EXHIBIT A

CITY OF TUALATIN
Community Development Department-Planning Division
Land Use Application—Type III

PROPOSAL NAME Commons on the Tualatin

PROPOSAL SUMMARY (Brief description)

This Application requests an Architectural Review of 5-building apartment complex, with private clubhouse, and proposes one community center. The subject property has frontage on the existing Nyberg Ln. and Nyberg St. public rights-of-way.

PROPERTY INFORMATION

Location (address if available): 6645 SW Nyberg Ln.

Tax Map & Lot #(s): Tax Lot 2600 and 2601 of Tax Map 2S124A Planning District: RH

Total site size: 10.99 AC Gross / 10.98 NET ☐ Developed ☐ Undeveloped

APPLICANT/CONTACT INFORMATION

Applicant or Primary Contact Name: Nyberg Road Property, LLC

Mailing Address: 1200 SW 66th Ave., Ste. 300

City/State: Portland, OR Zip: 97225

Phone: 503 222 0007 x103 Email: tandem1@tandemprop.com

Applicant's Signature: Date:

I hereby acknowledge that I have read this application and understand the requirements for approving and denying the application, that the information provided is correct, that I am the owner or authorized agent of the owner, and that plans submitted are in compliance with the City of Tualatin Development (TDC) and Municipal (TMC) Codes.

PROPERTY OWNER/DEED HOLDER INFORMATION (Attach list if more than one)

Name: Same as applicant

Mailing Address:

City/State: Zip:

Phone: Email:

Property Owner Signature: Date: 10.09.18

Power of attorney or letter of authorization required if application not signed by the property owner/deed holder.

LAND USE APPLICATION TYPE

- ☒ Architectural Review (ARB)
- ☐ Industrial Master Plan (IMP)
- ☐ Variance (VAR)
- ☐ Sign Variance (SVAR)
- ☐ Transitional Use Permit (TRP)
- ☐ Reinstatement of Use

FOR STAFF USE ONLY

Case No.:
Date Received:
By:
Fee Amount $:
Received by:

EXHIBIT A

GENERAL INFORMATION	
Site Address:	6645 SW Nyberg Ln. Tualatin, OR 97062
Assessor's Map and Tax Lot #:	2S124A0/2601 and 2600
Planning District:	RH
Parcel Size:	10.99 AC Gross / 10.98 NET
Property Owner:	Nyberg Road Property, LLC
Applicant:	same as property owner
Proposed Use:	RH

ARCHITECTURAL REVIEW DETAILS	
Residential x ☐ Commercial ☐ Industrial	
Number of parking spaces:	499
Square footage of building(s):	107,033
Square footage of landscaping:	220,200
Square footage of paving:	141,249
Proposed density (for residential):	24 DU

For City Personnel to complete:

Staff contact person:

ARCHITECTURAL REVIEW
CERTIFICATION OF SIGN POSTING

18"

24"

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>.

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

As the applicant for the ARCHITECTURAL REVIEW AT 6645 SW NYBERG LN project, I hereby certify that on this day, OCTOBER 16, 2018 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: KEN SANDBLAST
(PLEASE PRINT)

Applicant's Signature: Kenneth L Sandblast

Date: 10.16.18

NOTICE

ARCHITECTURAL REVIEW AR-18-0007

For more information call 503-691-3026 or visit www.tualatinoregon.gov

EXHIBIT B

NE 1/4 SECTION 24 T2S R1W W.M.

WASHINGTON COUNTY OREGON

SCALE 1"=200'

2S 1 24A

CANCELLED TAX LOT NUMBERS
2400, 2504, 1301, 701, 800, 100, 101, 102
103, 104, 105, 200, 300, 400, 401, 500, 600
700, 900, 1000, 1100, 1200, 1300, 1400
1500, 1600, 1700, 1800, 1900, 2000, 2100
2200, 2300, 2590, 2500, 2501-A1, 2501,
2505, 2509, 2506, 2507, 2700, 2502,

FOR ASSESSMENT PURPOSES ONLY
DO NOT RELY ON FOR ANY OTHER USE

SEE MAP
2S 1 24AB

SEE MAP
2S 1 24AA

SEE MAP
1S 1 24 A

SEE MAP
2S 1 24DB

SEE MAP
2S 1 24DA

TUALATIN RIVER

FREEWAY

R H BALDOCK

CLACKAMAS COUNTY

3100
22.68Ac.

2503
24.95 Ac.
2503-A1

2900
2.08AC.

TRACT "A"

2800
18.00AC.

2601
10.85 AC

2508
2.35 Ac.

3000
.81 Ac.

2600
.10 AC

23-76

C.S.13,929

(C.S. No. 11,529)

(VACATED 90-14169)

EASEMENT 95-61632

EASEMENT 2014-13490 2014-60303

EASEMENT 93-110724

RELINQUISHMENT 80-40717 2014-60308

2003-88103

SW NYBERG LANE

NYBERG CR 1153

STREET

CENTER SECTION

TERM 5913 857

TERM 1153

1/4 SEC. COR.

2760.09'W. & 1350.0'N TO SE COR W. T. BARR CLAIM

N. 13° N LINE W.T. BARR

pt. 1

SCH NE COR BARR'S

TUALATIN
2S 1 24A

EXHIBIT C

Chicago Title
Company of Oregon

PRELIMINARY REPORT

In response to the application for a policy of title insurance referenced herein Chicago Title Company of Oregon hereby reports that it is prepared to issue, or cause to be issued, as of the specified date, a policy or policies of title insurance describing the land and the estate or interest hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an exception herein or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations or Conditions of said policy forms.

The printed Exceptions and Exclusions from the coverage of said policy or policies are set forth in Exhibit One. The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. Copies of the policy forms should be read. They are available from the office which issued this report.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby.

The policy(s) of title insurance to be issued hereunder will be policy(s) of Chicago Title Insurance Company, a/an Florida corporation.

Please read the exceptions shown or referred to herein and the Exceptions and Exclusions set forth in Exhibit One of this report carefully. The Exceptions and Exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land.

This preliminary report is for the exclusive use of the parties to the contemplated transaction, and the Company does not have any liability to any third parties nor any liability until the full premium is paid and a policy is issued. Until all necessary documents are placed of record, the Company reserves the right to amend or supplement this preliminary report.

Countersigned

Maggie Metcalf

EXHIBIT C

Chicago Title Company of Oregon
1211 SW Fifth Ave., Ste 2130, Portland, OR 97204
(503)973-7400 FAX (503)248-0324

PRELIMINARY REPORT

ESCROW OFFICER: Jennifer Lyke
Jennifer.Lyke@CTT.com
503-973-7408

ORDER NO.: 472518004584

TITLE OFFICER: Tony Schadle

TO: Chicago Title Company of Oregon
1211 SW Fifth Ave., Ste 2130
Portland, OR 97204

ESCROW LICENSE NO.: 201004072
BUYER/BORROWER: Nyberg Road Property, LLC
PROPERTY ADDRESS: 6645 S.W. Nyberg Lane, Tualatin, OR 97062

EFFECTIVE DATE: September 10, 2018, 08:00 AM

1. THE POLICY AND ENDORSEMENTS TO BE ISSUED AND THE RELATED CHARGES ARE:

	AMOUNT	PREMIUM
ALTA Extended Loan Policy 2006 **Extended Lender's**	$ TBD	$ TBD
OTIRO 222-06 - Location (ALTA 22-06)		$ 0.00
OTIRO 209.10-06 - Restrictions, Encroachments, Minerals - Current Violations (ALTA 9.10-06)		$ 100.00
Government Lien Search		$ 25.00

2. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:

   A Fee

3. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:

   Nyberg Road Property, LLC, an Oregon limited liability company, which acquired title as Nyberg Road Property LLC

4. THE LAND REFERRED TO IN THIS REPORT IS SITUATED IN THE CITY OF TUALATIN, COUNTY OF WASHINGTON, STATE OF OREGON, AND IS DESCRIBED AS FOLLOWS:

   SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

EXHIBIT C

Order No.: 472518004584

EXHIBIT "A"

Legal Description

A tract of land in the Donation Land Claim of William J. Barr and Mary J. Barr, in the Northeast one-quarter of Section 24, Township 2 South, Range 1 West of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon, described as follows:

Beginning at a point on the East line of Section 24, 20 chains North of the Southeast corner of the North one-half of the South one-half of said Section 24; thence Northerly 1275 feet, more or less, to the Northeast corner of the Donation Land Claim of William J. Barr and Mary J. Barr; thence West along the North line of said Barr Donation Land Claim, 6 chains; thence South on a line parallel with the East line of said section a distance of 20 chains to the North line of the South one-half of said Section 24; thence East along the North line of the South one-half of said Section 24, approximately 396 feet to the point of beginning.

EXCEPTING THEREFROM that portion thereof lying within County Road No. 1153 also known as S.W. Nyberg Road and also S.W. Nyberg Lane, including but not limited to that portion of said land dedicated to the City of Tualatin in Deed recorded on June 2, 2003 as Fee No. 2003-088103.

FURTHER EXCEPTING THEREFROM Ownership of the State of Oregon in and to that portion of the premises herein described lying below the line of ordinary high water of the Tualatin River.

EXHIBIT C

Order No.: 472518004584

AS OF THE DATE OF THIS REPORT, ITEMS TO BE CONSIDERED AND EXCEPTIONS TO COVERAGE IN ADDITION TO THE PRINTED EXCEPTIONS AND EXCLUSIONS IN THE POLICY FORM WOULD BE AS FOLLOWS:

GENERAL EXCEPTIONS:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.

2. Any facts, rights, interests or claims, which are not shown by the Public Records but which could be ascertained by an inspection of the Land or which may be asserted by persons in possession thereof.

3. Easements, or claims thereof, which are not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.

4. Any encroachment, encumbrance, violation, variation or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.

5. Any lien, or right to a lien, for services, labor, material or equipment rental, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, heretofore or hereafter furnished, imposed by law and not shown by the Public Records.

SPECIFIC ITEMS AND EXCEPTIONS:

6. Property taxes in an undetermined amount, which are a lien but not yet payable, including any assessments collected with taxes to be levied for the fiscal year 2018-2019.

7. City Liens, if any, in favor of the City of Tualatin. None found as of September 13, 2018.

8. Rights of the public and of governmental bodies in and to that portion of the premises herein described lying below the high water mark of the Tualatin River.

9. Any adverse claims based upon the assertion that the Tualatin River has changed in location.

10. Any adverse claim based on the assertion that any portion of said land has been created by artificial means or has accreted to such portions so created.

11. Rights established pursuant to ORS 274.905, et seq to all or any portion of the herein described premises created by artificial means.

12. Easement for the purpose shown below and rights incidental thereto, as granted in a document:
Granted to: The City of Tualatin
Purpose: Sanitary sewer
Recording Date: July 27, 1970
Recording No.: 79-029909
Affects: The Southeasterly portion

13. Easement for the purpose shown below and rights incidental thereto, as granted in a document:
Granted to: Forest Rim Associates, Ltd.
Purpose: Sanitary sewer improvements and appurtenances
Recording Date: December 11, 1992
Recording No.: 92-088561
Affects: Various strip throughout said property

Said interest was assigned by instrument:
To: The City of Tualatin
Recording Date: January 13, 1995
Recording No.: 95-003174

14. Easement for the purpose shown below and rights incidental thereto, as granted in a document:
Granted to: The City of Tualatin
Purpose: Storm drainage
Recording Date: June 2, 2003
Recording No.: 2003-088103
Affects: A 5 foot wide strip through the Southerly portion

15. A Deed of Trust, Assignment of Leases and Rents, Security Agreement and Fixture Filing to secure an indebtedness in the amount shown below,
Amount: $15,000,000.00
Dated: March 27, 2015
Grantor: Nyberg Road Property, LLC, an Oregon limited liability company
Borrower: Thomas V. Clarey and Molly H. Clarey
Trustee: Chicago Title Insurance Company of Oregon
Beneficiary: Umpqua Bank
Loan No.: 70037755
Recording Date: March 27, 2015
Recording No.: 2015-021549

16. An Assignment of Rents and Income of all moneys due, or to become due as rental or otherwise from said Land, to secure payment of an indebtedness, shown below and upon the terms and conditions therein;
Assigned to: Umpqua Bank
Recording Date: March 27, 2015
Recording No.: 2015-021550

17. The Company will require the following documents for review prior to the issuance of any title insurance predicated upon a conveyance or encumbrance from the entity named below.
Limited Liability Company: Nyberg Road Property. LLC
a. A copy of its operating agreement, if any, and any and all amendments, supplements and/or modifications thereto, certified by the appropriate manager or member.
b. If a domestic Limited Liability Company, a copy of its Articles of Organization and all amendment thereto with the appropriate filing stamps.
c. If the Limited Liability Company is member-managed a full and complete current list of members certified by the appropriate manager or member.
d. A current dated certificate of good standing from the proper governmental authority of the state in which the entity was created
e. If less than all members, or managers, as appropriate, will be executing the closing documents, furnish evidence of the authority of those signing.

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

18. Facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.

To remove this item, the Company will require an affidavit and indemnity on a form supplied by the Company.

19. Any lien or right to a lien for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the public records.

To remove this item, the Company will require an affidavit and indemnity on a form supplied by the Company.

20. Any encroachment (of existing improvements located on the subject Land onto adjoining land or of existing improvements located on adjoining land onto the subject Land), encumbrance, violation, variation or adverse circumstance affecting the title that would be disclosed by an accurate and complete land survey of the subject Land.

The Company will require an inspection of the premises, and this exception may be eliminated or limited as a result thereof.

ADDITIONAL REQUIREMENTS/NOTES:

A. NOTE: Property taxes for the fiscal year shown below are paid in full.
Fiscal Year: 2017-2018
Amount: $61,654.25
Levy Code: 023.76
Account No.: R532980
Map No.: 2S124A-02601

Amount: $328.48
Levy Code: 023.76
Account No.: R532971
Map No.: 2S124A-02600

Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

B. In addition to the standard policy exceptions, the exceptions enumerated above shall appear on the final 2006 ALTA Policy unless removed prior to issuance.

C. NOTE: There are NO conveyances affecting said Land recorded within 24 months of the date of this report.

D. THE FOLLOWING NOTICE IS REQUIRED BY STATE LAW: YOU WILL BE REVIEWING, APPROVING AND SIGNING IMPORTANT DOCUMENTS AT CLOSING. LEGAL CONSEQUENCES FOLLOW FROM THE SELECTION AND USE OF THESE DOCUMENTS. YOU MAY CONSULT AN ATTORNEY ABOUT THESE DOCUMENTS. YOU SHOULD CONSULT AN ATTORNEY IF YOU HAVE QUESTIONS OR CONCERNS ABOUT THE TRANSACTION OR ABOUT THE DOCUMENTS. IF YOU WISH TO REVIEW TRANSACTION DOCUMENTS THAT YOU HAVE NOT SEEN, PLEASE CONTACT THE ESCROW AGENT.

E. NOTE: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

F. Recording Charge (Per Document) is the following:

County	First Page	Each Additional Page
Washington	$81.00	$5.00

NOTE: When possible the company will record electronically. An additional charge of $5.00 applies to each document that is recorded electronically.

G. NOTICE: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

EXHIBIT C

EXHIBIT ONE

2006 AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning) restricting, regulating, prohibiting or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions or location of any improvement erected on the land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed or agreed to by the Insured Claimant;
   (b) not known to the Company, not recorded in the Public Records at Date of Policy, but known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with the applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in the Covered Risk 13(b) of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
5. Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.

2006 AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning) restricting, regulating, prohibiting or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions or location of any improvement erected on the land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed or agreed to by the Insured Claimant;
   (b) not known to the Company, not recorded in the Public Records at Date of Policy, but known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in the Covered Risk 9 of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
5. Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.

EXHIBIT C

WIRESAFE™ | Inquire before you wire!

WIRE FRAUD ALERT

This Notice is not intended to provide legal or professional advice.
If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the number of relevant parties to the transaction as soon as an escrow account is opened.** DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

Federal Bureau of Investigation:
http://www.fbi.gov

Internet Crime Complain Center:
http://www.ic3.gov

EXHIBIT C

FIDELITY NATIONAL FINANCIAL
PRIVACY NOTICE
Revised May 1, 2018

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF", "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

Types of Information Collected

We may collect two types of information from you: Personal Information and Browsing Information.

Personal Information. FNF may collect the following categories of Personal Information:

- contact information (e.g., name, address, phone number, email address);
- demographic information (e.g., date of birth, gender, marital status);
- identity information (e.g. Social Security Number, driver's license, passport, or other government ID number);
- financial account information (e.g. loan or bank account information); and
- other personal information necessary to provide products or services to you.

Browsing Information. FNF may automatically collect the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or mobile device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

How Personal Information is Collected

We may collect Personal Information about you from:

- information we receive from you on applications or other forms;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

How Browsing Information is Collected

If you visit or use an FNF Website, Browsing Information may be collected during your visit. Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics

Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to other websites. FNF is not responsible for the privacy practices or the content of any of those other websites. We advise you to read the privacy policy of every website you visit.

Use of Personal Information

FNF uses Personal Information for three main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and third parties' products and services, jointly or independently.

When Information Is Disclosed

We may make disclosures of your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;
- to nonaffiliated third party service providers with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Please see **"Choices With Your Information"** to learn the disclosures you can restrict.

Security of Your Information

We maintain physical, electronic, and procedural safeguards to guard your Personal Information. We limit access to nonpublic personal information about you to employees who need to know that information to do their job. When we provide Personal Information to others as discussed in this Privacy Notice, we expect that they process such information in compliance with our Privacy Notice and in compliance with applicable privacy laws.

Choices With Your Information

If you do not want FNF to share your information with our affiliates to directly market to you, you may send an "opt out" request by email, phone, or physical mail as directed at the end of this Privacy Notice. We do not share your Personal Information with nonaffiliates for their use to direct market to you.

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

For California Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties, except as permitted by California law.

For Nevada Residents: You may be placed on our internal Do Not Call List by calling (888) 934-3354 or by contacting us via the information set forth at the end of this Privacy Notice. Nevada law requires that we also provide you with the following contact information: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: BCPINFO@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not disclose information about you creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

Information From Children

The FNF Websites are meant for adults and are not intended or designed to attract persons under the age of eighteen (18). We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian.

International Users

FNF's headquarters is located within the United States. If you reside outside the United States and choose to provide Personal Information or Browsing Information to us, please note that we may transfer that information outside of your country of residence for any of the purposes described in this Privacy Notice. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection, transfer, and use of such information in accordance with this Privacy Notice.

FNF Website Services for Mortgage Loans

Certain FNF companies provide services to mortgage loan servicers, including hosting websites that collect customer information on behalf of mortgage loan servicers (the "Service Websites"). The Service Websites may contain links to both this Privacy Notice and the mortgage loan servicer or lender's privacy notice. The sections of this Privacy Notice titled When Information is Disclosed, Choices with Your Information, and Accessing and Correcting Information do not apply to the Service Websites. The mortgage loan servicer or lender's privacy notice governs use, disclosure, and access to your Personal Information. FNF does not share Personal Information collected through the Service Websites, except (1) as required or authorized by contract with the mortgage loan servicer or lender, or (2) as required by law or in the good-faith belief that such disclosure is necessary to comply with a legal process or applicable law, to enforce this Privacy Notice, or to protect the rights, property, or safety of FNF or the public.

Your Consent To This Privacy Notice; Notice Changes

By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information in accordance with this Privacy Notice. We may change this Privacy Notice at any time. The revised Privacy Notice, showing the new revision date, will be posted on the FNF Website. Each time you provide information to us following any amendment of this Privacy Notice, your provision of information to us will signify your assent to and acceptance of the terms of the revised Privacy Notice for all previously collected information and information collected from you in the future. We may use comments, information or feedback that you submit to us in any manner that we may choose without notice or compensation to you.

Accessing and Correcting Information; Contact Us

If you have questions, would like to access or correct your Personal Information, or want to opt-out of information sharing for affiliate marketing, send your requests via email to privacy@fnf.com, by phone to (888) 934-3354, or by mail to:

Fidelity National Financial, Inc.
601 Riverside Avenue,
Jacksonville, Florida 32204
Attn: Chief Privacy Officer

CITY OF TUALATIN FACT SHEET

General

Proposed use: Residential High Density / Multi-family Complex			
Site area: 10.99 Gross / 10.98 Net	acres	Building footprint: 109489	sq. ft.
Development area: 375,140	acres Sq. ft.	Paved area: 141249	sq. ft.
		Development area coverage: 64%	%

Parking

Spaces required (see TDC 73.400) *(example: warehouse @ 0.3/1000 GFA)* _____@____/1000 GFA = _____ _____@____/1000 GFA = _____ _____@____/1000 GFA =_____ Total parking required: 396 ADA accessible = 9 Req. w/ 2 Van Accessible spaces	Spaces provided: Total parking provided: Standard = 499 ADA accessible = 11 Van pool = Compact = Loading berths =

Bicycles

Covered spaces required: 264	Covered spaces provided: 264

Landscaping

Landscaping required: 25 % of dvpt. area 375,140 Square feet 93,785	Landscaping provided: 33.9 % of dvpt. area Square feet 127,100
Landscaped parking island area required: 6,550 SF	Landscaped parking island area provided: 8,600 SF

Trash and recycling facility

Minimum standard method: Yes	square feet 2,207
Other method: _____	square feet

For commercial/industrial projects only

Total building area:	sq. ft.	2nd floor:	sq. ft.
Main floor:	sq. ft.	3rd floor:	sq. ft.
Mezzanine:	sq. ft.	4th floor:	sq. ft.

For residential projects only

Number of buildings: 5	Total sq. ft. of buildings: 107033 sq. ft.
Building stories: 2	

Clean Water Services
Our commitment is clear.

CWS File Number: 18-003752

Service Provider Letter

This form and the attached conditions will serve as your Service Provider Letter in accordance with Clean Water Services Design and Construction Standards (R&O 19-5).

Jurisdiction:	City of Tualatin	**Review Type:**	Minor Encroachment
Site Address / Location:	6645 SW Nyberg Lane Tualatin, OR 97062	**SPL Issue Date:** **SPL Expiration Date:**	August 19, 2019 August 19, 2021

Applicant Information:		**Owner Information:**	
Name	KEN SANBLAST	Name	TOM CLAREY
Company	WESTLAKE CONSULTANTS, INC	Company	NYBERG ROAD PROPERTY, LLC
Address	15115 SW SEQUOIA PKWY. STE. 150 TIGARD, OR 97224	Address	1200 SW 66TH AVE. STE. 300 PORTLAND, OR 97225
Phone/Fax	(503) 684-0652	Phone/Fax	(503) 750-1012
E-mail:	ksandblast@westlakeconsultants.com	E-mail:	tandem1@tandemprop.com

Tax lot ID		**Development Activity**
2S124A002601		Tualatin Waterfront Apartments and Trail
21E19C00300	(off-site trail extension)	

Pre-Development Site Conditions:		**Post Development Site Conditions:**	
Sensitive Area Present:	[X] On-Site [X] Off-Site	Sensitive Area Present:	[X] On-Site [X] Off-Site
Vegetated Corridor Width:	125	Vegetated Corridor Width:	Variable
Vegetated Corridor Condition:	Marginal/Degraded		

Enhancement of Remaining Vegetated Corridor Required: [X] **Square Footage to be enhanced:** 17,340

Encroachments into Pre-Development Vegetated Corridor:

Type and location of Encroachment:	Square Footage:
Building (Permanent Encroachment; Mitigation Required)	3,745
Pathway (Permanent Encroachment; Mitigation Required beyond 3' width for Allowed Use Path)	5,895
Grading for removal of existing fill (Permanent Encroachment for Enhancement; Restoration & Planting In-Place Required)	2,905
Stormwater outfall (Permanent Encroachment; No Mitigation Required for up to 100 SF)	50
Stormwater pipe (Temporary Encroachment; Restoration & Planting In-Place Required)	1,320

Mitigation Requirements:

Type/Location	Sq. Ft./Ratio/Cost
On-site Enhancement of Existing VC as Mitigation for total of 8,550 SF of Permanent Encroachment	20,130/2.35:1

[X] Conditions Attached [X] Development Figures Attached (3) [ ] Planting Plan Attached [ ] Geotech Report Required

This Service Provider Letter does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered on your property.

In order to comply with Clean Water Services water quality protection requirements the project must comply with the following conditions:

1. No structures, development, construction activities, gardens, lawns, application of chemicals, uncontained areas of hazardous materials as defined by Oregon Department of Environmental Quality, pet wastes, dumping of materials of any kind, or other activities shall be permitted within the sensitive area or Vegetated Corridor which may negatively impact water quality, except those allowed in R&O 19-5, Chapter 3.
2. Prior to any site clearing, grading or construction the Vegetated Corridor and water quality sensitive areas shall be surveyed, staked, and temporarily fenced per approved plan. During construction the Vegetated Corridor shall remain fenced and undisturbed except as allowed by R&O 19-5, Section 3.06.1 and per approved plans.
3. Prior to any activity within the sensitive area, the applicant shall gain authorization for the project from the Oregon Department of State Lands (DSL) and US Army Corps of Engineers (USACE). The applicant shall provide Clean Water Services or its designee (appropriate city) with copies of all DSL and USACE project authorization permits. **No wetland or non-wetland water impacts proposed for this project.**
4. An approved Oregon Department of Forestry Notification is required for one or more trees harvested for sale, trade, or barter, on any non-federal lands within the State of Oregon.
5. **Prior to ground disturbing activities, an erosion control permit is required. Appropriate Best Management Practices (BMP's) for Erosion Control, in accordance with Clean Water Services' Erosion Prevention and Sediment Control Planning and Design Manual, shall be used prior to, during, and following earth disturbing activities.**
6. Prior to construction, a Stormwater Connection Permit from Clean Water Services or its designee is required pursuant to Ordinance 27, Section 4.B.
7. Activities located within the 100-year floodplain shall comply with R&O 19-5, Section 5.10.
8. Removal of native, woody vegetation shall be limited to the greatest extent practicable.
9. The water quality swale and detention pond shall be planted with Clean Water Services approved native species, and designed to blend into the natural surroundings.
10. **Should final development plans differ significantly from those submitted for review by Clean Water Services, the applicant shall provide updated drawings, and if necessary, obtain a revised Service Provider Letter.**
11. The Vegetated Corridor width for sensitive areas within the project site shall be a minimum of 125 feet wide, as measured horizontally from the delineated boundary of the sensitive area.
12. **For Vegetated Corridors greater than 50 feet in width, the applicant shall enhance the first 50 feet closest to the sensitive area to meet or exceed good corridor condition as defined in R&O 19-5, Section 3.14.2, Table 3-3.**
13. Removal of invasive non-native species by hand is required in all Vegetated Corridors rated ""good."" Replanting is required in any cleared areas larger than 25 square feet using low impact methods. The applicant shall calculate all cleared areas larger than 25 square feet prior to the preparation of the required Vegetated Corridor enhancement/restoration plan.
14. Prior to any site clearing, grading or construction, the applicant shall provide Clean Water Services with a Vegetated Corridor enhancement/restoration plan. Enhancement/restoration of the Vegetated Corridor shall be provided in accordance with R&O 19-5, Appendix A, and shall include planting specifications for all Vegetated Corridor, including any cleared areas larger than 25 square feet in Vegetated Corridor rated ""good.""
15. Prior to installation of plant materials, all invasive vegetation within the Vegetated Corridor shall be removed per methods described in Clean Water Services' Integrated Vegetation and Animal Management Guidance, 2003. During removal of invasive vegetation care shall be taken to minimize impacts to existing native tree and shrub species.

16. Clean Water Services shall be notified 72 hours prior to the start and completion of enhancement/restoration activities. Enhancement/restoration activities shall comply with the guidelines provided in Planting Requirements (R&0 19-5, Appendix A).
17. **Maintenance and monitoring requirements shall comply with R&O 19-5, Section 2.12.2. If at any time during the warranty period the landscaping falls below the 80% survival level, the owner shall reinstall all deficient planting at the next appropriate planting opportunity and the two year maintenance period shall begin again from the date of replanting.**
18. **Performance assurances for the Vegetated Corridor shall comply with R&O 19-5, Section 2.07.2, Table 2-1 and Section 2.11, Table 2-2.**
19. **Clean Water Services will require an easement over the Vegetated Corridor conveying storm and surface water management to Clean Water Services or the City that would prevent the owner of the Vegetated Corridor from activities and uses inconsistent with the purpose of the corridor and any easements therein.**

FINAL PLANS

20. **Final construction plans shall include landscape plans.** In the details section of the plans, a description of the methods for removal and control of exotic species, location, distribution, condition and size of plantings, existing plants and trees to be preserved, and installation methods for plant materials is required. Plantings shall be tagged for dormant season identification and shall remain on plant material after planting for monitoring purposes.
21. **A Maintenance Plan shall be included on final plans** including methods, responsible party contact information, and dates (minimum two times per year, by June 1 and September 30).
22. **Final construction plans shall clearly depict the location and dimensions of the sensitive area and the Vegetated Corridor** (indicating good, marginal, or degraded condition). Sensitive area boundaries shall be marked in the field.
23. Protection of the Vegetated Corridors and associated sensitive areas shall be provided by the installation of permanent fencing and signage between the development and the outer limits of the Vegetated Corridors. **Fencing and signage details to be included on final construction plans.**

This Service Provider Letter is not valid unless CWS-approved site plan is attached.

Please call (503) 681-3653 with any questions.

Lindsey Obermiller
Environmental Plan Review

Attachments (3)

COMMONS ON THE TUALATIN

TUALATIN, OREGON

EXISTING CONDITIONS PLAN
OVERALL

DATE	2019-06-14
REVISION	3
DRAWN BY	JAB
CHECKED BY	KLS
JOB NO.	WCI 2752-001

EXISTING VEGETATED CORRIDOR AREAS

(TOTAL AREA 51,080 SF)

50' VEGETATED CORRIDOR (Marginal Condition)
20,435 SF

ADDITIONAL 75' VEGETATED CORRIDOR (Degraded Condition)
30,645 SF

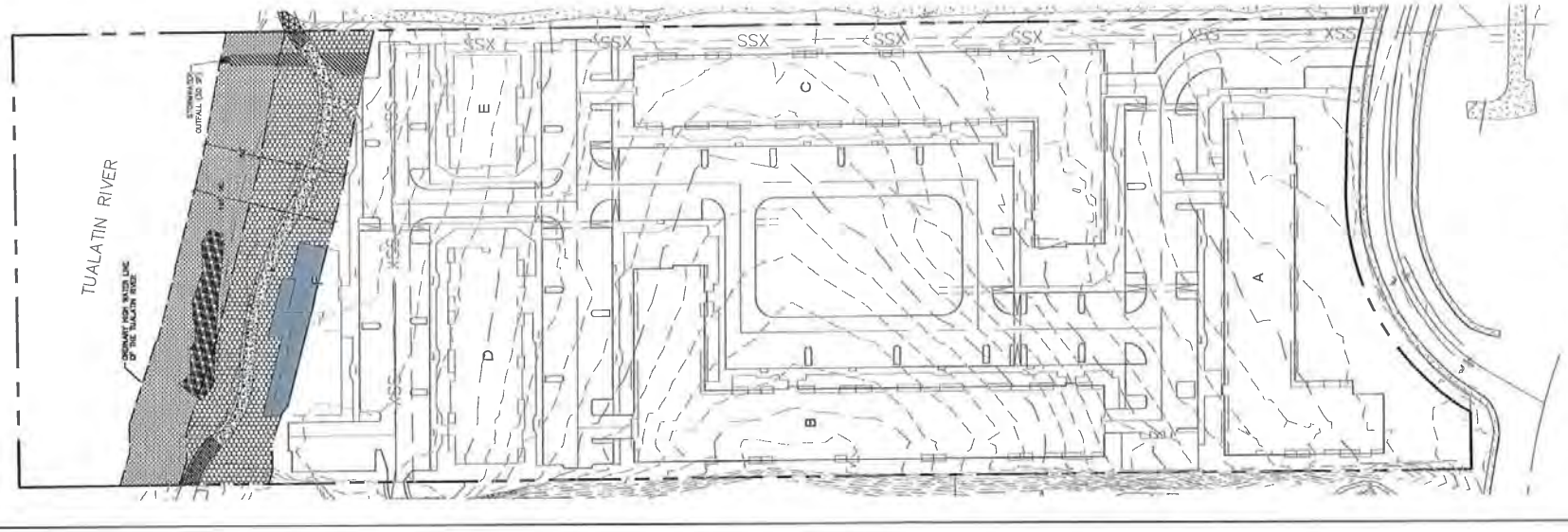
0 50' 100'
SCALE: 1" = 100'

CWS FILE NO. 18-003752
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By KD Date 8/19/2019
SPL ATTACHMENT 1 OF 3

ENLARGEMENT

TUALATIN RIVER

DRAWING NAME: J:\2752-001\7\6. ENGINEERING\3. CAD\EXHIBITS\2019-06-14 - VC IMPACT\SCHOTT - EXISTING.DWG 2019/06/14 - 04:30PM - JAB



0 50' 100'

SCALE: 1"=100'

VEGETATED CORRIDOR ENCROACHMENT AND PLANTING AREAS

- SITE DEVELOPMENT ENCROACHMENT
  3,745 SF (BUILDING F – 3,740 SF, PARKING – 5 SF)
- 12' GREENWAY PATH ENCROACHMENT
  4,765 SF (3' – 1,090 SF, 9' – 3,675 SF)
- 14' GREENWAY AERIAL PATH ENCROACHMENT
  830 SF
- OFFSITE 14' GREENWAY AERIAL PATH
  300 SF
- ENHANCEMENT (1ST 50' VC) PLANTING REQUIRED
  17,340 SF
- ENHANCEMENT OF EXISTING VC AS MITIGATION (2:1)
  20,130 SF
- TEMPORARY VC ENCROACHMENTS: RESTORED AND PLANTED TO GOOD CORRIDOR CONDITION
  1,320 SF
- GRADING FOR REMOVAL OF EXISTING FILL AND PLANTING TO GOOD CORRIDOR CONDITION : MITIGATED IN PLACE
  2,905 SF

** TOTAL PERMANENT VC ENCROACHMENTS REQUIRING MITIGATION: 8,550 SF
(DOES NOT INCLUDE 1,090 SF OF FIRST 3' OF 12' WIDE ALLOWED USE PATH)

CWS FILE NO. 18-003752
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By _____ Date 8/19/2019
SPL ATTACHMENT 2 OF 3

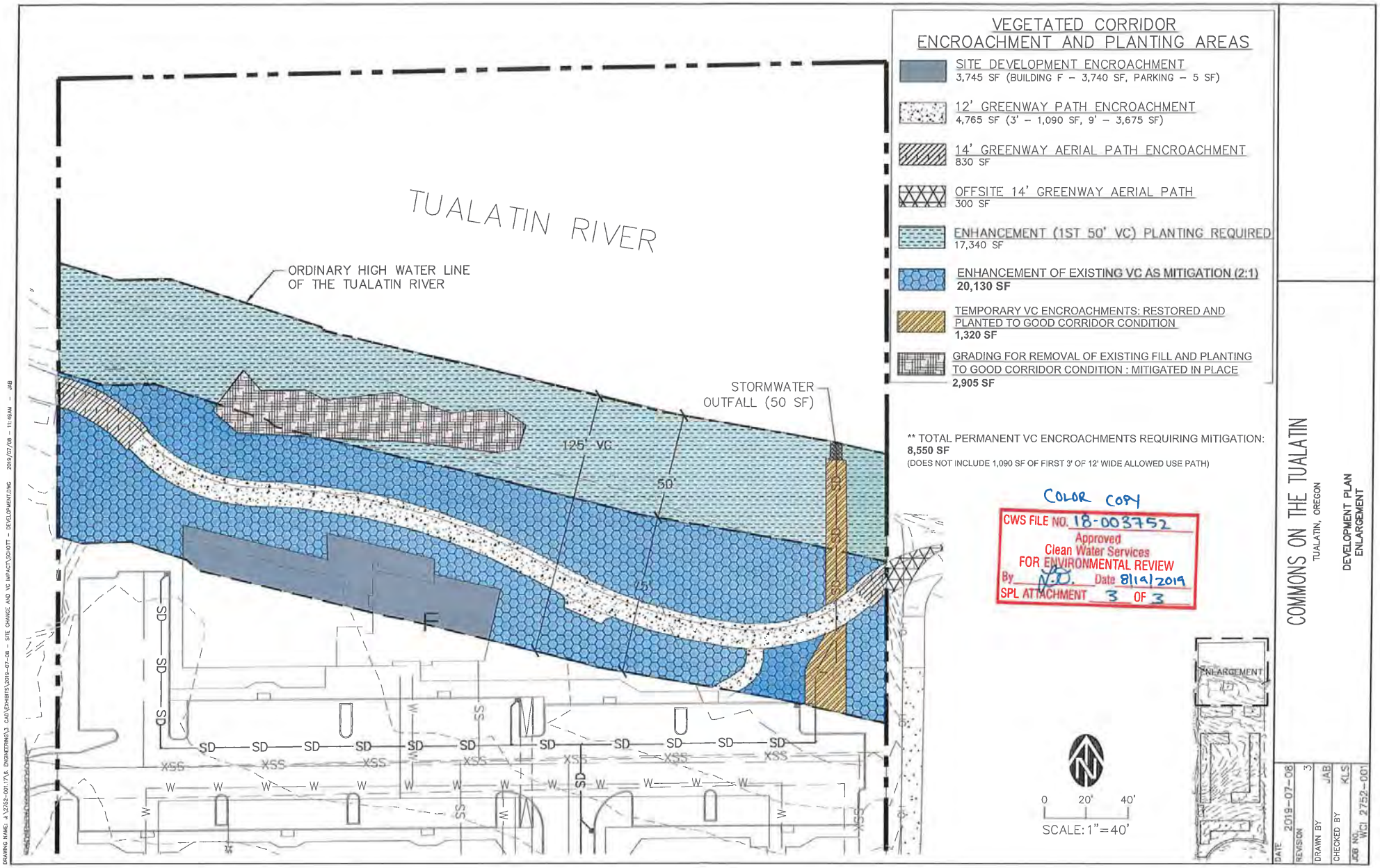
COMMONS ON THE TUALATIN

TUALATIN, OREGON

DEVELOPMENT PLAN OVERALL

DATE	2019-07-08
REVISION	3
DRAWN BY	JAB
CHECKED BY	KLS
JOB NO	WCI 2752-001

DRAWING NAME: J:\2752-001\17\6 ENGINEERING\3 CAD\EXHIBITS\2019-07-08 - SITE CHANGE AND VC IMPACTS\SHOT1 - DEVELOPMENT.DWG 2019/07/08 - 11:49AM - JAB



VEGETATED CORRIDOR ENCROACHMENT AND PLANTING AREAS

- SITE DEVELOPMENT ENCROACHMENT
  3,745 SF (BUILDING F – 3,740 SF, PARKING – 5 SF)
- 12' GREENWAY PATH ENCROACHMENT
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** TOTAL PERMANENT VC ENCROACHMENTS REQUIRING MITIGATION:
8,550 SF
(DOES NOT INCLUDE 1,090 SF OF FIRST 3' OF 12' WIDE ALLOWED USE PATH)

COLOR COPY

CWS FILE NO. 18-003752
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By N.D. Date 8/19/2019
SPL ATTACHMENT 3 OF 3

ENLARGEMENT

0 20' 40'
SCALE: 1"=40'

COMMONS ON THE TUALATIN
TUALATIN, OREGON

DEVELOPMENT PLAN
ENLARGEMENT

DATE	REVISION	DRAWN BY	CHECKED BY	JOB NO.
2019-07-08	3	JAB	KLS	WCI 2752-001

DRAWING NAME: J:\2752-001\7.0 ENGINEERING\3 CAD\EXHIBITS\2018-07-08 - SITE CHANGE AND VC IMPACTS\SCHOTT - DEVELOPMENT.DWG 2019/07/08 - 11:48AM - JAB

City of Tualatin
www.tualatinoregon.gov

Exhibit H

Hydraulic Modeling Fee

Water supply modeling is necessary for larger projects to determine the impact of the project's water demand on the water supply system. Water supply modeling will be performed by a consulting engineer based on the most recent version of the Tualatin Water System Master Plan.

Due to possible impacts to the water supply system, the following projects in Tualatin require hydraulic modeling based on the size and type of the project and projected water use for the finished project. The outcome of modeling could require offsite improvements to the water supply system in order to ensure that adequate water supply is available to serve the project and reduce impacts to the overall system.

Hydraulic modeling of the water supply system is required for the following project type/sizes/demand:

Project Type	Criteria	Permit Fee
Commercial or Industrial Building	Building floor area greater than 48,300 square feet **or** Anticipated daily water demand greater than 870 gallons per acre per day	$ 300 per building
Residential development	More than 49 dwelling units	$ 1,000
Multi-family development	More than 49 dwelling units **or** a combined building floor area greater than 48,300 square feet	$ 300 per building

Please complete this form and submit the form and required fee (if applicable) with your land-use application (architectural review, subdivision, etc.).

☐ Commercial or Industrial Development

- Building floor area _____ square feet
- Anticipated water demand (if known) _____ gallons per day
- Described planned building use _____

☐ Residential Development

- Number of dwelling units or single family home lots _____

☒ Multi-Family Residential Development

- Number of dwelling units 264
- Building floor area (sum of all building) _____
- Number of multi-family buildings (5) MF Blds + Clubhouse = 2,494 SF

Permit fee required based on the information provided above $ 1,500

- If no fee is required, enter $0.

NOTE: Water Supply Modeling does not replace the requirement for fire hydrant flow testing. Flow testing of fire hydrants will still be required to verify adequate fire flow of finished system

REPUBLIC SERVICES

10295 Southwest Ridder Road Wilsonville OR 97070
o 503.570.0626 f 503.582.9307 republicservices.com

November 16, 2018

Campbell Clarey
Tandem Property Management

Re: Commons on the Tualatin
6625 SW Nyberg Ln.
Tualatin, OR 97062

Dear Campbell,

Thank you, for sending us the final site plans for this proposed development in Tualatin.

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

The design location of the recycle enclosure sent 11/14/2018 repositioned to the South to allow for greater separation between enclosure and any obstacles to the North, with gate post width of no less than 8'feet wide post to post Inside Diameter and, minimum 90 degree swing radius opening is adequate for our trucks to service the recycle containers. Gate cane poles will need to be installed and pin holes drilled in the floor surface to secure the gates in the open and closed positions. Back stop rails should be installed on the interior walls to protect the walls from coming into contact with the containers. The floor transition between the enclosure and the driveway should be level with no curbs or speedbumps to allow unobstructed rolling of recycle containers.

The Compactor enclosure design dimensions sent 11/14/2018 which includes removal of the roof above the compactor stall with gate post width of no less than 13' feet wide post to post Inside Diameter and 120 degree swing radius opening. The gate hinges should be mounted on the front of the posts facing outward in order to maintain the full 13' feet of clearance between gate posts when gates are fully opened to allow sufficient clearance for our trucks to service the compactor. Gate cane poles will need to be installed and pin holes drilled in the floor surface to secure the gates in the open and closed positions. Additionally, location of the hydraulic power unit inside the enclosure should be positioned away from the compactor as to not impede full access around the compactor unit. Compactor wheel guides and wheel stops will need to be installed to ensure proper placement of the unit when returned after servicing.

REPUBLIC SERVICES

10295 Southwest Ridder Road Wilsonville OR 97070
o 503.570.0626 f 503.582.9307 republicservices.com

Operating controls must be available to our drivers as needed to disable the parking garage door located on the South end of Building B immediately North of the trash/recycle enclosures (see diagram).

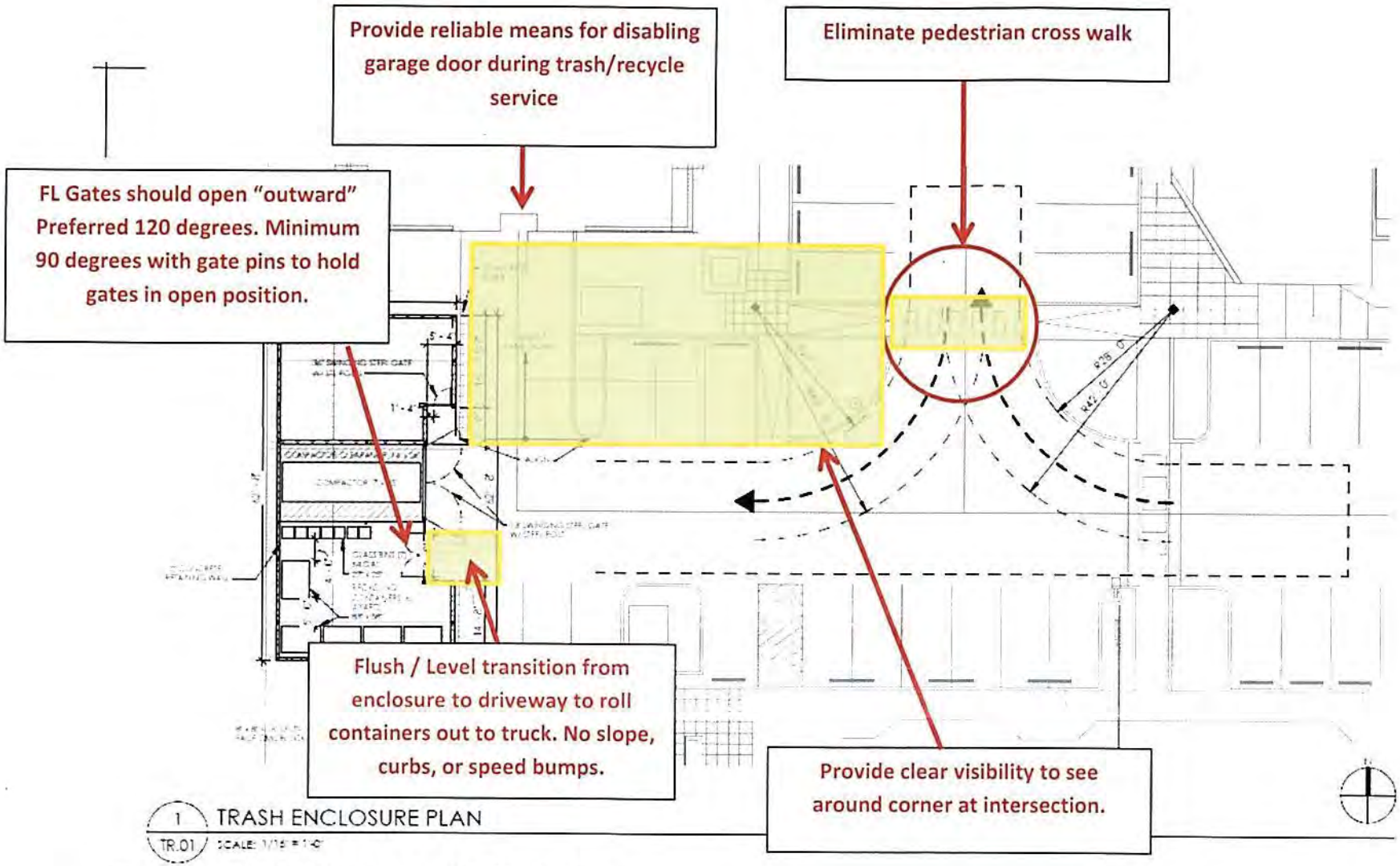
The designated pedestrian crossing located between building B and building C should be removed (see diagram).

Cautionary signage should be installed in high visibility locations to alert motorist and pedestrians of truck traffic in the service area.

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

Sincerely,

Kelly Herrod
Operations Supervisor
Republic Services Inc.



1 TR.01 TRASH ENCLOSURE PLAN

SCALE: 1/16" = 1'-0"

Commons on the Tualatin

Nyberg Road Property LLC / Tandem Property Management

wilson

1711 10.17.2018

TR.01

EXHIBIT K

STORMWATER ANALYSIS
TUALATIN WATERFRONT APARTMENTS
2018

For:

Tandem Development
c/o Tom & Campbell Clarey
34 NW First, Ste 401
Portland, Oregon 97209

Prepared By:

Westlake Consultants Inc.
15115 SW Sequoia Parkway, Suite 150
Tigard, OR 972247
Phone: (503) 684-0652
Fax: (503) 624-0157

August 30, 2018
WCI #2752-001

Westlake consultants, inc

Table of Contents:

Appendix:

A) Preliminary Plans
B) As-Built Record Drawings - Nyberg Lane
C) Developed Drainage Basin Map
D) Inspection & Maintenance Procedures for Storm Facilities
E) Geotech Report
F) NRCS Soils Report
G) WQ Vault (Stormfilter) Details
H) HydroCAD Report
   a. Conveyance Model
   b. Nyberg Downstream Model
I) Sensitive Area Map (Vegetative Corridor)
J) Flood Plain Map FEMA

PROJECT OVERVIEW:

It has been requested of Westlake Consultants, Inc. to prepare a storm water analysis report for the Tualatin Waterfront Apartments for the design development stage with the City of Tualatin. The purpose of this report is to identify the conveyance capacity of the proposed storm sewer system on-site, provide adequate storm water treatment per Clean Water Services standards and review potential conveyance issues for the downstream portion of runoff that will discharge to the Nyberg right-of-way. There is no detention requirement for direct discharge to the Tualatin River.

The project site is located at 6645 SW Nyberg Lane and has a total area of 10.99 acres. The site contains an abandoned RV park with primitive roads, pedestrian paths, outhouses and sanitary sewer connection points blanketing the site for RV parking. The remainder of the site consists of gravel stock piles, a dog park located near the river and a combination of grass and trees (Appendix A, P200).

Development will consist of removing the RV park in its entirety to perform mass grading to allow construction of 5 separate apartment buildings containing 264 units, a club house with a swimming pool, access roads, parking lots and sidewalks. The remainder of the site will be covered in landscaping. Under a separate permit, a public pedestrian path will be constructed along the northern portion of the site along the frontage of the Tualatin River to make a continuous connection with existing paths on east and west side of the site. (Appendix A, P400, P500, P600)

Water quality will be provided by a pair of underground Stormfilter Vaults (Appendix G) as an approved proprietary filtration system per Clean Water Services "2007 Design and Construction Standards for Sanitary and Surface Water Management" Chapter 4, Section 4.05.8. The outfall from the treatment facilities will be to the Tualatin River for the north basin and to the Nyberg Lane ROW for the south basin. Detention is not required for discharge to the Tualatin River. A downstream analysis is included in this report for the Nyberg Lane ROW.

SITE ASSESSMENT AND FEASIBILITY ANALYSIS:

Preliminary Plans (Appendix A) and Basin Maps (Appendix C) for the proposed development application have been included in this report and consist of the following:

- Existing Conditions and Demolition Plan
- Grading and Erosion Control Plan
- Composite Utility Plan
- Post Developed Basin Map
- Overall Basin Map (including downstream analysis basin map)

Westlake Consultants Inc. has completed a topo and boundary survey of the site including trees located on the site and the adjacent off-site western boundary (Appendix A, P300).

Maps have been downloaded from FEMA's on-line mapping tool or drafted based on CWS table 3-1 for Perennial Streams and are included in Appendix I & J:

- Sensitive Area Map (vegetative corridor)
- Flood Plain Map

The Northern portion of the site is located within both the 100-year flood plain (Appendix J) and is also categorized as a sensitive area (Appendix I). This portion of the site will be developed under a separate permit to construct a public pedestrian path. Stormwater facilities for the path are to be addressed with that permit and land use application. Stormwater discharge from the Apartment site will be a pipe outfall to the Tualatin River that must cross the sensitive area. The limits of disturbance to install the pipe will be accounted for in the sensitive area mitigation requirement presented to CWS as a separate report.

There is also a 100-year flood plain located on the southeast and southwest corners of the site adjacent to the Nyberg Road ROW. Any placement of fill material in the flood plain will be mitigated with an equal amount of cut in the flood plain to ensure a balanced net neutral effect.

WATER QUALITY ANALYSIS:

Proposed water quality treatment for the Tualatin Waterfront Apartments will be provided by Stormfilter vaults (Appendix G) produced by Contech Engineered Solutions. These systems are available per the CWS approved vendor list and meet the code section: 4.05.8(c)1 & 2. The systems will be sized to treat the total precipitation of 0.36 inches falling in a 4-hour duration with a storm return period of 96 hours.

TABLE 1: AREA CALCULATIONS

Site Areas:	Area (SF)
Total Raw Site Area	478,754
River below OHW	55,244
Vegetative Corridor	44,031
ROW Dedication	4,339
Developed Site Area	375,140

Impervious Areas:	
Basin North	
Building B	33,886
Building C	33,886
Building D	12,123
Building E	6,087
Building F	2,836
Pool	4,930
Roads, Parking Lots and Sidewalks	101,830

Basin North Impervious Area (SF)
195,578

Basin South		
Building A	24,421	
Roads, Parking Lots and Sidewalks	39,419	**Basin South Impervious Area (SF) 63,840**
	Total Impervious Area (SF) =	**259,418**
Pervious*:		
Yards and Landscaping	375,140 – 259,418 =	**115,722**

* Pervious = Total Developed Site Area – Total Impervious improvements

BASIN NORTH

Water Quality Volume (WQV)

$$WQV\ (cf) = \frac{0.36\ (in) \times Impervious\ area\ (sf)}{12\ (in/ft)} = \frac{0.36\ (in) \times 195{,}578\ (sf)}{12\ (in/ft)} = \mathbf{5{,}867.3\ CF}$$

Water Quality Flow (WQF)

$$WQF\ (cfs) = \frac{WQV\ (cf)}{14{,}400\ seconds} = \frac{5{,}867.3\ (cf)}{14{,}400\ seconds} = \mathbf{0.407\ CFS}$$

BASIN SOUTH

Water Quality Volume (WQV)

$$WQV\ (cf) = \frac{0.36\ (in) \times Impervious\ area\ (sf)}{12\ (in/ft)} = \frac{0.36\ (in) \times 63{,}840\ (sf)}{12\ (in/ft)} = \mathbf{1{,}915.2\ CF}$$

Water Quality Flow (WQF)

$$WQF\ (cfs) = \frac{WQV\ (cf)}{14{,}400\ seconds} = \frac{1{,}915.2\ (cf)}{14{,}400\ seconds} = \mathbf{0.133\ CFS}$$

The water quality vaults will be sized to treat the WQF for each contributing basin. The North basin will have (13) 18" ZPG cartridges in a 96" MH with a maximum treatment rate of 0.434 cfs. The South basin will have (4) 18" ZPG cartridges in a 60" MH with a maximum treatment rate of 0.133 cfs. Both structures will require a flow diversion MH to route larger storm events around the treatment facility as not to resuspend captured pollutants. A copy of the manufacturers Inspection and maintenance procedures is included in Appendix D. Pre-treatment will be provided by trapped catch basins through out the site per CWS manual section 4.05.7(a).

CONVEYANCE ANALYSIS:

Calculations have been performed using the HydroCAD Version 10.00-16 design and analysis software (Appendix H-a). Calculations are based on the Santa Barbara Urban Hydrograph runoff method (SBUH) using the Type 1A, 24-hour storm events as required in the Clean Water Services Design and Construction Standards dated April 2017 section 5.04.2(b)2.

The design storm used for conveyance design is the following:
25-year 24-hour storm (3.9 inches)

The stormwater conveyance design for the development is based on conveyance requirements in the Clean Water Services Design and Construction Standards dated April 2017, which require a minimum 10-inch pipe size and conveyance for the runoff based on a 25-year storm event.

The United States Department of Agriculture Natural Resources Conservation Service (NRCS) websoil survey (Appendix F) was utilized to determine the hydrological soil group for the project site. The site is approximately 67% hydrological soils group B and 33% hydrological soils group C, see appendix.
(http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx)

CONVEYANCE DESIGN:

The on-site contributing basin areas were created for both the North and South conveyance systems to ensure adequate pipe size for the Tualatin Riverfront Apartments. The specifics of the basins are shown below in Table 3. All of the main line conveyance pipe for both basins shall be HDPE N-12 Pipe (AASHTO M294) with a Manning's "n" of 0.013.

TABLE 2: CONTRIBUTING DRAINAGE BASINS

Drainage Basin	Area (SF)	CN	TC (min)	25-Year Peak Flow Rate (CFS)
North Basin	195,578 49,313	98 61	5.0	4.17
South Basin	63,840 18,253	98 74	5.0	1.47

The north basin will have 10" diameter pipes at the upper end of the system where flows are lower and 12" pipes for the remainder. All slopes on the north basin will be at least 2% slope. The capacity of 12" diameter pipe at a slope of 2% is calculated to be 5.04 cfs. The south basin will be composed of 10" pipes and the minimum slope due to grade is 1%. The capacity of 10" diameter pipe at a slope of 1% is calculated to be 2.19 cfs. Therefore, both systems are adequately sized with reserve capacity as a safety factor.

DOWNSTREAM ANALYSIS:

The "north basin" of the site will discharge directly to the Tualatin River and has been determined by rule to not require detention. The "south basin" will discharge to the Public Storm Sewer system located in the western frontage of the site within the Nyberg Lane and Street Right-of-Way (Appendix B). Detention shall not be required when the existing system has been determined to have the capacity to convey the existing base flow from the full build-out of the contributing basin with the addition of the proposed developments runoff. The existing Nyberg Street storm sewer discharges to the wetland located on the south side of the Nyberg Street Right-of-Way.

The existing basin delineation (Appendix C) has been modeled in HydroCAD as a separate "downstream" file (Appendix H-b). The limiting pipe within the existing conveyance system is the conveyance pipe that crosses Nyberg Street. Base flow runoff for the 25-year storm event is 2.58 cfs. With the addition of runoff from the proposed development (south basin) the peak flow during the 25-year event will increase to 3.85 cfs. The capacity of the 15" pipe (n=0.013) at 1.45% slope is calculated to be 7.78 cfs. Therefore, detention shall not be required.

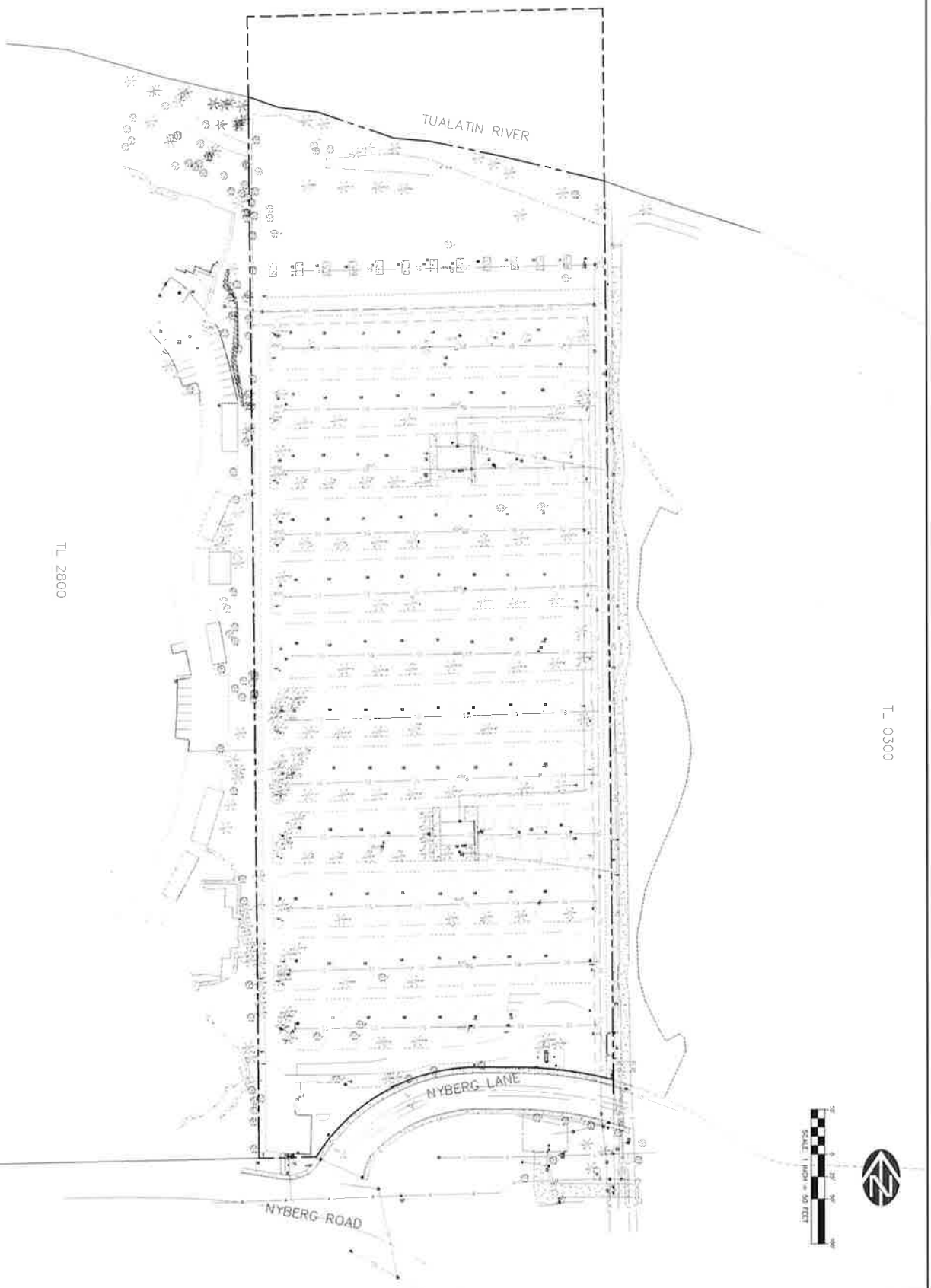
CONCLUSION:

The proposed water quality facilities in both the north and south basins can adequately treat the anticipated development of impervious area for the proposed project. The Geotechnical Report prepared by GeoPacific dated January 6, 2012 (Appendix E) shows the boring logs and provides evidence of variable ground water depth. Due to the proximity to the river and a wetland south of Nyberg Road, infiltration of storm water is not feasible and discharge off-site will be proposed. Additionally, no conveyance issues for the existing downstream system of the south basin were identified. Therefore, the proposed storm sewer design for the developments meets the requirements of CWS and the City of Tualatin.

EXHIBIT K

Appendix A:

Preliminary Plans



JOB NO. 2752-001

SHEET P200

EXHIBIT K

REVISIONS

NO	DATE	DESCRIPTION	DRAFT BY	CHECK BY

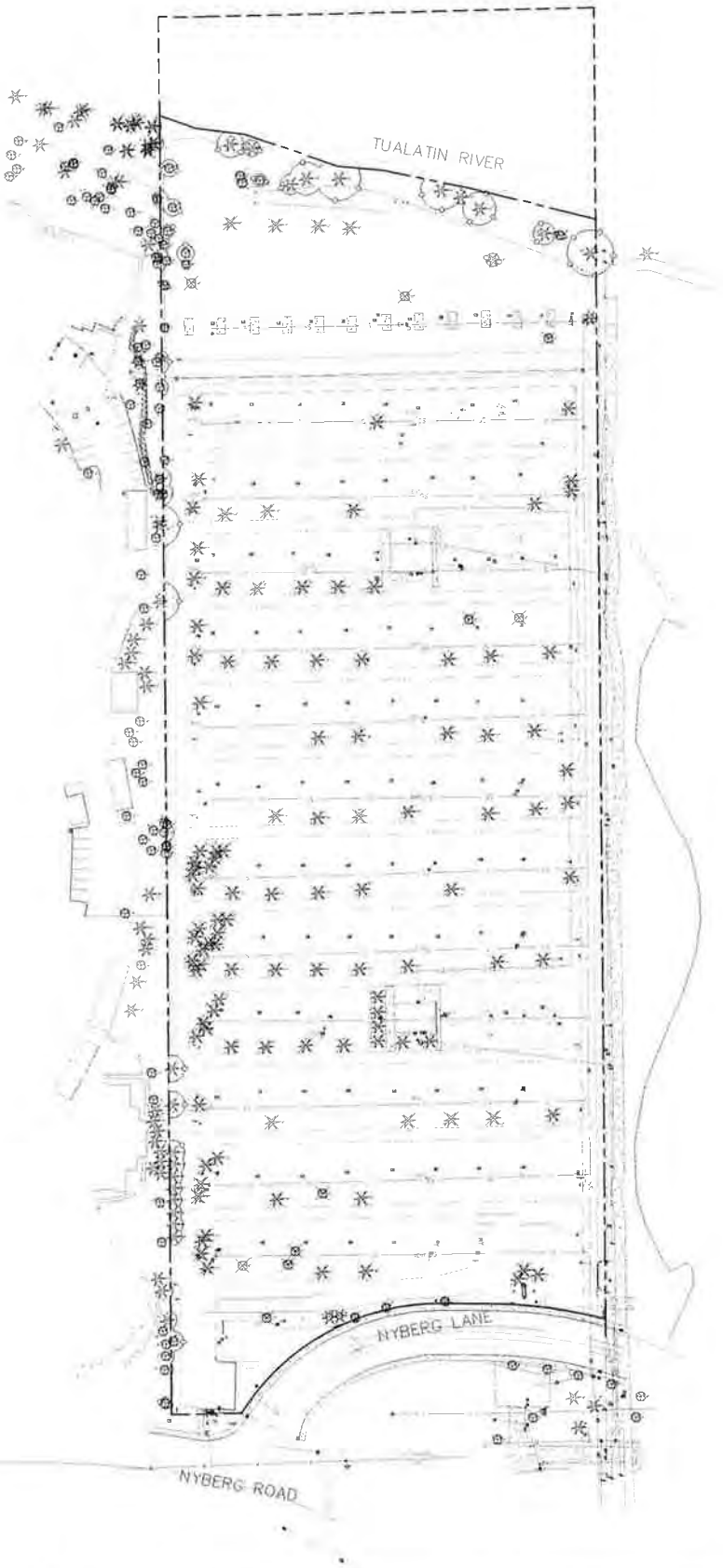
PRELIMINARY

COMMONS ON THE TUALATIN

TUALATIN, OR

EXISTING CONDITIONS

WESTLAKE CONSULTANTS INC.
ENGINEERING • SURVEYING • PLANNING
PACIFIC CORPORATE CENTER
15115 S.W. SEQUOIA PARKWAY, SUITE 150
TIGARD, OREGON 97224
(503) 684-0652
FAX (503) 684-0157



LEGEND

TREE PROTECTION FENCING

SCALE 1 INCH = 50 FEET

N

COMMONS ON THE TUALATIN

TUALATIN, OR

TREE PROTECTION AND REMOVAL PLAN

WESTLAKE CONSULTANTS INC

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PACIFIC CORPORATE CENTER
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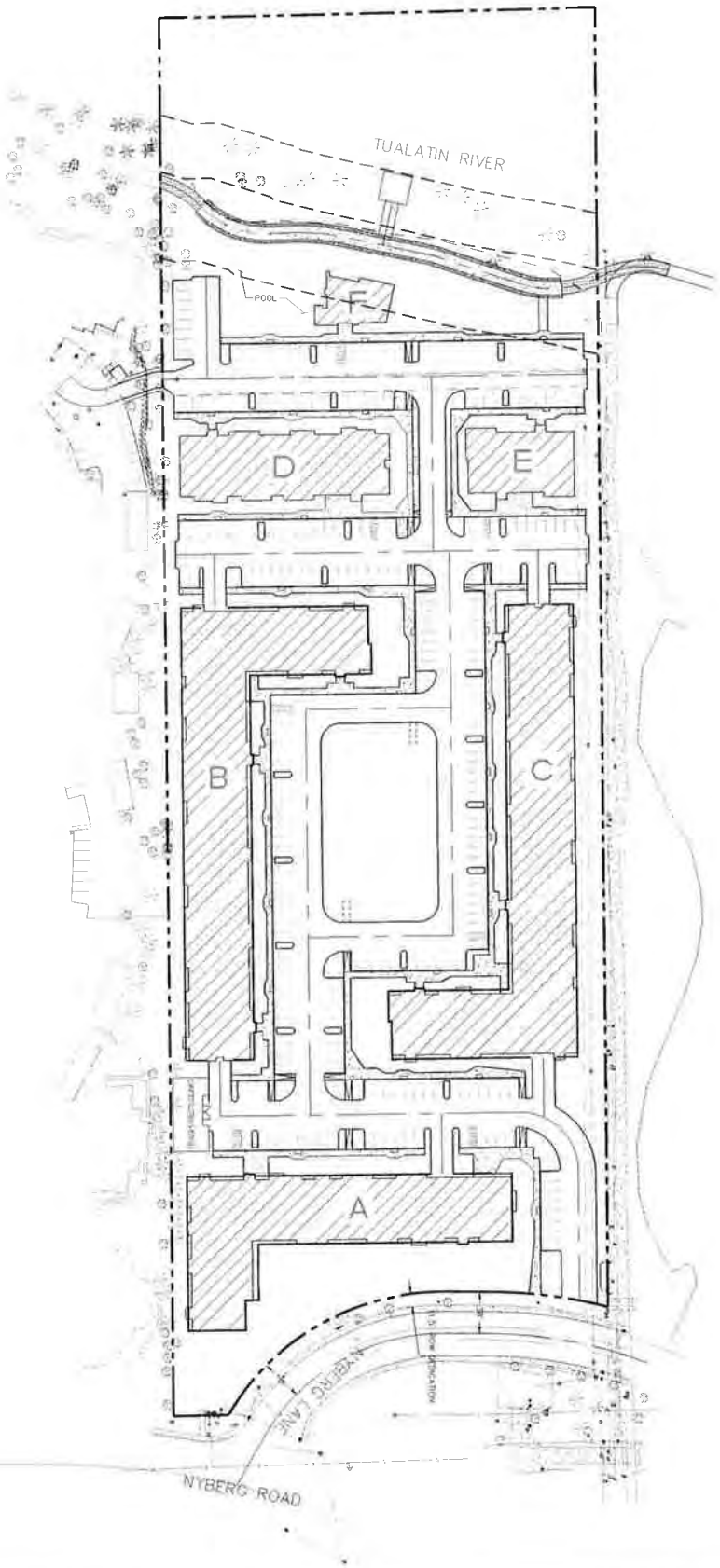
JOB NO. 2752-001

SHEET P300

REVISIONS

NO. DATE DESCRIPTION DAB DRAFT BY JAB CHECK BY

EXHIBIT K



JOB NO. 2752-001

SHEET P400

REVISIONS

NO	DATE	DESCRIPTION	DAB DRAFT BY	MB CHECK BY

EXHIBIT K

PRELIMINARY

COMMONS ON THE TUALATIN

TUALATIN, OR

PRELIMINARY SITE PLAN OVERALL

WESTLAKE CONSULTANTS INC.
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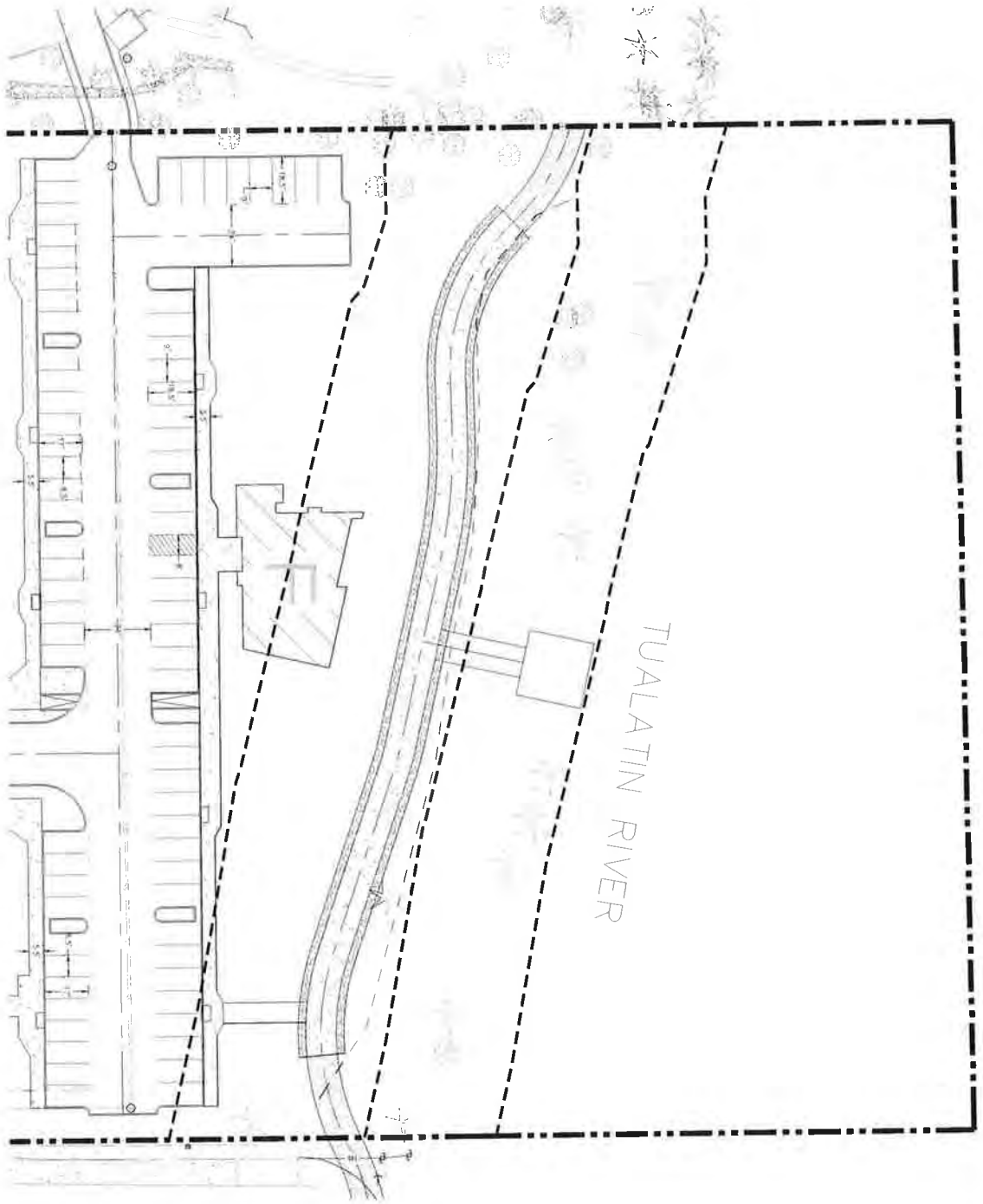
PACIFIC CORPORATE CENTER
15115 S.W. SEQUOIA PARKWAY, SUITE 150
TIGARD, OREGON 97224
(503) 684-0652
FAX (503) 624-0157



SCALE: 1 INCH = 50 FEET

JOB NO. 2752-001

SHEET P404

REVISIONS

NO	DATE	DESCRIPTION	DRAFT BY	CHECK BY

PRELIMINARY

COMMONS ON THE TUALATIN

TUALATIN, OR

PRELIMINARY SITE PLAN 4

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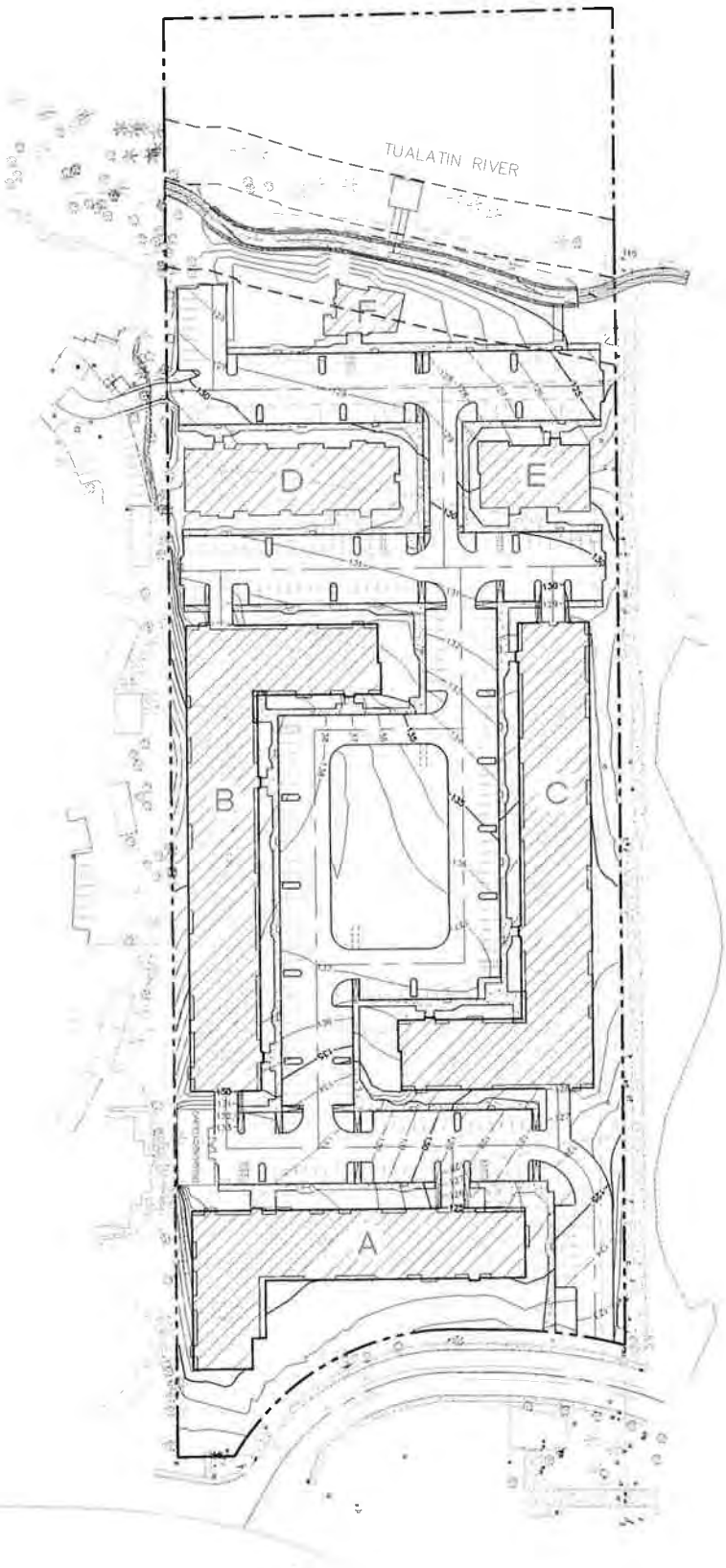
FAX (503) 624-0157

EXHIBIT K



SCALE: 1 INCH = 50 FEET

EXHIBIT K

JOB NO. 2752-001

SHEET P500

REVISIONS

NO	DATE	DESCRIPTION	DRAWN BY	CHECKED BY

PRELIMINARY

COMMONS ON THE TUALATIN

TUALATIN, OR

PRELIMINARY GRADING PLAN OVERALL

WESTLAKE CONSULTANTS INC.
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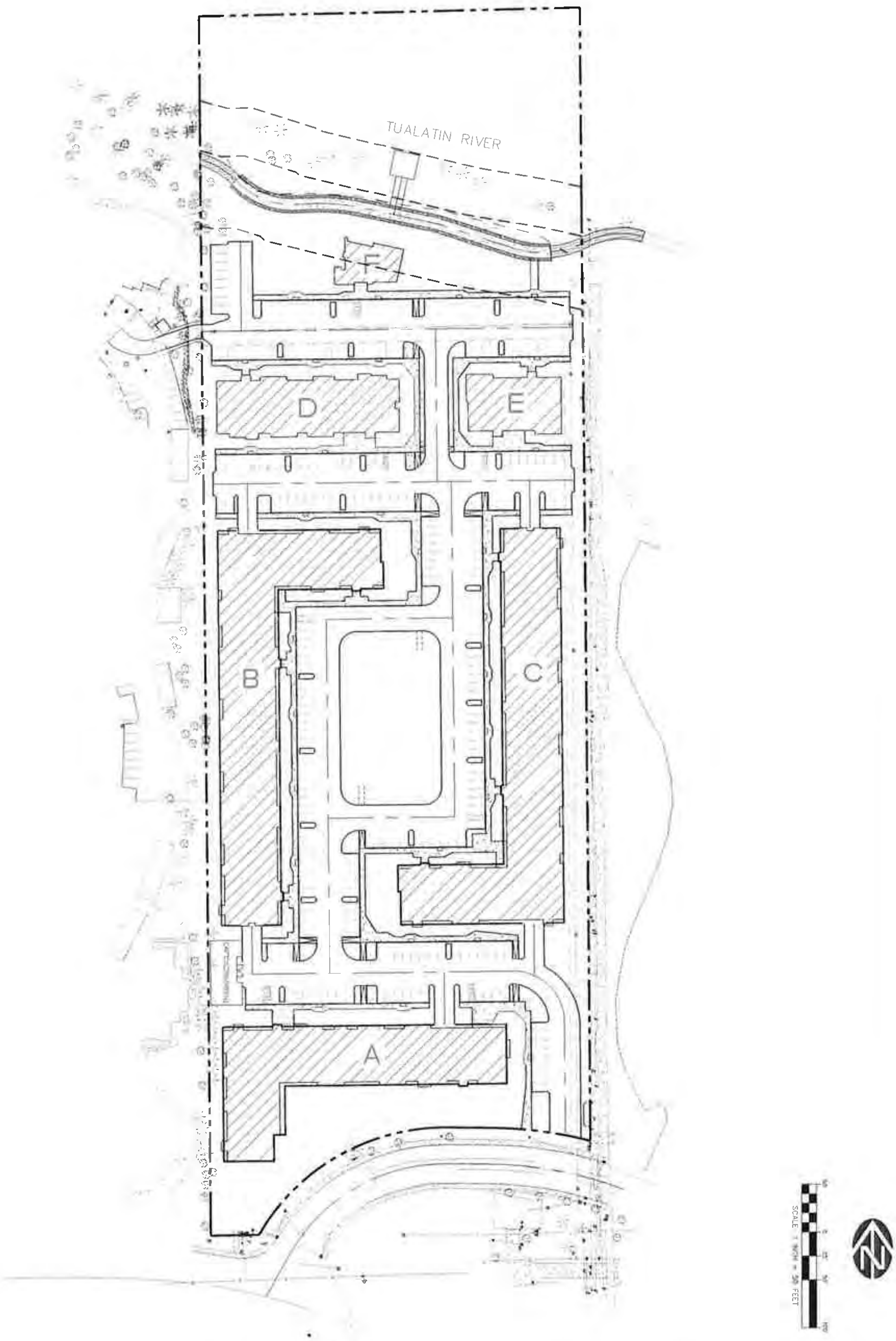
FAX (503) 624-0157



COMMONS ON THE TUALATIN

TUALATIN, OR

PRELIMINARY UTILITY PLAN OVERALL

PRELIMINARY

NO	DATE	DESCRIPTION	DRAFT BY	CHECK BY
			DAB	JAB

REVISIONS

SHEET P600

JOB NO 2752-001

EXHIBIT K

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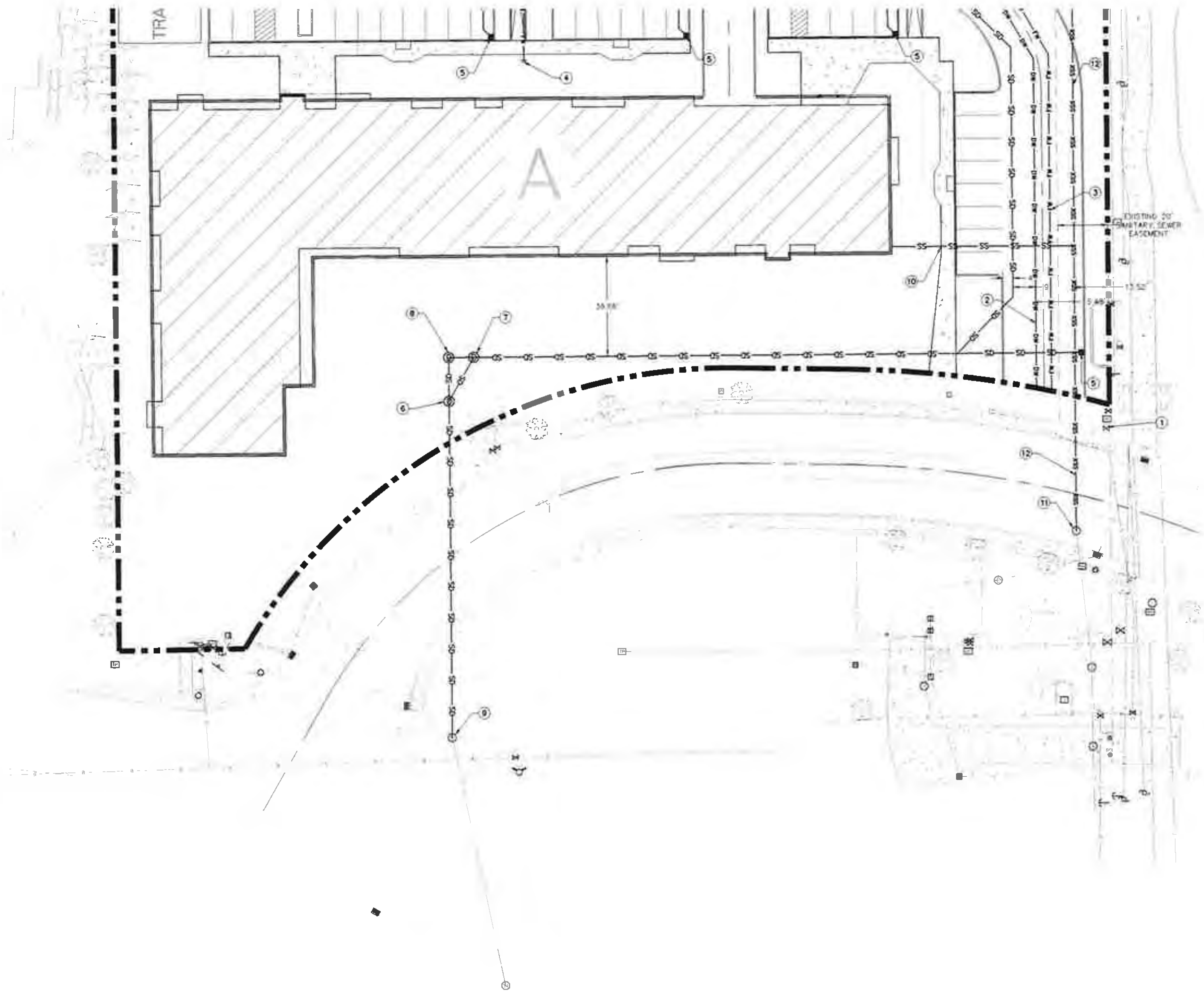

SCALE: 1 INCH = 20 FEET

CONSTRUCTION KEYNOTES

1. CONNECT TO EXISTING WATERLINE.
2. PROPOSED DOMESTIC WATER LINE
3. PROPOSED FIRE SERVICE LINE
4. PROPOSED FIRE HYDRANT
5. PROPOSED CATCH BASIN
6. PROPOSED 48" STORM STANDARD MANHOLE
7. PROPOSED 48" STORM SPLITTER MANHOLE
8. PROPOSED 72" STORM TREATMENT MANHOLE
9. EXISTING 48" STORM DRAIN MANHOLE
10. PROPOSED SANITARY LATERAL
11. EXISTING 48" SANITARY SEWER MANHOLE
12. EXISTING SANITARY SEWER LINE

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FAX (503) 624-0157

COMMONS ON THE TUALATIN

TUALATIN, OR

PRELIMINARY UTILITY PLAN 1

PRELIMINARY

REVISIONS	DESCRIPTION	DATE	DRAFT BY	CHECK BY
			SAB	JHB

EXHIBIT K

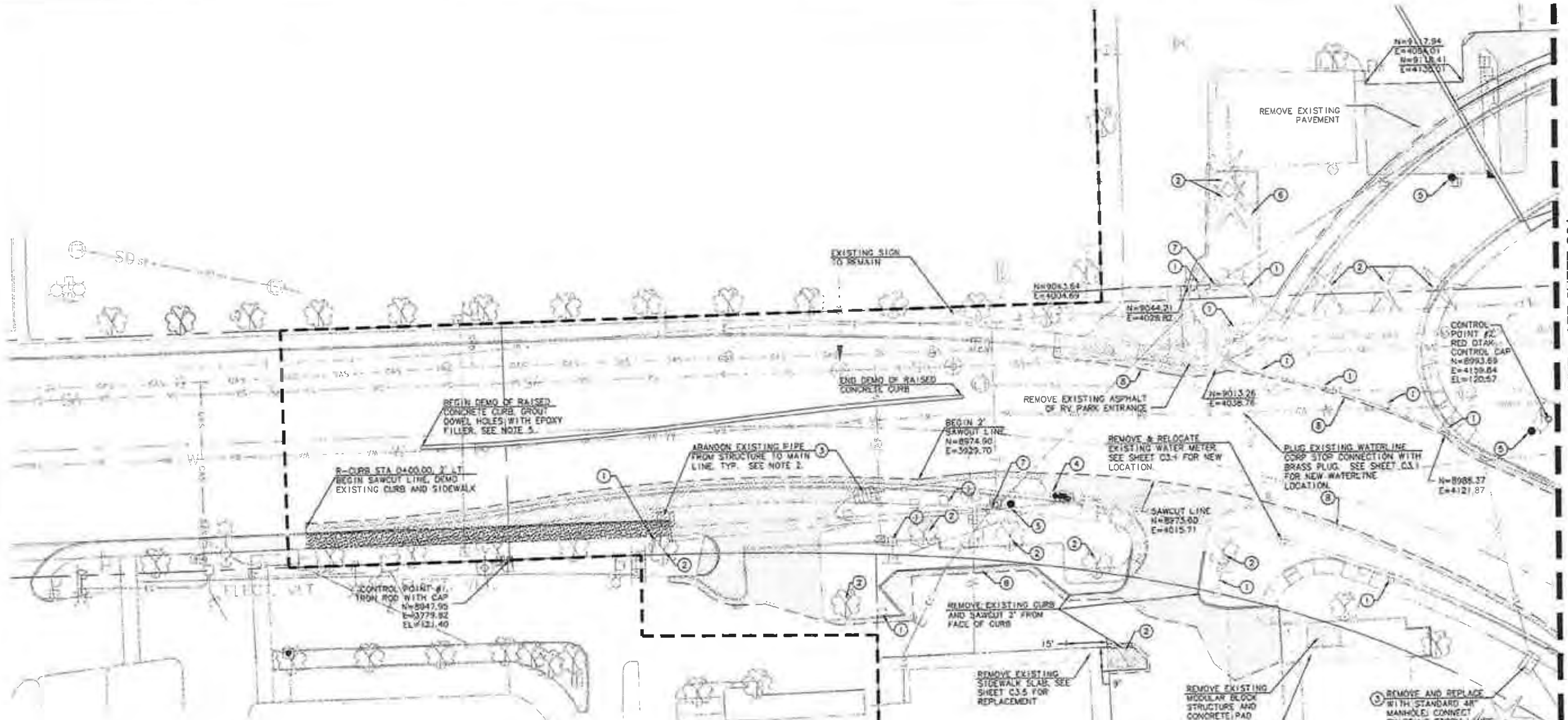
SHEET P601

JOB NO 2752-001

EXHIBIT K

Appendix B:

Existing Storm Sewer – Nyberg Street



CONSTRUCTION NOTES

1. REMOVE EXISTING SIGN, SALVAGE
2. REMOVE EXISTING TREE
3. REMOVE EXISTING DRAINAGE STRUCTURE, DISPOSE
4. REMOVE EXISTING MAILBOXES, SEE NOTE 4
5. REMOVE EXISTING BOLLARD
6. REMOVE EXISTING FENCE
7. REMOVE AND RELOCATE EXISTING POWER POLE, BY OTHERS
8. SAWCUT LINE, AS DIRECTED
9. REMOVE EXISTING SIGN, DISPOSE

NOTES:

1. SAWCUT A MINIMUM OF 2' FROM PROPOSED CURB LINE AND EDGE OF ANY EXISTING PAVEMENT, UNLESS OTHERWISE DIRECTED
2. CONTRACTOR TO FIELD LOCATE CONNECTION POINT OF LATERAL TO MAIN. ABANDON AND FILL PIPE WITH CONCRETE, TYP.
3. FOR SALVAGED SIGNS, CONTRACTOR TO COORDINATE WITH CITY INSPECTOR AND PROPERTY OWNER FOR NEW SIGN LOCATION.
4. MAILBOXES TO BE REMOVED AND PLACED IN TEMPORARY LOCATION. CONTRACTOR TO INSTALL PERMANENT BOX PER DIRECTION OF CITY INSPECTOR. SEE SHEET C3.5 FOR BOX TYPE AND APPROXIMATE LOCATION.
5. FILL DOWEL HOLES WITH EPOXY FILLER "ASPHALT RUBBER PLUS," MANUFACTURED BY CRAFCO, INC. OR APPROVED FILLER.

Washington County File No. 03-310

SW 65th/Nyberg St Improvements

Tualatin, Oregon

DEMOLITION PLAN – NYBERG STREET

"AS-BUILT"

BY ____ DATE ____

NO.	DATE	BY	REVISION COMMENTS

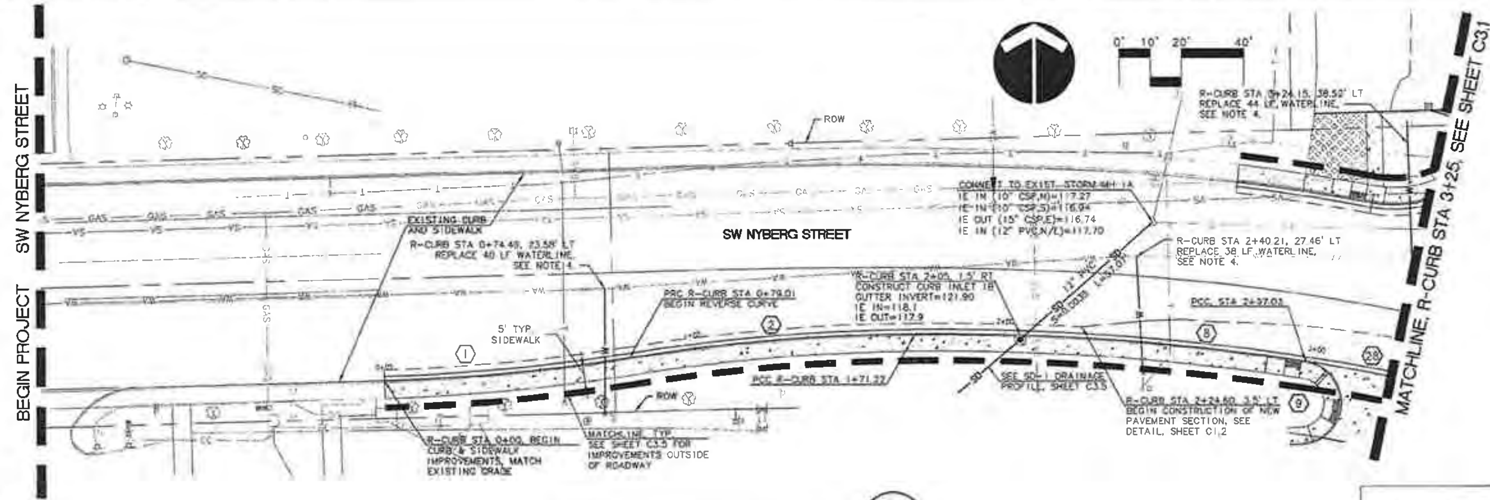
Design	Drawn	Checked	Date	Initial Issue Date
TMS	ARM	R.B.	6/03	June 2003

otak Incorporated
17355 SW Boones Ferry Rd
Lake Oswego, Oregon 97035

Project No. 10684 Drawing No. C684S020

Sheet No. C2.0

EXHIBIT K



NYBERG STREET PLAN

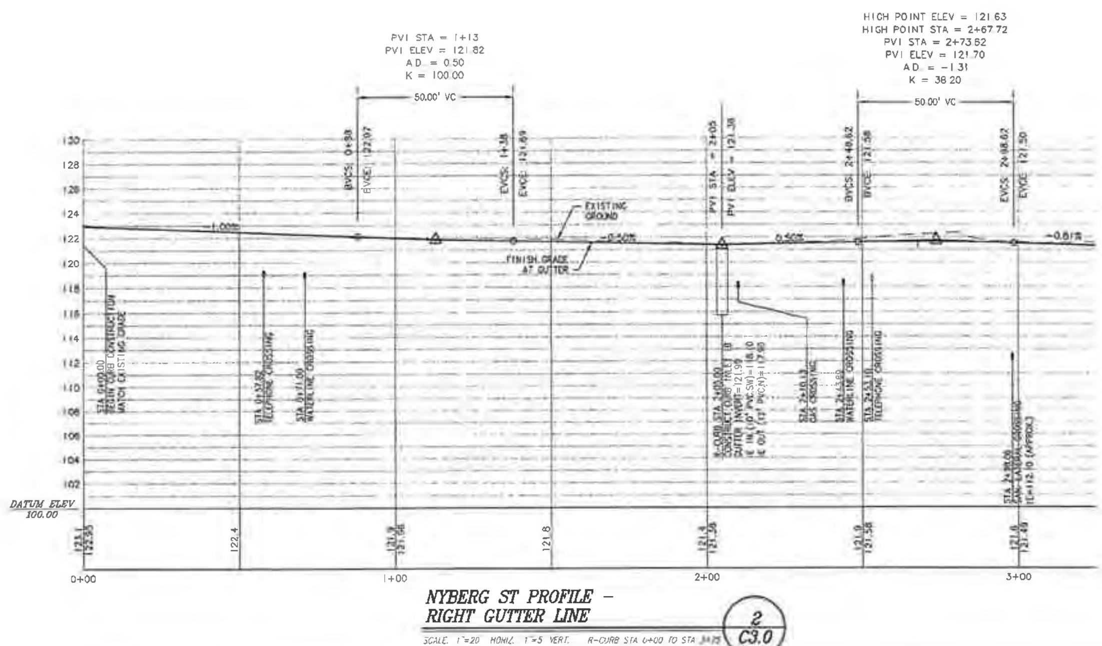
SCALE: 1"=20' HORIZ. R-CURB STA 0+00 TO STA 3+25 (1 / C3.0)

CURVE	LENGTH	RADIUS	TANGENT	DELTA ANGLE	CHORD LENGTH	CHORD BEARING
C1	70.01'	630.00'	35.50'	7°11'58"	70.96'	N84°45'49"E
C2	92.21'	630.00'	46.19'	8°23'09"	92.13'	S85°21'48"W
C8	125.92'	800.00'	63.03'	9°00'36"	125.87'	N85°56'19"W
C9	39.77'	13.46'	144.06'	169°19'37"	26.80'	N05°13'41"E
C26	85.96'	507.40'	43.08'	9°42'22"	85.85'	N76°34'45"W

(# CURVE TABLE)

CURB NO.		STA	OFFSET	GUTTER ELEV.	RADIUS	TANGENT	LENGTH	DELTA
9*		2+97.01	0.81' RT	121.91	13.46'	144.06'	39.77'	169°19'37"
	1/4 Δ			121.52				
	1/2 Δ			121.66				
	3/4 Δ			121.87				
	ECR	2+99.66	25.67' RT	121.80				

* SEE SHEET C3.5 FOR MORE SPOT ELEVATIONS



NYBERG ST PROFILE – RIGHT GUTTER LINE

SCALE: 1"=20' HORIZ. 1"=5' VERT. R-CURB STA 0+00 TO STA 3+25 (2 / C3.0)

NOTES:

1. SAWCUT A MINIMUM OF 2' FROM PROPOSED CURB LINE AND EXISTING EDGE OF PAVEMENT, UNLESS OTHERWISE DIRECTED
2. CURB ALONG NYBERG STREET SHALL BE CONSTRUCTED AS CURB AND GUTTER TO MATCH EXISTING, PER CITY OF TUALATIN STANDARD DETAIL #470 OR WASHINGTON COUNTY STD DETAIL CS-300.
3. CURB INLETS SHALL BE CONSTRUCTED PER CITY OF TUALATIN STANDARD DETAIL #041 OR ODOT/APWA CONCRETE INLET CG-3
4. REPLACE EXISTING WATER SERVICE LINE FROM MAINLINE TO METER WITH COPPER PIPE, PER CITY OF TUALATIN STANDARD DETAIL #631, MATCH EXISTING DIAMETER. TAP INTO MAINLINE USING CORP STOP. PLUG EXISTING CORP STOP CONNECTION WITH BRASS PLUG. CONNECT NEW PIPE TO EXISTING METER. STATIONING GIVEN AT APPROXIMATE MAINLINE CONNECTION POINT
5. CROSSING INFORMATION IS A GRAPHICAL REPRESENTATION ONLY. THE CONTRACTOR SHALL CONFIRM ACTUAL CLEARANCES BEFORE INSTALLATION OF THE GRAVITY STORM SYSTEM.

Washington County File No. 01-910

SW 65th/Nyberg St Improvements

Tualatin, Oregon
NYBERG STREET & STORM SEWER – RIGHT GUTTER LINE
PLAN AND PROFILE R-CURB STA 0+00 TO STA 3+25

"AS-BUILT"

otak Incorporated
17355 SW Boones Ferry Rd. Lake Oswego, Oregon 97035
Internet: WWW.OTAK.COM

EXHIBIT K

10684 C684S230
Project No. Drawing No.
C3.0
Sheet No.

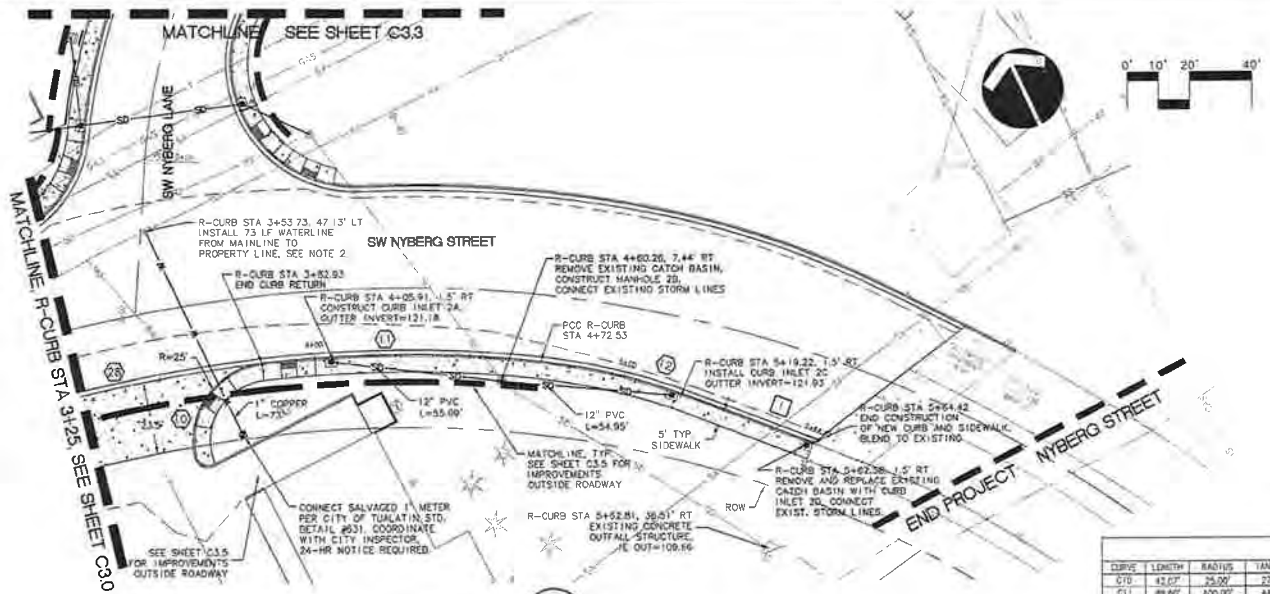
NO.	DATE	BY	REVISION COMMENTS

Design	Drawn	Checked	Date	Initial Issue Date
TMS	AMN	MJB	6/03	June 2003

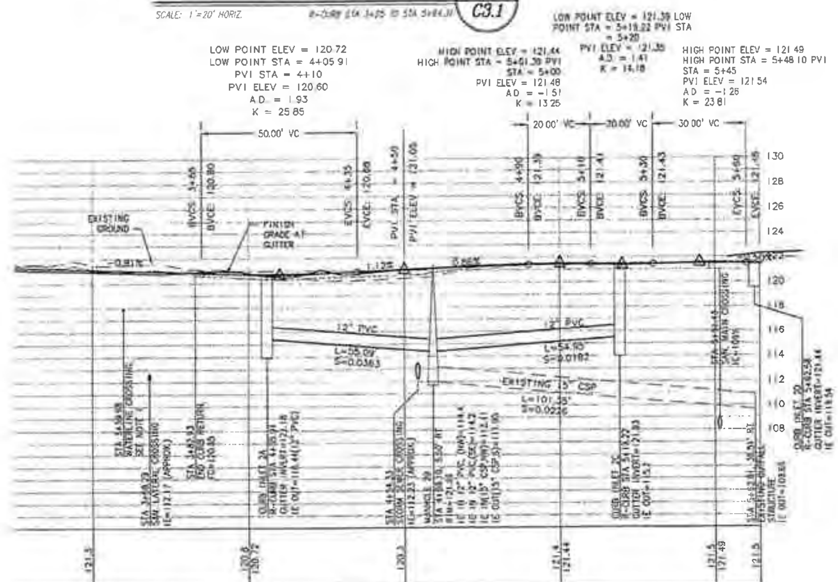
SW 65th/Nyberg St Improvements

Tualatin, Oregon
NYBERG STREET & STORM SEWER – RIGHT GUTTER LINE
PLAN AND PROFILE STA 3+25 TO STA 5+64.42

"AS-BUILT"



NYBERG STREET PLAN (1 / C3.1)
SCALE: 1"=20' HORIZ. R-CURB STA 3+25 TO STA 5+64.42



NYBERG ST PROFILE – RIGHT GUTTER LINE (2 / C3.1)
SCALE: 1"=20' HORIZ. 1"=5' VERT. R-CURB STA 3+25 TO STA 5+64.42

CURVE TABLE						
CURVE	LENGTH	RADIUS	TANGENT	DELTA ANGLE	CHORD LENGTH	CHORD BEARING
C10	42.07'	25.00'	27.97'	96°25'27"	37.28'	S60°20'48"E
C11	89.60'	400.00'	44.99'	12°50'08"	89.42'	N65°01'25"W
C12	51.14'	200.00'	25.71'	14°39'05"	51.00'	N51°16'30"W
C28	85.96'	507.40'	43.08'	9°42'22"	85.85'	N70°34'45"W

LINE TABLE		
LINE	LENGTH	BEARING
1	40.84'	N43°37'18"W

CURB NO.		STA	OFFSET	GUTTER ELEV.	RADIUS	TANGENT	LENGTH	DELTA
10	BCR	3+56.64	27.02' R	121.40	25	42.07	42.07'	69 57'54"
	1/4 Δ			121.35				
	1/2 Δ			121.21				
	3/4 Δ			121.01				
	ECR	3+83.03	10' R	120.85				

NOTES:

1. CROSSING INFORMATION IS A GRAPHICAL REPRESENTATION ONLY. THE CONTRACTOR SHALL CONFIRM ACTUAL CLEARANCES BEFORE INSTALLATION OF THE GRAVITY STORM SYSTEM

2. REPLACE EXISTING 1" WATER SERVICE LINE IN NEW LOCATION FROM MAINLINE TO METER WITH COPPER PIPE, PER CITY OF TUALATIN STANDARD DETAIL #631. TAP INTO MAINLINE USING CORP STOP. PLUG EXISTING CORP STOP CONNECTION WITH BRASS PLUG. CONNECT NEW PIPE TO EXISTING METER. STATIONING GIVEN AT APPROXIMATE MAINLINE CONNECTION POINT

3. CURB ALONG NYBERG STREET SHALL BE CONSTRUCTED TO MATCH EXISTING, PER CITY OF TUALATIN STD. DETAIL #470 OR WASHINGTON COUNTY STD. DETAIL CS-300

4. CURB INLETS SHALL BE CONSTRUCTED PER CITY OF TUALATIN STD. DETAIL #041 OR ODOT/APWA CONCRETE INLET, CG-3

5. SAWCUT A MINIMUM OF 2' FROM PROPOSED CURB LINE AND EXISTING EDGE OF PAVEMENT, UNLESS OTHERWISE DIRECTED

Washington County File No. 03-910

otak Incorporated
10684 C6845031
Project No. Drawing No.
C3.1
Sheet No.

EXHIBIT K

NO.	DATE	BY	REVISION COMMENTS

Design	Drawn	Checked	Date	Initial Issue Date
TMS	ANM	RJB	6/03	June 2003

NOTES:

1. CROSSING INFORMATION IS A GRAPHICAL REPRESENTATION ONLY. CONTRACTOR SHALL CONFIRM ACTUAL CLEARANCES BEFORE INSTALLATION OF UNDERGROUND UTILITIES.

2 SEED TURF BLOCK SECTION WITH SAME MIX SPECIFIED IN EROSION CONTROL NOTES, C2.4

3. ALL SIDEWALKS TO BE CONSTRUCTED PER CITY OF TUALATIN STANDARD DETAIL #475, UNLESS OTHERWISE NOTED. ALL CURB ON NYBERG STREET TO BE CONSTRUCTED AS CURB AND GUTTER TO MATCH EXISTING, PER CITY OF TUALATIN STD. DETAIL #470 OR WASHINGTON COUNTY STD DETAIL CS-300

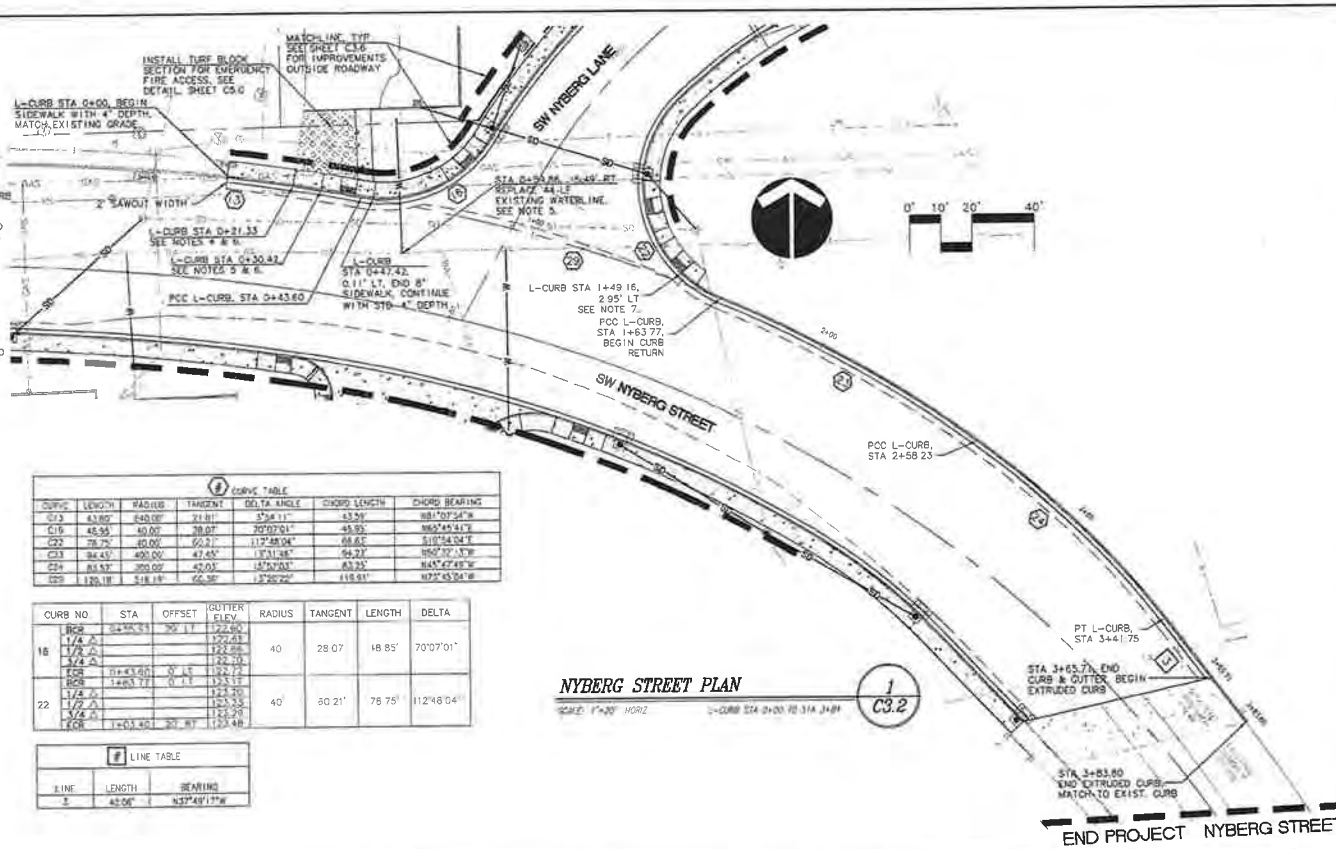
4 BEGIN CONSTRUCTION OF CURB & GUTTER PER WASHINGTON COUNTY STD DETAIL CS-300. CONSTRUCT SIDEWALK TO 8" DEPTH; SEE DETAIL, SHEET C5.0.

5. BEGIN CONSTRUCTION OF CURB RAMP PER CITY OF TUALATIN STD. DETAIL #463. CONTINUE WASH. CO. CURB & GUTTER THROUGH LANDING OF CURB RAMP, ONLY. COMPLETE CURB RAMP CURB & GUTTER PER CITY OF TUALATIN STD DETAIL #470

6. CURB AND GUTTER ALONG THE LEFT CURB LINE OF NYBERG STREET SHALL BE CONSTRUCTED WITH ADVERSE GRADE TO MATCH SUPERELEVATION AND PROVIDE POSITIVE DRAINAGE ACROSS TO RIGHT GUTTER LINE, L-CURB STA 0+00 TO 0+43.60, STA 1+63.77 TO 3+65.71. TRANSITION FROM ADVERSE GRADE TO FLAT GUTTER GRADE FROM L-CURB STA 0+43.60 TO 0+55.64, 1.74' LT AND STA 1+45.03, 5.02' LT TO 1+63.77.

7. BEGIN CONSTRUCTION OF CURB AND GUTTER AT END OF CURB RAMP LANDING PER WASHINGTON COUNTY STD. DETAIL CS-300; CONTINUE WASH. CO. CURB AND GUTTER ALONG REMAINDER OF SW NYBERG STREET TO L-CURB STA 3+65.71. CURB AND GUTTER ALONG SW NYBERG LANE SHALL BE CONSTRUCTED PER CITY OF TUALATIN STD. DETAIL #470.

8. REPLACE EXISTING WATER SERVICE LINE FROM MAINLINE TO EXISTING METER WITH COPPER PIPE, PER CITY OF TUALATIN STANDARD DETAIL #631. MATCH DIAMETER. TAP INTO MAINLINE WITH CORP STOP CONNECTION. PLUG EXISTING CORP STOP CONNECTION WITH BRASS PLUG. CONNECT NEW PIPE TO EXISTING METER



CURVE TABLE						
CURVE	LENGTH	RADIUS	TANGENT	DELTA ANGLE	CHORD LENGTH	CHORD BEARING
C13	43.80'	640.00'	21.81'	3°54'11"	43.59'	N81°07'54"W
C16	48.95'	40.00'	28.07'	70°07'01"	45.95'	N65°45'41"E
C22	78.75'	40.00'	60.21'	112°48'04"	66.62'	S10°54'04"E
C23	94.45'	400.00'	47.45'	13°31'48"	94.23'	N50°32'13"W
C24	83.57'	300.00'	42.03'	15°57'03"	83.25'	N45°47'48"W
C29	120.18'	518.19'	60.36'	13°20'22"	119.91'	N73°45'04"W

CURB NO		STA	OFFSET	GUTTER ELEV	RADIUS	TANGENT	LENGTH	DELTA
16	BCR	0+55.51	20' LT	122.60	40	28.07	48.85'	70°07'01"
	1/4 △			122.61				
	1/2 △			122.66				
	3/4 △			122.70				
	ECR	0+43.60	0' LT	122.72				
22	BCR	1+63.77	0' LT	123.17	40'	60.21'	78.75'	112°48'04"
	1/4 △			123.20				
	1/2 △			123.23				
	3/4 △			123.29				
	ECR	1+03.40	20' RT	123.48				

LINE TABLE		
LINE	LENGTH	BEARING
1	42.06'	N37°49'17"W

NYBERG STREET PLAN
SCALE: 1"=20' HORIZ L-CURB STA 0+00 TO STA 3+84
1 / C3.2

NYBERG ST PROFILE– LEFT GUTTER LINE
SCALE: 1"=20' HORIZ. 1"=5' VERT L-CURB STA 0+00 TO STA 3+84
2 / C3.2

Washington County File No. 03-910

SW 65th/Nyberg St Improvements

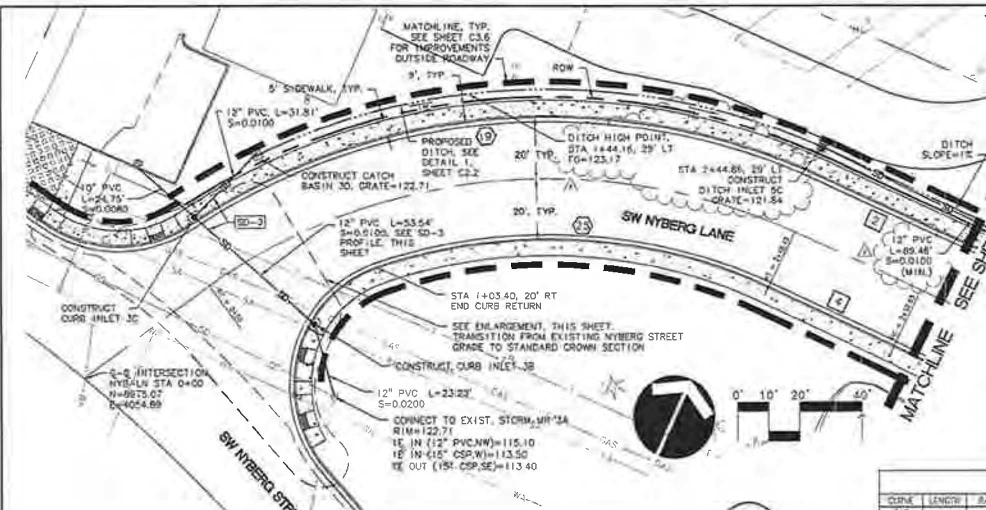
Tualatin, Oregon
NYBERG STREET & STORM SEWER – LEFT CURB
PLAN AND PROFILE L-CURB STA 0+00 TO STA 3+84

"AS-BUILT"

otak Incorporated
17355 SW Boones Ferry Rd. Lake Oswego, Oregon

10684 C684S332
Project No. Drawing No.
C3.2
Sheet No.

EXHIBIT K

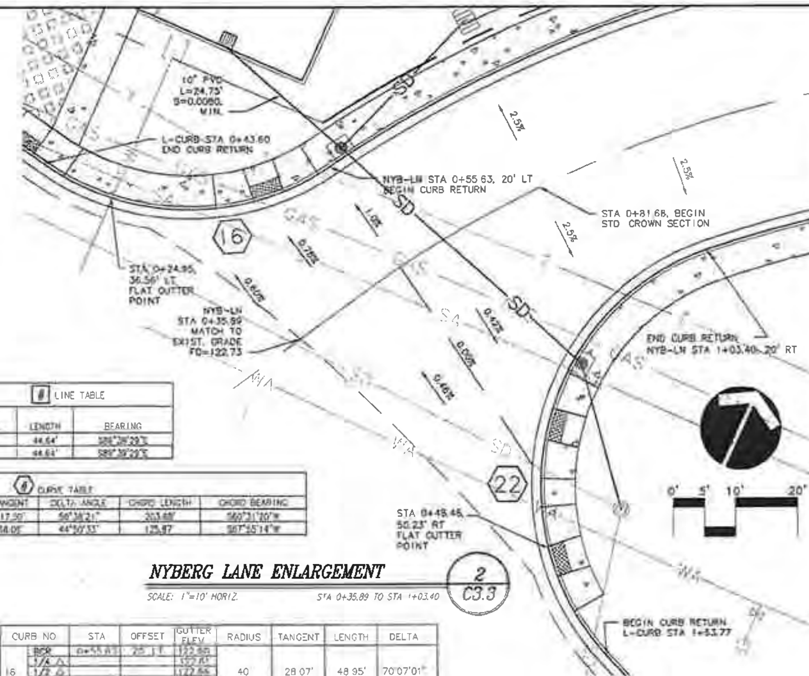


NYBERG LANE CENTERLINE PLAN (1/C3.3)

SCALE: 1"=20' HORIZ. STA 0+00 TO STA 3+00

# LINE TABLE		
LINE	LENGTH	BEARING
3	44.64'	S89°39'29"E
4	44.64'	S89°39'29"E

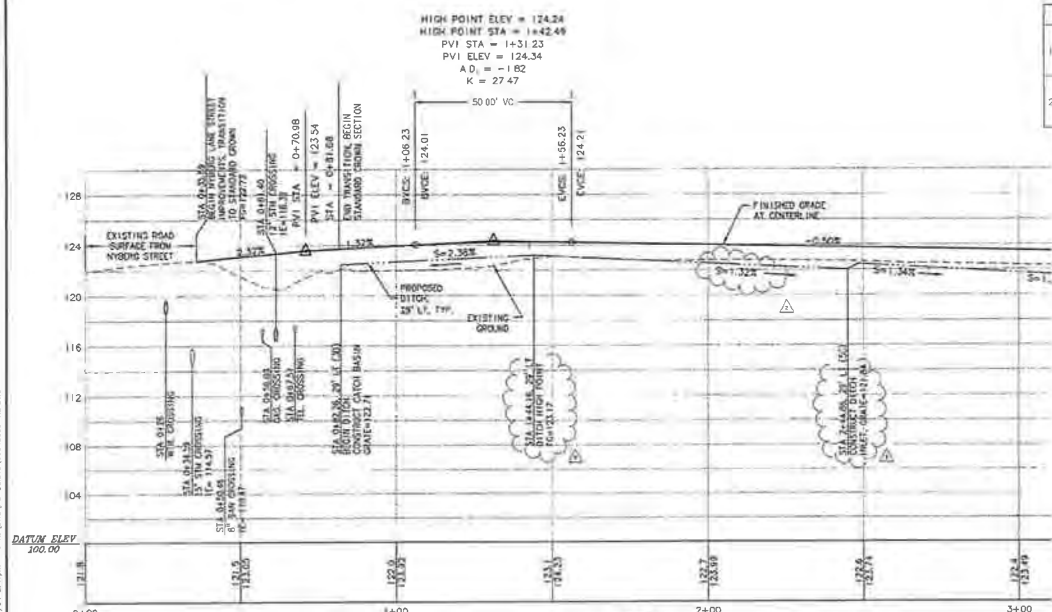
# CURVE TABLE						
CURVE	LENGTH	RADIUS	TANGENT	DELTA ANGLE	CHORD LENGTH	CHORD BEARING
C19	213.35'	205.00'	117.50'	59°38'21"	203.68'	S60°31'20"W
C20	129.14'	165.00'	68.05'	44°50'33"	125.87	S67°55'14"W



NYBERG LANE ENLARGEMENT (2/C3.3)

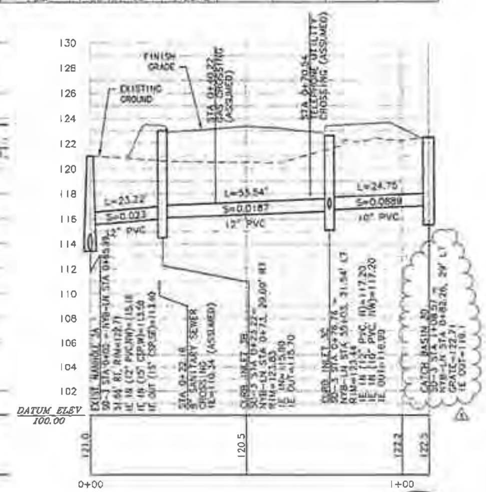
SCALE: 1"=10' HORIZ. STA 0+35.89 TO STA 1+03.40

CURB NO		STA	OFFSET	GUTTER ELEV	RADIUS	TANGENT	LENGTH	DELTA
16	BCR	0+55.63	20' LT	122.60	40	28.07'	48.95'	70°07'01"
	1/4 △			122.61				
	1/2 △			122.66				
	3/4 △			122.70				
	ECR	0+43.60	0' LT	122.72				
22	BCR	1+53.77	0' LT	123.17	40	60.21'	78.75'	112°48'04"
	1/4 △			123.20				
	1/2 △			123.23				
	3/4 △			123.29				
	ECR	1+03.40	20' RT	123.46				



NYBERG LANE CENTERLINE PROFILE (3/C3.3)

SCALE: 1"=20' HORIZ. 1"=5' VERT. STA 0+00 TO STA 3+00



SD-3 PROFILE (4/C3.3)

SCALE: 1"=20' HORIZ. 1"=5' VERT

NOTES:

1. CROSSING INFORMATION IS A GRAPHICAL REPRESENTATION ONLY. CONTRACTOR SHALL CONFIRM ACUTAL CLEARANCES BEFORE INSTALLATION OF UNDERGROUND UTILITIES.

2. CURB ALONG NYBERG LANE SHALL BE CONSTRUCTED AS CURB & GUTTER, PER CITY OF TUALATIN STANDARD DETAIL #470, EXCEPT AS NOTED IN NOTE 3.

3. TRANSITION GUTTER SLOPE FROM FLAT GRADE TO TYPICAL GRADE: NYB-LN STA 0+24.95, 36.56' LT TO STA 0+81.68, 20' LT & NYB-LN STA 0+48.48, 50.23' RT TO STA 0+81.68, 20' RT. SEE SHEET C3.2 FOR REMAINING CURB & GUTTER DATA ON NYBERG STREET.

4. CURB INLETS SHALL BE CONSTRUCTED PER CITY OF TUALATIN STD. DETAIL #041 OR ODOT/APWA CONCRETE INLET, CG-3.

5. FOR GRADING REQUIREMENTS OUTSIDE OF NYBERG LANE RIGHT-OF-WAY, SEE SHEET C2.2.

6. FOR IMPROVEMENTS OUTSIDE OF ROADWAY, SEE SHEET C3.6.

Washington County File No. 03-010

SW 65th/Nyberg St Improvements

Tualatin, Oregon

NYBERG LANE STREET & STORM SEWER – CENTERLINE PLAN AND PROFILE STA 0+00 TO STA 3+00

"AS-BUILT"

otak incorporated

17355 SW Boones Ferry Rd. Lake Oswego, Oregon

Project No. 10684 Drawing No. C684SC33

Sheet No. C3.3

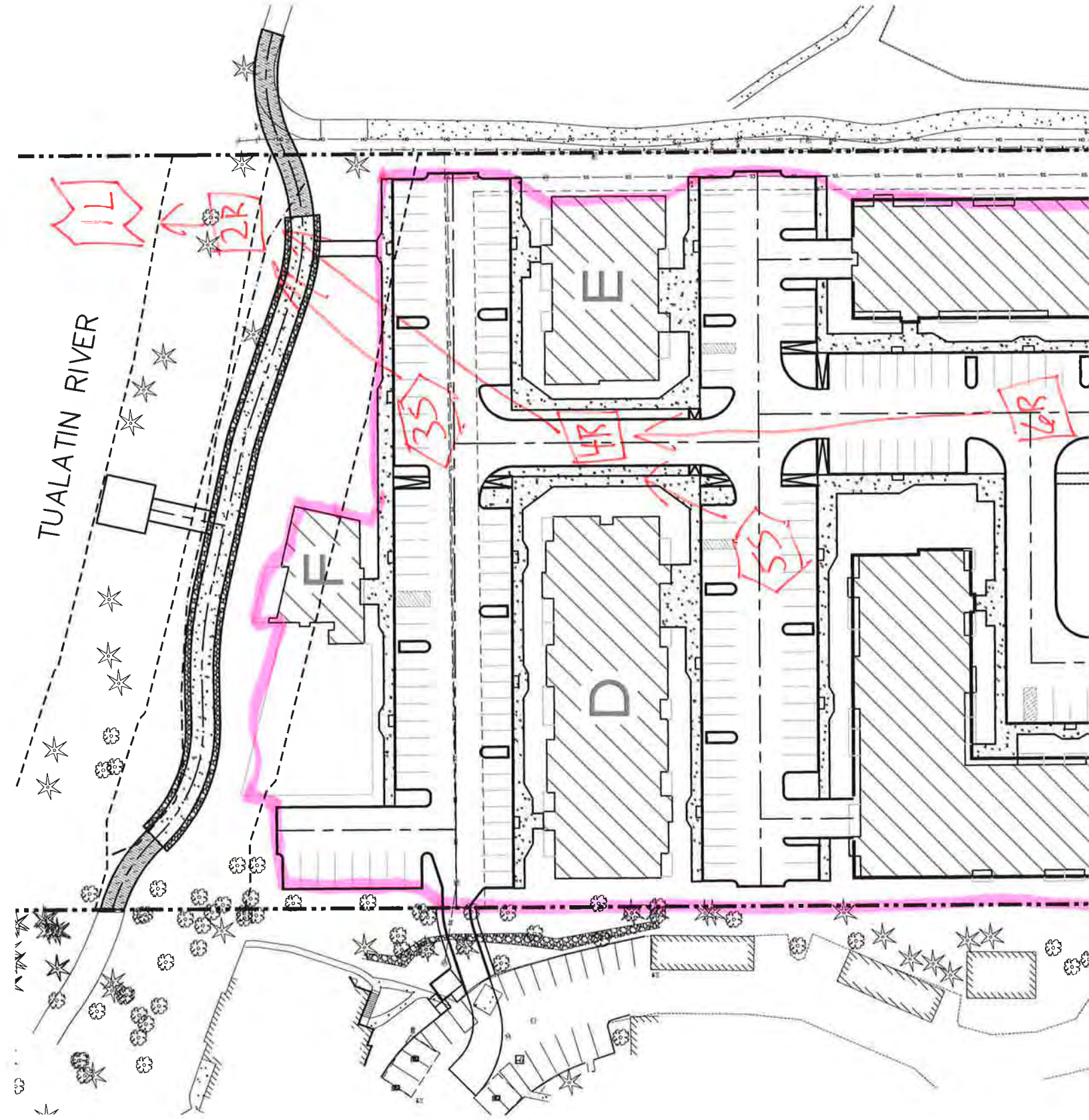
EXHIBIT K

EXHIBIT K

Appendix C:

Developed Drainage Basin Map

EXHIBIT K




Wireframe]
st Rim Apartments
st Rim Apartments
Nyberg Rd
SW Nyberg Rd
SW Nyberg Ln
SW Nyberg Ln
SW 65th Ave
SW
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EXHIBIT A

EXHIBIT K

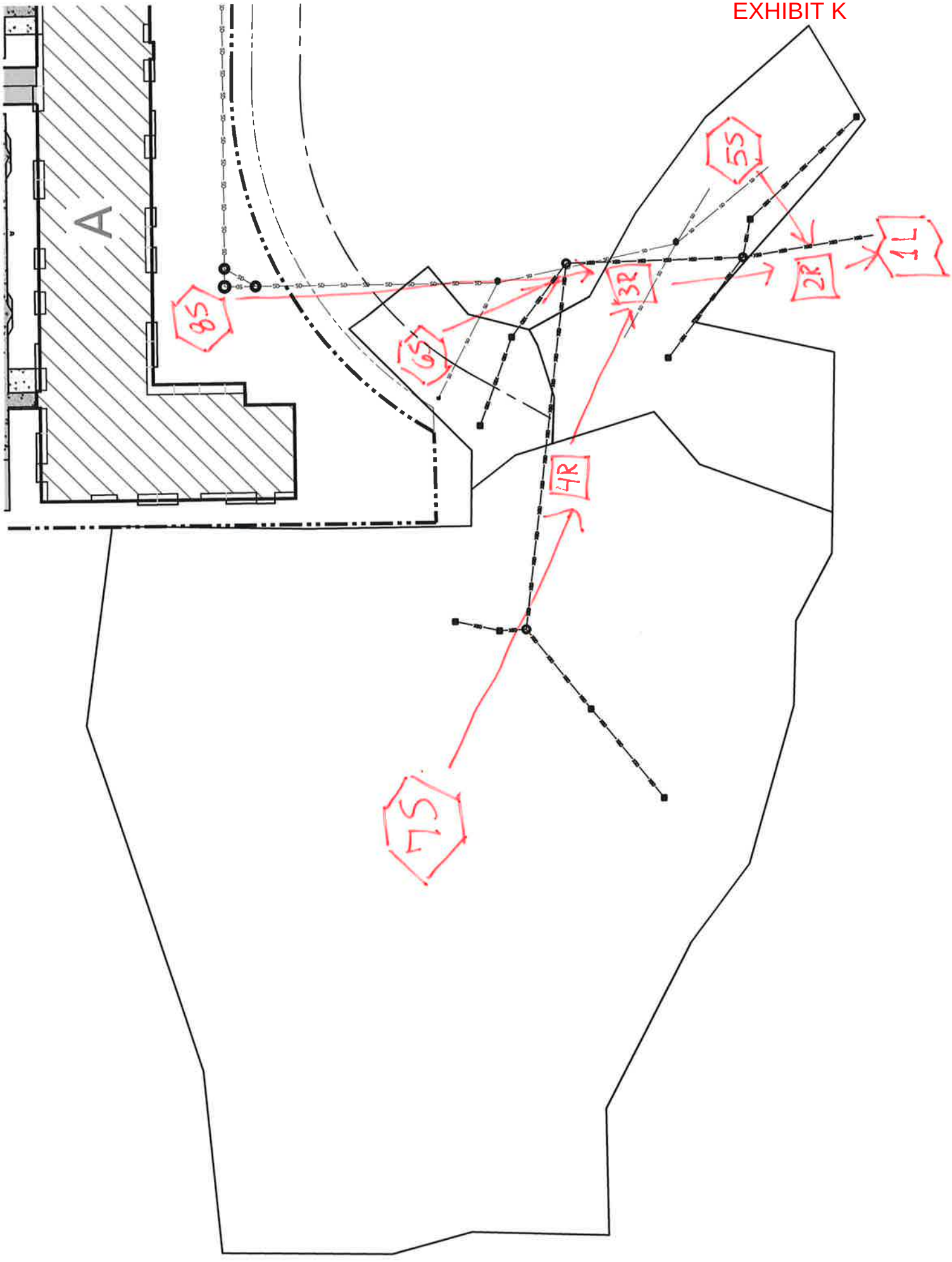


EXHIBIT K

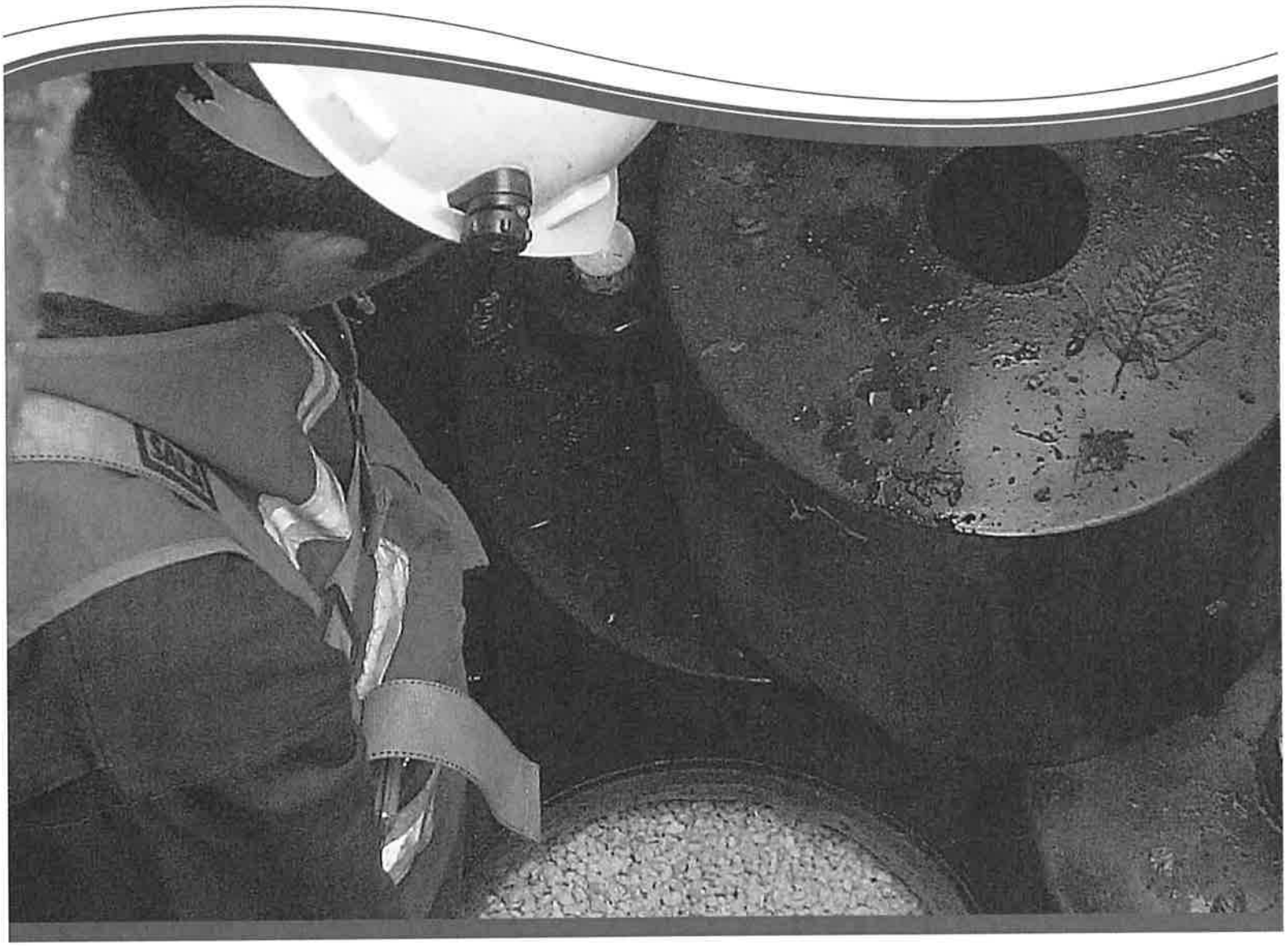
Appendix D:

Inspection & Maintenance

EXHIBIT K

CONTECH®
ENGINEERED SOLUTIONS

StormFilter Inspection and Maintenance Procedures



The Stormwater Management StormFilter®

EXHIBIT K

Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are many effective maintenance options, we believe the following procedure to be efficient, using common equipment and existing maintenance protocols. The following two-step procedure is recommended::

1. **Inspection**
   - Inspection of the vault interior to determine the need for maintenance.
2. **Maintenance**
   - Cartridge replacement
   - Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.

In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/ maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, during dryer months in late summer to early fall.

Maintenance Frequency

The primary factor for determining frequency of maintenance for the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis, in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

The average maintenance lifecycle is approximately 1-5 years. Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

Regulatory requirements or a chemical spill can shift maintenance timing as well. The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs..

EXHIBIT K

Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit.

1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to whether or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered)

1. Sediment loading on the vault floor.
   a. If >4" of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
   a. If >1/4" of accumulation, maintenance is required.
3. Submerged cartridges.
   a. If >4" of static water above cartridge bottom for more than 24 hours after end of rain event, maintenance is required. (Catch basins have standing water in the cartridge bay.)
4. Plugged media.
   a. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
   a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
   a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
   a. If pronounced scum line (say ≥ 1/4" thick) is present above top cap, maintenance is required.

EXHIBIT K

Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from Contech Engineered Solutions.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

   Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact Contech Engineered Solutions for suggested attachment devices.

B. Remove the used cartridges (up to 250 lbs. each) from the vault.

Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner.

C. Set the used cartridge aside or load onto the hauling truck.

D. Continue steps a through c until all cartridges have been removed.

Method 2:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

B. Unscrew the cartridge cap.

C. Remove the cartridge hood and float.

D. At location under structure access, tip the cartridge on its side.

E. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.

F. Set the empty, used cartridge aside or load onto the hauling truck.

G. Continue steps a through e until all cartridges have been removed.

EXHIBIT K

8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used **empty** cartridges to Contech Engineered Solutions.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Related Maintenance Activities - Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

EXHIBIT K

Inspection Report

Date: Personnel:

Location: System Size:

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

Sediment Thickness in Forebay: Date:

Sediment Depth on Vault Floor:

Structural Damage:

Estimated Flow from Drainage Pipes (if available):

Cartridges Submerged: Yes ☐ No ☐ Depth of Standing Water:

StormFilter Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal:

☐ Minor Structural Repairs:

☐ Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source:

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source:

Erosion of Landscaped Areas: Yes ☐ No ☐ Source:

Items Needing Further Work:

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

Review the condition reports from the previous inspection visits.

EXHIBIT K

StormFilter Maintenance Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

List Safety Procedures and Equipment Used: _____

System Observations

Months in Service:

Oil in Forebay (if present): Yes ☐ No ☐

Sediment Depth in Forebay (if present): _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes ☐ No ☐ Details: _____

Replace Cartridges: Yes ☐ No ☐ Details: _____

Sediment Removed: Yes ☐ No ☐ Details: _____

Quantity of Sediment Removed (estimate?):

Minor Structural Repairs: Yes ☐ No ☐ Details: _____

Residuals (debris, sediment) Disposal Methods: _____

Notes:

EXHIBIT K

RECYCLED PAPER

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Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other Contech division offerings, visit www.ContechES.com or call 800.338.1122.

Support

- Drawings and specifications are available at www.conteches.com.
- Site-specific design support is available from our engineers.

EXHIBIT K

Appendix E:

Geotechnical Report

EXHIBIT K

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

January 6, 2012
Project No. 11-2475

Tom Clarey
HMI Management
1200 SW 66th Avenue, Suite 300
Portland, Oregon 97225
Via email: tandem1@tandemprop.com

SUBJECT: PRELIMINARY GEOTECHNICAL ENGINEERING REPORT
RV PARK OF PORTLAND
6645 SW NYBERG LANE
TUALATIN, OREGON

This report presents the preliminary results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-4059, dated October 13, 2011, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site is approximately 9.5 acres in size and is located on the north side of SW Nyberg Lane in the City of Tualatin, Washington County, Oregon. Topography at the site is gently sloping to the northeast and southwest from a topographical high located in the central western boundary of the site. Slopes steepen adjacent to the Tualatin River, which forms the northern property boundary of the site. The majority of the site is currently occupied by a RV Park. Two structures that house restroom and laundry facilities are present on the site. A manufactured home that serves as an office is located in the southwestern portion of the site.

Based on the preliminary site plans provided, the proposed development consists of the construction of a new apartment building that may be up to three stories in height, driveway and parking areas, and associated underground utilities. A grading plan has not been provided for our review, however; we understand that grading will be minimized.

REGIONAL AND LOCAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of

rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies approximately along the Oregon Coast at depths of between 20 and 40 kilometers below the surface.

SUBSURFACE CONDITIONS

Our site-specific exploration for this report was conducted on December 16 and 19, 2011. A total of fourteen exploratory borings were drilled to depths of 2.2 to 13.8 feet at the approximate location indicated on Figure 2. It should be noted that the boring location was located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate.

The borehole was drilled using a trailer-mounted drill rig and solid stem auger methods. At boring location B-1, SPT (Standard Penetration Test) sampling was performed in general accordance with ASTM D1586 using a 2-inch outside diameter split-spoon sampler and a 140-pound hammer equipped with a rope and cathead mechanism. During the test, a sample is obtained by driving the sampler 18 inches into the soil with the hammer free-falling 30 inches. The number of blows for each 6 inches of penetration is recorded. The Standard Penetration Resistance ("N-value") of the soil is calculated as the number of blows required for the final 12 inches of penetration. If 50 or more blows are recorded within a single 6-inch interval, the test is terminated, and the blow count is recorded as 50 blows for the number of inches driven. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils. At the completion of the borings, the holes were backfilled with bentonite.

A GeoPacific geologist continuously monitored the field exploration program and logged the boring. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System. Rock hardness was classified in accordance with Table 1, modified from the ODOT Rock Hardness Classification Chart.

Soil Moisture and Groundwater

On December 16 and 19, 2011, static groundwater was encountered in boring B-6 at a depth of 8.45 feet below the ground surface. Groundwater seepage was not encountered in borings B-1 through B-5 and B-7 through B-14 to a maximum depth of 13.75 feet. Soil and rock encountered in our explorations were generally moist. Experience has shown that temporary storm related perched groundwater within surface soils often occur over native deposits such as those beneath the site, particularly during the wet season. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors.

CONCLUSIONS AND RECOMMENDATIONS

Our investigation indicates that the proposed development may be geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. Practical refusal on medium hard (R4) basalt was encountered in all borings at depths of 2.2 feet (western central portion of site) to 13.75 feet (southwestern portion of the site) as indicated on Figure 2. The nature of the drilling operation could not discern solid bedrock from large boulders; therefore, it is possible that deeper excavations may be obtainable with a large excavator equipped with ripper teeth. It is our understanding that extreme measures (including blasting) were required to install the utilities on the adjacent property to the west. Similar methods would likely be necessary at this site in order to maintain proper drainage for utilities.

The existing soil could be reused as engineered fill provided that the soil is properly moisture treated prior to compaction.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. The checklist attached to this report outlines recommended geotechnical observations and testing for the project. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared.

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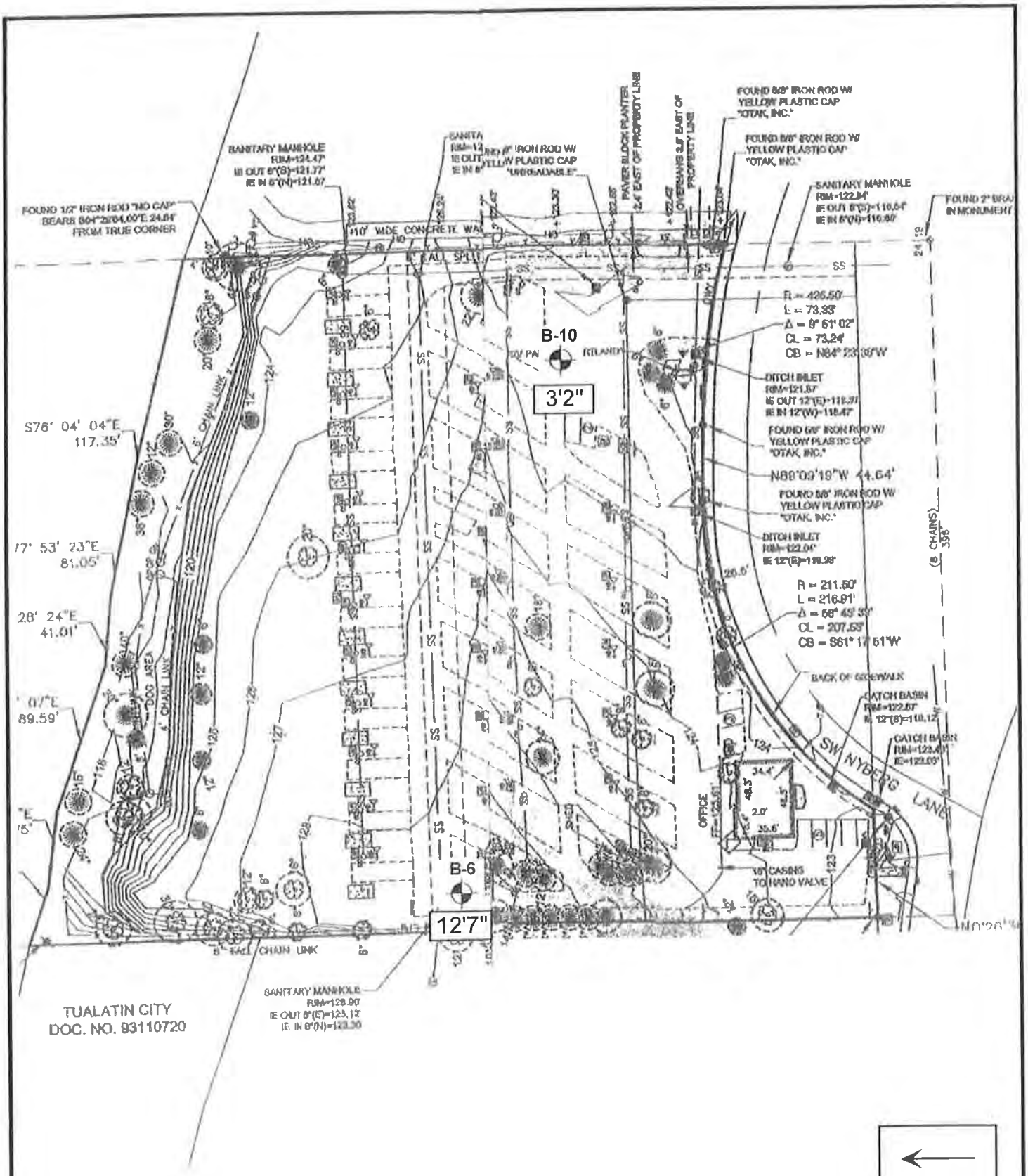
EXHIBIT K



Legend

B-1 Boring Designation and Approximate

6'3" Depth of Refusal on Hard Rock

Note: Location of all geotechnical information

405

SITE PLAN AND EXPLORATION LOCATIONS

Project No. 11-2475	Drawn By: EKR	FIGURE 2

EXHIBIT K

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-2**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
						Stiff, clayey SILT (ML) to silty CLAY (CL), light reddish brown, moist (Residual Soil)
		8/50 for 5"				Soft (R2) to Hard (R4), BASALT, with trace silty clay to clayey silt matrix, dark brown to gray, strong to subtle orange and gray mottling, iron staining, trace yellow secondary mineralization, moist (Columbia River Basalt Formation)
5		50 for 3"				
		50 for 3"				Practical Refusal on Hard (R4) Basalt at 6.25 Feet.
						No Groundwater or Seepage encountered.
10						
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/16/2011
Logged By: B. Rapp
Surface Elevation: 136 Feet

EXHIBIT K

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-4**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
		50 for 2"				Stiff, clayey SILT (ML) to silty CLAY (CL), reddish brown, moist (Residual Soil)
						Hard (R4), BASALT, trace reddish brown silty clay matrix, gray, moist (Columbia River Basalt Formation)
						Practical Refusal on Hard (R4) Basalt at 2.2 Feet.
						No Groundwater or Seepage encountered.
5						
10						
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/16/2011
Logged By: B. Rapp
Surface Elevation: 140 Feet

EXHIBIT K

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland
Portland, Oregon

Project No. 11-2475

Boring No. **B-6**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
5		2/4/4	8			Stiff, clayey SILT (ML) to silty CLAY (CL), trace coarse grained sand, light reddish brown, strong orange and gray mottling, moist (Residual Soil)
		5/5/5	10			
		4/6/7	13		▼	
10		3/35/50 for 3"				
		50 for 1"				Medium Hard (R3) to Hard (R4), BASALT, gray, vesicular, moist (Columbia River Basalt Formation)
15						Practical Refusal on Hard (R4) Basalt at 12.6 Feet.
						Groundwater Encountered at 8.45 Feet.
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 129 Feet

EXHIBIT K

GeoPacific Engineering Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland
Portland, Oregon

Project No. 11-2475

Boring No. **B-8**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
		3/7/12	19			Stiff, clayey SILT (ML) to silty CLAY (CL), with weathered basalt fragments, trace fine grained sand, light reddish brown, moist (Residual Soil)
5		4/4/6	10			
		50 for 3"				Hard (R4), BASALT, with zones of reddish brown silty clay to clayey silt matrix, gray, vesicular, moist (Columbia River Basalt Formation)
10						Practical Refusal on Hard (R4) Basalt at 7.8 Feet.
						No Groundwater or Seepage encountered.
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 133 Feet

EXHIBIT K

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland
Portland, Oregon

Project No. 11-2475

Boring No. **B-10**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
						Stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt fragments, reddish brown, strong orange and gray mottling, moist (Residual Soil)
						Hard (R4), BASALT, gray, moist (Columbia River Basalt Formation)
		4/50 for 2"				Practical Refusal on Hard (R4) Basalt at 3.2 Feet.
5						No Groundwater or Seepage encountered
10						
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 123 Feet

EXHIBIT K

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland
Portland, Oregon

Project No. 11-2475

Boring No. **B-13**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
		2/2/8	10			Stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt fragments, light reddish brown, moist (Residual Soil)
5		50 for 5.5"				Extremely Soft (R0) to Hard (R4), BASALT, with zones of reddish brown silty clay to clayey silt matrix, gray, vesicular, yellow secondary mineralization, moist (Columbia River Basalt Formation)
		13/10/12	22			
10		14/21/21	42			
		18/50 for 5.5"				
15						Practical Refusal on Hard (R4) Basalt at 12.4 Feet.
						No Groundwater or Seepage encountered.
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

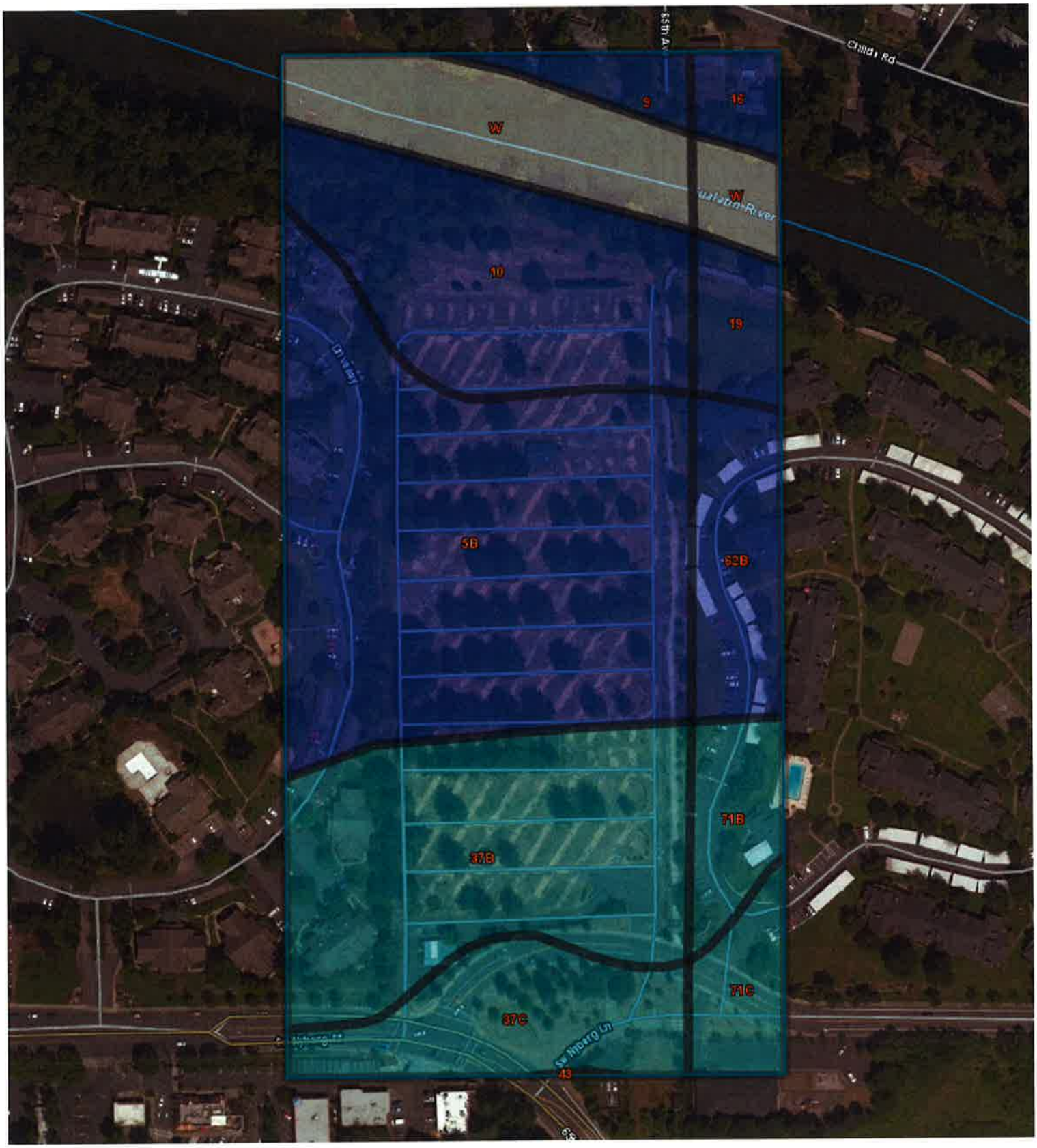
Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 129 Feet

EXHIBIT K

Appendix F:

NRCS Soils Data

EXHIBIT K



Summary by Map Unit – Clackamas County Area, Oregon (OR610)
Summary by Map Unit – Washington County, Oregon (OR067)

Summary by Map Unit — Clackamas County Area, Oregon (OR610)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
16	Chehalis silt loam	B	0.4	1.7%
19	Cloquato silt loam	B	0.6	2.7%
52B	Multnomah cobbly silt loam, 0 to 7 percent slopes	B	1.4	5.7%
71B	Quatama loam, 3 to 8 percent slopes	C	0.9	3.6%
71C	Quatama loam, 8 to 15 percent slopes	C	0.7	3.1%
W	Water		0.4	1.7%
Subtotals for Soil Survey Area			**4.4**	**18.5%**

Summary by Map Unit — Washington County, Oregon (OR067)

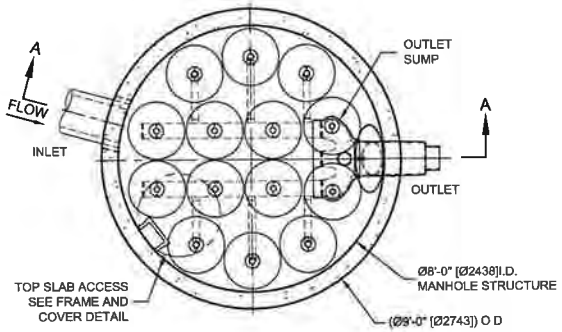
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
5B	Briedwell stony silt loam, 0 to 7 percent slopes	B	7.4	30.5%
9	Chehalis silty clay loam, occasional overflow	B	0.5	1.9%
10	Chehalis silt loam, occasional overflow	B	3.5	14.5%
37B	Quatama loam, 3 to 7 percent slopes	C	4.5	18.7%
37C	Quatama loam, 7 to 12 percent slopes	C	1.9	7.9%
43	Wapato silty clay loam	C/D	0.0	0.0%
W	Water		1.9	7.9%
Subtotals for Soil Survey Area			**19.6**	**81.5%**
Totals for Area of Interest			**24.1**	**100.0%**

EXHIBIT K

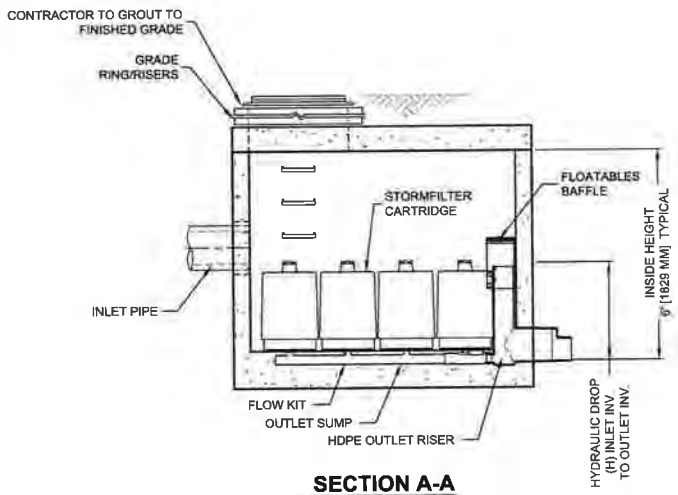
EXHIBIT K

Appendix G:

WQ Vault Details



PLAN VIEW
STANDARD OUTLET RISER
FLOWKIT: 43A



SECTION A-A

The Stormwater Management
StormFilter®

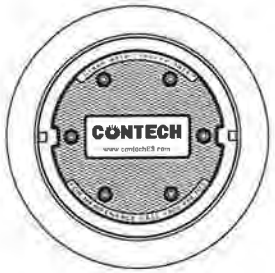
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (14). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 14 CARTRIDGES Ø8'-0" [2438 mm] MANHOLE STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.8 CFS [51 L/s]. IF THE SITE CONDITIONS EXCEED 1.8 CFS [51 L/s] AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27" [686 mm]			18" [458 mm]			LOW DROP		
RECOMMENDED HYDRAULIC DROP (H)	3.05' [930 mm]			2.3' [700 mm]			1.8' [550 mm]		
SPECIFIC FLOW RATE (gpm/sf) [L/s/m²]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]
CARTRIDGE FLOW RATE (gpm) [L/s]	22.5 [1.42]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.44]	10 [0.63]	8.35 [0.54]	5 [0.32]

* 1.67 gpm/sf [1.08 L/s/m²] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



FRAME AND COVER
(DIAMETER VARIES)
N.T.S

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs) [L/s]	*
PEAK FLOW RATE (cfs) [L/s]	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (SEE TABLE ABOVE)	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' [1524 mm] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES [178 mm]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft)[m²]
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
E. CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8 INCHES [200 mm], CONTRACTOR TO REMOVE THE 8 INCH [200 mm] OUTLET STUB AT MOLDED-IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
F. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF

CONTECH®
ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

SFMH96
STORMFILTER
STANDARD DETAIL

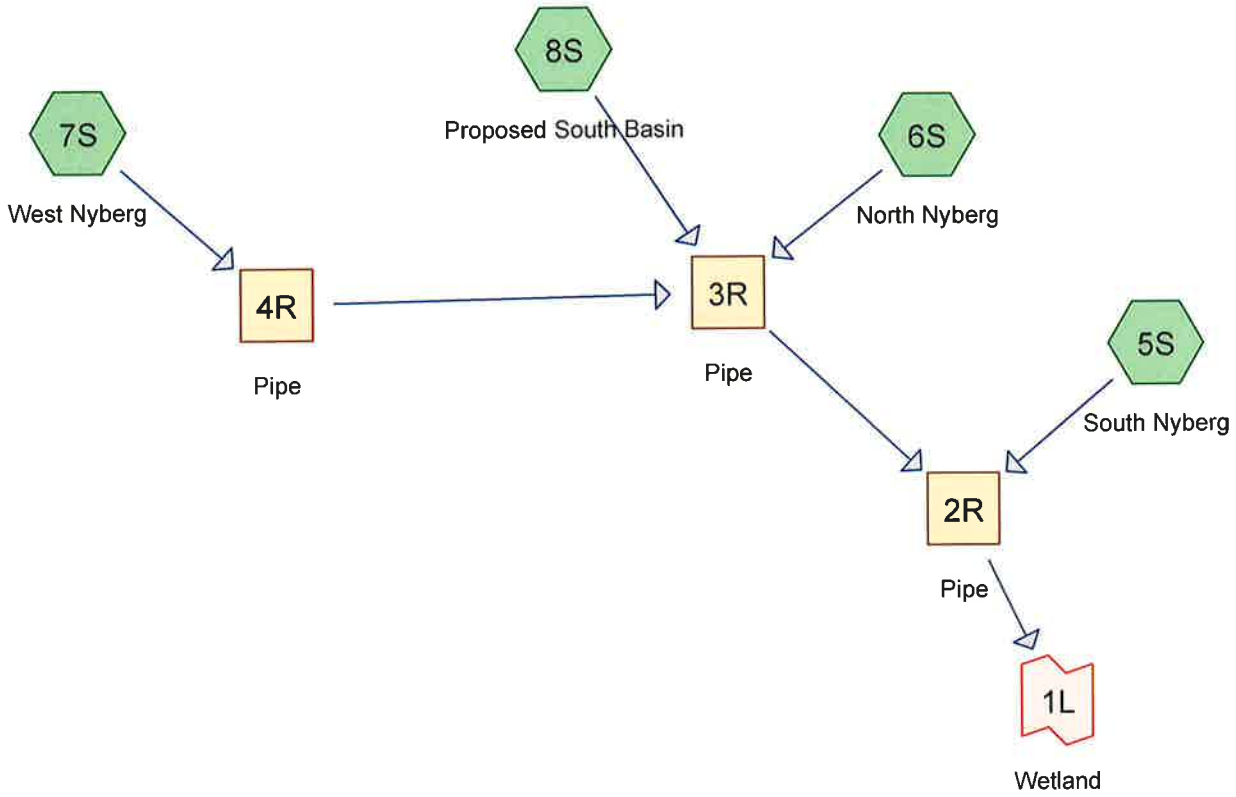
EXHIBIT K

EXHIBIT K

Appendix H:

HydroCAD Models

EXHIBIT K



Subcat Reach Pond Link

Routing Diagram for 2752-001 Nyberg DownStream
Prepared by HP Inc., Printed 8/30/2018
HydroCAD® 10.00-16 s/n 09621 © 2015 HydroCAD Software Solutions LLC

EXHIBIT K

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
132,120	90	1/8 acre lots, 65% imp, HSG C (7S)
39,419	98	Paved parking, HSG C (8S)
24,421	98	Roofs, HSG C (8S)
29,674	94	Urban commercial, 85% imp, HSG C (5S, 6S)
225,634	**93**	**TOTAL AREA**

EXHIBIT K

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
225,634	HSG C	5S, 6S, 7S, 8S
0	HSG D	
0	Other	
225,634		**TOTAL AREA**

EXHIBIT K

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	132,120	0	0	132,120	1/8 acre lots, 65% imp
0	0	39,419	0	0	39,419	Paved parking
0	0	24,421	0	0	24,421	Roofs
0	0	29,674	0	0	29,674	Urban commercial, 85% imp
0	**0**	**225,634**	**0**	**0**	**225,634**	**TOTAL AREA**

EXHIBIT K

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2R	111.95	109.66	101.3	0.0226	0.013	15.0	0.0	0.0
2	3R	113.40	111.93	101.3	0.0145	0.013	15.0	0.0	0.0
3	4R	115.45	113.40	205.0	0.0100	0.013	15.0	0.0	0.0

EXHIBIT K

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment5S: South Nyberg Runoff Area=22,945 sf 85.00% Impervious Runoff Depth>3.31"
Tc=5.0 min CN=71/98 Runoff=0.43 cfs 6,326 cf

Subcatchment6S: North Nyberg Runoff Area=6,729 sf 85.00% Impervious Runoff Depth>3.31"
Tc=5.0 min CN=71/98 Runoff=0.13 cfs 1,855 cf

Subcatchment7S: West Nyberg Runoff Area=132,120 sf 65.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=75/98 Runoff=2.05 cfs 32,242 cf

Subcatchment8S: Proposed South Basin Runoff Area=63,840 sf 100.00% Impervious Runoff Depth>3.65"
Tc=10.0 min CN=0/98 Runoff=1.27 cfs 19,434 cf

Reach 2R: Pipe Avg. Flow Depth=0.55' Max Vel=7.46 fps Inflow=3.85 cfs 59,815 cf
15.0" Round Pipe n=0.013 L=101.3' S=0.0226 '/' Capacity=9.71 cfs Outflow=3.85 cfs 59,801 cf

Reach 3R: Pipe Avg. Flow Depth=0.58' Max Vel=6.14 fps Inflow=3.44 cfs 53,505 cf
15.0" Round Pipe n=0.013 L=101.3' S=0.0145 '/' Capacity=7.78 cfs Outflow=3.43 cfs 53,489 cf

Reach 4R: Pipe Avg. Flow Depth=0.48' Max Vel=4.67 fps Inflow=2.05 cfs 32,242 cf
15.0" Round Pipe n=0.013 L=205.0' S=0.0100 '/' Capacity=6.46 cfs Outflow=2.04 cfs 32,216 cf

Link 1L: Wetland Inflow=3.85 cfs 59,801 cf
Primary=3.85 cfs 59,801 cf

Total Runoff Area = 225,634 sf Runoff Volume = 59,858 cf Average Runoff Depth = 3.18"
22.47% Pervious = 50,693 sf 77.53% Impervious = 174,941 sf

EXHIBIT K

Summary for Subcatchment 5S: South Nyberg

Runoff = 0.43 cfs @ 7.90 hrs, Volume= 6,326 cf, Depth> 3.31"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

Area (sf)	CN	Description
22,945	94	Urban commercial, 85% imp, HSG C
3,442	71	15.00% Pervious Area
19,503	98	85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5S: South Nyberg

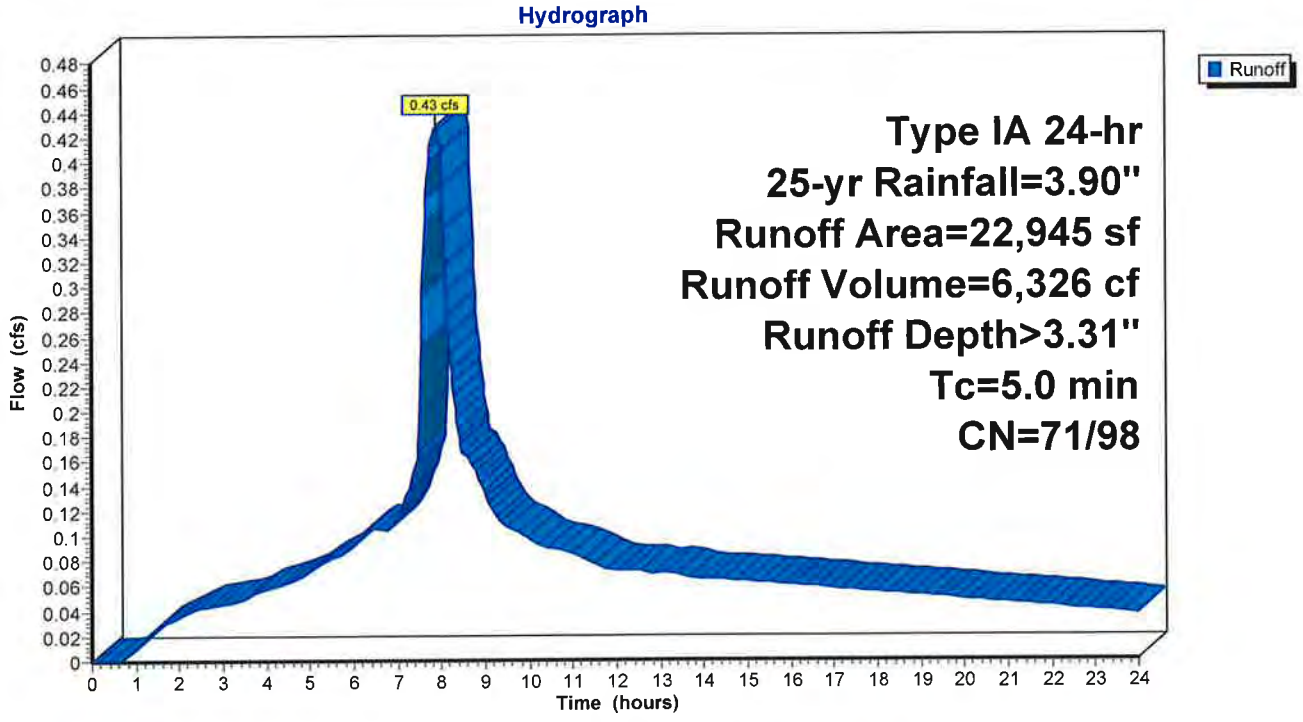


EXHIBIT K

Summary for Subcatchment 6S: North Nyberg

Runoff = 0.13 cfs @ 7.90 hrs, Volume= 1,855 cf, Depth> 3.31"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

Area (sf)	CN	Description
6,729	94	Urban commercial, 85% imp, HSG C
1,009	71	15.00% Pervious Area
5,720	98	85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: North Nyberg

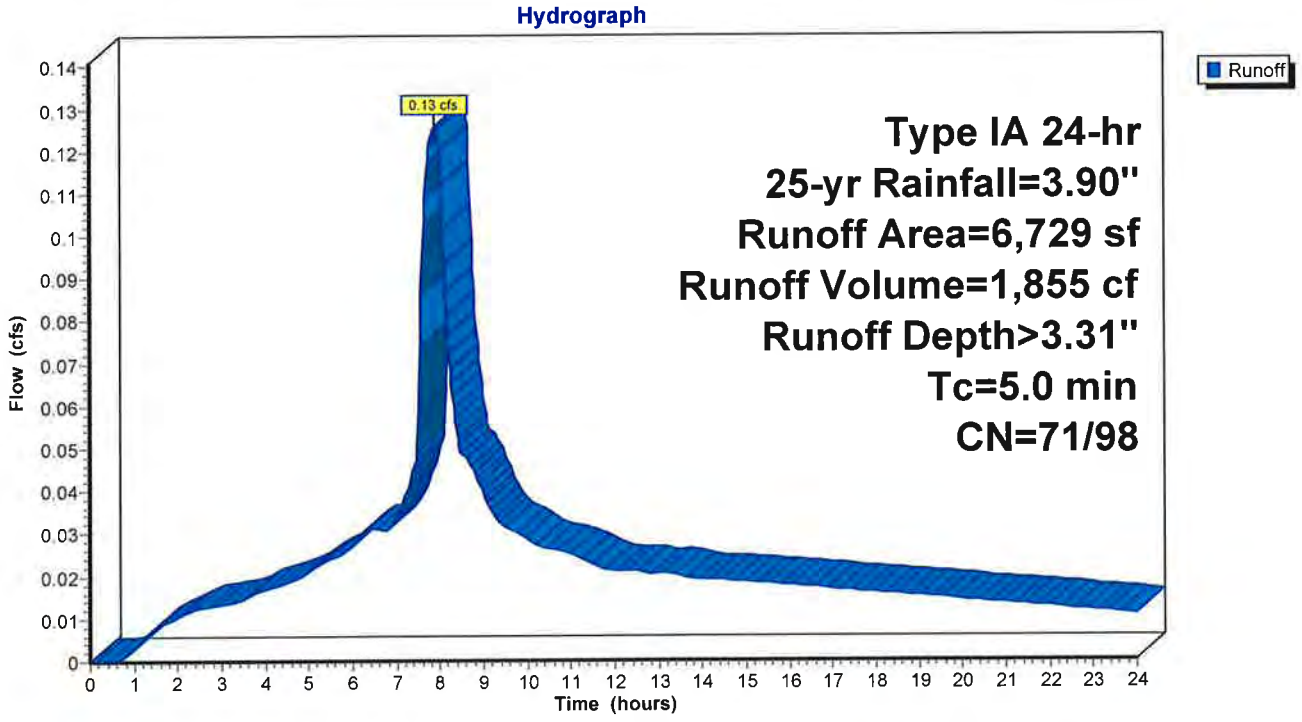


EXHIBIT K

Summary for Subcatchment 7S: West Nyberg

Runoff = 2.05 cfs @ 7.98 hrs, Volume= 32,242 cf, Depth> 2.93"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

Area (sf)	CN	Description
132,120	90	1/8 acre lots, 65% imp, HSG C
46,242	75	35.00% Pervious Area
85,878	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 7S: West Nyberg

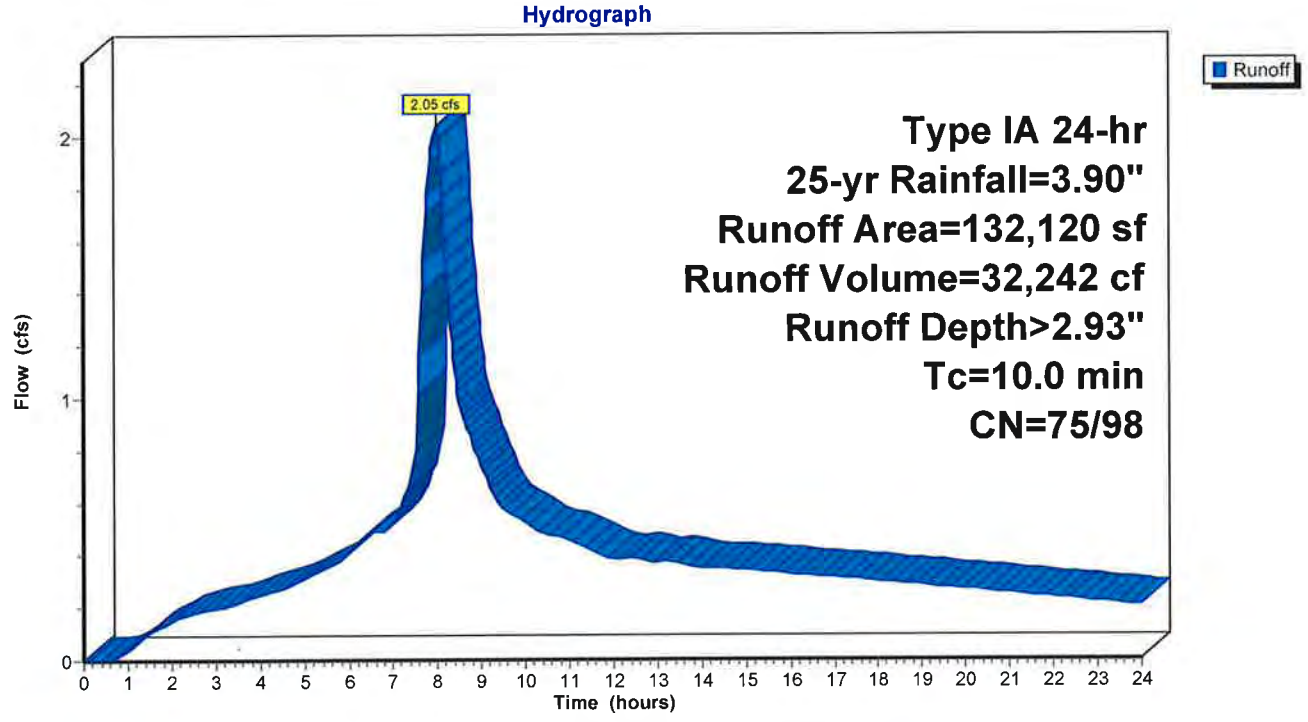


EXHIBIT K

Summary for Subcatchment 8S: Proposed South Basin

Runoff = 1.27 cfs @ 7.97 hrs, Volume= 19,434 cf, Depth> 3.65"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

Area (sf)	CN	Description
39,419	98	Paved parking, HSG C
24,421	98	Roofs, HSG C
63,840	98	Weighted Average
63,840	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 8S: Proposed South Basin

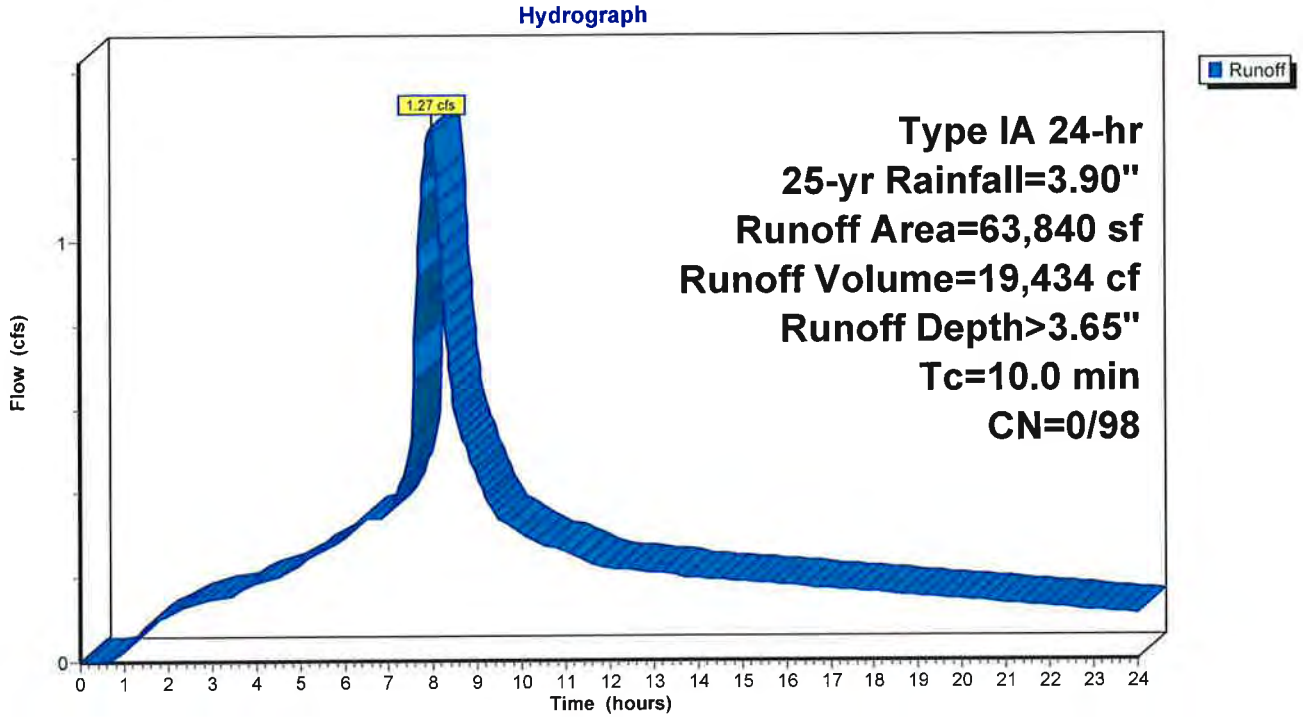


EXHIBIT K

Summary for Reach 2R: Pipe

[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 3R OUTLET depth by 0.02' @ 0.00 hrs

Inflow Area = 225,634 sf, 77.53% Impervious, Inflow Depth > 3.18" for 25-yr event
Inflow = 3.85 cfs @ 7.98 hrs, Volume= 59,815 cf
Outflow = 3.85 cfs @ 7.98 hrs, Volume= 59,801 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.46 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 4.42 fps, Avg. Travel Time= 0.4 min

Peak Storage= 52 cf @ 7.98 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.71 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 101.3' Slope= 0.0226 '/'
Inlet Invert= 111.95', Outlet Invert= 109.66'

EXHIBIT K

Reach 2R: Pipe

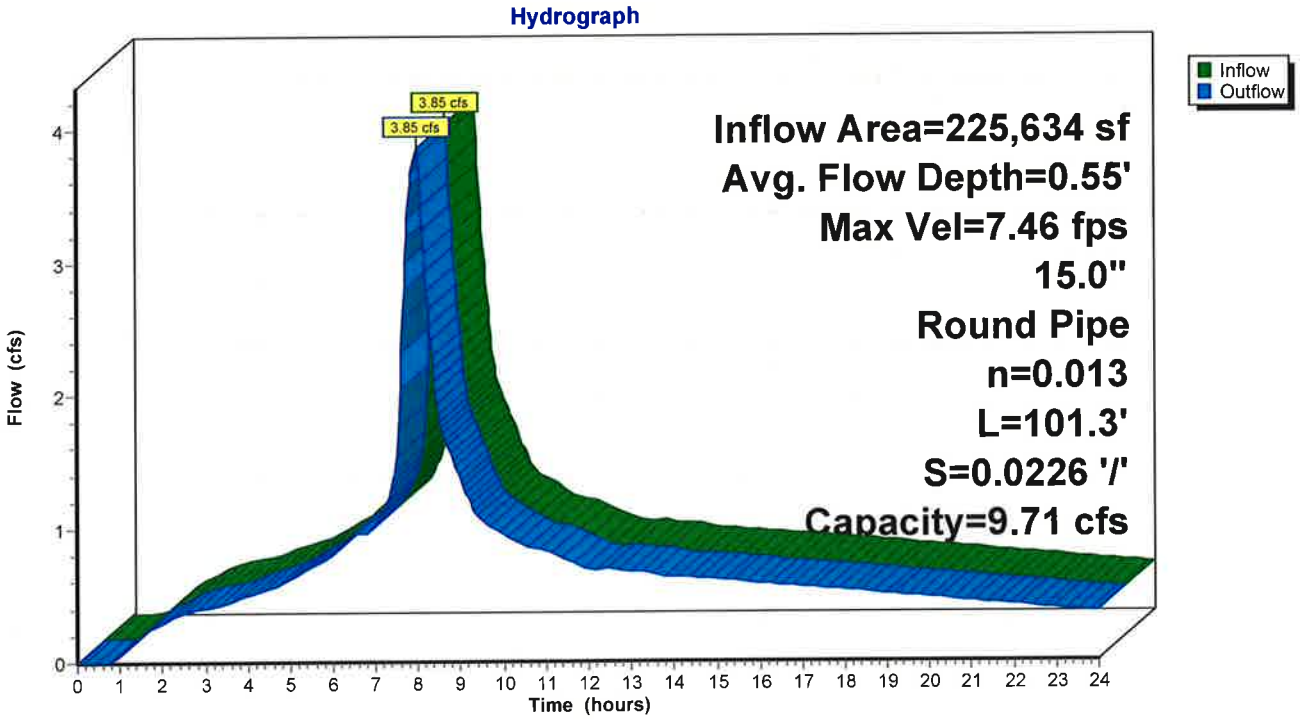


EXHIBIT K

Summary for Reach 3R: Pipe

[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.10' @ 7.98 hrs

Inflow Area = 202,689 sf, 76.69% Impervious, Inflow Depth > 3.17" for 25-yr event
Inflow = 3.44 cfs @ 7.98 hrs, Volume= 53,505 cf
Outflow = 3.43 cfs @ 7.99 hrs, Volume= 53,489 cf, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.14 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.65 fps, Avg. Travel Time= 0.5 min

Peak Storage= 57 cf @ 7.98 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.78 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 101.3' Slope= 0.0145 '/'
Inlet Invert= 113.40', Outlet Invert= 111.93'

EXHIBIT K

Reach 3R: Pipe

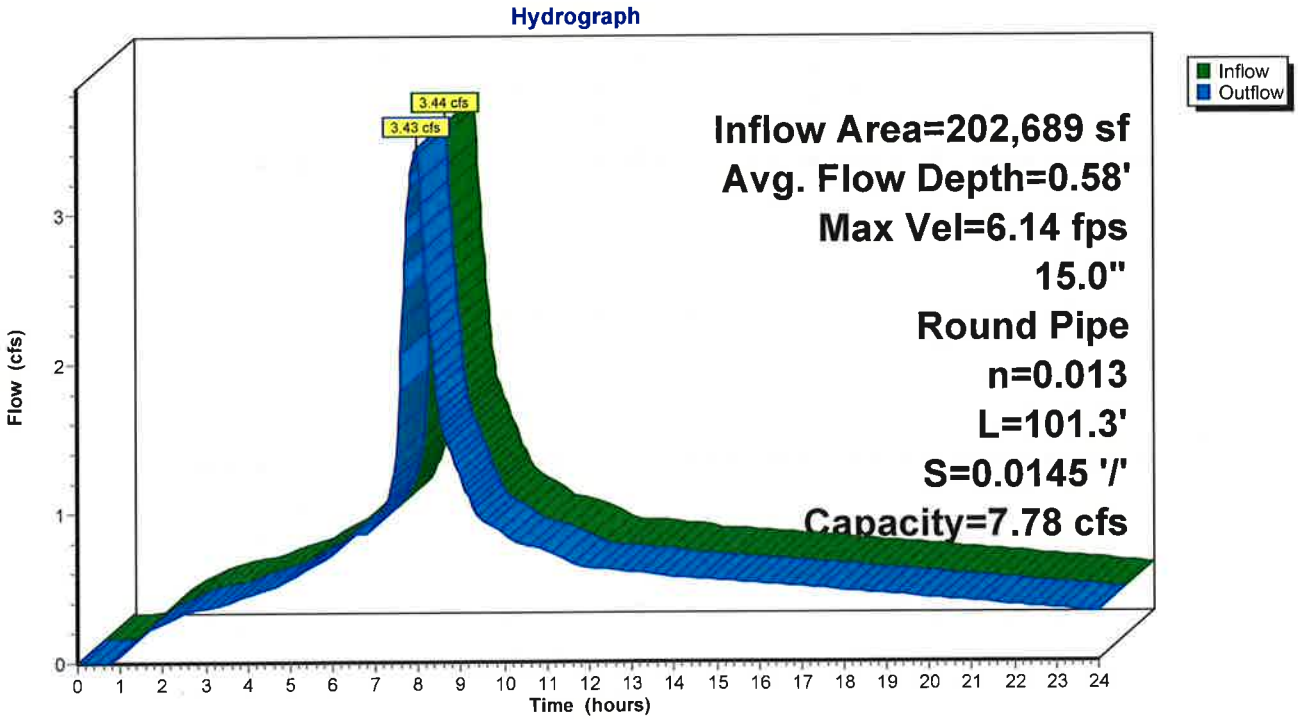


EXHIBIT K

Summary for Reach 4R: Pipe

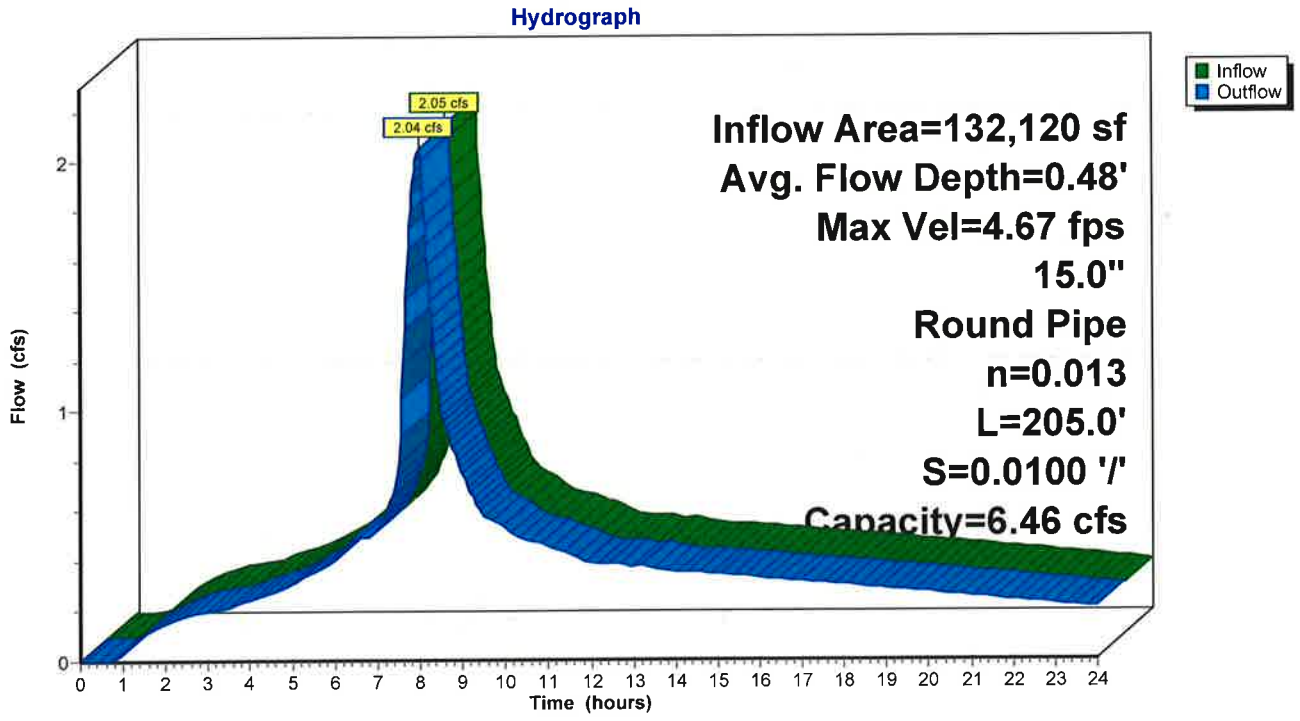
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 132,120 sf, 65.00% Impervious, Inflow Depth > 2.93" for 25-yr event
Inflow = 2.05 cfs @ 7.98 hrs, Volume= 32,242 cf
Outflow = 2.04 cfs @ 8.00 hrs, Volume= 32,216 cf, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.67 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.76 fps, Avg. Travel Time= 1.2 min

Peak Storage= 90 cf @ 7.98 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.46 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 205.0' Slope= 0.0100 '/'
Inlet Invert= 115.45', Outlet Invert= 113.40'



Summary for Link 1L: Wetland

Inflow Area = 225,634 sf, 77.53% Impervious, Inflow Depth > 3.18" for 25-yr event
Inflow = 3.85 cfs @ 7.98 hrs, Volume= 59,801 cf
Primary = 3.85 cfs @ 7.98 hrs, Volume= 59,801 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Link 1L: Wetland

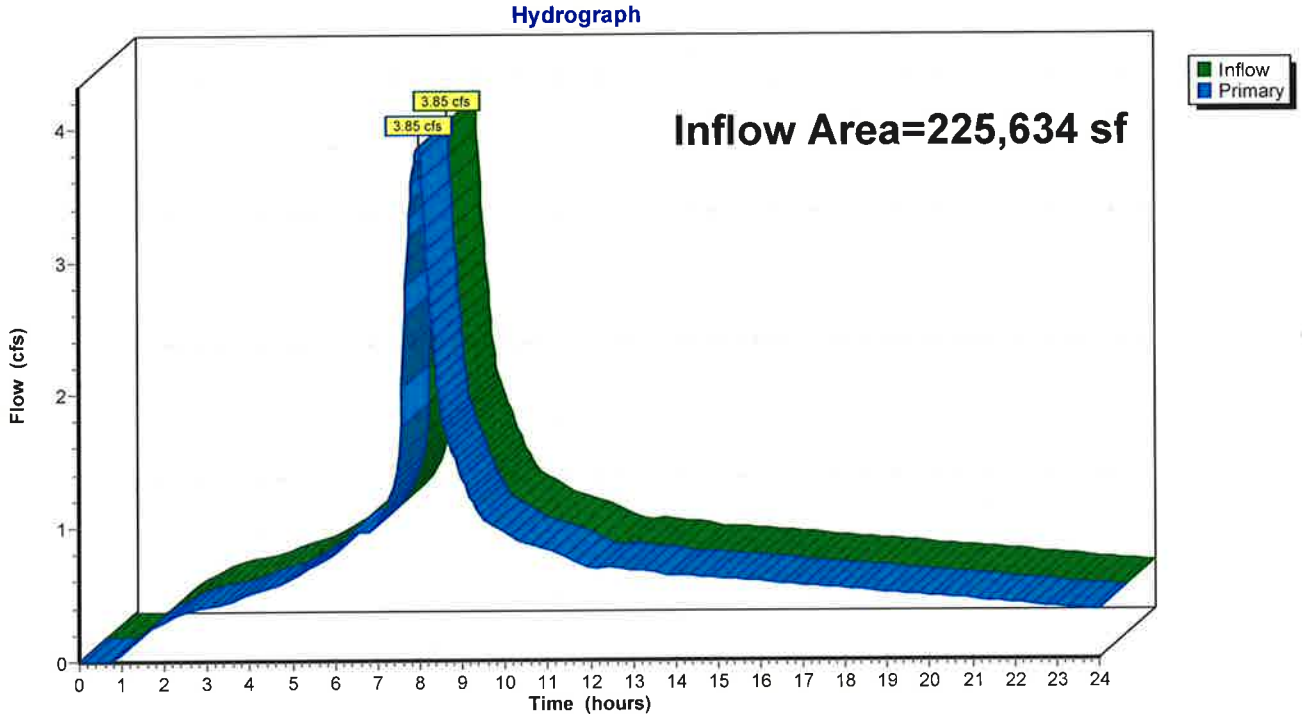


EXHIBIT K

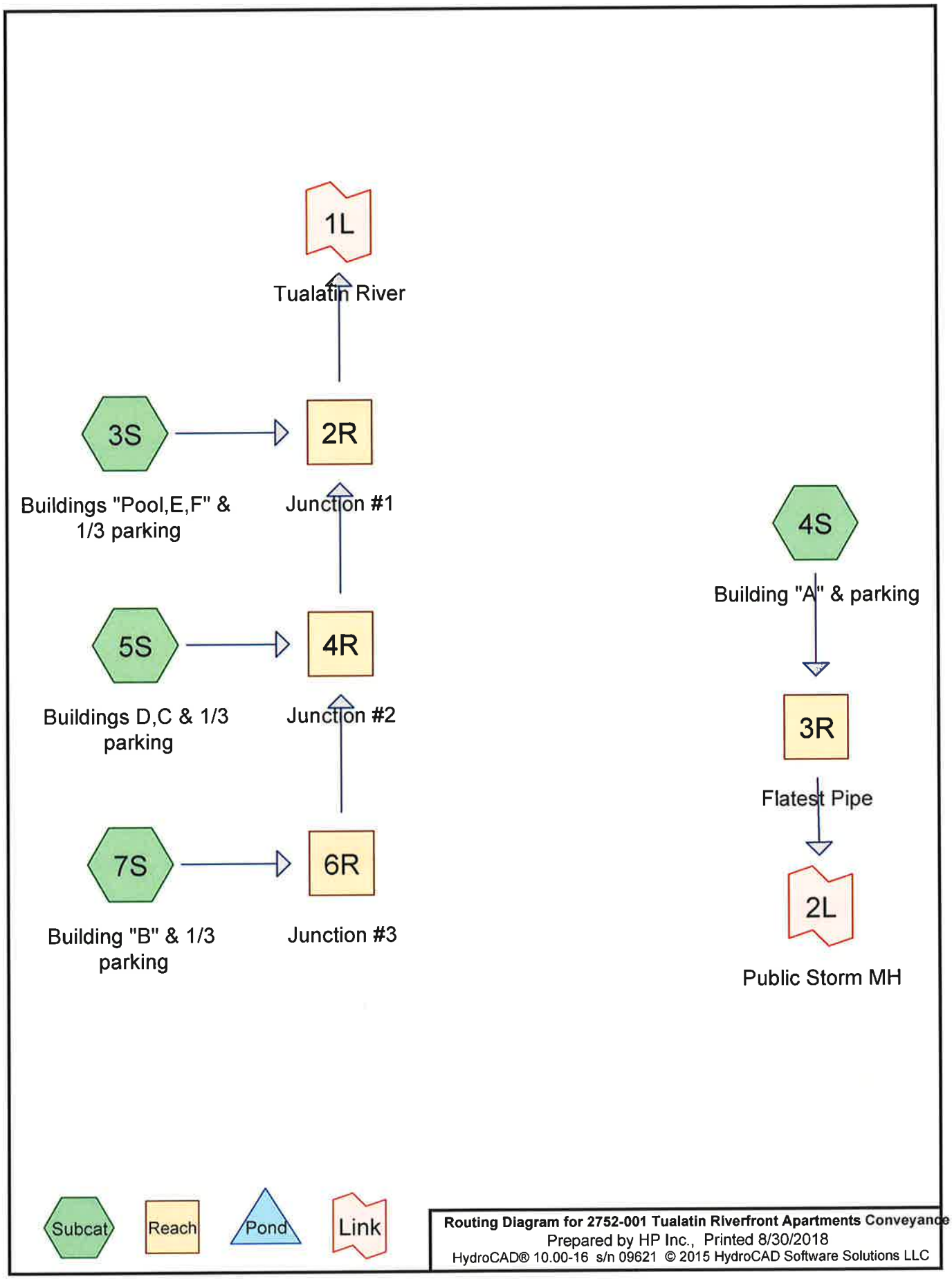

1L
Tualatin River
3S
2R
Buildings "Pool,E,F" & 1/3 parking
Junction #1
4S
Building "A" & parking
5S
4R
Buildings D,C & 1/3 parking
Junction #2
3R
Flatest Pipe
7S
6R
2L
Building "B" & 1/3 parking
Junction #3
Public Storm MH
Subcat
Reach
Pond
Link
Routing Diagram for 2752-001 Tualatin Riverfront Apartments Conveyance
Prepared by HP Inc., Printed 8/30/2018
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EXHIBIT K

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
49,312	61	>75% Grass cover, Good, HSG B (3S, 5S, 7S)
18,253	74	>75% Grass cover, Good, HSG C (4S)
141,249	98	Paved parking, HSG C (3S, 4S, 5S, 7S)
84,283	98	Roofs, HSG C (3S, 4S, 5S)
33,886	98	Unconnected roofs, HSG C (7S)
326,983	**91**	**TOTAL AREA**

EXHIBIT K

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
49,312	HSG B	3S, 5S, 7S
277,671	HSG C	3S, 4S, 5S, 7S
0	HSG D	
0	Other	
326,983		**TOTAL AREA**

EXHIBIT K

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	49,312	18,253	0	0	67,565	>75% Grass cover, Good
0	0	141,249	0	0	141,249	Paved parking
0	0	84,283	0	0	84,283	Roofs
0	0	33,886	0	0	33,886	Unconnected roofs
0	**49,312**	**277,671**	**0**	**0**	**326,983**	**TOTAL AREA**

EXHIBIT K

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2R	117.00	113.00	200.0	0.0200	0.013	12.0	0.0	0.0
2	3R	118.00	116.00	200.0	0.0100	0.013	12.0	0.0	0.0
3	4R	123.00	117.00	300.0	0.0200	0.013	12.0	0.0	0.0
4	6R	129.00	123.00	300.0	0.0200	0.013	12.0	0.0	0.0

EXHIBIT K

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment3S: Buildings "Pool,E,F" & Runoff Area=64,233 sf 74.41% Impervious Runoff Depth>2.92"
Tc=5.0 min CN=61/98 Runoff=1.03 cfs 15,615 cf

Subcatchment4S: Building "A" & parking Runoff Area=82,093 sf 77.77% Impervious Runoff Depth>3.18"
Tc=5.0 min CN=74/98 Runoff=1.47 cfs 21,777 cf

Subcatchment5S: Buildings D,C & 1/3 Runoff Area=96,389 sf 82.95% Impervious Runoff Depth>3.16"
Tc=5.0 min CN=61/98 Runoff=1.70 cfs 25,420 cf

Subcatchment7S: Building "B" & 1/3 Runoff Area=84,268 sf 80.49% Impervious Runoff Depth>3.09"
Tc=5.0 min CN=61/98 Runoff=1.45 cfs 21,724 cf

Reach 2R: Junction #1 Avg. Flow Depth=0.69' Max Vel=7.17 fps Inflow=4.17 cfs 62,700 cf
12.0" Round Pipe n=0.013 L=200.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=4.17 cfs 62,670 cf

Reach 3R: Flatest Pipe Avg. Flow Depth=0.45' Max Vel=4.32 fps Inflow=1.47 cfs 21,777 cf
12.0" Round Pipe n=0.013 L=200.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=1.47 cfs 21,759 cf

Reach 4R: Junction #2 Avg. Flow Depth=0.57' Max Vel=6.77 fps Inflow=3.15 cfs 47,122 cf
12.0" Round Pipe n=0.013 L=300.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=3.14 cfs 47,086 cf

Reach 6R: Junction #3 Avg. Flow Depth=0.37' Max Vel=5.54 fps Inflow=1.45 cfs 21,724 cf
12.0" Round Pipe n=0.013 L=300.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=1.45 cfs 21,702 cf

Link 1L: Tualatin River Inflow=4.17 cfs 62,670 cf
Primary=4.17 cfs 62,670 cf

Link 2L: Public Storm MH Inflow=1.47 cfs 21,759 cf
Primary=1.47 cfs 21,759 cf

Total Runoff Area = 326,983 sf Runoff Volume = 84,536 cf Average Runoff Depth = 3.10"
20.66% Pervious = 67,565 sf 79.34% Impervious = 259,418 sf

Summary for Subcatchment 3S: Buildings "Pool,E,F" & 1/3 parking

Runoff = 1.03 cfs @ 7.90 hrs, Volume= 15,615 cf, Depth> 2.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

Area (sf)	CN	Description
13,853	98	Roofs, HSG C
33,943	98	Paved parking, HSG C
16,437	61	>75% Grass cover, Good, HSG B
64,233	89	Weighted Average
16,437	61	25.59% Pervious Area
47,796	98	74.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 3S: Buildings "Pool,E,F" & 1/3 parking

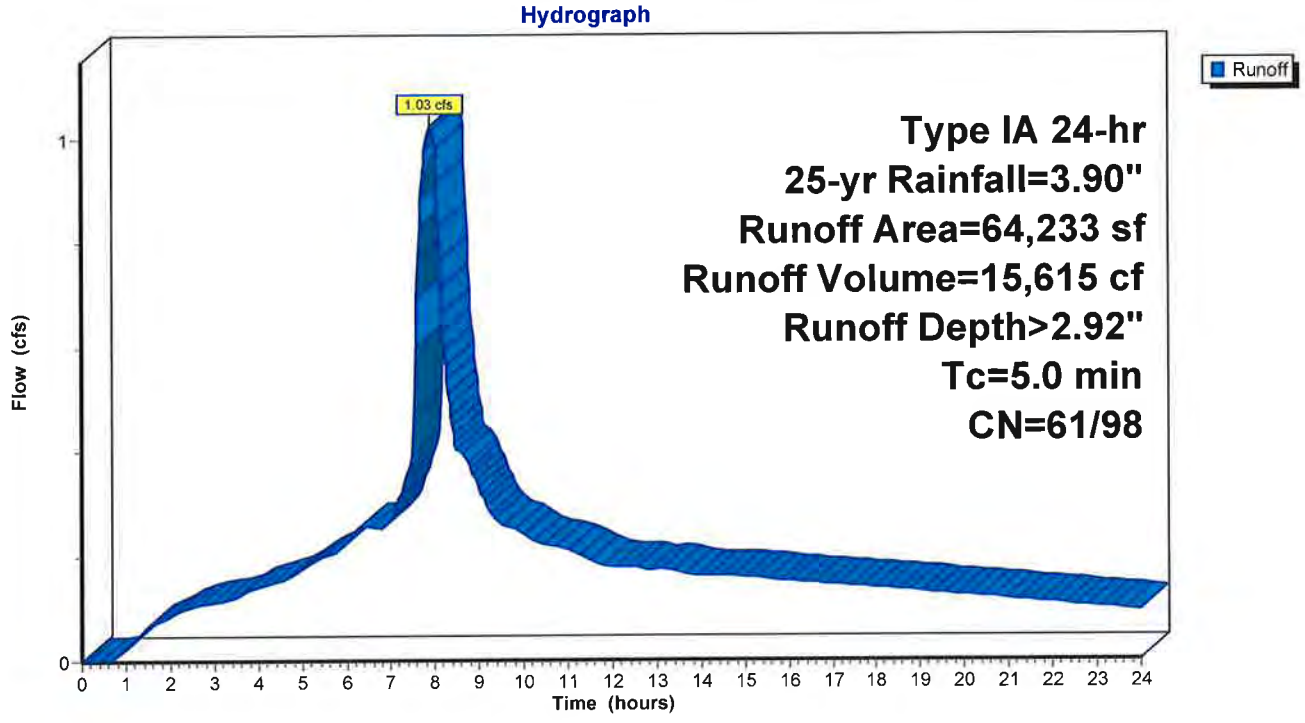


EXHIBIT K

Summary for Subcatchment 4S: Building "A" & parking

Runoff = 1.47 cfs @ 7.90 hrs, Volume= 21,777 cf, Depth> 3.18"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

Area (sf)	CN	Description
24,421	98	Roofs, HSG C
39,419	98	Paved parking, HSG C
18,253	74	>75% Grass cover, Good, HSG C
82,093	93	Weighted Average
18,253	74	22.23% Pervious Area
63,840	98	77.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 4S: Building "A" & parking

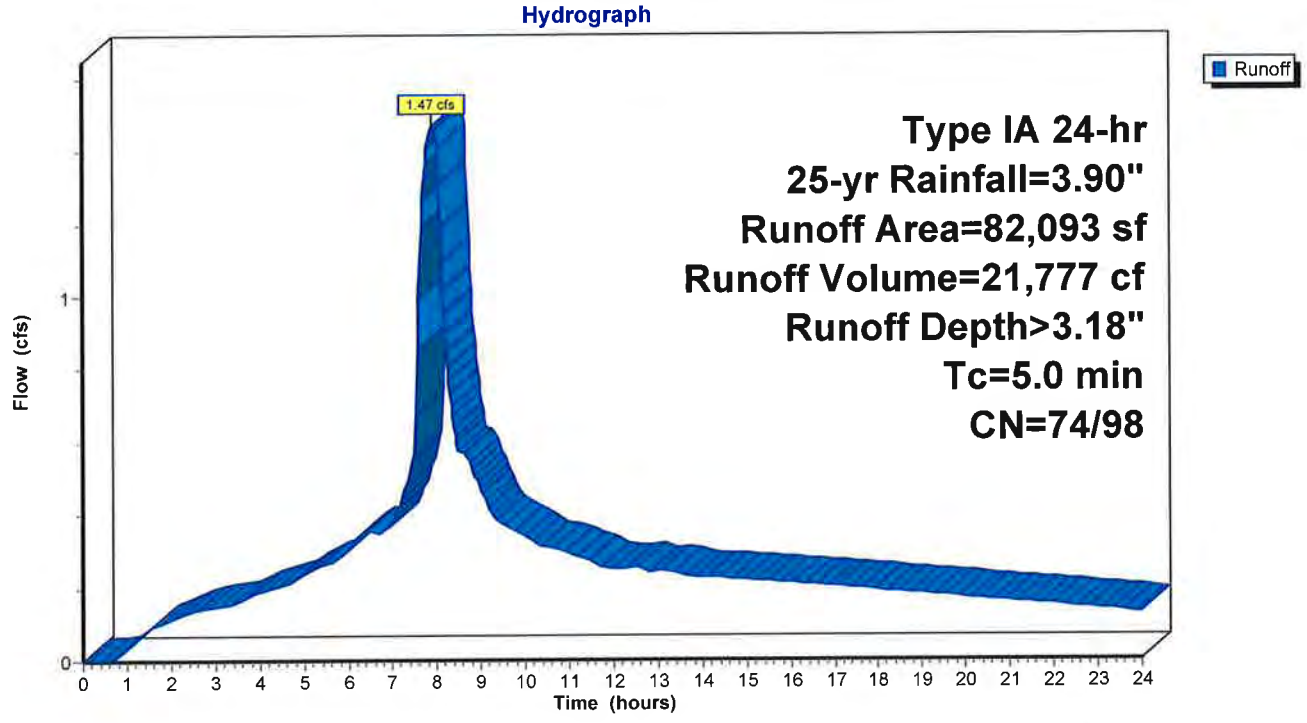


EXHIBIT K

Summary for Subcatchment 5S: Buildings D,C & 1/3 parking

Runoff = 1.70 cfs @ 7.90 hrs, Volume= 25,420 cf, Depth> 3.16"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

Area (sf)	CN	Description
46,009	98	Roofs, HSG C
33,943	98	Paved parking, HSG C
16,437	61	>75% Grass cover, Good, HSG B
96,389	92	Weighted Average
16,437	61	17.05% Pervious Area
79,952	98	82.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5S: Buildings D,C & 1/3 parking

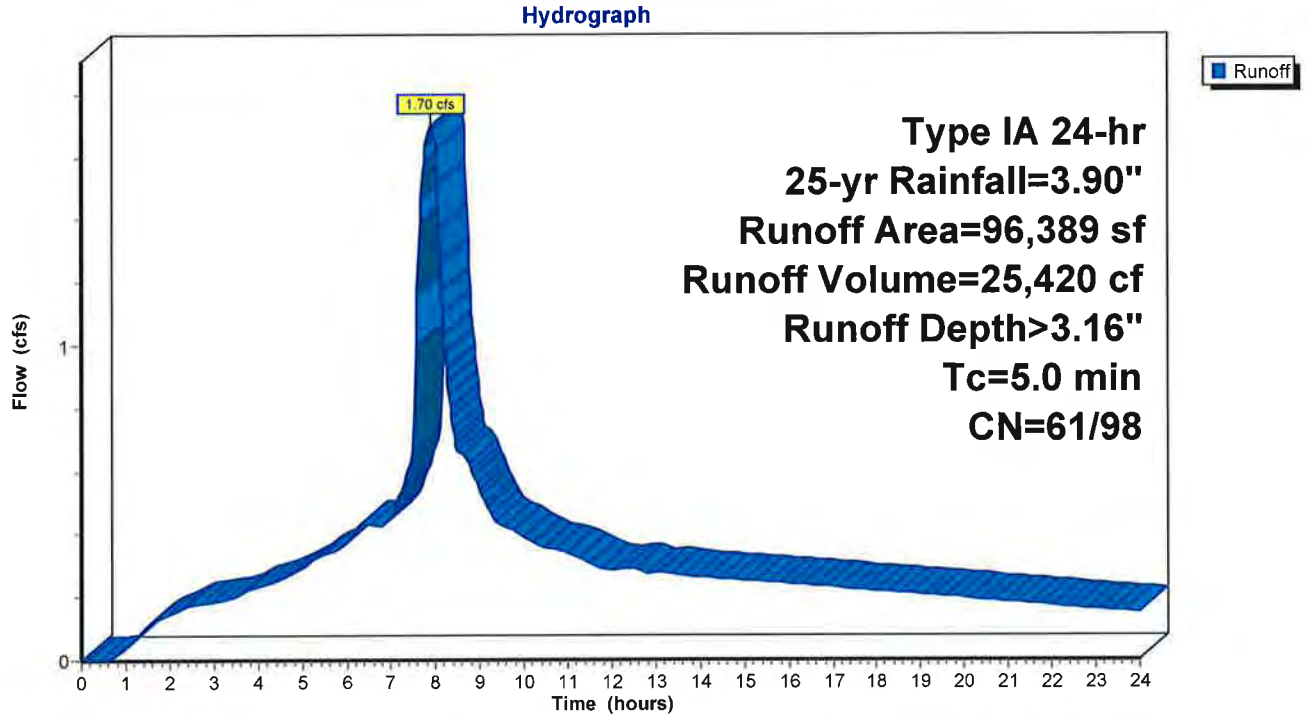


EXHIBIT K

Summary for Subcatchment 7S: Building "B" & 1/3 parking

Runoff = 1.45 cfs @ 7.90 hrs, Volume= 21,724 cf, Depth> 3.09"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type IA 24-hr 25-yr Rainfall=3.90"

Area (sf)	CN	Description
33,886	98	Unconnected roofs, HSG C
33,944	98	Paved parking, HSG C
16,438	61	>75% Grass cover, Good, HSG B
84,268	91	Weighted Average
16,438	61	19.51% Pervious Area
67,830	98	80.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 7S: Building "B" & 1/3 parking

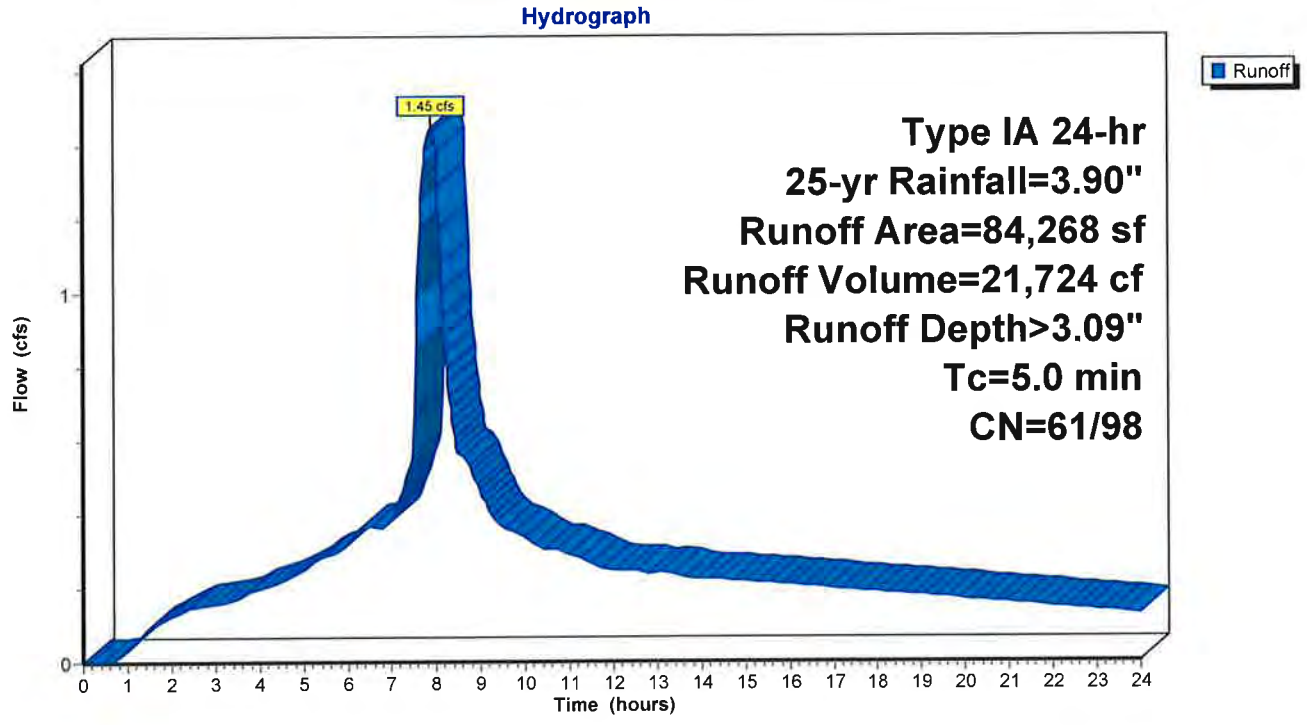


EXHIBIT K

Summary for Reach 2R: Junction #1

[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.12' @ 7.95 hrs

Inflow Area = 244,890 sf, 79.86% Impervious, Inflow Depth > 3.07" for 25-yr event
Inflow = 4.17 cfs @ 7.92 hrs, Volume= 62,700 cf
Outflow = 4.17 cfs @ 7.94 hrs, Volume= 62,670 cf, Atten= 0%, Lag= 0.9 min

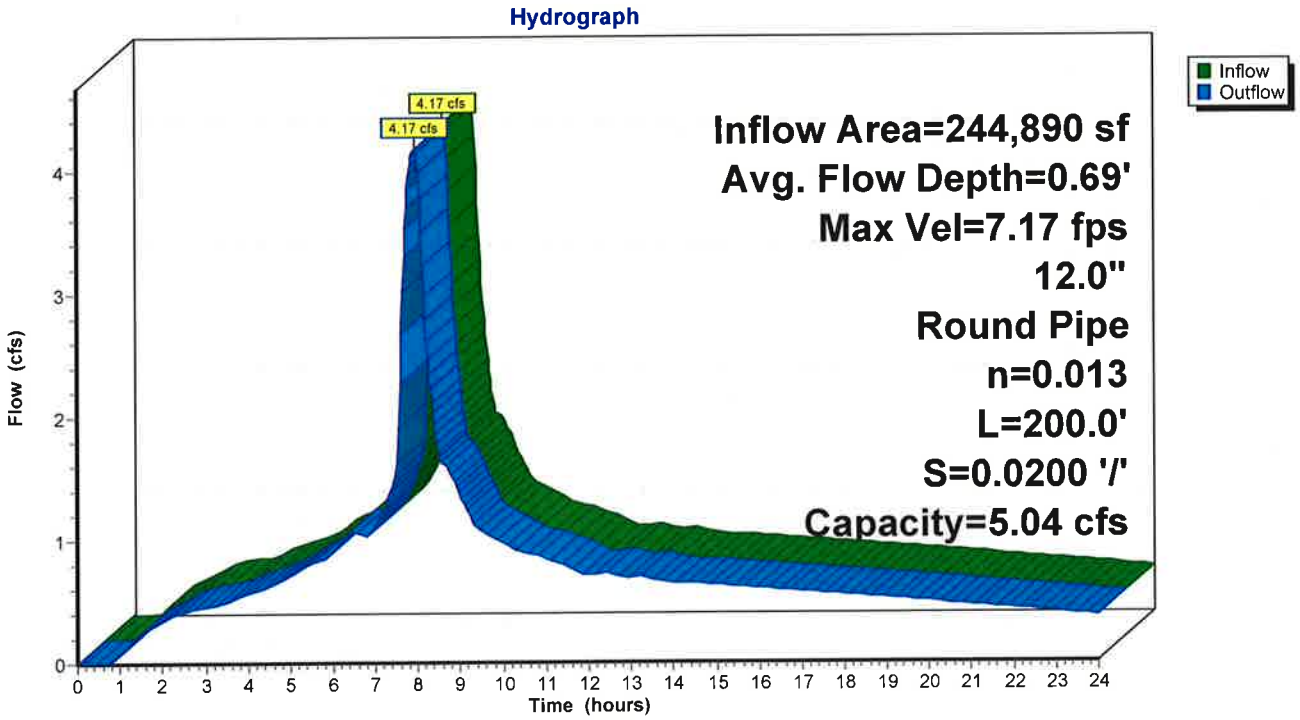
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.17 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 4.39 fps, Avg. Travel Time= 0.8 min

Peak Storage= 116 cf @ 7.93 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.04 cfs

12.0" Round Pipe
n= 0.013
Length= 200.0' Slope= 0.0200 '/'
Inlet Invert= 117.00', Outlet Invert= 113.00'

EXHIBIT K

Reach 2R: Junction #1



Summary for Reach 3R: Flatest Pipe

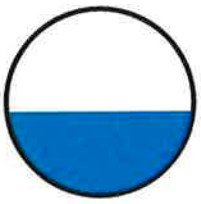
[52] Hint: Inlet/Outlet conditions not evaluated

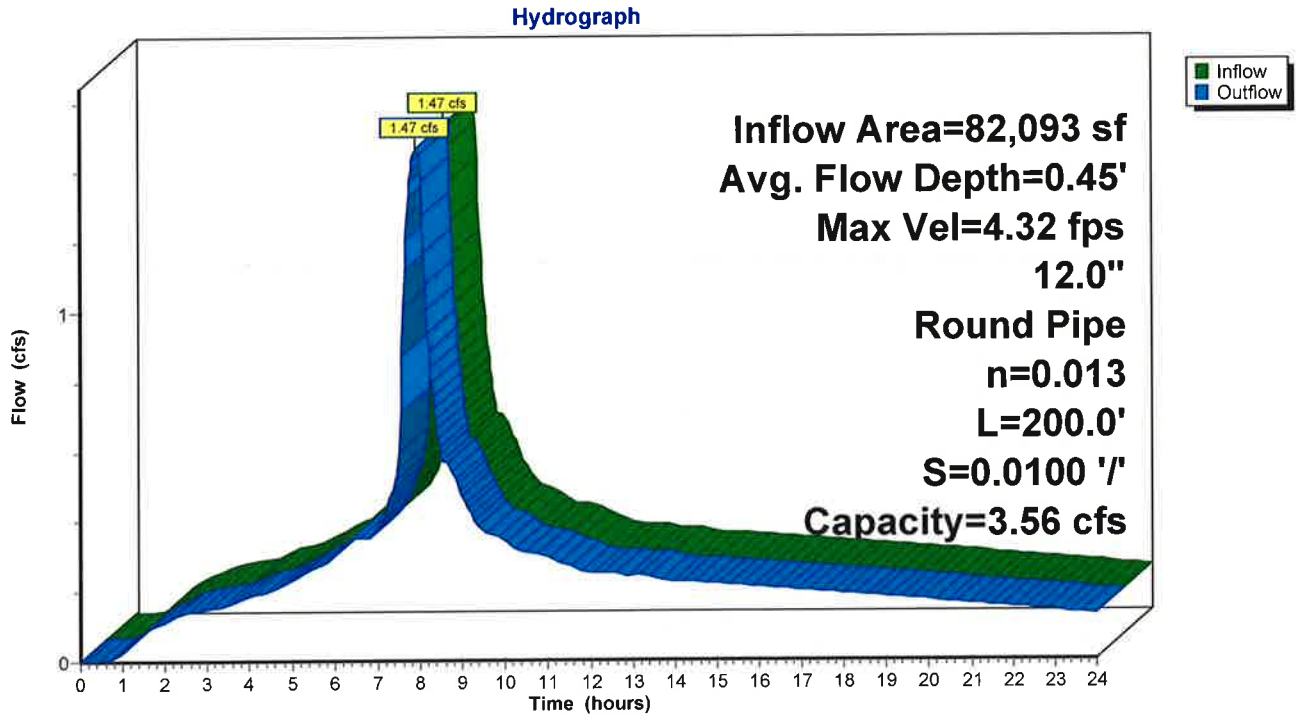
Inflow Area = 82,093 sf, 77.77% Impervious, Inflow Depth > 3.18" for 25-yr event
Inflow = 1.47 cfs @ 7.90 hrs, Volume= 21,777 cf
Outflow = 1.47 cfs @ 7.92 hrs, Volume= 21,759 cf, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.32 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.52 fps, Avg. Travel Time= 1.3 min

Peak Storage= 68 cf @ 7.91 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 118.00', Outlet Invert= 116.00'





Summary for Reach 4R: Junction #2

[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 6R OUTLET depth by 0.21' @ 7.92 hrs

Inflow Area = 180,657 sf, 81.80% Impervious, Inflow Depth > 3.13" for 25-yr event
Inflow = 3.15 cfs @ 7.91 hrs, Volume= 47,122 cf
Outflow = 3.14 cfs @ 7.93 hrs, Volume= 47,086 cf, Atten= 0%, Lag= 1.3 min

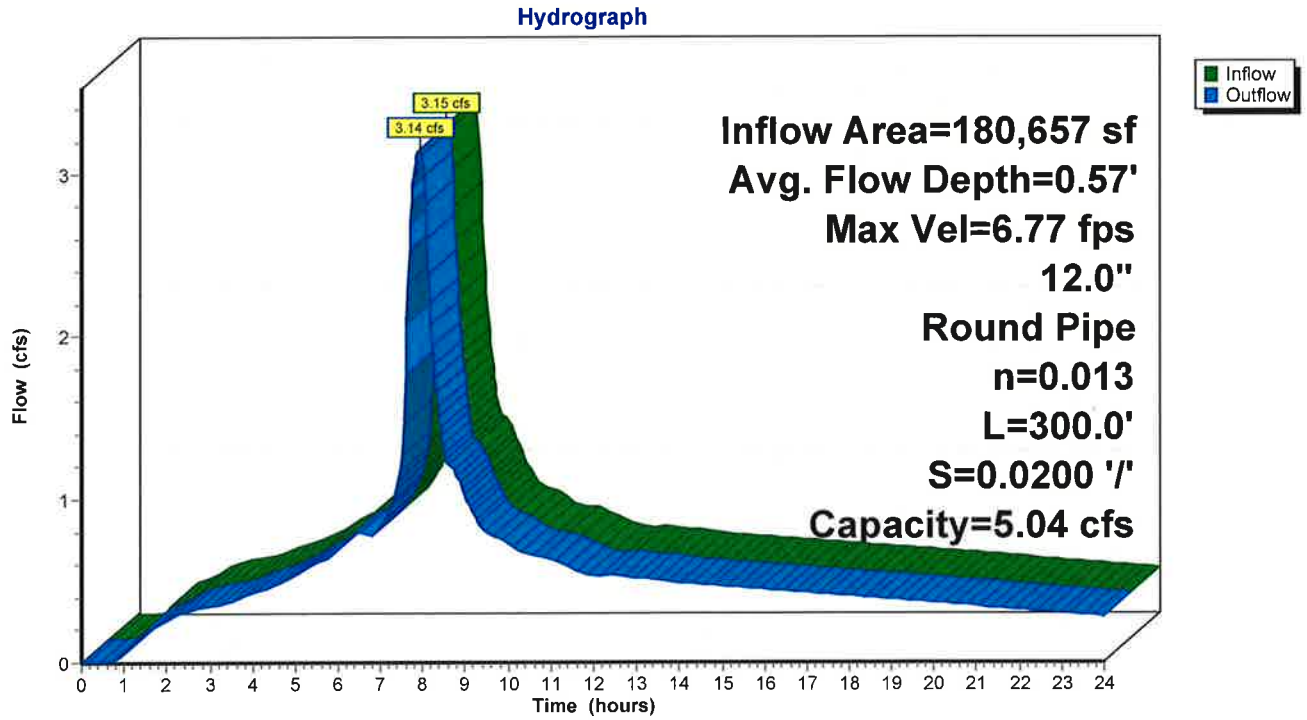
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.77 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 4.04 fps, Avg. Travel Time= 1.2 min

Peak Storage= 139 cf @ 7.92 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.04 cfs

12.0" Round Pipe
n= 0.013
Length= 300.0' Slope= 0.0200 '/'
Inlet Invert= 123.00', Outlet Invert= 117.00'

EXHIBIT K

Reach 4R: Junction #2



Summary for Reach 6R: Junction #3

[52] Hint: Inlet/Outlet conditions not evaluated

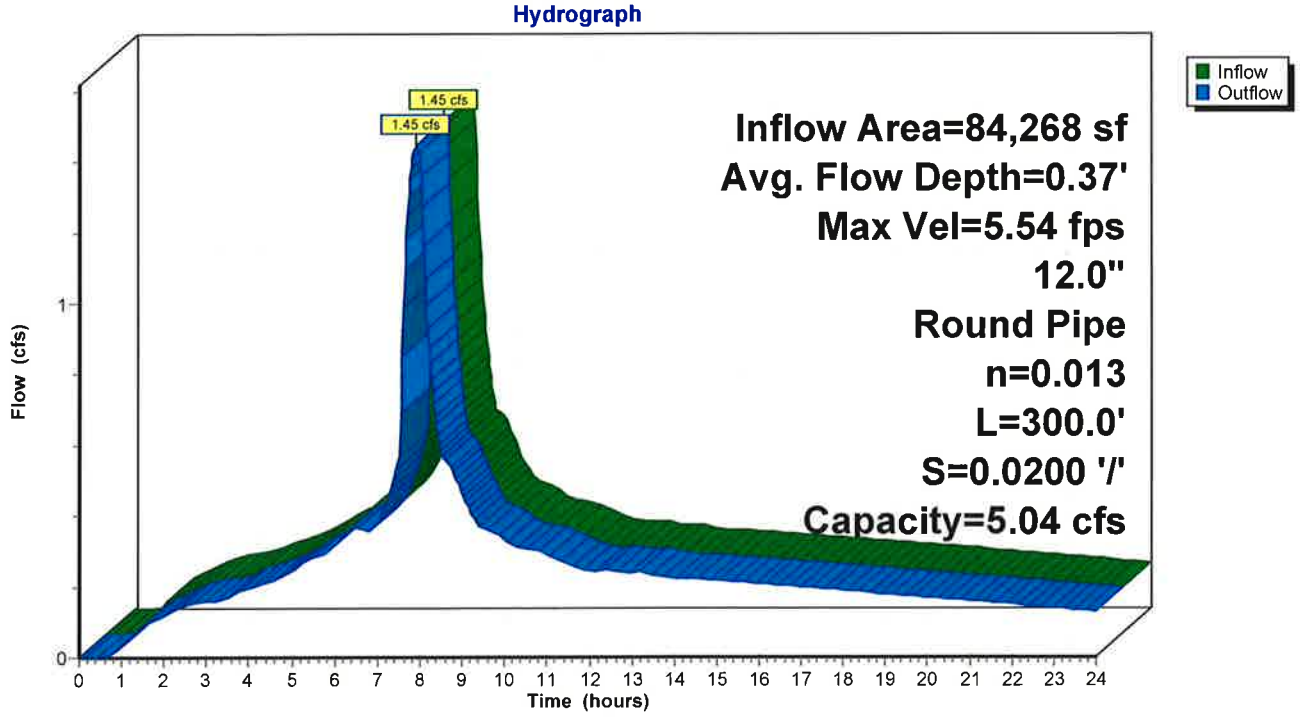
Inflow Area = 84,268 sf, 80.49% Impervious, Inflow Depth > 3.09" for 25-yr event
Inflow = 1.45 cfs @ 7.90 hrs, Volume= 21,724 cf
Outflow = 1.45 cfs @ 7.92 hrs, Volume= 21,702 cf, Atten= 0%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.54 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 3.23 fps, Avg. Travel Time= 1.5 min

Peak Storage= 78 cf @ 7.91 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.04 cfs

12.0" Round Pipe
n= 0.013
Length= 300.0' Slope= 0.0200 '/'
Inlet Invert= 129.00', Outlet Invert= 123.00'

Reach 6R: Junction #3

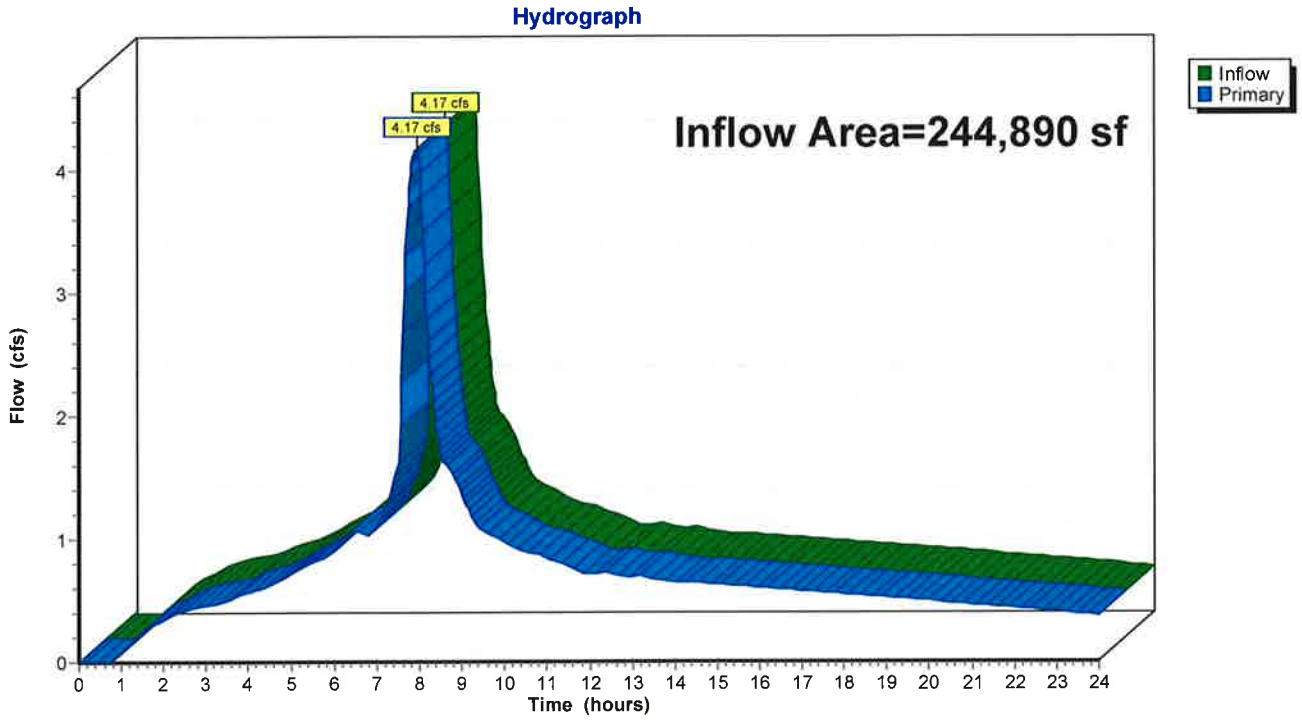


Summary for Link 1L: Tualatin River

Inflow Area = 244,890 sf, 79.86% Impervious, Inflow Depth > 3.07" for 25-yr event
Inflow = 4.17 cfs @ 7.94 hrs, Volume= 62,670 cf
Primary = 4.17 cfs @ 7.94 hrs, Volume= 62,670 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Link 1L: Tualatin River



Summary for Link 2L: Public Storm MH

Inflow Area = 82,093 sf, 77.77% Impervious, Inflow Depth > 3.18" for 25-yr event
Inflow = 1.47 cfs @ 7.92 hrs, Volume= 21,759 cf
Primary = 1.47 cfs @ 7.92 hrs, Volume= 21,759 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Link 2L: Public Storm MH

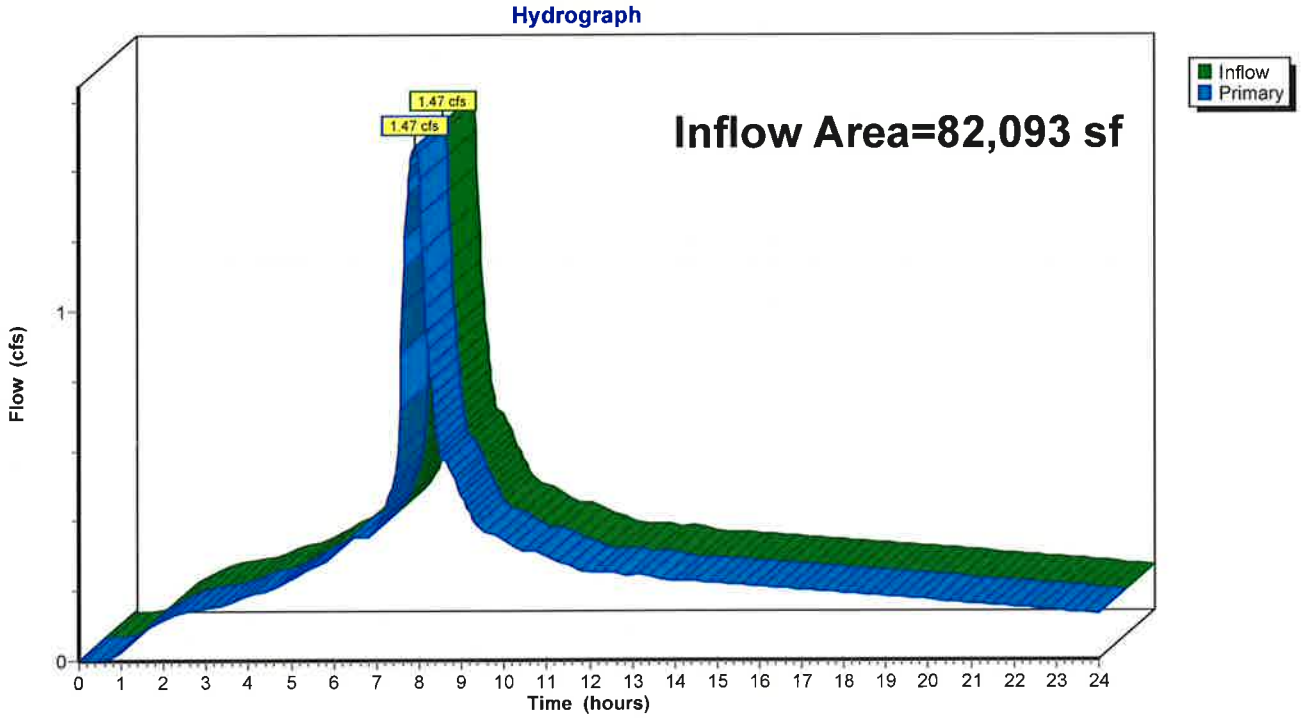
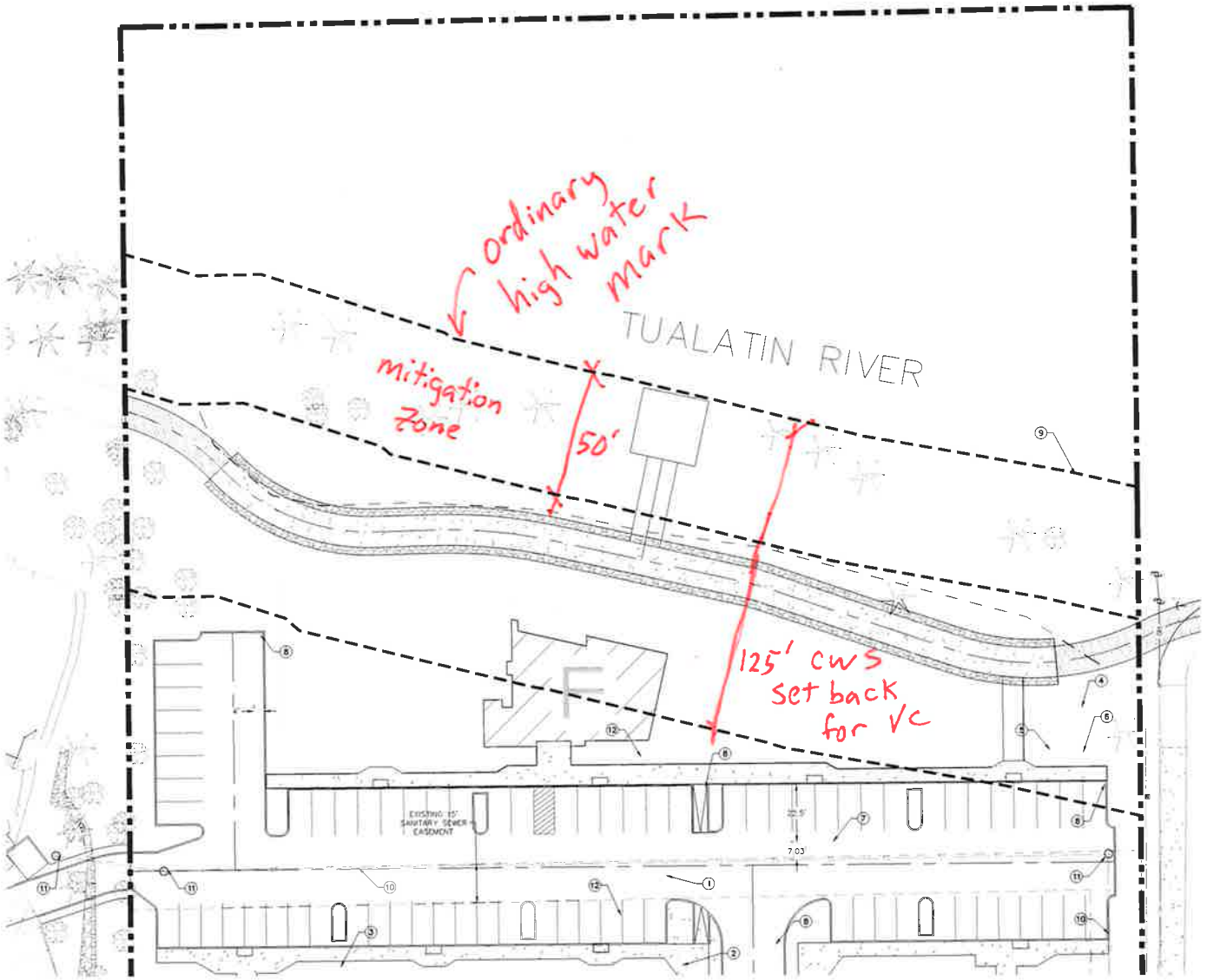


EXHIBIT K

Appendix I:

Sensitive Area Map (VC setback)



SCALE: 1 INCH = 50 FEET

CONSTRUCTION KEYNOTES

1. PROPOSED DOMESTIC WATER SERVICE LINE
2. PROPOSED FIRE SERVICE LINE
3. PROPOSED FIRE HYDRANT
4. PROPOSED 48" STORM DRAIN MANHOLE
5. PROPOSED 48" STORM SPLITTER MANHOLE
6. PROPOSED 96" STORM TREATMENT MANHOLE
7. PROPOSED STORM DRAIN MAINLINE
8. PROPOSED CATCH BASIN
9. PROPOSED STORM OUTFALL WITH BACK FLOW PREVENTER
10. EXISTING SANITARY MAINLINE
11. EXISTING STANDARD 48" SANITARY MANHOLE
12. PROPOSED SANITARY LATERAL

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COMMONS ON THE TUALATIN

TUALATIN, OR

PRELIMINARY UTILITY PLAN 4

PRELIMINARY

REVISIONS

DATE | DESCRIPTION | DRAFT BY | JOB CAPT BY

EXHIBIT K

SHEET
P604

JOB NO
2752-001

EXHIBIT K

Appendix J:

Flood Plain Map FEMA

EXHIBIT K


CITY OF RIVERGROVE
410022
City of Rivergrove
(AREA NOT INCLUDED)
City of Tualatin
410277
41067C0563E
eff. 11/4/2016
A
E
F

EXHIBIT M

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

January 6, 2012
Project No. 11-2475

Tom Clarey
HMI Management
1200 SW 66th Avenue, Suite 300
Portland, Oregon 97225
Via email: tandem1@tandemprop.com

SUBJECT: PRELIMINARY GEOTECHNICAL ENGINEERING REPORT
RV PARK OF PORTLAND
6645 SW NYBERG LANE
TUALATIN, OREGON

This report presents the preliminary results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-4059, dated October 13, 2011, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site is approximately 9.5 acres in size and is located on the north side of SW Nyberg Lane in the City of Tualatin, Washington County, Oregon. Topography at the site is gently sloping to the northeast and southwest from a topographical high located in the central western boundary of the site. Slopes steepen adjacent to the Tualatin River, which forms the northern property boundary of the site. The majority of the site is currently occupied by a RV Park. Two structures that house restroom and laundry facilities are present on the site. A manufactured home that serves as an office is located in the southwestern portion of the site.

Based on the preliminary site plans provided, the proposed development consists of the construction of a new apartment building that may be up to three stories in height, driveway and parking areas, and associated underground utilities. A grading plan has not been provided for our review, however; we understand that grading will be minimized.

REGIONAL AND LOCAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of

EXHIBIT M

fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The subject site is underlain by the Columbia River Basalt Formation (Madin, 1990). The Miocene aged (about 14.5 to 16.5 million years ago) Columbia River Basalts are a thick sequence of lava flows which form the crystalline basement of the Tualatin Valley. The basalts are composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints. Individual basalt flow units typically range from 25 to 125 feet thick and interflow zones are typically vesicular, scoriaceous, brecciated, and sometimes include sedimentary rocks.

REGIONAL SEISMIC SETTING

At least three major fault zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site. These include the Portland Hills Fault Zone, the Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone.

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills, and is about 7 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 5 miles northeast of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Gales Creek-Newberg-Mt. Angel Structural Zone

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies about 13.5 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek Fault (the fault closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a

rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies approximately along the Oregon Coast at depths of between 20 and 40 kilometers below the surface.

SUBSURFACE CONDITIONS

Our site-specific exploration for this report was conducted on December 16 and 19, 2011. A total of fourteen exploratory borings were drilled to depths of 2.2 to 13.8 feet at the approximate location indicated on Figure 2. It should be noted that the boring location was located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate.

The borehole was drilled using a trailer-mounted drill rig and solid stem auger methods. At boring location B-1, SPT (Standard Penetration Test) sampling was performed in general accordance with ASTM D1586 using a 2-inch outside diameter split-spoon sampler and a 140-pound hammer equipped with a rope and cathead mechanism. During the test, a sample is obtained by driving the sampler 18 inches into the soil with the hammer free-falling 30 inches. The number of blows for each 6 inches of penetration is recorded. The Standard Penetration Resistance ("N-value") of the soil is calculated as the number of blows required for the final 12 inches of penetration. If 50 or more blows are recorded within a single 6-inch interval, the test is terminated, and the blow count is recorded as 50 blows for the number of inches driven. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils. At the completion of the borings, the holes were backfilled with bentonite.

A GeoPacific geologist continuously monitored the field exploration program and logged the boring. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System. Rock hardness was classified in accordance with Table 1, modified from the ODOT Rock Hardness Classification Chart.

Table 1. Rock Hardness Classification Chart

ODOT Rock Hardness Rating	Field Criteria	Unconfined Compressive Strength	Typical Equipment Needed For Excavation
Extremely Soft (R0)	Indented by thumbnail	<100 psi	Small excavator
Very Soft (R1)	Scratched by thumbnail, crumbled by rock hammer	100-1,000 psi	Small excavator
Soft (R2)	Not scratched by thumbnail, indented by rock hammer	1,000-4,000 psi	Medium excavator (slow digging with small excavator)
Medium Hard (R3)	Scratched or fractured by rock hammer	4,000-8,000 psi	Medium to large excavator (slow to very slow digging), typically requires chipping with hydraulic hammer or mass excavation)
Hard (R4)	Scratched or fractured w/ difficulty	8,000-16,000 psi	Slow chipping with hydraulic hammer and/or blasting
Very Hard (R5)	Not scratched or fractured after many blows, hammer rebounds	>16,000 psi	Blasting

During exploration, our geologist also noted geotechnical conditions such as soil consistency, moisture and groundwater conditions. Logs of the borings are attached to this report. The following report sections are based on the exploration program and summarize subsurface conditions encountered at the site.

Undocumented Fill: Undocumented fill was not encountered during our explorations; however, areas of undocumented fill may be present outside our boring locations and in the vicinity of the existing structures.

Existing Pavement – In borings, the ground surface was directly underlain by existing pavement composed of about 2 inches of asphalt concrete underlain by about 6 inches of crushed rock.

Residual Soil – In borings B-1 through B-14, the existing pavement was directly underlain by residual soil derived from in place decomposition of the underlying Columbia River Basalt Formation. These soils generally consisted of stiff, light reddish brown, clayey SILT (ML) to silty CLAY (CL) with varying amounts of weathered basalt fragments. The residual soil displayed subtle to strong orange and gray mottling and extended to a depth of about 1 to 11 feet below the ground surface.

Columbia River Basalt Formation – In borings B-1 through B-14, the residual soil was directly underlain by rock belonging to the Columbia River Basalt Formation. The gray, vesicular basalt generally ranged from extremely soft (R0) to hard (R4) and contained trace silty clay to clayey silt matrix. Practical refusal on medium hard (R4) basalt was obtained in borings B-1 through B-14 at depths of 2.2 to 13.8 feet.

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Soil Moisture and Groundwater

On December 16 and 19, 2011, static groundwater was encountered in boring B-6 at a depth of 8.45 feet below the ground surface. Groundwater seepage was not encountered in borings B-1 through B-5 and B-7 through B-14 to a maximum depth of 13.75 feet. Soil and rock encountered in our explorations were generally moist. Experience has shown that temporary storm related perched groundwater within surface soils often occur over native deposits such as those beneath the site, particularly during the wet season. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors.

CONCLUSIONS AND RECOMMENDATIONS

Our investigation indicates that the proposed development may be geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. Practical refusal on medium hard (R4) basalt was encountered in all borings at depths of 2.2 feet (western central portion of site) to 13.75 feet (southwestern portion of the site) as indicated on Figure 2. The nature of the drilling operation could not discern solid bedrock from large boulders; therefore, it is possible that deeper excavations may be obtainable with a large excavator equipped with ripper teeth. It is our understanding that extreme measures (including blasting) were required to install the utilities on the adjacent property to the west. Similar methods would likely be necessary at this site in order to maintain proper drainage for utilities.

The existing soil could be reused as engineered fill provided that the soil is properly moisture treated prior to compaction.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. The checklist attached to this report outlines recommended geotechnical observations and testing for the project. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared.

No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

EXPIRES: 06/30/2013

Beth K. Rapp, G.I.T.
Project Geologist

James D. Imbrie, G.E., C.E.G.
Principal Geotechnical Engineer

Attachments: References
Checklist of Recommended Geotechnical Testing and Observation
Figure 1 – Vicinity Map
Figure 2 – Site and Exploration Plan
Boring Logs (B-1 – B-14)

EXHIBIT M

REFERENCES

Atwater, B.F., 1992, Geologic evidence for earthquakes during the past 2,000 years along the Copalis River, southern coastal Washington: Journal of Geophysical Research, v. 97, p. 1901-1919.

Carver, G.A., 1992, Late Cenozoic tectonics of coastal northern California: American Association of Petroleum Geologists-SEPM Field Trip Guidebook, May, 1992.

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EXHIBIT M

GeoPacific Engineering, Inc.
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Sherwood, Oregon 97140
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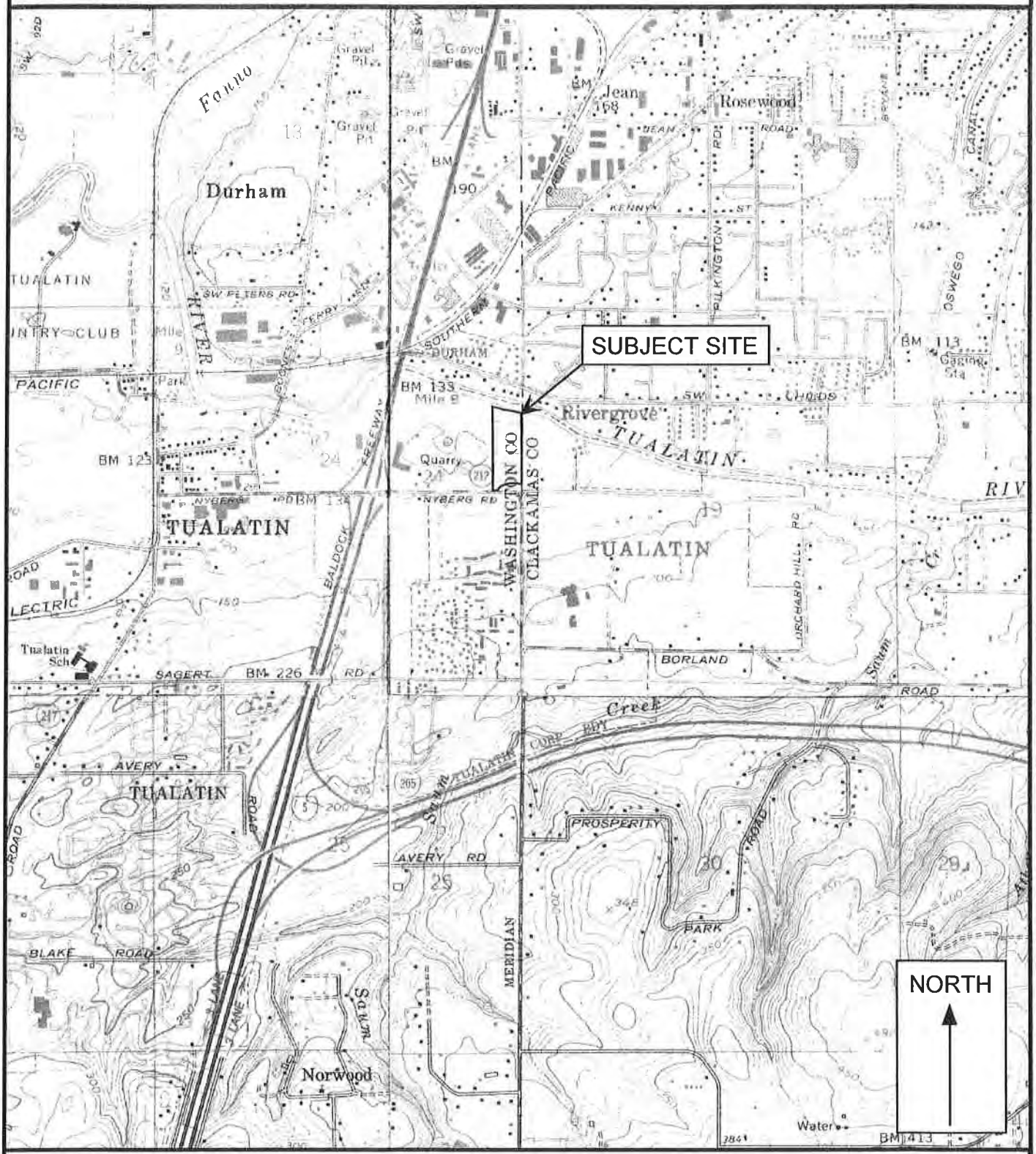
VICINITY MAP



Legend

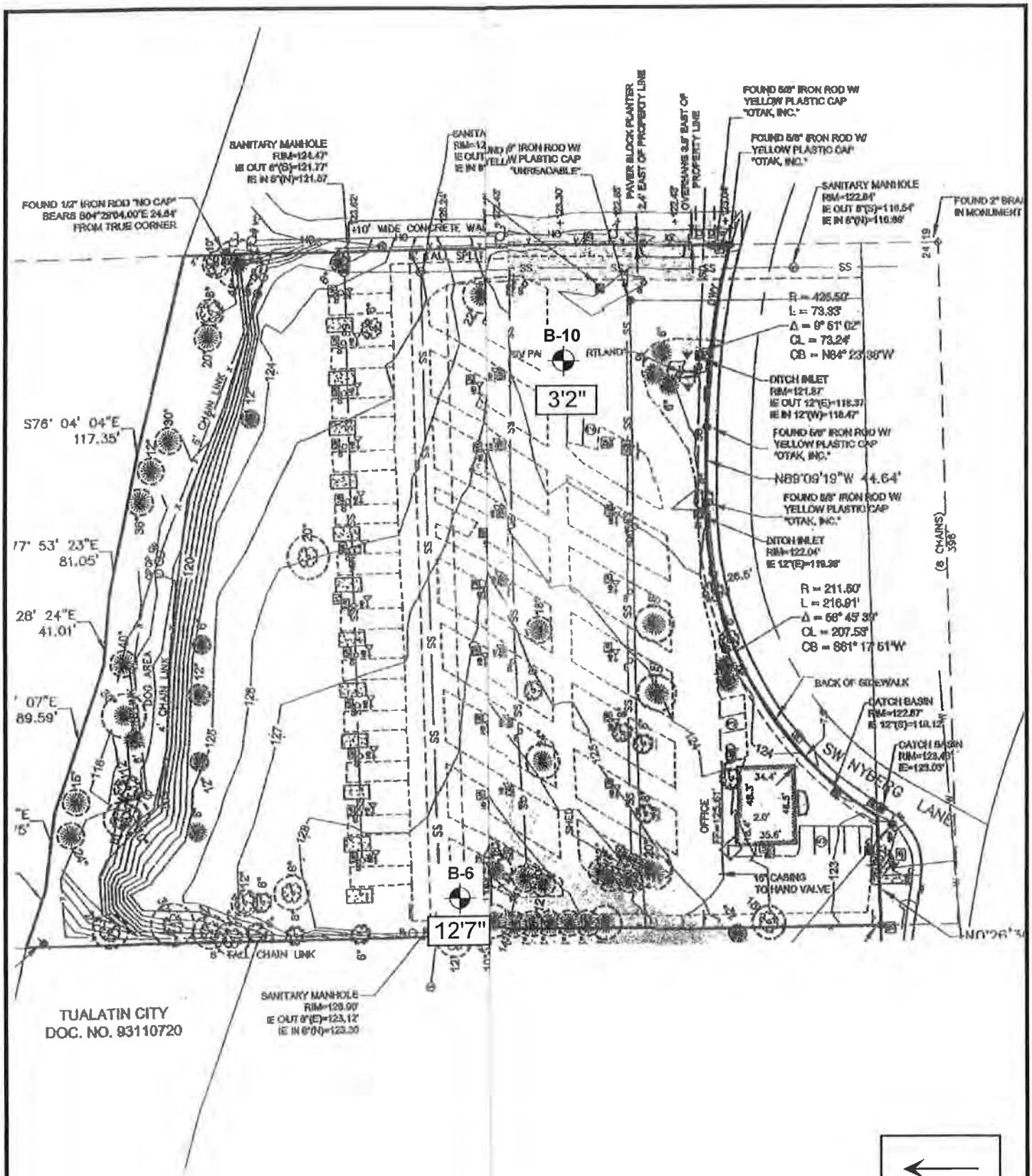
Approximate Scale 1 in = 2,000 ft

Date: 1/5/2012
Drawn by: EKR

Base maps: U.S. Geological Survey 7.5 minute Topographic Map Series, Lake Oswego, Oregon Quadrangle, 1961 (Revised 1984), Beaverton, Oregon Quadrangle, 1961 (Revised 1984), Sherwood, Oregon Quadrangle, 1961 (Revised 1985), and Canby, Oregon Quadrangle, 1961 (Revised 1985)

Project: RV Park of Portland Tualatin, Oregon	Project No. 11-2475	FIGURE 1

EXHIBIT M



Legend

B-1 Boring Designation and Approximate

6'3" Depth of Refusal on Hard Rock

Note: Location of all geotechnical information

North

405

SITE PLAN AND EXPLORATION LOCATIONS

Project No. 11-2475	Drawn By: EKR	FIGURE 2

EXHIBIT M

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-1**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
						Stiff, clayey SILT (ML) to silty CLAY (CL), light reddish brown, moist (Residual Soil)
		5/25/43	68			
5		50 for 5" 48/49/17	66			
						Very Soft (R1) to Hard (R4), BASALT, with trace silty clay to clayey silt matrix, dark brown to gray, strong to subtle orange and gray mottling, iron staining, trace yellow secondary mineralization, moist (Columbia River Basalt Formation)
		15/13/19	32			
10		5/10/11	21			
		50 for 4"				
15						Practical Refusal on Hard (R4) Basalt at 13.75 Feet.
						No Groundwater or Seepage encountered.
20						
25						
30						
35						

LEGEND

Bag Sample | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table | Water Bearing Zone

Date Drilled: 12/16/2011
Logged By: B. Rapp
Surface Elevation: 128 Feet

EXHIBIT M

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-2**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
						Stiff, clayey SILT (ML) to silty CLAY (CL), light reddish brown, moist (Residual Soil)
5		8/50 for 5" 50 for 3" 50 for 3"				Soft (R2) to Hard (R4), BASALT, with trace silty clay to clayey silt matrix, dark brown to gray, strong to subtle orange and gray mottling, iron staining, trace yellow secondary mineralization, moist (Columbia River Basalt Formation)
10						Practical Refusal on Hard (R4) Basalt at 6.25 Feet. No Groundwater or Seepage encountered.
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/16/2011
Logged By: B. Rapp
Surface Elevation: 136 Feet

EXHIBIT M

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-3**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
						Stiff, clayey SILT (ML) to silty CLAY (CL), reddish brown, moist (Residual Soil)
		50 for 3"				Soft (R2) to Hard (R4), BASALT, gray, iron staining, moist (Columbia River Basalt Formation)
		50 for 2"				
5						Practical Refusal on Hard (R4) Basalt at 3.2 Feet.
						No Groundwater or Seepage encountered.
10						
15						
20						
25						
30						
35						

LEGEND

Bag Sample


Split-Spoon


Shelby Tube Sample


Static Water Table at Drilling

Static Water Table


Water Bearing Zone

Date Drilled: 12/16/2011
Logged By: B. Rapp
Surface Elevation: 140 Feet

EXHIBIT M

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-4**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
						Stiff, clayey SILT (ML) to silty CLAY (CL), reddish brown, moist (Residual Soil)
		50 for 2"				Hard (R4), BASALT, trace reddish brown silty clay matrix, gray, moist (Columbia River Basalt Formation)
						Practical Refusal on Hard (R4) Basalt at 2.2 Feet.
						No Groundwater or Seepage encountered.
5						
10						
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/16/2011
Logged By: B. Rapp
Surface Elevation: 140 Feet

EXHIBIT M

GeoPacific Engineering, Inc.
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-5**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
5		5/6/4	10			Stiff, clayey SILT (ML) to silty CLAY (CL), trace fine grained sand, light reddish brown, moist (Residual Soil)
		3/5/4	9			
		15/11/22	33			Extremely Soft (R0) to Hard (R4), BASALT, with zones of reddish brown silty clay to clayey silt matrix, gray, iron staining, moist (Columbia River Basalt Formation)
10		35/50 for 5.5"				
						Practical Refusal on Hard (R4) Basalt at 10.9 Feet.
						No Groundwater or Seepage encountered.
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/16/2011
Logged By: B. Rapp
Surface Elevation: 134 Feet

EXHIBIT M

GeoPacific Engineering, Inc
13910 SW Galbreath Drive, Suite 102
Sherwood, Oregon 97140
Tel: (503) 625-4455 Fax: (503) 625-4405

BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-6**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
5		2/4/4	8			Stiff, clayey SILT (ML) to silty CLAY (CL), trace coarse grained sand, light reddish brown, strong orange and gray mottling, moist (Residual Soil)
		5/5/5	10			
		4/6/7	13		▼	
10		3/35/50 for 3"				Medium Hard (R3) to Hard (R4), BASALT, gray, vesicular, moist (Columbia River Basalt Formation)
		50 for 1"				Practical Refusal on Hard (R4) Basalt at 12.6 Feet.
						Groundwater Encountered at 8.45 Feet.
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 129 Feet

EXHIBIT M

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BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-7**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
5		2/3/6	9			Stiff, clayey SILT (ML) to silty CLAY (CL), with weathered basalt fragments, trace fine grained sand, light reddish brown, moist (Residual Soil)
		4/3/3	6			
10		9/27/50 for 4" 50 for 5"				Soft (R2) to Hard (R4), BASALT, with zones of reddish brown silty clay to clayey silt matrix, gray, vesicular, moist (Columbia River Basalt Formation)
						Practical Refusal on Hard (R4) Basalt at 9.4 Feet.
						No Groundwater or Seepage encountered.
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 132 Feet

EXHIBIT M

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BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-8**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
0						
		3/7/12	19			Stiff, clayey SILT (ML) to silty CLAY (CL), with weathered basalt fragments, trace fine grained sand, light reddish brown, moist (Residual Soil)
5		4/4/6	10			
		50 for 3"				Hard (R4), BASALT, with zones of reddish brown silty clay to clayey silt matrix, gray, vesicular, moist (Columbia River Basalt Formation)
10						Practical Refusal on Hard (R4) Basalt at 7.8 Feet. No Groundwater or Seepage encountered.
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 133 Feet

EXHIBIT M

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BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-9**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
5		1/2/3	5			Stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt fragments, light reddish brown, moist (Residual Soil)
		5/9/6	15			
		12/31/41	72			Very Soft (R1) to Hard (R4), BASALT, with zones of reddish brown silty clay to clayey silt matrix, gray, trace yellow secondary mineralization, moist (Columbia River Basalt Formation)
10		41/50 for 3.5"				
						Practical Refusal on Hard (R4) Basalt at 11 Feet.
						No Groundwater or Seepage encountered.
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 130 Feet

EXHIBIT M

GeoPacific Engineering, Inc.
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BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-10**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
						Stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt fragments, reddish brown, strong orange and gray mottling, moist (Residual Soil)
						Hard (R4), BASALT, gray, moist (Columbia River Basalt Formation)
		4/50 for 2"				
5						Practical Refusal on Hard (R4) Basalt at 3.2 Feet.
						No Groundwater or Seepage encountered.
10						
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 123 Feet

EXHIBIT M

GeoPacific Engineering, Inc.
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Sherwood, Oregon 97140
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BORING LOG

Project: RV Park of Portland, Portland, Oregon	Project No. 11-2475	Boring No. B-12

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
		2/3/9	12			Stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt fragments, light reddish brown, moist (Residual Soil)
5		43/50 for 1"				Medium Hard (R3) to Hard (R4), BASALT, with zones of reddish brown silty clay to clayey silt matrix, gray, moist (Columbia River Basalt Formation)
						Practical Refusal on Hard (R4) Basalt at 5.6 Feet.
						No Groundwater or Seepage encountered.
10						
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 125 Feet

EXHIBIT M

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Sherwood, Oregon 97140
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BORING LOG

Project: RV Park of Portland
Portland, Oregon

Project No. 11-2475

Boring No. **B-13**

Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
		2/2/8	10			Stiff, clayey SILT (ML) to silty CLAY (CL), trace weathered basalt fragments, light reddish brown, moist (Residual Soil)
5		50 for 5.5"				Extremely Soft (R0) to Hard (R4), BASALT, with zones of reddish brown silty clay to clayey silt matrix, gray, vesicular, yellow secondary mineralization, moist (Columbia River Basalt Formation)
		13/10/12	22			
10		14/21/21	42			
		18/50 for 5.5"				
15						Practical Refusal on Hard (R4) Basalt at 12.4 Feet.
						No Groundwater or Seepage encountered.
20						
25						
30						
35						

LEGEND

- Bag Sample (100 to 1,000 g)
- Split-Spoon
- Shelby Tube Sample
- Static Water Table at Drilling
- Static Water Table (10-20-99)
- Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 129 Feet

EXHIBIT M

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BORING LOG

Project: RV Park of Portland Portland, Oregon	Project No. 11-2475	Boring No. **B-14**

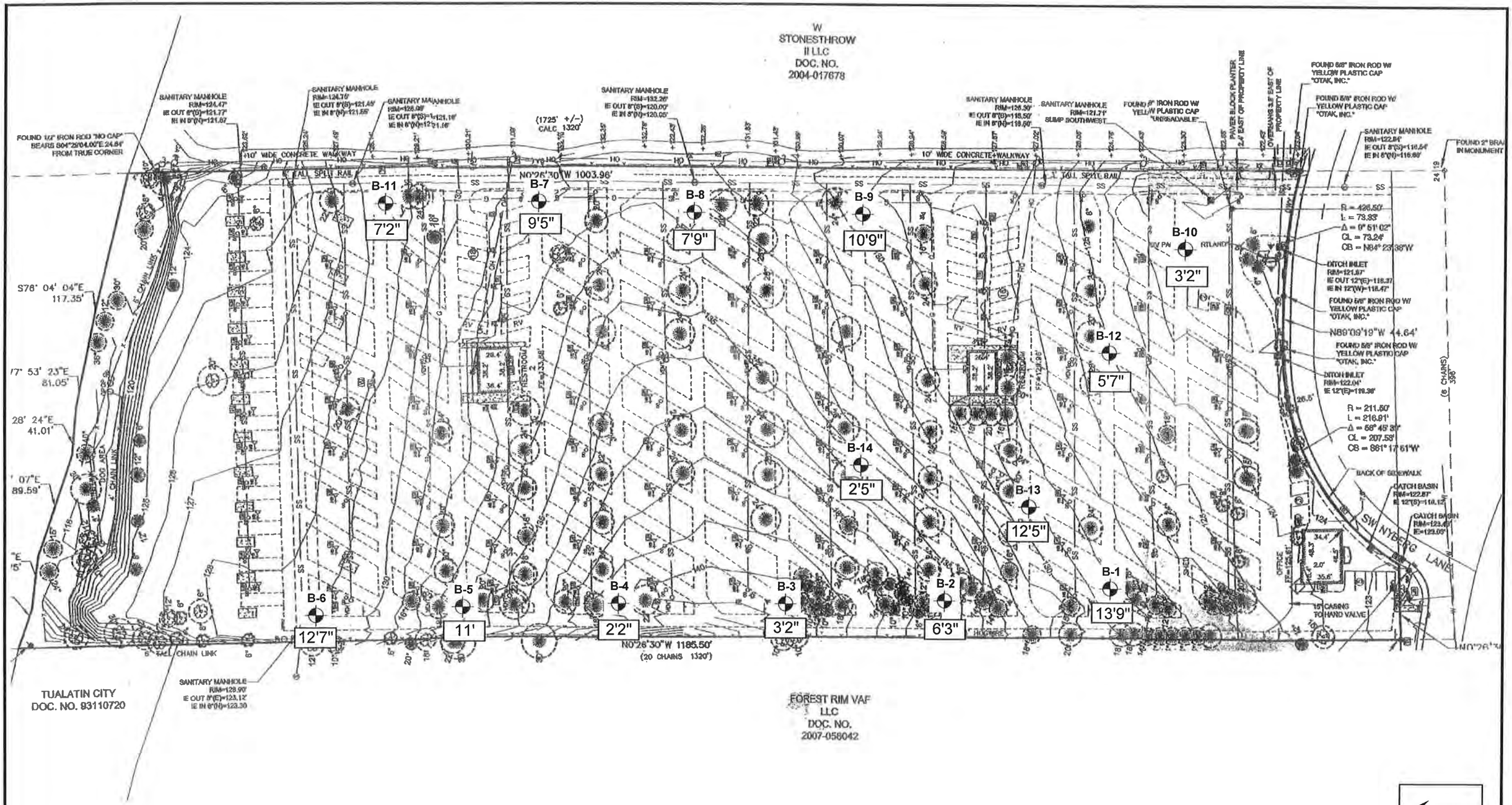
Depth (ft)	Sample Type	Blow Counts	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
						Stiff, clayey SILT (ML) to silty CLAY (CL), light reddish brown, moist (Residual Soil)
		50 for 5"				Medium Hard (R3) to Hard (R4), BASALT, gray, moist (Columbia River Basalt Formation)
5						Practical Refusal on Hard (R4) Basalt at 2.4 Feet.
						No Groundwater or Seepage encountered.
10						
15						
20						
25						
30						
35						

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Static Water Table at Drilling | Static Water Table (10-20-99) | Water Bearing Zone

Date Drilled: 12/19/2011
Logged By: B. Rapp
Surface Elevation: 133 Feet

EXHIBIT M



Legend

B-1 Boring Designation and Approximate Location

6'3" Depth of Refusal on Hard Rock

SCALE

0 80 160 FEET

1 IN = 80 FT

Note: Location of all geotechnical information is approximate. Base map provided by Westlake Consultants, Inc.

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SITE PLAN AND EXPLORATION LOCATIONS

Project: RV Park of Portland, Tualatin, Oregon	Project No. 11-2475	Drawn By: EKR	FIGURE 2

EXHIBIT M

From: Brian Frank [mailto:BrianF@keywaycorp.com]

Sent: Thursday, January 7, 2016 12:41 PM

To: Campbell Clarey <CClarey@TandemProp.Com>; Tandem1 <Tandem1@TandemProp.Com>

Subject: Nyberg Rd - Exploratory dig

Importance: High

Nyberg Rd - Exploratory dig

See attached regarding Tuesdays exploratory dig at Nyberg Rd as well as following notes;

· Boring Pit #4- dug to 13' deep with no refusal, bottom of dig figured to be about elevations 127, soil was getting wet and guessing water at 15' or so. Water seeped into pit at 13' over the course of the 2 hours prior to back filling.

· Boring Pit #3- dug to 12' deep with no refusal. bottom of dig figured to be about elevations 129

· Boring Pit #14- dug to 12' deep with no refusal. bottom of dig figured to be about elevations 122

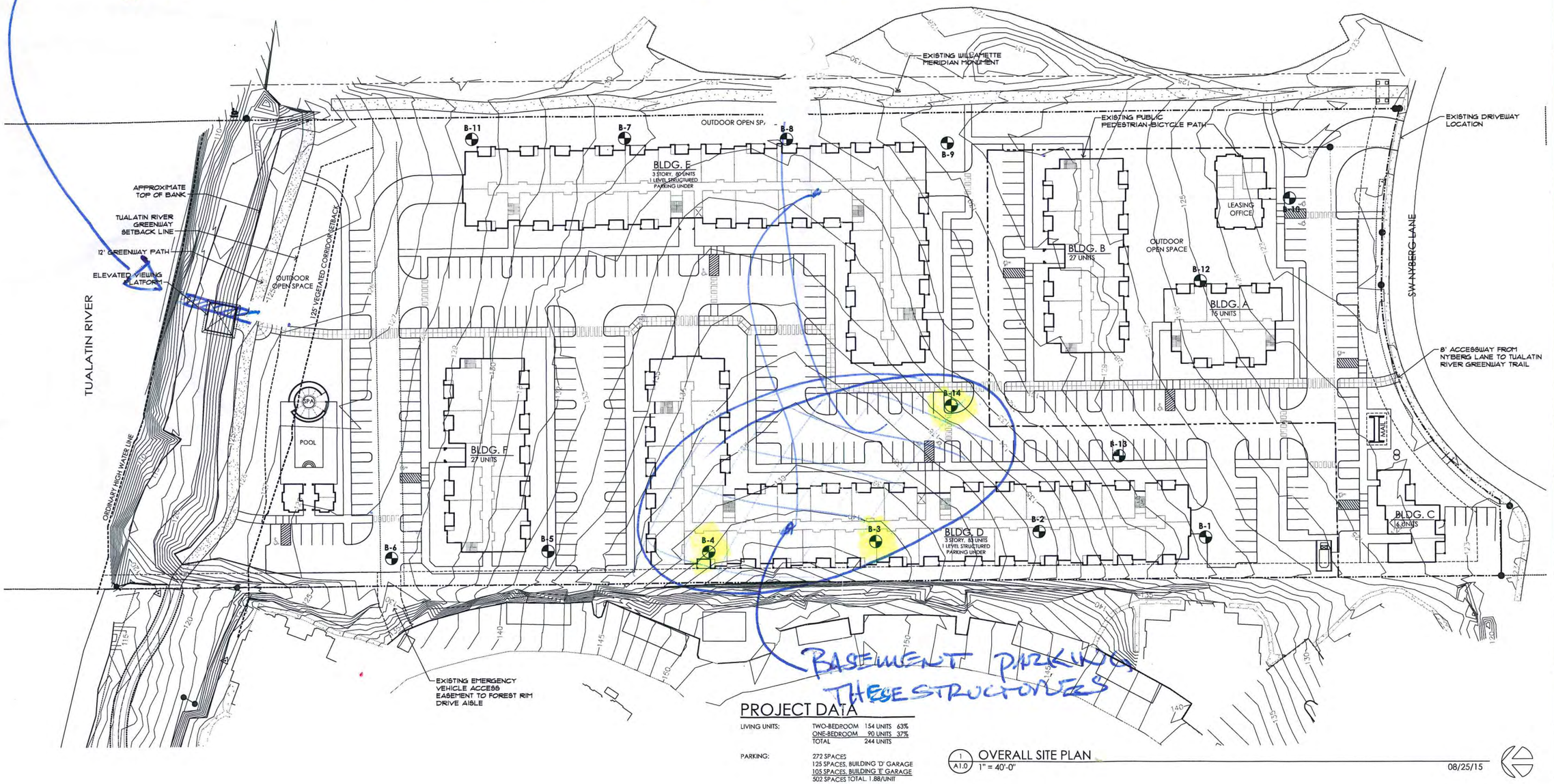
· Most l soil/rocks dug was smaller fractured rock which looked to be excellent material for structural fills, not to big rock and fairly consistent other than an occasional boulder. Our Geo should be able to allow us to use this material as structural fill on site.

· Additionally we should consider how to make use of the big boulders on site, landscaping rockery walls, or toe support at edge of fills. Don't want to haul these off site unless we have way too many to use on site, maybe a rock pile and we call it a "play structure" to get the Amenity Bonus from the City,J

EXHIBIT M

FEILD NOTE FROM TUESDAY'S DIG @ NYBERG ROAD

- B-4 - DUG TO 13' DEEP "NO REFUSAL", SOIL WAS GETTING WET, GROUND WATER WEEPING IN @ 13' DEEP
- B-3 - DUG TO 12' DEEP "NO REFUSAL"
- B-14 - DUG TO 12' DEEP "NO REFUSAL"
- DUG TRENCH TO NATIVE, MARTIN SHOTZ VIEWED APPROX 3'-3½' OF FILL OVER NATIVE FOR LENGTH OF TRENCH



PROJECT DATA

LIVING UNITS:	TWO-BEDROOM	154 UNITS	63%
	ONE-BEDROOM	90 UNITS	37%
	TOTAL	244 UNITS	
PARKING:	272 SPACES		
	125 SPACES, BUILDING 'D' GARAGE		
	105 SPACES, BUILDING 'E' GARAGE		
	502 SPACES TOTAL 1.88/UNIT		

1 / A1.0 OVERALL SITE PLAN
1" = 40'-0"

08/25/15

RDG
REITER DESIGN GROUP
ARCHITECTS, INC.
7965 SW CIRRUS DRIVE BEAVERTON, OREGON 97008 (503) 574-3056

TUALATIN APARTMENTS
6625 SW NYBERG LANE TUALATIN, OREGON

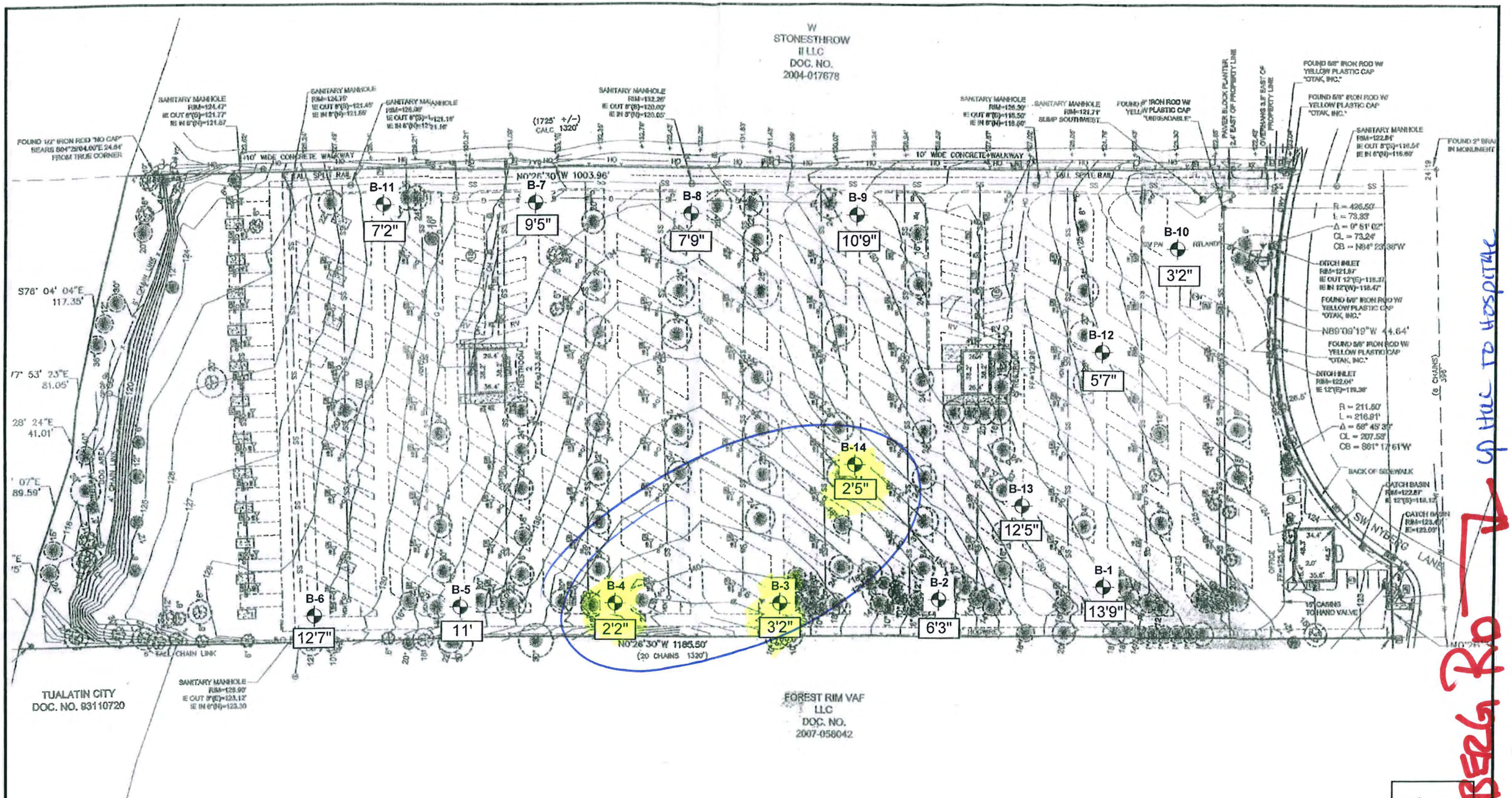
OWNER:
TANDEM PROPERTIES
1200 SW 66TH AVENUE, SUITE 300 PORTLAND, OREGON 97225

OVERALL SITE PLAN

date: AUGUST 25, 2015
scale: AS NOTED
drawn: SAR
job no: 1409
revisions:

A
1.0

EXHIBIT M



Legend

B-1 Boring Designation and Approximate Location

6'3" Depth of Refusal on Hard Rock

SCALE

0 80 160 FEET

1 IN = 80 FT

Note: Location of all geotechnical information is approximate. Base map provided by Westlake Consultants, Inc.

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SITE PLAN AND EXPLORATION LOCATIONS

Project: RV Park of Portland, Tualatin, Oregon	Project No. 11-2475	Drawn By: EKR	FIGURE 2