stormwater 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 stormwater 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.*

**Response:** A CWS Service Provider Letter (SPL) indicating that no site assessment or service provider letter is required is included with the Architectural Review application.

If you have any questions regarding this application, please feel free to contact Bob Frentress, Jr. or myself at 503-224-9560.

Sincerely,



Mark Person, AICP  
Planner

c: Bob Frentress - Mackenzie

# MACKENZIE.

DESIGN DRIVEN | CLIENT FOCUSED

March 16, 2016

City of Tualatin, Planning and Zoning  
Attention Rob Dehnert  
18880 SW Martinazzi Avenue  
Tualatin, OR 97062-7092

Re: **Koch Buildings 10, 11, and 12**  
*Public Facilities Narrative*  
Project Number 2140559.06

Dear Rob:

This letter addresses the items you identified in your letter dated February 19, 2016, regarding AR16-0001 for Koch 10, 11, and 12.

The public works narrative has been revised to include the sections of Tualatin Municipal Code (TMC) and Tualatin Development Code (TDC) referenced in your letter. An updated transportation memo has also been completed that addresses afternoon off peak hours for the intersection of 115th and Itel. A copy of this memo is included with this resubmittal. Lastly, stormwater calculations that include conveyance for the site have been completed and are included with this letter.

As detailed within this narrative and as shown on the revised plan and technical reports, the incomplete items for Koch 10, 11, and 12 AR16-0001 should be satisfied. If you have any questions or require additional information, please feel free to contact me.

Sincerely,



Mark Person, AICP  
Planner

c: Matt Oyen, Eric Sporre – PacTrust  
Adam Solomonson, Bob Frentress, Jr., Dennis Woods – Mackenzie



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Portland, Oregon ■ Vancouver, Washington ■ Seattle, Washington

# MACKENZIE.

DESIGN DRIVEN | CLIENT FOCUSED

## **ARCHITECTURAL REVIEW**

**To**  
City of Tualatin

**For**  
PacTrust  
Koch Lots 10, 11, and 12

**Submitted**  
January 19, 2016

**Project Number**  
2140559.06



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**TABLE OF CONTENTS**

- I. PROJECT SUMMARY ..... 1
- II. INTRODUCTION AND PROPOSAL ..... 3
  - Site Description ..... 3
  - Previous Permits..... 3
  - Proposal ..... 3
- III. DEVELOPMENT CODE COMPLIANCE OVERVIEW..... 5
  - On-Site Development..... 5
- IV. ARCHITECTURAL REVIEW APPROVAL CRITERIA ..... 7
  - Chapter 61: General Manufacturing Planning District ..... 8
  - Chapter 73: Community Design Standards..... 9
- V. SUMMARY ..... 39

**EXHIBITS**

- A. Application Form and Fact Sheet
- B. Affidavit of Posting AR Notice
- C. CWS Service Provider Letter (Pre-Screen)
- D. Neighborhood/Developer Meeting Materials
- E. Legal Descriptions
- F. Aerial Map
- G. Republic Services Approval Letter
- H. Tax Map
- I. Plans
- J. Lighting Cut Sheets

**ATTACHED SEPARATELY:**

- (1) Architectural Review Submittal Check
- (1) Mailing Labels
- (5) Transportation Impact Analysis
- (1) 8.5"x11" Plans
- (5) 24"x36" Plans – folded
- (1) Public Facilities Narrative



## I. PROJECT SUMMARY

<b>Applicant:</b>	PacTrust Attention: Matt Oyen 15350 SW Sequoia Parkway, Suite 300 Portland, OR 97224
<b>Applicant's Representative/ Project Contact:</b>	Mackenzie Mark Person, Planner mperson@mcknze.com 1515 SE Water Avenue, Suite 100 Portland, OR 97214 (503) 224-9560
<b>Plan District Designation:</b>	MG (General Manufacturing)
<b>Site Address:</b>	SW 115th Avenue and SW IteI Street Tualatin, Oregon
<b>Site Size:</b>	448,480 SF (10.3 acres) <ul style="list-style-type: none"><li>▪ Building 10 Lot: 150,996 SF (3.47 AC)</li><li>▪ Building 11 Lot: 128,107 SF (2.94 AC)</li><li>▪ Building 12 Lot: 169,377 SF (3.89 AC)</li></ul>
<b>Tax Map/Lots:</b>	2S127AC00700
<b>Request:</b>	Architectural Review for three new manufacturing/warehouse buildings at Koch Corporate Center
<b>Applicable Criteria:</b>	TDC Chapter 61: General Manufacturing Planning District <ul style="list-style-type: none"><li>61.020 Permitted Uses</li><li>61.050 Lot Size</li><li>61.060 Setback Requirements</li></ul> TDC Chapter 73: Community Design Standards <ul style="list-style-type: none"><li>Architectural Review Approval</li><li>73.050 Criteria and Standards</li><li>Design Standards<ul style="list-style-type: none"><li>73.150 Objectives</li><li>73.160 Standards</li><li>73.210 Objectives</li><li>73.220 Standards</li><li>73.226 Objectives</li><li>73.227 Standards</li></ul></li><li>Landscaping<ul style="list-style-type: none"><li>73.240 Landscaping General Provisions</li><li>73.250 Tree Preservation</li><li>73.260 Tree and Plant Specifications</li><li>73.270 Grading</li><li>73.280 Irrigation System Required</li></ul></li></ul>

73.290 Re-vegetation in Un-landscaped Areas

73.310 Landscape Standards – Commercial, Industrial,  
Public and Semi-Public Uses

Off-Street Parking Lot Landscaping

73.320 Off-Street Parking Lot Landscaping Standards

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

73.360 Off-Street Parking Lot Landscape Islands -  
Commercial, Industrial, Public, and Semi-Public Uses

73.370 Off-Street Parking and Loading

73.380 Off-Street Parking Lots (6)

73.390 Off-Street Loading Facilities

73.400 Access

## **II. INTRODUCTION AND PROPOSAL**

This application package includes narrative, plans, drawings, and additional documentation in support of an Architectural Review (AR) for three speculative industrial buildings at Koch Corporate Center near SW 115th and SW Itel Street in Tualatin. Pacific Realty Associates, L.P. (PacTrust) is the applicant and developer.

### **Site Description**

The subject site is specifically described as map 2S127AC, lot 700. The subject lots and surrounding properties are industrially zoned MG – General Manufacturing Planning District. Surrounding properties are a mix of undeveloped and developed parcels.

The overall Koch Corporate Center is bound by SW Tualatin Sherwood Road to the north and SW 115th Avenue to the west; SW Itel Street bisects the property east to west. Existing industrial development abuts the site to the south and east. The street frontages of SW 115th Avenue and SW Itel Street have been designed and constructed to meet or exceed the intent of City of Tualatin Public Works standards.

### **Previous Permits**

The site was previously subdivided through SB-11-01. Architectural review for the two buildings under construction at the northwest corner of Itel and 115th Avenue was previously completed under AR-12-05, and Lots 1, 5, and 8 were approved under AR-15-05.

### **Proposal**

The three buildings (10, 11, and 12) will be 38,812 SF, 42,500 SF, and 45,941 SF, respectively. They are speculative buildings at this time; specific tenants are not yet determined. This proposal is for a phased development. The applicant requires the flexibility to phase the proposed development as market needs and demand dictate in which order the buildings are constructed. Each lot and building will be designed and constructed with the ability to be developed individually. As shown in the attached plans each building will exist on future platted lots – the final plat is currently under review at Washington County. This application addresses the applicable development standards for the proposed three buildings.

The proposed development will be an aesthetic asset to the area. The landscape design and architectural features will create a business park feel. The buildings will be painted, scored concrete tilt-up and will have windows and storefront details to provide an office appearance along the front and side facades. The entryways will be recessed, and the entry feature will be protruded for articulation along the front façades. The overall appearance for this industrial development will be businesslike.

A scoping meeting for this project was held with the City of Tualatin on October 15, 2015. The applicant submitted a request that the scoping meeting satisfy the requirements for the pre-application conference. A neighborhood/developer meeting was held on December 3, 2015; mailing labels, invitation letter, affidavit of mailing, certification of posting, and meeting sign-in sheet are attached to this application as Exhibit D.

Figure II.1 Aerial Map of Subject Site



### III. DEVELOPMENT CODE COMPLIANCE OVERVIEW

The proposed development complies with City of Tualatin Development Code standards, as shown below. As mentioned above, this application requests AR approval for a new 126,753 SF warehouse/manufacturing/office (buildings are speculative at this time) development on the 10-acre site. There will be three separate buildings; the following table summarizes the specific lots and buildings:

Table III.1 Site Analysis				
	Building 10	Building 11	Building 12	Site Total or Average
Lot Area (SF)	150,996	128,107	169,377	<b>448,480</b>
Building Area (SF)	38,812	42,500	45,941	<b>127,253</b>
Building Coverage On Lot (%)	25.8%	35.8%	27.1%	<b>29.6%</b>
Landscape Area (SF)	30,198	23,240	37,044	<b>90,482</b>
Landscape %	19.9%	17.7%	21.9%	<b>19.8%</b>
Total Parking	73	65	108	<b>246</b>
Accessible Parking	4	4	5	<b>13</b>
Van/Carpool Parking	4	4	5	<b>13</b>
Bicycle Parking	6	6	6	<b>18</b>

#### On-Site Development

This application proposes three buildings: 38,812 SF, 42,500 SF, and 45,941 SF. No specific tenants are known at this time. The buildings are designed for warehouse and manufacturing uses (see sheet C2.1). The site is zoned MG – General Manufacturing and the proposed uses are permitted outright.

The buildings will range from 27.5' to 35' tall and will all be tilt-up concrete with a decorative scoring pattern and paint scheme (see attached colored perspectives). Storefront entrance systems and windows are proposed along the building façades to help break up the scale of the buildings and provide articulation facing the abutting streets. Loading docks will be located between Buildings 10, 11, and Building 12. The loading docks on the west end of Building 11 will be buffered by the change in grades from SW 115th to the west and Tualatin-Sherwood Road to the north. The location and design of the trash and recycling areas for each building have been approved by Republic Services, the solid waste hauler (see Exhibit G, letter from Frank Lonergan).

As shown in the table above, 246 parking spaces will be provided to serve the building users, with 13 of these being ADA compliant. Parking lot landscaping and perimeter landscape materials are proposed in accordance with City code standards.

#### Stormwater

- Buildings 10, 11, and 12: LIDA basins are proposed at various locations on the lots and are designed to provide water quality. A series of pipes and catch basins will collect the remainder of the impervious area.

### ***Stormwater System***

A public stormwater system has been designed and permitted that will be constructed north of Building 10.

See attached utility plans (C2.3) for details.

### ***Sanitary Sewer System***

- Building 10: The sanitary sewer connection will be made from an existing lateral in the private street to the south.
- Buildings 11 and 12: The sanitary sewer connection will be made from an existing lateral in 115th Avenue.

All three buildings will use gravity drains, and no pumps will be required. See attached utility plans (C2.3 for Building 1 and C2.3 for buildings 5 and 8) for details.

### ***Streets***

- Vehicle and truck access for Buildings 10, 11, and 12 will be from the private drive to the south. There are three driveways proposed as shown on Sheet C2.1. No vehicle access is proposed to either SW 115th Avenue or SW Tualatin Sherwood Road.

#### IV. ARCHITECTURAL REVIEW APPROVAL CRITERIA

This application addresses the necessary approval standards of the Tualatin Development Code relevant to Architectural Review for industrial development. As described in the following narrative, the proposal meets the standards of TDC Chapter 61: General Manufacturing Planning District (MG) and TDC Chapter 73: Community Design Standards.

The following tables identify applicable development standards and how the proposed development satisfies each (see the complete tables on the attached site plan C2.1 for full calculations).

Table IV.2 Development Standards		
	City of Tualatin (MG District)	Proposed (Bldgs 10, 11, 12)
<b>Setback Requirements</b>		(from property line to building)
Front Yard	30'	53' minimum
Side Yard	0'	30' minimum
Rear Yard	0'	3' minimum (trash enclosures)
<b>Parking and Circulation</b>	10' (adjacent to 115th and Tualatin Sherwood) 5' (when internal)	23' minimum
<b>Maximum Structure Height</b>	60'	35'
<b>Landscaping</b>	15% of total site area	19.8% of total site area
<b>Minimum Parking (per 1,000 GSF)</b>		
Warehousing	0.3	0.5 per 1,000 Average
Manufacturing	1.6	
<b>Maximum Parking (per 1,000 GSF)</b>	<u>Zone B</u>	
Warehousing	0.5	
Manufacturing	None	
<b>Minimum Bicycle Parking</b>	Warehousing/Manufacturing: 2, or 0.1 per 1,000 GSF, whichever is greater	18
<b>Percentage of Bicycle Parking to be Covered</b>	First 5 spaces or 30% of parking spaces, whichever is greater	33.3%

For the purposes of determining parking ratios, the future tenant spaces of Building 10, 11, and 12 have been estimated based on a likely mix of uses (70% warehousing and 30% manufacturing). The minimum parking ratio has been met and exceeded to ensure that the development can serve its future tenants and allow for flexibility, since the tenants are unknown at this time.

## Chapter 61: General Manufacturing Planning District

### Section 61.020 Permitted Uses

*No building, structure or land shall be used, except for the following uses as restricted in TDC 61.021.*

(1) *All uses permitted by TDC 60.020 in the Light Manufacturing Planning District.*

**Response:** The future proposed uses associated with this development are manufacturing and warehousing; these uses are allowed in the MG district. While future tenants have not been identified, it is known that the development will serve warehousing and manufacturing uses. This standard is met.

### Section 61.050 Lot Size

*Except for lots for public utility facilities, natural gas pumping stations and 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 area shall be 20,000 square feet.*

(2) *The minimum lot width shall be 100 feet.*

(3) *The minimum average lot width at the building line shall be 100 feet.*

(4) *The minimum lot width at the street shall be 100 feet.*

(5) *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).*

(6) *The minimum lot width at the street shall be 50 feet on a cul-de-sac street.*

**Response:** As shown on the attached plans (see sheet C2.1), all lots meet the current dimensional standards for the MG zone. This standard is met.

### Section 61.060 Setback Requirements

(1) *Front yard. The minimum setback is 30 feet. When the front yard is across the street from a residential or Manufacturing Park (MP) district, a front yard setback of 50 feet is required. When a fish and wildlife habitat area 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 non-profit conservation organization or is retained in private ownership by the developer, the minimum setback is 10 – 30 feet, as determined in the Architectural Review process, with the exception of front yards across the street from a residential or MP District, provided the buildings are located farther away from fish and wildlife habitat areas.*

**Response:** This proposal is for an Architectural Review. Front yard setbacks will be determined by this process. This standard is met.

(2) *Side yard. The minimum setback is 0 to 50 feet, as determined through the Architectural Review process. When the side yard is adjacent to a property line or across the street from a residential or Manufacturing Park (MP) District, a side yard setback of 50 feet is required.*

**Response:** This proposal is for an Architectural Review. Side yard setbacks will be determined by this process. This standard is met.

(3) *Rear yard. The minimum setback is 0 to 50 feet, as determined through the Architectural Review process. When the rear yard is adjacent to a property line or across the street from a residential or Manufacturing Park (MP) District, a rear yard setback of 50 feet is required.*

**Response:** This proposal is for an Architectural Review. Rear yard setbacks will be determined by this process. This standard is met.

- (4) *Corner lot yards. The minimum set-back is the maximum setback prescribed for each yard for a sufficient distance from the street intersections and driveways to provide adequate sight distance for vehicular and pedestrian traffic at intersections and driveways, as determined through the Architectural Review process.*

**Response:** This proposal is for an Architectural Review. The corner lot yard setbacks (for Buildings 11 and 12, located on a corner lot) will be determined by this process. This standard is met.

- (5) *The minimum parking and circulation area setback is 5 feet, except when a yard is adjacent to public streets or Residential or Manufacturing Park District, the minimum setback is 10 feet. No setback is required from lot lines within ingress and egress areas shared by abutting properties in accordance with TDC 73.400(2).*

**Response:** As shown in the attached plans, the minimum proposed parking and circulation area setback is 5 feet adjacent to other lots and over 24' adjacent to a public street. The site does not abut a residential or manufacturing park district. This standard is met.

- (6) *No spur rail trackage shall be permitted within 200 feet of an adjacent residential district.*

**Response:** The proposed development does not include rail spur trackage. This standard does not apply.

- (7) *No setbacks are required at points where side or rear property lines abut a rail-road right-of-way or spur track.*

**Response:** The property lines do not abut a rail right-of-way or spur track. This standard does not apply.

- (8) *No fence shall be constructed within 10 feet of a public right-of-way.*

**Response:** No fences are proposed in the proposed development. This standard does not apply.

- (9) *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.*

**Response:** The proposed development does not include a wireless communication facility. This standard does not apply.

## **Chapter 73: Community Design Standards**

### ***Architectural Review Approval***

#### *Section 73.050 Criteria and Standards*

- (1) *In exercising or performing his or her powers, duties, or functions, the Planning 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;*
  - (b) *The proposed design of the development is compatible with the design of other developments in the general vicinity; and*

- (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 proposed development is consistent with the existing industrial development on all sides, all zoned MG and similarly developed. The proposed development has been designed as a high-quality and long lasting development, similar to other PacTrust properties. The development will be compatible with future surrounding industrial properties. As shown below and on the enclosed plans, the proposed development meets the applicable standards of the City of Tualatin Development Code. This standard is met.

- (2) *In making his or her determination of compliance with the above requirements, the Planning 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:** This application includes architectural features as well as utility facilities and public improvements. Mackenzie has worked closely with the City of Tualatin to plan utilities in a manner consistent with City code and beneficial for both the subject site and the surrounding area. This standard is met.

- (3) *In determining compliance with the requirements set forth, the Planning Director shall consider the effect of his or her action on the availability and cost of needed housing...*

**Response:** The proposed development does not include housing. This standard does not apply.

- (4) *As part of Architectural Review, the property owner may apply for approval to cut trees in addition to those allowed in TDC 34.200. The granting or denial of a tree cutting permit shall be based on the criteria in TDC 34.230.*

**Response:** The development will make use of a previously developed site that has been mass graded and improved as part of the Koch Corporate Development. There are existing street trees along the northern side of the private drive to the south. There are five existing trees at the east end of the site, east of proposed Building 10. These trees are between 24-36 inches in diameter, are outside the development area, and will be retained. No trees are proposed to be removed and no tree cutting permit is proposed at this time. This standard does not apply.

- (5) *Conflicting Standards. In addition to the MUCOD requirements, the requirements in TDC Chapter 73 (Community Design Standards) and other applicable Chapters apply...*

**Response:** The subject site is not within the MUCOD. This standard does not apply.

## **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:** As shown on the attached plans (see sheet C2.1), 5' to 6.5' wide concrete walkways will be provided between primary building entries and parking areas. Sidewalks along the site's frontage of SW 115th Avenue have been designed and approved through a previous phase of development. Walkways are designed to be ADA compliant. This objective is met.

(2) *Avoid barriers to disabled individuals.*

**Response:** As shown in the attached plans, barriers to disabled individuals will be avoided and ADA and local codes will be met to provide adequate facilities. This objective is met.

(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 proposed development does not include drive-through facilities. This objective does not apply.

(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 in the attached Civil and Landscape plans, parking areas will be broken up by landscaping and walkways across the three lots. This objective is met.

(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:** As shown in the attached Civil and Landscape plans, landscaping shapes in parking areas will provide structure and direction for vehicular movement, as well as screening from headlights, across the three lots. This objective is met.

(6) *Provide vehicular connections to adjoining sites.*

**Response:** As shown in the attached plans (see sheet C2.1), convenient vehicular connections will be available between Buildings 10, 11, and 12 and existing Buildings 6 and 7 and future Buildings 5 and 8. This objective is met.

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

**Response:** As shown in the attached plans (see L-1 and L-2 for Buildings 10, 11, and 12), landscaping will emphasize the entries to all three buildings. This objective is met.

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

**Response:** As shown in the attached Civil and Landscape plans, parking areas will be broken up by landscaping and walkways across the three lots. This objective is met.

(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:** This proposal is for industrial development, and no areas for pedestrian lingering are safe or proposed. However, as shown in the attached plans (see L-1 and L-2 for Buildings 10, 11, and 12), plantings with a variety of textures will be included. This objective does not apply but is met as much as practical.

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

**Response:** This proposal is for industrial development, and no areas for pedestrian visiting are safe or proposed. This objective does not apply.

(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:** There are no fish or wildlife habitat areas on any of the lots. This objective does not apply.

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

**Response:** As shown on the attached plans (see sheet C2.1), 5' to 6.5' wide concrete walkways will be provided between primary building entries and parking areas. Sidewalks along the site's frontage of SW 115th Avenue have been designed and approved with a previous phase of development. Walkways will be ADA compliant. This objective is met.

(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:** The proposed development does not include commercial, public, or semi-public uses. This objective does not apply.

(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:** The proposed development does not include commercial, public, or semi-public uses. This objective does not apply.

(15) *Provide accessways between industrial development and abutting greenways where a bikeway or pedestrian path is provided or designated.*

**Response:** As shown on the attached plans (see sheet C2.1 for Building 1 and C2.1 for buildings 5 and 8), accessways will be provided between the proposed industrial buildings and the future trail when it is developed by others. An accessway connection will be provided from Building 10 to the Ice Age Tonquin Trail to the east as shown on sheet C2.1. Since the exact location and grade cannot be identified at this time, the connection will not be fully constructed. This objective is met.

(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 shown on the attached plans (see sheet C2.1), accessways will be provided between the proposed industrial buildings and the future trail when it is developed by others. Exact locations can be identified at that time, but potential locations are shown on the site plans and will not affect, restrict, or inhibit development opportunities for adjacent properties. This objective is met.

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

**Response:** As shown on the attached plans (see sheet C2.1), carpool/vanpool will be provided. These spaces will be provided at the rates required by 73.370.3., as addressed in that section of this narrative. This objective is met.

(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:** As shown on the attached plans, on-grade electrical or mechanical equipment is proposed. The equipment will be placed internal to the site, within the loading areas and screened from the public view by landscaping, retaining walls, or grade changes from adjacent public right-of-way. The proposed development does not include any pump stations, reading stations, or water reservoirs; this portion of this objective (and 73.160.4.c.) does not apply.

(19) *Parking structure exteriors and underground parking should be designed to be harmonious with surrounding buildings and architecturally compatible with the treatment of buildings they serve.*

**Response:** The proposed development does not include any parking structures or underground parking. This objective does not apply.

(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.*

**Response:** No fish and wildlife habitat area abuts or is on the subject property. This objective does not apply.

#### *Section 73.160 Standards*

(1) *Pedestrian and Bicycle Circulation:*

(b) *For Industrial Uses:*

(i) *a walkway shall be provided from the main building entrance to sidewalks in the public right-of-way and other on-site buildings and accessways. The walkway shall be a minimum of 5 feet wide and 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 attached plans (see sheet C2.1), 5' to 6.5' wide concrete walkways will be provided between primary building entries and parking areas. Sidewalks along the site's frontage of SW 115th Avenue have been designed and approved with a previous phase of development. Walkways are designed to be ADA compliant. This standard is met.

(ii) *Walkways through parking areas, drive aisles and loading areas shall have a different appearance than the adjacent paved vehicular areas.*

**Response:** As shown on the attached plans (see sheet C2.1), 6' to 8.5' wide scored concrete walkways will be provided where the route crosses drive aisles. This standard is met.

(iii) *Accessways shall be provided as a connection between the development's walkway and bikeway circulation system and an adjacent bike lane;*

**Response:** There is a bike lane on SW Tualatin Sherwood Road. As shown on the attached plans (see sheet C2.1), access for bikes will be available via the accessway on Lot 12. This standard is met.

(iv) *Accessways may be gated for security purposes;*

**Response:** Accessways are not proposed to be gated.

- (v) *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 attached plans (see sheet C2.1), accessways will be provided between the proposed industrial buildings and the future trail when it is developed by others. Since the trail elevation and design is not set, the connection to the Ice Age Tonquin Trail will not be constructed east of Building 10 at this time. An easement will be provided for this future connection. This standard is met.

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

**Response:** Curb ramps will be provided where the walkway crosses a curb or drive aisle, as shown on the attached site plans (see sheet C2.1). This standard is met.

- (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 accessways 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:** A public accessway is provided from Building 10 to the future Tonquin Trail to the east and from Building 12 to Tualatin Sherwood Road as shown on the attached plans (see sheet C2.1). These designated accessways are a minimum of 8 feet wide concrete. Additionally, on-site walkways will be provided between primary building entries, and parking areas. This standard is met.

- (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 review and approval.*

**Response:** No accessways to undeveloped parcels or transit facilities are required or proposed. This standard does not apply.

- (f) *Where a bridge or culvert would be necessary to span a designated greenway or wetland to provide a connection to a bike or pedestrian path, the City may limit the number and location of accessways to reduce the impact on the greenway or wetland.*

**Response:** There are no wetlands on the site. This standard does not apply.

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

**Response:** All accessways will be constructed, owned, and maintained by the applicant. This standard is met.

## (2) *Drive-up Uses*

**Response:** The use proposed does not include a drive-up facility. This section does not apply.

## (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.*

**Response:** In order to create a safe environment, the proposed development includes exterior building lighting as well as parking lot lighting (see attached site plan C2.1 and lighting cut sheets). As shown in the attached architectural plans (A3.1 – A3.3), windows will be located on at least three elevations of all buildings, thus facing all parking areas and facing as many pedestrian, drive aisle, and loading areas as possible. This standard is met.

*(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.*

**Response:** The proposed industrial development will be oriented to the street and public rights-of-way along SW 115th Avenue, SW Tualatin-Sherwood Road, and to the private street to the south; on building frontages along these streets, additional storefront window systems will allow building users the ability to view abutting pedestrian and parking areas. Windows will be visible from the sidewalks. Dock doors will include windows to allow visibility to loading areas. In addition (see lighting plan SL1), site lighting will illuminate the building frontages and the parking area in between the building and right-of-way. This standard is met.

*(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.*

**Response:** No fish or wildlife habitat areas exist near the site. As shown on the lighting plan (SL1), site lighting will illuminate the buildings, loading areas, and parking areas, allowing these areas to be seen from the right-of-way. This standard is met.

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

**Response:** As shown in the attached plans (see A3.1 for Building 10 and A3.2 for Building 11 and A3.3 for Building 12), building addresses will be mounted at building corners near entrances, clearly visible for building users and from the adjacent rights-of-way. Building and site signage (through separate applications) will clearly identify tenant entrances for visitors and site users. This standard is met.

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

**Response:** As shown in the attached landscape plans (L Sheets in the plan set), landscaping in the parking areas will meet these standards. No trees will be planted in clear vision areas, and shrub species in vision clearance areas of the parking area will be no higher than 30". This standard is met.

*(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.*

**Response:** The proposed development does not include any of these elements. This standard does not apply.

**(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.*

**Response:** Proposed transformers will be internal to the site and screened from public streets by buildings, grade changes, and landscaping as shown on the plans included with this submittal. Transformers are shown on Sheet C2.1, Keynote 23. This standard is met.

(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.*

**Response:** The proposed development does not include any outdoor storage except trash and recycling enclosures. This standard does not apply.

(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:** The proposed development does not include any of these elements. This standard does not apply.

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

**Response:** The site plan and building are generated with the knowledge that ADA and OSSC standards must be met during the building permit process. This standard is met.

(6) (a) *All industrial, institutional, retail and office development on a transit street designated in TDC Chapter 11 (Figure 11-5) 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.*

**Response:** Tualatin-Sherwood Road to the north of the site is a transit street as designated in TDC Chapter 11. Sidewalk improvements along Tualatin-Sherwood Road have been designed and approved by City of Tualatin and Washington County. Additionally, an on-site pedestrian circulation system is proposed as shown on the site plan included with this submittal (see sheet C2.1). This standard is met.

(b) *In addition to (a) above, new retail, office and institutional uses abutting major transit stops as designated in TDC Chapter 11 (Figure 11-5) shall...*

**Response:** The site is for industrial and does not abut a major transit stop shown in the figure. This standard does not apply.

### *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:** The site has been mass graded and improved as part of the Koch Corporate Development. There are no natural features such as water features or trees on the site. The site's natural features

were disturbed during the original development of previous phases of the site's development, and no further disruption will occur. This objective is met.

- (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:** Generous glazing along the street-facing façades, in combination with extruded storefront entrance systems, will clearly highlight the main entrances for the buildings. Additional windows will be provided along the corner façades to emphasize corners and provide visual interest where potential office areas may occur. All proposed window areas will allow building users to view the abutting parking areas. Other building elements, such as reveals, roof forms, and parapets, will be consistent among the Koch Corporate Center and similar to other industrial buildings in Tualatin, and will create a cohesive design. The reveals will be spaced to create a human scale, align with building elements, create an overall balanced façade, and will be consistent between the three buildings. The roof forms will be screened by the parapets; that look will be cohesive amongst other tilt concrete buildings in the area. This objective is met.

- (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.*

**Response:** As shown in the attached plans (see sheet C2.1), the loading areas for Building 10 and 11 will be located along the north side of the buildings, with access to the private street to the south. The loading and service areas for Buildings 12 will be oriented to the south, internal to the development. Loading docks will be accessed via the private street to the south. This objective is met.

- (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 provided landscape will improve energy efficiency for the three buildings; where possible, trees will be located on the south and west sides of the buildings to provide shade. Modern, efficient insulation will be used in all buildings according to the ComCheck energy modeling tool, in compliance with the Oregon Energy Code. This objective is met.

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

**Response:** As shown in the attached plans, entries and loading/service areas will be located along the wide sides of buildings for function and accessibility, screened from view by landscaping and/or other buildings or grade changes. This objective is met.

- (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:** As shown in the attached architectural plans, in order to create a safe environment, windows will be located on all elevations of all buildings, thus facing all parking areas and facing pedestrian areas, drive aisles, and loading areas. Windows will be visible from walkways. This objective is met.

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

**Response:** The building materials (concrete tilt-up with reveals, storefront window glazing, and decorative elements such as paint schemes emphasizing the entrances and storefront) are typical of and suitable for similar industrial buildings in the region and area. The materials contribute to the industrial identity of the area with the surrounding industrial uses while providing an attractive site to future warehouse and manufacturing tenants and users. See attached colored elevations (Exhibit I) for renderings. This objective is met.

(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 warm tan color scheme selected for the proposed buildings will create a visually appealing development. The color selection and placement will create a visual balance and add emphasis to the entrances and storefronts of the three buildings. See attached colored perspectives (Exhibit I) for renderings. This objective is met.

(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:** As shown in the attached architectural plans, in order to create a safe environment, windows will be located along all elevations, thus facing all parking, pedestrian, drive aisle, and loading areas. Windows will be visible from walkways. This objective is met.

(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.*

**Response:** As shown in the attached architectural plans, in order to create a safe environment, windows will be located on at all elevations of all buildings, thus facing all parking areas, pedestrian areas, drive aisles, and loading areas. Windows will be visible from walkways. In addition, exterior lighting will be located around the buildings at strategic locations to provide lighting at walkways and near building windows, allowing pedestrians and other users of the right-of-way to clearly view the buildings and dock areas (see attached lighting plan, SL1). This objective is met.

#### Section 73.220 Standards

(1) *Safety and Security*

(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.*

**Response:** As shown in the attached plans, all buildings will be oriented toward street frontages. In order to create a safe environment, the proposed development includes exterior building lighting as well as parking lot lighting (see attached lighting plan SL1). Site lighting will illuminate the building frontages and the parking area in between the building and right-of-way. No fish or wildlife habitat areas exist near the site. This standard is met.

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

**Response:** Building addresses will be mounted at building corners near entrances, clearly visible for building users and from the adjacent rights of way. Separate applications for building and site signage will clearly identify tenant entrances for visitors and site users. This standard is met.

(c) *Shrubs in parking areas shall not exceed 30 inches in height, and tree canopies must not extend below 8 feet measured from grade, ...*

**Response:** As shown in the attached landscape plans (see L Sheets in plan set), landscaping in the parking areas will meet these standards. Tree canopies will be maintained to be no lower than 8' at grade, and shrub species in vision clearance areas of the parking area will be no higher than 30". This standard is met.

### *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.*

**Response:** As shown on the attached plans, six trash/recycling areas are proposed for the buildings, providing easy access and maneuverability for the solid waste hauler. These will be placed to the interior of the lots within the loading and maneuvering areas or to the rear of the building and will be screened by sight-obscuring painted concrete tilt-up walls and metal gates as well as sight-obscuring evergreen shrubs (in accordance with 73.227(6)(b)(iii), as addressed in that section of this narrative). This objective is met.

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

**Response:** As shown on the attached plans, trash enclosures will be located across the lots, two per building, providing convenient access for both building users and the trash hauler. The trash enclosures will be located near entrance doors, loading areas, and parking areas and drive aisles, and have been approved by Republic Services (see Exhibit G, letter from Frank Lonergan). This objective is met.

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

**Response:** Republic Services, the trash hauler for the proposed development, requires 20'x10' enclosures with no center posts, in addition to 35"-40" openings for glass carts and user access. Trash containers will be typically 3-4 cubic yard size and be 8' wide and 4'-5' deep. As shown on the attached plans (see details on A8.1 – A8.3), trash enclosures will be 14' by 20', and will include 4' wide openings for carts and pedestrian users. These have been approved by Republic Services (see Exhibit G, letter from Frank Lonergan). This objective is met.

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

**Response:** As shown on the attached plans, trash enclosures will be placed to the interior or rear of the lots within the loading and maneuvering areas and will be screened by sight-obscuring painted concrete tilt-up walls and metal gates as well as sight-obscuring evergreen shrubs. This objective is met.

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

**Response:** As shown, the trash enclosures will accommodate both recycling, glass recycling, and garbage containers. All trash enclosures will accommodate typical Republic Services trash and recycling containers (trash containers will be typically 8' wide and 4'-5' deep). This objective is met. Per City standards, 10 SF of garbage storage per 1,000 SF of building will be provided for each building, as described in Section 73.227.(2)(a)(v) , and have been approved by Republic Services (see Exhibit G, letter from Frank Lonergan). This objective is met.

(6) *Improve the efficiency of collection of mixed solid waste and source separated recyclables.*

**Response:** According to Republic Services and City standards, the trash enclosures are designed to efficiently accommodate both trash and recycling containers, and allow convenient access by hauler vehicles. These have been approved by Republic Services (see Exhibit G, letter from Frank Lonergan). This objective is met.

#### *Section 73.227 Standards*

(1) *The mixed solid waste and source separated recyclables storage standards shall apply to all new or expanded multi-family residential developments containing five or more units and to new or expanded commercial, industrial, public and semi-public development.*

**Response:** The project is a new industrial development. These standards apply and are addressed below. The applicant chose to implement the minimum standards method to demonstrate compliance.

(2) *Minimum Standards Method.*

(a) *The size and location of the storage area(s) shall be indicated on the site plan. Compliance with the requirements set forth below are reviewed through the Architectural Review process.*

(i) *The storage area requirement is based on the area encompassed by predominant use(s) of the building (e.g., residential, office, retail, wholesale/warehouse/manufacturing, educational/institutional or other) as well as the area encompassed by other distinct uses. If a building has more than one use and that use occupies 20 percent or less of the gross leasable area (GLA) of the building, the GLA occupied by that use shall be counted toward the floor area of the predominant use(s). If a building has more than one use and that use occupies more than 20 percent of the GLA of the building, then the storage area requirement for the whole building shall be the sum of the area of each use.*

**Response:** As shown on the attached plans, each building is expected to contain tenants of a mix of uses, although no specific tenants are yet known. The calculation below in section 73.227(2)(a)(v) explains the required solid waste storage area for each building. This standard is met.

(ii) *Storage areas for multiple uses on a single site may be combined and shared.*

**Response:** While no tenants are proposed at this time, it is anticipated that the buildings will include a mix of warehouse and manufacturing users (approximately 30 percent manufacturing and 70 percent warehouse). Two trash enclosures are proposed for each building. This standard is met.

(iii) *The specific requirements are based on an assumed storage area height of 4 feet for mixed solid waste and source separated recyclables. Vertical storage higher than 4 feet, but no higher than 7 feet may be used to accommodate the same volume of storage in a reduced floor space (potential reduction of 43 percent of specific requirements). Where vertical or stacked storage is proposed, submitted plans shall include drawings to illustrate the layout of the storage area and dimensions for containers.*

**Response:** No stacked or vertical storage is proposed. This standard does not apply.

(iv) *Multi-family residential developments containing 5-10 units shall provide a minimum storage area of 50 square feet. Multi-family residential developments containing*

*more than 10 units shall provide 50 square feet plus an additional 5 square feet per unit for each unit above 10.*

**Response:** The project does not include any multi-family residential development. This standard does not apply.

(v) *Commercial, industrial, public and semi-public developments shall provide a minimum storage area of 10 square feet plus: Office - 4 square feet/1000 square feet gross leasable area (GLA); Retail - 10 square feet/1000 square feet GLA; Wholesale/ Warehouse/ Manufacturing - 6 square feet/1000 square feet GLA; Educational and institutional - 4 square feet/1000 square feet GLA; and other - 4 square feet/1000 square feet GLA.*

**Response:** As shown in the table below and in the attached plans (see sheet C2.1), trash enclosure requirements vary by building and use, but tenants of each building will share trash enclosures. The enclosures proposed will be more than adequate and are far more than are required for each building and use. This standard is met.

Trash Enclosure Requirements			
	Use	Trash Enclosures (SF)	
		Required: 6 SF per 1,000 SF Building Area	Provided
<b>Building 10</b>	Warehouse/ Manufacturing	233	240
<b>Building 11</b>	Warehouse/ Manufacturing	255	480
<b>Building 12</b>	Warehouse/ Manufacturing	276	480
<b>Additional 10 SF</b>		10	
	<b>Total</b>	<b>774</b>	<b>1,200</b>

Trash/recycling areas will be 240 SF in size and will provide easy access and maneuverability for the solid waste hauler. These will be placed to the interior or rear of the lots within the loading and maneuvering areas and will be screened by sight-obscuring painted concrete tilt-up walls and metal gates as well as sight-obscuring arborvitae evergreen shrubs. The local garbage hauler, Republic Services, has reviewed and approved the proposed design (see Exhibit G, letter from Frank Lonergan). This standard is met.

(6) *Location, Design and Access Standards for Storage Areas.*

(a) *Location Standards*

(i) *To encourage its use, the storage area for source separated recyclables may be co-located with the storage area for mixed solid waste.*

**Response:** As shown in the attached plans (see details on A8.1 – A8.3), the trash enclosure areas will include space for recyclables as well as trash. This standard is met.

(ii) *Indoor and outdoor storage areas shall comply with Building and Fire Code requirements.*

**Response:** As shown in the attached plans (see details on A8.1 – A8.3), the trash enclosure areas will comply with Building and Fire Code requirements and will be constructed entirely of non-combustible materials. This standard is met.

*(iii) Storage area space requirements can be satisfied with a single location or multiple locations, and can combine both interior and exterior locations.*

**Response:** As shown in the attached plans and described above, eight trash enclosures will be provided to serve the three buildings; these will all be located in exterior locations. This standard is met.

*(iv) Exterior storage areas shall not be located within a required front yard setback or in a yard adjacent to a public or private street.*

**Response:** As shown in the attached plans (see sheet C2.1), all trash enclosure areas will be located in the loading and drive areas; none are located in the required setbacks or in yards between buildings and the public streets. In addition, all trash enclosures will be screened with evergreen arborvitae shrubs, as shown on the attached landscape plans (see L Sheets in plan set). Locations have been approved by Republic Services, as shown in Exhibit G. This standard is met.

*(v) Exterior storage areas shall be located in central and visible locations on the site to enhance security for users.*

**Response:** As shown in the attached plans (see sheet C2.1), all trash enclosure areas will be located in easily accessible. This standard is met.

*(vi) Exterior storage areas can be located in a parking area, if the proposed use provides parking spaces required through the Architectural Review process. Storage areas shall be appropriately screened according to TDC 73.227(6)(b)(iii).*

**Response:** As shown in the attached plans (see sheet C2.1), all trash enclosure areas will be located in the loading and drive areas adjacent to parking areas. All required parking spaces will be provided in the parking lots. Trash enclosures will be screened by sight-obscuring painted concrete tilt-up walls and metal gates as well as sight-obscuring evergreen shrubs. This standard does not apply and is met.

*(vii) Storage areas shall be accessible for collection vehicles and located so that the storage area will not obstruct pedestrian or vehicle traffic movement on site or on public streets adjacent to the site.*

**Response:** As shown in the attached plans (see sheet C2.1), all trash enclosure areas will be located in easily accessible locations along internal maneuvering areas; use of these areas will not obstruct the required drive aisle width and no pedestrian paths cross their access areas. According to Republic Services standards, all trash enclosures sizes and locations meet their requirements, so trucks can maneuver easily. This standard is met.

*(b) Design Standards*

*(i) The dimensions of the storage area shall accommodate containers consistent with current methods of local collection at the time of Architectural Review approval.*

**Response:** As shown on the attached plans, and discussed in this narrative, all trash enclosures meet the size requirements of the City and hauler, Republic Services. The proposed development will meet the Minimum Standards method for trash storage, as discussed in this narrative's response to Section 73.227.(2)(A). This standard is met.

(ii) *Storage containers shall meet Fire Code standards and be made and covered with water proof materials or situated in a covered area.*

**Response:** Storage containers will be provided by Republic Services and will be standard trash and recyclable storage receptacles, made of and covered with waterproof metal and/or plastic. This standard is met.

(iii) *Exterior storage areas shall be enclosed by a sight obscuring fence or wall at least 6 feet in height. In multi-family, commercial, public and semi-public developments evergreen plants shall be placed around the enclosure walls, excluding the gate or entrance openings. Gate openings for haulers shall be a minimum of 10 feet wide and shall be capable of being secured in a closed and open position. A separate pedestrian access shall also be provided in multi-family, commercial, public and semi-public developments.*

**Response:** As shown on the attached plans, trash/recycling areas will be screened by sight-obscuring painted concrete tilt-up walls and metal gates as well as sight-obscuring evergreen shrubs surrounding the trash and recycling units. Gate openings will be 25' wide. The project is not a multi-family, commercial, public, or semi-public development. This standard is met.

(iv) *Exterior storage areas shall have either a concrete or asphalt floor surface.*

**Response:** As shown in the attached plans (see details on A8.5), the trash enclosures will have concrete footings and concrete slab bases. This standard is met.

(v) *Storage areas and containers shall be clearly labeled to indicate the type of material accepted.*

**Response:** Storage containers will be provided by Republic Services and will be standard trash and recyclable storage receptacles, clearly labeled. This standard is met.

(c) *Access Standards*

(i) *Access to storage areas can be limited for security reasons. However, the storage areas shall be accessible to users at convenient times of the day, and to hauler personnel on the day and approximate time they are scheduled to provide hauler service.*

**Response:** In accordance with Republic Services standards, trash enclosures will have gates that open by up to 180 degrees. Gates can be latched when closed, but storage areas will be accessible to haulers and pedestrians through gates and the pedestrian/cart access openings (staggered closures). This standard is met.

(ii) *Storage areas shall be designed to be easily accessible to hauler trucks and equipment, considering paving, grade, gate clearance and vehicle access. A minimum of 10 feet horizontal clearance and 8 feet vertical clearance is required if the storage area is covered.*

**Response:** As shown on the attached plans (see sheet C2.1), the trash enclosure areas will be placed to the interior or rear of the lots within the loading and maneuvering areas and will provide easy access and maneuverability for the solid waste hauler. Trash enclosures will not be covered. This standard is met.

(iii) *Storage areas shall be accessible to collection vehicles without requiring backing out of a driveway onto a public street. If only a single access point is available to the*

*storage area, adequate turning radius shall be provided to allow vehicles to safely exit the site in a forward motion.*

**Response:** As shown on the attached plans (see sheet C2.1), no use of the public street will be required for access to any of the trash enclosures. Adequate turning radius will be available for each. This standard is met.

**Landscaping**

*Section 73.240 Landscaping General Provisions*

(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:** As shown in the table below and in the attached plans (see sheet C2.1 ), on average across the three lots, 19.8% of the proposed development will be landscaped. This standard is met.

Landscape Coverage				
Use	Warehouse/Distribution/Supporting Office			
	Building 10	Building 11	Building 12	Site Total or Average
Lot Area (SF)	150,996	128,107	169,377	<b>448,480</b>
Landscape Area (SF)	30,198	23,240	37,044	<b>90,482</b>
Landscape %	19.9	17.7	21.9	<b>19.8</b>

(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:** All landscaped areas will be covered with living plant materials, including trees, shrubs, and groundcover. Bark mulch will cover ground in the landscaped areas between plantings, suppressing weeds and retaining moisture. There are no disturbed soils on the site that need to be amended. This standard is met or does not apply.

(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.*

**Response:** No new fences are proposed for the project. This standard does not apply.

*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:** The existing street trees along the private road to the south of Buildings 10 and 11 will be retained. These trees are shown on the landscape plans and on sheet C2.1. This standard is met.

- (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 existing street trees will be separated from construction activities by the existing sidewalk. The above standards will be followed during construction. This standard is met.

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

**Response:** The existing landscaping under the street trees will remain. This standard does not apply.

- (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*

**Response:** Street trees along the private street to the south will remain. This standard does not apply.

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

**Response:** Pruning will be in accordance with the pruning standards for shade trees. This standard has been met.

- (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.*

**Response:** The landscape plans included with this submittal apply the existing landscaping for Building 10. This standard is met.

### *Section 73.260 Tree and Plant Specifications*

- (1) *The following specifications are minimum standards for trees and plants:*

- (a) *Deciduous Trees:*

*Deciduous shade and ornamental trees shall be a minimum one and one-half inch (1 1/2") caliper measured six inches (6") above ground, balled and burlapped. Bare root trees will be acceptable to plant during their dormant season. Trees shall be characteristically shaped specimens.*

- (b) *Coniferous Trees.*

*Coniferous trees shall be a minimum five feet (5') in height above ground, balled and burlapped. Bare root trees will be acceptable to plant during their dormant season. Trees shall be well branched and characteristically shaped specimens.*

(c) *Evergreen and Deciduous Shrubs.*

*Evergreen and deciduous shrubs shall be at least one (1) to five (5) gallon size. Shrubs shall be characteristically branched. Side of shrub with best foliage shall be oriented to public view.*

(d) *Groundcovers.*

*Groundcovers shall be fully rooted and shall be well branched or leafed. English ivy (Hedera helix) is considered a high maintenance material which is detrimental to other landscape materials and buildings and is therefore prohibited.*

(e) *Lawns.*

*Lawns shall consist of grasses, including sod, or seeds of acceptable mix within the local landscape industry. Lawns shall be 100 percent coverage and weed free.*

**Response:** As shown in the attached landscape plans (see L Sheets in plan set), the proposed development includes a variety of appropriate landscaping elements including deciduous trees, coniferous trees, evergreen and deciduous shrubs, and groundcovers. No lawns are proposed. As described on the landscape plans, the proposed tree, shrub, and groundcover varieties will meet the dimensional standards and care described above. These standards are met.

(2) *Landscaping shall be installed in accordance with the provisions of Sunset New Western Garden Book (latest edition), Lane Publishing Company, Menlo Park, California or the American Nurserymen Association Standards (latest edition).*

**Response:** Landscaping will be installed in accordance with the *Sunset New Western Garden Book* standards and has been designed by a professional landscape architect. This standard is met.

(3) *The following guidelines are suggested to ensure the longevity and continued vigor of plant materials:*

(a) *Select and site permanent landscape materials in such a manner as to produce a hardy and drought-resistant landscaped area.*

(b) *Consider soil type and depth, spacing, exposure to sun and wind, slope and contours of the site, building walls and overhangs, and compatibility with existing native vegetation preserved on the site or in the vicinity.*

**Response:** Hardy, drought-resistant plants, appropriate to the proposed development and region, have been selected. The project contractor will test and amend the soil as needed. These guidelines are addressed.

(4) *All trees and plant materials shall be healthy, disease-free, damage-free, well-branched stock, characteristic of the species.*

**Response:** All plant materials will be new and healthy. This standard is met.

(5) *All plant growth in landscaped areas of developments shall be controlled by pruning, trimming or otherwise so that:*

(a) *It will not interfere with designated pedestrian or vehicular access; and*

(b) *It will not constitute a traffic hazard because of reduced visibility.*

**Response:** The selected plant materials are appropriate for the proposed development and climate and will not interfere with visibility or movement. In clear vision areas, no trees will exist within the 30" to 8' clear area. Responsibility for maintenance of landscaping is accepted by the property owner. This standard is met.

### Section 73.270 Grading

- (1) *After completion of site grading, top-soil is to be restored to exposed cut and fill areas to provide a suitable base for seeding and planting.*

**Response:** Topsoil will be stockpiled during excavation to be used for backfill of landscape areas. Additionally, amendments will be added to the topsoil at that time. This standard is met.

- (2) *All planting areas shall be graded to provide positive drainage.*

**Response:** As shown on the attached grading plan (see C2.2), the proposed development is designed to provide positive drainage to the storm conveyance system or the LIDA basins. Planting areas will be graded consistently with the rest of the lots. This standard is met.

- (3) *Neither soil, water, plant materials nor mulching materials shall be allowed to wash across roadways or walkways.*

**Response:** All soil, plant, and mulching materials will be contained in landscape areas and surrounded by curbing, and will not cross roadways or walkways. Water on the proposed development's impervious areas will drain directly to storm drains (see C2.2.). This standard is met.

- (4) *Impervious surface drainage shall be directed away from pedestrian walkways, dwelling units, buildings, outdoor private and shared areas and landscape areas except where the landscape area is a water quality facility.*

**Response:** As shown on the attached grading plans (see C2.2), drainage on impervious surfaces will be directed to proposed storm drain systems. Catch basins and entry points into the LIDA basins have been placed to minimize overland flow in areas of designated walkways. This standard is met.

### Section 73.280 Irrigation System Required

*Except for townhouse lots, landscaped areas shall be irrigated with an automatic underground or drip irrigation system.*

**Response:** As shown in the attached plans (see L Sheets in plan set), the landscaped areas will be irrigated. This standard is met.

### Section 73.290 Re-vegetation in Un-landscaped Areas

*The purpose of this section is to ensure erosion protection, and in appropriate areas to encourage soil amendment, for those areas not included within the landscape percentage requirements so native plants will be established, and trees will not be lost.*

- (1) *Where vegetation has been removed or damaged in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements, vegetation shall be replanted.*

**Response:** The proposed project will make use of a previously developed site; the area was recently mass graded as part of the Koch Corporate Center development. This standard does not apply.

- (2) *Plant materials shall be watered at intervals sufficient to ensure survival and growth for a minimum of two growing seasons.*

**Response:** No replanted vegetation is proposed as part of this AR application. Any existing vegetation on the site will be removed through the previous demolition and erosion control permits (except the six trees along the private drive, which will be preserved if possible). This standard does not apply.

- (3) *The use of native plant materials is encouraged to reduce irrigation and maintenance demands.*

**Response:** No replanted vegetation is proposed as part of this AR application. Any existing vegetation on the site will be removed through the previous demolition and erosion control permits (except the six trees along the private drive, which will be preserved if possible). This standard does not apply.

(4) *Disturbed soils should be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity.*

**Response:** There are no disturbed soils on the site that need to be amended. This standard does not apply.

#### *Section 73.310 Landscape Standards – Commercial, Industrial, Public and Semi-Public Uses*

(1) *A minimum 5'-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...*

**Response:** As shown on the attached plans (see sheet C2.1), a minimum 5' wide landscaped area will be constructed around all building perimeters facing the right-of-way and parking lots. This standard is met.

(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.*

**Response:** The provided walkways will be exclusively for pedestrian use, and will contain amenities such as shade trees. These are included in the landscape area requirement. This standard is understood.

(3) *All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas or undisturbed natural areas shall be landscaped.*

**Response:** As shown on the attached plans, all areas not identified above are proposed to be landscaped with a variety of materials. This standard is met.

#### **Off-Street Parking Lot Landscaping**

##### *Section 73.320 Off-Street Parking Lot Landscaping Standards*

(2) *Application. Off-street parking lot landscaping standards shall apply to any surface vehicle parking or circulation area.*

**Response:** As shown on the attached landscape plans, all vehicle parking and circulation areas will be landscaped to off-street parking lot landscaping standards and meet the above goals. This standard is met.

##### *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, ....*

**Response:** As shown in the attached landscape plans (see L Sheets in plan set), landscaping in the parking areas will meet these standards. No trees will be planted in the vision clearance area, and shrub species in vision clearance areas of the parking area will be no higher than 30". This standard is met.

(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).*

**Response:** As shown in the attached plans (see sheet C2.1), perimeter landscape areas of more than 5' to more than 25' will be provided around all parking, circulation, and loading areas. This standard is met.

(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.*

**Response:** As shown on the attached landscape plans, landscape areas will contain a mix of all of the above plantings. Deciduous trees will be planted in every landscape island. Shrubs (of a variety that will reach a mature height of 30" or more in three years) and ground cover will be spaced appropriately to achieve at least 90% coverage within three years. Plantings will include a mixture of native and drought-tolerant appropriate plants to achieve biodiversity and longevity. This standard is met.

(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.*

**Response:** The site currently comprises one lot. The applicant obtained preliminary approval to divide the existing lot into three parcels in 2012. The applicant is in the process of recording the final plat for the site and each building will be on its own lot as shown on the plans included with this application. The three buildings will be connected by vehicular access. According to this section, no landscape strips will be required between Buildings 10, 11, and 12. This standard is met.

#### *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 which are protected from vehicles by curbs. These landscape areas shall be dispersed throughout the parking area [see 73.380(3)]. Landscape square footage requirements shall not apply to parking structures and underground parking.*

**Response:** As shown on the attached plans (see sheet C2.1), 246 parking spaces are proposed; therefore, 6,150 SF of landscape island areas are required. This standard is met through the standard 16' to 18' long landscape islands located every eight or fewer parking spaces, as well as through the landscaped areas at the ends of parking bays. Across the entire site, 9,730 SF of "landscape island areas" will be provided in the parking lot. This standard is met.

(2) *All landscaped island areas with trees shall be a minimum of 5 feet in width (60 inches from inside of curb to curb) and protected with curbing from surface runoff and damage by vehicles. Landscaped areas shall contain groundcover or shrubs and deciduous shade trees.*

**Response:** As shown in the attached plans, all areas considered toward the landscape island area requirement exceed 5' in width; all provide ample room for the proposed trees and plantings. As shown in the attached landscape plans (see L Sheets), all landscape island areas will be covered with trees, shrubs, and groundcover. This standard is met.

(3) Provide a minimum of one deciduous shade tree for every four (4) parking spaces to lessen the adverse impacts of glare from paved surfaces and to emphasize circulation patterns...

**Response:** For the 246 parking spaces proposed, 62 deciduous shade trees are required. As shown on the landscape plan, 64 large trees will be planted within the parking area. This standard is met.

(4) Landscaped islands shall be utilized at aisle ends to protect parked vehicles from moving vehicles and emphasize vehicular circulation patterns. ...

**Response:** As shown on the attached plans, typical landscape islands are proposed spaced every eight or fewer parking spaces, as well as through landscaped areas at the ends of parking bays. This standard is met.

(5) Required landscaped areas shall be planted so as to achieve 90 percent coverage within three years.

**Response:** Shrubs and ground cover will be spaced appropriately to achieve at least 90% coverage within three years. This standard is met.

*Section 73.370 Off-Street Parking and Loading*

(2) *Off-Street Parking Provisions.*

(a) *The following are the minimum and maximum requirements for off-street motor vehicle parking in the City...*

USE	MINIMUM MOTOR VEHICLE PARKING REQUIREMENT	MAXIMUM MOTOR VEHICLE PARKING REQUIREMENT	BICYCLE PARKING REQUIREMENT	PERCENTAGE OF BICYCLE PARKING TO BE COVERED
<u>Industrial</u>				
(i) Manufacturing	1.60 spaces per 1,000 sq. ft. of gross floor area	None	2, or 0.10 spaces per 1,000 gross sq. ft., whichever is greater	First 5 spaces or 30%, whichever is greater
(ii) Warehousing	0.30 spaces per 1,000 sq. ft. of gross floor area	Zone A: 0.4 spaces per 1,000 sq. ft. gross floor area Zone B: 0.5 spaces per 1,000 sq. ft. gross floor area	2, or 0.10 spaces per 1,000 gross sq. ft., whichever is greater	First 5 spaces or 30%, whichever is greater
(iii) Wholesale establishment	3.00 spaces per 1,000 sq. ft. of gross floor area	None	2, or 0.50 spaces per 1,000 gross sq. ft., whichever is greater	First 5 spaces or 30%, whichever is greater

**Response:** While no tenants have been identified, the proposed buildings will accommodate a mix of manufacturing and warehousing uses (see the table on sheet C2.1). This assumption provides a flexible amount of parking spaces for likely future users. The proposed parking (246 spaces across the site) exceeds minimum requirements (93 spaces), in order to provide adequate parking for likely future users. Additionally, 18 bicycle parking spaces are proposed, 33.3% of which (6) will be located inside the building, meeting the 30% coverage requirement. This standard is met.

(3) *Off-Street Vanpool and Carpool Parking Provisions.*

*The minimum number of off-street Vanpool and Carpool parking for commercial, institutional and industrial uses is as follows:*

Number of Required Parking Spaces	Number of Vanpool or Carpool Spaces
0 to 10	1
10 to 25	2
26 and greater	1 for each 25 spaces

**Response:** As shown on the attached plans (see sheet C2.1), 13 carpool/vanpool spaces will be provided across the site, distributed proportionately by building (exceeding the requirement of 9.8 stalls). This standard is met.

*73.380 Off-Street Parking Lots*

(1) *Off-street parking lot design shall comply with the dimensional standards set forth in Figure 73-1 of this section....*

**Response:** Of the proposed 246 parking spaces, most will be larger-than-standard 9'x19.5' parking stalls (9' wide, 17' long striped pervious area plus a 2.5' landscaped overhang protected by bumper). In some areas, stalls will be 9'x18.5' (16' stripes with a 2.5' overhang). This standard is met.

(2) *Parking stalls for sub-compact vehicles shall not exceed 35 percent of the total parking stalls required by TDC 73.370(2).*

**Response:** No sub-compact stalls are proposed. This standard is met.

(3) *Off-street parking stalls shall not exceed eight continuous spaces in a row without a landscape separation...*

**Response:** As shown on the attached plans, typical landscape islands are proposed to be spaced every 8 or fewer parking spaces, as well as through landscaped areas at the ends of parking bays. This standard is met.

(4) *Areas used for standing or maneuvering of vehicles shall have paved asphalt or concrete surfaces maintained adequately for all-weather use and so drained as to avoid the flow of water across sidewalks.*

**Response:** As shown in the attached grading and utility plans (see sheet C2.2 and C2.3), water from the paved vehicle areas will drain to storm drains in order to avoid the flow of water across pedestrian walkways; storm lines will flow into the on-site water quality and detention facilities. This standard is met.

- (5) *Except for parking to serve residential uses, parking areas adjacent to or within residential planning districts or adjacent to residential uses shall be designed to minimize disturbance of residents.*

**Response:** The site does not abut any residential uses. This standard does not apply.

- (6) *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 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:** The project site does not abut residential uses. Site lighting is designed to not impair drivers along the abutting streets. As shown on the attached lighting plan (SL1), foot-candle levels will be low at the edges of parking and drive areas abutting the property line and right-of-way. This standard is met.

- (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:** Service drives are designed to facilitate the flow of traffic and provide maximum safety on this site. This standard is met.

- (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:** As shown on the attached plans, curbing will be provided in front of all parking stalls to protect pedestrians and landscape material. This standard is met.

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

**Response:** As shown on the attached plans (see sheet C2.1), 13 ADA parking spaces will be provided in conformance with applicable standards. This standard is met.

- (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.*

**Response:** As shown on the attached plans (see sheet C2.1), drive aisles on the site will provide access to parking areas with regular parking spaces. Drive aisles will range from 24' to more than 50' wide; most of them will be 26' wide to accommodate the site's expected truck traffic, as well as vehicles and the garbage hauler's trucks. This standard is met.

#### *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

**Response:** Three off-street loading berths are required for industrial uses with floor area of 60,000 SF or more; the project includes more than 127,253 SF of building floor area. As shown on the attached plans, each building will have dedicated concrete dock aprons and loading berths; the site total is 35 loading docks and 12 on-grade loading doors (10 docks and 4 drive-in doors on Building 10, 12 docks and 4 on-grade doors on Building 11, and 13 docks and 4 on-grade doors on Building 12). This standard is met.

- (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.*

**Response:** As shown on the attached plans (see sheet C2.1), the loading berths will be a minimum of 12.5' wide by 60' long. The heavy duty area of the loading spaces will be constructed of heavy duty pavement over a 4" crushed rock base, to provide a strong support for the truck pads to rest on. The 60' long loading spaces will be separated by more than 50' of drive aisle between buildings. This standard is met.

- (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.*

**Response:** As shown on the attached plans (see landscape plans), all loading areas will be screened with landscape areas at their ends (not obscuring clear vision areas), planted with sight-obscuring evergreen arborvitae trees and shrubs. Loading docks of Building 10 will be screened by Building 12 and Building 12 will be screened from the private street to the south by Building 10 and 11. The loading docks on the northwest side of Building 11 will be screened from SW Tualatin Sherwood Road by grade changes (there is approximately 10 feet of rise from Tualatin Sherwood to Building 11). This standard is met.

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

**Response:** This standard is accepted as a condition of use. This standard is met.

- (5) *A driveway designed for continuous forward flow of passenger vehicles for the purpose of loading and unloading children shall be located on the site of a school or child day care center having a capacity greater than 25 students.*

**Response:** The proposed development does not include a school or day care. This standard does not apply.

- (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.*

**Response:** The off-street loading spaces are not part of the off-street parking areas. This standard is met.

- (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...*

**Response:** The property is not located within the Central Design District. No adjustments to the loading standards are requested. This standard does not apply.

#### 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. Access management and spacing standards are provided in this section of the TDC and TDC Chapter 75. 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:** The provision and maintenance of vehicular and pedestrian accesses on the site will be maintained throughout construction. This standard is understood and is met.

- (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:** All existing lots within Koch Corporate Center are owned by the same owner. This standard does not apply.

- (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.*

**Response:** There are no commercial uses adjacent to the site. This standard does not apply.

- (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.*

**Response:** All existing lots within Koch Corporate Center are owned by the same owner. This standard does not apply.

- (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.

**Response:** All existing lots within Koch Corporate Center are owned by the same owner. This standard does not apply.

(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 [comprising] 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.*

**Response:** This application addresses the portion of the Koch Corporate Center site to be developed with unknown phasing (order of buildings to be constructed). However, as shown in the attached plans, access will be provided for the first, second, and third buildings constructed at all times. This standard is met.

- (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:** This project does not include a commercial development or retail center. This standard does not apply.

(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:** As shown on the attached plans, all buildings will have access to the private street to the south via the three proposed driveways as shown on sheet C2.1. No motor vehicle access to either SW 115th Avenue to the west or SW Tualatin-Sherwood Road to the north is proposed. This standard is understood.

(6) *Except as provided in TDC 53.100, all ingress and egress shall connect directly with public streets.*

**Response:** The subject site is not in the Central Commercial Planning District. TDC 53.100 does not apply. As shown on the attached plans, the subject site (all lots proposed for development) has access via consecutively owned lots to connect directly with public streets. This standard is met.

(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:** The project does not include any residential uses. This standard 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:** The subject lots front improved streets and the private drive. Sidewalks along the private drive are existing; sidewalks along SW 115th Avenue and SW Tualatin Sherwood Road have been designed and approved through construction permits for those streets. This standard is met.

(9) *The standards set forth in this Code are minimum standards for access and egress, and may be increased through the Architectural Review process in any particular instance where the standards provided herein are deemed insufficient to protect the public health, safety, and general welfare.*

**Response:** This standard is understood.

(10) *Minimum access requirements for residential uses:*

**Response:** The proposed project is for an industrial use. This standard does not apply.

(11) *Minimum Access Requirements for Commercial, Public and Semi-Public Uses.*

**Response:** The proposed project is for an industrial use. This standard does not apply.

(12) *Minimum Access Requirements for Industrial Uses.*

*Ingress and egress for industrial uses shall not be less than the following:*

Required Parking Spaces	Minimum Number Required	Minimum Pavement Width	Minimum Pavement Walkways, Etc.
1-250	1	36 feet for first 50' from ROW, 24' thereafter	No curbs or walkway required
Over 250	As required by City Engineer	As required by City Engineer	As required by City Engineer

**Response:** Fewer than 250 parking spaces are proposed (246). The project includes multiple vehicular accessways into the site for cars and trucks; this configuration was discussed with the City Engineer in the project scoping meeting and follow-up communication. This standard is met.

(13) *One-way Ingress or Egress.*

*When approved through the Architectural Review process, one-way ingress or egress may be used to satisfy the requirements of Subsections (7), (8), and (9). However, the hard surfaced pavement of one-way drives shall not be less than 16 feet for multi-family residential, commercial, or industrial uses.*

**Response:** Neither one-way ingress nor egress is proposed. This standard does not apply.

(14) *Maximum Driveway Widths and Other Requirements.*

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

**Response:** As shown in the attached plans (see dimensions sheet C2.1), driveway openings from the private street to the subject lots will range from 26' to 36' as measured by the City of Tualatin Approach Private Driveway diagram. This standard is met.

(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).*

**Response:** As shown on the attached plans, no driveways will be within 5' of adjacent property lines. This standard is met.

(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:** As shown on the attached plans, all driveways will be located at least approximately 220' from one another. This standard is met.

(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.*

**Response:** SW 115th Avenue is classified as a collector. The proposed development will access a private drive that will intersect with SW 115th Avenue. The closest driveway to the intersection of the private drive and 115th is in excess of 200 feet. This standard is met.

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

**Response:** As stated previously, the closest driveway is 200 feet from the nearest intersection. This standard is met.

(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).*

**Response:** The driveways on the site meet the driveway and intersection separation standards. This standard does not apply.

(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:** No driveways on the site will be less than 200' from an intersection. This standard does 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 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).*

**Response:** As shown in the attached landscape plans (see L Sheets), no landscaping between 30" and 8' high will exist in the clear vision areas (10' back from the property lines at the local streets). This standard is met.

(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).*

**Response:** SW 115th Avenue is a collector street, a vision clearance area meeting the above standard is shown on the plans (see sheet C2.1). This standard is met.

(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).*

**Response:** As shown in the attached landscape plans (see L-1.1, L-1.2, and L-1.3 for Building 1, L-1 for Building 5, and L-1 for Building 8), landscaping in the driveway entrances and ends of parking aisles will meet these standards. No trees will be planted in clear vision areas, and shrub species in vision clearance areas of the parking area will be no higher than 30". This standard is met.

(17) *Major driveways, as defined in 31.060, in new residential and mixed-use areas are required to connect with existing or planned streets except where prevented by topography, rail lines, freeways, pre-existing development or leases, easements or covenants, or other barriers.*

**Response:** The project is not in a new residential or mixed-use area. This standard does not apply.

## **V. SUMMARY**

The proposed three industrial buildings meet all applicable Architectural Review standards. The development will be compatible with current and existing surrounding uses, and is designed to comply with the zoning requirements of the General Manufacturing District. This application complies with City requirements, will result in economic growth for the area, and merits approval as requested.

## STORMWATER REPORT

To  
City of Tualatin

For  
Koch Corporate Center  
Lots 10, 11 and 12  
Tualatin, OR

January 12, 2016

Project Number  
2140559.05

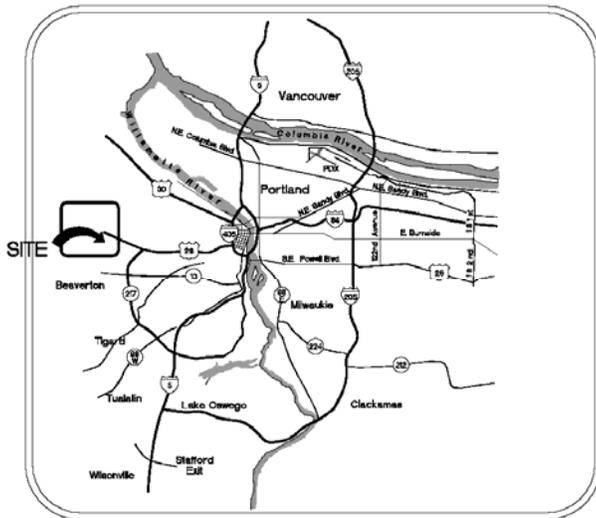


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Since 1960

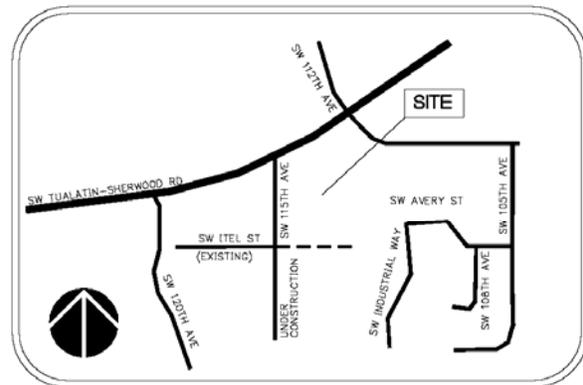
Heritage Building | 601 Main Street, Suite 101, Vancouver, WA 98660  
T 360.695.7879 | T 360.693.6637 | [www.mackenzie.com](http://www.mackenzie.com)

## 1. PROJECT DESCRIPTION

The proposed Koch Corporate Center Subdivision is a division of approximately 42 acres of property located on the SE corner of Tualatin Sherwood Road and SW 115<sup>th</sup> Avenue in Tualatin, OR.



VICINITY MAP NOT TO SCALE



VICINITY MAP NOT TO SCALE

The newly constructed private cul-da-sac, which runs east-west, runs adjacent to the south side of lots 10 and 11. The three lots 10, 11 and 12 which are addressed under this report will be designed with some water quality in the form of LIDA basins. The purpose of the LIDA basins although functional will be more demonstrative in nature as all of the runoff from these three lots will be routed and conveyed through the regional City maintained facility located in the NE corner of the site. The City facility was previously designed and constructed to treat and detail all of the runoff north of ITEL Street, assuming 85% impervious surfaces. Since previous developments as well as this proposed development all meet the minimum 15% landscaped area, the original 85% impervious area design is still valid.

The mass grading and compaction that has occurred within the site as part of the previous overall Koch mass grading plan, in combination with the poor drainage characteristics of the native soils, results in soils with infiltration rates that cannot be relied on to dispose of all stormwater alone. In order to meet City of Tualatin standards, detention of stormwater will need to be provided. The demonstrative

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DESIGN DRIVEN | CLIENT FOCUSED

stormwater facilities will infiltrate some stormwater but a perforated pipe will underlie the LIDA facility to ensure that the basins will drain. The City's storm facility will also detain stormwater runoff to release runoff from the site at the predeveloped runoff rate. The regional facility discharges to Hedges Creek just NE of the City's stormwater facility.

## 2. METHODOLOGY

### Water Quality Design

The existing undeveloped site has been mass graded previously, and is set up for development. Water quality for the developed site will be accomplished through the use of LIDA basins designed to treat parking areas throughout the site as a demonstration to the public that stormwater is being accomplished. The LIDA basins will also be designed to meet Clean Water Services (CWS) Standards. All of the site will drain to the public stormline that runs westward from the south side of the pond. The line will be connected to the public system routed through the CWS designed water quality manhole and into the extended dry detention pond.

The Clean Water Services design water quality event is 0.36 inches of precipitation falling in 4 hours with an average storm return period of 96 hours. The regional pond has been sized to treat all of the lots north of Itel Street and has assumed an 85% impervious surface area.

### Detention Design

In the existing condition, site runoff discharges via sheet flow to Hedges Creek, which runs along the east edge of the property. The entirety of lots 10, 11 and 12 will flow to an existing public extended dry detention pond located near the NE corner of the Koch Corporate Center. The lots have been previously designed and a storm stub has been extended to each lot. The public sewer extension has been approved and has been conditioned upon lots 1, 5 and 8. The public facility was designed to match existing runoff rates for storm events up to and including the 25 year event. Therefore, the existing detention pond will match the existing conditions runoff discharge for the portion of the Koch Corporate Center north of Itel Street. The public stormlines have been designed to convey the undetained stormwater from the site to the public stormwater facility.



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## 3. DESIGN ASSUMPTIONS

### Conveyance System

- 1) SCS/SBUH Method used
- 2) 24-hr design storm
- 3)  $T_c=5$  minutes
- 4) Intensity: 25-year storm per CWS
- 5) Manning's number=0.013

### Detention

- 1) SCS/SBUH Method used
- 2) 24-hr design storm
- 3)  $T_c=10$  minutes
- 4) Intensity: varies per CWS

## 4. ANALYSIS

The regional facility serving all lots north of IteI Street have been designed to meet CWS standards and requirements for both water quality and detention through the use of an extended dry detention pond. The water quality portion of the facility was designed to treat the summer storm defined as the first 0.36 inches of rainfall in a four hour period. Detention requirements were determined by the City of Tualatin and have been sized to match existing runoff rates for events up to and including the 25 year, 24 hour event using SCS methodology. The hydraulic modeling software Stormshed was used to model the regional facility.

## 5. ENGINEERING CONCLUSIONS

The regional facility is essentially oversized since it ignores any treatment or detention/retention that has occurred in the LIDA basins. The pond as modeled meets the Clean Water Services standards and requirements.

## 6. ATTACHEMENTS

- A. Stormwater Master Plan
- B. C1.0 – Existing Conditions Plan
- C. C2.3 – Overall Storm Drainage Plan
- D. C8.2 – Storm Details
- E. Drainage Basin Map
- F. Stormwater Quality Volume Calculations



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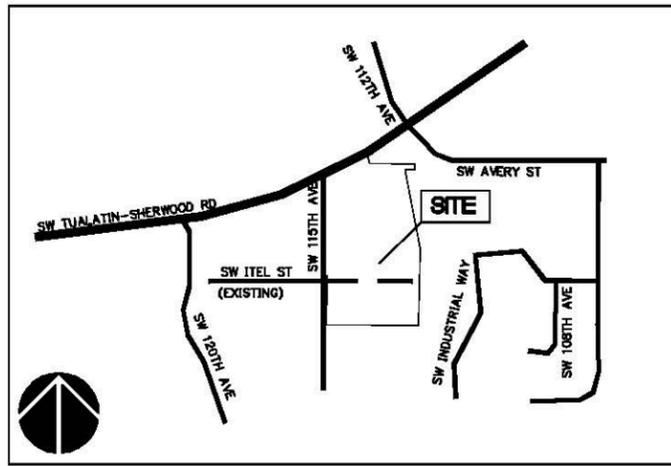
DESIGN DRIVEN | CLIENT FOCUSED

- G. Pond Sizing Calculations
- H. Conveyance Basin Map
- I. Conveyance Calculations



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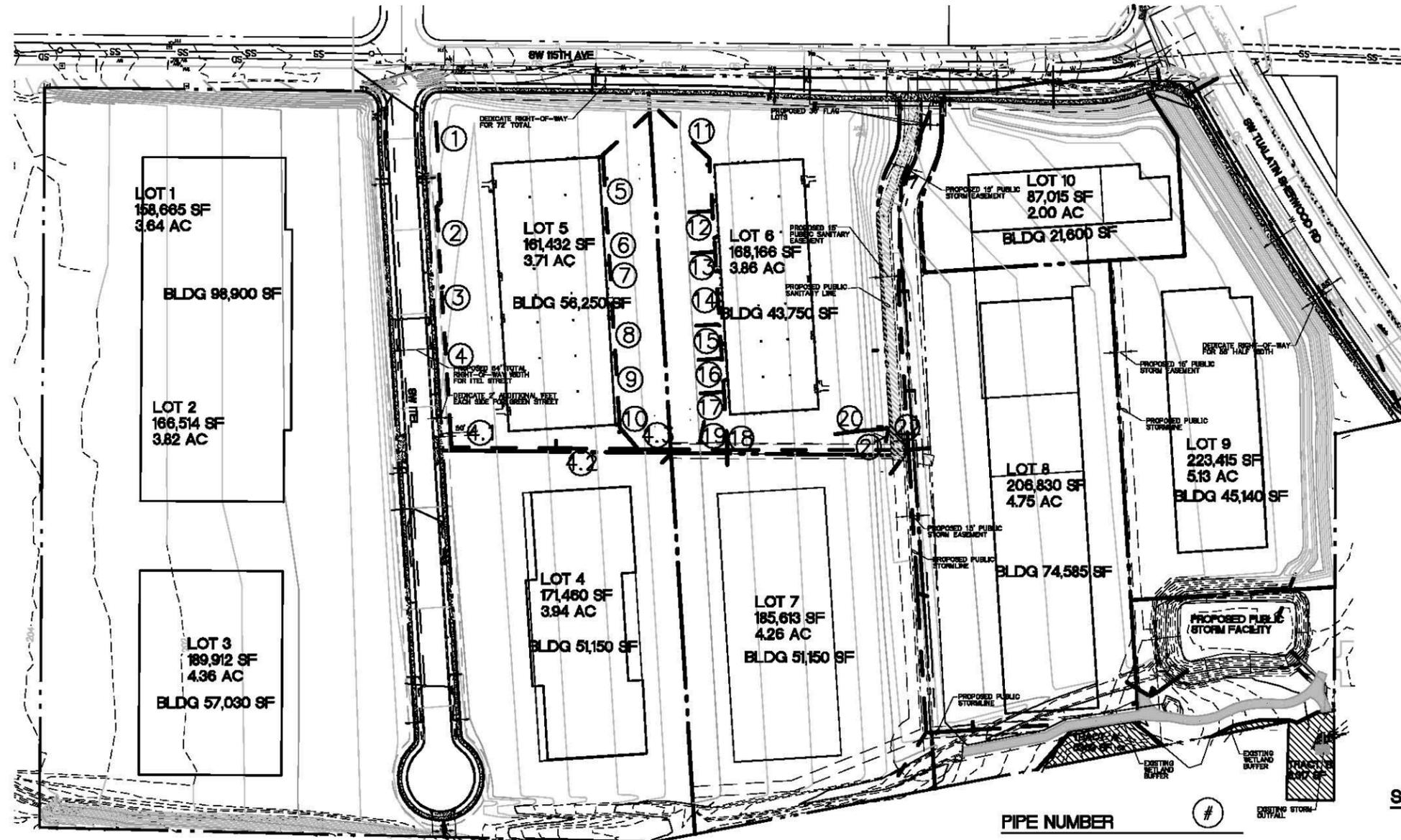
VICINITY MAP NOT TO SCALE

# KOCH CORPORATE CENTER

## TUALATIN, OREGON STORMWATER MASTER PLAN

### PHASING

- PHASE 1 LOTS 1, 2, & 3
- PHASE 2 LOTS 4, 5, 6, & 7
- PHASE 3 LOTS 8, 9, & 10



### OWNER

**PACTRUST**  
15350 SW Sequoia Way, Suite 300  
Portland, OR 97224  
Phone: (503) 624-6300  
Fax: (503) 624-7755  
Contact: Matt Oyan

### PLANNER / CIVIL ENGINEER

**GROUP MACKENZIE**  
RiverEast Center  
1515 SE Water Avenue, Suite 100  
Portland, Oregon 97214  
P.O. Box 14310  
Portland OR 97283  
Phone: (503) 224-9560  
Fax: (503) 228-1285  
Planning Contact: Rhye Konrad  
Civil Contact: Bob Frantress, P.E.

### SURVEYOR

**WEDDLE SURVEYING INC.**  
6850 SW Hampton Street, Suite 170  
Tigard, Oregon 97223  
Phone: (541) 595-8702  
Contact: Tony Ryan

### PROPERTY DESCRIPTION

Property is located in the northeast and southeast one-quarters of section 27, township 2 south, range 1 west, w.m. City of Tualatin, Washington County, Oregon

### SITE LEGEND

- PROPOSED PUBLIC STORM EASEMENT
- PROPOSED PUBLIC SANITARY EASEMENT
- PROPOSED PUBLIC SANITARY EASEMENT
- PROPOSED PUBLIC SANITARY EASEMENT
- PROPOSED PUBLIC MANHOLE
- PROPOSED DOMESTIC WATER METER
- PROPOSED DOMESTIC BACKFLOW

**GROUP MACKENZIE**  
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Seattle, WA 206.749.9989

**PACTRUST**  
A PROPERTY

Project  
**KOCH CORPORATE CENTER**  
PRELIMINARY SUBDIVISION

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REVISIONS:  
BY: [ ] REVISION: [ ] DATE: [ ]  
BY: [ ] REVISION: [ ] DATE: [ ]  
BY: [ ] REVISION: [ ] DATE: [ ]

SHEET TITLE:  
**PRELIMINARY PLAT**

DRAWN BY:  
CHECKED BY:  
SHEET:

**MP**

JOB NO. **2080260.02**

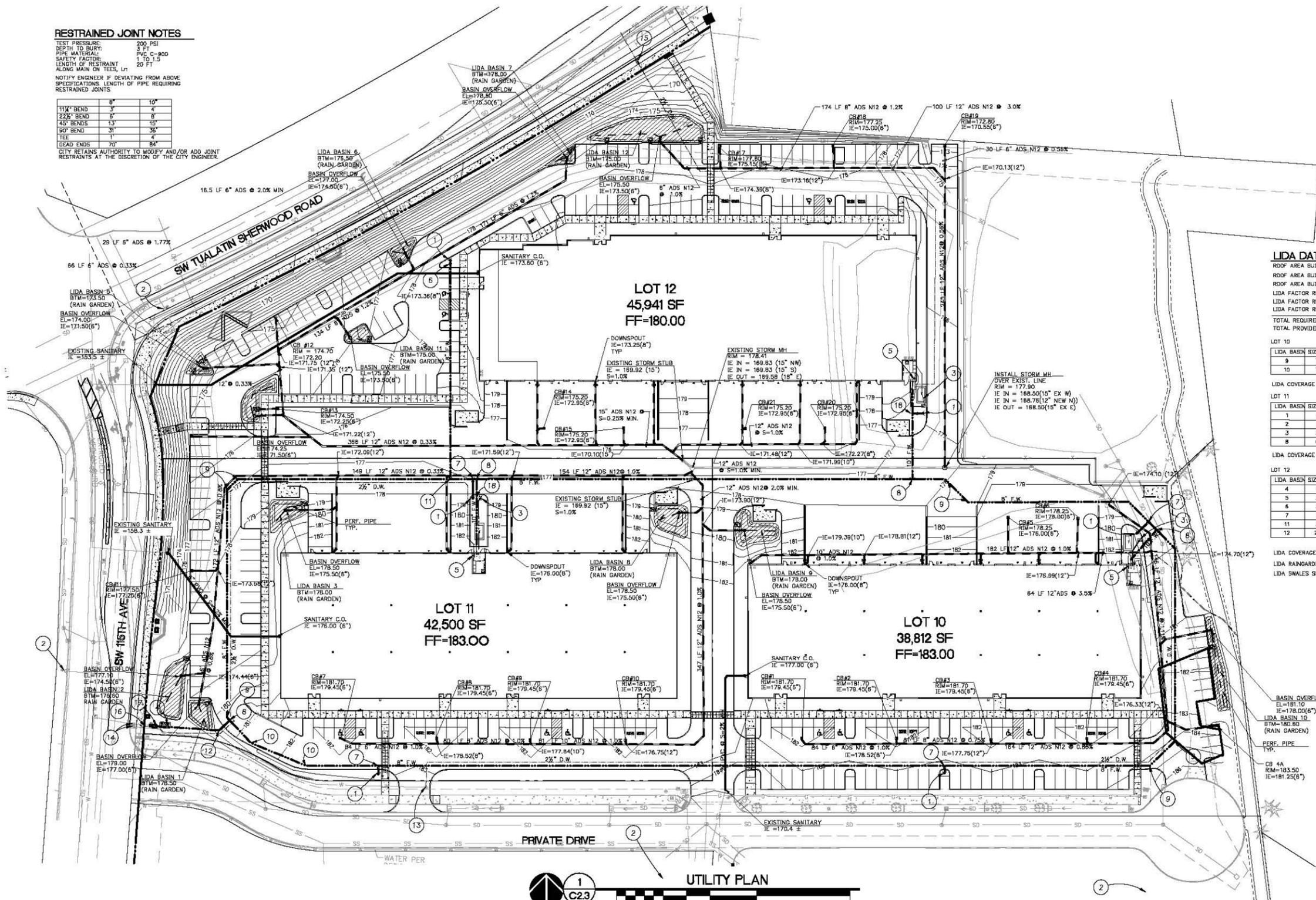
### RESTRAINED JOINT NOTES

TEST PRESSURE: 200 PSI  
DEPTH TO BURY: 3 FT C-900  
PIPE MATERIAL: PVC C-900  
SAFETY FACTOR: 1 TO 1.5  
LENGTH OF RESTRAINT:  
ALONG MAIN ON TEES, L:  
20 FT

NOTIFY ENGINEER IF DEVIATING FROM ABOVE  
SPECIFICATIONS. LENGTH OF PIPE REQUIRING  
RESTRAINED JOINTS

11 1/4" BEND	3'	10'
22 1/2" BEND	6'	4'
45° BENDS	13'	13'
90° BEND	31'	35'
TEE	1'	4'
DEAD ENDS	70'	84'

CITY RETAINS AUTHORITY TO MODIFY AND/OR ADD JOINT  
RESTRAINTS AT THE DISCRETION OF THE CITY ENGINEER.



### LIDA DATA

ROOF AREA BUILDING 10	= 39,812 SF
ROOF AREA BUILDING 11	= 42,900 SF
ROOF AREA BUILDING 12	= 45,941 SF
LIDA FACTOR REQ'D BLDG 10 @ 6%	= 2,329 SF
LIDA FACTOR REQ'D BLDG 11 @ 6%	= 2,550 SF
LIDA FACTOR REQ'D BLDG 12 @ 6%	= 2,769 SF
TOTAL REQUIRED TREATED AREA	= 7,635 SF
TOTAL PROVIDED	= 7,642 SF

LOT 10

LIDA BASIN SIZE (SF)	CONTRIBUTING AREA (SF)	LIDA FACTOR
9	720	6.8%
10	728	18.4%

LIDA COVERAGE PROVIDED LOT 10 = 1,448 SF

LOT 11

LIDA BASIN SIZE (SF)	CONTRIBUTING AREA (SF)	LIDA FACTOR
1	413	14.7%
2	961	65.6%
3	542	59.1%
8	638	58.9%

LIDA COVERAGE PROVIDED LOT 11 = 2,604 SF

LOT 12

LIDA BASIN SIZE (SF)	CONTRIBUTING AREA (SF)	LIDA FACTOR
4	613	3.0%
5	232	1.6%
6	293	9.7%
7	194	3.0%
11	237	10.8%
12	2,101	37.8%

LIDA COVERAGE PROVIDED LOT 12 = 3,590 SF

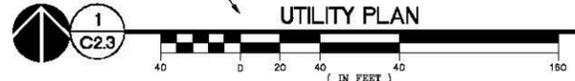
LIDA RAINGARDENS SEE 12/CB.2  
LIDA SWALES SEE 11/CB.2

### UTILITY NOTES

- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF TUALATIN, CLEAN WATER SERVICES, AND THE CURRENT EDITION OF THE UNIFORM PLUMBING CODE AND THE INTERNATIONAL BUILDING CODE. ALL WORK WITHIN THE PUBLIC R.O.W. REQUIRES A PUBLIC WORKS PERMIT.
- THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED FOR INSTALLATION IN THE SPACE PROVIDED. THEY DO NOT SHOW EVERY DIMENSION, COMPONENT PIECE, SECTION, JOINT OR FITTING REQUIRED TO COMPLETE THE PROJECT.
- ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH EXISTING CONDITIONS IN THE FIELD BEFORE BEGINNING CONSTRUCTION. EXISTING UNDERGROUND UTILITIES LAYING WITHIN THE LIMITS OF EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING, PROVIDING SUCH IS PERMITTED BY LOCAL PUBLIC AUTHORITIES WITH JURISDICTION, BEFORE BEGINNING CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
- PROVIDE CLEANOUTS AS REQUIRED IN THE CURRENT UNIFORM PLUMBING CODE CHAPTER 7, SECTIONS 707 AND 719, AND CHAPTER 11, SECTION 1101.12. NOTE: NOT ALL REQUIRED CLEANOUTS ARE SHOWN ON THE PLANS.
- ALL STORM PIPING IS SIZED FOR A MANNING'S "N" VALUE = 0.013 ALL STORM PIPING IS DESIGNED USING CONCENTRIC PIPE TO PIPE AND WYE FITTINGS, UNLESS OTHERWISE NOTED. 12. 30 MIL LINER TO BE INSTALLED AT BOTTOM OF ALL LIDA BASINS WITHIN 10 LINEAL FEET OF FOOTING.
- SEE MECHANICAL DRAWINGS FOR UTILITIES LOCATED WITHIN THE BUILDING AND TO 5' OUTSIDE THE BUILDING.
- ALL DOWNSPOUT LEADERS TO BE 6" AT 2.0% MIN. UNLESS NOTED OTHERWISE. VERIFY LOCATION, SIZE AND DEPTH OF EXISTING UTILITIES BY POT-HOLING PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF DISCREPANCIES.
- THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS BASED ON A SURVEY PREPARED BY WESTLAKE CONSULTANTS, INC. DATED JANUARY 30, 2015. CONTRACTOR TO PROVIDE POWER TO IRRIGATION CONTROLLER. SEE SPECIFICATIONS AND LANDSCAPE PLANS.
- SEE BUILDING PLUMBING DRAWINGS FOR PIPING WITHIN THE BUILDING AND UP TO 5' OUTSIDE THE BUILDING, INCLUDING ANY FOUNDATION DRAINAGE PIPING.
- CONTRACTOR TO MAINTAIN MINIMUM 3 FT OF COVER OVER ALL WATER LINE.
- NO WATER VALVES ALLOWED ON SITE EXCEPT FOR HYDRANT VALVES ON FIRE SYSTEM.

### WATERLINE KEYNOTES

- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED FDC
- PROPOSED 10" DDCV
- INSTALL 2 1/2" RP BACKFLOW IN RISER ROOM
- INSTALL 8"x6" REDUCER
- INSTALL 8"x8" TEE
- INSTALL 10" TEE (2) 10"x8" REDUCERS
- INSTALL 8" 45° BEND WITH RESTRAINT JOINTS
- INSTALL 6" 22 1/2° BEND WITH RESTRAINT JOINTS
- INSTALL 8"x8" TEE WITH RESTRAINT JOINTS
- INSTALL 10" 45° BEND WITH RESTRAINT JOINTS
- CONNECT TO AND EXTEND 2 1/2" WATERLINE TO BLDG 10
- INSTALL 2" WATER METER IN EXISTING METER BOX
- CONTRACTOR SHALL INSTALL 2" RIGID COPPER TYPE K WATER SERVICE TO PROPOSED METER BOX AND INSTALL 2" WATER METER PER I.C.O. STANDARD PLANS
- CONNECT TO EXISTING 2 1/2" WATERLINE TO EXISTING STUB, STUBBED 3' PAST BACK OF SIDEWALK
- REMOVE BLOWOFF AND CONNECT TO EXISTING 10" WATERLINE STUB
- INSTALL 10"x8" TEE WITH RESTRAINT JOINTS





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Project  
**KOCH CORPORATE CENTER**  
LOTS 10, 11 AND 12  
20950 SW 115TH AVE.  
TUALATIN, OR 97062



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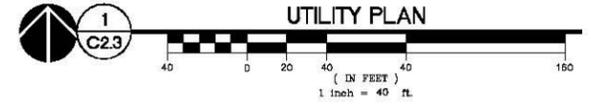
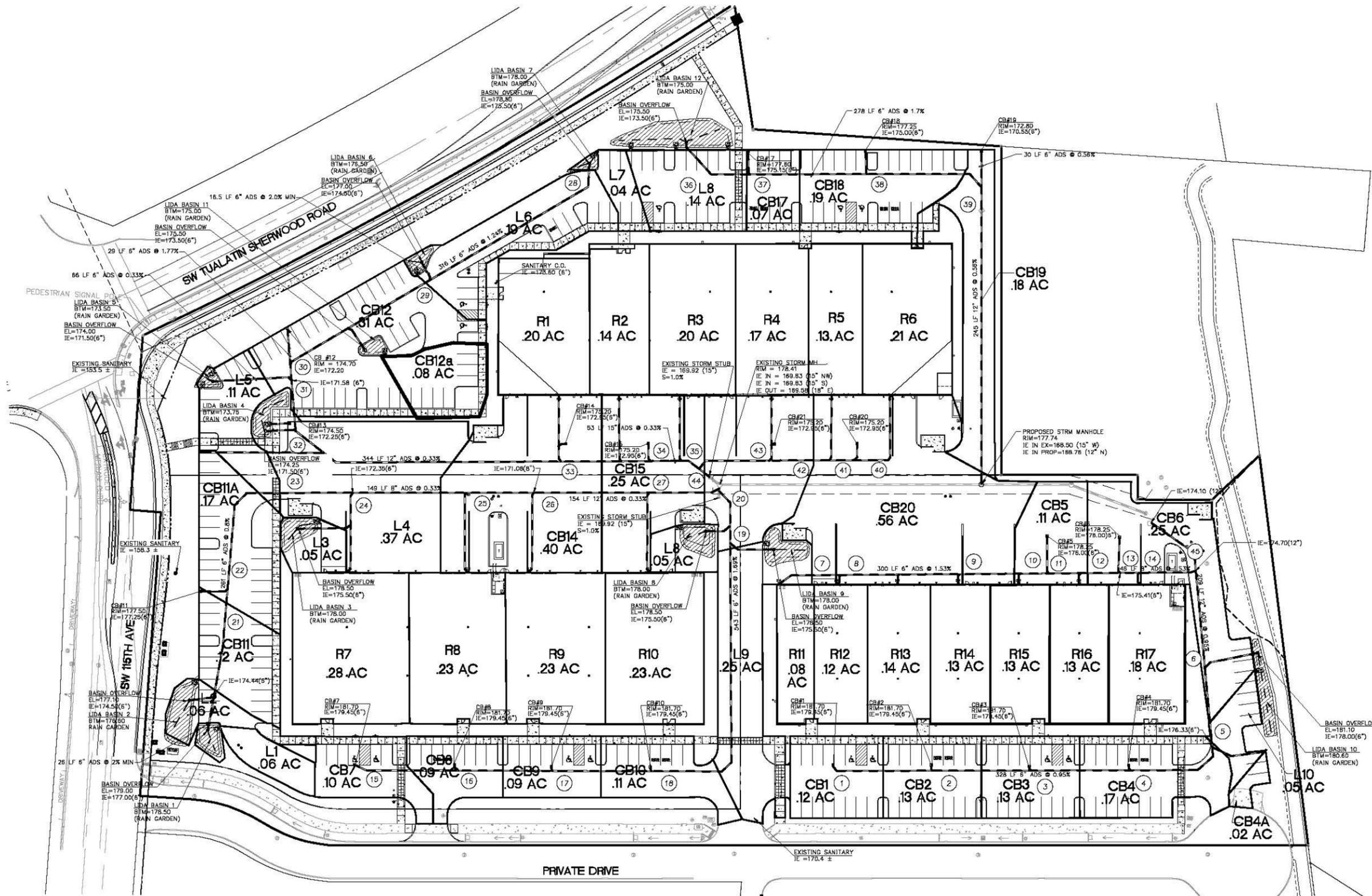
NO.	REVISIONS	REVISION DELTA	DATE	CLOSING DATE

SHEET TITLE:  
**UTILITY PLAN**

DRAWN BY: ASP  
CHECKED BY: RLF  
SHEET:

**C2.3**

JOB NO. 2140559.05



THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS SHOWN FOR REFERENCE ONLY AND IS BASED ON A SURVEY BY MCKENZIE, APRIL 2010, DATE: MAY 6, 2010.

# Pipe Sizing Calculation

Based on SCS flow inputs  
(Flows calculated in "Stormshed")



Project: KOCH BLDG 10, 11, 12  
By: ASP  
Checked: BCH  
Date: 3/14/2016  
Job: 2140559.05

Mannings n= 0.013

Pipe #	Storm Input Descriptions	Incremental Flow (cfs)	Total Flow (cfs)	Pipe Slope (%)	Pipe Diameter (inches)	Pipe Capacity (cfs)	Pipe Velocity (fps)
1	CB1	0.1073	0.1073	1	6	0.56	0.55
2	1+CB2	0.1162	0.2235	0.75	8	1.04	0.64
3	2+CB3	0.1162	0.3397	0.86	12	3.30	0.43
4	3+CB4	0.1520	0.4917	0.86	12	3.30	0.63
5	4+CB4A	0.0179	0.5096	1.11	12	3.75	0.65
6	5+L10	0.0447	0.5543	1.11	12	3.75	0.71
7	R11	0.0536	0.0536	1	8	1.21	0.15
8	7+R12	0.1073	0.1609	1	10	2.19	0.30
9	8+R13	0.1252	0.2861	1	12	3.56	0.36
10	9+R14	0.1162	0.4023	1	12	3.56	0.51
11	10+CB5	0.0983	0.5006	1	12	3.56	0.64
12	11+R16	0.1162	0.6168	1	12	3.56	0.79
13	12+CB6	0.2235	0.8403	1	12	3.56	1.07
14	13+R17	0.1609	1.0012	3.5	12	6.66	1.28
15	CB7	0.0894	0.0894	1	6	0.56	0.46
16	15+CB8	0.0805	0.1699	1	8	1.21	0.49
17	16+CB9	0.0805	0.2504	1	10	2.19	0.46
18	17+CB10	0.0983	0.3487	1	12	3.56	0.44
19	18+L9	0.2235	0.5722	2	12	5.03	0.73
20	19+L8	0.0447	0.6169	2	12	5.03	0.79
21	L1+L2	0.1072	0.1072	0.8	6	0.50	0.55
22	21+CB11	0.1073	0.2145	0.8	12	3.18	0.27
23	22+CB11A	0.1660	0.3805	0.8	12	3.18	0.48
24	23+L3+R7	0.2950	0.6755	0.33	12	2.04	0.86
25	24+R8	0.2056	0.8811	0.33	12	2.04	1.12
26	25+R9	0.2056	1.0867	1	12	3.56	1.38
27	26+R10	0.2056	1.2923	1	12	3.56	1.65
28	L7	0.0805	0.0805	1.2	6	0.61	0.41
29	28+L6	0.1699	0.2504	1.2	8	1.32	0.72
30	29+CB12+CB12a	0.3576	0.6080	0.33	12	2.04	0.77
31	30+L5	0.0983	0.7063	0.33	12	2.04	0.90
32	31+L4	0.3308	1.0371	0.33	12	2.04	1.32
33	32+R1+CB14	0.5364	1.5735	0.33	12	2.04	2.00
34	33+R2+CB15	0.3487	1.9222	0.25	15	3.23	1.57
35	34+R3	0.1788	2.1010	0.25	15	3.23	1.71
36	L8	0.0805	0.0805	1	6	0.56	0.41
37	36+CB17	0.0626	0.1431	1.2	8	1.32	0.41
38	37+CB18	0.1699	0.3130	3	12	6.16	0.40
39	38+CB19	0.1609	0.4739	0.56	12	2.66	0.60
40	R6	0.1878	0.1878	1	8	1.21	0.54
41	40+CB20	0.5007	0.6885	1	10	2.19	1.26
42	41+R5	0.1269	0.8154	1	12	3.56	1.04
43	42+CB21+R4	0.1520	0.9674	1	12	3.56	1.23
44	35+43	2.1010	3.0684	0.3	15	3.53	2.50
45	6+14	1.5555	1.5555	2	12	5.03	1.98

Koch lots 10, 11 and 12  
 Project; 2140559.05

09:56:12 Friday, January 15, 2016

**CB01 Event Summary**

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1073	8.01	0.0367	0.1200	SCS	TYPE1A

**Record Id: CB01**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.12 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>			<b>SubArea</b>	<b>Sub cn</b>		
Impervious surfaces (pavements, roofs, etc)			0.12 ac	98.00		
Pervious Compositied CN (AMC 2)			98.00			
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

**CB02 Event Summary**

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1162	8.01	0.0398	0.1300	SCS	TYPE1A

**Record Id: CB02**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			

		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.13 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.13 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min
Pervious TC			5.00 min

### CB03 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1162	8.01	0.0398	0.1300	SCS	TYPE1A

### Record Id: CB03

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.13 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.13 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min

Pervious TC	5.00 min
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### CB04 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1520	8.01	0.0520	0.1700	SCS	TYPE1A

### Record Id: CB04

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.17 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.17 ac	98.00
Pervious Compositd CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed			<b>Coeff</b>
			<b>Misc</b>
			<b>TT</b>
			5.00 min
			Pervious TC
			5.00 min

### CB04A Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0179	8.01	0.0061	0.0200	SCS	TYPE1A

### Record Id: CB04A

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20

<b>Pervious Area (AMC 2)</b>	0.02 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.02 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed			<b>Coeff</b>
			<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

### CB05 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0983	8.01	0.0336	0.1100	SCS	TYPE1A

### Record Id: CB05

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.11 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.11 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed			<b>Coeff</b>
			<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

## CB06 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.2235	8.01	0.0765	0.2500	SCS	TYPE1A

### Record Id: CB06

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.25 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.25 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed		<b>Coeff</b>	<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

## CB07 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0894	8.01	0.0306	0.1000	SCS	TYPE1A

### Record Id: CB07

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.10 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min

<b>Pervious CN Calc</b>						
<b>Description</b>				<b>SubArea</b>	<b>Sub cn</b>	
Impervious surfaces (pavements, roofs, etc)				0.10 ac	98.00	
Pervious Compositied CN (AMC 2)				98.00		

<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### CB08 Event Summary

<b>Event</b>	<b>Peak Q (cfs)</b>	<b>Peak T (hrs)</b>	<b>Hyd Vol (acft)</b>	<b>Area (ac)</b>	<b>Method</b>	<b>Raintype</b>
25 year	0.0805	8.01	0.0275	0.0900	SCS	TYPE1A

### Record Id: CB08

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.09 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min

<b>Pervious CN Calc</b>						
<b>Description</b>				<b>SubArea</b>	<b>Sub cn</b>	
Impervious surfaces (pavements, roofs, etc)				0.09 ac	98.00	
Pervious Compositied CN (AMC 2)				98.00		

<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### CB09 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0805	8.01	0.0275	0.0900	SCS	TYPE1A

**Record Id: CB09**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.09 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.09 ac	98.00
Pervious Compositd CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed			<b>Coeff</b>
			<b>Misc</b>
			<b>TT</b>
			5.00 min
			Pervious TC
			5.00 min

**CB10 Event Summary**

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0983	8.01	0.0336	0.1100	SCS	TYPE1A

**Record Id: CB10**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.11 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			

Description		SubArea	Sub cn
Impervious surfaces (pavements, roofs, etc)		0.11 ac	98.00
Pervious Compositd CN (AMC 2)			98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### CB11 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1073	8.01	0.0367	0.1200	SCS	TYPE1A

### Record Id: CB11

Design Method	SCS	Rainfall type	TYPE1A
Hyd Intv	10.00 min	Peaking Factor	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	0.12 ac	DCIA	0.00 ac
Pervious CN	98.00	DC CN	0.00
Pervious TC	5.00 min	DC TC	0.00 min

Pervious CN Calc		
Description	SubArea	Sub cn
Impervious surfaces (pavements, roofs, etc)	0.12 ac	98.00
Pervious Compositd CN (AMC 2)		98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### CB12 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
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25 year	0.3576	8.01	0.1223	0.4000	SCS	TYPE1A
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**Record Id: CB12**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.40 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.40 ac	98.00
Pervious Compositod CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min
Pervious TC			5.00 min

**CB13 Event Summary**

<b>Event</b>	<b>Peak Q (cfs)</b>	<b>Peak T (hrs)</b>	<b>Hyd Vol (acft)</b>	<b>Area (ac)</b>	<b>Method</b>	<b>Raintype</b>
25 year	0.3308	8.01	0.1132	0.3700	SCS	TYPE1A

**Record Id: CB13**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.37 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>

Impervious surfaces (pavements, roofs, etc)	0.37 ac	98.00				
Pervious Compositated CN (AMC 2)		98.00				
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### CB14 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.3576	8.01	0.1223	0.4000	SCS	TYPE1A

### Record Id: CB14

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.40 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>			
Impervious surfaces (pavements, roofs, etc)		0.40 ac	98.00			
Pervious Compositated CN (AMC 2)			98.00			
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### CB15 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
other	0.1171	8.01	0.0390	0.2500	SCS	TYPE1A

25 year	0.2235	8.01	0.0765	0.2500	SCS	TYPE1A
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**Record Id: CB15**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.25 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.25 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min
Pervious TC			5.00 min

**CB16 Event Summary**

<b>Event</b>	<b>Peak Q (cfs)</b>	<b>Peak T (hrs)</b>	<b>Hyd Vol (acft)</b>	<b>Area (ac)</b>	<b>Method</b>	<b>Raintype</b>
25 year	0.0805	8.01	0.0275	0.0900	SCS	TYPE1A

**Record Id: CB16**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.09 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>

Impervious surfaces (pavements, roofs, etc)	0.09 ac	98.00				
Pervious Compositated CN (AMC 2)		98.00				
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### CB17 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0626	8.01	0.0214	0.0700	SCS	TYPE1A

### Record Id: CB17

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.07 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>			
Impervious surfaces (pavements, roofs, etc)		0.07 ac	98.00			
Pervious Compositated CN (AMC 2)			98.00			
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### CB18 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1699	8.01	0.0581	0.1900	SCS	TYPE1A

**Record Id: CB18**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.19 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.19 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min
Pervious TC			5.00 min

**CB19 Event Summary**

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1609	8.01	0.0550	0.1800	SCS	TYPE1A

**Record Id: CB19**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.18 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.18 ac	98.00
Pervious Compositied CN (AMC 2)			98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### CB20 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.5007	8.01	0.1713	0.5600	SCS	TYPE1A

### Record Id: CB20

Design Method	SCS	Rainfall type	TYPE1A
Hyd Intv	10.00 min	Peaking Factor	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	0.56 ac	DCIA	0.00 ac
Pervious CN	98.00	DC CN	0.00
Pervious TC	5.00 min	DC TC	0.00 min

Pervious CN Calc		
Description	SubArea	Sub cn
Impervious surfaces (pavements, roofs, etc)	0.56 ac	98.00
Pervious Compositied CN (AMC 2)		98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### L01 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0536	8.01	0.0183	0.0600	SCS	TYPE1A

### Record Id: L01

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.06 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.06 ac	98.00
Pervious Compositd CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed			<b>Coeff</b>
			<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

## L02 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0536	8.01	0.0183	0.0600	SCS	TYPE1A

## Record Id: L02

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.06 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.06 ac	98.00
Pervious Compositd CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			

Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### L03 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0447	8.01	0.0153	0.0500	SCS	TYPE1A

### Record Id: L03

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.05 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>					<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)					0.05 ac	98.00
Pervious Compositd CN (AMC 2)						98.00
<b>Pervious TC Calc</b>						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### L04 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.3308	8.01	0.1132	0.3700	SCS	TYPE1A

### Record Id: L04

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
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<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.37 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.37 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed		<b>Coeff</b>	<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

### L05 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0983	8.01	0.0336	0.1100	SCS	TYPE1A

### Record Id: L05

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.11 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.11 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
		<b>Coeff</b>	<b>Misc</b>
			<b>TT</b>

Fixed		5.00 min
Pervious TC		5.00 min

### L06 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1699	8.01	0.0581	0.1900	SCS	TYPE1A

### Record Id: L06

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.19 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>			
Impervious surfaces (pavements, roofs, etc)		0.19 ac	98.00			
Pervious Compositd CN (AMC 2)			98.00			
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### L07 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0805	8.01	0.0275	0.0900	SCS	TYPE1A

### Record Id: L07

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00

		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.09 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.09 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min
Pervious TC			5.00 min

### L08 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0447	8.01	0.0153	0.0500	SCS	TYPE1A

### Record Id: L08

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.05 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.05 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min

Pervious TC	5.00 min
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### L09 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.2235	8.01	0.0765	0.2500	SCS	TYPE1A

### Record Id: L09

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.25 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>			
Impervious surfaces (pavements, roofs, etc)		0.25 ac	98.00			
Pervious Compositd CN (AMC 2)			98.00			
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### L10 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0447	8.01	0.0153	0.0500	SCS	TYPE1A

### Record Id: L10

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20

<b>Pervious Area (AMC 2)</b>	0.05 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.05 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed			<b>Coeff</b>
			<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

### R01 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1788	8.01	0.0612	0.2000	SCS	TYPE1A

### Record Id: R01

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.20 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.20 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed			<b>Coeff</b>
			<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

## R02 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1252	8.01	0.0428	0.1400	SCS	TYPE1A

### Record Id: R02

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.14 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.14 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed		<b>Coeff</b>	<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

## R03 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1788	8.01	0.0612	0.2000	SCS	TYPE1A

### Record Id: R03

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.20 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min

Pervious CN Calc						
Description					SubArea	Sub cn
Impervious surfaces (pavements, roofs, etc)					0.20 ac	98.00
Pervious Compositied CN (AMC 2)						98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### R04 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1520	8.01	0.0520	0.1700	SCS	TYPE1A

### Record Id: R04

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.17 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min

Pervious CN Calc						
Description					SubArea	Sub cn
Impervious surfaces (pavements, roofs, etc)					0.17 ac	98.00
Pervious Compositied CN (AMC 2)						98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### R05 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1162	8.01	0.0398	0.1300	SCS	TYPE1A

**Record Id: R05**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.13 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>			<b>SubArea</b>	<b>Sub cn</b>		
Impervious surfaces (pavements, roofs, etc)			0.13 ac	98.00		
Pervious Compositd CN (AMC 2)				98.00		
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

**R06 Event Summary**

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1878	8.01	0.0642	0.2100	SCS	TYPE1A

**Record Id: R06**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.21 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						

Description		SubArea	Sub cn
Impervious surfaces (pavements, roofs, etc)		0.21 ac	98.00
Pervious Compositd CN (AMC 2)			98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### R07 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.2503	8.01	0.0856	0.2800	SCS	TYPE1A

### Record Id: R07

Design Method	SCS	Rainfall type	TYPE1A
Hyd Intv	10.00 min	Peaking Factor	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	0.28 ac	DCIA	0.00 ac
Pervious CN	98.00	DC CN	0.00
Pervious TC	5.00 min	DC TC	0.00 min

Pervious CN Calc		
Description	SubArea	Sub cn
Impervious surfaces (pavements, roofs, etc)	0.28 ac	98.00
Pervious Compositd CN (AMC 2)		98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### R08 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
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25 year	0.2056	8.01	0.0703	0.2300	SCS	TYPE1A
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**Record Id: R08**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.23 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.23 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min
Pervious TC			5.00 min

**R09 Event Summary**

<b>Event</b>	<b>Peak Q (cfs)</b>	<b>Peak T (hrs)</b>	<b>Hyd Vol (acft)</b>	<b>Area (ac)</b>	<b>Method</b>	<b>Raintype</b>
25 year	0.2056	8.01	0.0703	0.2300	SCS	TYPE1A

**Record Id: R09**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.23 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>

Impervious surfaces (pavements, roofs, etc)	0.23 ac	98.00				
Pervious Compositated CN (AMC 2)		98.00				
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### R10 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.2056	8.01	0.0703	0.2300	SCS	TYPE1A

### Record Id: R10

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.23 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>			
Impervious surfaces (pavements, roofs, etc)		0.23 ac	98.00			
Pervious Compositated CN (AMC 2)			98.00			
<b>Pervious TC Calc</b>						
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>	<b>Coeff</b>	<b>Misc</b>	<b>TT</b>
Fixed						5.00 min
Pervious TC						5.00 min

### R11 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.0536	8.01	0.0183	0.0600	SCS	TYPE1A

**Record Id: R11**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.06 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.06 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min
Pervious TC			5.00 min

**R12 Event Summary**

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1073	8.01	0.0367	0.1200	SCS	TYPE1A

**Record Id: R12**

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.12 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.12 ac	98.00
Pervious Compositied CN (AMC 2)			98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### R13 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1252	8.01	0.0428	0.1400	SCS	TYPE1A

### Record Id: R13

Design Method	SCS	Rainfall type	TYPE1A
Hyd Intv	10.00 min	Peaking Factor	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	0.14 ac	DCIA	0.00 ac
Pervious CN	98.00	DC CN	0.00
Pervious TC	5.00 min	DC TC	0.00 min

Pervious CN Calc		
Description	SubArea	Sub cn
Impervious surfaces (pavements, roofs, etc)	0.14 ac	98.00
Pervious Compositied CN (AMC 2)		98.00

Pervious TC Calc						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### R14 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1162	8.01	0.0398	0.1300	SCS	TYPE1A

### Record Id: R14

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.13 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.13 ac	98.00
Pervious Compositd CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
Fixed			<b>Coeff</b>
			<b>Misc</b>
			<b>TT</b>
			5.00 min
Pervious TC			5.00 min

### R15 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1162	8.01	0.0398	0.1300	SCS	TYPE1A

### Record Id: R15

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.13 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.13 ac	98.00
Pervious Compositd CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			

Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### R16 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1162	8.01	0.0398	0.1300	SCS	TYPE1A

### Record Id: R16

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00			
		<b>Abstraction Coeff</b>	0.20			
<b>Pervious Area (AMC 2)</b>	0.13 ac	<b>DCIA</b>	0.00 ac			
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00			
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min			
<b>Pervious CN Calc</b>						
<b>Description</b>					<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)					0.13 ac	98.00
Pervious Compositd CN (AMC 2)						98.00
<b>Pervious TC Calc</b>						
Type	Description	Length	Slope	Coeff	Misc	TT
Fixed						5.00 min
Pervious TC						5.00 min

### R17 Event Summary

Event	Peak Q (cfs)	Peak T (hrs)	Hyd Vol (acft)	Area (ac)	Method	Raintype
25 year	0.1609	8.01	0.0550	0.1800	SCS	TYPE1A

### Record Id: R17

<b>Design Method</b>	SCS	<b>Rainfall type</b>	TYPE1A			
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<b>Hyd Intv</b>	10.00 min	<b>Peaking Factor</b>	484.00
		<b>Abstraction Coeff</b>	0.20
<b>Pervious Area (AMC 2)</b>	0.18 ac	<b>DCIA</b>	0.00 ac
<b>Pervious CN</b>	98.00	<b>DC CN</b>	0.00
<b>Pervious TC</b>	5.00 min	<b>DC TC</b>	0.00 min
<b>Pervious CN Calc</b>			
<b>Description</b>		<b>SubArea</b>	<b>Sub cn</b>
Impervious surfaces (pavements, roofs, etc)		0.18 ac	98.00
Pervious Compositied CN (AMC 2)			98.00
<b>Pervious TC Calc</b>			
<b>Type</b>	<b>Description</b>	<b>Length</b>	<b>Slope</b>
<b>Coeff</b>	<b>Misc</b>	<b>TT</b>	
Fixed			5.00 min
Pervious TC			5.00 min

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