Exhibit A2

Type I & III Site Plan Review
Minor Modification/C.U.P.
Sherwood Commerce Center

21600 SW Oregon Street
Sherwood, OR 97140

September 16, 2022
Rev. October 13, 2022

VLMK
ENGINEERING + DESIGN

Case No. _____
Fee _____
Receipt #_____
Date _____
TYPE_____

City of Sherwood
Oregon
Home of the Tualatin River National Wildlife Refuge

City of Sherwood

Application for Land Use Action

Type of Land Use Action Requested: (check all that apply)

- ☐ Annexation
- ☐ Plan Amendment (Proposed Zone _____)
- ☐ Planned Unit Development
- ☐ Site Plan (square footage of building and parking area)
- ☐ Variance (list standards to be varied in description)
- ☒ Conditional Use
- ☐ Partition (# of lots _____)
- ☐ Subdivision (# of lots _____)
- ☒ Other: MINOR MODIFICATION

By submitting this form the Owner, or Owner's authorized agent/ representative, acknowledges and agrees that City of Sherwood employees, and appointed or elected City Officials, have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related specifically to the project site.

Note: See City of Sherwood current Fee Schedule, which includes the "Publication/Distribution of Notice" fee, at **www.sherwoodoregon.gov.** Click on Government/Finance/Fee Schedule.

Owner/Applicant Information:

Applicant: VLMK Engineering + Design - Jennifer Kimura Phone: 503.222.4453
Applicant Address: 3933 S Kelly Ave Portland, OR 97239 Email: jenniferk@vlmk.com
Owner: Sherwood Commerce Center, LLC Phone: 503.242.2900
Owner Address: 1121 SW Salmon Street Portland, OR 97205 Email: ryans@schnitzerproperties.com
Contact for Additional Information: _____

Property Information:

Street Location: 21600 SW Oregon Street & 14240 SW Tonquin Rd
Tax Lot and Map No: 2S128C000600 & 2S1330000401
Existing Structures/Use: None + existing residence to be demolised
Existing Plan/Zone Designation: EI - Employment Industrial/TEA - Tonquin Employment Area
Size of Property(ies) 38.74 , 7.89

Proposed Action:

Purpose and Description of Proposed Action:

This application includes a modification to the previously approved Land Use action to allow the inclusion of the yet-to-be-named "East/West Road", and the extension of the Tonquin Court (aka Laurelwood Way) cul-de-sac to the South. The majority of the application remains unchanged from the previous approval, and the applicant is requesting to maintain the previously approved Variance to allow for interim single-access to the site.

Proposed Use: Shell Buildings - no tenants at this time

Proposed No. of Phases (one year each): 1

Continued on Reverse

LAND USE APPLICATION FORM

Authorizing Signatures:

I am the owner/authorized agent of the owner empowered to submit this application and affirm that the information submitted with this application is correct to the best of my knowledge.

I further acknowledge that I have read the applicable standards for review of the land use action I am requesting and understand that I must demonstrate to the City review authorities compliance with these standards prior to approval of my request.

Applicant's Signature — Date: 10/10/22

Owner's Signature — Date: 10/10/22

Ryan Schera, AVP Development - Sherwood Commerce Center, LLC

The following materials must be submitted with your application or it will not be accepted at the counter. Once taken at the counter, the City has up to 30 days to review the materials submitted to determine if we have everything we need to complete the review. Applicant can verify submittal includes specific materials necessary for the application per checklist.

☐ **3 Copies of Application Form*** completely filled out and signed by the property owner (or person with authority to make decisions on the property.

☐ **Copy of Deed** to verify ownership, easements, etc.

☐ **At least 3 folded** sets of plans*

☐ **At least 3 copies** of narrative addressing application criteria*

☐ **Fee** (along with calculations utilized to determine fee if applicable)

☐ **Neighborhood Meeting Verification** including affidavit, sign-in sheet and meeting summary (required for Type III, IV and V projects)

* **Note** that the required numbers of copies identified on the checklist are required for completeness; however, upon initial submittal applicants are encouraged to submit only 3 copies for completeness review. Prior to completeness, the required number of copies identified on the checklist and one full electronic copy will be required to be submitted.

Case No. _____
Fee _____
Receipt #_____
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City of Sherwood
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Home of the Tualatin River National Wildlife Refuge

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Application for Land Use Action

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Owner/Applicant Information:

Applicant: VLMK Engineering + Design - Jennifer Kimura
Phone: 503.222.4453
Applicant Address: 3933 S Kelly Ave Portland, OR 97239
Email: jenniferk@vlmk.com
Owner: Woodburn Industrial Capitol Group
Phone: 971.235.5003
Owner Address: 395 Shenandoah Lane NE
Email: Tkerr@kerrcontractors.com
Contact for Additional Information: _____

Property Information:

Street Location: Tonquin Road
Tax Lot and Map No: 2S1330000400 & 2S133BB00100
Existing Structures/Use: None
Existing Plan/Zone Designation: EI - Employment Industrial/TEA - Tonquin Employment Area
Size of Property(ies) 20 acres + 8.17 acres

Proposed Action:

Purpose and Description of Proposed Action:

This application is provided in conjunction with the Sherwood Commerce Center land use modification to allow for the inclusion of the full length of Laurelwood Way, which impacts the properties noted on this application.

Proposed Use: Shell Buildings - no tenants at this time

Proposed No. of Phases (one year each): 1

Continued on Reverse

LAND USE APPLICATION FORM

Authorizing Signatures:

I am the owner/authorized agent of the owner empowered to submit this application and affirm that the information submitted with this application is correct to the best of my knowledge.

I further acknowledge that I have read the applicable standards for review of the land use action I am requesting and understand that I must demonstrate to the City review authorities compliance with these standards prior to approval of my request.

Applicant's Signature — Date: 10/10/2022

Owner's Signature — Date: 10/10/22

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☐ **At least 3 copies** of narrative addressing application criteria*

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☐ **Neighborhood Meeting Verification** including affidavit, sign-in sheet and meeting summary (required for Type III, IV and V projects)

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SHERWOOD COMMERCE CENTER - PHASE 1
SITE PLAN REVIEW SUBMITTAL NARRATIVE MINOR MODIFICATION AND CONDITIONAL USE PERMIT

21600 SW Oregon Street
Sherwood, Oregon

SITE PLAN REVIEW

VLMK Project Number: 20210190

Schnitzer Properties
1121 SW Salmon St. #400
Portland, OR 97205

Prepared By: Colby Anderson
October 13th, 2022

Project:	Sherwood Commerce Center - Phase 1	*Project Number:*	20210190
Project Address:	21600 SW Oregon Street Sherwood, Oregon	*Document:*	Land Use Submittal Project Narrative (Modification)

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- Appendix A – Vicinity Map
- Appendix B – Neighborhood Meeting Documentation
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- Appendix D – Preliminary Development Plans
- Appendix E – Draft Future Road Connectivity Diagram
- Appendix F – Cooperative Development Agreement
- Appendix G – Mailing Labels
- Appendix H – Preliminary Storm Report
- Appendix J – Geotechnical Report
- Appendix K – Title Reports
- Appendix L – Tualatin Valley Fire & Rescue Service Provider Letter

Project: Sherwood Commerce Center – Phase 1 (Modification and CUP)

Site:	Address: 21600 SW Oregon Street, Sherwood, Oregon Washington County Assessor's Map: 2S128C Tax Lot 600	
Cross Streets:	Oregon Street between SW Dahlke Lane and SW Tonquin Road	
Applicant:	VLMK Engineering + Design	Contact: Jennifer Kimura, 503.222.4453
Owner:	Schnitzer Properties	Contact: Ryan Schera, 503.973.0258
Proposal:	Modification to existing approved land use application to incorporate new public infrastructure.	
Zoning:	Employment Industrial (EI)	

OVERVIEW

This application is to propose a modification to the existing approved land use application (LU 2021-012 SP/CUP/VAR, approved on February 23, 2022). The site plan and associated design elements are substantially unchanged from the approved application, however new public infrastructure is proposed to run along the South side of the development. The name of this road is yet to be determined, but will herein be referred to as the 'East/West Road'. Additionally, the previously proposed Laurelwood Way (fka Tonquin Ct.) is being proposed to extend South beyond the property boundary and terminate in a cul-de-sac. The intent of this extension is to provide infrastructure for future development of future lots to the South (particularly tax lots 2S1330000400, 2S1330000600 and 2S133BB00100)

Preliminary discussions have taken place with City staff to discuss the viability of this road layout, as well as with the neighboring property owners, and we believe this represents a benefit to the overall TEA by way of pushing development forward and providing easy traffic circulation throughout the area.

This application has been prepared to address any areas in which the previous approval has been modified by this adjustment. For information relating to any section not included in this application, please reference the previously approved application. In an effort to keep development moving forward the Sherwood Commerce Center development is asking to maintain the existing approvals, including the variance to allow for the interim single access while the adjacent roadways are completed.

TRAFFIC AND TRANSPORTATION

The Traffic Impact Analysis (TIA) that was submitted with the previous application still applies.

CLEAN WATER SERVICES SPL

The Clean Water Services Service Provider Letter has been submitted and is in the review process. This will be provided prior to the preparation of findings ahead of the planning commission meeting.

TUALATIN VALLEY FIRE & RESCUE SPL

The required plans and elevations have been reviewed by TVF&R and the Service Provider Letter has been included as an appendix to this application.

SITE UTILITIES (Unchanged from previous approval)

Storm:	Runoff conveyed to filtration manhole and underground detention chambers before discharging to proposed storm main in Laurelwood Way (fka Tonquin Ct.).
Sanitary:	Sanitary from each building to tie to proposed public sanitary main in Tonquin Court.
Water:	Fire water to loop the site service building sprinklers and private fire hydrants. Domestic line to serve each building and irrigation.
Gas:	All franchise utility designs will be coordinated directly with service providers concurrently with permitting of site development.
Power:	All franchise utility designs will be coordinated directly with service providers concurrently with permitting of site development.
Lighting:	See preliminary photometric plan included within this submittal.

ADDITIONAL SITE AND ENVIRONMENTAL PERMITS (Unchanged from previous approval)

The following additional site and environmental permits are in process. The application numbers have been provided below for reference:

- Department of State Lands (DSL) permit number 63597.
- US Army Corps of Engineers (USACE) application ID number: NWP-2021-528.

NARRATIVE AND COMPLIANCE

DIVISION II. – LAND USE AND DEVELOPMENT

Chapter 16.31 – Industrial Land Use Districts

16.31.030 - Development Standards

A. *Generally*

No lot area, setback, yard, landscaped area, open space, off-street parking or loading area, or other site dimension or requirement, existing on, or after, the effective date of this Code shall be reduced below the minimum required by this Code. Nor shall the conveyance of any portion of a lot, for other than a public use or right-of-way, leave a lot or structure on the remainder of said lot with less than minimum Code dimensions, area, setbacks or other requirements, except as permitted by Chapter 16.84 (Variances and Adjustments).

B. *Development Standards*

Except as otherwise provided, required minimum lot areas and dimensions and setbacks shall be:

Development Standards by Zone	*LI*	*GI*	*EI*
Lot area - industrial uses:	*10,000 SF*	*20,000 SF*	*3 acres [9]*
Lot area - commercial uses (subject to Section 16.31.050):	*10,000 SF*	*20,000 SF*	*10,000 SF*
Lot width at front property line:	*100 feet*		
Lot width at building line:	*100 feet*		
Front yard setback [11]	*20 feet*	*None*	*20 feet*
Side yard setback [10]	*None*	*None*	*None*
Rear yard setback [11]	*None*	*None*	*None*
Corner lot street side [11]	*20 feet*	*None*	*20 feet*
Height [11]	*50 feet*		

[9] Lots within the EI zone that were legal lots of record prior to October 5, 2010 and smaller than the minimum lot size required in the table below may be developed if found consistent with other applicable requirements of Chapter 16.31 and this Code. Further subdivision of lots smaller than three acres shall be prohibited unless Section 16.31.050 applies.
[10] When a yard is abutting a residential zone or public park, there shall be a minimum setback of forty (40) feet provided for properties zoned Employment Industrial and Light Industrial zones, and a minimum setback of fifty (50) feet provided for properties zoned General Industrial.
[11] Structures located within one hundred (100) feet of a residential zone shall be limited to the height requirements of that residential zone.

[9] Lots within the EI zone that were legal lots of record prior to October 5, 2010 and smaller than the minimum lot size required in the table below may be developed if found consistent with other applicable requirements of Chapter 16.31 and this Code. Further subdivision of lots smaller than three acres shall be prohibited unless Section 16.31.050 applies.

[10] When a yard is abutting a residential zone or public park, there shall be a minimum setback of forty (40) feet provided for properties zoned Employment Industrial and Light Industrial zones, and a minimum setback of fifty (50) feet provided for properties zoned General Industrial.

[11] Structures located within one hundred (100) feet of a residential zone shall be limited to the height requirements of that residential zone.

RESPONSE: The proposed development complies with the minimum lot size and setback requirements noted within this section. The building heights will not exceed 50 feet and are not located within 100 feet of a residential zone.

UPDATED RESPONSE: The minimum setbacks are maintained along the new road at the South boundary of the site, therefore satisfaction of this criteria has not been changed.

Chapter 16.66 - TRANSPORTATION FACILITIES AND IMPROVEMENTS

16.66.010 - Generally

A. *Except as otherwise noted, transportation facilities and improvements as defined in Section 16.10.020 will be a permitted use in all zoning districts.*

B. *A Conditional Use Permit is required for Transportation Facilities and Improvements that are:*

   1. *Not designated in the adopted City of Sherwood Transportation System Plan (TSP); or*
   2. *Not designed and constructed as part of an approved land use application.*

(Ord. No. 2015-003, § 2, 3-17-2015)

RESPONSE: The applicant is proposing a Conditional Use Permit for the inclusion of the East/West Road and the extension of Laurelwood Way (fka Tonquin Court). These roadways are not designed or constructed as a part of another land use application, and therefore satisfy criteria B.2 of this section.

DIVISION III – ADMINISTRATIVE PROCEDURES

Chapter 16.72 – Provisions for Processing Development Permits

16.72.010 – Generally

A. *Classifications*
Except for Final Development Plans for Planned Unit Developments, which are reviewed per Section 16.40.030, all ministerial, administrative, and quasi-judicial development permit applications and legislative land use actions shall be classified as one of the following:

1. *Residential Design Checklist Review – N/A*
2. *Type I*
The following administrative actions shall be subject to a Type I review process:
   a. *Signs;*
   b. *Property line adjustments;*
   c. *Interpretation of similar uses;*
   d. *Temporary uses;*
   e. *Final subdivision and partition plats;*
   f. *Final site plan review;*
   g. *Time extensions of approval, per Sections 16.90.020; 16.124.010;*
   h. *Class A home occupation permits;*
   i. *Interpretive decisions by the city manager or his/her designee;*
   j. *Tree removal permit—Street trees over five inches DBH, per section 16.142.050.B.2 and 3;*
   k. *Adjustments;*
   l. *Re-platting, lot consolidations and vacations of plats;*
   m. *Minor modifications to approved site plans;*
   n. *Accessory dwelling units;*
   o. *Residential Design Checklist Review with Adjustment.*

RESPONSE: The applicant understands that the minor adjustments to the site plan as it relates to the additional frontage improvements will be processed as a minor modification, thus a Type I procedure will be required.

3. *Type II*
The following administrative actions shall be subject to a Type II review process:
   a. *Land Partitions (creation of 3 or fewer lots within 1 calendar year)*
   b. *Expedited Land Divisions - The Community Development Director shall make a decision based on the information presented, and shall issue a development permit if the applicant has complied with all of the relevant requirements of the Zoning and Community Development Code. Conditions may be imposed by the Community Development Director if necessary to fulfill the requirements of the adopted Comprehensive Plan, Transportation System Plan or the Zoning and Community Development Code.*

c. *"Fast-track" Site Plan review, defined as those site plan applications which propose less than 15,000 square feet of floor area, parking or seating capacity of public, institutional, commercial or industrial use permitted by the underlying zone, or up to a total of 20% increase in floor area, parking or seating capacity for a land use or structure subject to a Conditional Use Permit, except as follows: auditoriums, theaters, stadiums, and those applications subject to Section 16.72.010.A.4.*

d. *"Design Upgraded" Site Plan review, defined as those site plan applications which propose between 15,001 and 40,000 square feet of floor area, parking or seating capacity and which propose a minimum of eighty percent (80%) of the total possible points of design criteria in the "Commercial Design Review Matrix" found in Section 16.90.020.D.6.d.*

e. *Industrial "Design Upgraded" projects, defined as those site plan applications which propose between 15,001 and 60,000 square feet of floor area, parking or seating capacity and which meet all of the criteria in Section 16.90.020.D.7.b.*

f. *Homeowner's association street tree removal and replacement program extension.*

g. *Class B Variance.*

h. *Street Design Modification.*

i. *Subdivisions between 4—10 lots.*

j. *Medical marijuana dispensary permit.*

k. *Residential Design Checklist Review with Class B Variance.*

RESPONSE: Type II procedure is not applicable to this application.

4. *Type III*
The following quasi-judicial actions shall be subject to a Type III review process:

a. *Conditional Uses.*

b. *Site Plan Review — between 15,001 and 40,000 square feet of floor area, parking or seating capacity except those within the Old Town Overlay District, per Section 16.72.010.A.*

c. *Subdivisions between 11—50 lots.*

RESPONSE: A type III procedure will be required due to the Conditional Use Permit request included in this application per section 16.66 to allow for the inclusion of public improvements outside of a land use decision002E

B. *Hearing and Appeal Authority*

1. *The Hearing and Appeal Authorities shall be as follows:*

a. *The Residential Design Checklist review authority is the Community Development Director or their designee. The decision is final on the date it is signed by the Community Development Director. It is not a land use decision as defined by ORS 197.015, and therefore is not subject to local appeal or appeal to the state Land Use Board of Appeals (LUBA).*

b. *The Type I Hearing Authority is the Community Development Director and the Appeal Authority is the Planning Commission.*
    1. *The Community Development Director 's decision shall be made without public notice or public hearing. Notice of the decision shall be provided to the applicant.*
    2. *The applicant may appeal the Community Development Director's decision.*
c. *The Type II Hearing Authority is the Community Development Director and the Appeal Authority is the Planning Commission.*
    1. *The Community Development Director 's decision shall be made without a public hearing, but not until at least fourteen (14) days after a public notice has been mailed to the applicant and all property owners within 1,000 feet of the proposal. Any person may submit written comments to the Community Development Director which address the relevant approval criteria of the Zoning and Development Code. Such comments must be received by the Planning Department within fourteen (14) days from the date of the notice.*
    2. *Any person providing written comments may appeal the Community Development Director 's decision.*
d. *The Type III Hearing Authority is the Hearings Officer and the Appeal Authority is the Planning Commission.*
    1. *The Hearings Officer shall hold a public hearing following public notice in accordance with Sections 16.72.020 through 16.72.080.*
    2. *Any person who testified before the Hearings Officer at the public hearing or submitted written comments prior to the close of the record may appeal the Hearings Officer's decision.*
e. *The Type IV… N/A*
f. *The Type V… N/A*
g. *Review by Council*
    1. *Review of a decision by a Hearing Authority may be initiated by the City Council when the Council determines that:a.The matter involves important issues of policy; andb.The original decision likely involves errors of law or was not supported by substantial evidence.*
    2. *Review by Council must be initiated by resolution of the City Council within fourteen (14) calendar days after the date of mailing of the final written decision of the Hearing Authority. Any City Council resolution calling a decision up for review shall specify whether the City Council will review the decision called up on the record or de novo and whether it intends to limit the issues on review to certain specified issues.*
    3. *Approval of such a resolution shall stay the original decision until the decision on review has become final. No right or benefit accorded by the original decision may be exercised until the decision on review has become final.*
    4. *Review shall include a public hearing conducted by the City Council. Except as otherwise provided in this Section, the public notice and hearing procedures shall be the same as the procedures used in initially taking the action which is being reviewed.*

5. *The City Council may act to affirm, reverse, remand, or amend the action being reviewed. The action of the City Council shall be the final City of Sherwood action on the application, unless remanded to the Hearing Authority. Upon remand, the decision of the Hearing Authority shall be the final City of Sherwood action. The decision upon Council review shall become final on the date when written notice of the decision is mailed to persons entitled to notice of the decision.*

2. *Each quasi-judicial development permit application shall potentially be subject to two (2) levels of review, with the first review by a Hearing Authority and the second review, if an appeal is filed, by an Appeal Authority. The decision of the Hearing Authority shall be the City's final decision, unless an appeal is properly filed within fourteen (14) days after the date on which the Hearing Authority took final action. In the event of an appeal, the decision of the Appeal Authority shall be the City's final decision.*
3. *Each Type V legislative land use action shall be reviewed at a public hearing by the Planning Commission with a recommendation made to the City Council. The City Council shall conduct a public hearing and make the City's final decision.*

RESPONSE: Noted.

C. *Approval Criteria*

1. *The approval criteria for each development permit application shall be the approval standards and requirements for such applications as contained in this Code. Each decision made by a Hearing Authority or Appeal Authority shall list the approval criteria and indicate whether the criteria are met. It is the applicant's burden to demonstrate to the Hearing Authority and Appeal Authority how each of the approval criteria are met. An application may be approved with conditions of approval imposed by the Hearing Authority or Appeal Authority. On appeal, the Appeal Authority may affirm, reverse, amend, refer, or remand the decision of the Hearing Authority.*
2. *In addition to Section 1 above, all Type IV quasi-judicial applications except Residential Design Review shall also demonstrate compliance with the Conditional use criteria of Section 16.82.020.*

(Ord. No. 2021-010 , § 2, 12-7-2021; Ord. No. 2019-003, § 2, 3-5-2019; Ord. No. 2015-005, § 2, 5-5-2015; Ord. No. 2015-003, § 2, 3-17-2015; Ord. No. 2011-011, § 1, 10-4-2011; Ord. No. 2011-003, § 2, 4-5-2011; Ord. No. 2011-001, §§ 1, 2, 2-15-2011; Ord. No. 2010-015, § 2, 10-5-2010; Ord. No. 2010-05, § 2, 4-6-2010; Ord. No. 2009-005, § 2, 6-2-2009; Ord. 2003-1148, § 3; 2001-1119; 99-1079; 98-1053)

RESPONSE: Noted. The applicant presents this narrative and findings document, as well as the attached drawings and backup documentation as demonstration of compliance with the applicable sections within this Code and the approval criteria contained within.

16.72.020 - Public Notice and Hearing

A. *Newspaper Notice*

Notices of all public hearings for Type III, IV and V land use actions required by this Code shall be published in a newspaper of general circulation available within the City two (2) calendar weeks prior to the initial scheduled hearing before the Hearing Authority and shall be published one additional time in the Sherwood Archer, Sherwood Gazette or similarly local publication, no less than 5 days prior to the initial scheduled hearing before the hearing authority.

B. *Posted Notice*

1. *Notices of all Type II, III, IV and V land use actions required by this Code shall be posted by the City in no fewer than five (5) conspicuous locations within the City, not less than fourteen (14) calendar days in advance of the staff decision on Type II applications or twenty (20) calendar days in advance of the initial hearing before the Hearing Authority for Type III, IV and V applications.*
2. *Signage must be posted on the subject property fourteen (14) calendar days in advance of the staff decision on Type II applications and twenty (20) calendar days in advance of the initial hearing before the Hearing Authority for Type III, IV and V applications.*
    a. *On-site posted notice shall provide a general description of the land use action proposed, the project number and where additional information can be obtained.*
    b. *On-site posted notice shall be designed to be read by motorists passing by; the exact size and font style to be determined by the City.*
    c. *On-site posted notice shall be located on the property in a manner to be visible from the public street. For large sites or sites with multiple street frontages, more than one sign may be required.*

C. *Mailed Notice*

1. *For Type II, III, IV and V actions specific to a property or group of properties, the City shall send written notice by regular mail to owners of record of all real property within one thousand (1,000) feet from the property subject to the land use action. Written notice shall also be sent to Oregon Department of Transportation (ODOT), Metro, the applicable transit service provider and other affected or potentially affected agencies. If the subject property is located adjacent to or split by a railroad crossing ODOT Rail Division shall also be sent public notice.*
2. *Written notice to property owners shall be mailed at least fourteen (14) calendar days prior to a decision being made on a Type II land use action and at least twenty (20) calendar days in advance of the initial public hearing before the Hearing Authority. If two (2) or more hearings are required on a land use action, notices shall be mailed at least ten (10) calendar days in advance of the initial hearing before the Commission or Council.*
3. *For the purposes of mailing the written notice, the names and addresses of the property owners of record, as shown on the most recent County Assessor's records in the possession of the City, shall be used. Written notice shall also be mailed to homeowners associations when the homeowners association owns common property within the notification area and is listed in the County Assessor's records.*
4. *For written notices required by this Code, other than written notices to property owners of record, the City shall rely on the address provided by the persons so notified. The City shall not be responsible for verifying addresses so provided.*
5. *If a zone change application proposes to change the zone of property which includes all or part of a manufactured home park, the City shall give written notice by first class mail to each existing mailing address for tenants of the manufactured home park at least twenty (20) days but not more than forty (40) days before the date of the first hearing on the application. Such notice costs are the responsibility of the applicant.*

D. *Failure to Receive Notice*

1. *The failure of a property owner or other party to an application to receive notice of a public hearing as provided in Code of this Chapter or to receive notice of continuances and appeals as provided by this Code due to circumstances beyond the control of the City, including but not limited to recent changes in ownership not reflected in County Assessors records, loss of the notice by the postal service, or an inaccurate address provided by the County Assessor or the party to the application, shall not invalidate the applicable public hearing or land use action. The City shall prepare and maintain affidavits demonstrating that public notices were mailed, published, and posted pursuant to this Code.*
2. *Persons who should have received notice of a proposed land use action but can prove, to the City's satisfaction that notice was not received due to circumstances beyond their control, may be permitted, at the City's discretion, to exercise the right to appeal the action as per Chapter 16.76. All appeals filed under such conditions shall cite the circumstances resulting in the non-receipt of the notice.*

(Ord. No. 2015-003, § 2, 3-17-2015; Ord. No. 2010-015, § 2, 10-5-2010; Ord. 2006-021; Ord. 2003-1148, § 3; 99-1079; 98-1053; 91-922, § 3; Ord. 86-851)

RESPONSE: Noted. The applicant will work with the city to ensure all proper notices are released at the appropriate stages of the project, therefore satisfying the requirements of this section.

Chapter 16.82 CONDITIONAL USES*

16.82.010 Generally

A. *Authorization*
Uses permitted in zoning districts as conditional uses may be established, enlarged, or altered by authorization of the Commission in accordance with the standards and procedures established in this Chapter. If the site or other conditions are found to be inappropriate for the use requested, the Commission or Hearings Officer (cited below as Hearing Authority) may deny the conditional use.

B. *Changes in Conditional Uses*
Changes in use or expansion of a legal non-conforming use, structure or site, or alteration of structures or uses classified as conditional uses, that either existed prior to the effective date of this Code or were established pursuant to this Chapter shall require the filing of a new application for review conforming to the requirements of this Chapter if the proposed changes would increase the size, square footage, seating capacity or parking of existing permitted improvements by twenty percent (20%) or more.

C. *Application and Fee*
An application for a Conditional Use Permit (CUP) shall be filed with the City and accompanied by the appropriate fee pursuant to Section 16.74.010. The applicant is responsible for submitting a complete application which addresses all criteria of this Chapter and other applicable sections of this Code.
(Ord. No. 2010-015, § 2, 10-5-2010; Ord. 2001-1119, § 1; Ord. 86-851)

16.82.020 Permit Approval

A. *Hearing Authority Action*
   1. *The Hearings Authority shall conduct a public hearing pursuant to Chapter 16.72 and take action to approve, approve with conditions, or deny the application. Conditions may be imposed by the Hearings Authority if necessary to fulfill the requirements of the adopted*

Comprehensive Plan, Transportation System Plan, or the Code. The decision shall include appropriate findings of fact as required by this Section, and an effective date.

2. *Conditional uses may be approved at the hearing for a larger development (i.e. business campus or industrial park), to include future tenants of such development, if the range of uses allowed as conditional uses are considered, and specifically approved, at the time of original application.*

B. *Final Site Plan*
Upon approval of a conditional use by the Hearing Authority, the applicant shall prepare a final site plan for review and approval pursuant to Section 16.90. The final site plan shall include any revisions or other features or conditions required by the Hearing Authority at the time of the approval of the conditional use.

RESPONSE: Noted.

C. *Use Criteria*
No conditional use shall be granted unless each of the following is found:

1. *All public facilities and services to the proposed use, including but not limited to sanitary sewers, water, transportation facilities, and services, storm drains, electrical distribution, park and open space and public safety are adequate; or that the construction of improvements needed to provide adequate services and facilities is guaranteed by binding agreement between the applicant and the City.*

   RESPONSE: Noted.

2. *Proposed use conforms to other standards of the applicable zone and is compatible with abutting land uses in regard to noise generation and public safety.*

   RESPONSE: No change in zoning is proposed, therefore this criteria does not apply.

3. *The granting of the proposal will provide for a facility or use that meets the overall needs of the community and achievement of the goals and/or policies of the Comprehensive Plan, the adopted City of Sherwood Transportation System Plan and this Code.*

   RESPONSE: Noted. The proposed roadways (see item 8 below) meet the overall needs of the community and help to achieve and expedite the goals of the Tonquin Employment Area (TEA).

4. *Surrounding property will not be adversely affected by the use, or that the adverse effects of the use on the surrounding uses, the neighborhood, or the City as a whole are sufficiently mitigated by the conditions proposed.*

   RESPONSE: Noted. The proposed public improvements should benefit the surrounding properties and the TEA as as whole.

5. *The impacts of the proposed use of the site can be accommodated considering size, shape, location, topography and natural features.*

   RESPONSE: The proposed public improvements are compatible with the local area, including location, topography, and natural features.

6. *The use as proposed does not pose likely significant adverse impacts to sensitive wildlife species or the natural environment.*

   RESPONSE: Noted. There are no known environmental or wildlife impacts due to the proposed public improvements.

7. *For wireless communication facilities, no Conditional Use Permit will be granted unless the following additional criteria is found:*

a. *The applicant demonstrates to the satisfaction of the City that the wireless communication facility cannot be located in an IP zone due to the coverage needs of the applicant.*

b. *The proposed wireless communication facility is designed to accommodate co-location or it can be shown that the facility cannot feasibly accommodate co-location.*

c. *The applicant demonstrates a justification for the proposed height of the tower or antenna and an evaluation of alternative designs which might result in lower heights.*

d. *The proposed wireless communication facility is not located within one-thousand (1,000) feet of an existing wireless facility or that the proposed wireless communication facility cannot feasibly be located on an existing wireless communication facility.*

e. *The proposed wireless communication facility is located a minimum of three-hundred (300) feet from residentially zoned properties.*

RESPONSE: The proposed scope of work does not include wireless communication facilities, therefore this section does not apply.

8. *The following additional criteria apply to transportation facilities and improvements subject to Conditional Use approval per Chapter 16.66. These are improvements and facilities that are (1) not designated in the adopted City of Sherwood Transportation System Plan (TSP), and are (2) not designed and constructed as part of an approved land use application.*

a. *The project preserves or improves the safety and function of the facility through access management, traffic calming, or other design features.*

RESPONSE: Noted. The proposed inclusion of the E/W Road and the extension of Laurelwood Way to the Shouth of the subject property represent an improvement to the overall circulation in this area, and should serve to drastically expedite the development of the surrounding properties in the TEA.

b. *The project includes provisions for bicycle and pedestrian access and circulation consistent with the Comprehensive Plan, the requirements of this Code, and the TSP.*

RESPONSE: Noted. Sidewalks and bicycle lanes are being provided throughout the proposed public infrastructure in accordance with the appropriate roadway classifications and code requirements.

c. *Proposal inconsistent with TSP: If the City determines that the proposed use or activity or its design is inconsistent with the TSP, then the applicant is required to apply for and obtain a plan and/or zoning amendment prior to or in conjunction with Conditional Use Permit approval.*

RESPONSE: The proposed improvements represent mild deviations from the TSP, but are consistent with the overall intent of the TEA. The applicant would propose that the traffic circulation and overall connectivity of the proposed roadway layouts meet the intent of the TSP and will benefit the TEA.

d. *State transportation system facility or improvement projects: The Oregon Department of Transportation (ODOT) must provide a narrative statement with the application demonstrating compliance with all of the criteria and standards in Sections 16.82.020.C.1—6 and 8.a—8.d. Where applicable, an Environmental Impact Statement or Environmental Assessment may be used to address one or more of these criteria.*

RESPONSE: No state transportation systems are being proposed or modified as a part of this application.

D. *Additional Conditions*
In permitting a conditional use or modification of an existing conditional use, additional

conditions may be applied to protect the best interests of the surrounding properties and neighborhoods, the City as a whole, and the intent of this Chapter. These conditions may include but are not limited to the following:

1. *Mitigation of air, land, or water degradation, noise, glare, heat, vibration, or other conditions which may be injurious to public health, safety or welfare in accordance with environmental performance standards.*
2. *Provisions for improvement of public facilities including sanitary sewers, storm drainage, water lines, fire hydrants, street improvements, including curb and sidewalks, and other above and underground utilities.*
3. *Increased required lot sizes, yard dimensions, street widths, and off-street parking and loading facilities.*
4. *Requirements for the location, number, type, size or area of vehicular access points, signs, lighting, landscaping, fencing or screening, building height and coverage, and building security.*
5. *Submittal of final site plans, land dedications or money-in-lieu of parks or other improvements, and suitable security guaranteeing conditional use requirements.*
6. *Limiting the number, size, location, height and lighting of signs.*
7. *Requirements for the protection and preservation of existing trees, soils, vegetation, watercourses, habitat areas and drainage areas.*
8. *Requirements for design features which minimize potentially harmful environmental impacts such as noise, vibration, air pollution, glare, odor and dust.*

RESPONSE: Noted.

E. *Time Limits*
Unless approved under Section 16.82.020.A.2 for a larger development to include future tenants of such development, authorization of a conditional use shall be void after two (2) years or such lesser time as the approval may specify unless substantial construction, in the City's determination, has taken place. The Hearing Authority may extend authorization for an additional period, not to exceed one (1) year, upon a written request from the applicant showing adequate cause for such extension, and payment of an extension application fee as per Section 16.74.010.

RESPONSE: Noted.

F. *Revocation*
Any departure from approved plans not authorized by the Hearing Authority shall be cause for revocation of applicable building and occupancy permits. Furthermore, if, in the City's determination, a condition or conditions of CUP approval are not or cannot be satisfied, the CUP approval, or building and occupancy permits, shall be revoked.
(Ord. No. 2015-003, § 2, 3-17-2015; Ord. No. 2010-015, § 2, 10-5-2010; Ord. 2005-006, §§ 4, 6, 7; Ord. 2003-1148, § 3; Ord. 2001-1119, § 1; 97-1019; Ord. 86-851)

RESPONSE: Noted.

DIVISION IV – PLANNING PROCEDURES

Chapter 16.84 – Variances

16.84.010 Purpose

This Chapter provides standards and procedures for variances, which are modifications to land use or development standards that are not otherwise permitted elsewhere in this Code as exceptions to Code standards. This Chapter provides flexibility, while maintaining the purposes and intent of the Code. No variances shall be granted to allow the use of property for a purpose not authorized within the zone in which the proposed use is located. In granting a variance, conditions may be imposed when necessary to protect the best interests of surrounding properties and neighborhoods, and otherwise achieve the purposes of the adopted Comprehensive Plan, the Transportation System Plan, and other Code provisions.

(Ord. No. 2011-003, § 2, 4-5-2011)

UPDATED RESPONSE: The applicant is requesting to maintain the previously approved variance for this development. This will allow the project to continue to move through the approvals process and begin construction without delay. As noted previously, the variance to allow for a single access is only an interim requirement, and will not be needed long-term once the Laurelwood Way and Ice Age Drive are functional.

DIVISION V – COMMUNITY DESIGN

Chapter 16.90 – Site Planning

16.90.020 - Site Plan Review

A. *Site Plan Review Required*
Site Plan review is required prior to any substantial change to a site or use that is not subject to Residential Design Checklist or Residential Design Review, does not meet the criteria of a minor or major modification per 16.90.030, issuance of building permits for a new building or structure, or for the substantial alteration of an existing structure or use. Exemptions noted below.

Site Plan Review is required for the following development:

1. *Multi-dwelling*
2. *Commercial*
3. *Industrial*
4. *Mixed-use*

For the purposes of Section 16.90.020, the terms "substantial change" and "substantial alteration" mean any development activity as defined by this Code that generally requires a building permit and may exhibit one or more of the following characteristics:

1. *The activity alters the exterior appearance of a structure, building or property and is not considered a modification.*
2. *The activity involves changes in the use of a structure, building, or property from residential to commercial or industrial and is not considered a modification.*
3. *The activity involves non-conforming uses as defined in Chapter 16.48.*
4. *The activity constitutes a change in a City approved plan, per Section 16.90.020 and is not considered a modification.*
5. *The activity is subject to site plan review by other requirements of this Code.*
6. *The activity increases the size of the building by more than 100% (i.e. the building more than doubles in size), regardless of whether it would be considered a major or minor modification.*

UPDATED RESPONSE: This application for a modification to our existing approval does not substantially change the site plan or proposed buildings.

16.90.030 - Site Plan Modifications and Revocation

A. *Modifications to Approved Site Plans*
   1. *Major Modifications to Approved Site Plans*
      a. *Defined. A major modification review is required if one or more of the changes listed below are proposed:*
         1) *A change in land use (i.e. residential to commercial, commercial to industrial, etc.);*
         2) *An increase in density by more than ten (10) percent, provided the resulting density does not exceed that allowed by the land use district;*
         3) *A change in setbacks or lot coverage by more than ten (10) percent, provided the resulting setback or lot coverage does not exceed that allowed by the land use district;*
         4) *A change in the type and/or location of access-ways, drives or parking areas negatively affecting off-site traffic or increasing Average Daily Trips (ADT) by more than 100;*

5) *An increase in the floor area or height proposed for non-residential use by more than ten (10) percent;*
6) *A reduction of more than ten (10) percent of the area reserved for common open space; or*
7) *Change to a condition of approval that was specifically applied to this approval (i.e. not a "standard condition"), or a change similar to items identified in Section 16.90.030.A.1.a.(1)—(2) as determined by the Review Authority.*

RESPONSE: A major modification is not being proposed under this application.

b. *Approval Criteria. An applicant may request a major modification as follows:*
   1) *Upon the review authority determining that the proposed modification is a major modification, the applicant must submit an application form, filing fee and narrative, and a site plan using the same plan format as in the original approval. The review authority may require other relevant information, as necessary, to evaluate the request.*
   2) *The application is subject to the same review procedure (Type II, III or IV), decision making body, and approval criteria used for the initial project approval, except that adding a Conditional Use to an approved Type II project is reviewed using a Type III procedure.*
   3) *The scope of review is limited to the modification request and does not open the entire site up for additional review unless impacted by the proposed modification. For example, a request to modify a parking lot requires site design review only for the proposed parking lot and any changes to associated access, circulation, pathways, lighting, trees, and landscaping.*
   4) *Notice must be provided in accordance with Chapter 16.72.020.*
   5) *The decision maker approves, denies, or approves with conditions an application for major modification based on written findings of the criteria.*

2. *Minor Modifications to Approved Site Plans*
   a. *A Minor Modification is any modification to a land use decision or approved development plan that is not within the description of a major modification.*
   b. *Minor Modification Review Procedure. An application for approval of a minor modification is reviewed by the review authority using a Type I review procedure under Section 16.72.010.A. Minor modifications involve only clear and objective Code standards.*
   c. *Minor Modification Applications. An application for minor modification must include an application form, filing fee and narrative, updated Clean Water Services (CWS) Service Provider Letter or equivalent acknowledgement from CWS, and a site plan using the same plan format as in the original approval if possible. The review authority may require other relevant information, as necessary, to evaluate the request.*
   d. *Minor Modification Approval Criteria. The review authority approves, denies, or approves with conditions an application for minor modification based on written findings that the modification is in compliance with all applicable requirements of the Development Code and conditions of approval on the original decision, and the modification is not a major modification.*

RESPONSE: Given that the changes proposed as a part of this modification do not trigger the major modification requirements, the applicant understands that a minor modification will be required to reconcile with the original application/approval.

B. *Revocation*
Any departure from an approved plan is cause for revocation of applicable building and occupancy permits. Furthermore if, in the City's determination, a condition or conditions of site plan approval are not or cannot be satisfied, the site plan approval, or building and occupancy permits, will be revoked.
(Ord. No. 2015-003, § 2, 3-17-2015; Ord. No. 2014-012, § 3, 7-17-2014; Ord. No. 2011-011, § 1, 10-4-2011)

Chapter 16.92 – Landscaping

16.92.030 - Site Area Landscaping and Perimeter Screening Standards

A. *Perimeter Screening and Buffering*

2. *Perimeter Landscaping Buffer*

a. *A minimum ten (10) foot wide landscaped strip comprised of trees, shrubs and ground cover shall be provided between off-street parking, loading, or vehicular use areas on separate, abutting, or adjacent properties.*

b. *The access drives to a rear lots in the residential zone (i.e. flag lot) shall be separated from abutting property(ies) by a minimum of forty-two-inch sight-obscuring fence or a forty-two-inch to an eight (8) feet high landscape hedge within a four-foot wide landscape buffer. Alternatively, where existing mature trees and vegetation are suitable, Review Authority may waive the fence/buffer in order to preserve the mature vegetation.*

3. *Perimeter Landscape Buffer Reduction*
If the separate, abutting property to the proposed development contains an existing perimeter landscape buffer of at least five (5) feet in width, the applicant may reduce the proposed site's required perimeter landscaping up to five (5) feet maximum, if the development is not adjacent to a residential zone. For example, if the separate abutting perimeter landscaping is five (5) feet, then applicant may reduce the perimeter landscaping to five (5) feet in width on their site so there is at least five (5) feet of landscaping on each lot.

RESPONSE: The perimeter landscape buffer of at least 10 feet is provided along all property boundaries, therefore this section is satisfied.

UPDATED RESPONSE: The required landscape buffer of at least 10 feet has been maintained along the frontage of the E/W Road along the South side of the development.

B. *Parking Area Landscaping*

2. *Required Landscaping*

There shall be at least forty-five (45) square feet parking area landscaping for each parking space located on the site. The amount of required plant materials are based on the number of spaces as identified below.

RESPONSE: Noted. The proposed development currently includes 682 parking spaces, which would result in a required 30,690 square feet of parking area landscaping. The currently proposed landscaping exceeds this requirement, therefore this standard is satisfied.

UDPATED RESPONSE: The updated site plan slightly reduced the overall parking to provide 635 parking spaces. The satisfaction of this section has not been impacted by this adjustment.

Chapter 16.94 – Off-Street Parking and Loading

16.94.020 Off-Street Parking Standards

A. *Generally*

Where square feet are specified, the area measured shall be the gross building floor area primary to the functioning of the proposed use. Where employees are specified, persons counted shall be those working on the premises, including proprietors, during the largest shift at peak season. Fractional space requirements shall be counted as a whole space. The Review Authority may determine alternate off - street parking and loading requirements for a use not specifically listed in this Section based upon the requirements of comparable uses.

Table 1: Minimum and Maximum Parking Standards
(Metro spaces are based on 1 per 1,000 sq ft of gross leasable area)

	Minimum Parking Standard	***Maximum Permitted Parking Zone A[1]***	***Maximum Permitted Parking Zone B[2]***
Industrial	*1.6*	*None*	*None*
Warehouse (gross square feet; parking ratios apply to warehouses 150,000 gsf or greater)	*0.3*	*0.4*	*0.5*

[1] *Parking Zone A reflects the maximum number of permitted vehicle parking spaces allowed for each listed land use. Parking Zone A areas include those parcels that are located within one-quarter (¼) mile walking distance of bus transit stops, one-half (½) mile walking distance of light rail station platforms, or both, or that have a greater than twenty-minute peak hour transit service.*

[2] *Parking Zone B reflects the maximum number of permitted vehicle parking spaces allowed for each listed land use. Parking Zone B areas include those parcels that are located at a distance greater than one-quarter (¼) mile walking distance of bus transit stops, one-half (½) mile walking distance of light rail station platforms, or both.*

[3] *If the street on which the house has direct access does not permit on-street parking or is less than twenty-eight (28) feet wide, two (2) off-street parking spaces are required per single-family residential unit. (includes single-family detached or attached, two-family dwelling or a manufactured home on an individual lot) If the abutting street is twenty-eight (28) feet or wider, one (1) standard (9 ft. × 20 ft.) parking space is required.*

RESPONSE: The proposed development contains (3) industrial buildings which total approximately 435,107 square feet. Per the parking calculations on the drawings, our assumption is that this speculative development will be populated with a mix of industrial and warehousing tenants, so we are showing a mixed used based on a conservative 80/20 ratio (given that the tenants are not known at this time). This utilizes the 1.6/1,000sf ratio for the industrial space, and the 0.3/1,000sf ratio for the warehousing space.

Based on this, we calculate a required auto parking space count of 583 spaces. We are providing a total of 682 spaces, therefore satisfying this requirement. See the parking calculations contained on the site plan sheet for additional information.

UPDATED RESPONSE: As noted in a previous section, the revised site plan has increased the total building square footage by approximately 2%, bringing the new total to 445,000 square feet. Using rationale similar to the response above as previously approved, we calculate a total of 596 spaces required. Per the site plan accompanying this application, the applicant is providing 635 total spaces, therefore satisfying this requirement.

B. *Bicycle Parking Facilities*

Table 4: Minimum Required Bicycle Parking Spaces

Use Categories	***Minimum Required Spaces***
Industrial	*2 or 1 per 40 spaces, whichever is greater*
Public and Institutional Categories	

(Ord. No. 2018-007, § 2, 10-2-2018; Ord. No. 2015-003, § 2, 3-17-2015; Ord. No. 2014-012, § 3, 7-17-2014; Ord. No. 2012-008, § 2, 7-17-2012; Ord. No. 2010-015, § 2, 10-5-2010; Ord. 2006-021; 2005-009 § 8; Ord. 2000-2001 § 3; Ord. 86-851 § 3)

RESPONSE: There are approx. 682 parking spaces provided throughout the site, therefore at one bicycle space per (40) auto spaces, this site should have at least (17) bicycle parking spaces. Per the currently proposed site plan, there are (30) short-term bicycle parking spaces, and (24) in-door long-term bicycle parking spaces. This exceeds the 25% minimum requirement for long-term spaces per section C.1.d above.

UPDATED RESPONSE: The revised site plan includes 635 auto parking stalls, which results in a required (16) bicycle parking stalls. The proposed site plan exceeds this requirement, therefore satisfying this section.

DIVISION VI – PUBLIC INFRASTRUCTURE

Chapter 16.106 – Transportation Facilities

16.106.010 - Generally

A. *Creation*
Public streets shall be created in accordance with provisions of this Chapter. Except as otherwise provided, all street improvements and rights-of-way shall conform to standards for the City's functional street classification, as shown on the Transportation System Plan (TSP) Map (Figure 17) and other applicable City standards. The following table depicts the guidelines for the street characteristics.

Type of Street	***Right of Way Width***	***Number of Lanes***	***Minimum Lane Width***	***On Street Parking Width***	***Bike Lane Width***	***Sidewalk Width***	***Landscape Strip (exclusive of Curb)***	***Median Width***
Principal Arterial (99W)	*122'*	*4-6*	*12'*	*Prohibited*	*6'*	*6'*	*5'*	*14'*
Arterial	*60-102'*	*2-5*	*12'*	*Limited*	*6 feet*	*6-8'*	*5'*	*14' if required*
Collector	*58-92'*	*2-3*	*11'*	*8' optional*	*6'*	*6-8'*	*5'*	*14' median turn lane*
40' Commercial/ Industrial Not Exceeding 3000 vehicles per day	*64'*	*2*	*20'*	*8'*	*none*	*6'*	*5'*	*none*
50' Commercial/ Industrial Exceeding 3000 vehicles per day	*64'*	*2*	*12'*	*8'*	*5'*	*6'*	*5'*	*none*
Neighborhood 1,000 vehicles per day	*64'*	*2*	*18'*	*8'*	*None*	*8'*	*5' with 1' buffer*	*none*
Local	*52'*	*2*	*14'*	*8' on one side only*	*None*	*6'*	*5' with 1' buffer*	*none*
Alley	*16-25'*	*1-2*	*10-12'*	*One side if 20'*	*none*	*none*	*none*	*none*
Downtown Street Standard	*60'*	*2*	*11'*	*7'*	*none*	*12' pedestrian zone*	*4' (included in pedestrian zone)*	*none*

RESPONSE: Dedication for future Tonquin Court and Ice Age Drive have been provided as a part of the proposed development. For additional context regarding the road alignments surrounding this site, see the 'Site Plan Adjustments and Variance Narrative' in the overview preceding this document.

Tonquin Court is anticipated to be designated as a 50' commercial/industrial exceeding 3000 vehicles per day based on engineer's estimate and traffic impact analysis (TIA), though exact vehicle count unknown at this time. Trips generated by the Sherwood Commerce Center alone do not exceed 3,000 trips daily, but trips generated by future development accessing Tonquin Court will likely pass this threshold. ROW,

paved and other widths proposed for Tonquin Court reflect those listed in the table above.

The dedication for Ice Age Drive is shown as 76' total based on a Collector ROW width, as coordinated with the City of Sherwood. At this size, there is room on each side of the street for an 8ft sidewalk, 5ft planter strip, 6ft bike lane, 11ft traffic lane, and a center 14ft median/turn lane.

UPDATED RESPONSE: The 'East/West Road' (name to be determined) has been illustrated to the South of this development to aid in overall circulation in the TEA and expedite the development of the area. Per preliminary conversations with city staff, our understanding is that a 64-foot right-of-way will be required for this road (similar to Laurelwood Way). This ROW dedication is anticipated to accompany this development, along with a proposed 8' Public Utility Easement along the South side of this roadway.

The extension of Laurelwood Way (fka Tonquin Ct.) to the South has been discussed and agreed upon by all impacted property owners (see attached private cooperative agreement), and it is understood that the appropriate dedications of ROW will be required to make this possible.

B. *Street Naming*
   1. *All streets created by subdivision or partition will be named prior to submission of the final plat.*
   2. *Any street created by a public dedication shall be named prior to or upon acceptance of the deed of dedication.*
   3. *An action to name an unnamed street in the City may be initiated by the Council or by a person filing a petition as described in this Section.*
   4. *All streets named shall conform to the general requirements as outlined in this Section.*
   5. *At the request of the owner(s), the City may approve a private street name and address. Private streets are subject to the same street name standards as are public streets. All private street signs will be provided at the owner(s) expense.*

C. *Street Name Standards*
   1. *All streets named or renamed shall comply with the following criteria:*
      a. *Major streets and highways shall maintain a common name or number for the entire alignment.*
      b. *Whenever practicable, names as specified in this Section shall be utilized or retained.*
      c. *Hyphenated or exceptionally long names shall be avoided.*
      d. *Similar names such as Farview and Fairview or Salzman and Saltzman shall be avoided.*
      e. *Consideration shall be given to the continuation of the name of a street in another jurisdiction when it is extended into the City.*
   2. *The following classifications (suffixes) shall be utilized in the assignment of all street names:*
      a. *Boulevards: North/south arterials providing through traffic movement across the community.*
      b. *Roads: East/west arterials providing through traffic movement across the community.*
      c. *Avenues: Continuous, north/south collectors or extensions thereof.*
      d. *Streets: Continuous, east-west collectors or extensions thereof.*

e. *Drives: Curvilinear collectors (less than 180 degrees) at least 1,000 feet in length or more.*
f. *Lanes: Short east/west local streets under 1,000 feet in length.*
g. *Terraces: short north/south local streets under 1,000 feet in length.*
h. *Court: All east/west cul-de-sacs.*
i. *Place: All north/south cul-de-sacs.*
j. *Ways: All looped local streets (exceeding 180 degrees).*
k. *Parkway: A broad landscaped collector or arterial.*

3. *Except as provided for by this section, no street shall be given a name that is the same as, similar to, or pronounced the same as any other street in the City unless that street is an extension of an already-named street.*
4. *All proposed street names shall be approved, prior to use, by the City.*

D. *Preferred Street Names*
Whenever practicable, historical names will be considered in the naming or renaming of public roads. Historical factors to be considered shall include, but not be limited to the following:

1. *Original holders of Donation Land Claims in Sherwood.*
2. *Early homesteaders or settlers of Sherwood.*
3. *Heirs of original settlers or long-time (50 or more years) residents of Sherwood.*
4. *Explorers of or having to do with Sherwood.*
5. *Indian tribes of Washington County.*
6. *Early leaders and pioneers of eminence.*
7. *Names related to Sherwood's flora and fauna.*
8. *Names associated with the Robin Hood legend.*
(Ord. No. 2018-003, § 2, 3-20-2018; Ord. No. 2014-012, § 3, 7-17-2014; Ord. No. 2011-011, § 1, 10-4-2011)

RESPONSE: The names of the future roadway(s) adjacent to this development are as outlined in the City of Sherwood's *Tonquin Employment Area (TEA) plan,* and are believed to conform to the City's own naming standards.

UPDATED RESPONSE: The newly proposed 'East/West Road' is not yet named. Applicant intends to work with City staff and/or Planning Commission to determine a name that is acceptable.

16.106.020 - Required Improvements

A. *Generally*
Except as otherwise provided, all developments containing or abutting an existing or proposed street, that is either unimproved or substandard in right-of-way width or improvement, shall dedicate the necessary right-of-way prior to the issuance of building permits and/or complete acceptable improvements prior to issuance of occupancy permits. Right-of-way requirements are based on functional classification of the street network as established in the Transportation System Plan, Figure 17.

RESPONSE: The required dedications for future Tonquin Court and future Ice Age Drive are being proposed with this development. See plan for specific dedication requirements. The dedication shown for Tonquin Court is slightly larger (about 2ft) than

required to allow for horizontal separation on our proposed utilities (while keeping them entirely on our side of the property line).

UPDATED RESPONSE: In addition to the previously noted dedications for Laurelwood Way (fka Tonquin Ct.) and Ice Age Drive, a 64-foot Right-of-Way dedication is anticipated for the East/West Road and for the extension of Laurelwood Way to the South.

B. *No changes from previous approval.*

C. *No changes from previous approval.*

D. *Extent of Improvements*

1. *Streets required pursuant to this Chapter shall be dedicated and improved consistent with Chapter 6 of the Community Development Plan, the TSP and applicable City specifications included in the City of Sherwood Construction Standards. Streets shall include curbs, sidewalks, catch basins, street lights, and street trees. Improvements shall also include any bikeways designated on the Transportation System Plan map. Applicant may be required to dedicate land for required public improvements only when the exaction is directly related to and roughly proportional to the impact of the development, pursuant to Section 16.106.090.*
2. *If the applicant is required to provide street improvements, the City Engineer may accept a future improvements guarantee in lieu of street improvements if one or more of the following conditions exist, as determined by the City:*
   a. *A partial improvement is not feasible due to the inability to achieve proper design standards;*
   b. *A partial improvement may create a potential safety hazard to motorists or pedestrians.*
   c. *Due to the nature of existing development on adjacent properties it is unlikely that street improvements would be extended in the foreseeable future and the improvement associated with the project under review does not, by itself, provide a significant improvement to street safety or capacity;*
   d. *The improvement would be in conflict with an adopted capital improvement plan;*
   e. *The improvement is associated with an approved land partition on property zoned residential use and the proposed land partition does not create any new streets; or*
   f. *Additional planning work is required to define the appropriate design standards for the street and the application is for a project that would contribute only a minor portion of the anticipated future traffic on the street.*

RESPONSE: The applicant is dedicating the required right-of-way for the adjacent future roadways, but is not proposing to include street improvement work as a part of the current application. For additional information regarding the roadway alignments adjacent to this site, reference the 'Site Plan Adjustments and Variance Narrative' contained within the overview preceding this document.

UPDATED RESPONSE: The applicant intends to pursue permits, dedications, etc. as needed to construct the full length of Laurelwood Way (fka Tonquin Ct.) and the East/West Road concurrently with the development.

That said, as noted in the introduction to this narrative, the applicant is requesting to maintain the currently approved variance to allow for an interim single-access to the site such that the review and approvals for the off-site road improvements do not impede the construction of the on-site scope.

E. Transportation Facilities Modifications

1. *A modification to a standard contained within this Chapter and Section 16.58.010 and the standard cross sections contained in Chapter 8 of the adopted TSP may be granted in accordance with the procedures and criteria set out in this section.*
2. *A modification request concerns a deviation from the general design standards for public facilities, in this Chapter, Section 16.58.010, or Chapter 8 in the adopted Transportation System Plan. The standards that may be modified include but are not limited to:*
   a. *Reduced sight distances.*
   b. *Vertical alignment.*
   c. *Horizontal alignment.*
   d. *Geometric design (length, width, bulb radius, etc.).*
   e. *Design speed.*
   f. *Crossroads.*
   g. *Access policy.*
   h. *A proposed alternative design which provides a plan superior to these standards.*
   i. *Low impact development.*
   j. *Access Management Plans*
3. *Modification Procedure*
   a. *A modification shall be proposed with the application for land use approval.*
   b. *A modification is processed as a Type II application. Modification requests shall be processed in conjunction with the underlying development proposal.*
   c. *When a modification is requested to provide a green street element that is not included in the Engineering Design Manual, the modification process will apply, but the modification fee will be waived.*
4. *Criteria for Modification: Modifications may be granted when criterion 4a and any one of criteria 4b through 4e are met:*
   a. *Consideration shall be given to public safety, durability, cost of maintenance, function, appearance, and other appropriate factors to advance the goals of the adopted Sherwood Comprehensive Plan and Transportation System Plan as a whole. Any modification shall be the minimum necessary to alleviate the hardship or disproportional impact.*
   b. *Topography, right-of-way, existing construction or physical conditions, or other geographic conditions impose an unusual hardship on the applicant, and an equivalent alternative which can accomplish the same design purpose is available.*
   c. *A minor change to a specification or standard is required to address a specific design or construction problem which, if not enacted, will result in an unusual hardship. Self-imposed hardships shall not be used as a reason to grant a modification request.*
   d. *An alternative design is proposed which will provide a plan equal to or superior to the existing street standards.*

e. *Application of the standards of this chapter to the development would be grossly disproportional to the impacts created.*
(Ord. No. 2018-003, § 2, 3-20-2018; Ord. No. 2014-012, § 3, 7-17-2014; Ord. No. 2011-011, § 1, 10-4-2011)

RESPONSE: The proposed design for access to future Tonquin Court deviates from block length requirements set forth in 16.106.030(B)(3). The code requires a maximum block length of 530', while the proposal would create a block length of 580' if/when Tonquin Court is paved by the City in the future. Per 16.106.020(E)(4)(a), *consideration has been given to public safety, durability, cost of maintenance, function, appearance, and other appropriate factors to advance the goals of the adopted Sherwood Comprehensive Plan as a whole*, and no adverse impacts have been determined as a result of this deviation. Furthermore, per 16.106.020(E)(4)(e) adherence to the standard block length would result in a loss of 30,000 SF of building onsite, which is *grossly disproportional to the impacts created*.

UPDATED RESPONSE: The inclusion of the East/West road should serve to bring our design closer to compliance with the previous block length modification, though the above response still applies.

Additionally, three modifications are being requested for the extent of Laurelwood Way (fka Tonquin Ct) to the South of East/West Road.

1. The length of the cul-de-sac is approximately 960-feet long, which exceeds the 200-foot maximum length for cul-de-sacs per section 16.106.40(E)(1).
2. Due to the industrial nature of this and surrounding developments and the natural topography of the area, the applicant requests to omit the pedestrian pathway continuance per section 16.106.040(E)(3).

   Per 16.106.020(E)(4)(a), consideration has been given to public safety, durability, cost of maintenance, function, appearance, and other appropriate factors to advance the goals of the adopted Sherwood Comprehensive Plan as a whole, and no adverse impacts have been determined as a result of the deviations proposed under items (1) and (2).

   The applicant is proposing that both sections 16.106.020(E)(4)(b) and 16.106.020(E)(4)(e) have also been satisfied to allow this modification. For item (b), the natural topography and connection limitations to the South towards Tonquin Road make it impractical to make this connection, in addition to the hardship it would put on the neighbor to the South. For item (e), the applicant proposes that the previously suggested alternative for this traffic system, which would have required roadways on the South and East sides of the SCC second phase development, would necessitate *grossly disproportionate impacts* to the project by way of property dedications.

   The inclusion of the cul-de-sac at the Southern termination of Laurelwood Way (fka Tonquin Ct.) is also supported by the design intent illustrated in the TEA Implementation plan.
3. The intersection offset between the East/West road and the driveway location for the Oregon Street Business Park (LU 2021-015 SP / VAR), which occurs on the opposing side of the road, is currently proposed at 20.6-feet, which is less than

the 25-foot standard per section 16.106.040.M.2.a.
The applicant is proposing that the provided configuration substantially complies with the intent of the requirement, with a proposed deviation of less than 20% (4.4 feet). Due to the low speed classification of these roads and the industrial nature of these developments, the applicant is proposing that criteria 4.a of this section is satisfied.
Additionally, the proposed driveway and road intersections were designed such that they are in the most functional location for each property based upon both existing conditions and the proposed site plans for OSBP and SCC. Both applicants would endure hardships should a different location be proposed for either the driveway or road intersection. Moving the E/W Road to the South result in an additional loss of developable area of more than 5,000 square feet to the applicant's properties. Requesting that the neighboring driveway be relocated would likely result in additional project delays due to the procedural timelines. Per criteria 4.c, the applicant would propose that, in this case, '*A minor change to a specification or standard is required to address a specific design or construction problem which, if not enacted, will result in an unusual hardship*.'

16.106.030 - Location

A. *Generally*
The location, width and grade of streets shall be considered in their relation to existing and planned streets, topographical conditions, and proposed land uses. The proposed street system shall provide adequate, convenient and safe traffic and pedestrian circulation, and intersection angles, grades, tangents, and curves shall be adequate for expected traffic volumes. Street alignments shall be consistent with solar access requirements as per Chapter 16.156, and topographical considerations.

B. *Street Connectivity and Future Street Systems*
1. *Future Street Systems. The arrangement of public streets shall provide for the continuation and establishment of future street systems as shown on the Local Street Connectivity Map contained in the adopted Transportation System Plan (Figure 16).*

RESPONSE: The Local Street Connectivity Map (Figure 18) of the TSP indicates a proposed roadway representing Ice Age Drive. No other extensions are shown adjacent to the subject site on this map.

UPDATED RESPONSE: No change from previous approval.

2. *Connectivity Map Required. New residential, commercial, and mixed use development involving the construction of new streets shall be submitted with a site plan that implements, responds to and expands on the Local Street Connectivity map contained in the TSP.*
   a. *A project is deemed to be consistent with the Local Street Connectivity map when it provides a street connection in the general vicinity of the connection(s) shown on the map, or where such connection is not practicable due to topography or other physical constraints; it shall provide an alternate connection approved by the decision-maker.*

b. *Where a developer does not control all of the land that is necessary to complete a planned street connection, the development shall provide for as much of the designated connection as practicable and not prevent the street from continuing in the future.*

c. *Where a development is disproportionately impacted by a required street connection, or it provides more than its proportionate share of street improvements along property line (i.e., by building more than 3/4 width street), the developer shall be entitled to System Development charge credits, as determined by the City Engineer.*

d. *Driveways that are more than 24 feet in width shall align with existing streets or planned streets as shown in the Local Street Connectivity Map in the adopted Transportation System Plan (Figure 17), except where prevented by topography, rail lines, freeways, pre-existing development, or leases, easements, or covenants.*

RESPONSE: A future road connectivity map has been included as a part of this application, see Appendix J. While we realize there are many moving parts to this, much of which are outside of our control, this has been provided to illustrate a potential layout for connection throughout this portion of the Tonquin Employment Area.

UPDATED RESPONSE: As noted in the introductory section of this narrative, the proposed roadway locations have been preliminarily discussed and studied by the applicant, City staff, and many of the neighboring property owners. We believe the proposed road locations represent a benefit to the TEA by enhancing traffic circulation and allowing development to proceed in a timely manner. An updated future connectivity map has been included in the appendix of this application.

Additionally, the private cooperative agreement between the property owners has been included in this application, which demonstrates the collective agreement of the adjacent developers.

3. *Block Length. For new streets except arterials, block length shall not exceed 530 feet. The length of blocks adjacent to arterials shall not exceed 1,800 feet.*

RESPONSE: Block length along Oregon Street between future Tonquin Court and interim access to the site is 470', which is adequate for an arterial roadway. With the future development of Ice Age Drive (and subsequent removal of interim access to Oregon St), this block length will increase to 760' between Tonquin Court and Ice Age Drive, which is still acceptable for an arterial. Along future Ice Age Drive, block length will be less than 530', as required for the collector.

Deviation from this standard along future Tonquin Court is discussed in the Transportation Facilities Modification request in this narrative, section 16.16.020(E) above.

UPDATED RESPONSE: The inclusion of the East/West road should serve to bring our design closer to compliance with this section, though the proposed modification above still applies.

4. *No Change from previous approval.*

5. *No Change from previous approval.*
6. *Pedestrian and Bicycle Connectivity. Paved bike and pedestrian accessways consistent with cross section standards in Figure 8-6 of the TSP shall be provided on public easements or right- of-way when full street connections are not possible, with spacing between connections of no more than 300 feet. Multi-use paths shall be built according to the Pedestrian and Bike Master Plans in the adopted TSP.*

RESPONSE: Figure 12 (Pedestrian Projects) of the City's TSP identifies future Ice Age Drive as a proposed sidewalk, and Oregon Street as a proposed shared-use path under project P16. Figure 13 (Biking Projects) of the City's TSP identifies future Ice Age Drive as a proposed bike lane. This development will not impede on either of these future projects.

UPDATED RESPONSE: The shared-use path along Oregon St. as identified in the previous response will be continued along the frontage impacted by the intersection of Laurelwood Way (fka Tonquin Ct.) and Oregon St.

7. *Exceptions. Streets, bike, and pedestrian connections need not be constructed when any of the following conditions exists:*
   a. *Physical or topographic conditions make a street or accessway connection impracticable. Such conditions include but are not limited to freeways, railroads, steep slopes, wetlands or other bodies of water where a connection could not reasonably be provided.*
   b. *Buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or*
   c. *Where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements existing as of May 1, 1995, which preclude a required street or accessway connection.*

C. *Underground Utilities*
All public and private underground utilities, including sanitary sewers and storm water drains, shall be constructed prior to the surfacing of streets. Stubs for service connections shall be long enough to avoid disturbing the street improvements when service connections are made.

UPDATED RESPONSE: Noted.

16.106.040 - Design

Standard cross sections showing street design and pavement dimensions are located in the City of Sherwood's Engineering Design Manual.

A. *Reserve Strips*
Reserve strips or street plugs controlling access or extensions to streets are not allowed unless necessary for the protection of the public welfare or of substantial property rights. All reserve strips shall be dedicated to the appropriate jurisdiction that maintains the street.

RESPONSE: No reserve strips are being proposed with this development.

B. *Alignment*
All proposed streets shall, as far as practicable, be in alignment with existing streets. In no case shall the staggering of streets create a "T" intersection or a dangerous condition. Street offsets of less than one hundred (100) feet are not allowed.

RESPONSE: Future Tonquin Court, as illustrated on our plans, intersects Oregon Street directly opposite an existing private driveway. No 100' offsets are being created.

UPDATED RESPONSE: The proposed alignment of Laurelwood Way (fka Tonquin Ct.) directly aligns with the existing driveway on the opposing side of Oregon St.

C. *Future Extension*

Where necessary to access or permit future subdivision or development of adjoining land, streets must extend to the boundary of the proposed development and provide the required roadway width. Dead-end streets less than 100' in length must comply with the Engineering Design Manual.

A durable sign must be installed at the applicant's expense. The sign is required to notify the public of the intent to construct future streets. The sign must read as follows: "This road will be extended with future development. For more information contact the City of Sherwood Engineering Department."

RESPONSE: Right of way for the adjacent roadways is proposed as a part of this development, but not roadways are proposed to be built at this time.

UPDATED RESPONSE: Noted. The required signage will be posted at the east end of the 'East/West Road'. The termination of Laurelwood Way (fka Tonquin Ct.) is proposed to be a cul-de-sac to serve the development to the South, therefore not future extension is anticipated.

D. *Intersection Angles*

Streets shall intersect as near to ninety (90) degree angles as practical, except where topography requires a lesser angle. In all cases, the applicant shall comply with the Engineering Design Manual.

RESPONSE: While not under the current scope of this project, future Tonquin Court and future Ice Age Drive, as illustrated on our plans, would satisfy the requirement for 90 degree intersection angles.

UPDATED RESPONSE: The intersections of Laurelwood Way (fka Tonquin Ct.), the East/West Road, and future Ice Age Drive (outside the scope of this application) are being proposed as 90-degree intersections, therefore complying with this requirement.

E. *Cul-de-sacs*

1. *All cul-de-sacs shall be used only when exceptional topographical constraints, existing development patterns, or compliance with other standards in this code preclude a street extension and circulation. A cul-de-sac shall not be more than two hundred (200) feet in length and shall not provide access to more than 25 dwelling units.*
2. *All cul-de-sacs shall terminate with a turnaround in accordance with the specifications in the Engineering Design Manual. The radius of circular turnarounds may be larger when they contain a landscaped island, parking bay in their center, Tualatin Valley Fire and Rescue submits a written request, or an industrial use requires a larger turnaround for truck access.*

3. *Public easements, tracts, or right-of-way shall provide paved pedestrian and bicycle access ways at least 6 feet wide where a cul-de-sac or dead-end street is planned, to connect the ends of the streets together, connect to other streets, or connect to other existing or planned developments in accordance with the standards of this Chapter, the TSP, the Engineering Design Manual or other provisions identified in this Code for the preservation of trees.*

RESPONSE: No cul-de-sac is being proposed with this development.

UPDATED RESPONSE: As noted in section 16.106.020(E), the applicant is requesting a modification of sections (1) and (3) of this section for the Southern extension of Laurelwood Way (fka Tonquin Ct.) to the South of the East-West Road.

F. *Grades and Curves - no change from previous approval.*

G. *Streets Adjacent to Railroads – no change from previous approval.*

H. *Buffering of Major Streets - no change from previous approval.*

I. *Median Islands - no change from previous approval.*

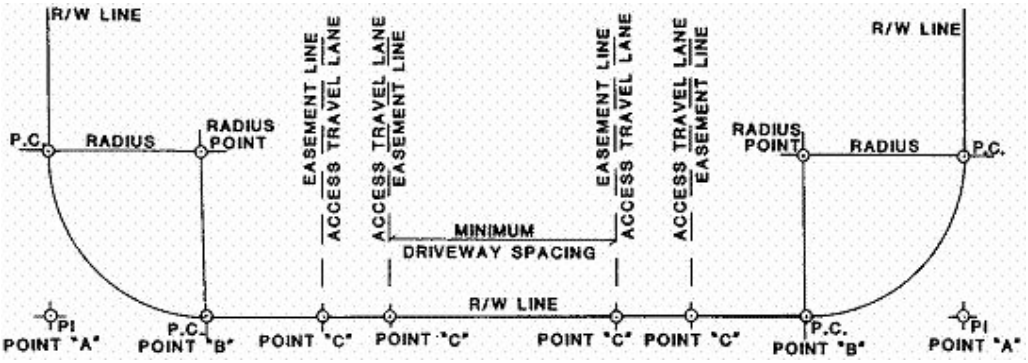
J. *Transit Facilities - no change from previous approval.*

K. *Traffic Controls - no change from previous approval.*

L. *Traffic Calming - no change from previous approval.*

M. *Vehicular Access Management*
All developments shall have legal access to a public road. Access onto public streets shall be permitted upon demonstration of compliance with the provisions of adopted street standards in the Engineering Design Manual.

1. *Measurement: See the following access diagram where R/W = Right-of-Way; and P.I. = Point-of-Intersection where P.I. shall be located based upon a 90 degree angle of intersection between ultimate right-of-way lines.*
   a. *Minimum right-of-way radius at intersections shall conform to City standards.*
   b. *All minimum distances stated in the following sections shall be governed by sight distance requirements according to the Engineering Design Manual.*
   c. *All minimum distances stated in the following sections shall be measured to the nearest easement line of the access or edge of travel lane of the access on both sides of the road.*
   d. *All minimum distances between accesses shall be measured from existing or approved accesses on both sides of the road.*
   e. *Minimum spacing between driveways shall be measured from Point "C" to Point "C" as shown below:*



2. *Roadway Access*
No use will be permitted to have direct access to a street or road except as specified below. Access spacing shall be measured from existing or approved accesses on either side of a street or road. The lowest functional classification street available to the legal lot, including alleys within a public easement, shall take precedence for new access points.

   a. *Local Streets:*
   Minimum right-of-way radius is fifteen (15) feet. Access will not be permitted within ten (10) feet of Point "B," if no radius exists, access will not be permitted within twenty-five (25) feet of Point "A." Access points near an intersection with a Neighborhood Route, Collector or Arterial shall be located beyond the influence of standing queues of the intersection in accordance with AASHTO standards. This requirement may result in access spacing greater than ten (10) feet.

   RESPONSE: Proposed access to future Tonquin Court will likely be located more than 50' from any other driveway on Tonquin Court.

   UPDATED RESPONSE: The East/West Road alignment, as it relates to the driveway location for the Oregon St. Business Park, is shown with a 20.6-foot offset. Per section 16.106.020(E), the applicant is requesting a modification to this criterion to allow the roadway and driveway to remain in the proposed locations.

   b. *Neighborhood Routes - N/A*

   c. *Collectors - N/A*

   d. *Arterials and Highway 99W - Points of ingress or egress to and from Highway 99W and arterials designated on the Transportation Plan Map, attached as Figure 1 of the Community Development Plan, Part II, shall be limited as follows:*

      1. *Single and two-family uses and manufactured homes on individual residential lots developed after the effective date of this Code shall not be granted permanent driveway ingress or egress from Highway 99W or arterials. If alternative public access is not available at the time of development, provisions shall be made for temporary access which shall be discontinued upon the availability of alternative access.*
      2. *Other private ingress or egress from Highway 99W and arterial roadways shall be minimized. Where alternatives to Highway 99W or arterials exist or are proposed, any new or altered uses developed after the effective date of this Code shall be required to use the alternative ingress and egress. Alternatives include shared or crossover access agreement between properties,*

consolidated access points, or frontage or backage roads. When alternatives do not exist, access shall comply with the following standards:

a. *Access to Highway 99W shall be consistent with ODOT standards and policies per OAR 734, Division 51, as follows: Direct access to an arterial or principal arterial will be permitted provided that Point 'A' of such access is more than six hundred (600) feet from any intersection Point 'A' or other access to that arterial (Point 'C').*

b. *The access to Highway 99W will be considered temporary until an alternative access to public right-of-ways is created. When the alternative access is available the temporary access to Highway 99W shall be closed.*

3. *All site plans for new development submitted to the City for approval after the effective date of this Code shall show ingress and egress from existing or planned local, neighborhood route or collector streets, including frontage or backage roads, consistent with the Transportation Plan Map and Chapter 6 of the Community Development Plan.*

RESPONSE: Temporary access to Oregon Street is being proposed until the city builds Ice Age Drive and Tonquin Court, at which point the Oregon Street access will be deconstructed, and driveways onto Ice Age Drive will be built. See attached TIA for additional information.

UPDATED RESPONSE: The previous response and approval is still applicable, except that the applicant is proposing to build Laurelwood Way (fka Tonquin Ct.). As noted previously in this document, the approved variance for single-access to the site is being requested to remain in place such that the approvals for the public improvements of Tonquin Court and East/West road do not impede the development timeline and commencement of construction.

Upon such time that Tonquin Court (aka Laurelwood Way) is constructed, the applicant understands that the Access Management Plan requires the temporary Oregon Street access to become a right-in/right-out access.

16.106.060 - Sidewalks

A. *Required Improvements*

1. *Except as otherwise provided, sidewalks shall be installed on both sides of a public street and in any special pedestrian way within new development.*
2. *For Highway 99W, arterials, or in special industrial districts, the City Manager or designee may approve a development without sidewalks if alternative pedestrian routes are available.*
3. *In the case of approved cul-de-sacs serving less than fifteen (15) dwelling units, sidewalks on one side only may be approved by the City Manager or designee.*

B. *Design Standards*

1. *Arterial and Collector Streets*
   Arterial and collector streets shall have minimum six (6) or eight (8) foot wide sidewalks/multi-use paths, located as required by this Code. Residential areas shall have a minimum of a six (6) foot wide sidewalk and commercial industrial areas shall have a minimum of an eight (8) foot wide sidewalk.

2. *Local Streets*
Local streets shall have minimum five (5) foot wide sidewalks, located as required by this Code.

RESPONSE: Future Tonquin Court and future Ice Age Drive dedication widths allow for sidewalks in conformance with the TSP for each respective road classification.

UPDATED RESPONSE: The previous response and approval remains applicable. The proposed right-of-way widths for the extension of Laurelwood Way (fka Tonquin Ct.) and the East/West Road will allow for the construction of sidewalks to satisfy the criteria within this section.

3. *Handicapped Ramps*
Sidewalk handicapped ramps shall be provided at all intersections.

RESPONSE: Noted. ADA ramps may also be provided where sidewalks cross driveways.

UPDATED RESPONSE: Noted, ADA ramps will be provided where sidewalks cross driveways.

C. *Pedestrian and Bicycle Paths – No change from previous approval.*

16.106.070 - Bike Lanes

If shown in Figure 13 of the Transportation System Plan, bicycle lanes shall be installed in public rights-of-way, in accordance with City specifications. Bike lanes shall be installed on both sides of designated roads, should be separated from the road by a twelve-inch stripe or other means approved by Engineering Staff, and should be a minimum of five (5) feet wide.

(Ord. No. 2014-012, § 3, 7-17-2014; Ord. No. 2011-011, § 1, 10-4-2011)

Editor's note— Ord. No. 2014-012, § 3, adopted July 17, 2014, amended the Code by repealing former § 16.106.070 in its entirety, and renumbering former § 16.106.080 as a new § 16.106.070. Former § 16.106.070 pertained to the Hwy. 99W Capacity Allocation Program (CAP), and derived from Ord. No. 2011-011, adopted October 4, 2011.

RESPONSE: Future Tonquin Court and future Ice Age Drive dedication widths allow for bike lanes in conformance with the TSP for each respective road classification.

UPDATED RESPONSE: Noted, all proposed right-of-way widths will allow for bike lanes in conformance with the TSP for each respective road classification.

16.106.080 - Traffic Impact Analysis (TIA)

A. *Purpose*
The purpose of this section is to implement Sections 660-012-0045(2)(b) and -0045(2)(e) of the State Transportation Planning Rule (TPR), which require the City to adopt performance standards and a process to apply conditions to land use proposals in order to minimize impacts on and protect transportation facilities. This section establishes requirements for when a traffic impact analysis (TIA) must be prepared and submitted; the analysis methods and content involved in a TIA; criteria used to review the TIA; and authority to attach conditions of approval to minimize the impacts of the proposal on transportation facilities.

This section refers to the TSP for performance standards for transportation facilities as well as for projects that may need to be constructed as mitigation measures for a proposal's projected impacts. This section also relies on the City's Engineering Design Manual to provide street design standards and construction specifications for improvements and projects that may be constructed as part of the proposal and mitigation measures approved for the proposal.

B. *Applicability*
A traffic impact analysis (TIA) shall be required to be submitted to the City with a land use application at the request of the City Engineer or if the proposal is expected to involve one (1) or more of the following:

1. *An amendment to the Sherwood Comprehensive Plan or zoning map.*
2. *A new direct property approach road to Highway 99W is proposed.*
3. *The proposed development generates fifty (50) or more PM peak-hour trips on Highway 99W, or one hundred (100) PM peak-hour trips on the local transportation system.*
4. *An increase in use of any adjacent street or direct property approach road to Highway 99W by ten (10) vehicles or more per day that exceed the twenty thousand-pound gross vehicle weight.*
5. *The location of an existing or proposed access driveway does not meet minimum spacing or sight distance requirements, or is located where vehicles entering or leaving the property are restricted, or such vehicles are likely to queue or hesitate at an approach or access connection, thereby creating a safety hazard.*
6. *A change in internal traffic patterns that may cause safety problems, such as back up onto the highway or traffic crashes in the approach area.*

RESPONSE: A traffic impact analysis has been provided as Appendix G.

UPDATED RESPONSE: The traffic impact analysis provided with the previous application is still applicable and has been included again in the appendix of this application. As noted above in this narrative, the previous variance to allow for an interim single access to the site is being requested to remain in place.

C. *Requirements – No change from previous approval.*

D. *Study Area - No change from previous approval.*

E. *Analysis Periods – No change from previous approval.*

F. *Approval Criteria – No change from previous approval.*

16.106.090 - Rough Proportionality – No change from previous approval.

Chapter 16.108 – Improvement Plan Review

No changes from previous approval.

Chapter 16.110 – Sanitary Sewers

No changes from previous approval, except that some on-site utilities along the South border of the development are not proposed to be public infrastructure within the East/West Road. This is depicted in the updated utility plans contained within this application. The remainder of the design intent is consistent with the previous approval.

Chapter 16.112 – Water Supply

No changes from previous approval, except that some on-site utilities along the South border of the development are not proposed to be public infrastructure within the East/West Road. This is depicted in the updated utility plans contained within this application. The remainder of the design intent is consistent with the previous approval.

Chapter 16.114 – Storm Water

16.114.010 - Required Improvements

Storm water facilities, including appropriate source control and conveyance facilities, shall be installed in new developments and shall connect to the existing downstream drainage systems consistent with the Comprehensive Plan and the requirements of the Clean Water Services water quality regulations contained in their Design and Construction Standards R&O 04-9, or its replacement.

(Ord. 2006-021; 2000-1092 § 3; 93-972)

(Note: Section 16.114.015, Street Systems Improvement Fees (SIF) was repealed by Ordinance 91-922 § 19) to be removed from the SZCDC and permanently located in the Municipal Code).

RESPONSE: Stormwater management will be provided in accordance with CWS standards. Water quality and flow control will be managed on site before being discharged to public conveyance system to Rock Creek.

UPDATED RESPONSE:

The stormwater management strategy for the on-site stormwater for the proposed Sherwood Commerce Center project is unchanged from the previous approval. The onsite stormwater will be managed with CWS Hydromodification requirements into the proposed public stormwater infrastructure. See plans for additional information.

The stormwater treatment for the entire length of Laurelwood Way (fka Tonquin Ct.) is being treated in a public stormwater treatment facility on the Polley property (our Neighbor to the West). More details of this arrangement are outlined in the Cooperative Development Agreement, included for reference in the appendix of this application.

For the East/West Road, the intent is to create a public stormwater treatment facility on the Applicant's property in the Southeast corner of the intersection of Laurelwood Way and East/West Road. This facility will provide stormwater management per CWS Hydromodification requirements. See the plans for additional information.

16.114.020 - Design Standards

A. *Capacity*
Storm water drainage systems shall be sized, constructed, located, and installed at standards consistent with this Code, the Storm Drainage Master Plan Map, attached as Exhibit E, Chapter 7 of the Community Development Plan, other applicable City standards, the Clean Water Services Design and Construction standards R&O 04-9 or its replacement, and hydrologic data and improvement plans submitted by the developer.

B. *On-Site Source Control*
Storm water detention and groundwater recharge improvements, including but not limited to such facilities as dry wells, detention ponds, and roof top ponds shall be constructed according to Clean Water Services Design and Construction Standards.

RESPONSE: Infiltration is a component of the onsite design. The tested rates are not enough to completely infiltrate onsite runoff per CWS requirements; however, infiltration is utilized to the maximum extent practicable.

C. *Conveyance System*
The size, capacity and location of storm water sewers and other storm water conveyance improvements shall be adequate to serve the development and accommodate upstream and downstream flow. If an upstream area discharges through the property proposed for development, the drainage system shall provide capacity to the receive storm water discharge from the upstream area. If downstream drainage systems are not sufficient to receive an increase in storm water caused by new development, provisions shall be made by the developer to increase the downstream capacity or to provide detention such that the new development will not increase the storm water caused by the new development.
(Ord. No. 2010-015, § 2, 10-5-2010; Ord. 2006-021; 2000-1092 § 3; 91-922; Ord. 86-851 § 3)

RESPONSE: The project proposes multiple storm mains that will drain runoff from sites adjacent to the subject site. This conveyance has been sized to convey the pre-developed discharge rate for a 25-yr rainfall event from each served lot.

16.114.030 - Service Availability

Approval of construction plans for new storm water drainage facilities pursuant to Chapter 16.106, and the issuance of building permits for new development to be served by existing storm water drainage systems shall include certification by the City that existing or proposed drainage facilities are adequate to serve the development.

(Ord. 86-851, § 3)

RESPONSE: Stormwater infrastructure does not exist for this site beyond native overland runoff. For this reason, the project proposes public stormwater infrastructure that will serve the subject (and adjoining) lots.

Chapter 16.116 – Fire Protection

No changes from previous approval, except that some on-site utilities along the South border of the development are not proposed to be public infrastructure within the East/West Road. This is depicted in the updated utility plans contained within this application. The remainder of the design intent is consistent with the previous approval.

Chapter 16.118 – Public and Private Utilities

Footnotes: --- (49) ---
Editor's note— Some sections may not contain a history.

16.118.010 - Purpose – No changes from previous approval.

16.118.020 - Standard

A. *Installation of utilities shall be provided in public utility easements and shall be sized, constructed, located and installed consistent with this Code, and applicable utility company and City standards.*
B. *Public utility easements shall be a minimum of eight (8) feet in width unless a reduced width is specifically exempted by the City Engineer. An eight-foot wide public utility easement (PUE) shall be provided on private property along all public street frontages. This standard does not apply to developments within the Old Town Overlay.*
C. *Where necessary, in the judgment of the City Manager or his designee, to provide for orderly development of adjacent properties, public and franchise utilities shall be extended through the site to the edge of adjacent property(ies).*
D. *Franchise utility conduits shall be installed per the utility design and specification standards of the utility agency.*
E. *Public Telecommunication conduits and appurtenances shall be installed per the City of Sherwood telecommunication design standards.*
F. *Exceptions: Installation shall not be required if the development does not require any other street improvements. In those instances, the developer shall pay a fee in lieu that will finance installation when street or utility improvements in that location occur.*
(Ord. No. 2018-007, § 2, 10-2-2018; Ord. No. 2009-005, § 2, 6-2-2009)

RESPONSE: 8' PUEs will be provided adjacent to all newly dedicated ROW. Additionally, an approximately 20' utility easement will be provided along the site's NW edge. This easement allows Sanitary and Storm service to reach future development to the north without having to disturb Oregon St.

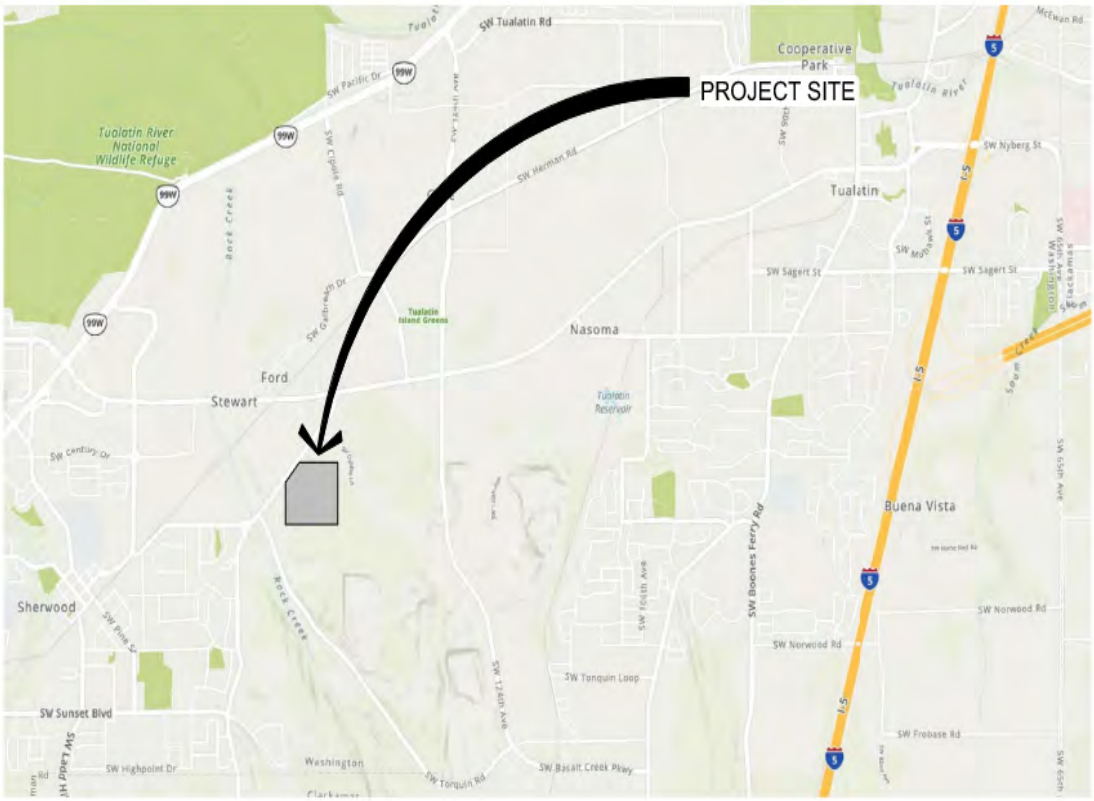
UPDATED RESPONSE: The applicant is proposing to provide an 8' PUE on only the South side of the East/West road. Given that the applicant can assist with coordinating the installation of all noted utilities during construction, and controls the property on both sides of this road, the intent of this request is to consolidate the utilities to one side to allow for more efficient use of the spaces for the on-site developments. Additionally, the retaining wall along the East side of Laurelwood Way (fka Tonquin Ct.) turns Eastward to border the East/West road, so this request helps the frontage to remain consistent with our previous approval along Tonquin Ct.

16.118.030 - Underground Facilities – No changes from previous approval.

16.118.040 - Exceptions – No changes from previous approval.

16.118.050 - Private Streets – No changes from previous approval.

APPENDIX A – VICINITY MAP



VICINITY MAP

APPENDIX B - NEIGHBORHOOD MEETING DOCUMENTATION

Affidavit of Mailing

DATE: 11-22-21

STATE OF OREGON)
)
Washington County)

I, Amy Tallent, representative for the Sherwood Commerce Center proposed development project do hereby certify that the attached notice to adjacent property owners and recognized neighborhood organizations that are within 1,000 feet of the subject project, was placed in a U.S. Postal receptacle on 8-29-22.

Amy Tallent

Representatives Name: Amy Tallent
Name of the Organization: VLMK Engineering + Design

VLMK ENGINEERING + DESIGN

MEETING NOTES

Project:	Sherwood Commerce Center Neighborhood Meeting	*Date:*	September 7, 2022
Project Number:	20210190	*Meeting Name:*	Neighborhood Meeting
Address:	21600 SW Oregon	*Client:*	Schnitzer Properties
Location:	Virtual (Microsoft Teams)		

These minutes reflect our understanding of the topics discussed during the Sherwood Commerce Center Neighborhood Meeting held at 12:00 pm via Microsoft Teams on Wednesday, September 7, 2022.

ATTENDEES AT MEETING

Please see attached Attendee Sheet.

SUMMARY OF MEETING

12:00 pm - Colby Anderson/VLMK, Jennifer Kimura/VLMK, Ryan Schera/Schnitzer Properties signed into the virtual Neighborhood Meeting via Microsoft Teams.

There were no other attendees or questions.

12:30 pm – Meeting adjourned.

NEIGHBORHOOD MEETING SIGN IN SHEET

Proposed Project: Sherwood Commerce Center

Proposed Project Location: 21600 SW Oregon

Project Contact: Colby Anderson/VLMK Engineering + Design

Meeting Location: Virtual - Teams Meeting/Call in

Meeting Date: 09/07/2022

Name	Address	E-Mail	Please identify yourself (check all that apply)			
			Resident	Property owner	Business owner	Other
Colby Anderson	3933 S Kelly Ave. Portland, OR 97239	colbya@vlmk.coom				X
Ryan Schera	1121 SW Salmon Street Portland, OR 97205	jonathans@vlmk.com		X		
Jennifer Kimura	3933 S Kelly Ave. Portland, OR 97239	jenniferk@vlmk.com				X

Exhibit A2

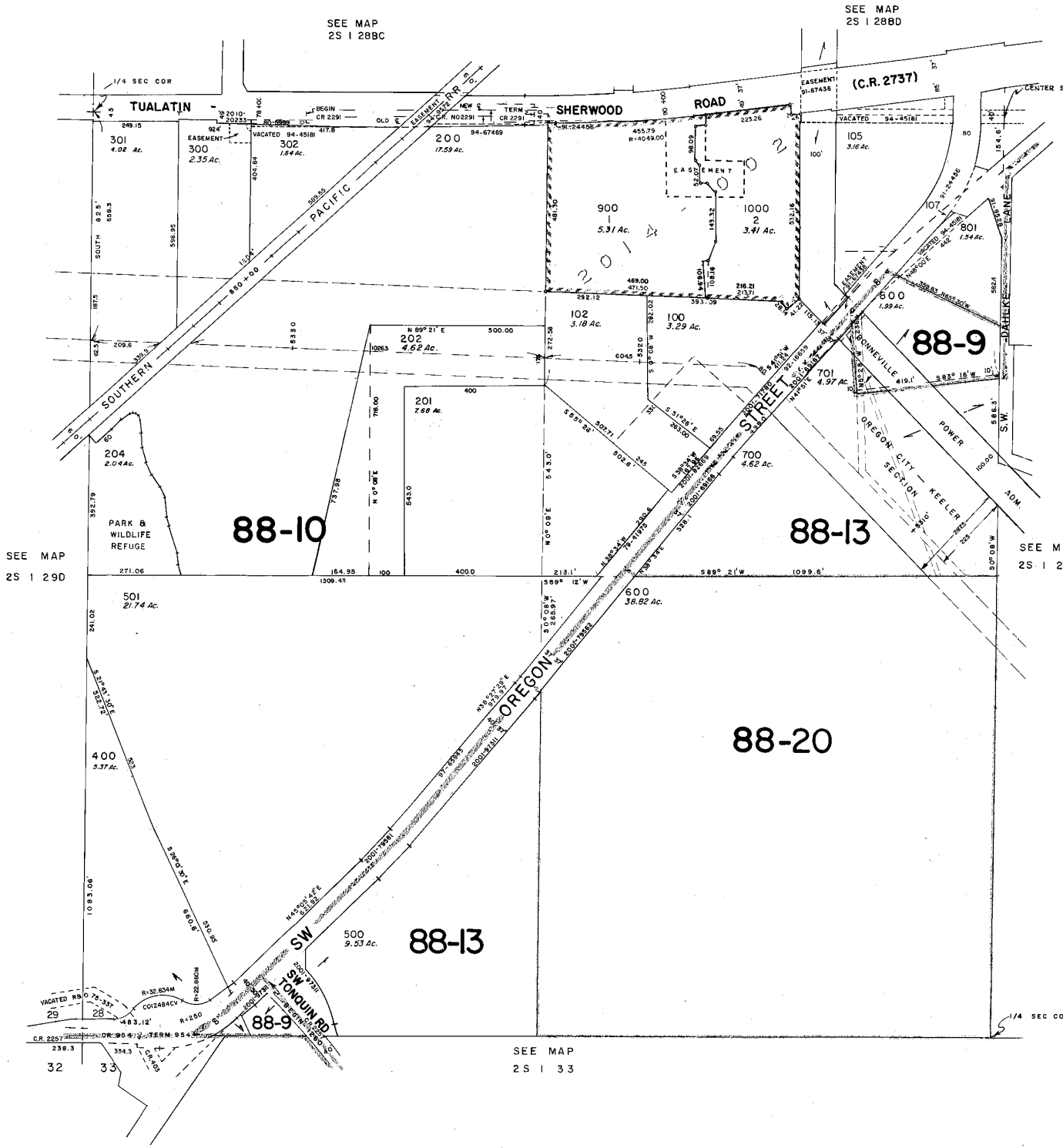
APPENDIX C – TAX MAP

SW1/4 SECTION 28 T2S R1W W.M.

WASHINGTON COUNTY OREGON

SCALE 1"=200'

2S 1 28C
Exhibit A2



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

SHERWOOD
2S 1 28C

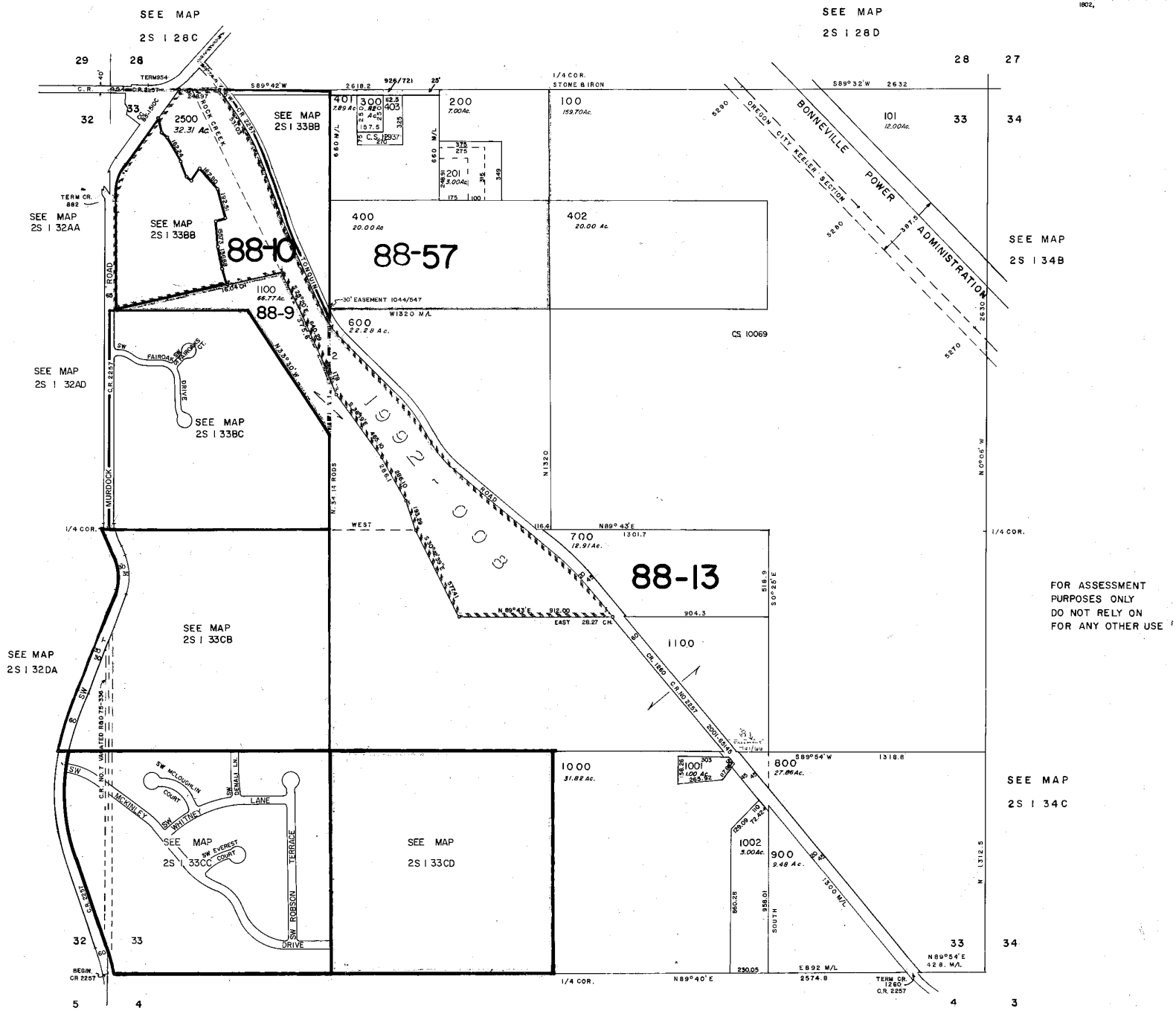
SECTION 33 T2S R1W W.M.

WASHINGTON COUNTY OREGON

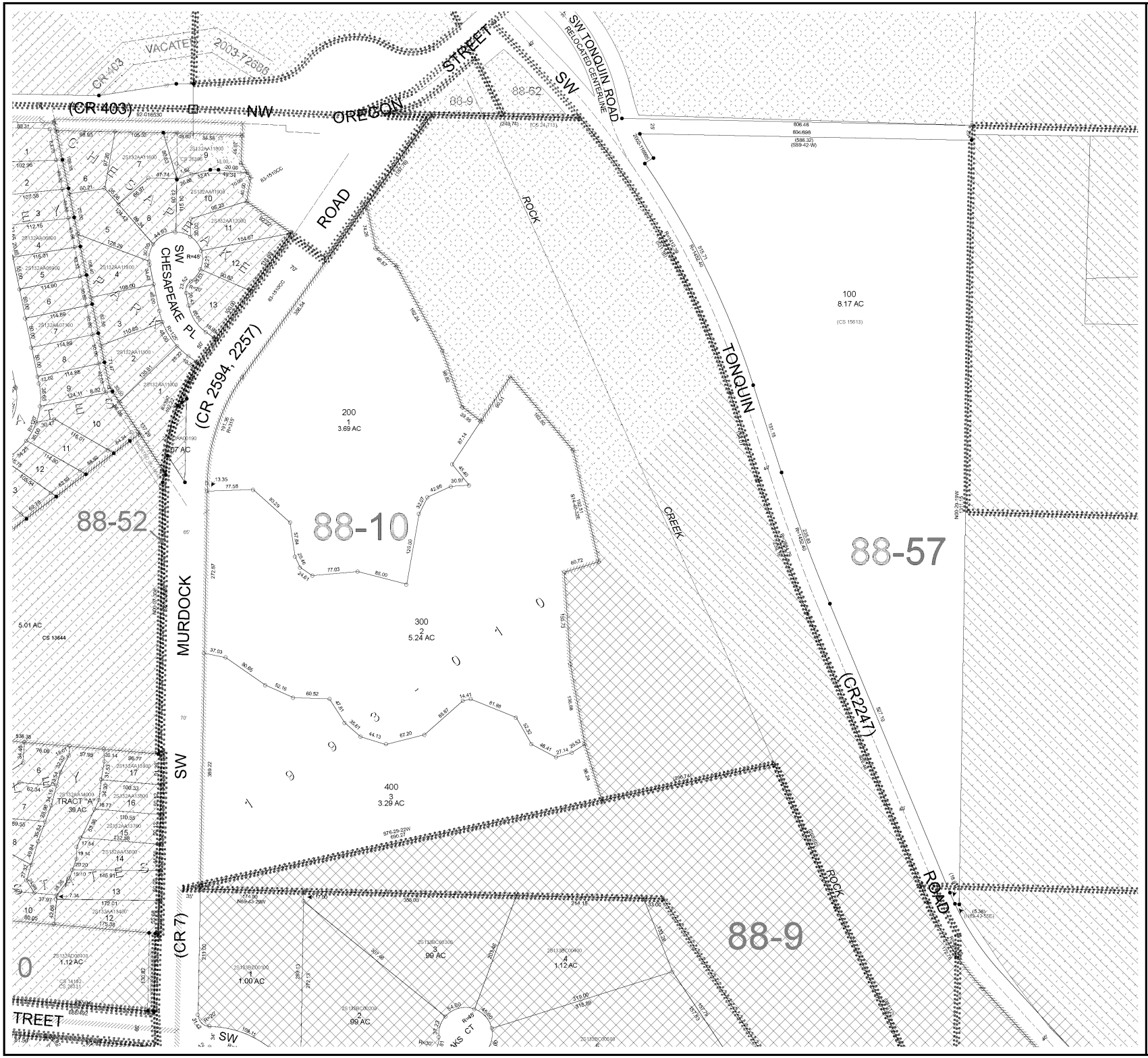
SCALE 1"=400'

2S 1 33
Exhibit A2
SHERWOOD

CANCELLED TAX LOTS
1700, 1400, 1500, 1801, 1800, 1601, 1602, 1603, 1604, 1900, 2000, 1200, 2300, 500, 2400, 2100, 2200, 1800, 2600, 2700, 1802,



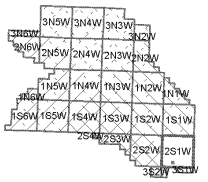
FOR ASSESSMENT PURPOSES ONLY
DO NOT RELY ON FOR ANY OTHER USE



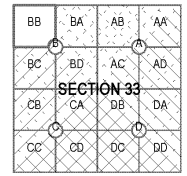
2S133BB

Exhibit A2

WASHINGTON COUNTY OREGON
NW 1/4 NW 1/4 SECTION 33 T2S R1W
SCALE 1"= 100'



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



FOR ADDITIONAL MAPS VISIT OUR WEBSITE AT
www.co.washington.or.us

Cancelled Taxlots For: 2S133BB
None

Feet
0 50 100 200 300

Assessment
CARTOGRAPHY
Taxation

PLOT DATE: 4/11/2022
Rotation: 0

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

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

SHERWOOD
2S133BB

APPENDIX D – PRELIMINARY DEVELOPMENT PLANS

SHERWOOD COMMERCE CENTER

PHASE 1

21600 SW OREGON ST.
SHERWOOD, OR

PLANNING AND ZONING SUMMARY

PROPERTY OWNER:	SCHNITZER PROPERTIES
APPLICANT:	VLMK ENGINEERING + DESIGN 3933 S KELLY AVE. PORTLAND, OR 97239
JURISDICTION:	CITY OF SHERWOOD
LAND USE ZONE:	EMPLOYMENT INDUSTRIAL (EI)
OVERLAY DISTRICTS:	NONE
NEIGHBORHOOD:	NONE
LEGAL DESCRIPTION:	R547475
TAX ACOUNT/PARCEL NUMBER:	2S128C000600
STREET ADDRESS AND CROSS...	21600 SW OREGON ST. SHERWOOD, OR 97140
SITE AREA:	38.82 ACRES
WETLANDS:	NONE
FLOODPLAIN:	NONE
OTHER:	NONE

AREA SUMMARY:

Description	Area			
Overall Site	1,688,458	sqft	38.76	Acres
ROW Dedication	168,146	sqft	3.86	Acres
Impact Area (NE Triangle)	21,306	sqft	0.49	Acres
Undeveloped Area	296,296	sqft	6.80	Acres
Development Area	1,202,710	sqft	27.61	Acres
Landscaping	194,675	sqft		16.19%
Sidewalks	40,285	sqft		3.35%
Concrete Aprons	72,756	sqft		6.05%
AC Paving (Approx.)	449,994	sqft		37.42%
Total Impervious	1,008,035	sqft		83.81%
Building A				
Building Area	106,600	sqft		
Parking Spaces	174	sp.	1.63	/1000 SF
Building B				
Building Area	166,400	sqft		
Parking Spaces	238	sp.	1.43	/1000 SF
Building C				
Building Area	172,000	sqft		
Parking Spaces	224	sp.	1.30	/1000 SF
Total Building Footage	445,000	sqft		
Site Coverage	37.0%			

CURRENT CODES

1)	BUILDING	2019 Oregon Structural Specialty Code (OSSC)
2)	MECHANICAL	2019 Oregon Mechanical Specialty Code (OMSC)
3)	ELECTRICAL	2017 Oregon Electrical Specialty Code (OESC)
4)	PLUMBING	2017 Oregon Plumbing Specialty Code (OPSC)
5)	FIRE	2019 Oregon Fire Code (OFC)
6)	ENERGY	2019 Oregon Zero Energy Ready Commercial Code (OZERCC)
7)	ADA	2010 Standards for Accessible Design
8)	N.F.P.A.	(NATIONAL FIRE PROTECTION AGENCY)

Owner:

Schnitzer Properties
1121 SW Salmon St. #500
Portland, OR 97205
Contact: Ryan Schera
Phone: 503.242.2900
Email: ryans@schnitzerproperties.com

Engineer:

VLMK Engineering + Design
3933 S Kelly Ave.
Portland, Oregon 97239
Contact: Colby Anderson
Phone: 971.254.8280
Email: colbya@vlmk.com

Jurisdiction:

City of Sherwood
22560 SW Pine St.
Sherwood, OR 97140
Contact: Eric Rutledge
Phone: 503.925.2308
Email: rutledgee@sherwoodoregon.gov

Geo Engineer:

GeoDesign Inc.
9450 SW Commerce Cirle, Ste 300
Wilsonville, OR 97070
Contact: Shawn Dimke, PE, GE
Phone: 360.693.8416
Email: Shawn.Dimke@nv5.com

Site Surveyor:

Terramark
8196 SW Hall Boulevard Suite #201
Beaverton, OR 97008
Contact: Michael Hoffmann
Phone: 503.860.2255
Email: mikeh@terramarking.com

Landscape Architect:

Otten Landscape Architects
3933 S Kelly Ave. Suite B
Portland, Oregon 97239
Contact: Erin Holsonback
Phone: 503.972.0311
Email: erin@ottenla.com

MEP

System Design Consultants
333 SE 2nd Ave.
Portland, OR 97214
Contact: John Rogers
Phone: 503.248.0227
Email: john@sdcpdx.com

VICINITY MAP

SCHEDULE OF DRAWINGS

SHEET	DRAWING NAME	CUP SUBMITTAL	CUP RESUBMITTAL
	DESCRIPTION OF SET		
	CURRENT REVISION		
	DATE	9/16/2022	10/11/2022
COVER			
LU1	COVER SHEET	N	R
GENERAL			
LU2	OVERALL SITE PLAN	N	R
LU3	EXISTING CONDITIONS PLAN		N
CIVIL - ONSITE			
C1.0	SITE GRADING PLAN - OVERALL	R	R
C1.1	SITE GRADING PLAN - NORTHWEST	R	X
C1.2	SITE GRADING PLAN - NORTHEAST	R	X
C1.3	SITE GRADING PLAN - SOUTHWEST	R	R
C1.4	SITE GRADING PLAN - SOUTHEAST	R	X
C2.0	SITE UTILITY PLAN - OVERALL	R	R
C2.1	SITE UTILITY PLAN - NORTHWEST	R	X
C2.2	SITE UTILITY PLAN - NORTHEAST	R	X
C2.3	SITE UTILITY PLAN - SOUTHWEST	R	R
C2.4	SITE UTILITY PLAN - SOUTHEAST	R	X
EROSION CONTROL PLANS			
C3.1	ESCP EXTG CONDTIONS & DEMO PLAN - NORTH		N
C3.2	ESCP EXTG CONDTIONS & DEMO PLAN - SOUTH		N
C3.3	ESCP EXTG CONDTIONS & DEMO PLAN - WEST		N
C3.4	ESCP PUBLIC UTILITIES		N
C3.5	ESCP PUBLIC UTILITIES - SOUTH		N
C3.6	ESCP PUBLIC UTILITIES - WEST		N
SURVEY			
1 OF 5	TOPOGRAPHIC SURVEY	X	X
2 OF 5	TOPOGRAPHIC SURVEY	X	X
3 OF 5	TOPOGRAPHIC SURVEY		X
4 OF 5	TOPOGRAPHIC SURVEY		X
5 OF 5	TOPOGRAPHIC SURVEY		X
LANDSCAPING			
L1.0	LANDSCAPE PLAN	X	X
L1.1	LANDSCAPE PLAN	X	X
L1.2	LANDSCAPE PLAN	X	X
L1.3	LANDSCAPE PLAN	X	X
L1.4	LANDSCAPE PLAN	X	X
L1.5	LANDSCAPE PLANT LIST	X	X
L2.0	DETAILS AND SPECS	X	X
ARCHITECTURAL			
A2.A0	BLDG A - BUILDING ELEVATIONS	R	X
A2.B0	BLDG B - BUILDING ELEVATIONS	R	X
A2.B1	BLDG B - BUILDING ELEVATIONS	R	X
A2.C0	BLDG C - BUILDING ELEVATIONS	R	X
A2.C1	BLDG C - BUILDING ELEVATIONS	R	X
CIVIL - OFFSITE			
2 OF 35	KEY PLAN AND LEGEND	N	R
4 OF 35	TYPICAL ROAD SECTIONS	N	R
5 OF 35	PLAN & PROFILE	N	R
6 OF 35	PLAN & PROFILE	N	R
7 OF 35	PLAN & PROFILE	N	R
8 OF 35	PLAN & PROFILE	N	R
9 OF 35	PLAN & PROFILE	N	R
10 OF 35	PLAN & PROFILE	N	R
11 OF 35	PLAN & PROFILE	N	R
12 OF 35	PLAN & PROFILE	N	R
13 OF 35	PLAN & PROFILE	N	R
14 OF 35	PLAN & PROFILE	N	R
15 OF 35	PLAN & PROFILE	N	R
16 OF 35	PLAN & PROFILE	N	R
17 OF 35	PLAN & PROFILE	N	R
18 OF 35	PLAN & PROFILE	N	R
19 OF 35	PLAN & PROFILE	N	R
20 OF 35	PLAN & PROFILE	N	R
21 OF 35	PLAN & PROFILE	N	R
22 OF 35	PLAN & PROFILE	N	R
23 OF 35	PLAN & PROFILE	N	R
24 OF 35	PLAN & PROFILE	N	R
25 OF 35	PLAN & PROFILE	N	R
26 OF 35	PLAN & PROFILE	N	R
27 OF 35	SIGNING AND STRIPING PLAN	N	R
	TOTAL	51	61

LEGEND

N	FIRST RELEASE DRAWING
	NOT ISSUED WITH SET
X	RE-ISSUED WITH NO CHANGES
R	REVISED DRAWING
D	DELETED DRAWING (NOT SHOWN)

PROJECT NARRATIVE

THIS PROJECT INCLUDES (3) NEW CONCRETE TILT-UP SHELL BUILDINGS DESIGNED FOR MULTIPLE TENTANTS EACH, AND WILL BRING STATE OF THE ART FACILITIES TO THE COMMUNITY FOR A LARGE RANGE OF BUSINESS ACTIVITIES. THE FACILITIES AND ASSOCIATED SITE WORK ARE DESIGNED TO ACCOMODATE A RANGE OF USERS, FROM SMALL BUSINESSES UP TO LARGER USERS.

Exhibit A2

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

Schnitzer PROPERTIES

PROJECT NAME
SHERWOOD COMMERCE CENTER
PHASE 1
21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY
NOT FOR CONSTRUCTION

DATE
OCTOBER 11, 2022

SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN: JAB	CHECKED: CGA

COVER SHEET

LU1

10/11/2022 3:33:53 PM

AREA SUMMARY:

Description	Area		
Overall Site	1,688,458	sqft	38.76 Acres
ROW Dedication	168,146	sqft	3.86 Acres
Impact Area (NE Triangle)	21,306	sqft	0.49 Acres
Undeveloped Area	296,296	sqft	6.80 Acres
Development Area	1,202,710	sqft	27.61 Acres
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Sidewalks	40,285	sqft	3.35%
Concrete Aprons	72,756	sqft	6.05%
AC Paving (Approx.)	449,994	sqft	37.42%
Total Impervious	1,008,035	sqft	83.81%
Building A			
Building Area	106,600	sqft	
Parking Spaces	174	sp.	1.63 /1000 SF
Building B			
Building Area	166,400	sqft	
Parking Spaces	238	sp.	1.43 /1000 SF
Building C			
Building Area	172,000	sqft	
Parking Spaces	224	sp.	1.30 /1000 SF
Total Building Footage	445,000	sqft	
Site Coverage	37.0%		

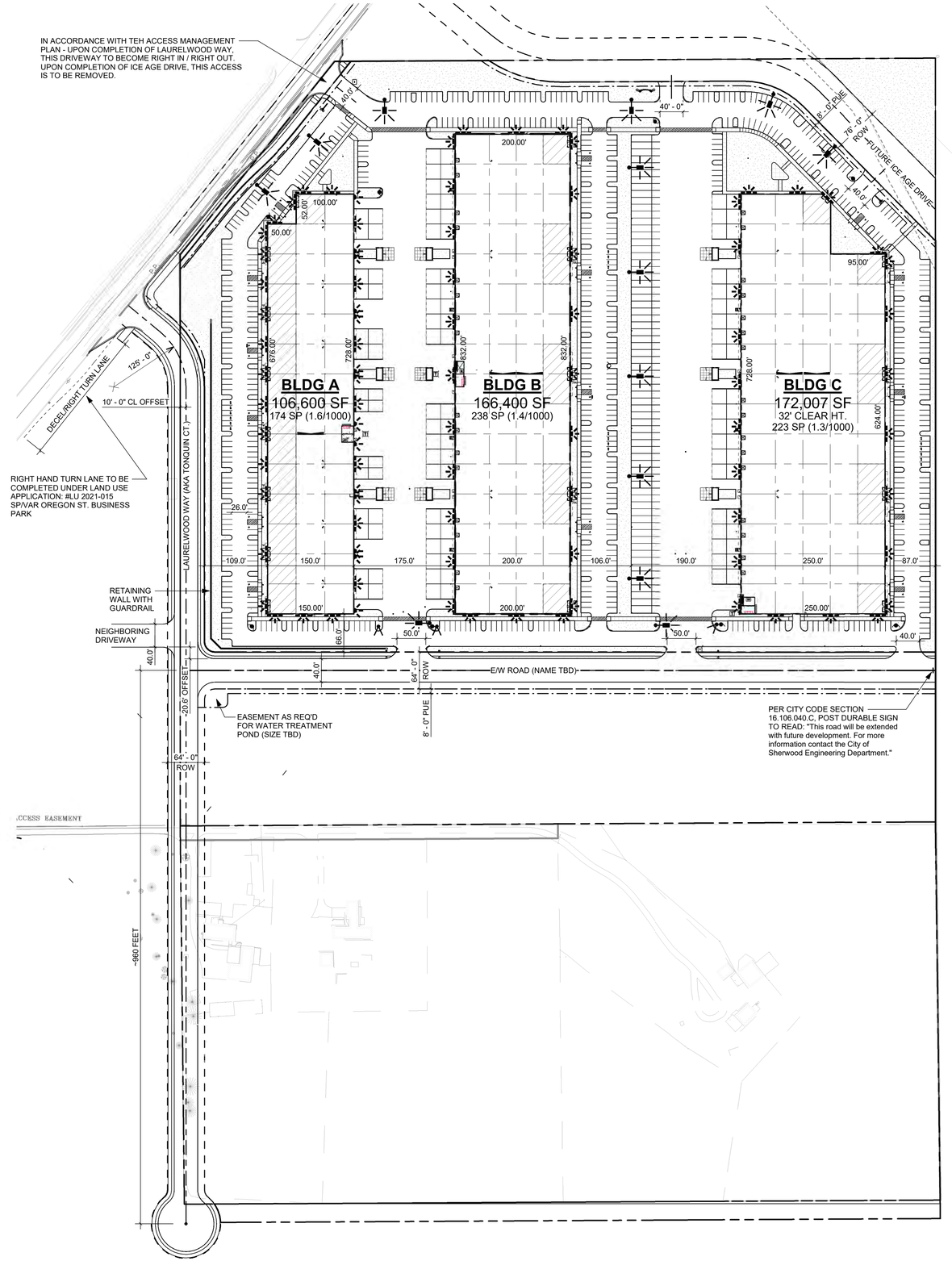
OFF-STREET PARKING CALCULATIONS

BUILDING	AREA (SQFT)		MINIMUM		MAXIMUM
BUILDING A	106,600				
INDUSTRIAL (ASSUMED 80%)	85,280	1 SPACE/ 625	136		NONE
WAREHOUSE (ASSUMED 20%)	21,320	0.3 SPACE/ 1,000	6	0.5 SPACE/ 1,000	11
BUILDING B	166,400				
INDUSTRIAL (ASSUMED 80%)	133,120	1 SPACE/ 625	213		NONE
WAREHOUSE (ASSUMED 20%)	33,280	0.3 SPACE/ 1,000	10	0.5 SPACE/ 1,000	17
BUILDING C	172,000				
INDUSTRIAL (ASSUMED 80%)	137,600	1 SPACE/ 625	220		NONE
WAREHOUSE (ASSUMED 20%)	34,400	0.3 SPACE/ 1,000	10	0.5 SPACE/ 1,000	17
TOTAL	445,000	MINIMUM REQ. =	596	MAX ALLOWED =	UNLIMITED
CODE SECTION:			TOTAL PROVIDED:		ADA PROVIDED:
16.94.020: TABLE 1 MIN. & MAX. PARKING STANDARDS			633		(11) ADA SPACES (2) VAN ACCESSIBLE SPACES

BICYCLE PARKING CALCULATIONS

16.94.020: TABLE 1 MIN. & MAX. PARKING STANDARDS — MIN. (1) SPACE PER TENANT PROPOSED

BICYCLE PARKING REQUIRED (1 PER 40 AUTO STALLS):	16
TOTAL SHORT-TERM BICYCLE PARKING :	30
TOTAL LONG-TERM BICYCLE PARKING :	24



A LU2 LAND USE MODIFICATION SITE PLAN
1" = 100'-0"

Exhibit A2

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REVISIONS

	DATE	DESCRIPTION

PRELIMINARY
NOT FOR CONSTRUCTION

DATE: OCTOBER 11, 2022	
SCALE: AS NOTED	PROJ. NO.: 20210190
DRAWN: CGA	CHECKED: CGA

LAND USE MODIFICATION SITE PLAN

LU2

10/11/2022 9:14:27 AM

A LU3 EXISTING CONDITIONS PLAN
1" = 100'-0"

Exhibit A2

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SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

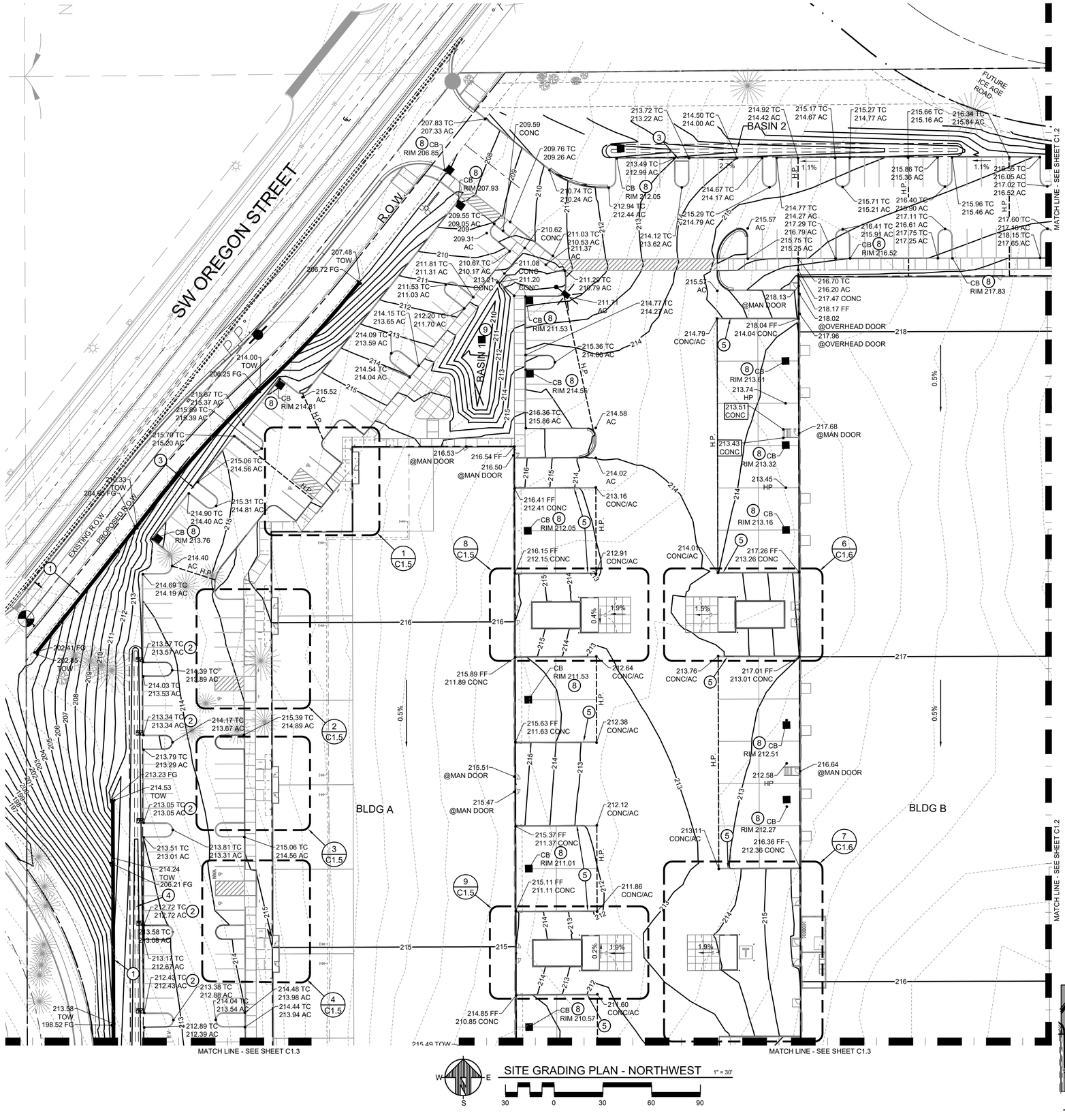
PRELIMINARY
NOT FOR CONSTRUCTION

DATE OCTOBER 11, 2022	
SCALE AS NOTED	PROJ. NO. 20210190
DRAWN CGA	CHECKED CGA

EXISTING CONDITIONS PLAN

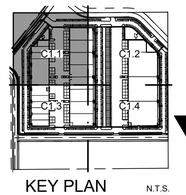
LU3

10/11/2022 9:14:41 AM



GRADING KEYNOTES (X)

1 RETAINING WALL - DESIGN BUILD BY OTHERS
2 LIDA SWALE CURB CUT OUTLET WITH RIP RAP
3 LANDSCAPE ISLAND CURB CUT
4 LIDA SWALE
5 DOCK WALL - SEE STRUCTURAL PLANS
8 CATCH BASIN - SEE UTILITY PLANS



KEY PLAN N.T.S.

G:\Acad\2021\20211019\0-Drawings\13 Onsite Civil Set Phase 1\100 C1.0 Grading Plan.dwg 7/18/2022 3:40 PM

Exhibit A2

VLMK
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3933 S Kelly Avenue
Portland, Oregon 97239
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Schnitzer PROPERTIES

PROJECT NAME
SHERWOOD COMMERCE CENTER

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY
NOT FOR CONSTRUCTION

DATE	SEPTEMBER 15, 2022
SCALE	AS NOTED
PROJ. NO.	20210190
DRAWN	CJM
CHECKED	JAB

SITE GRADING PLAN - NORTHWEST

C1.1

Exhibit A2

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Schnitzer PROPERTIES

PROJECT NAME
SHERWOOD COMMERCE CENTER

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

Δ	DATE	DESCRIPTION
	-	

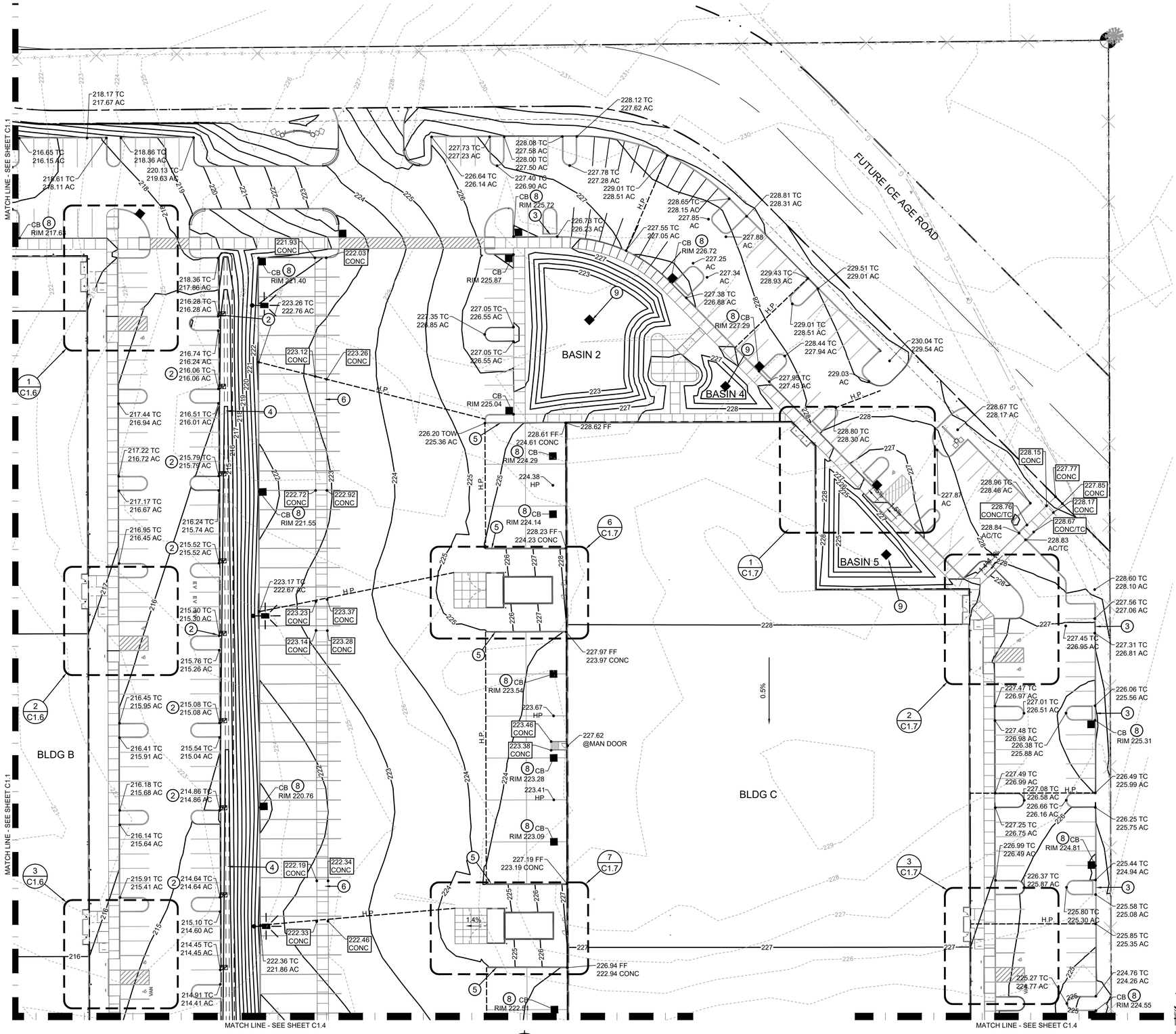
PRELIMINARY
NOT FOR CONSTRUCTION

DATE
SEPTEMBER 15, 2022

SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN	CHECKED
CJM	JAB

SITE GRADING PLAN - NORTHEAST

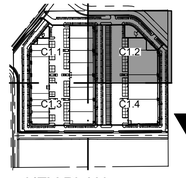
C1.2



GRADING KEYNOTES (X)

2 LIDA SWALE CURB CUT OUTLET WITH RIP RAP
3 LANDSCAPE ISLAND CURB CUT
4 LIDA SWALE
5 DOCK WALL - SEE STRUCTURAL PLANS
6 CONCRETE DOLLY PAD
8 CATCH BASIN - SEE UTILITY PLANS

W E S N
SITE GRADING PLAN - NORTHEAST 1" = 30'
30 0 30 60 90



KEY PLAN N.T.S.

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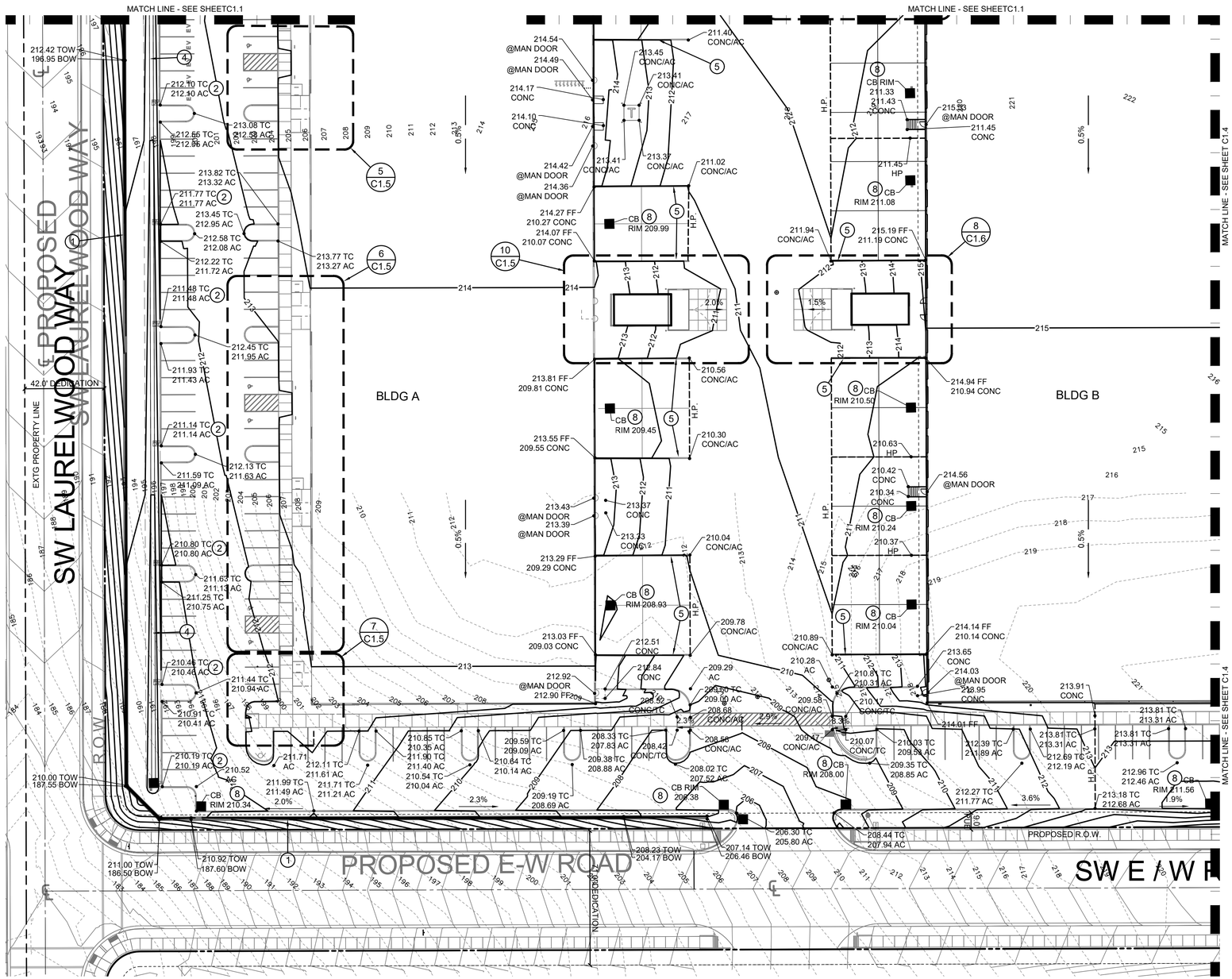
Exhibit A2

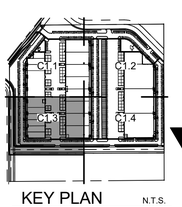


SITE GRADING PLAN - SOUTHWEST 1" = 30'

30 0 30 60 90

GRADING KEYNOTES (X)

1 RETAINING WALL - DESIGN BUILD BY OTHERS
2 CURB CUT OUT, PER CWS DETAIL 752
4 WATER QUALITY SWALE, PER CWS DETAIL 705 & 706
5 DOCK WALL - SEE STRUCTURAL PLANS
8 CATCH BASIN - SEE UTILITY PLANS



KEY PLAN N.T.S.

VLMK
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3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

Schnitzer PROPERTIES

PROJECT NAME
SHERWOOD COMMERCE CENTER PHASE 1

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY NOT FOR CONSTRUCTION

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SITE GRADING PLAN - SOUTHWEST

C1.3

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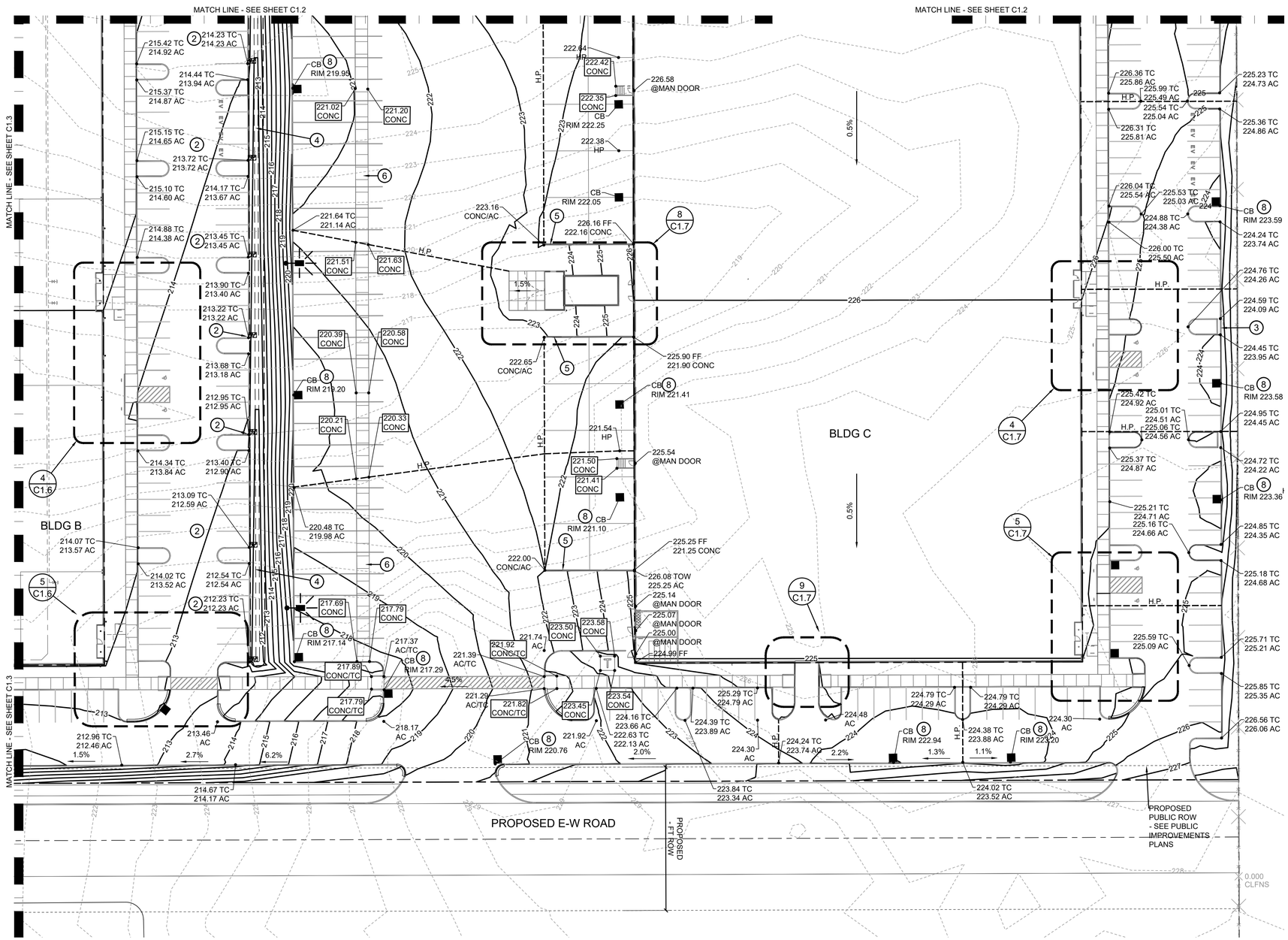
Exhibit A2

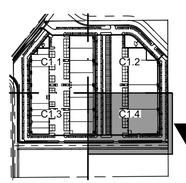


SITE GRADING PLAN - SOUTHEAST 1" = 30'

30 0 30 60 90

GRADING KEYNOTES (X)

2 LIDA SWALE CURB CUT OUTLET WITH RIP RAP
3 LANDSCAPE ISLAND CURB CUT
4 LIDA SWALE
5 DOCK WALL - SEE STRUCTURAL PLANS
8 CATCH BASIN - SEE UTILITY PLANS



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SITE GRADING PLAN - SOUTHEAST

C1.4

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Exhibit A2

UTILITY NOTES

1. ATTENTION EXCAVATORS: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 811 OR 1-800-332-2344. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CALL CENTER. YOU MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 811 OR 1-800-332-2344.
2. THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED OR INSTALLATION OF THE UTILITIES SHOWN. THE DRAWINGS DO NOT DEPICT EVERY DIMENSION, COMPONENT PIECE, SECTION, JOINT OR FITTING REQUIRED TO COMPLETE THE PROJECT. ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH EXISTING CONDITIONS IN THE FIELD BEFORE BEGINNING CONSTRUCTION. EXISTING UNDERGROUND UTILITIES LAYING WITHIN THE LIMITS OF EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING, PROVIDING SUCH IS PERMITTED BY LOCAL PUBLIC AUTHORITIES WITH JURISDICTION, BEFORE BEGINNING CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES.
3. BEDDING AND PIPE ZONE BACKFILL SHALL BE PER "PIPE TRENCH EMBEDMENT" DETAIL, SHEET C2.6
4. CONTRACTORS SHALL CONTACT CITY OF SHERWOOD ENGINEERING DEPARTMENT AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL (503) 925-2309.
5. THE MINIMUM HORIZONTAL SEPARATION BETWEEN SEWER LINES & PUBLIC WATER LINES SHALL BE 10-FT.
6. EXCAVATED SEWER TRENCH SPOIL MATERIAL SHALL BE TESTED AND LEGALLY DISPOSED OF AT A PROPER LANDFILL OR OTHER APPROPRIATE LOCATION.
7. ALL SEWER TRENCH LINES AND EXCAVATIONS SHALL BE PROPERLY SHORED AND BRACED TO PREVENT CAVING. UNUSUALLY DEEP EXCAVATIONS MAY REQUIRE EXTRA SHORING AND BRACING. ALL SHEETING, SHORING, AND BRACING OF TRENCHES SHALL CONFORM TO OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION (OSHA) REGULATIONS AND THE CITY OF SHERWOOD STANDARD CONSTRUCTION SPECIFICATIONS.
8. CONTRACTOR SHALL NOTIFY AND COORDINATE WITH PRIVATE UTILITIES FOR RELOCATION OF CONDUITS, POWER POLES, VAULTS, PEDESTALS, ETC.
9. ALL EXISTING FACILITIES SHALL BE MAINTAINED BY THE CONTRACTOR UNLESS OTHERWISE SHOWN OR DIRECTED. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO SUPPORT, MAINTAIN, OR OTHERWISE PROTECT EXISTING UTILITIES AND OTHER FACILITIES AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL LEAVE EXISTING FACILITIES IN AN EQUAL OR BETTER-THAN-ORIGINAL CONDITION.
10. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATION, SIZE & DEPTH OF EXISTING UTILITIES. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
11. ALL SANITARY DRAINAGE, RAIN DRAIN AND STORM SEWER PIPING INSTALLED WITHIN 5-FT OF THE OUTSIDE OF THE BUILDING SHALL BE CAST IRON, SCHEDULE 40 ABS-D.W.V., SCHEDULE 40 PVC-D.W.V. OR OTHER MATERIAL AS APPROVED BY THE OREGON AMENDMENTS TO THE UNIFORM PLUMBING CODE.
12. HORIZONTAL STORM AND SANITARY DRAINAGE PIPE SHALL BE PROVIDED WITH A CLEANOUT AT ITS UPPER TERMINAL AND EACH RUN OF PIPING, WHICH IS MORE THAN 100 FOOT IN TOTAL DEVELOPED LENGTH, SHALL BE PROVIDED WITH A CLEANOUT FOR EACH 100 FOOT, OR FRACTION THEREOF, IN LENGTH OF SUCH PIPING. AN ADDITIONAL CLEANOUT SHALL BE PROVIDED FOR EACH AGGREGATE HORIZONTAL CHANGE OF DIRECTION EXCEEDING 135 DEGREES. THE MAXIMUM DISTANCE ALLOWED BETWEEN MANHOLES IS 300 FEET. ALL REQUIRED CLEANOUTS MAY NOT BE LOCATED ON PLAN.
13. PRIVATE SANITARY SEWER LINES, DENOTED "SAN" OR "SA", SHALL BE PVC 3034 OR APPROVED EQUAL IN ACCORDANCE WITH PROJECT SPECIFICATIONS. USE PVC C900 OR CL52 DIP WHERE COVER IS LESS THAN 15-INCHES FROM PIPE CROWN TO PAVED SURFACE. NOTE: ALL SANITARY PIPING WITHIN 5-FT OF AN EXTERIOR BUILDING WALL SHALL BE SCHEDULE 40 PVC OR OTHER PER APPROVED MATERIALS PER THE UNIFORM PLUMBING CODE.
14. PRIVATE STORM SEWER LINES, DENOTED "STM" OR "ST", SHALL BE PVC 3034, PVC C900, PVC C905, HDPE, CL52 DIP OR APPROVED EQUIVALENT, UNLESS OTHERWISE NOTED. ALL STORM PIPING SHOWN HAS BEEN SIZED FOR A MANNING'S "N" VALUE = 0.013 AND PIPE INVERTS HAVE BEEN DESIGNED USING CONCENTRIC PIPE TO PIPE AND WYE FITTINGS, UNLESS OTHERWISE NOTED.
15. ALL STORM LATERALS SHALL HAVE #10 GAUGE COPPER WIRE OR TRACER TAPE AT 1.5-FT TO 2.0-FT ABOVE THE LATERAL.
16. ALL DOMESTIC (POTABLE) WATER SERVICE LINES OUTSIDE OF THE BUILDING DENOTED "DW" SHALL BE SCHEDULE 40 PVC OR PVC C900 CL150 UNLESS OTHERWISE NOTED. FIRE WATER SERVICE LINES OUTSIDE OF THE BUILDING DENOTED, "FW", "FDC" SHALL BE PVC C900 CL150 UNLESS OTHERWISE NOTED.
17. CONCRETE THRUST BLOCKING AND/OR MECHANICAL RESTRAINTS ("MEGA-LUG" OR EQUIVALENT) SHALL BE PROVIDED AT ALL WATERLINE FITTINGS AS REQUIRED BY THE CITY OF SHERWOOD. BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH AND CLEAR OF JOINT ACCESSORIES. BEARING AREA OF THRUST BLOCK SHALL BE COMPUTED ON THE BASIS OF ALLOWABLE SOIL BEARING PRESSURE. SEE DETAIL SHEET G____.
18. MINIMUM COVER OVER WATERLINES IS TO BE 36 INCHES AS MEASURED FROM FINISH GRADE TO TOP OF PIPE. MINIMUM VERTICAL SEPARATION BETWEEN WATERLINE AND SANITARY SEWER AT A CROSSING IS 18 INCHES. SANITARY SEWER AT WATERLINE CROSSINGS WITH LESS THAN THE MINIMUM VERTICAL SEPARATION SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH WATERTIGHT JOINTS. IN SUCH CASES THE 18-FOOT LENGTH OF SANITARY SEWER SHALL BE CENTERED AT THE CROSSING.
19. PRIOR TO BEING PLACED IN SERVICE, THE WATERLINE AND SERVICES SHALL BE FLUSHED, STERILIZED, AND RE-FLUSHED, ALL IN ACCORDANCE WITH THE CITY OF SHERWOOD "PUBLIC WORKS CONSTRUCTION CODE." CITY CREWS WILL TAKE BACTERIOLOGICAL TESTS WHEN SO REQUESTED BY THE CONTRACTOR INSTALLING WATER MAINS. THE REQUEST FOR THESE TESTS SHALL BE MADE THROUGH THE CITY INSPECTOR.
20. PRIOR TO CONSTRUCTION, ALL ON-SITE FIRE WATER SYSTEM LINE SIZES, METER SIZES, DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) SIZES, AND OTHER APPURTENANCES SHOWN ON THE UTILITY PLAN SHALL BE VERIFIED BY THE FIRE PROTECTION ENGINEER FOR THE PROJECT. ANALYSIS OF THE SYSTEM SHALL BE FROM THE NEW FACILITY SERVICE TO THE POINT OF CONNECTION WITH THE PUBLIC WATER SYSTEM. THE MAKES AND MODELS OF ALL SYSTEM COMPONENTS SHALL BE ACCEPTABLE PER WATER DISTRICT LIST OF APPROVED COMPONENTS.

STORMWATER NARRATIVE

STORMWATER MANAGEMENT FOR THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE CURRENT CITY OF SHERWOOD STANDARDS AND CLEAN WATER SERVICES (CWS) "DESIGN & CONSTRUCTION STANDARDS FOR SANITARY SEWER AND SURFACE WATER MANAGEMENT", DATED DECEMBER 2019.

PER CWS HYDRO-MODIFICATION STANDARDS, THIS PROJECT IS CLASSIFIED AS CATEGORY 3 AS IT IS A "LARGE PROJECT" (>80,000SF) AND IT IS LOCATED WITHIN AN "EXPANSION" AREA.

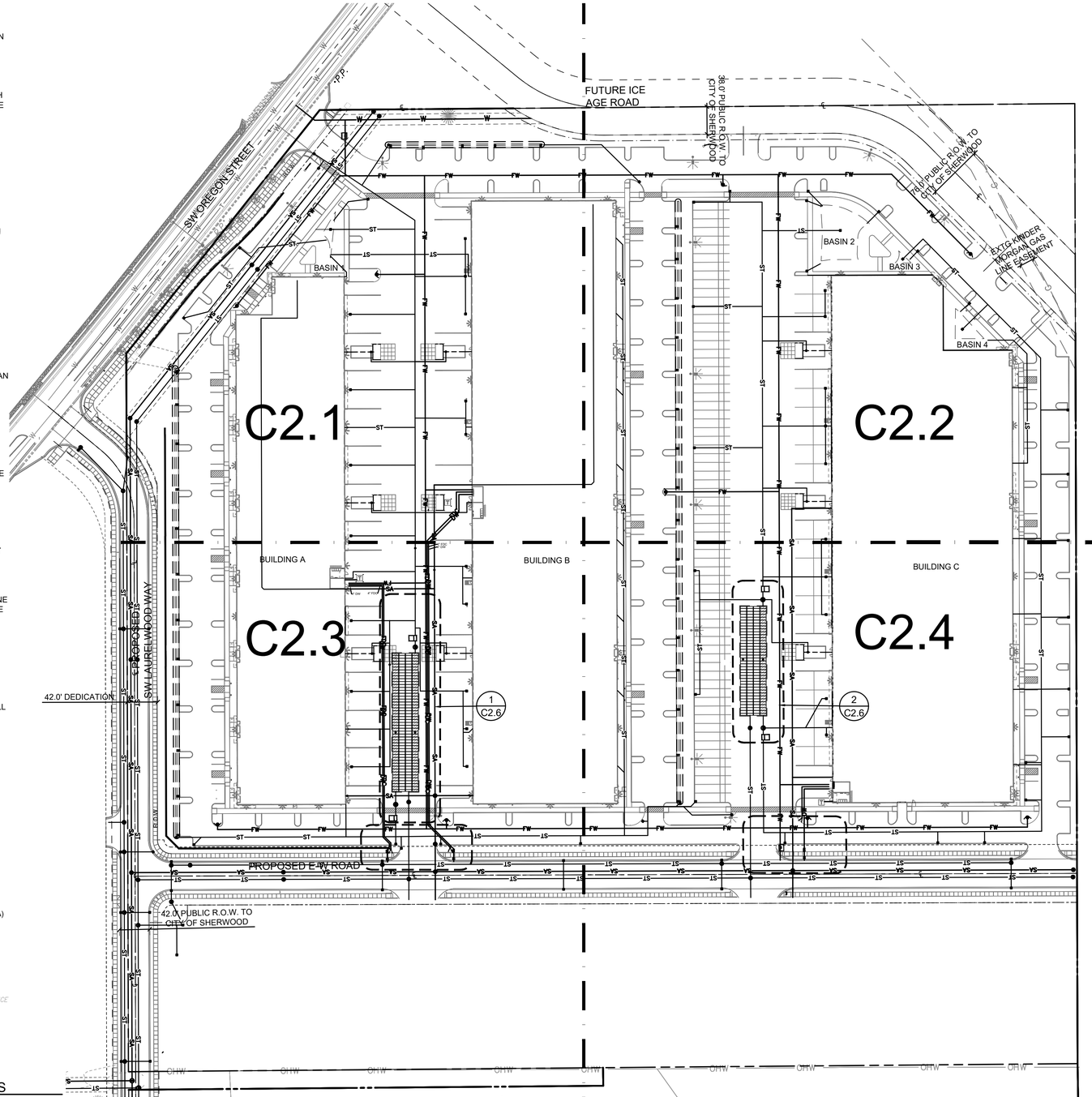
THIS PROJECT WILL BE SATISFYING THE HYDROMODIFICATION REQUIREMENTS BY ADDRESSING OPTION (1.) - PEAK-FLOW MATCHING DETENTION AND PROVIDING LIDA FACILITIES.

- THIS PROJECT HAS BEEN DESIGNED TO TREAT 33% OF THE IMPERVIOUS AREA USING A COMBINATION OF LIDA FACILITIES INCLUDING STRUCTURAL FLOW-THROUGH PLANTERS, NON-STRUCTURAL FLOW-THROUGH RAIN GARDENS, AND VEGETATED SWALES.
- THE DESIGN 100-YEAR STORM EVENT WATER ELEVATION REMAINS WITHIN THE TOP ROCK LAYER OF THE UNDERGROUND DETENTION FACILITY.

ONSITE STORMWATER RUNOFF WILL BE COLLECTED AT VARIOUS CATCH BASINS, ROOF DRAINS, AND/OR RAIN GARDENS LOCATED THROUGHOUT THE PROPERTY. ALL RUNOFF IS THEN CONVEYED THROUGH PRETREATMENT SUMPED SEDIMENT MANHOLES, THEN INTO A BAYFILTE FILTER TREATMENT VAULT, PRIOR TO ENTERING ONE OF THE TWO STORMTECH UNDERGROUND CHAMBER INFILTRATION/RETENTION FACILITIES. DISCHARGE FROM THESE SYSTEMS IS INTO LATERALS CONNECTED TO THE PUBLIC STORM MAINS LOCATED IN THE PUBLIC RIGHT-OF-WAY. ULTIMATE DISCHARGE IS TO ROCK CREEK.

THE WATER QUALITY TREATMENT BMP DESIGNS COMPLY WITH CHAPTER 4.04 "WATER QUALITY TREATMENT REQUIREMENTS," AND 4.05 "LOW IMPACT DEVELOPMENT APPROACH (LIDA) REQUIREMENTS".

SEE STORMWATER REPORT FOR SPECIFIC DESIGNS OF THESE PROPOSED PRIVATE STORMWATER FACILITIES.



SURVEY LEGEND (EXISTING):

B.D.	BRASS DISK		CURB INLET
(C)	CALCULATED DATA		WIRE/CHAIN LINK FENCE
C.L.	CENTER LINE		WOOD FENCE
C.L.F.	CHAIN LINK FENCE		LIGHT POLE
C.M.H.	COMMUNICATIONS MANHOLE	OHW	OVERHEAD WIRE
C.T.	CONIFEROUS TREE	ST	STORMWATER
D.T.	DECIDUOUS TREE	W	WATER
FD.	FOUND		
I.P.	IRON PIPE		
I.R.	IRON ROD		
(M)	MEASURED DATA		
MON.SN.	MONUMENT SIGN		
P.L.	PROPERTY LINE		
P.P.	POWER POLE		
(R1)	USBT 2019-001		
(R2)	USBT 2011-039		
(R3)	USBT 2002-062		
(R4)	USBT 2002-010		
(R5)	USBT BK. 7, PG.'S 21-22		
(R6)	USBT BK. 5, PG. 95		
(R7)	USBT BK. 2, PG. 104		
(R8)	SN 13413		
(R9)	SN 29428		
(R10)	SN 24713		
(R11)	SN 19375		
(R12)	SN 18368		
(R13)	SN 12936		
(R14)	SN 10069		
(R15)	SN 5897		
(R16)	SN 5180		
S.D.M.H.	STORM DRAIN MANHOLE		
T.PED.	TELEPHONE PEDESTAL		
WR.F.	WIRE FENCE		
Y.P.C.	YELLOW PLASTIC CAP		
	BLOCK/CONCRETE WALL		
	CONCRETE		
	ASPHALTIC CONCRETE		
	BUILDING LINE		

GENERAL SYMBOLS

NEW.

- CATCH BASIN (CB) -OR- AREA DRAIN (AD)
- MANHOLE (MH)
- UTILITY POLE
- FIRE HYDRANT (FH)
- METER
- UTILITY VAULT
- TRANSFORMER
- VALVE BOX COVER
- POST INDICATOR VALVE
- LIGHT POLE
- WALL MOUNTED LIGHT
- FIRE DEPARTMENT CONNECTION (FDC)
- GATE VALVE
- CHECK VALVE
- CLEAN OUT (CO)

UTILITY SYMBOLS

SA	SANITARY - EXISTING
SA	SANITARY - NEW
ST	STORM - EXIST
ST	STORM - NEW
G	GAS - EXISTING
G	GAS - NEW
T	TELEPHONE - EXISTING
T	TELEPHONE - NEW
E	ELECTRICAL - EXISTING
E	ELECTRICAL - NEW
W	WATER - EXISTING
W	WATER - NEW
DW	DOMESTIC WATER - NEW
FW	FIRE WATER - NEW
FDC	FDC SERVICE LINE - NEW

ABBREVIATIONS

CB	CATCH BASIN
CIP	CORRUGATED IRON PIPE
C.O.	CLEAN OUT
CONC	CONCRETE
DC	DOUBLE CHECK VALVE
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
DIP	DUCTILE IRON PIPE
DW	DOMESTIC WATER
FDC	FIRE DEPARTMENT CONNECTION
FW	FIRE WATER
HDPE	HIGH-DENSITY POLYETHYLENE
PVC	POLYVINYL CHLORIDE
PVC C900	HIGH PRESSURE RATED PVC
SAN	SANITARY
STM	STORM

W E S

SITE UTILITY PLAN - OVERALL

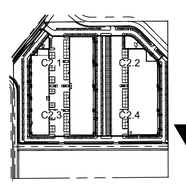
1" = 60'

60 0 60 120 180

SITE INFORMATION

SURVEY INFORMATION FROM TOPOGRAPHIC SURVEY OF LOT 600 AND LOT 200, WASHINGTON COUNTY MAP 2S128C0. LOCATED IN SW 1/4 SEC. 28, T.2S., R.1W., W.M, CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON. PROVIDED BY: TERRAMARK . (ADDRESS: 8196 SW Hall Boulevard, Suite #201, Beaverton, Oregon 97008, PHONE: 503-860-2255, JOB #:20204194)

BENCHMARK:
ELEVATIONS SHOWN HEREON ARE BASED ON WASHINGTON COUNTY BENCHMARK NO. 962, WHICH BEARS AN ELEVATION OF 189.81 ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONTOURS ARE SHOWN AT 1' INTERVALS.



KEY PLAN N.T.S.

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(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

Dig Safely.

Call the Oregon One-Call Center
DIAL 811 or 1-800-332-2344

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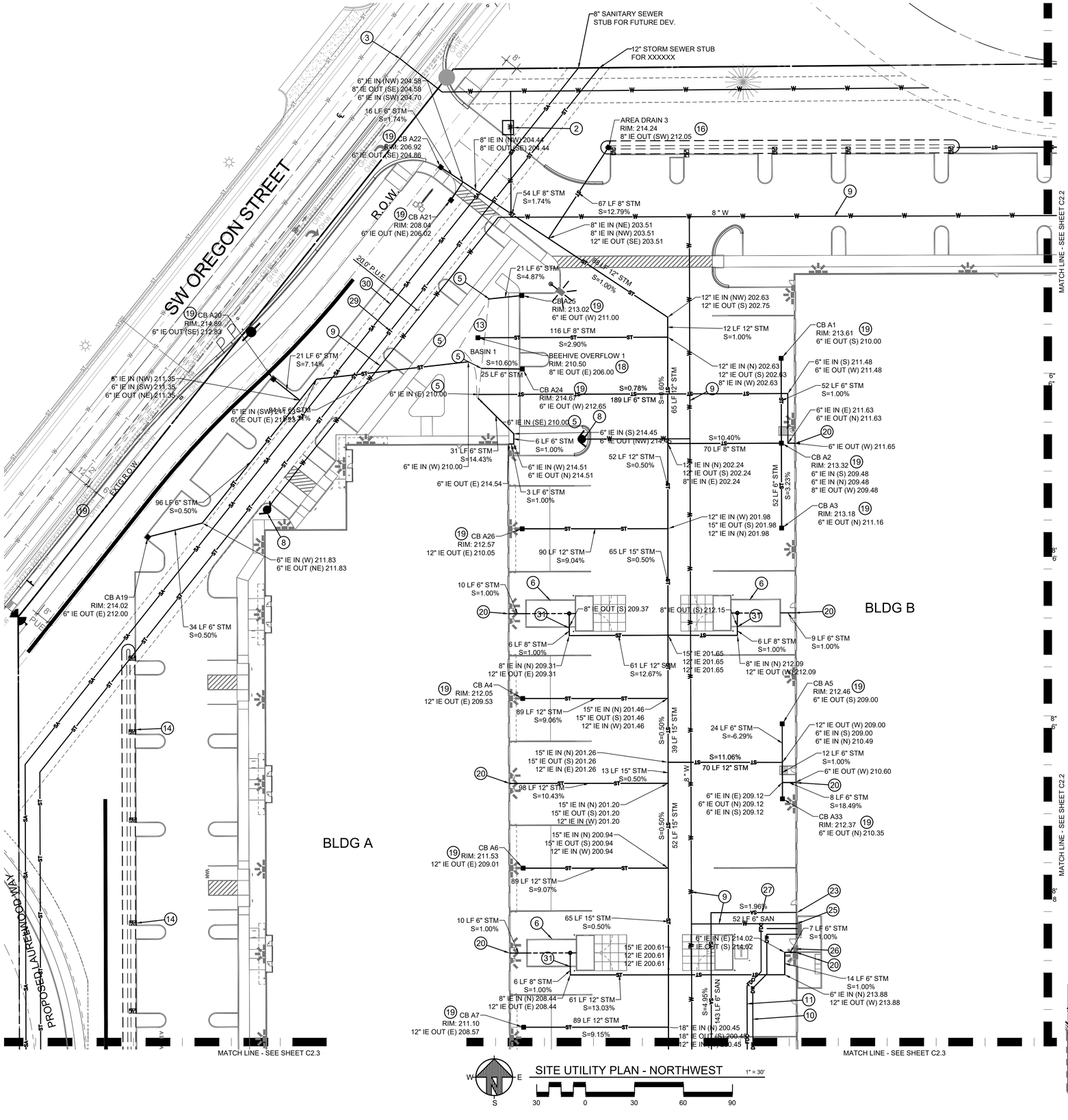
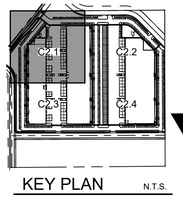
SITE UTILITY PLAN - OVERALL

C2.0



UTILITY NOTES (X)

2 8"DCDA PER DETAIL 6, SHEET C2.5
3 8" DCDA CONNECT TO EXISTING 8" WATER SERVICE
4 1-1/2" BACKFLOW ASSEMBLY PER DETAIL W-78, SHEET C2.7
5 OUTFALL TO RAIN GARDEN WITH RIP RAP PAD
8 6" FIRE HYDRANT PER DETAIL W-21, SHEET C2.7
9 8" FIRE LINE
10 1-1/2" DOMESTIC WATER LINE
11 4" FDC LINE
13 NON-STRUCTURAL FLOW THROUGH PLANTER (RAIN GARDEN) PER CWS DETAIL 735, SHEET C2.4
14 LIDA SWALE CURB CUT WITH RIP RAP
18 BEEHIVE OVERFLOW INLET PER CWS DETAIL 405, SHEET C2.4
19 JENSEN STYLE CATCH BASIN WITH GRATED LID PER DETAIL
20 DOWNSPOUT CONNECTION. SEE PUMBING SHEETS FOR DETAIL.
22 AREA DRAIN II, PER CWS DETAIL 380
23 SANITARY SEWER BUILDING POINT OF CONNECTION. COORDINATE WITH PLUMBING PLANS.
25 FIRE WATER LINE BUILDING CONNECTION
26 TRANSFORMER CONNECTION, COORDINATE WITH MEP PLANS.
27 8" SANITARY SEWER LINE
29 PUBLIC SANITARY SEWER LINE (SEE PUBLIC WORKS PLANS)
30 PUBLIC STORM LINE (SEE PUBLIC WORKS PLANS)
31 FLOW THROUGH PLANTER CONNECTION



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SITE UTILITY PLAN - NORTHWEST

C2.1

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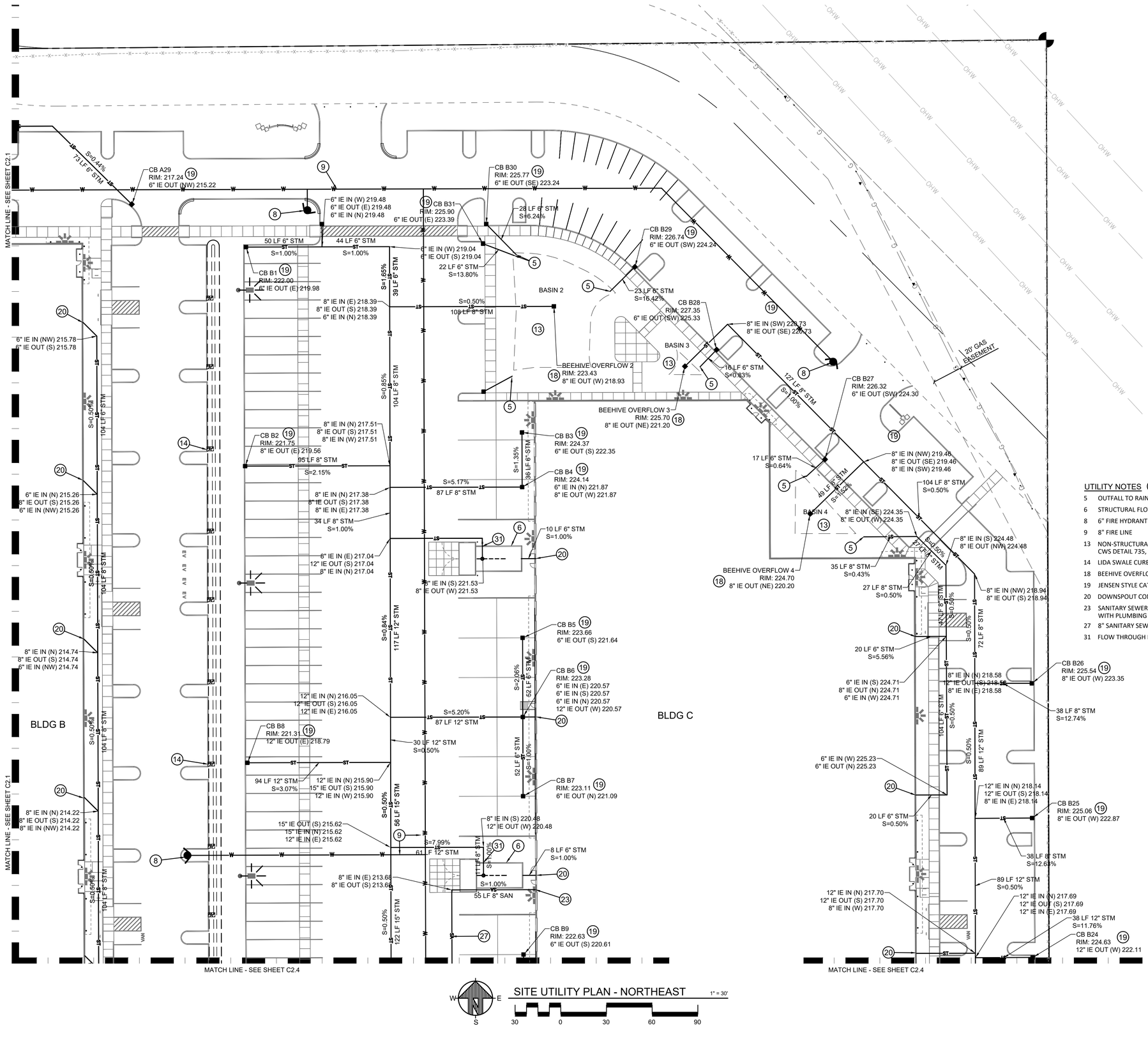
Exhibit A2



UTILITY NOTES (X)

5 OUTFALL TO RAIN GARDEN WITH RIP RAP PAD
6 STRUCTURAL FLOW THROUGH PLANTER
8 6" FIRE HYDRANT PER DETAIL W-21, SHEET C2.7
9 8" FIRE LINE
13 NON-STRUCTURAL FLOW THROUGH PLANTER (RAIN GARDEN) PER CWS DETAIL 735, SHEET C2.4
14 LIDA SWALE CURB CUT WITH RIP RAP
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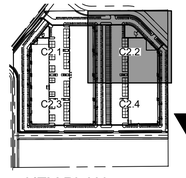
27 8" SANITARY SEWER LINE
31 FLOW THROUGH PLANTER CONNECTION



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SITE UTILITY PLAN - NORTHEAST

C2.2

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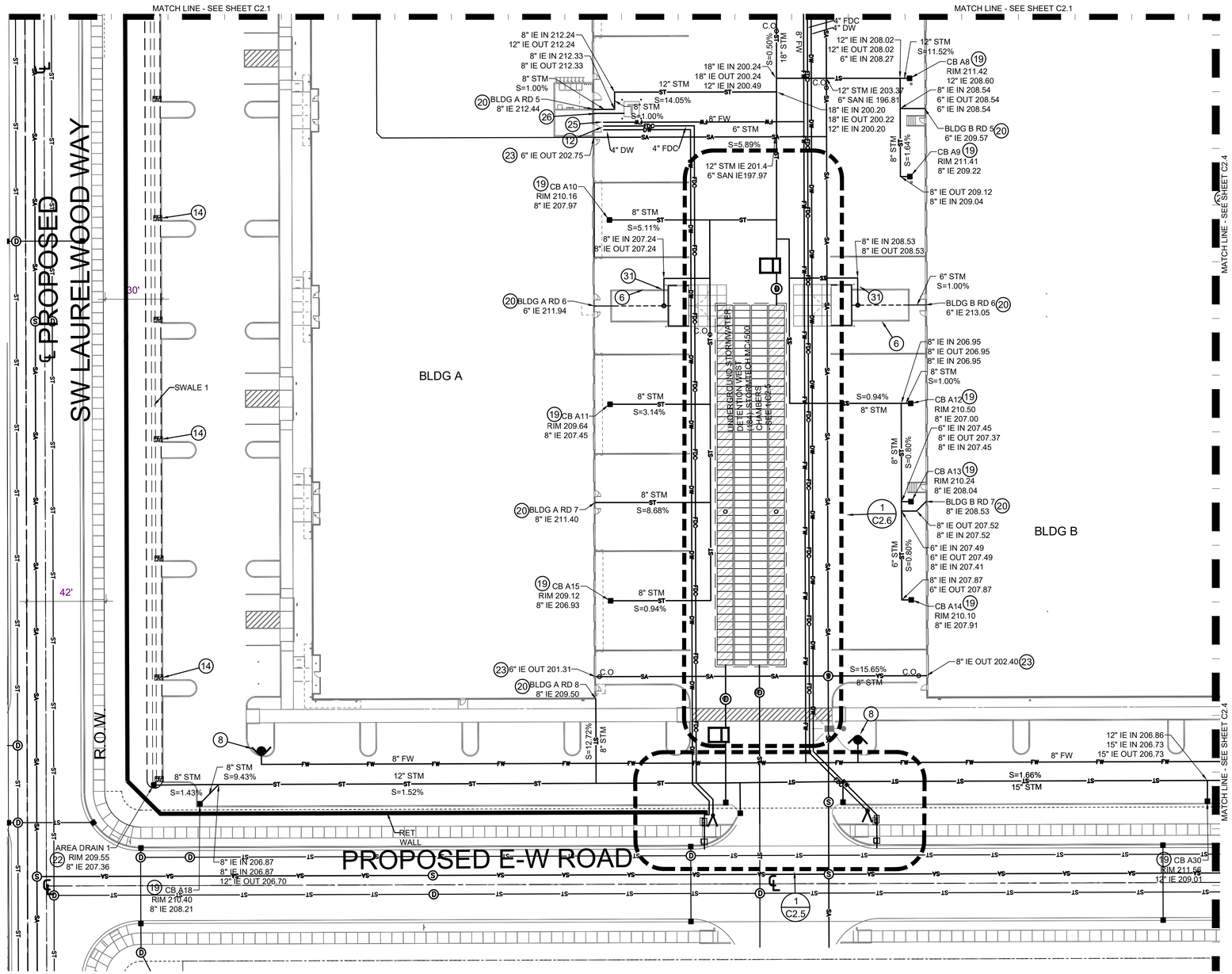
Exhibit A2



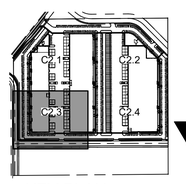
SITE UTILITY PLAN - SOUTHWEST 1" = 30'

W E N S

30 0 30 60 90

UTILITY NOTES (X)

1 3" DOMESTIC METER AND SERVICE PER DETAIL W-60, SHEET C2.7
4 3" BACKFLOW ASSEMBLY PER DETAIL W-78, SHEET C2.7
6 FLOW THROUGH PLANTER, PER CWS DETAIL 730
8 6" FIRE HYDRANT PER DETAIL W-21, SHEET C2.7
12 FIRE DEPARTMENT CONNECTION (FDC) PER DETAIL 2, SHEET C2.5
14 LIDA SWALE CURB CUT WITH RIP RAP
15 PRETREATMENT 60" MANHOLE
17 ADS BAYFILTER VAULTS PER DETAIL 1, SHEET C2.9
19 JENSEN STYLE CATCH BASIN WITH GRATED LID PER DETAIL
20 DOWNSPOUT CONNECTION. SEE PUMBING SHEETS FOR DETAIL.
22 AREA DRAIN II, PER CWS DETAIL 380
23 SANITARY SEWER BUILDING POINT OF CONNECTION. PROVIDE CLEANOUT AT END OF LATERAL. COORDINATE WITH PLUMBING PLANS.
25 FIRE WATER LINE BUILDING CONNECTION
26 TRANSFORMER CONNECTION, COORDINATE WITH MEP PLANS.
31 FLOW THROUGH PLANTER CONNECTION
32 CONNECTION TO SANITARY SEWER PUBLIC LINE (SEE PUBLIC WORKS PLANS)
33 CONNECTION TO STORM WATER PUBLIC LINE (SEE PUBLIC WORKS PLANS)
34 CONNECTION TO WATER PUBLIC LINE (SEE PUBLIC WORKS PLANS)



KEY PLAN N.T.S.

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

Schnitzer PROPERTIES

PROJECT NAME
SHERWOOD COMMERCE CENTER PHASE 1

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY NOT FOR CONSTRUCTION

DATE OCTOBER 11, 2022	
SCALE AS NOTED	PROJ. NO. 20210190
DRAWN CJM	CHECKED JB

SITE UTILITY PLAN - SOUTHWEST

C2.3

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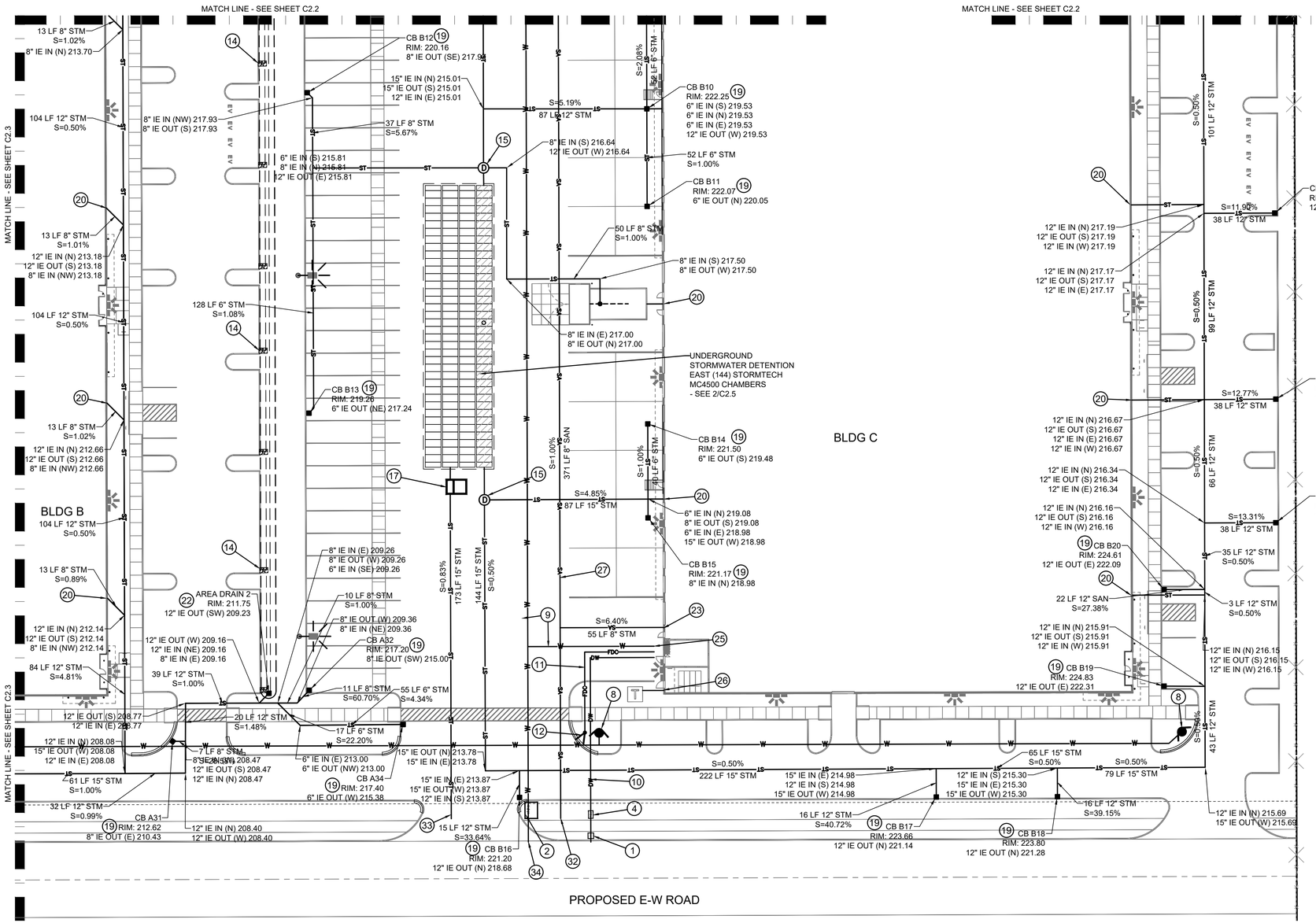
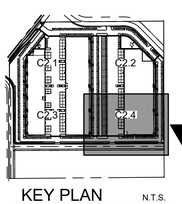
Exhibit A2



UTILITY NOTES (X)

1 1" DOMESTIC METER AND SERVICE PER DETAIL W-60, SHEET C2.7
2 8"DCDA PER DETAIL 6, SHEET C2.5
4 1-1/2" BACKFLOW ASSEMBLY PER DETAIL W-78, SHEET C2.7
8 6" FIRE HYDRANT PER DETAIL W-21, SHEET C2.7
9 8" FIRE LINE
10 1-1/2" DOMESTIC WATER LINE
11 4" FDC LINE
14 LIDA SWALE CURB CUT WITH RIP RAP
15 PRETREATMENT 60" MANHOLE
17 ADS BAYFILTER VAULTS PER DETAIL 5, SHEET C2.4
19 JENSEN STYLE CATCH BASIN WITH GRATED LID PER DETAIL
20 DOWNSPOUT CONNECTION. SEE PUMBING SHEETS FOR DETAIL.
23 SANITARY SEWER BUILDING POINT OF CONNECTION. COORDINATE WITH PLUMBING PLANS.
25 FIRE WATER LINE BUILDING CONNECTION
26 TRANSFORMER CONNECTION, COORDINATE WITH MEP PLANS.
27 8" SANITARY SEWER LINE
32 CONNECTION TO SANITARY SEWER PUBLIC LINE (SEE PUBLIC WORKS PLANS)
33 CONNECTION TO STORM WATER PUBLIC LINE (SEE PUBLIC WORKS PLANS)
34 CONNECTION TO WATER PUBLIC LINE (SEE PUBLIC WORKS PLANS)

SITE UTILITY PLAN - SOUTHEAST 1" = 30'
30 0 30 60 90



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21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

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	-	

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DATE SEPTEMBER 15, 2022

SCALE	PROJ. NO.
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DRAWN	CHECKED
CJM	JB

SITE UTILITY PLAN - SOUTHEAST

C2.4

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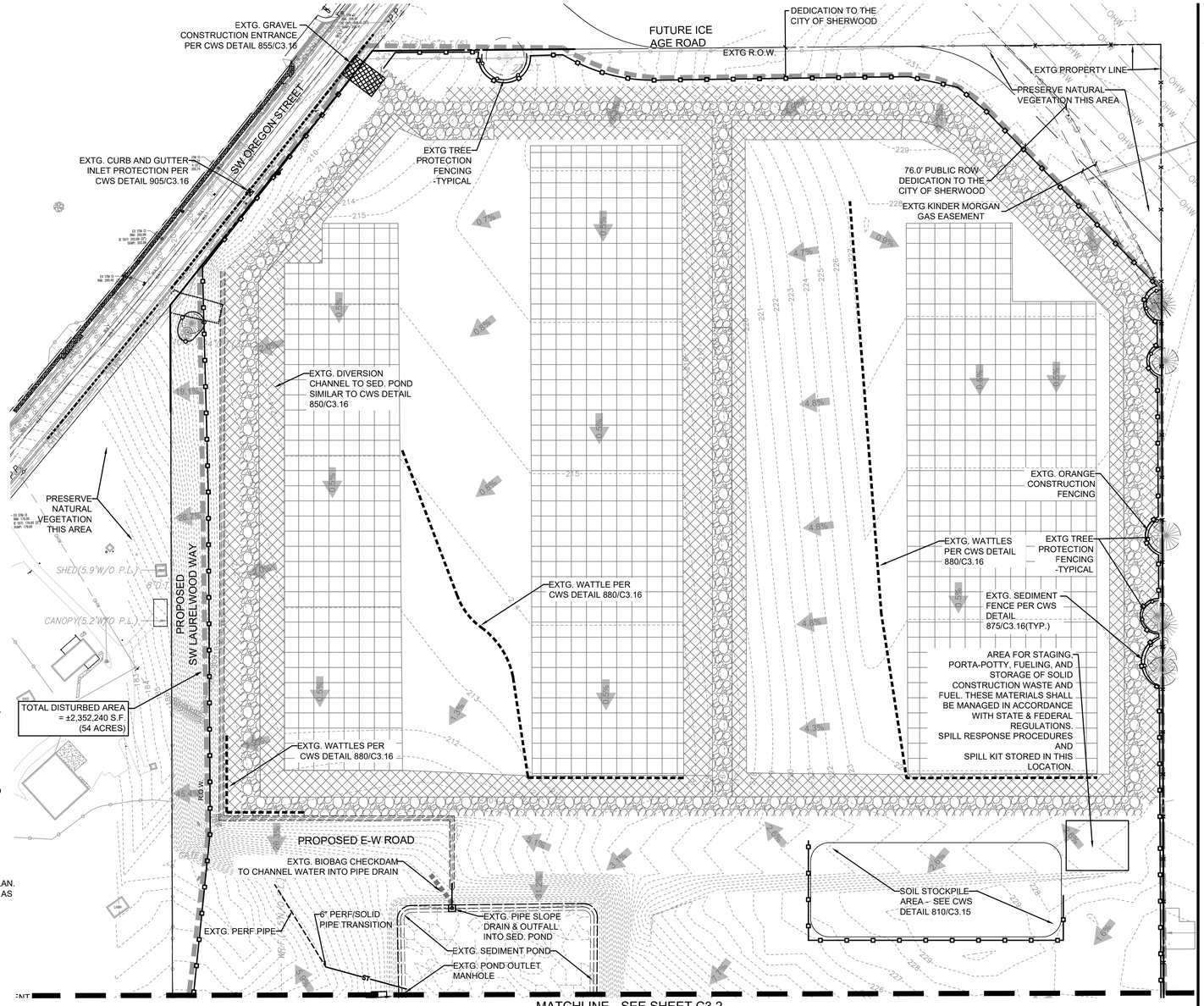

PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES:

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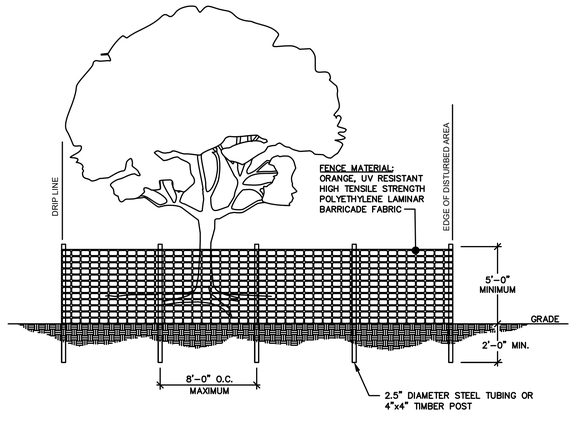
2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.

3. SENSITIVE RESOURCES INCLUDING, BUT NOT LIMITED TO, TREES, WETLANDS, AND RIPARIAN PROTECTION AREAS SHALL BE CLEARLY DELINEATED WITH ORANGE CONSTRUCTION FENCING OR CHAIN LINK FENCING IN A MANNER THAT IS CLEARLY VISIBLE TO ANYONE IN THE AREA. NO ACTIVITIES ARE PERMITTED TO OCCUR BEYOND THE CONSTRUCTION BARRIER.

4. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING, AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

5. RUN-ON AND RUN-OFF CONTROLS SHALL BE IN PLACE AND FUNCTIONING PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES. RUN-ON AND RUN-OFF CONTROL MEASURES INCLUDE: SLOPE DRAINS (WITH OUTLET PROTECTION), CHECK DAMS, SURFACE ROUGHENING, AND BANK STABILIZATION.

PRIOR TO ANY SITE CLEARING, GRADING OR CONSTRUCTION THE VEGETATED CORRIDOR AND WATER QUALITY SENSITIVE AREAS SHALL BE SURVEYED, STAKED, AND TEMPORARILY FENCED PER APPROVED PLAN. DURING CONSTRUCTION THE VEGETATED CORRIDOR SHALL REMAIN FENCED AND UNDISTURBED EXCEPT AS ALLOWED BY R&O 07-20, SECTION 3.06.1 AND PER APPROVED PLANS.



TREE PROTECTION FENCING

N.T.S

NOTES:
1. ALL PLANTS DESIGNATED TO BE SAVED SHALL BE PROTECTED BY FENCING, AS ILLUSTRATED.
2. INSTALL TREE PROTECTION FENCE AT TREE DRIP LINE OR AT EDGE OF DISTURBED AREA, AS SHOWN ON PLANS, OR PER ARBORIST DIRECTION IN THE FIELD PRIOR TO CONSTRUCTION.
3. AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
3. THERE SHALL BE NO STORAGE OF MATERIAL WITHIN THE BOUNDARIES OF THE TREE PROTECTION FENCING.
4. TREE PROTECTION FENCING SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.

SURVEY LEGEND

B.D.	BRASS DISK
(C)	CALCULATED DATA
C.L.F.	CHAIN LINK FENCE
I.R.	IRON ROD
(M)	MEASURED DATA
M.B.	MONUMENT BOX
P.P.	POWER POLE
WR.F.	WIRE FENCE
	CONCRETE
	ASPHALTIC CONCRETE
	BUILDING LINE
	CHAIN LINK/WIRE FENCE
OHW	OVERHEAD WIRE
	DECIDUOUS TREE
	CONIFEROUS TREE
	TREE TO BE REMOVED
	ROOT PROTECTION ZONE

ESCP EXTG CONDITIONS & DEMO PLAN - NORTH

1" = 80'

80 0 80 160 240

GRAVELED FUTURE BUILDING PADS

GRAVELED FUTURE DRIVE AISLES

GRAVELED FUTURE CAR PARKING AREAS

ESC PLAN LEGEND

- INLET PROTECTION PER CWS DETAILS
- SEDIMENT FENCE
- ORANGE CONSTRUCTION FENCING
- GRAVEL CONSTRUCTION ENTRANCE
- PRE-DEV. DRAINAGE FLOW ARROW
- LIMIT OF DISTURBED AREA

EXISTING CONDITIONS NARRATIVE:

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3. THE EXISTING SEDIMENTATION POND SHOWN WAS SIZED TO ACCOMMODATE THE 2-YEAR, 24-HR STORM VOLUME FOR THE EXISTING SITE CONDITIONS OF ROCK AND HYDROSEED COVER. THE VOLUME REQUIRED IS xxxx, THE VOLUME OF THE POND XXX PEAK ELEVATION, FREEBOARD AND ELEV???? (COPY THIS NOTE TO c3.2...

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Exhibit A2

VLMK
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3933 SW Kelly Avenue
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503.222.4453
VLMK.COM

PROJECT NAME
SHERWOOD COMMERCE CENTER PHASE 1

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

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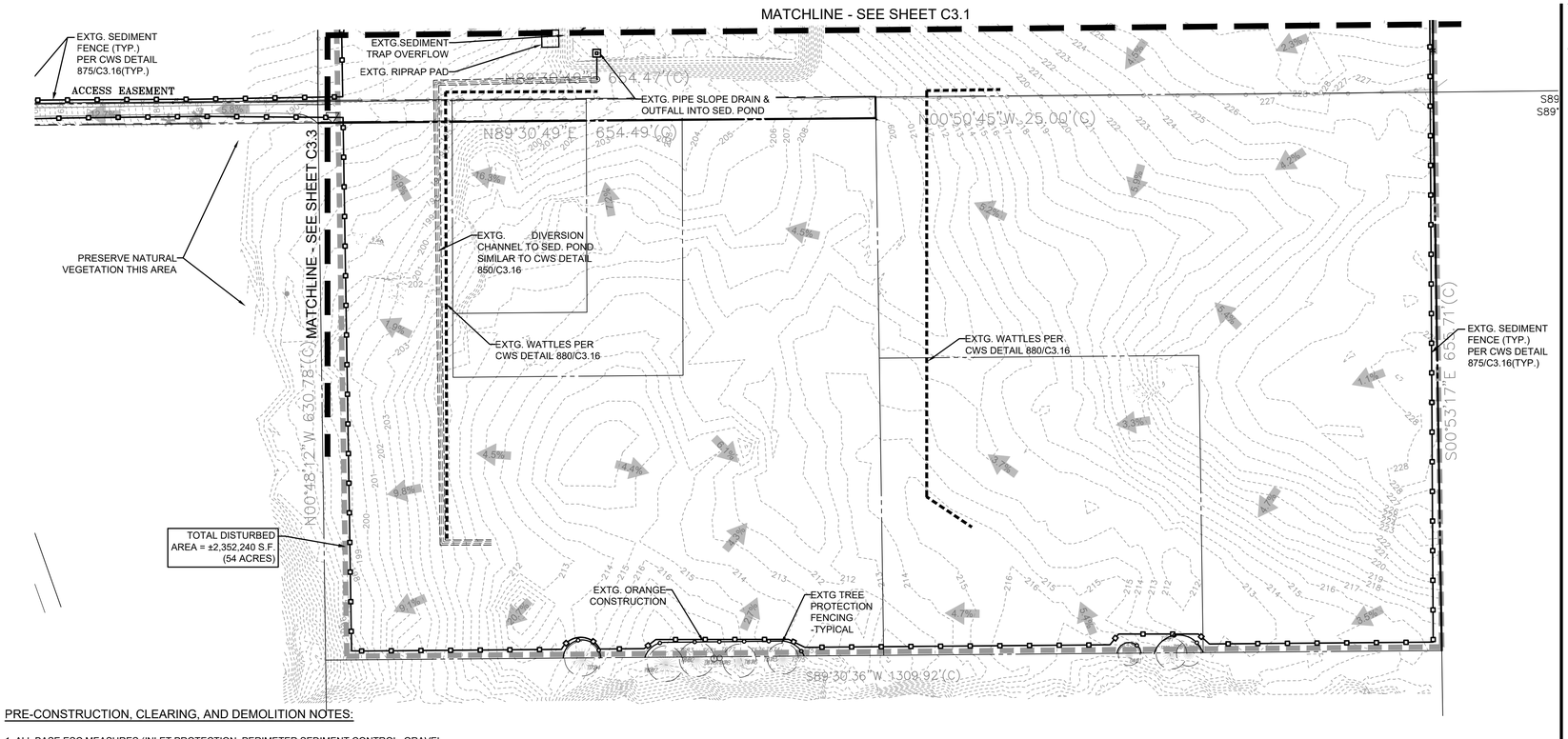
DRAWN	CHECKED
OO	JAB

ESCP EXTG CONDITIONS & DEMO PLAN - NORTH

C3.1



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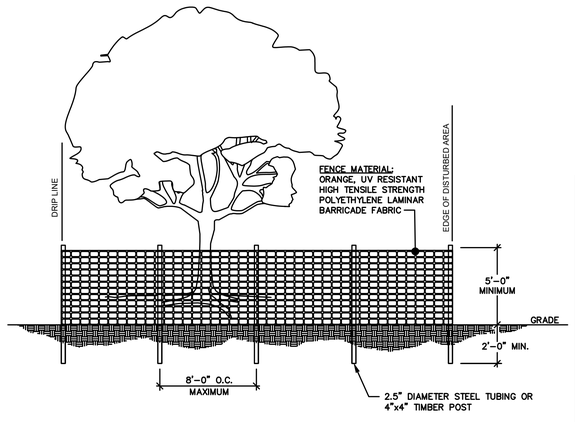

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TREE PROTECTION FENCING

N.T.S

ESCP EXTG CONDITIONS & DEMO PLAN - SOUTH

1" = 80'

80 0 80 160 240

ESC PLAN LEGEND

- INLET PROTECTION PER CWS DETAILS
- SEDIMENT FENCE
- ORANGE CONSTRUCTION FENCING
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- PRE-DEV. DRAINAGE FLOW ARROW
- LIMIT OF DISTURBED AREA

SURVEY LEGEND

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SHERWOOD, OR

CUP APPLICATION

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⚠	DATE	DESCRIPTION

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OO	JAB

ESCP EXTG CONDITIONS & DEMO PLAN - SOUTH

C3.2

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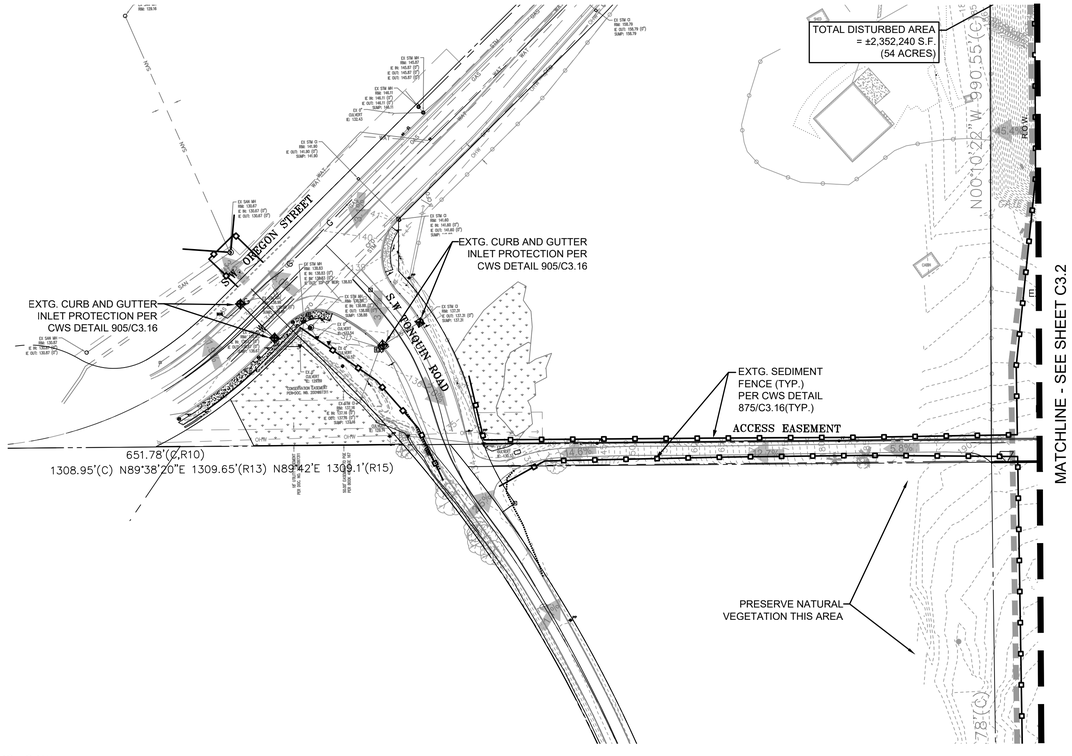

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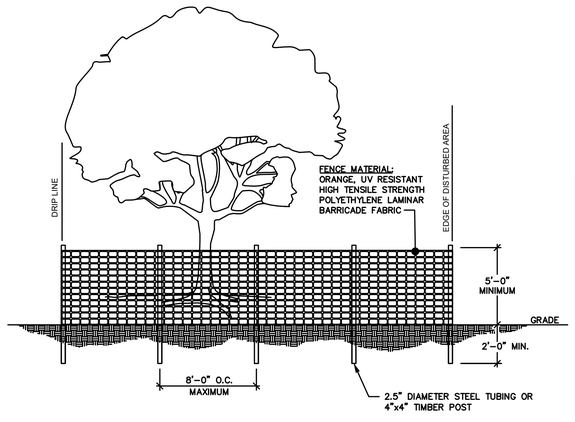

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TREE PROTECTION FENCING

N.T.S

ESC PLAN LEGEND

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ESCP EXTG CONDITIONS & DEMO PLAN - WEST

C3.3

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PLAN NOTES:

REDUCING EROSION ONSITE USING EXISTING SITE FEATURES IS EFFECTIVE AND ECONOMICAL. SCHEDULING CONSTRUCTION SEQUENCES TO MINIMIZE EROSION AS RECOMMENDED BELOW CAN REDUCE COSTS ON MATERIALS, LABOR, MAINTENANCE, AND DISPOSAL OF TRADITIONAL BMP'S USED TO TRAP SEDIMENT.

ALL DISTURBED SOILS THAT WILL BE INACTIVE DURING CONSTRUCTION SHALL BE STABILIZED TO PREVENT EROSION THROUGH THE WET SEASON USING STRAW MULCHING.

- APPLY STRAW AND MULCH AT A RATE OF AT LEAST 1½ -2 TONS PER ACRE, UNTIL THE SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH. MULCH MAY NEED TO BE HELD IN PLACE BY SPRAYED-ON TACKIFIERS OR NETTING.
- STRAW MULCH WILL NEED A TACKIFIER IF IT IS SPREAD LOOSE FROM BALES. USE STRAW THAT IS STERILE OR CONTAINS NO STRAW SEEDS, WHEAT, RYE, GRASS SEED, ETC. OTHER THAN WHAT IS BEING GROWN ON PURPOSE. IF IT IS BLOWN, SHORTER STRAW STRANDS DO NOT APPEAR TO BE AS AFFECTED BY WIND AS THE LONGER LOOSE STRAW, AND USUALLY WILL NOT REQUIRE A TACKIFIER.

VEGETATED BUFFER AREAS (VBA)
WHERE POSSIBLE, CREATE VBA'S. LET CONSTRUCTION RUNOFF SHEET FLOW TO VBA SO THAT SEDIMENT CAN SETTLE OUT OF THE RUNOFF BEFORE IT CAN LEAVE THE SITE. SCHEDULE STRIPPING AND GRADING OF THE VBA IMMEDIATELY PRIOR TO FINAL LANDSCAPING.

SAWCUTTING
ALL SAWCUTTING ACTIVITIES SHALL BE SWEPT OR VACUUMED.
SAWCUTTING DISCHARGES SHALL NOT BE ALLOWED TO ENTER THE UNDERGROUND STORM WATER SYSTEM OR SURFACE INFILTRATION FACILITIES.

STRIPPINGS STOCKPILE
EARLY AND FREQUENT WATERING OF STRIPPINGS STOCKPILES WILL ENCOURAGE GROWTH AND REDUCE THE NEED TO COVER WITH PLASTIC OR OTHER STABILIZATION BMPS.

GENERAL
THE PROJECT FOREMAN AND ON-SITE CESCL SHOULD COORDINATE TO MINIMIZE EXPOSURE AND RISK OF SEDIMENT RELEASES OFF SITE. THE CESCL IS ENCOURAGED TO REVISE THE ESC PLAN AND SUBMIT AN ACTION PLAN AS NECESSARY TO IMPROVE THE ENGINEER'S DESIGN, BASED ON FIELD CONDITIONS. FOR EXAMPLE, MOVING THE CONSTRUCTION ENTRANCE TO MINIMIZE ONSITE TRAVEL ROUTES AND REDUCE MUD PICK-UP.

REMOVE ESC CONTROL BMPS WHEN THEY ARE NO LONGER NECESSARY.

EROSION AND SEDIMENT CONTROL BMP IMPLEMENTATION:

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2. ALL "SEDIMENT BARRIERS (TO BE INSTALLED AFTER GRADING)" SHALL BE INSTALLED IMMEDIATELY FOLLOWING ESTABLISHMENT OF FINISHED GRADE AS SHOWN ON THESE PLANS.

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GRADING, EROSION AND SEDIMENT CONSTRUCTION NOTES:

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     2. CREEPING RED FESCUE (20% BY WEIGHT)
   - B. STANDARD HEIGHT GRASS MIX (MIN. 100LB./AC.)
     1. ANNUAL RYEGRASS (40% BY WEIGHT)
     2. TURF-TYPE FESCUE (60% BY WEIGHT)

2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.

3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.

4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.

5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.

6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.

7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.

8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

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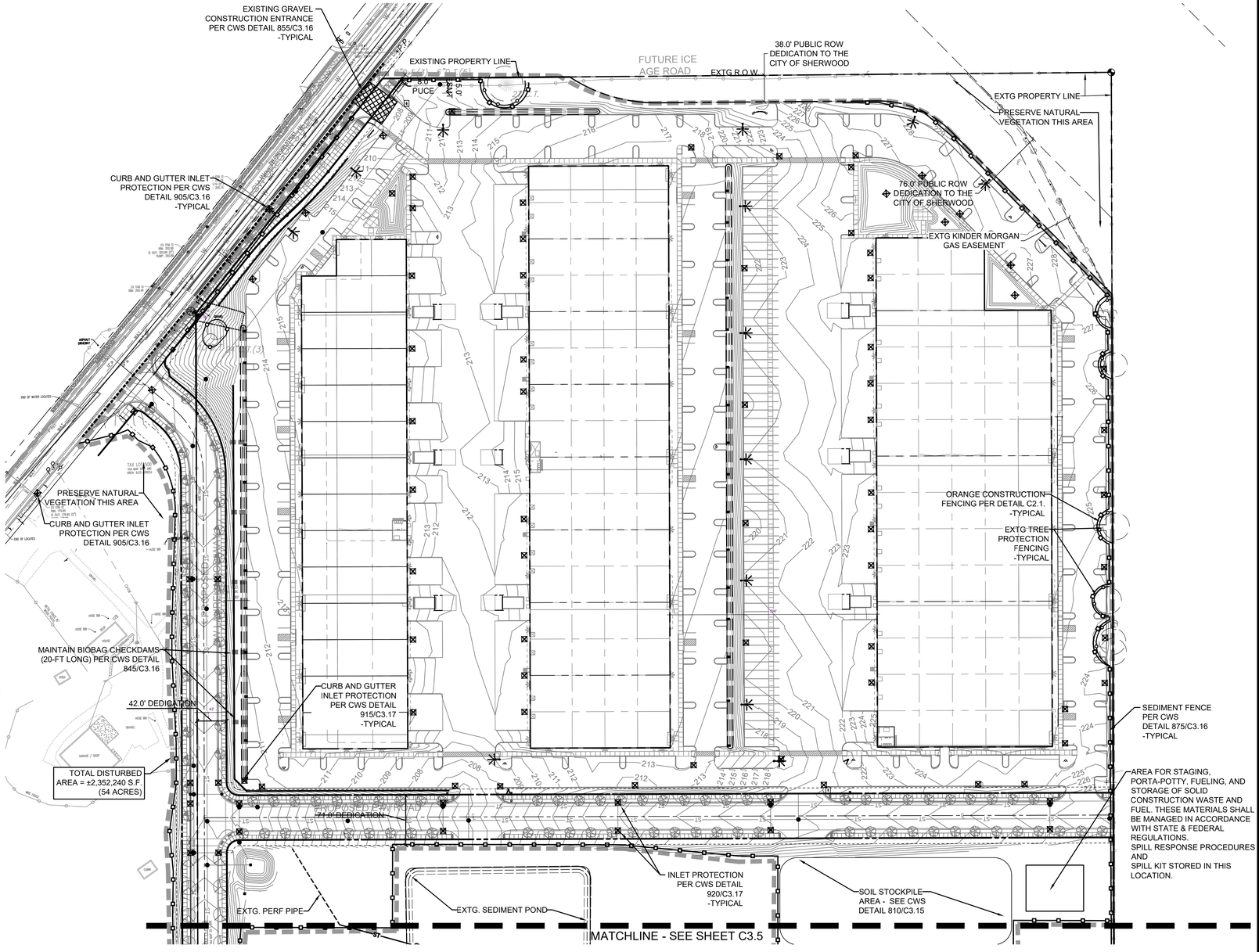
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.

11. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.



W N E S

ESCP PUBLIC UTILITIES - NORTH 1" = 80'

80 0 80 160 240

ESC PLAN LEGEND

- INLET PROTECTION PER CWS DETAILS
- SEDIMENT FENCE
- ORANGE CONSTRUCTION FENCING
- GRAVEL CONSTRUCTION ENTRANCE
- LIMIT OF DISTURBED AREA

PUBLIC UTILITIES INSTALLATION PHASE INFORMATION

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Exhibit A2
VLMK
ENGINEERING + DESIGN
3933 SW Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
SHERWOOD COMMERCE CENTER PHASE 1

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY NOT FOR CONSTRUCTION

DATE OCTOBER 11, 2022

SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN	CHECKED
OO	JAB

ESCP PUBLIC UTILITIES - NORTH

C3.4

G:\Acad\2021\20210190\0-Drawings\s14 1200C Onsite And Public\C3.4 ESCP PUBLIC UTIL.dwg10/3/2022 9:22 AM

Exhibit A2

PLAN NOTES:

REDUCING EROSION ONSITE USING EXISTING SITE FEATURES IS EFFECTIVE AND ECONOMICAL. SCHEDULING CONSTRUCTION SEQUENCES TO MINIMIZE EROSION AS RECOMMENDED BELOW CAN REDUCE COSTS ON MATERIALS, LABOR, MAINTENANCE, AND DISPOSAL OF TRADITIONAL BMP'S USED TO TRAP SEDIMENT.

ALL DISTURBED SOILS THAT WILL BE INACTIVE DURING CONSTRUCTION SHALL BE STABILIZED TO PREVENT EROSION THROUGH THE WET SEASON USING STRAW MULCHING.

- APPLY STRAW AND MULCH AT A RATE OF AT LEAST 1½ -2 TONS PER ACRE, UNTIL THE SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH. MULCH MAY NEED TO BE HELD IN PLACE BY SPRAYED-ON TACKIFIERS OR NETTING.
- STRAW MULCH WILL NEED A TACKIFIER IF IT IS SPREAD LOOSE FROM BALES. USE STRAW THAT IS STERILE OR CONTAINS NO STRAW SEEDS, WHEAT, RYE, GRASS SEED, ETC. OTHER THAN WHAT IS BEING GROWN ON PURPOSE. IF IT IS BLOWN, SHORTER STRAW STRANDS DO NOT APPEAR TO BE AS AFFECTED BY WIND AS THE LONGER LOOSE STRAW, AND USUALLY WILL NOT REQUIRE A TACKIFIER.

VEGETATED BUFFER AREAS (VBA)
WHERE POSSIBLE, CREATE VBA'S. LET CONSTRUCTION RUNOFF SHEET FLOW TO VBA SO THAT SEDIMENT CAN SETTLE OUT OF THE RUNOFF BEFORE IT CAN LEAVE THE SITE. SCHEDULE STRIPPING AND GRADING OF THE VBA IMMEDIATELY PRIOR TO FINAL LANDSCAPING.

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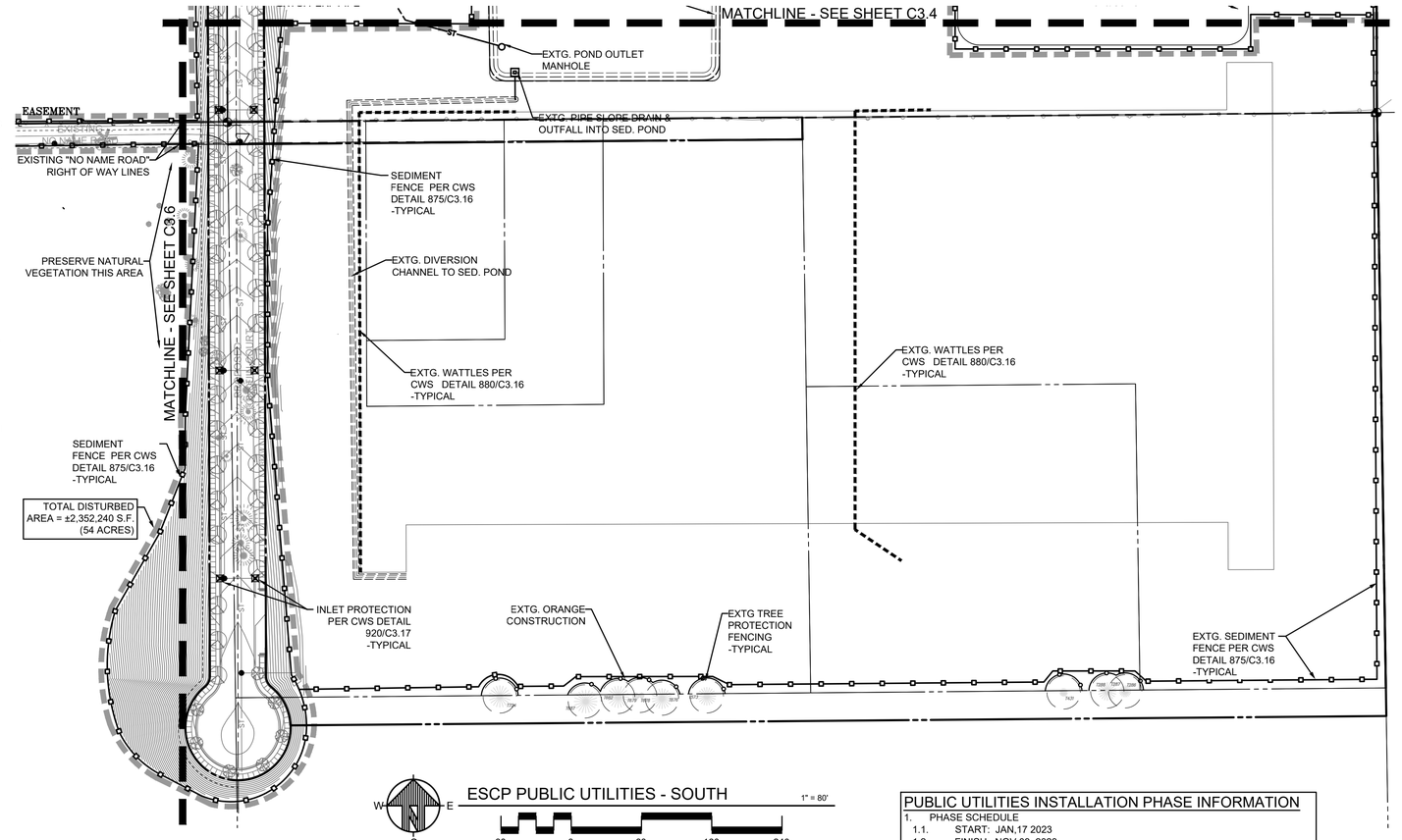

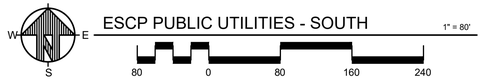

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ESCP PUBLIC UTILITIES - SOUTH

C3.5

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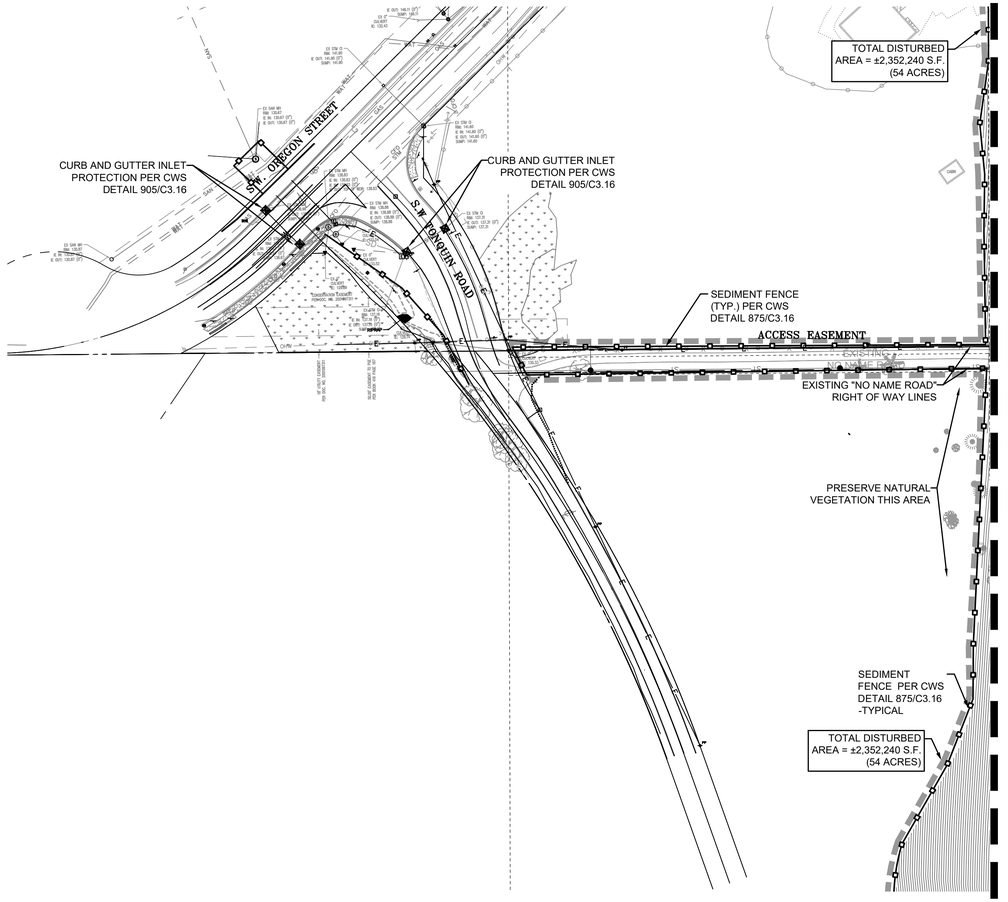

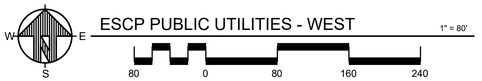

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Exhibit A2

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PROJECT NAME
SHERWOOD COMMERCE CENTER PHASE 1

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CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY
NOT FOR CONSTRUCTION

DATE: OCTOBER 11, 2022	
SCALE: AS NOTED	PROJ. NO.: 20210190
DRAWN: OO	CHECKED: JAB

ESCP PUBLIC UTILITIES - WEST

C3.6

LEGAL DESCRIPTION

PARCEL I:
THAT PART OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 28, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, LYING SOUTH OF COUNTY ROAD NO. 492.

PARCEL II:
A TRACT OF LAND IN THE NORTHWEST ONE-QUARTER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID NORTHWEST ONE-QUARTER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE QUARTER OF SAID SECTION 33; RUNNING THENCE EAST ALONG THE NORTH LINE OF SAID SECTION, 157- 1/2 FEET TO THE NORTH LINE OF SAID SECTION; THENCE SOUTH AND PARALLEL WITH THE WEST LINE OF SAID SECTION, 250 FEET; THENCE EAST AND PARALLEL WITH THE NORTH LINE OF SAID SECTION, 157-1/2 FEET; THENCE NORTH AND PARALLEL WITH THE WEST LINE OF SAID SECTION, 250 FEET TO THE NORTH LINE OF SAID SECTION; THENCE EAST ALONG THE NORTH LINE OF SAID SECTION, 345 FEET, MORE OR LESS, TO THE NORTHWEST CORNER OF PROPERTY CONVEYED TO HAROLD E. SEVERSON AND LORANE R. SEVERSON, BY DEED RECORDED AT DEED BOOK 400, PAGE 106, WASHINGTON COUNTY, OREGON; THENCE SOUTH AND PARALLEL TO THE WEST LINE OF SAID SECTION, 660 FEET, MORE OR LESS, TO THE SOUTHWEST CORNER OF THE SAID SEVERSON PROPERTY; THENCE WEST AND PARALLEL TO THE NORTH LINE OF SAID SECTION TO A POINT, 660 FEET, MORE OR LESS, TO A POINT SOUTH OF THE POINT OF BEGINNING OF THE TRACT HEREIN CONVEYED; THENCE NORTH AND PARALLEL TO THE WEST LINE OF SAID SECTION, 660 FEET, MORE OR LESS, TO A POINT ON THE NORTH LINE OF SAID SECTION AND TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THE FOLLOWING DESCRIBED PROPERTY:

A PORTION OF THAT TRACT OF LAND IN THE NORTHWEST ONE-QUARTER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, CONVEYED TO IVAN C. REED, ET UX, BY DEED RECORDED APRIL 22, 1960, IN BOOK 429, PAGE 692, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, DEED RECORDS; MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF THAT TRACT OF LAND CONVEYED TO JOHN J. GOULD, JR., BY DEED RECORDED JANUARY 25, 1965, IN BOOK 538, PAGE 438, RECORDS OF WASHINGTON COUNTY, OREGON; THENCE SOUTH PARALLEL WITH THE WEST LINE OF SAID REED TRACT, 75 FEET; THENCE EAST PARALLEL WITH THE NORTH LINE OF SAID SECTION 33, A DISTANCE OF 270 FEET; THENCE NORTH PARALLEL WITH THE WEST LINE OF SAID REED TRACT, 325 FEET TO THE NORTH LINE OF SAID REED TRACT; THENCE WEST ALONG THE NORTH LINE OF SAID REED TRACT, 112.50 FEET TO THE NORTHEAST CORNER OF SAID GOULD TRACT; THENCE SOUTH ALONG THE EAST LINE OF SAID GOULD TRACT, 250 FEET TO THE SOUTHEAST CORNER THEREOF; THENCE WEST ALONG THE SOUTH LINE OF SAID GOULD TRACT, 157.50 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPTING THEREFROM THE NORTH 25 FEET THEREOF, BEING THAT PORTION DEDICATED TO THE PUBLIC AS PUBLIC WAY BY DEDICATION DEED RECORDED MAY 25, 1973 IN BOOK 926, PAGE 721, RECORDS OF WASHINGTON COUNTY, OREGON.

PARCEL III:
A TRACT OF LAND IN THE NORTHWEST ONE-QUARTER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF THE SAID NORTHWEST ONE-QUARTER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE QUARTER OF SAID SECTION 33; RUNNING THENCE EAST ALONG THE NORTH LINE OF SAID SECTION, 157-1/2 FEET TO A POINT IN THE NORTH LINE OF SAID SECTION, WHICH IS TRUE POINT OF BEGINNING OF THE TRACT HEREINAFTER DESCRIBED; THENCE SOUTH AND PARALLEL WITH THE WEST LINE OF SAID SECTION, 250 FEET; THENCE EAST AND PARALLEL WITH THE NORTH LINE OF SAID SECTION, 157-1/2 FEET; THENCE NORTH AND PARALLEL WITH THE WEST LINE OF SAID SECTION, 250 FEET TO A POINT IN THE NORTH LINE OF SAID SECTION; THENCE WEST ALONG THE NORTH LINE OF SAID SECTION, 157-1/2 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THE NORTH 25 FEET THEREOF, BEING THAT PORTION DEDICATED TO THE PUBLIC AS PUBLIC WAY BY DEDICATION DEED RECORDED MAY 25, 1973 IN BOOK 926, PAGE 721, RECORDS OF WASHINGTON COUNTY, OREGON.

PARCEL IV:
A PORTION OF THAT TRACT OF LAND IN THE NORTHWEST ONE-QUARTER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, CONVEYED TO IVAN C. REED, ET UX, BY DEED RECORDED APRIL 22, 1960, IN BOOK 429, PAGE 692, WASHINGTON COUNTY, OREGON, DEED RECORDS, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF THAT TRACT OF LAND CONVEYED TO JOHN J. GOULD, JR., BY DEED RECORDED JANUARY 25, 1965, IN BOOK 538, PAGE 438, RECORDS OF WASHINGTON COUNTY, OREGON; THENCE SOUTH PARALLEL WITH THE WEST LINE OF SAID REED TRACT, A DISTANCE OF 75 FEET; THENCE EAST PARALLEL WITH THE NORTH LINE OF SAID SECTION 33, A DISTANCE OF 270 FEET; THENCE NORTH PARALLEL WITH THE WEST LINE OF SAID REED TRACT, A DISTANCE OF 325 FEET TO THE NORTH LINE OF SAID REED TRACT; THENCE WEST ALONG THE NORTH LINE OF SAID REED TRACT, A DISTANCE OF 112.5 FEET TO THE NORTHEAST CORNER OF SAID GOULD TRACT; THENCE SOUTH ALONG THE EAST LINE OF SAID GOULD TRACT, A DISTANCE OF 250 FEET TO THE SOUTHEAST CORNER THEREOF; THENCE WEST ALONG THE SOUTH LINE OF SAID GOULD TRACT, A DISTANCE OF 157.5 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THE NORTH 25 FEET THEREOF, BEING THAT PORTION DEDICATED TO THE PUBLIC AS PUBLIC WAY BY DEDICATION DEED RECORDED MAY 25, 1973 IN BOOK 926, PAGE 721, RECORDS OF WASHINGTON COUNTY, OREGON.

PARCEL V:
THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 1 WEST, OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON.

EXCEPTING THEREFROM THAT PORTION DESCRIBED IN DOCUMENT RECORDED JANUARY 7, 1974 IN BOOK 958, PAGE 754, DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHWEST CORNER OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, WASHINGTON COUNTY, OREGON; THENCE NORTH ALONG THE WEST LINE OF SAID NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER, 349 FEET TO A POINT; THENCE EAST AND PARALLEL TO THE SOUTH LINE OF SAID NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER, 375 FEET TO A POINT; THENCE SOUTH AND PARALLEL WITH SAID WEST LINE, 349 FEET TO A POINT ON THE SOUTH LINE OF SAID NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE WEST ALONG SAID SOUTH LINE 375 FEET TO THE TRUE POINT OF BEGINNING.

PARCEL VI:
A TRACT OF LAND SITUATED IN THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTH WEST QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 1 WEST, OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, WASHINGTON COUNTY, OREGON; THENCE NORTH ALONG THE WEST LINE OF SAID NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER, 349 FEET TO A POINT; THENCE EAST AND PARALLEL TO THE SOUTH LINE OF SAID NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER, 375 FEET TO A POINT; THENCE SOUTH AND PARALLEL WITH SAID WEST LINE, 349 FEET TO A POINT ON THE SOUTH LINE OF SAID NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE WEST ALONG SAID SOUTH LINE 375 FEET TO THE TRUE POINT OF BEGINNING.

THE LEGAL DESCRIPTION SHOWN ABOVE DESCRIBES ALL THAT PROPERTY IN THE PRELIMINARY TITLE REPORT IDENTIFIED AS "FIRST AMERICAN TITLE INSURANCE COMPANY" ORDER NUMBER NCS-1082701-CHI2, WITH AN EFFECTIVE DATE OF MAY AUGUST 5, 2021.

LAND AREA

THE LAND AREA OF THE SUBJECT PROPERTY IS AS FOLLOWS:

PARCEL I:	1,688,458 SQ.FT. (38.76 ACRES)
PARCEL II:	331,972 SQ.FT. (7.62 ACRES)
PARCEL III:	35,437 SQ.FT. (0.81 ACRES)
PARCEL IV:	45,562 SQ.FT. (1.05 ACRES)
PARCEL V:	298,432 SQ.FT. (6.85 ACRES)
PARCEL VI:	130,872 SQ.FT. (3.00 ACRES)
TOTAL:	2,530,733 SQ.FT. (58.10 ACRES)

NOTES CORRESPONDING TO SCHEDULE B

FIRST AMERICAN TITLE INSURANCE COMPANY: ORDER NO: NCS-1082701-CHI2; EFFECTIVE DATE: AUGUST 5, 2021;

THE FOLLOWING SURVEY RELATED ITEMS WERE FOUND IN SAID TITLE REPORT AND ARE REFERENCED ON THIS MAP.

11 RESERVATION OF MINERAL RIGHTS RECORDED DECEMBER 22, 1888 IN BOOK Z, PAGE 311.
SAID ITEM IS BLANKET IN NATURE OVER PARCEL II THROUGH VI PROPERTY AND IS THEREFORE NOT SHOWN HEREON.

12 AN EASEMENT FOR TRANSMISSION LINE PURPOSES RECORDED NOVEMBER 27, 1956 AS BOOK 388, PAGE 444.
SAID ITEM LIES ON PARCEL I AND IS SHOWN HEREON.

13 AN EASEMENT FOR PIPE LINE PURPOSES RECORDED MAY 3, 1962 AS BOOK 462, PAGE 264.
SAID ITEM LIES ON THE SUBJECT PROPERTY AND IS SHOWN HEREON.

14 AN EASEMENT FOR PUBLIC ROAD PURPOSES RECORDED AUGUST 7, 2001 AS REC. NO. 2011-079562.
SAID ITEM LIES WITHIN THE PUBLIC RIGHT-OF-WAY OF OREGON STREET AND IS THEREFORE NOT SHOWN HEREON.

BASIS OF BEARINGS

THE BEARINGS SHOWN HEREON ARE BASED ON THE EAST-WEST CENTER SECTION LINE OF SECTION 28 AS SHOWN ON U.S.B.T. BK. 7, PG. 21-22, FILED IN THE OFFICE OF THE WASHINGTON COUNTY SURVEYOR, STATE OF OREGON, BEING SOUTH 89°30'44" WEST.

GENERAL NOTES

1. THE LOCATION OF UTILITIES SERVING THE SUBJECT PROPERTY CAN ONLY BE DETERMINED BY OBSERVED EVIDENCE TOGETHER WITH PLANS AND MARKINGS PROVIDED BY CLIENT, UTILITY COMPANIES, AND OTHER APPROPRIATE SOURCES. THE LOCATION OF UTILITIES EXISTING ON OR SERVING THE SURVEYED PROPERTY FOR THIS SURVEY WAS DETERMINED BY OBSERVATION OF ABOVE GROUND EVIDENCE. THIS SURVEY WOULD NOT SHOW UTILITIES COVERED BY VEHICLES, OR OVERGROWTH OF FOLIAGE, TREES, BUSH OR SHRUBS.
2. ITEM NUMBERS SHOWN HEREON ARE STATED AS MATTERS ON REFERENCED COMMITMENT. NO RESPONSIBILITY FOR THE COMPLETENESS, ACCURACY, OR CONTENT OF SAID REPORT IS ASSUMED BY THIS MAP.
3. THERE IS NO OBSERVABLE EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION OR BLDG. ADDITIONS WITHIN RECENT MONTHS.
4. THERE ARE NO CHANGES IN STREET RIGHT OF WAY LINES EITHER COMPLETED OR PROPOSED TO THE BEST OF OUR KNOWLEDGE, AND AVAILABLE FROM THE CONTROLLING JURISDICTION.
5. THERE IS NO OBSERVABLE EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.
6. THERE IS NO OBSERVABLE EVIDENCE OF SITE USE AS A CEMETERY.
7. THIS SURVEY MAP CORRECTLY REPRESENTS THE FACTS FOUND AT THE TIME OF THE SURVEY.
8. THERE ARE NO DISCREPANCIES BETWEEN THE BOUNDARY LINES OF THE PROPERTY AS SHOWN ON THIS SURVEY MAP AND AS DESCRIBED IN THE LEGAL DESCRIPTION PRESENTED IN THE TITLE COMMITMENT.
9. THE BOUNDARY LINE DIMENSIONS AS SHOWN ON THIS SURVEY MAP FORM A MATHEMATICALLY CLOSED FIGURE WITHIN +/-0.1'.
10. THE BOUNDARY LINES OF THE PROPERTY ARE CONTIGUOUS WITH THE BOUNDARY LINES OF ALL ADJOINING STREETS, HWYS., RIGHTS OF WAY AND EASEMENTS, PUBLIC OR PRIVATE, AS DESCRIBED IN THEIR MOST RECENT RESPECTIVE LEGAL DESCRIPTIONS OF RECORD.
11. THE SUBJECT PROPERTY HAS DIRECT ACCESS TO/FROM N.E. OREGON STREET AND AN UN-NAMED DEDICATED ROAD, BEING PUBLIC RIGHTS-OF-WAY, GAINING INDIRECT ACCESS TO/FROM SW TONQUIN ROAD BY WAY OF SAID UN-NAMED ROAD.
12. ELEVATIONS SHOWN HEREON ARE BASED ON WASHINGTON COUNTY BENCHMARK NO. 962, WHICH BEARS AN ELEVATION OF 189.81 FEET ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONTOURS ARE SHOWN AT 1' INTERVALS.
13. SEE SHEETS 4-5 FOR A TREE INVENTORY OF PARCELS II-VI.

SITE RESTRICTIONS

ACCORDING TO A ZONING REPORT PREPARED BY BBG UNDER PROJECT NO. 0520001631 AND DATED MARCH 23, 2020, THE SUBJECT PROPERTY IS ZONED "EI" (EMPLOYMENT INDUSTRIAL) AND IS SUBJECT TO THE FOLLOWING CONDITIONS:

USE:	UNDEVELOPED-PERMITTED BY RIGHT
HEIGHT RESTRICTION:	50'
FRONT SETBACK:	20'
SIDE SETBACK:	NONE
REAR SETBACK:	NONE
CORNER LOT STREET:	20'

PARKING RESTRICTIONS:

INDUSTRIAL:	1.6 SPACES FOR EACH 1000 SQUARE FEET OF GROSS FLOOR AREA
WAREHOUSE > 150,000 SQ. FT.:	0.5 SPACES FOR EACH 1000 SQUARE FEET OF GROSS FLOOR AREA
WAREHOUSE < 150,000 SQ. FT.:	0.3 SPACES FOR EACH 1000 SQUARE FEET OF GROSS FLOOR AREA

EXISTING PARKING:
NO STRIPED PARKING EXISTS ON THE SUBJECT PROPERTY.

FLOOD NOTE:

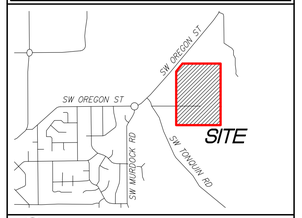
THE SUBJECT PROPERTY LIES WITHIN ZONE "X" (UNSHADED) OF THE FLOOD INSURANCE RATE MAP NO. 41067C0602F, COMMUNITY PANEL NO. 4102.38 0602 F, WHICH BEARS AN EFFECTIVE DATE OF OCTOBER 19, 2018. ZONE "X" (UNSHADED) IS DEFINED AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

STATEMENT OF POSSIBLE ENCROACHMENTS

(A) - WIRE FENCED AREA EXTENDS UP TO 99.8' WESTERLY INTO THE ADJOINING PROPERTY.
(B) - GATE PROVIDES ACCESS TO/FROM WESTERLY ADJOINING PROPERTY.
(C) - WIRE FENCE EXTENDS UP TO 4.5' NORTHERLY INTO THE UN-NAMED DEDICATED ROADWAY.
(D) - WIRE FENCE EXTENDS UP TO 11.0' SOUTHERLY INTO THE ADJOINING PROPERTY.

REGISTERED
PROFESSIONAL
LAND SURVEYOR
3/24/2022
OREGON
FEBRUARY 19, 1999
MICHAEL A. HOFFMANN
57847LS
EXPIRES: 30 JUNE, 2023

VICINITY MAP



SCALE: NONE

TERRAMARK
8196 SW HALL BOULEVARD, SUITE #111
BEAVERTON, OR 97008; PH: 503/860-2255

ELEVATION SURVEY

SHERWOOD COMMERCE CENTER
21600 SW OREGON STREET
SHERWOOD, OREGON

DATE : 3/23/2022	DRAWN BY: K.L.M.
SCALE : 1" = 100'	CHECKED BY: M.A.H.
JOB NO: 20224969	SHEET: 1 OF 5

PRELIMINARY PROGRESS SET FOR REVIEW 06.14.2022

LEGEND

B.D.	BRASS DISK
(C)	CALCULATED DATA
C.L.	CENTER LINE
C.L.F.	CHAIN LINK FENCE
C.M.H.	COMMUNICATIONS MANHOLE
C.T.	CONIFEROUS TREE
D.T.	DECIDUOUS TREE
FD.	FOUND
I.P.	IRON PIPE
I.R.	IRON ROD
(M)	MEASURED DATA
MON.SN.	MONUMENT SIGN
P.L.	PROPERTY LINE
P.P.	POWER POLE
(R1)	USBT 2019-001
(R2)	USBT 2011-039
(R3)	USBT 2002-062
(R4)	USBT 2002-010
(R5)	USBT BK. 7, PG.'S 21-22
(R6)	USBT BK. 5, PG. 95
(R7)	USBT BK. 2, PG. 104
(R8)	SN 3341.3
(R9)	SN 29428
(R10)	SN 24713
(R11)	SN 19375
(R12)	SN 18368
(R13)	SN 12936
(R14)	SN 10069
(R15)	SN 5897
(R16)	SN 5180
S.D.M.H.	STORM DRAIN MANHOLE
T.PED.	TELEPHONE PEDESTAL
WR.F.	WIRE FENCE
Y.P.C.	YELLOW PLASTIC CAP
	BLOCK/CONCRETE WALL
	CONCRETE
	ASPHALTIC CONCRETE
	BUILDING LINE
	WIRE/CHAIN LINK FENCE
	WOOD FENCE
	LIGHT POLE
OHW	OVERHEAD WIRE

CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	CHORD
C1(C)	341.36'	426.51'	45°51'27"	N68°01'13"E 332.32'
C1(R9)	341.36'	426.51'	45°51'27"	N68°01'26"E 332.32'
C2(C)	126.36'	1312.33'	5°31'00"	N42°19'59"E 126.31'
C2(R9)	126.36'	1312.33'	5°31'00"	N42°20'12"E 126.31'
C3(C)	25.66'	1312.33'	1°07'13"	N39°00'53"E 25.66'
C3(R9)	25.66'	1312.33'	1°07'13"	N39°01'05"E 25.66'
C4(C)	18.51'	1349.33'	0°47'10"	N38°50'51"E 18.51'
C5(M)	66.70'	1312.33'	2°54'44"	N39°54'38"E 66.70'
C5(R9)	66.70'	1312.33'	2°54'44"	N39°54'51"E 66.70'

TERRAMARK

8196 SW HALL BOULEVARD, SUITE #111
BEAVERTON, OR 97008; PH: 503/860-2255

100' 50' 0 100' 200'

SCALE 1" = 100'

MATCH LINE

SHEET 2- SHEET 3

JOB NO: 20224969	SHEET: 2 OF 5

PRELIMINARY PROGRESS SET FOR REVIEW 06.14.2022

N.E. OREGON STREET (C.R. NO. 492)
(74' DEDICATED PUBLIC RIGHT-OF-WAY)
N40°55'29"E 515.84'(C) N40°55'42"E 515.84'(R9)
S69°10'47"E 155.21'(C)
S69°10'51"E 155.21'(R9)
C1
C2
651.78'(C,R10)
1,308.95'(C) N89°38'20"E 1309.65'(R13) N89°42'E 1309.1'(R15)
FD.2"B.D. PER(R2);HELD AS SW CORNER OF SECTION 28 & NW CORNER OF SECTION 33 CORNER FALLS S00°56'56"W 6.00' FROM C.L. OF N.E. OREGON STREET (S00°57'09"W 6.00 PER(R9))
29
32
33
P.P.
SW TONQUIN ROAD
(40' DEDICATED PUBLIC RIGHT-OF-WAY)
1311.66'(C) 1311.1'(R15)
N00°45'07"W 2623.31'(M) N00°40'35"W 2623.49'(R10) N00°14'30"W 2622.2'(R15)
FD.2"B.D. PER(R3);HELD AS WEST 1/4 CORNER OF SECTION 33
1,310.89'(C) 1314.7'(R15)
1,312.83'(C) 1320.83'(R15)
N00°48'12"W 630.78'(C)
N00°10'22"W 990.55'(C)
MATCH LINE
SHEET 2-SHEET 3
N89°30'49"E 2617.90'(M) N89°33'02"E 2617.88'(R10) N89°42'00"W 2618.92'(R13) N89°42'W 2618.2'(R15)
FD.5/8"I.R. PER(R16);N20°35'20"E 1.09'
N89°30'49"E 654.47'(C)
N89°30'49"E 654.49'(C)
L1
L2
L3
L4
L5
L6
L7
L8
25.00'
605.01'(C) 606.46'(R13)
(UN-NAMED DEDICATED ROAD-WAY)
P.O.B. PARCEL III(TITLE)
P.O.B. PARCEL II(TITLE)
T.P.O.B. "PARCEL III(TITLE)
FD.5/8"I.R. PER(R13); N00°12'14"W 1.20'
FD.5/8"I.R. PER(R13); N00°12'14"W 1.10'
FD.5/8"I.R. PER(R13); N00°12'14"W 0.89'
N89°30'49"E 1308.95'(C) N89°45'50"E 1309.27'(R13) N89°42'E 1309.1'(R15) EAST 1315.0'(R16)
654.42'(C)
N00°50'45"W 25.00'(C)
FD.3"B.D. PER(R7);HELD AS SOUTH 1/4 CORNER OF SECTION 28 & NORTH 1/4 CORNER OF SECTION 33
S89°19'55"W 2631.83'(C)
S89°23'06"W 2631.67'(R3)
28
27
33
34
FD.2"B.D. PER(R5);HELD AS W
N00°06'21"W 330.00'(C)
N00°02'52"W 330.00'(R5)
BARN(2.2'E/O P.L.)
WR.F.(4.8'/O P.L.)
WR.F.(1.0'E/0 P.L.)
S00°53'17"E 655.71'(C)
S00°54'E 655.54'(R14)
WR.F.(99.8'W/O P.L.)
WR.F.(4.2'E/O P.L.
WR.F.(8.3'N/O P.L.)
WR.F.(11.5'/O P.L.)
WR.F.(5.5'S/O P.L.)
655.78'(C)
S89°30'28"W 2621.78'(C)
1,311.54'(C)
N00°45'47"W 2623.07'(C)
1,310.89'(C) 1314.7'(R15)
1,311.42'(C) 1311.09'(R14)
FD.5/8"I.R. W/Y.P.C. MARKED "SWLS INC" PER(R8); HELD AS THE CENTER OF SECTION 33
1,312.83'(C) 1320.3'(R15)
S89°30'08"W 2625.65'(M) S89°32'16"W 2625.58'(R8) S89°32'18"W 2625.72'(R10) S89°43'W 2640.6'(R15)
1311.42'(C) 1311.2'(R14,R15)
S00°44'E 2622.4'(R14,R15)
S00°50'55"E 2622.98'(R10) S00°50'52"E 2622.82'(R8) S00°53'17"E 2622.84'(M) S00°50'52"E 2622.82'(R8) S00°53'17"E 2622.84'(M)
654.96'(C)
375.00'(C) WEST 375'(D5,D6)
654.96'(C) WEST 660'(D2)
S89°30'36"W 1309.92'(C)
N89°30'36"E 375.00'(C) EAST 375'(D5,D6)
S00°50'45"E 655.75'(C) SOUTH 660'(D2) NORTH 349'(D5,D6)
S00°50'45"E 654.96'(C) SOUTH 349'(D5,D6)
P.O.B. PARCEL V(TITLE)
P.O.B. "EXCEPTING" PARCEL V(TITLE)
P.O.B. "EXCEPTING"-PARCEL II(TITLE)
P.O.B. PARCEL V(TITLE)
PARCEL II(TITLE)
PARCEL III(TITLE)
PARCEL IV(TITLE)
PARCEL V(TITLE)
"EXCEPTING" Bk. 162A, Pg. 721(TITLE)
1 STORY BUILDING AREA=2500 SQ.FT.
1 STORY BUILDING AREA=1,574 SQ.FT.
1 STORY BUILDING AREA=1959 SQ.FT.
1 STORY BUILDING AREA=610 SQ.FT.
2 STORY BUILDING AREA=838 SQ.FT.
SHED(3.6'E/O P.L.)
BARN
HORSE STALL
STORAGE
SHED
GATE
CANAL
7"C.T.
8"C.T.
10"C.T.
11"C.T.
12"C.T.
15"C.T.(2)
30"C.T.(2)
36"C.T.(2)
48"D.T.
WR.F.(2.1'E/O P.L.)
WR.F.(1.4'W/O P.L.)
GATE(0.6'S/O P.L.)
WR.F.(1.5'E/O P.L.)

LINE TABLE

LINE	BEARING	LENGTH
L1(C)	N89°30'49"E	157.50'
L1(R13)	N89°45'50"E	157.50'
L1(D2,D3)	EAST	157-1/2'
L2(C)	S89°30'49"W	157.50'
L2(R13)	S89°45'50"W	157.50'
L2(D3)	WEST	157-1/2'
L3(C)	S89°30'49"W	112.50'
L3(R13)	N89°49'50"E	112.50'
L3(D2E,D4)	N89°30'49"E	112.50'
L4(C)	N89°30'50"E	339.47'
L4(D2)	EAST	345'
L5(C)	S00°12'14"E	250.00'
L5(R13)	S00°14'30"E	250.00'
L5(D2,D3)	SOUTH	250'
L6(C)	S00°12'14"E	75.00'
L6(R13)	S00°13'30"E	75.00'
L6(D2E,D4)	SOUTH	75'
L7(C)	S89°30'49"W	157.50'
L7(R13)	S89°45'50"W	157.50'
L7(D2,D3)	EAST	157-1/2'
L7(D2E,D4)	WEST	157.5'
L8(C)	N89°30'49"E	270.00'
L8(R13)	N89°45'50"E	270.00'
L8(D2E,D4)	EAST	270'
L9(C)	N00°12'14"W	250.00'
L9(R13)	N00°14'30"W	250.00'
L9(D2,D3)	NORTH	250'
L9(D2E,D4)	SOUTH	250'
L10(C)	N00°12'14"W	325.00'
L10(R13)	N00°14'30"W	325.00'
L10(D2E,D4)	NORTH	325'

LEGEND

B.D.	BRASS DISK
(C)	CALCULATED DATA
C.L.	CENTER LINE
(D2)	DEED DATA-PARCEL II
(D2E)	DEED DATA-PARCEL II "EXCEPTING"
(D3)	DEED DATA-PARCEL III
(D4)	DEED DATA-PARCEL IV
(D5)	DEED DATA-PARCEL V
(D6)	DEED DATA-PARCEL VI
FD.	FOUND
I.P.	IRON PIPE
I.R.	IRON ROD
(M)	MEASURED DATA
MON.SN.	MONUMENT SIGN
P.L.	PROPERTY LINE
P.O.B.	POINT OF BEGINNING
P.P.	POWER POLE
(R1)	USBT 2019-001
(R2)	USBT 2011-039
(R3)	USBT 2002-062
(R4)	USBT 2002-010
(R5)	USBT BK. 7, PG.'S 21-22
(R6)	USBT BK. 5, PG. 95
(R7)	USBT BK. 2, PG. 104
(R8)	SN 33413
(R9)	SN 29428
(R10)	SN 24713
(R11)	SN 19375
(R12)	SN 18368
(R13)	SN 12936
(R14)	SN 10069
(R15)	SN 5897
(R16)	SN 5180
WR.F.	WIRE FENCE
Y.P.C.	YELLOW PLASTIC CAP
	BLOCK/CONCRETE WALL
	CONCRETE
	ASPHALTIC CONCRETE
	BUILDING LINE
	WIRE FENCE
	WOOD FENCE
	LIGHT POLE
OHW	OVERHEAD WIRE

TERRAMARK
8196 SW HALL BOULEVARD, SUITE #111
BEAVERTON, OR 97008; PH: 503/860-2255

TERRA MARK

100' 50' 0 100' 200'
SCALE 1" = 100'

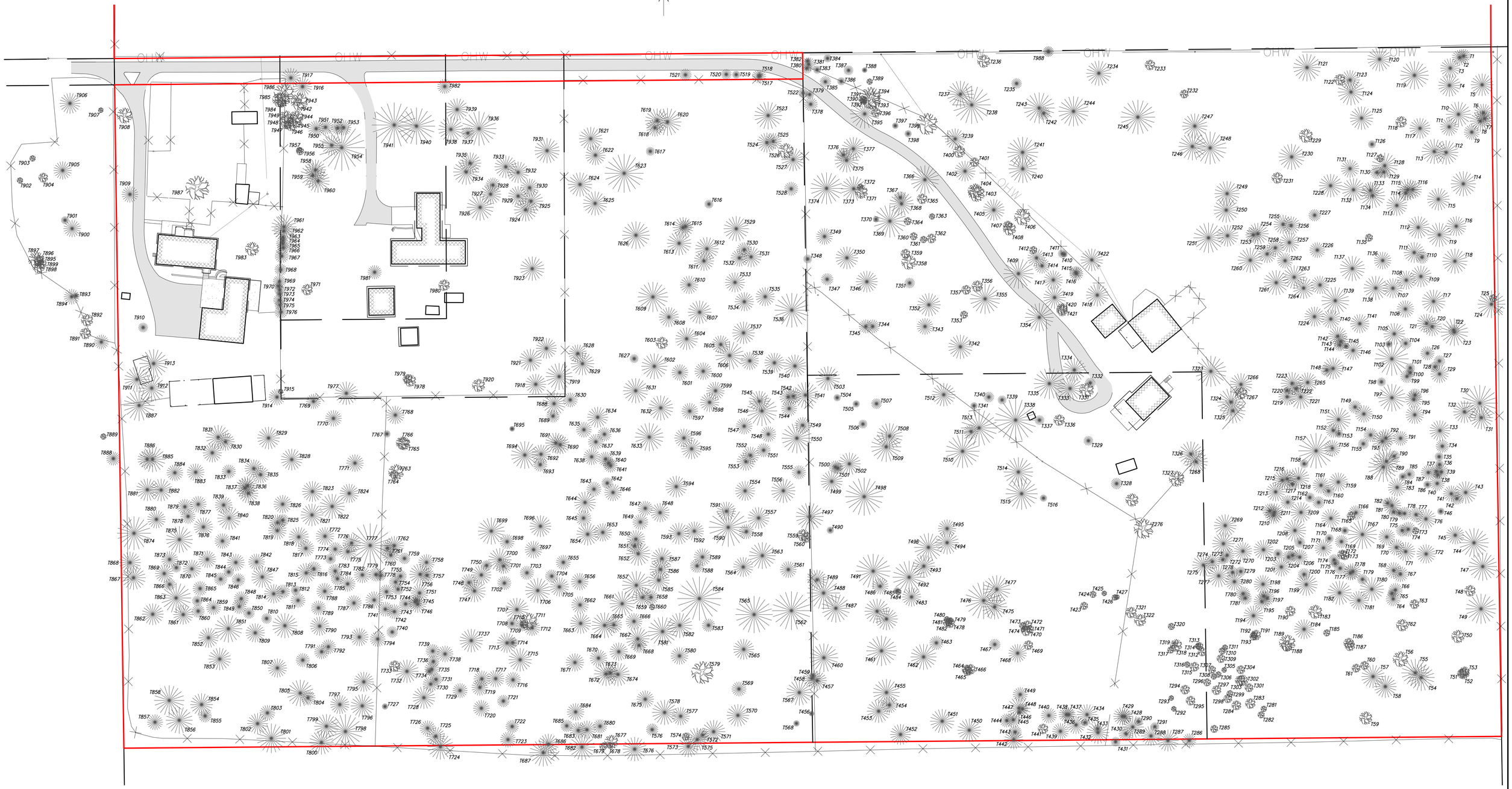
SOUTH PROPERTY TREE INVENTORY-MAP

40' 20' 0 40' 80'

SCALE 1" = 40'

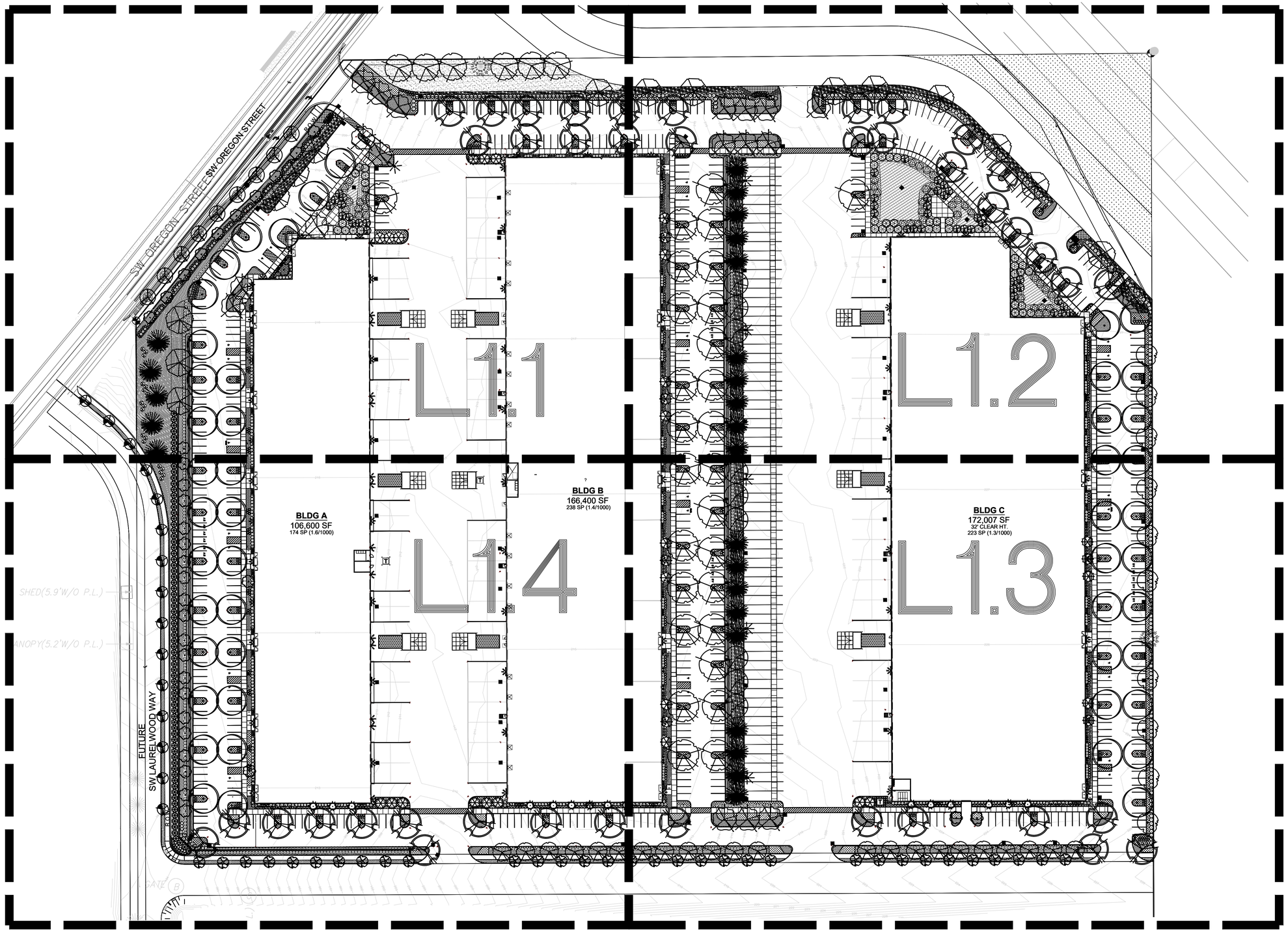
TERRA MARK

TERRAMARK
8196 SW HALL BOULEVARD, SUITE #111
BEAVERTON, OR 97008; PH: 503/860-2255



SOUTH PROPERTY TREE INVENTORY-TABLE

Tree #	DBH (in.)	Species
1	16.0	Douglas Fir
2	18.3	Douglas Fir
3	23.3	Douglas Fir
4	25.9	Douglas Fir
5	26.0	Douglas Fir
6	21.4	Douglas Fir
7	19.4	Douglas Fir
8	23.8	Douglas Fir
9	18.5	Douglas Fir
10	28.8	Douglas Fir
11	20.8	Douglas Fir
12	28.0	Douglas Fir
13	29.4	Douglas Fir
14	29.0	Douglas Fir
15	26.4	Douglas Fir
16	22.7	Douglas Fir
17	27.2	Douglas Fir
18	28.6	Douglas Fir
19	28.4	Douglas Fir
20	22.5	Douglas Fir
21	22.0	Douglas Fir
22	13.1	Douglas Fir
23	31.7	Douglas Fir
24	32.0	Douglas Fir
25	9.3	Magnolia
26	16.5	Douglas Fir
27	13.4	Douglas Fir
28	11.7	Douglas Fir
29	21.0	Douglas Fir
30	42.3	Douglas Fir
31	27.0	Douglas Fir
32	26.4	Douglas Fir
33	23.7	Douglas Fir
34	15.4	Douglas Fir
35	9.5	Douglas Fir
36	10.0	Douglas Fir
37	14.8	Douglas Fir
38	10.3	Douglas Fir
39	17.4	Douglas Fir
40	16.9	Douglas Fir
41	18.8	Douglas Fir
42	13.9	Douglas Fir
43	25.5	Douglas Fir
44	13.8	Douglas Fir
45	20.8	Douglas Fir
46	7.8	Douglas Fir
47	33.3	Douglas Fir
48	12.5	Magnolia
49	35.0	Douglas Fir
50	14.8	Oregon White Oak
51	11.4	Oregon White Oak
52	12.5	Oregon White Oak
53	12.3	Oregon White Oak
54	31.1	Douglas Fir
55	31.7	Douglas Fir
56	17.7	Oregon White Oak
57	27.3	Douglas Fir
58	25.6	Douglas Fir
59	15.4	Oregon White Oak
60	9.9	Oregon White Oak
61	9.8	Oregon White Oak
62	13.8	Oregon White Oak
63	10.9	Oregon White Oak
64	17.3	Douglas Fir
65	9.5	Douglas Fir
66	16.2	Douglas Fir
67	18.2	Douglas Fir
68	19.3	Douglas Fir
69	19.2	Douglas Fir
70	18.5	Douglas Fir
71	21.9	Douglas Fir
72	22.3	Douglas Fir
73	8.2	Magnolia
74	17.0	Douglas Fir
75	13.5	Douglas Fir
76	23.2	Douglas Fir
77	16.7	Douglas Fir
78	15.3	Douglas Fir
79	9.2	Douglas Fir
80	11.9	Douglas Fir
81	20.6	Douglas Fir
82	12.4	Douglas Fir
83	21.2	Douglas Fir
84	8.6	Douglas Fir
85	13.0	Douglas Fir
86	8.7	Douglas Fir
87	16.5	Douglas Fir
88	34.6	Douglas Fir
89	30.9	Douglas Fir
90	13.0	Douglas Fir
91	16.7	Douglas Fir
92	21.1	Douglas Fir
93	12.5	Douglas Fir
94	20.5	Douglas Fir
95	19.8	Douglas Fir
96	15.0	Douglas Fir
97	32.1	Douglas Fir
98	9.8	Douglas Fir
99	15.0	Douglas Fir
100	10.3	Douglas Fir
101	10.9	Douglas Fir
102	38.7	Douglas Fir
103	8.1	Douglas Fir
104	13.1	Douglas Fir
105	25.2	Douglas Fir
106	20.1	Douglas Fir
107	23.2	Douglas Fir
108	22.4	Douglas Fir
109	25.1	Douglas Fir
110	15.0	Douglas Fir
111	24.3	Douglas Fir
112	25.9	Douglas Fir
113	24.0	Douglas Fir
114	17.1	Douglas Fir
115	25.0	Douglas Fir
116	20.6	Douglas Fir
117	24.3	Douglas Fir
118	12.5	Magnolia
119	33.1	Douglas Fir
120	27.9	Douglas Fir
121	32.0	Douglas Fir
122	13.1	Magnolia
123	22.8	Douglas Fir
124	31.1	Douglas Fir
125	26.6	Douglas Fir
126	8.7	Douglas Fir
127	8.9	Magnolia
128	30.4	Douglas Fir
129	14.3	Douglas Fir
130	14.8	Douglas Fir
131	20.6	Douglas Fir
132	27.0	Douglas Fir
133	20.2	Douglas Fir
134	29.0	Douglas Fir
135	9.2	Magnolia
136	19.5	Douglas Fir
137	28.7	Douglas Fir
138	27.8	Douglas Fir
139	31.5	Douglas Fir
140	21.9	Douglas Fir
141	22.0	Douglas Fir
142	21.5	Douglas Fir
143	17.8	Douglas Fir
144	13.8	Douglas Fir
145	7.1	Douglas Fir
146	22.0	Douglas Fir
147	24.8	Douglas Fir
148	14.4	Douglas Fir
149	15.0	Douglas Fir
150	19.8	Douglas Fir
151	27.5	Douglas Fir
152	16.6	Douglas Fir
153	8.5	Douglas Fir
154	15.5	Douglas Fir
155	12.3	Douglas Fir
156	18.7	Douglas Fir
157	41.2	Douglas Fir
158	10.3	Douglas Fir
159	22.4	Douglas Fir
160	14.0	Douglas Fir
161	19.3	Douglas Fir
162	10.9	Douglas Fir
163	13.7	Douglas Fir
164	22.0	Douglas Fir
165	10.0	Magnolia
166	17.4	Douglas Fir
167	33.7	Douglas Fir
168	9.2	Douglas Fir
169	15.4	Douglas Fir
170	9.5	Douglas Fir
171	19.8	Douglas Fir
172	11.1	Magnolia
173	11.3	Magnolia
174	13.0	Douglas Fir
175	9.8	Douglas Fir
176	13.5	Douglas Fir
177	17.3	Douglas Fir
178	19.4	Douglas Fir
179	12.0	Douglas Fir
180	28.3	Douglas Fir
181	22.0	Douglas Fir
182	28.0	Douglas Fir
183	16.2	Oregon White Oak
184	23.0	Douglas Fir
185	8.0	Oregon White Oak
186	11.7	Oregon White Oak
187	12.4	Oregon White Oak
188	13.0	Oregon White Oak
189	19.0	Oregon White Oak
190	12.1	Oregon White Oak
191	12.3	Oregon White Oak
192	7.7	Oregon White Oak
193	9.0	Oregon White Oak
194	22.5	Douglas Fir
195	18.5	Douglas Fir
196	13.0	Douglas Fir
197	16.8	Douglas Fir
198	20.9	Douglas Fir
199	26.2	Douglas Fir
200	13.8	Douglas Fir
201	22.1	Douglas Fir
202	23.3	Douglas Fir
203	10.8	Douglas Fir
204	15.3	Douglas Fir
205	13.2	Douglas Fir
206	17.6	Douglas Fir
207	11.6	Douglas Fir
208	25.8	Douglas Fir
209	24.2	Douglas Fir
210	20.1	Douglas Fir
211	20.8	Douglas Fir
212	16.5	Douglas Fir
213	22.0	Douglas Fir
214	16.3	Douglas Fir
215	23.1	Douglas Fir
216	21.6	Douglas Fir
217	12.9	Douglas Fir
218	25.2	Douglas Fir
219	19.5	Douglas Fir
220	8.8	Douglas Fir
221	27.5	Douglas Fir
222	15.5	Douglas Fir
223	25.5	Douglas Fir
224	23.0	Douglas Fir
225	20.5	Douglas Fir
226	18.0	Douglas Fir
227	13.8	Douglas Fir
228	27.4	Douglas Fir
229	16.1	Cherry
230	29.6	Douglas Fir
231	12.9	Unknown Deciduous Tree
232	9.6	Magnolia
233	12.3	Unknown Deciduous Tree
234	28.6	Douglas Fir
235	11.7	Douglas Fir
236	14.7	Magnolia
237	31.4	Douglas Fir
238	44.0	Douglas Fir
239	24.1	Douglas Fir
240	32.6	Douglas Fir
241	35.6	Douglas Fir
242	15.4	Douglas Fir
243	36.3	Douglas Fir
244	35.0	Douglas Fir
245	39.8	Douglas Fir
246	31.7	Douglas Fir
247	29.4	Douglas Fir
248	37.5	Douglas Fir
249	29.0	Douglas Fir
250	29.0	Douglas Fir
251	34.9	Douglas Fir
252	25.4	Douglas Fir
253	17.8	Douglas Fir
254	24.7	Douglas Fir
255	21.7	Douglas Fir
256	21.4	Douglas Fir
257	22.5	Douglas Fir
258	19.8	Douglas Fir
259	20.7	Douglas Fir
260	29.0	Douglas Fir
261	28.9	Douglas Fir
262	18.0	Douglas Fir
263	26.7	Douglas Fir
264	25.4	Douglas Fir
265	23.4	Douglas Fir
266	25.7	Douglas Fir
267	13.7	Big Leaf Maple
268	27.4	Douglas Fir
269	25.8	Douglas Fir
270	21.0	Douglas Fir
271	26.3	Douglas Fir
272	17.2	Douglas Fir
273	10.5	Douglas Fir
274	18.2	Douglas Fir
275	26.1	Douglas Fir
276	23.2	Magnolia
277	25.5	Douglas Fir
278	13.1	Douglas Fir
279	10.5	Douglas Fir
280	21.0	Douglas Fir
281	7.2	Aspen
282	8.3	Aspen
283	12.0	Aspen
284	10.9	Aspen
285	8.8	Aspen
286	16.4	Douglas Fir
287	24.9	Douglas Fir
288	23.4	Douglas Fir
289	25.5	Douglas Fir
290	9.8	Douglas Fir
291	9.9	Douglas Fir
292	6.3	Aspen
293	6.2	Aspen
294	10.8	Aspen
295	10.6	Aspen
296	8.5	Aspen
297	11.4	Aspen
298	9.8	Aspen
299	8.3	Aspen
300	10.5	Aspen
301	9.5	Aspen
302	13.1	Aspen
303	12.2	Aspen
304	10.1	Aspen
305	6.3	Aspen
306	6.8	Aspen
307	9.1	Aspen
308	6.9	Aspen
309	9.8	Aspen
310	8.3	Aspen
311	7.2	Aspen
312	10.3	Aspen
313	9.4	Aspen
314	6.8	Aspen
315	10.6	Aspen
316	7.2	Aspen
317	7.5	Aspen
318	14.0	Aspen
319	7.1	Aspen
320	7.7	Aspen
321	12.5	Oregon White Oak
322	14.0	Oregon White Oak
323	35.5	Douglas Fir
324	32.0	Douglas Fir
325	29.0	Douglas Fir
326	29.4	Douglas Fir
327	17.5	Magnolia
328	15.3	Magnolia
329	13.0	Engelmann Spruce
330	11.1	Blue Spruce
331	16.7	Magnolia
332	12.3	Spruce
333	29.4	Douglas Fir
334	27.0	Douglas Fir
335	35.7	Douglas Fir
336	12.8	Unknown Deciduous Tree
337	11.4	Douglas Fir
338	48.7	Douglas Fir
339	9.9	Douglas Fir
340	11.5	Douglas Fir
341	7.9	Douglas Fir
342	27.5	Douglas Fir
343	19.2	Douglas Fir
344	16.5	Douglas Fir
345	16.0	Douglas Fir
346	25.0	Douglas Fir
347	14.0	Douglas Fir
348	9.8	Douglas Fir
349	19.0	Douglas Fir
350	26.3	Douglas Fir
351	12.1	Douglas Fir
352	27.0	Douglas Fir
353	9.4	Cherry
354	33.0	Douglas Fir
355	34.5	Douglas Fir
356	12.8	Magnolia
357	10.9	Magnolia
358	16.6	Maple
359	11.0	Maple
360	9.4	Maple
361	7.8	Cherry
362	10.5	Cherry
363	7.1	Magnolia
364	8.9	Cherry
365	12.0	Cherry
366	32.6	Douglas Fir
367	14.0	Douglas Fir
368	27.3	Douglas Fir
369	17.7	Douglas Fir
370	7.2	Douglas Fir
371	15.0	Magnolia
372	6.7	Cherry
373	29.2	Douglas Fir
374	37.0	Douglas Fir
375	27.7	Douglas Fir
376	16.1	Douglas Fir
377	26.5	Douglas Fir
378	16.0	Douglas Fir
379	10.4	Ponderosa Pine
380	11.5	Ponderosa Pine
381	15.7	Ponderosa Pine
382	6.7	Ponderosa Pine
383	8.8	Douglas Fir
384	8.7	Douglas Fir
385	13.3	Ponderosa Pine
386	9.0	Douglas Fir
387	11.3	Douglas Fir
388	6.6	Douglas Fir
389	6.9	Unknown Deciduous Tree
390	8.6	Cherry
391	7.6	Cherry
392	7.2	Cherry
393	20.7	Poplar
394	24.7	Poplar
395	33.6	Douglas Fir
396	11.0	Cherry
397	6.5	Douglas Fir
398	7.7	Douglas Fir
399	24.5	Magnolia
400	14.3	Magnolia
401	10.5	Magnolia
402	23.7	Douglas Fir
403	18.7	Magnolia
404	16.9	Magnolia
405	25.0	Douglas Fir
406	18.6	Magnolia
407	11.1	Magnolia
408	15.2	Magnolia
409	34.6	Douglas Fir
410	7.1	Douglas Fir
411	9.5	Douglas Fir
412	9.3	Unknown Deciduous Tree
413	20.6	Douglas Fir
414	18.4	Douglas Fir
415	14.4	Douglas Fir
416	15.7	Douglas Fir
417	21.8	Douglas Fir
418	26.2	Douglas Fir
419	26.2	Douglas Fir
420	12.8	Magnolia
421	12.9	Magnolia
422	26.0	Douglas Fir
423	9.0	Aspen
424	7.5	Aspen
425	6.1	Aspen
426	6.9	Aspen
427	6.1	Aspen
428	17.1	Douglas Fir
429	20.9	Douglas Fir
430	17.4	Douglas Fir
431	10.8	Douglas Fir
432	26.3	Douglas Fir
433	9.8	Douglas Fir
434	23.6	Douglas Fir
435	8.8	Douglas Fir
436	20.5	Douglas Fir
437	15.8	Douglas Fir
438	17.8	Douglas Fir
439	19.4	Douglas Fir
440	18.3	Douglas Fir
441	11.5	Magnolia
442	22.2	Douglas Fir
443	15.1	Douglas Fir
444	15.5	Douglas Fir
445	17.6	Douglas Fir
446	6.1	Douglas Fir
447	26.8	Douglas Fir
448	12.7	Douglas Fir
449	17.2	Douglas Fir
450	27.3	Douglas Fir
451	28.0	Douglas Fir
452	24.2	Douglas Fir
453	26.7	Douglas Fir
454	19.4	Douglas Fir
455	30.5	Douglas Fir
456	6.2	Douglas Fir
457	21.7	Douglas Fir
458	20.5	Douglas Fir
459	7.2	Douglas Fir
460	33.2	Douglas Fir
461	34.8	Douglas Fir
462	29.7	Douglas Fir
463	15.5	Douglas Fir
464	11.4	Oregon White Oak
465	10.5	Oregon White Oak
466	11.8	Oregon White Oak
467	13.3	Douglas Fir
468	20.9	Douglas Fir
469	11.3	Oregon White Oak
470	11.6	Oregon White Oak
471	9.0	Oregon White Oak
472	11.1	Oregon White Oak
473	7.7	Oregon White Oak
474	6.4	Oregon White Oak
475	28.6	Douglas Fir
476	43.2	Douglas Fir
477	31.8	Douglas Fir
478	11.3	Oregon White Oak
479	7.3	Oregon White Oak
480	7.3	Oregon White Oak
481	10.0	Oregon White Oak
482	9.0	Oregon White Oak
483	21.9	Douglas Fir
484	6.7	Magnolia
485	8.0	Douglas Fir
486	18.6	Douglas Fir
487	32.7	Douglas Fir
488	38.2	Douglas Fir
489	22.7	Douglas Fir
490	7.8	Douglas Fir
491	40.3	Douglas Fir
492	38.0	Douglas Fir
493	25.5	Douglas Fir
494	27.4	Douglas Fir
495	21.2	Douglas Fir
496	33.2	Douglas Fir
497	31.9	Douglas Fir
498	44.3	Douglas Fir
499	24.8	Douglas Fir
500	15.0	Douglas Fir
501	13.1	Douglas Fir
502	26.0	Douglas Fir
503	28.3	Douglas Fir
504	7.9	Douglas Fir
505	8.3	Douglas Fir
506	10.3	Douglas Fir
507	11.6	Douglas Fir
508	29.7	Douglas Fir
509	34.7	Douglas Fir
510	39.3	Douglas Fir
511	16.9	Douglas Fir
512	26.9	Douglas Fir
513	41.5	Douglas Fir
514	33.7	Douglas Fir
515	37.3	Douglas Fir
516	8.4	Douglas Fir
517	15.7	Douglas Fir
518	7.7	Douglas Fir
519	9.2	Douglas Fir
520	12.2	Douglas Fir
521	13.5	Douglas Fir
522	11.1	Ponderosa Pine
523	31.8	Douglas Fir
524	22.6	Douglas Fir
525	18.5	Douglas Fir
526	17.7	Oregon White Oak
527	26.5	Douglas Fir
528	15.8	Douglas Fir
529	28.5	Douglas Fir
530	16.5	Douglas Fir
531	23.8	Douglas Fir
532	19.6	Douglas Fir
533	23.2	Douglas Fir
534	21.5	Douglas Fir
535	22.4	Douglas Fir
536	39.9	Douglas Fir
537	26.7	Douglas Fir
538	21.2	Douglas Fir
539	23.0	Douglas Fir
540	26.3	Douglas Fir
541	30.4	Douglas Fir
542	17.7	Douglas Fir
543	20.0	Douglas Fir
544	17.8	Douglas Fir
545	23.6	Douglas Fir
546	34.5	Douglas Fir
547	18.6	Douglas Fir
548	17.5	Douglas Fir
549	19.3	Douglas Fir
550	34.7	Douglas Fir
551	16.2	Douglas Fir
552	20.3	Douglas Fir
553	21.2	Douglas Fir
554	23.4	Douglas Fir
555	16.1	Douglas Fir
556	27.5	Douglas Fir
557	24.5	Douglas Fir
558	16.6	Douglas Fir
559	14.4	Magnolia
560	11.8	Magnolia
561	19.3	Douglas Fir
562	44.5	Douglas Fir
563	31.1	Douglas Fir
564	22.7	Douglas Fir
565	42.8	Douglas Fir
566	23.6	Douglas Fir
567	30.0	Douglas Fir
568	6.8	Douglas Fir
569	17.0	Douglas Fir
570	25.5	Douglas Fir
571	27.0	Douglas Fir
572	15.0	Douglas Fir
573	24.5	Douglas Fir
574	9.1	Magnolia
575	26.6	Douglas Fir
576	14.2	Douglas Fir
577	20.7	Douglas Fir
578	28.7	Douglas Fir
579	25.8	Oregon White Oak
580	19.6	Douglas Fir
581	33.7	Douglas Fir
582	29.4	Douglas Fir
583	15.0	Douglas Fir
584	50.8	Douglas Fir
585	25.3	Douglas Fir
586	24.9	Douglas Fir
587	25.1	Douglas Fir
588	15.5	Douglas Fir
589	20.4	Douglas Fir
590	44.9	Douglas Fir
591	22.4	Douglas Fir
592	22.0	Douglas Fir
593	24.8	Douglas Fir
594	24.9	Douglas Fir
595	24.1	Douglas Fir
596	21.6	Douglas Fir
597	19.0	Douglas Fir
598	21.5	Douglas Fir
599	21.0	Douglas Fir
600	19.9	Douglas Fir
601	19.3	Douglas Fir
602	29.3	Douglas Fir
603	13.7	Oregon White Oak
604	26.1	Douglas Fir
605	20.7	Douglas Fir
606	32.9	Douglas Fir
607	27.3	Douglas Fir
608	23.4	Douglas Fir
609	35.3	Douglas Fir
610	21.2	Douglas Fir
611	22.6	Douglas Fir
612	26.8	Douglas Fir
613	27.5	Douglas Fir
614	23.5	Douglas Fir
615	14.8	Douglas Fir
616	9.7	Douglas Fir
617	10.3	Douglas Fir
618	19.7	Douglas Fir
619	28.1	Douglas Fir
620	31.8	Douglas Fir
621	26.9	Douglas Fir
622	22.8	Douglas Fir
623	44.8	Douglas Fir
624	28.2	Douglas Fir
625	27.8	Douglas Fir
626	31.9	Douglas Fir
627	9.6	Douglas Fir
628	21.2	Douglas Fir
629	27.4	Douglas Fir
630	26.2	Douglas Fir
631	16.5	Douglas Fir
632	28.8	Douglas Fir
633	32.8	Douglas Fir
634	24.2	Douglas Fir
635	17.5	Douglas Fir
636	16.4	Douglas Fir
637	17.5	Douglas Fir
638	18.8	Douglas Fir
639	16.6	Douglas Fir
640	13.7	Douglas Fir
641	16.2	Douglas Fir
642	13.0	Douglas Fir
643	17.4	Douglas Fir
644	25.2	Douglas Fir
645	18.4	Douglas Fir
646	20.2	Douglas Fir
647	16.6	Douglas Fir
648	22.2	Douglas Fir
649	17.8	Douglas Fir
650	20.8	Douglas Fir
651	17.5	Douglas Fir
652	28.1	Douglas Fir
653	21.0	Douglas Fir
654	26.0	Douglas Fir
655	17.3	Douglas Fir
656	19.8	Douglas Fir
657	33.4	Douglas Fir
658	17.4	Douglas Fir
659	22.5	Douglas Fir
660	7.4	Magnolia
661	29.0	Douglas Fir
662	20.0	Douglas Fir
663	24.2	Douglas Fir
664	29.8	Douglas Fir
665	19.4	Douglas Fir
666	15.1	Douglas Fir
667	27.1	Douglas Fir
668	16.6	Douglas Fir
669	20.8	Douglas Fir
670	20.3	Douglas Fir
671	21.1	Douglas Fir
672	27.5	Douglas Fir
673	16.7	Douglas Fir
674	27.2	Douglas Fir
675	20.3	Douglas Fir
676	28.4	Douglas Fir
677	16.2	Magnolia
678	6.5	Magnolia
679	8.7	Magnolia
680	15.8	Douglas Fir
681	20.6	Douglas Fir
682	30.2	Douglas Fir
683	19.1	Douglas Fir
684	19.5	Douglas Fir
685	13.7	Douglas Fir
686	24.3	Douglas Fir
687	32.0	Douglas Fir
688	27.0	Douglas Fir
689	15.1	Douglas Fir
690	21.8	Douglas Fir
691	23.8	Douglas Fir
692	21.6	Douglas Fir
693	16.4	Douglas Fir
694	31.6	Douglas Fir
695	6.2	Douglas Fir
696	25.2	Douglas Fir
697	19.8	Douglas Fir
698	16.5	Douglas Fir
699	30.5	Douglas Fir
700	26.7	Douglas Fir
701	17.5	Douglas Fir
702	16.2	Douglas Fir
703	15.6	Douglas Fir
704	15.1	Douglas Fir
705	21.8	Douglas Fir
706	29.4	Douglas Fir
707	26.7	Douglas Fir
708	12.8	Douglas Fir
709	13.8	Douglas Fir
710	10.1	Magnolia
711	20.0	Magnolia
712	19.2	Douglas Fir
713	23.3	Douglas Fir
714	11.8	Douglas Fir
715	27.4	Douglas Fir
716	17.6	Douglas Fir
717	20.2	Douglas Fir
718	18.8	Douglas Fir
719	18.6	Douglas Fir
720	19.1	Douglas Fir
721	14.4	Douglas Fir
722	15.0	Douglas Fir
723	17.9	Douglas Fir
724	30.2	Douglas Fir
725	22.2	Douglas Fir
726	18.1	Douglas Fir
727	6.6	Douglas Fir
728	26.2	Douglas Fir
729	16.9	Douglas Fir
730	17.7	Douglas Fir
731	14.3	Douglas Fir
732	26.9	Douglas Fir
733	13.0	Magnolia
734	9.4	Douglas Fir
735	17.0	Douglas Fir
736	14.3	Douglas Fir
737	27.4	Douglas Fir
738	19.1	Douglas Fir
739	15.7	Douglas Fir
740	13.2	Douglas Fir
741	16.9	Douglas Fir
742	16.9	Douglas Fir
743	14.9	Douglas Fir
744	16.2	Douglas Fir
745	7.8	Douglas Fir
746	19.5	Douglas Fir
747	26.2	Douglas Fir
748	20.4	Douglas Fir
749	22.6	Douglas Fir
750	12.3	Douglas Fir
751	20.2	Douglas Fir
752	12.5	Douglas Fir
753	15.8	Douglas Fir
754	15.2	Douglas Fir
755	14.4	Douglas Fir
756	25.0	Douglas Fir
757	17.4	Douglas Fir
758	18.8	Douglas Fir
759	12.5	Douglas Fir
760	19.7	Douglas Fir
761	16.6	Douglas Fir
762	21.5	Douglas Fir
763	17.5	Magnolia
764	10.3	Magnolia
765	14.8	Magnolia
766	15.3	Magnolia
767	8.1	Douglas Fir
768	21.2	Douglas Fir
769	16.8	Douglas Fir
770	18.7	Douglas Fir
771	20.2	Douglas Fir
772	21.4	Douglas Fir
773	12.4	Douglas Fir
774	16.4	Douglas Fir
775	20.2	Douglas Fir
776	20.5	Douglas Fir
777	50.5	Douglas Fir
778	11.6	Douglas Fir
779	15.7	Douglas Fir
780	15.7	Douglas Fir
781	15.4	Douglas Fir
782	19.2	Douglas Fir
783	16.2	Douglas Fir
784	15.2	Douglas Fir
785	18.1	Douglas Fir
786	19.8	Douglas Fir
787	17.7	Douglas Fir
788	19.0	Douglas Fir
789	16.6	Douglas Fir
790	21.8	Douglas Fir
791	16.5	Douglas Fir
792	16.9	Douglas Fir
793	21.0	Douglas Fir
794	17.5	Douglas Fir
795	23.9	Douglas Fir
796	27.0	Douglas Fir
797	21.8	Douglas Fir
798	39.8	Douglas Fir
799	28.0	Douglas Fir
800	27.7	Douglas Fir
801	34.4	Douglas Fir
802	24.4	Douglas Fir
803	17.5	Douglas Fir
804	17.4	Douglas Fir
805	31.0	Douglas Fir



SITE LANDSCAPE PLAN

SCALE 1" = 60-0"

GENERAL NOTES:
1. Contractor is to verify all plant quantities.
2. Adjust plantings in the field as necessary.
3. Project is to be irrigated by an automatic, underground system, which will provide full coverage for all plant material. System is to be design/ build by Landscape Contractor. Guarantee system for a minimum one year. Show drip systems as alternate bid only.
4. All plants are to be fully foliaged, well branched and true to form.
5. Contractor is to notify Landscape Architect or Owner's Representative of any site changes or unforeseen conditions that may be detrimental to plant health, or cause future problems to any structural elements of the project.

KEY PLAN N.T.S.

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Exhibit A2

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www.ottenla.com

PROJECT NAME
SHERWOOD COMMERCE CENTER

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

REGISTERED LANDSCAPE ARCHITECT
LA793
ERIN HOLSOMBACK
OREGON
5/10/2013
EXP. 5/31/23

DATE
JULY 18, 2022

SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN	CHECKED

LANDSCAPE PLAN

L1.0

Exhibit A2

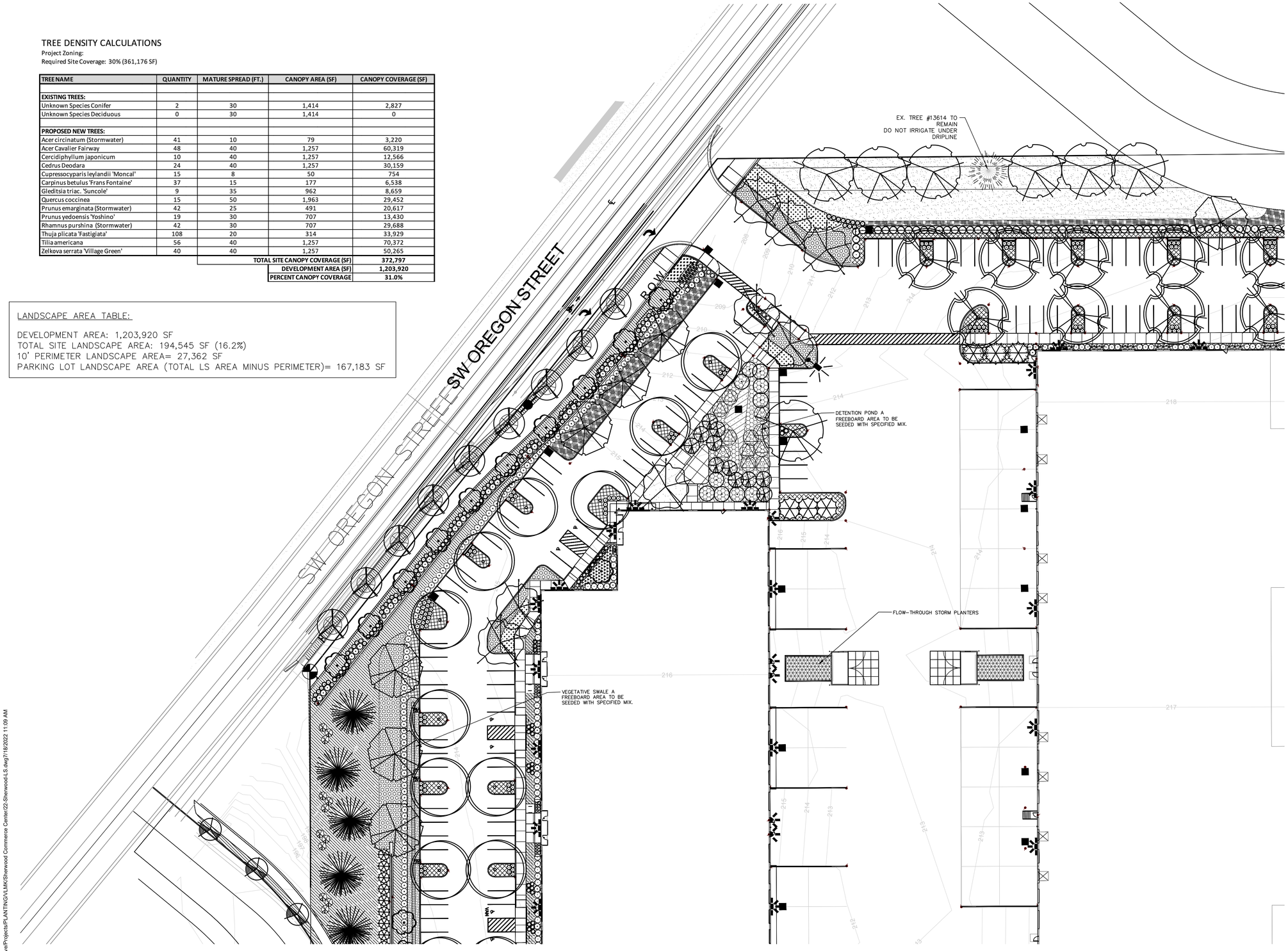
TREE DENSITY CALCULATIONS

Project Zoning:
Required Site Coverage: 30% (361,176 SF)

TREE NAME	QUANTITY	MATURE SPREAD (FT.)	CANOPY AREA (SF)	CANOPY COVERAGE (SF)
EXISTING TREES:				
Unknown Species Conifer	2	30	1,414	2,827
Unknown Species Deciduous	0	30	1,414	0
PROPOSED NEW TREES:				
Acer circinatum (Stormwater)	41	10	79	3,220
Acer Cavalier Fairway	48	40	1,257	60,319
Cercidiphyllum japonicum	10	40	1,257	12,566
Cedrus Deodara	24	40	1,257	30,159
Cupressocyparis leylandii 'Moncal'	15	8	50	754
Carpinus betulus 'Frans Fontaine'	37	15	177	6,538
Gleditsia triac. 'Suncole'	9	35	962	8,659
Quercus coccinea	15	50	1,963	29,452
Prunus emarginata (Stormwater)	42	25	491	20,617
Prunus yedoensis 'Yoshino'	19	30	707	13,430
Rhamnus purshina (Stormwater)	42	30	707	29,688
Thuja plicata 'Fastigiata'	108	20	314	33,929
Tilia americana	56	40	1,257	70,372
Zelkova serrata 'Village Green'	40	40	1,257	50,265
			TOTAL SITE CANOPY COVERAGE (SF)	**372,797**
			DEVELOPMENT AREA (SF)	**1,203,920**
			PERCENT CANOPY COVERAGE	**31.0%**

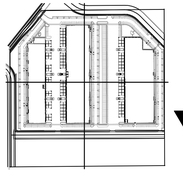
LANDSCAPE AREA TABLE:

DEVELOPMENT AREA: 1,203,920 SF
TOTAL SITE LANDSCAPE AREA: 194,545 SF (16.2%)
10' PERIMETER LANDSCAPE AREA= 27,362 SF
PARKING LOT LANDSCAPE AREA (TOTAL LS AREA MINUS PERIMETER)= 167,183 SF



LANDSCAPE PLAN

SCALE 1" = 30'-0"



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OREGON
5/10/2013
EXP. 5/31/23

DATE JULY 18, 2022

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LANDSCAPE PLAN

L1.1

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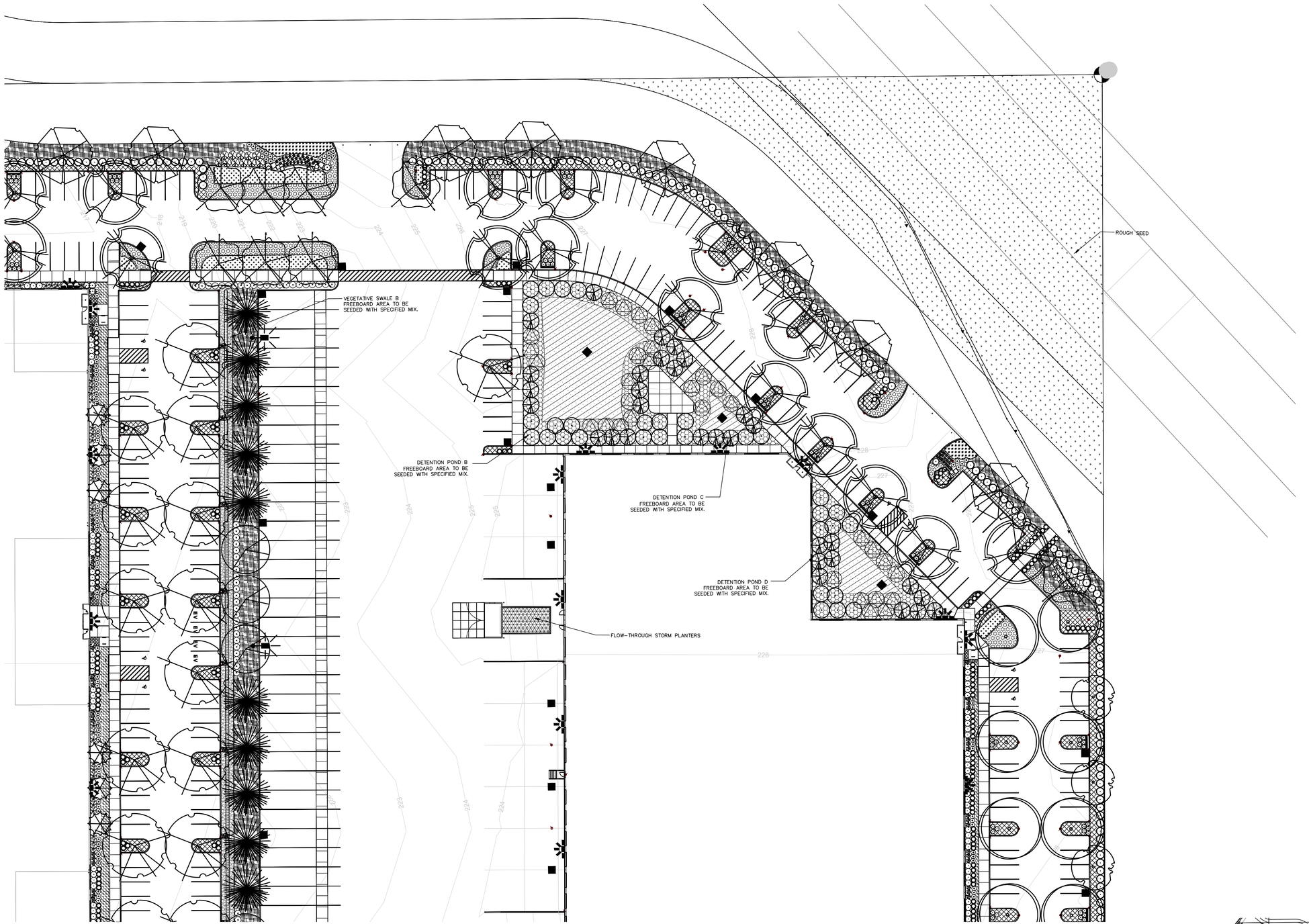
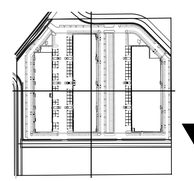
Exhibit A2



LANDSCAPE PLAN

SCALE 1" = 30'-0"



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OREGON
5/10/2013
EXP. 5/31/23

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JULY 18, 2022

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LANDSCAPE PLAN

L1.2

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Exhibit A2

?

BLDG B
166,400 SF
238 SP (1.4/1000)

BLDG C
172,007 SF
32' CLEAR HT.
223 SP (1.3/1000)

VEGETATIVE SWALE B
FREEBOARD AREA TO BE
SEEDED WITH SPECIFIED MIX.

FLOW-THROUGH STORM PLANTERS

EX. TREE #13718
TO REMAIN

LANDSCAPE PLAN

SCALE 1" = 30'-0"

KEY PLAN N.T.S.

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EXP. 5/31/23

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DRAWN	CHECKED

LANDSCAPE PLAN

L1.3

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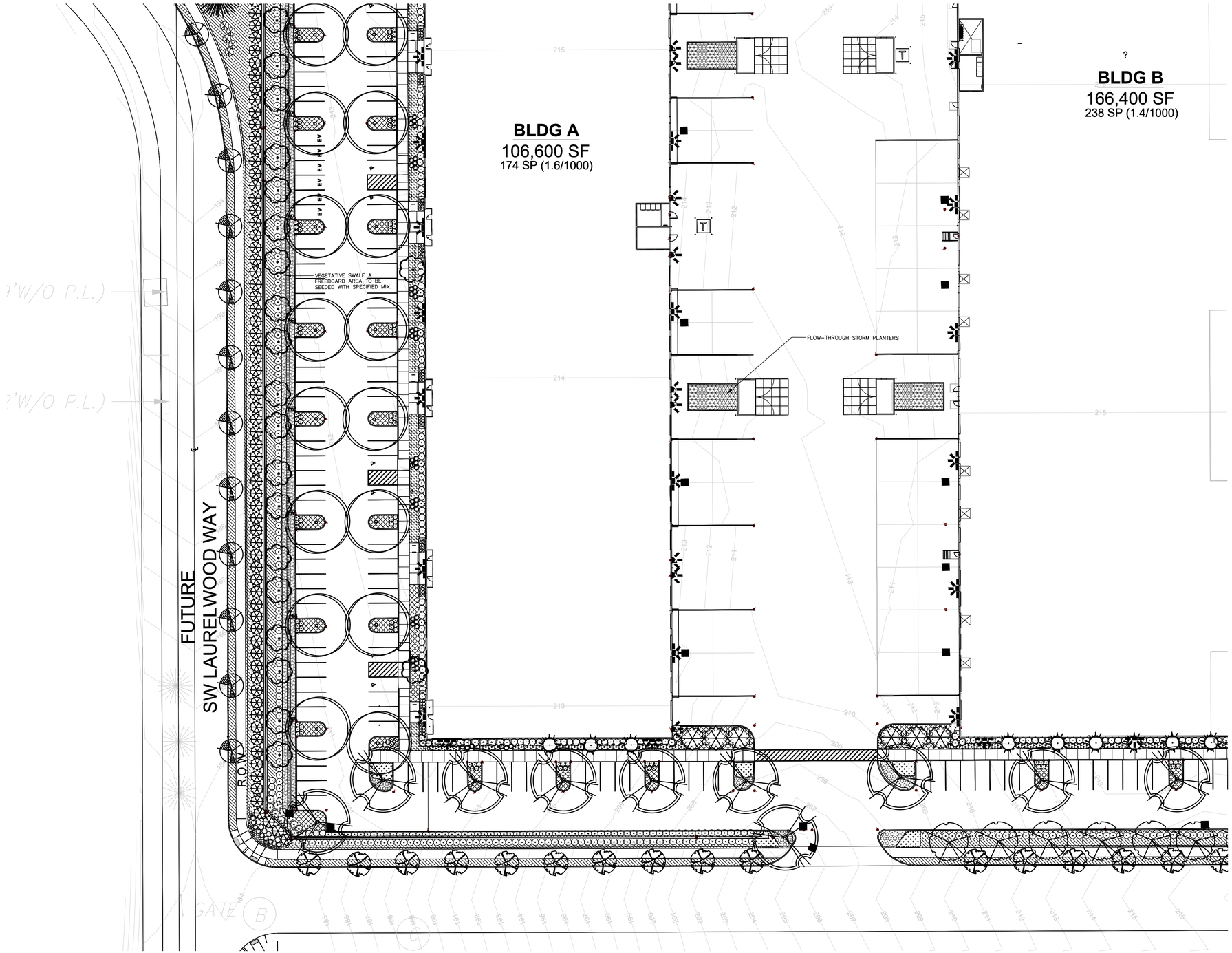
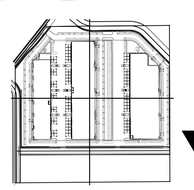
Exhibit A2



LANDSCAPE PLAN

SCALE 1" = 30'-0"



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OREGON
5/10/2013
EXP. 5/31/23

DATE
JULY 18, 2022

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DRAWN	CHECKED

LANDSCAPE PLAN

L1.4

/Users/Lupin/Synology Drive/Projects/PLANTING/VLMK/Sherwood Commerce Center/22-Sherwood-LS.dwg 7/18/2022 11:10 AM

PLANT LIST: GENERAL LANDSCAPING

SYMBOL	QTY.	LATIN NAME/ Common Name	SIZE	SPACING
		STREET TREES		
	9	ACER BUERGERANUM Trident Maple	2" cal.	As Shown
	15	PRUNUS SERRULATA 'KANZAN' Japanese Cherry	2" cal.	As Shown
	50	MAGNOLIA KOBUS 'DR. MERRILL' Dr. Merrill Magnolia	2" cal.	As Shown
		SITE TREES		
	48	ACER PLATANOIDES 'FAIRWAY' Cavalier Norway Maple	2" cal.	As Shown
	10	CERCDIPHYLLUM JAPONICUM Katsurea Tree	2" cal.	As Shown
	24	CEDRUS DEODARA Deodar Cedar	7'-8' ht.	As Shown
	15	CUPRESSOCYPARIS LEYLANDII 'MONCAL' Emerald Isle Leyland Cypress	6' ht.	As Shown
	37	CARPINUS BETULUS 'FRANS FONTAINE' Frans Fontaine European Hornbeam	2" cal.	As Shown
	9	GLEDITSIA TRIACANTHOS 'SUNCOLE' Sunburst Honeylocust	2" cal.	As Shown
	15	QUERCUS COCCINEA Scarlet Oak	2" cal.	As Shown
	19	PRUNUS YEDOENSIS 'YOSHINO' Yoshino Flowering Cherry	2" cal.	As Shown
	108	THUJA PLICATA 'FASTIGIATA' Hogan Cedar	6' ht.	As Shown
	56	TILIA AMERICANA American Linden	2" cal.	As Shown
	40	ZELKOVA SERRATA 'VILLAGE GREEN' Village Green Zelkova	2" cal.	As Shown
		SHRUBS		
	350	ABELIA 'LUCKY LOTS' Lucky Lots Abelia	2 gal.	3' o.c.
	97	AUCUBA JAPONICA 'MR. GOLDSTRIKE' Mr. Goldstrike Aucuba	5 gal.	4' o.c.
	112	BUXUS MICROPHYLLA "WNTER GEM" Microphylla "Winter Gem"	5 gal.	3' o.c.
	191	CISTUS LADANIFER Crimson-Spot Rock Rose	5 gal.	5' o.c.
	500	CORNUS SERICEA 'KELSEYI' Kelsey's Dwarf Red-osier Dogwood	2 gal.	3' o.c.
	213	PIERIS JAPONICA 'LITTLE HEATH' Little Heath Lily Of The Valley	3 gal.	3 o.c.
	316	PRUNUS LAUROCERASUS 'NANA' Dwarf English Laurel	4'-5' ht.	5' o.c.
	43	ESCALLONIA 'APPLE BLOSSOM' Apple Blossom Escallonia	5 gal.	5' o.c.
	50	EUONYMUS JAPONICUS 'GREEN SPIRE' Green Spire Euonymus	5 gal.	2' o.c.
	74	JUNIPERUS CHINENSIS "HETZ'S COLUMN Hetz's Columnar Juniper	3' ht.	5' o.c.
	152	RHODODENDRON 'SEPTEMBER SONG' September Song Rhododendron	18"-21" ht.	4' o.c.
	180	ROSA 'FLOWER CARPET AMBER' Flower Carpet Amber Rose	2 gal.	3' o.c.
	18	SPIRAEA JAPONICA 'LITTLE PRINCESS' Goldmound Spirea	2 gal.	3' o.c.
	101	TAXUS x MEDIA "HICKSII Hicks Yew	3' ht.	3' o.c.
	385	VIBURNUM DAVIDII David Viburnum	5 gal.	3' o.c.
	644	VIBURNUM TINUS 'SPRING BOUQUET' Spring Bouquet Viburnum	5 gal.	4' o.c.
	40	VIBURNUM PLIC. TOMENT. "MARIESII" Mariesii Doublefill Viburnum	5 gal.	8' o.c.
		GROUNDCOVER AND PERENNIALS		
	2,260	ARCTOSTAPHYLOS UVA-URSI "MASS." Massachusetts Kinnikinnick	1 gal.	3' o.c.
	1,916	COTONEASTER DAM. 'CORAL BEAUTY' Bearberry Cotoneaster	1 gal.	4' o.c.
	896	EUONYMUS FORTUNEI 'EMERALD GAIETY' Emerald Gaiety Winter Creeper	1 gal.	30" o.c.
	240	HELICTOTRICHON SEMPERVIRENS Blue Oat Grass	1 gal.	2' o.c.
	66	HEMEROCALLIS STELLA D'ORO Stella d'Oro Daylily	1 gal.	2' o.c.
	309	LONICERA PILEATA Box Leaf Honeysuckle	1 gal.	5' o.c.
	1,024	MAHONIA REPENS Creeping Oregon Grape	1 gal.	3' o.c.
	156	NANDINA DOMESTICA 'WOOD'S DWARF' Wood's Dwarf Nandina	1 gal.	2' o.c.
		SEEDED AREAS		
	22,474 SF	FINE LAWN See Specifications		
	68,460 SF	ROUGH SEED See Specifications		

PLANT LEGEND: DETENTION PONDS

SYMBOL	QTY.	LATIN NAME/ Common Name	SIZE	SPACING
		TREES		
	41	ACER CIRCINATUM Vine Maple	2 gal./3' ht.	As Shown
	42	PRUNUS EMARGINATA Bitter Cherry	1 gal./2' ht.	As Shown
	42	RHAMNUS PURSHIANA Cascara	1 gal./2' ht.	As Shown
		SHRUBS		
	157	CORNUS SERICEA Red Osier Dogwood	1 gal./2' ht.	As Shown
	157	PHILADELPHUS LEWISII Mock Orange	1 gal./2' ht.	As Shown
	157	SPIRAEA DOUGLASII Douglas Spirea	1 gal./1.5' ht.	As Shown
	156	SYMPHORICARPUS ALBUS Small Fruited Bulrush	1 gal./1.5' ht.	As Shown
		HERBACOUS PLANTS		
	10,686	JUNCUS PATENS Spreading Rush	Plugs	6 per SF
	10,686	CAREX OBNUPTA Slough Sedge	Plugs	6 per SF
	10,686	SCIRPUS MICROCARPUS Small Fruited Bulrush	Plugs	6 per SF

NOTE: REQUIRED TREE, SHRUB AND HERBACEOUS PLANT QUANTITIES FOR EACH POND SHALL INCLUDE EQUAL AMOUNTS OF EACH SPECIES.

STORM WATER FACILITY PLANTING CALCULATIONS
PER CLEAN WATER SERVICES DESIGN AND CONSTRUCTION STANDARDS

DETENTION POND 'A':
FACILITY AREA= 3,556 SF
TREATMENT AREA= 362 SF
HERBACEOUS PLANTS REQUIRED (6 PER SF)= 2,172
FREEBOARD AREA= 3,194 SF
TREES REQUIRED (3,194*.01)= 32
SHRUBS REQUIRED (3,194*.05)= 160

DETENTION POND 'B':
FACILITY AREA= 8,619 SF
TREATMENT AREA= 3,786 SF
HERBACEOUS PLANTS REQUIRED (6 PER SF)= 22,716
FREEBOARD AREA= 4,833 SF
TREES REQUIRED (4,833*.01)= 48
SHRUBS REQUIRED (4,833*.05)= 242

DETENTION POND 'C':
FACILITY AREA= 1,765 SF
TREATMENT AREA= 346 SF
HERBACEOUS PLANTS REQUIRED (6 PER SF)= 2,076
FREEBOARD AREA= 1,419 SF
TREES REQUIRED (1,419*.01)= 14
SHRUBS REQUIRED (1,419*.05)= 71

DETENTION POND 'D':
FACILITY AREA= 3,938 SF
TREATMENT AREA= 850 SF
HERBACEOUS PLANTS REQUIRED (6 PER SF)= 5,100
FREEBOARD AREA= 3,088 SF
TREES REQUIRED (3,088*.01)= 31
SHRUBS REQUIRED (3,088*.05)= 154

PLANT LEGEND: VEGETATIVE SWALES

SYMBOL	QTY.	LATIN NAME/ Common Name	SIZE	SPACING
		SHRUBS		
	147	CORNUS SERICEA 'KELSEYII' Kelsey Dogwood	1 gal./1.5' ht.	As Shown
	147	GAULTHERIA SHALLON Salal	1 gal./1.5' ht.	As Shown
	146	MAHONIA NERVOSA Dull Oregon Grape	1 gal./1.5' ht.	As Shown
		HERBACOUS PLANTS		
	5,900	JUNCUS PATENS Spreading Rush	Plugs	6 per SF
	5,900	CAREX OBNUPTA Slough Sedge	Plugs	6 per SF
	5,900	SYMPHYOTRICHUM SUB. Douglas Aster	Plugs	6 per SF

NOTE: REQUIRED TREE, SHRUB AND HERBACEOUS PLANT QUANTITIES FOR EACH POND SHALL INCLUDE EQUAL AMOUNTS OF EACH SPECIES.

STORM WATER CALCULATIONS PER CWS LIDA HANDBOOK

SWALE 'A':
TREATMENT AREA= 1,292 SF
6 PLUGS PER SF (1,292*6)= 7,752
FREEBOARD AREA=3,924 SF
SHRUBS REQUIRED (3,924*.05)=196

SWALE 'B':
TREATMENT AREA= 1,658 SF
6 PLUGS PER SF (1,658*6)= 9,948
FREEBOARD AREA=4,884 SF
SHRUBS REQUIRED (4,884*.05)=244

PLANT LEGEND: FLOW-THROUGH PLANTERS PER LIDA STANDARDS

SYMBOL	QTY.	LATIN NAME/ Common Name	SIZE	SPACING
		HERBACOUS PLANTS		
	1,454	JUNCUS PATENS Spreading Rush	Plugs	6 per SF
	1,453	CAREX OBNUPTA Slough Sedge	Plugs	6 per SF
	1,453	SYMPHYOTRICHUM SUB. Douglas Aster	Plugs	6 per SF

NOTE: REQUIRED HERBACEOUS PLANT QUANTITIES FOR EACH SWALE SHALL INCLUDE EQUAL AMOUNTS OF EACH SPECIES.

STORM WATER CALCULATIONS PER CWS LIDA HANDBOOK

TREATMENT AREA PER PLANTER= 474 SF
115 HERBACEOUS PLANTS PER 100 SF (4.74*115)=545 PLANTS PER PLANTER

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PROJECT NAME
SHERWOOD COMMERCE CENTER

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

⚠	DATE	DESCRIPTION

REGISTERED LA793 ERIN HOLSONBACK OREGON 5/10/2013 EXP. 5/31/23 LANDSCAPE ARCHITECT

DATE: JULY 18, 2022
SCALE: AS NOTED
PROJ. NO.: 20210190
DRAWN:
CHECKED:

LANDSCAPE PLAN

L1.5

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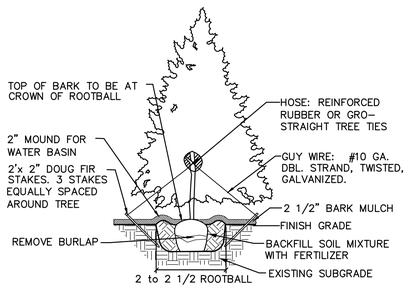
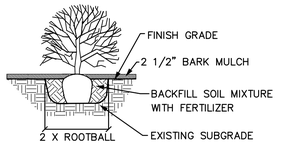


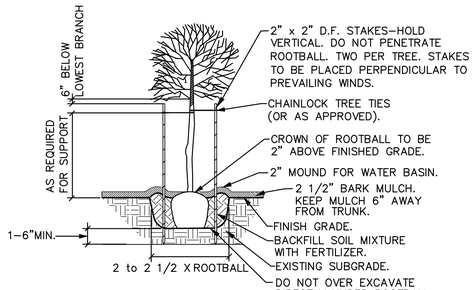
EVERGREEN TREE STAKING DETAIL

NOT TO SCALE



SHRUB PLANTING DETAIL

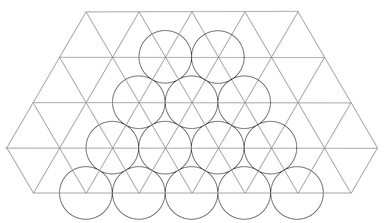
NOT TO SCALE



NOTE: ANY PROPOSED CHANGES TO OUR SPECIFICATION OR DETAIL SHOULD BE APPROVED BY THE LANDSCAPE ARCHITECT. LIKEWISE, IN ACCORDANCE WITH BEST PRACTICES OF LOCAL LANDSCAPE INSTALLATION, SHOULD THE LANDSCAPE CONTRACTOR FIND A PREFERRED ALTERNATE METHOD, THE LANDSCAPE ARCHITECT MAY BE SO ADVISED.

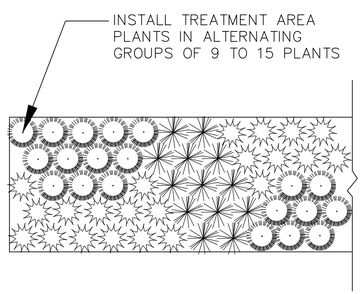
GENERAL DECIDUOUS TREE PLANTING DETAIL

NOT TO SCALE



GROUNDCOVER PLANTING DETAIL

NOT TO SCALE



STORMWATER FACILITY PLANTING DETAIL

NOT TO SCALE

OUTLINE SPECIFICATIONS PLANTING AND SEEDING:

GENERAL: All plants shall conform to all applicable standards of the latest edition of the "American Association of Nurserymen Standards", A.N.S.I. Z60.1 – 1973. Meet or exceed the regulations and laws of Federal, State, and County regulations, regarding the inspection of plant materials, certified as free from hazardous insects, disease, and noxious weeds, and certified fit for sale in Oregon.

The apparent silence of the Specifications and Plans as to any detail, or the apparent omission from them of a detailed description concerning any point, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of first quality are to be used. All interpretations of these Specifications shall be made upon the basis above stated.

Landscape contractor shall perform a site visit prior to bidding to view existing conditions.

PERFORMANCE QUALITY ASSURANCE: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary horticultural practices and who are completely familiar with the specified requirements and methods needed for the proper performance of the work of this section.

NOTIFICATION: Give Landscape Architect minimum of 2 days advance notice of times for inspections. Inspections at growing site does not preclude Landscape Architect's right of rejection of deficient materials at project site. Each plant failing to meet the above mentioned "Standards" or otherwise failing to meet the specified requirements as set forth shall be rejected and removed immediately from the premises by the Contractor and at his expense, and replaced with satisfactory plants or trees conforming to the specified requirements.

SUBSTITUTIONS: Only as approved by the Landscape Architect or the Owner's Representative.

GUARANTEE AND REPLACEMENT: All plant material shall be guaranteed from final acceptance for one full growing season or one year, whichever is longer. During this period the Contractor shall replace any plant material that is not in good condition and producing new growth (except that material damaged by severe weather conditions, due to Owner's negligence, normally unforeseen peculiarities of the planting site, or lost due to vandalism). Guarantee to replace, at no cost to Owner, unacceptable plant materials with plants of same variety, age, size and quality as plant originally specified. Conditions of guarantee on replacement plant shall be same as for original plant.

Landscape Contractor shall keep on site for Owner's Representative's inspection, all receipts for soil amendment and topsoil deliveries.

PROTECTION Protect existing roads, sidewalks, and curbs, landscaping, and other features remaining as final work. Verify location of underground utilities prior to doing work. Repair and make good any damage to service lines, existing features, etc. caused by landscaping installation.

PLANT QUALITY ASSURANCE: Deliver direct from nursery. Maintain and protect roots of plant material from drying or other possible injury. Store plants in shade and protect them from weather immediately upon delivery, if not to be planted within four hours.

Nursery stock shall be healthy, well branched and rooted, formed true to variety and species, full foliaged, free of disease, injury, defects, insects, weeds, and weed roots. Trees shall have straight trunks, symmetrical tips, and have an intact single leader. Any trees with double leaders will be rejected upon inspection. All Plants: True to name, with one of each bundle or lot tagged with the common and botanical name and size of the plants in accordance with standards of practice of the American Association of Nurserymen, and shall conform to the Standardized Plant Names, 1942 Edition.

Container grown stock: Small container-grown plants, furnished in removable containers, shall be well rooted to ensure healthy growth. **Grow container plants in containers a minimum of one year** prior to delivery, with roots filling container but not root bound. Bare root stock: Roots well-branched and fibrous. Balled and burlapped (B&B): Ball shall be of natural size to ensure healthy growth. Ball shall be firm and the burlap sound. No loose or made ball will be acceptable.

TOPSOIL AND FINAL GRADES: Landscape Contractor is to supply and place 12" of topsoil in planting beds and 6" in lawn areas. Landscape Contractor is to verify with the General Contractor if the on-site topsoil is or is not conducive to proper plant growth. The topsoil shall be a sandy loam, free of all weeds and debris inimical to lawn or plant growth. Furnish soil analysis by a qualified soil testing laboratory stating percentages of organic matter; gradation of sand, silt and clay content; cation exchange capacity, deleterious material; pH; and plant nutrient content of the topsoil. Report suitability of topsoil for plant growth and recommended quantities of nitrogen, phosphorus and potash nutrients and soil amendments (including compost) to be added to produce satisfactory topsoil. If stockpiled topsoil on site is not conducive to proper plant growth, the Landscape Contractor shall import the required amount.

Landscaping shall include finished grades and even distribution of topsoil to meet planting requirements. Grades and slopes shall be as indicated. Planting bed grades shall be approximately 3" below adjacent walks, paving, finished grade lines, etc., to allow for bark application. Finish grading shall remove all depressions or low areas to provide positive drainage throughout the area.

PLANTING SPECIFICATIONS:

HERBICIDES: Prior to soil preparation, all areas showing any undesirable weed or grass growth shall be treated with Round-up in strict accordance with the manufacturer's instructions.

SOIL PREPARATION: Work all areas by rototilling to a minimum depth of 8". Remove all stones (over 1½" size), sticks, mortar, large clumps of vegetation, roots, debris, or extraneous matter turned up in working. Soil shall be of a homogeneous fine texture. Level, smooth and lightly compact area to plus or minus .10 of required grades.

In groundcover areas add 2" of compost (or as approved) and till in to the top 6" of soil.

PLANTING HOLE: Lay out all plant locations and excavate all soils from planting holes to 2 1/2 times the root ball or root system width. Loosen soil inside bottom of plant hole. Dispose of any "subsoil" or debris from excavation. Check drainage of planting hole with water, and adjust any area showing drainage problems.

SOIL MIX: Prepare soil mix in each planting hole by mixing:
2 part native topsoil (no subsoil)
1 part compost (as approved)

Thoroughly mix in planting hole and add fertilizers at the following rates:
Small shrubs – 1/8 lb./ plant
Shrubs – 1/3 to 1/2 lb./ plant
Trees – 1/3 to 1 lb./ plant

FERTILIZER: For trees and shrubs use Commercial Fertilizer "A" Inorganic (5-4-3) with micro-nutrients and 50% slow releasing nitrogen. For initial application in fine seed lawn areas use Commercial Fertilizer "B" (8-16-8) with micro-nutrients and 50% slow-releasing nitrogen. For lawn maintenance use Commercial Fertilizer "C" (22-16-8) with micro-nutrients and 50% slow-releasing nitrogen. DO NOT apply fertilizer to Water Quality Swale.

PLANTING TREES AND SHRUBS: Plant upright and face to give best appearance or relationship to adjacent plants and structures. Place 6" minimum, lightly compacted layer of prepared planting soil under root system. Loosen and remove twine binding and burlap from top 1/2 of root balls. Cut off cleanly all broken or frayed roots, and spread roots out. Stagger Plants in rows. Backfill planting hole with soil mix while working each layer to eliminate voids.

When approximately 2/3 full, water thoroughly, then allow water to soak away. Place remaining backfill and dish surface around plant to hold water. Final grade should keep root ball slightly above surrounding grade, not to exceed 1". Water again until no more water is absorbed. Initial watering by irrigation system is not allowed.

STAKING OF TREES: Stake or guy all trees. Stakes shall be 2" X 2" (nom.) quality tree stakes with point. They shall be of Douglas Fir, clear and sturdy. Stake to be minimum 2/3 the height of the tree, not to exceed 8'-0". Drive stake firmly 1'-6" below the planting hole. Tree ties for deciduous trees shall be "Chainlock" (or better). For Evergreen trees use "Gro-Strait" Tree Ties (or a reinforced rubber hose and guy wires) with guy wires of a minimum 2 strand twisted 12 ga. wire. Staking and guying shall be loose enough to allow movement of tree while holding tree upright.

MULCHING OF PLANTINGS: Mulch planting areas with dark, aged, medium grind fir or hemlock bark (aged at least 6 months) to a depth of 2" in ground cover areas and 2½" in shrub beds. Apply evenly, not higher than grade of plant as it came from the nursery, and rake to a smooth finish. Water thoroughly, then hose down planting area with fine spray to wash leaves of plants.

FINE LAWN AREAS: In fine lawn area apply Commercial Fertilizer Mix "B" at 4.5 lbs. Per 1,000 sq.ft. and rake into soil surface. Establish an even, fine textured seedbed meeting grades, surfaces and texture. Sow seed with a mechanical spreader at the uniform rates as noted below. Rake seed lightly to provide cover.

ROUGH SEED AREA: In rough seeded area, establish an evenly graded seedbed. Sow seed with a mechanical spreader at the uniform rates as noted below. Rake seed lightly to provide cover.

SEED: Bluetag grass seed conforming to applicable State laws. No noxious weed seeds. Submit Guaranteed analysis.
Fine Lawn Seed Mix: To contain 50% Top Hat Perennial Ryegrass, 30% Derby Supreme Ryegrass, 20% Longfellow Chewings Fescue (Hobbs and Hopkins Pro-Time 303 Lawn Mix or as approved) Sow Seed at 5 lbs. / 1000 sq. ft.
Rough Seed Mix: PTLawn Seed-Quick Guard Seed, Nurse Crop & Erosion Control, or approved equal. Sow at 1 lbs. Per 1,000 sq.ft.

MAINTENANCE OF SEEDED AREAS:
Fine Lawn Areas: The lawn areas shall be maintained by watering, mowing, reseeding, and weeding for a minimum of 60 days after seeding. After 30 days, or after the second mowing, apply Commercial Fertilizer Mix "C" at 5 lbs. per 1,000 sq. ft. Mow and keep at 1½" to 2" in height. Remove clippings and dispose of off site.

GENERAL MAINTENANCE: Protect and maintain work described in these specifications against all defects of materials and workmanship, through final acceptance. Replace plants not in normal healthy condition at the end of this period. Water, weed, cultivate, mulch, reset plants to proper grade or upright position, remove dead wood and do necessary standard maintenance operations. Irrigate when necessary to avoid drying out of plant materials, and to promote healthy growth.

CLEAN-UP: At completion of each division of work all extra material, supplies, equipment, etc., shall be removed from the site. All walks, paving, or other surfaces shall be swept clean, mulch areas shall have debris removed and any soil cleared from surface. All areas of the project shall be kept clean, orderly and complete.

STORMWATER FACILITY SPECIFICATIONS PER APPENDIX A OF CLEAN WATER SERVICES DESIGN & CONSTRUCTION STANDARDS:

INVASIVE SPECIES CONTROL: Mechanical control by hand consistent with Clean Water Services' Integrated Vegetated and Animal Management Guide (March 2003) is recommended to control invasive spread prior to installing plantings. Invasive species control to be conducted as needed based upon the site inspections. Invasive species include: Himalayan and evergreen blackberry (Rubus discolor and R. laciniatus), reed canarygrass (Phalaris arundinacea), teasel (Dipsacus fullonum), Canada and bull thistle (Cirsium arvense and C. vulgare), Scotch broom (Cytisus scoparius), purple loosestrife (Lythrum salicaria), Japanese knotweed (Polygonium cuspidatum), morning glory (Convolvulus species, giant hogweed (Heracleum mantegazzianum), English ivy (Hedera helix), nightshade (Solanum species), and clematis (Clematis ligusticifolia and C. vitalba.

SITE PREPARATION (DETENTION POND): Landscape contractor shall asses the existing soil conditions of the vegetated swale and/or corridor to determine the appropriate soil preparation methods, as follows:

For areas with at least one foot of native topsoil, but containing non-native or invasive plants, remove undesirable plants, roots and seeds prior to planting.

For areas with either disturbed or compacted soils, or less than one foot of topsoil and containing non-native or invasive plants:
1. Remove undesireable plants, roots and seeds prior to adding topsoil.
2. Till the sub-grade in these areas to a depth of at least 4" and add at least 12" of clean compost-amended topsoil. The compost amended topsoil shall have the following characteristics to ensure a good growing medium:
   A) Texture – material passes through 1" screen
   B) Fertility – 35% organic matter
3. In the event of flood plain grading, over-excavate the sub grade to ensure 12" of topsoil can be applied without impacting surface water elevations.

Where appropriate and necessary for erosion control or to enhance organic matter, leaf compost may be placed uniformly on the topsoil. (Refer to Chapter 6, Erosion Prevention and Sediment Control). Other amendments, conditioners, and bio amendments may be added as needed to support the specified plants or adjust the soil pH. Traditional fertilization techniques (appplying N-P-K) are not necessary for native plants.

SITE PREPARATION (INFILTRATION PLANTERS): Contractor shall place 18" layer of growing medium meeting the specifications of Clean Water Services Detail 742A over the specified drainage layers throughout the stormwater facility area to meet final grades. Topsoil shall be placed in loose lifts not to exceed 8" and each lift should be compacted with a water-filled landscape roller.

Landscaping shall include finished grades and even distribution of topsoil to meet planting requirements. Grades shall be as indicated on civil plans. Finish grading shall remove all depressions or low areas to provide positive drainage throughout the area.

TIMING: Containerized stock shall be installed between February 1 and May 1, or between October 1 and November 15. Bare root stock shall be installed only from December 15 through April 15 (bare root stock must be 12-16 inches long). Notify Landscape Architect if planting must be performed outside these times, as additional approved measures may be needed to assure survival.

EROSION CONTROL: Grading, soil preparation, and seeding shall be performed during optimal weather conditions and at low flow levels to minimize sediment impacts. Site disturbance shall be minimized and desirable vegetation retained, where possible. Slopes shall be graded to support the establishment of vegetation. Where seeding is used for erosion control, an appropriate native grass, Regreen (or its equivalent), or sterile wheat shall be used to stabilize slopes until permanent vegetation is established. Biodegradable fabrics (coir, coconut or approved jute matting (minimum 1/4" square holes) may be used to stabilize slopes and channels. Fabrics such as burlap may be used to secure plant plugs in place and to discourage floating upon inundation. No plastic mesh that can entangle wildlife is permitted. Consult CWS Chapter 6 – Erosion Prevention and Sediment Control for additional information.

A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the swale cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Use high density jute matting in the treatment area (Geojute Plus or approved equal). In all other areas use low density jute matting (Econojute or approved equal). Landscaping shall include finished grades and even distribution of topsoil to meet planting requirements. Grades and slopes shall be as indicated on civil plans. Finish grading shall remove all depressions or low areas to provide positive drainage throughout the area.

PLANTING TREES AND SHRUBS: Plant upright and face to give best appearance or relationship to adjacent plants and structures. Loosen and remove twine binding and burlap from top one-half of root balls. Cut off cleanly all broken or frayed roots, and spread roots out. Stagger Plants in rows. Backfill planting hole with soil mix while working each layer to eliminate voids. Plantings shall be tagged for dormant season identification and shall remain on plant material after planting for monitoring purposes.

PLANTING HERBACEOUS PLANTS: Stagger plants and alternate grouping of same-species plants throughout the planting area at designated spacing. Excavate a hole slightly wider than the container root area and at a depth that maintains the above-ground vegetation at finish grade level after soil settling. Backfill soil around root ball and lightly tam to secure in place.

MULCHING: Trees, shrubs, and groundcovers planted in upland areas shall be mulched a minimum of 3" in depth and 18" in diameter, to retain moisture and discourage weed growth around newly installed plant material. Appropriate mulches are made from composted bark or leaves that have not been chemically treated. The use of mulch in frequently inundated areas shall be limited, to avoid any possible water quality impacts including the leaching of tannins and nutrients, and the migration of mulch into waterways.

For vegetated swales, see CWS Standard Detail 710 for mulching of the treatment area plantings.

WILDLIFE PROTECTION: Depending on site conditions, appropriate measures shall taken to limit wildlife-related damage (deer, beaver, nutria, mice and voles). Examples include installing tree protector tubes or wire mesh cylinders around newly installed plantings.

IRRIGATION: Plantings shall be watered using an approved temporary irrigation system (or equivalent) during the two year establishment period. Irrigation system shall be design/build by landscape contractor. All plantings under CWS jurisdiction are to be watered one inch per week from June 15 through October 15 for the duration of the two year maintenance period.

MAINTENANCE: The permitee is responsible for the maintenance of this facility to assess the status of plantings, irrigation, and mulchingfor for a minimum of two years following the acceptance of the facility by Clean Water Services. Owners Representative shall inspect the facility twice annually (Spring by June 1st & Fall by September 30th) throughout the two-year maintenance period. If at any time during the warranty period the landscaping falls below 80% survival of trees and shrubs, or 90% aerial coverage of herbaceous plants, or if the amount of invasive non-native species exceeds 20%, the Owner shall remove the undesirable vegetation and reinstall all deficient planting at the next appropriate time. The cause of plant loss and corrective measures taken shall be documented, and the two-year maintenance period shall begin again from the date of replanting.

Responsible Party:
Name
Address
Phone:

CLEAN-UP: At completion of each division of work all extra material, supplies, equipment, etc., shall be removed from the site. All walks, paving, or other surfaces shall be swept clean, mulch areas shall have debris removed and any soil cleared from surface. All areas of the project shall be kept clean, orderly and complete.

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PROJECT NAME
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SHERWOOD, OR

CUP APPLICATION

REVISIONS

⚠	DATE	DESCRIPTION

REGISTERED LA793 ERIN HOLSONBACK OREGON 5/10/2013 EXP. 5/31/23 LANDSCAPE ARCHITECT

DATE
JULY 18, 2022

SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN	CHECKED

LANDSCAPE PLAN

L2.0

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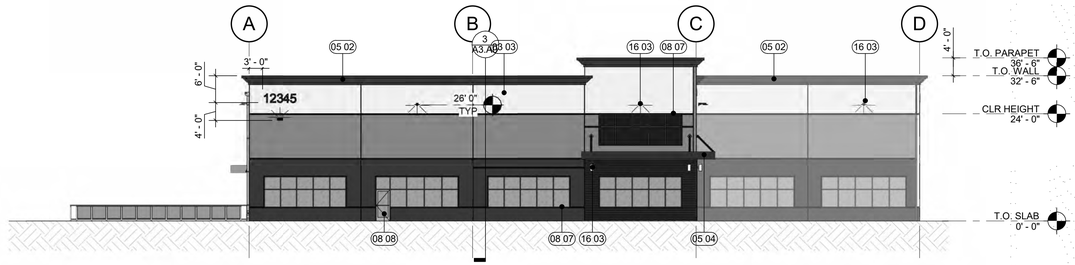
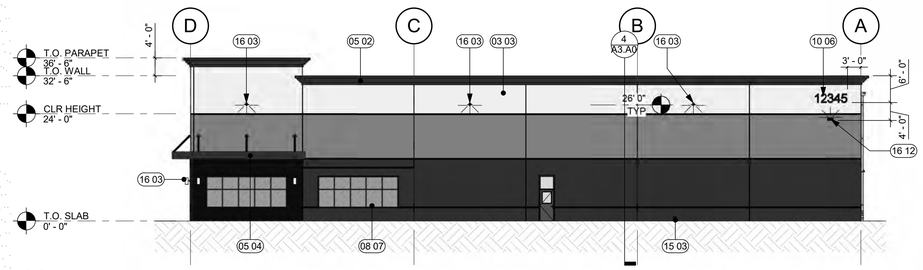
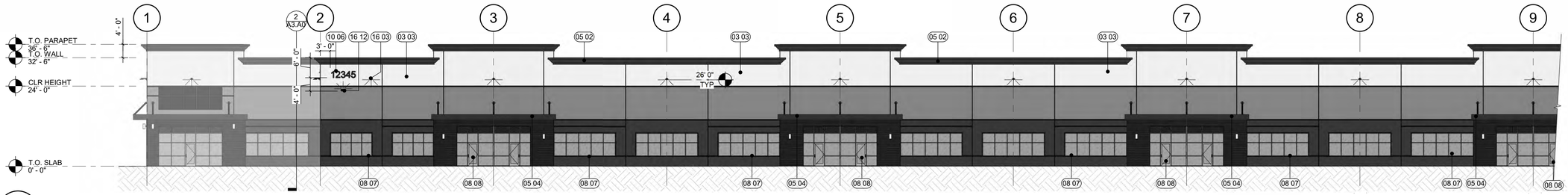


1 A2.A0 NORTH ELEVATION
1/16" = 1'-0" NORTH ELEVATION

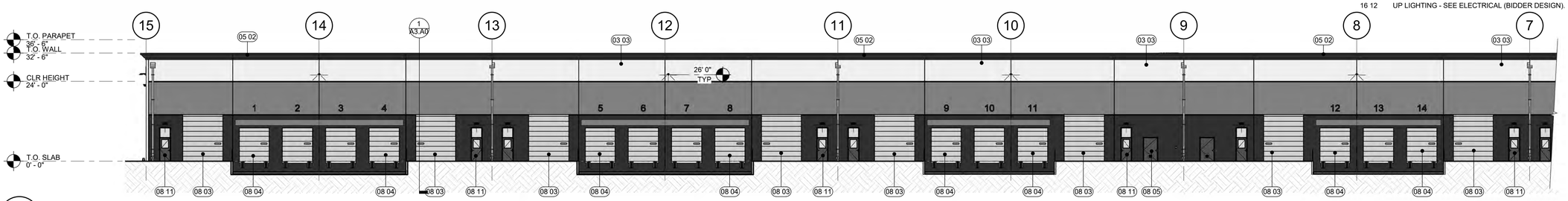


2 A2.A0 SOUTH ELEVATION
1/16" = 1'-0" SOUTH ELEVATION

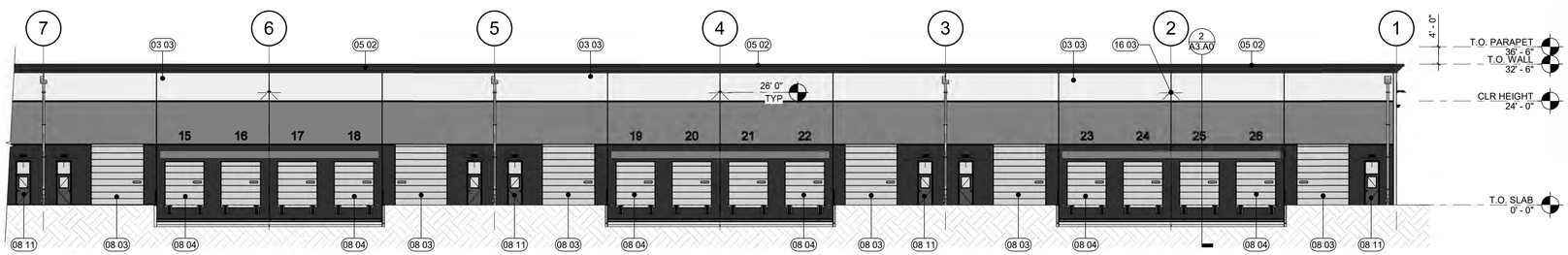


4 A2.A0 WEST ELEVATION
1/16" = 1'-0" WEST ELEVATION

5 A2.A0 WEST ELEVATION
1/16" = 1'-0" WEST ELEVATION - Dependent 1



3 A2.A0 EAST ELEVATION
1/16" = 1'-0" EAST ELEVATION



6 A2.A0 EAST ELEVATION
1/16" = 1'-0" EAST ELEVATION - Dependent 1

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
05 02	METAL CAP FLASHING TYPICAL AT PARAPET ON ALL SIDES. SEE SITE DETAIL SHEET
05 04	CANOPY PER PLANS AND DETAILS. SEE STRUCTURAL FOR MORE INFORMATION
08 03	OVERHEAD DOOR AT GRADE LEVEL PER DOOR SCHEDULE.
08 04	OVERHEAD DOORS AT DOCK LEVEL PER DOOR SCHEDULE.
08 05	EXTERIOR MAN DOOR PER DOOR SCHEDULE.
08 07	ALUMINUM STOREFRONT GLAZING PER DETAILS AND SPECIFICATIONS.
08 08	ALUM. STOREFRONT VESTIBULE AT MAIN ENTRY PER ENERGY CODE.
08 11	CHAIN OPERATED ROTARY ROOF VENTILATORS ABOVE, SEE SPECIFICATIONS.
10 06	24" HIGH, 1/2" THICK BLACK ACCRYLIC BLOCK LETTERS/NUMBERS. PROVIDE UPLIGHTING AT AL LOCATIONS - SEE ELECTRICAL (BIDDER DESIGN). ALL ADDRESS NUMBERS TO BE OF CONTRASTING COLOR TO THE BUILDING AND MEET THE REQUIREMENTS OF THE FIRE MARSHAL.
15 03	GAS METERS TYPICAL - SEE MECHANICAL (BIDDER DESIGN).
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.
16 08	RECESSED LIGHTING, BY OTHERS (BIDDER DESIGN)
16 12	UP LIGHTING - SEE ELECTRICAL (BIDDER DESIGN).

GLAZING CALCULATIONS [PER CITY CODE 16.90.020(D)(7)(a)(1)]

ELEVATION	GLAZING CALCULATIONS	
NORTH ELEVATION	OVERALL ELEVATION AREA	4,975 SF
	GLAZING REQUIRED (15%)	746 SF
	GLAZING PROVIDED	**923 SF**
WEST ELEVATION (GRIDS 1-5, WITHIN 200' OF OREGON ST.)	OVERALL ELEVATION AREA	7,092 SF
	15% GLAZING REQUIRED	1,064 SF
	GLAZING PROVIDED	**1,461 SF**

Exhibit A2

VLMK
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Schnitzer PROPERTIES

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BUILDING A

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REVISIONS

	DATE	DESCRIPTION

PRELIMINARY NOT FOR CONSTRUCTION

DATE SEPTEMBER 15, 2022
SCALE AS NOTED
PROJ. NO. 20210190
DRAWN JAB
CHECKED CGA

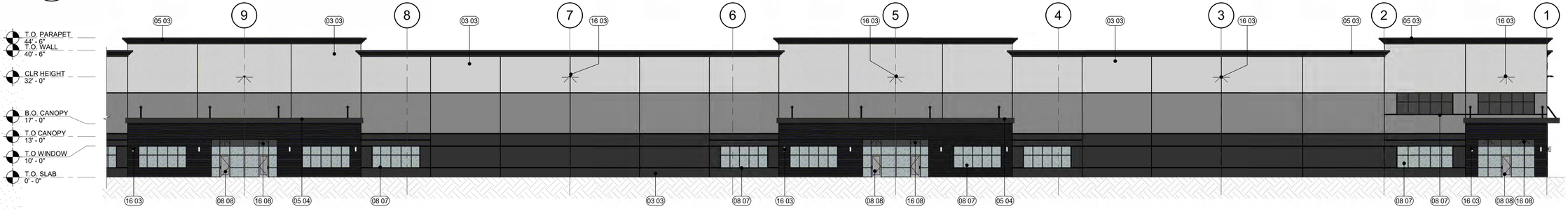
BLDG A - BUILDING ELEVATIONS

A2.A0

9/16/2022 7:02:01 AM

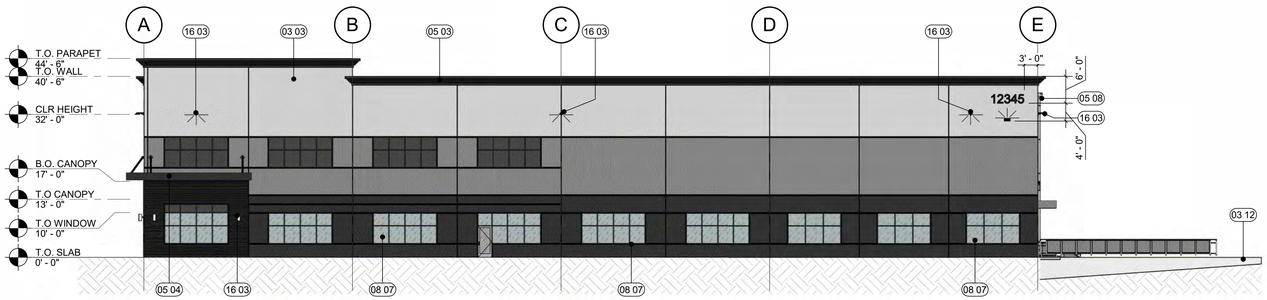
1 A2.B0 EAST ELEVATION

1/16" = 1'-0" EAST ELEVATION



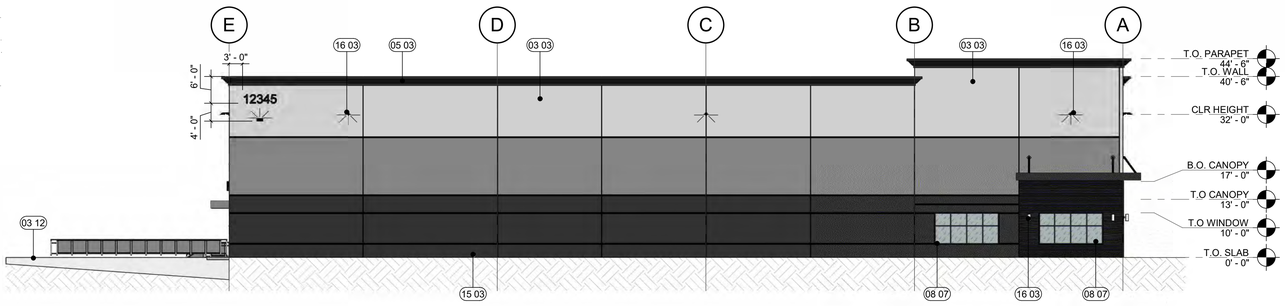
5 A2.B0 EAST ELEVATION

1/16" = 1'-0" EAST ELEVATION - Dependent 1



2 A2.B0 NORTH ELEVATION

1/16" = 1'-0" NORTH ELEVATION



3 A2.B0 SOUTH ELEVATION

1/16" = 1'-0" SOUTH ELEVATION

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
03 12	CAST-IN-PLACE CONCRETE WALL, SEE STRUCTURAL.
05 03	BUILT-UP METAL CORNICE PER DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 04	CANOPY PER PLANS AND DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 08	DOWNSPOUTS WITH SCUPPER PER ROOF PLAN AND DETAIL. ALSO SEE SITE UTILITY PLAN FOR STORM TIE IN.
08 07	ALUMINUM STOREFRONT GLAZING PER DETAILS AND SPECIFICATIONS.
08 08	ALUM. STOREFRONT VESTIBULE AT MAIN ENTRY PER ENERGY CODE.
15 03	GAS METERS TYPICAL - SEE MECHANICAL (BIDDER DESIGN).
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.
16 08	RECESSED LIGHTING, BY OTHERS (BIDDER DESIGN)

GLAZING CALCULATIONS [PER CITY CODE 16.90.020(D)(7)(a)(1)]

ELEVATION	GLAZING CALCULATIONS	
NORTH ELEVATION	OVERALL ELEVATION AREA	8,287 SF
	GLAZING REQUIRED (15%)	1,243 SF
	GLAZING PROVIDED	**1,294 SF**

Exhibit A2

VLMK
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Schnitzer PROPERTIES

PROJECT NAME
SHERWOOD COMMERCE CENTER
BUILDING B

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY NOT FOR CONSTRUCTION

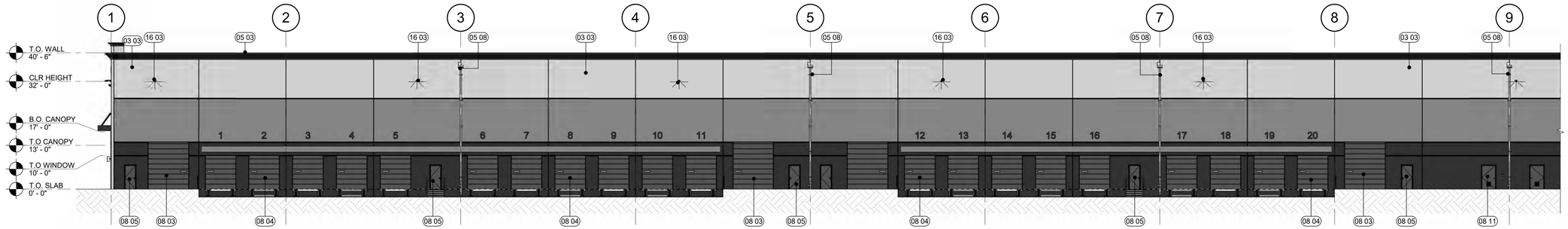
DATE SEPTEMBER 15, 2022

SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN JAB	CHECKED CGA

BLDG B - BUILDING ELEVATIONS

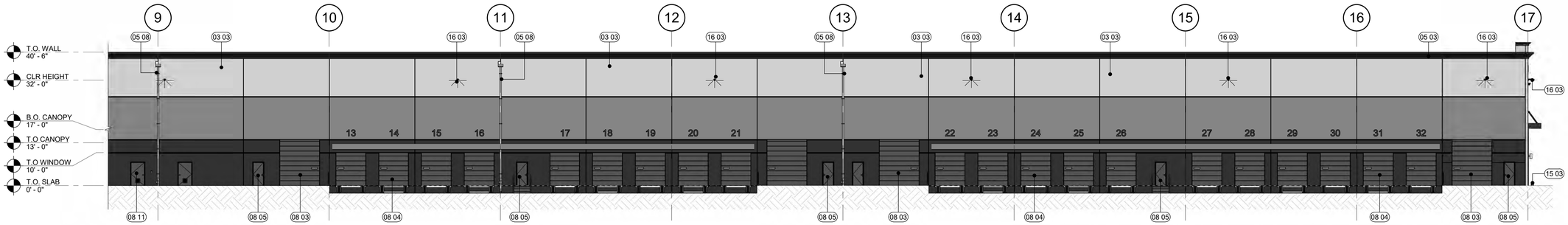
A2.B0

9/16/2022 8:49:49 AM



1 A2.B1 **WEST ELEVATION**

1/16" = 1'-0" WEST ELEVATION



2 A2.B1 **WEST ELEVATION**

1/16" = 1'-0" WEST ELEVATION - Dependent 1

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
05 03	BUILT-UP METAL CORNICE PER DETAILS, SEE STRUCTURAL FOR MORE INFORMATION.
05 08	DOWNSPOUTS WITH SCUPPER PER ROOF PLAN AND DETAIL. ALSO SEE SITE UTILITY PLAN FOR STORM TIE IN.
08 03	OVERHEAD DOOR AT GRADE LEVEL PER DOOR SCHEDULE.
08 04	OVERHEAD DOORS AT DOCK LEVEL PER DOOR SCHEDULE.
08 05	EXTERIOR MAN DOOR PER DOOR SCHEDULE.
08 11	CHAIN OPERATED ROTARY ROOF VENTILATORS ABOVE, SEE SPECIFICATIONS.
15 03	GAS METERS TYPICAL - SEE MECHANICAL (BIDDER DESIGN).
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.

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BLDG B - BUILDING ELEVATIONS

A2.B1

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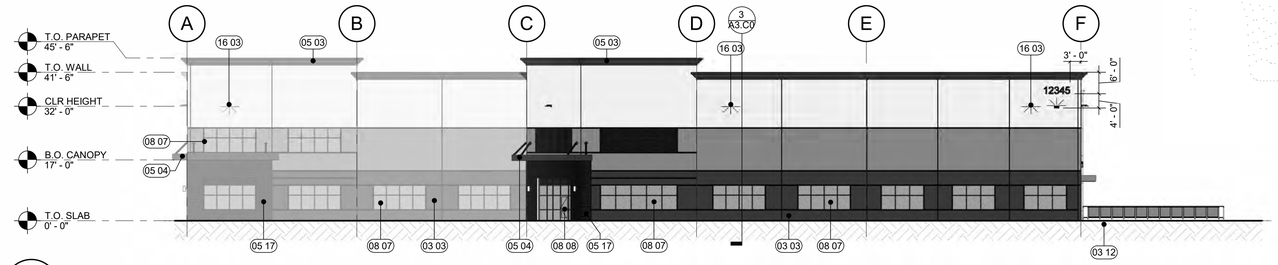
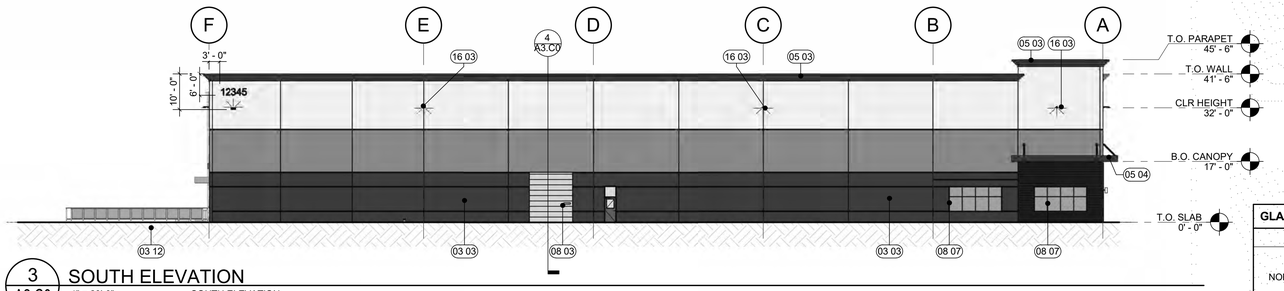


2 A2.C0 NORTH ELEVATION
1" = 20'-0" NORTH ELEVATION

GENERAL ELEVATION NOTES

1. FOR ADDITIONAL INFORMATION SEE STRUCTURAL PANEL ELEVATIONS.
2. FOR PANEL REINFORCING, EMBED, AND CONNECTION INFORMATION, SEE STRUCTURAL PANEL ELEVATIONS.
3. ALL PANEL THICKNESS TO BE AS INDICATED ON THE STRUCTURAL ELEVATIONS.
4. ALL ARCHITECTURAL BUILDING ELEVATIONS ARE DRAWN FROM THE EXTERIOR FACE, U.O.N.
5. SEE FOUNDATION PLAN AND ARCHITECTURAL SHEETS TO DETERMINE PANEL DIMENSIONS AND ELEVATIONS.
6. SEE SPECIFICATIONS FOR PANEL CONCRETE MIX REQUIREMENTS.



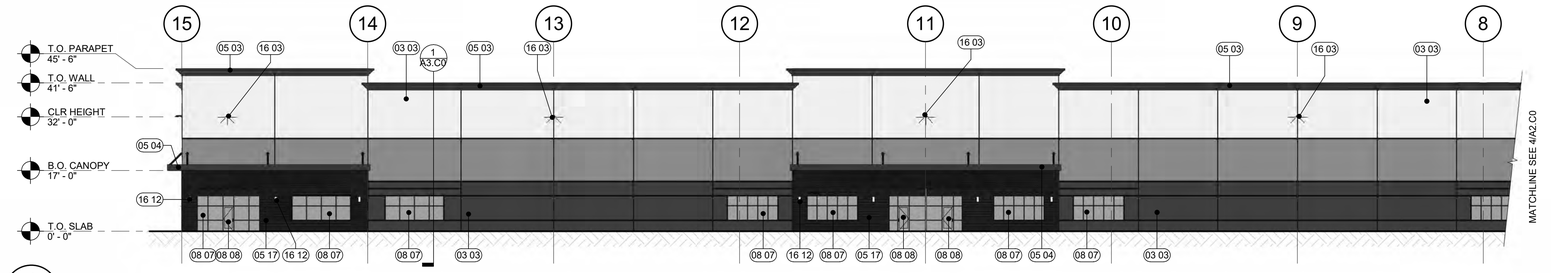
3 A2.C0 SOUTH ELEVATION
1" = 20'-0" SOUTH ELEVATION

KEYNOTE LEGEND

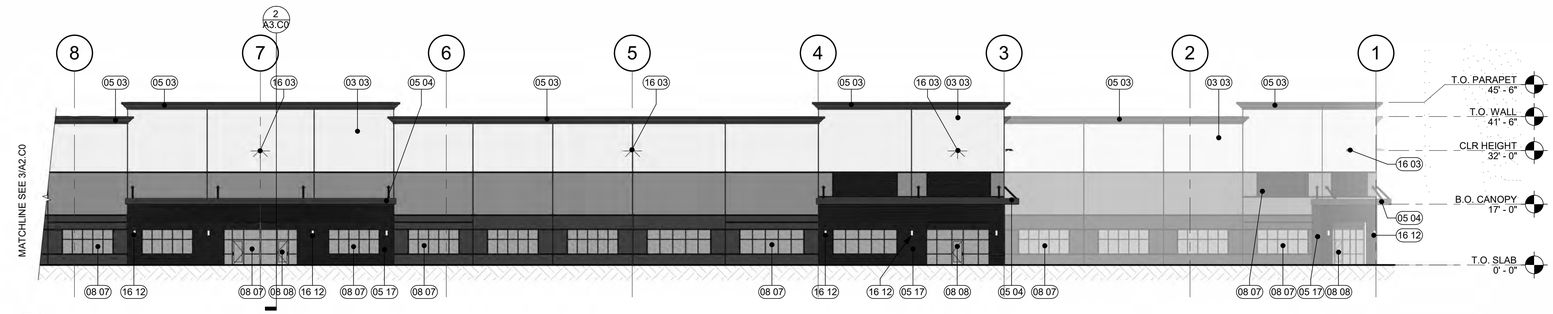
03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
03 12	CAST-IN-PLACE CONCRETE WALL, SEE STRUCTURAL.
05 03	BUILT-UP METAL CORNICE PER DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 04	CANOPY PER PLANS AND DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 17	ARCHITECTURAL METAL WALL PANEL, SEE DETAIL AND SPECIFICATIONS
08 03	OVERHEAD DOOR AT GRADE LEVEL PER DOOR SCHEDULE.
08 07	ALUMINUM STOREFRONT GLAZING PER DETAILS AND SPECIFICATIONS.
08 08	ALUM. STOREFRONT VESTIBULE AT MAIN ENTRY PER ENERGY CODE.
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.
16 12	UP LIGHTING - SEE ELECTRICAL (BIDDER DESIGN).

GLAZING CALCULATIONS [PER CITY CODE 16.90.020(D)(7)(a)(1)]

ELEVATION	GLAZING CALCULATIONS	
NORTH ELEVATION	OVERALL ELEVATION AREA	10,170 SF
	GLAZING REQUIRED (15%)	1,526 SF
	GLAZING PROVIDED	**1,560 SF**
EAST ELEVATION (GRIDS 1-6, WITHIN 200' OF ICE AGE DR.)	OVERALL ELEVATION AREA	11,147 SF
	15% GLAZING REQUIRED	1,672 SF
	GLAZING PROVIDED	**1,753 SF**



1 A2.C0 EAST ELEVATION - SOUTH
1" = 20'-0" EAST ELEVATION - SOUTH



5 A2.C0 EAST ELEVATION - NORTH
1" = 20'-0" EAST ELEVATION - NORTH

Exhibit A2

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Schnitzer PROPERTIES

PROJECT NAME
SHERWOOD COMMERCE CENTER
BUILDING C

21600 SW OREGON ST.
SHERWOOD, OR

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY NOT FOR CONSTRUCTION

DATE SEPTEMBER 15, 2022

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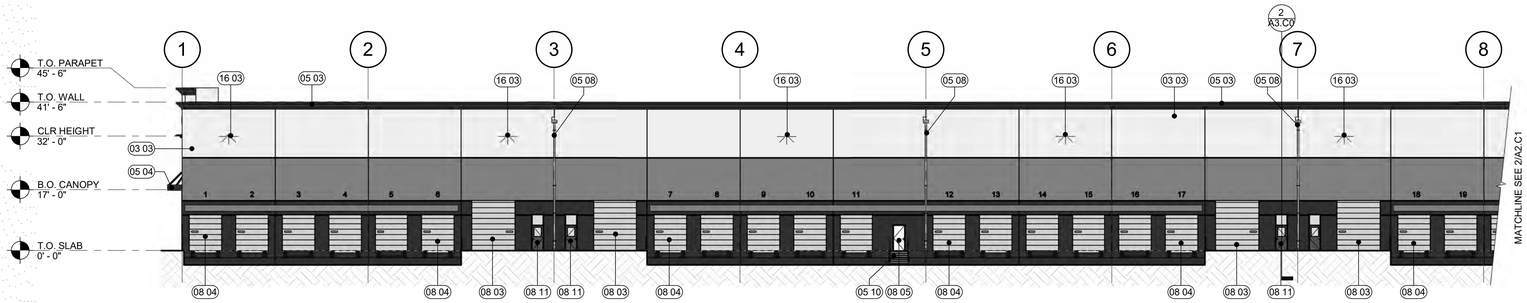
AS NOTED	20210190
DRAWN: JAB	CHECKED: CGA

BLDG C - BUILDING ELEVATIONS

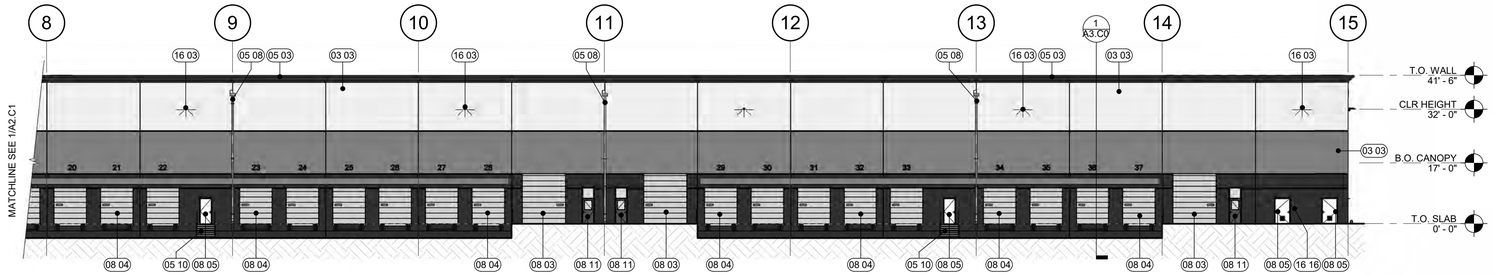
A2.C0

9/16/2022 8:43:12 AM



1 A2.C1 **WEST ELEVATION - NORTH**

1" = 20'-0" WEST ELEVATION - NORTH



2 A2.C1 **WEST ELEVATION - SOUTH**

1" = 20'-0" WEST ELEVATION - SOUTH

GENERAL ELEVATION NOTES

1. FOR ADDITIONAL INFORMATION SEE STRUCTURAL PANEL ELEVATIONS.
2. FOR PANEL REINFORCING, EMBED, AND CONNECTION INFORMATION, SEE STRUCTURAL PANEL ELEVATIONS.
3. ALL PANEL THICKNESS TO BE AS INDICATED ON THE STRUCTURAL ELEVATIONS.
4. ALL ARCHITECTURAL BUILDING ELEVATIONS ARE DRAWN FROM THE EXTERIOR FACE, U.O.N.
5. SEE FOUNDATION PLAN AND ARCHITECTURAL SHEETS TO DETERMINE PANEL DIMENSIONS AND ELEVATIONS.
6. SEE SPECIFICATIONS FOR PANEL CONCRETE MIX REQUIREMENTS.

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
05 03	BUILT-UP METAL CORNICE PER DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 04	CANOPY PER PLANS AND DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 08	DOWNSPOUTS WITH SCUPPER PER ROOF PLAN AND DETAIL. ALSO SEE SITE UTILITY PLAN FOR STORM TIE IN.
05 10	STAIRS AND LANDING PER SITE DETAIL SHEET, TYPICAL.
08 03	OVERHEAD DOOR AT GRADE LEVEL PER DOOR SCHEDULE.
08 04	OVERHEAD DOORS AT DOCK LEVEL PER DOOR SCHEDULE.
08 05	EXTERIOR MAN DOOR PER DOOR SCHEDULE.
08 11	CHAIN OPERATED ROTARY ROOF VENTILATORS ABOVE. SEE SPECIFICATIONS.
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.
16 16	KNOX BOX PER FIRE MARSHAL REQUIREMENTS.

Exhibit A2

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Schnitzer PROPERTIES

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SHERWOOD, OR

CUP APPLICATION

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BLDG C - BUILDING ELEVATIONS

A2.C1

9/16/2022 8:43:17 AM

Exhibit A2

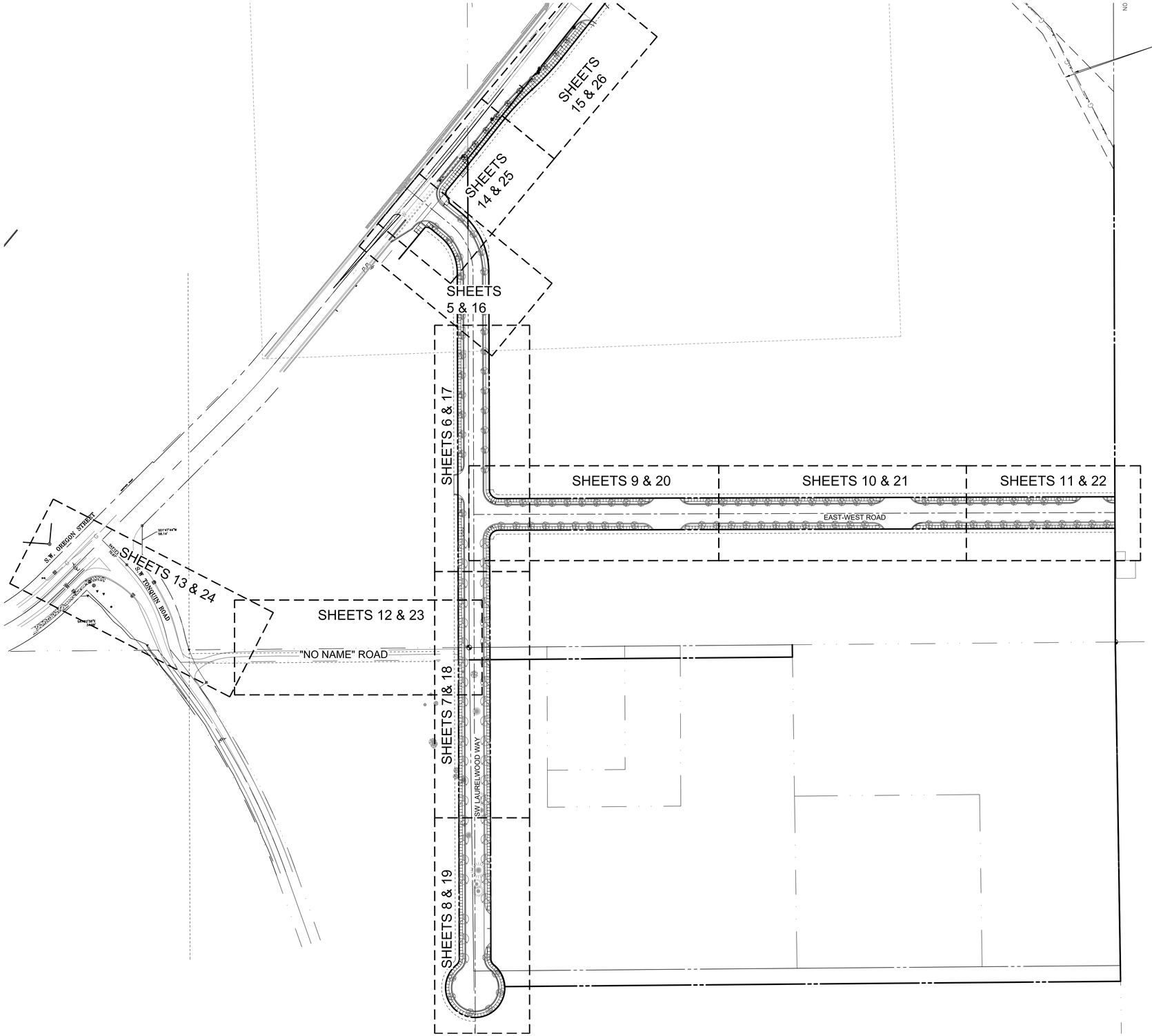
SURVEY LEGEND (EXISTING):

B.D.	BRASS DISK
(C)	CALCULATED DATA
C.L.	CENTER LINE
C.L.F.	CHAIN LINK FENCE
C.M.H.	COMMUNICATIONS MANHOLE
C.T.	CONIFEROUS TREE
D.T.	DECIDUOUS TREE
FD.	FOUND
I.P.	IRON PIPE
I.R.	IRON ROD
(M)	MEASURED DATA
MON.SN.	MONUMENT SIGN
P.L.	PROPERTY LINE
P.P.	POWER POLE
(R1)	USBT 2019-001
(R2)	USBT 2011-039
(R3)	USBT 2002-062
(R4)	USBT 2002-010
(R5)	USBT BK. 7, PG.'S 21-22
(R6)	USBT BK. 5, PG. 85
(R7)	USBT BK. 2, PG. 104
(R8)	SN 33413
(R9)	SN 29428
(R10)	SN 24713
(R11)	SN 19375
(R12)	SN 18368
(R13)	SN 12936
(R14)	SN 10069
(R15)	SN 5897
(R16)	SN 5180
S.D.M.H.	STORM DRAIN MANHOLE
T.PED.	TELEPHONE PEDESTAL
WR.F.	WIRE FENCE
Y.P.C.	YELLOW PLASTIC CAP
	BLOCK/CONCRETE WALL
	CONCRETE
	ASPHALTIC CONCRETE
	BUILDING LINE
	CURB INLET
	WIRE/CHAIN LINK FENCE
	WOOD FENCE
	LIGHT POLE
OHW	OVERHEAD WIRE
ST	STORMWATER
W	WATER

GENERAL SYMBOLS

NEW.

- STORM INLET
- MANHOLE (MH)
- UTILITY POLE
- FIRE HYDRANT (FH)
- METER
- UTILITY VAULT
- TRANSFORMER AND PAD
- VALVE BOX COVER
- POST INDICATOR VALVE
- LIGHT POLE
- FIRE DEPARTMENT CONNECTION (FDC)
- GATE VALVE
- CHECK VALVE



KEY PLAN 1" = 100'

100 0 100 200 300

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Schnitzer PROPERTIES

PROJECT NAME

CITY OF SHERWOOD PUBLIC WORKS PLANS FOR SW LAURELWOOD WAY, "EAST-WEST" ROAD, & PUBLIC UTILITIES

SHERWOOD, OREGON

CUP APPLICATION

REVISIONS

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AS NOTED	20210190
DRAWN	CHECKED
MMG	BMD

KEY PLAN AND LEGEND

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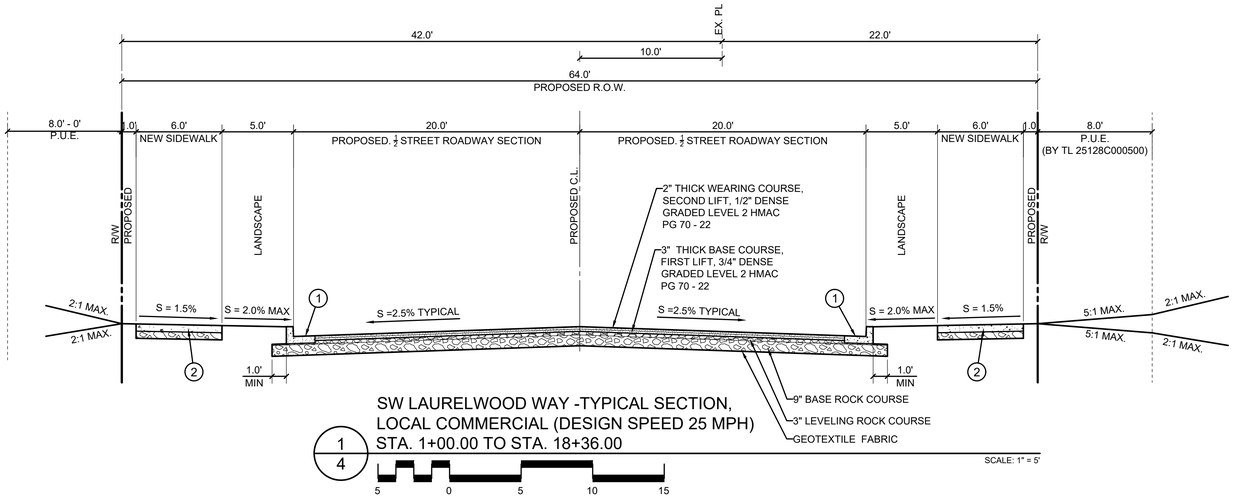
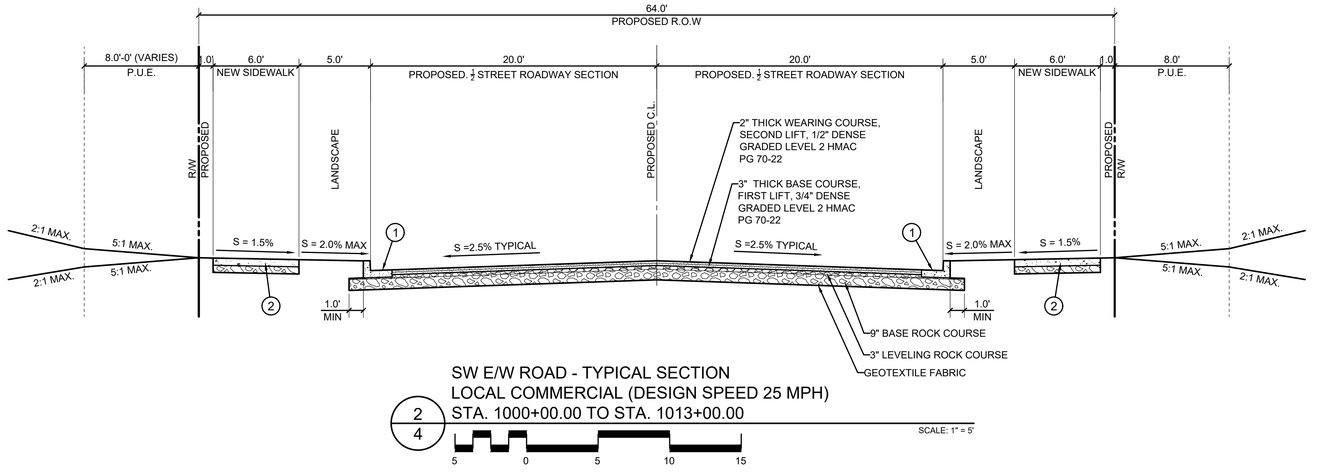


1/4 SW LAUREL WOOD WAY -TYPICAL SECTION, LOCAL COMMERCIAL (DESIGN SPEED 25 MPH) STA. 1+00.00 TO STA. 18+36.00

SCALE: 1" = 5'



2/4 SW E/W ROAD - TYPICAL SECTION LOCAL COMMERCIAL (DESIGN SPEED 25 MPH) STA. 1000+00.00 TO STA. 1013+00.00

SCALE: 1" = 5'

KEYNOTES:

1. CONCRETE CURB AND GUTTER - SEE CITY DWG RD-22, SHEET ##
2. CONCRETE SIDEWALK - SEE CITY DWG RD-26, SHEET ##

GENERAL NOTES:

1. ALL AGGREGATE SHALL MEET OREGON STATE HIGHWAY DIVISION (OSHD) SPECIFICATIONS FOR BASE ROCK
2. DURING COMPACTION, AGGREGATE SHALL BE MAINTAINED WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT. THE CONTRACTOR SHALL BEGIN COMPACTION OF EACH LAYER IMMEDIATELY AFTER THE MATERIAL IS SPREAD, AND CONTINUE UNTIL A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DENSITY HAS BEEN ACHIEVED. MAXIMUM DENSITY WILL BE DETERMINED BY AASHTO T-180
3. HMAC SHALL BE PLACED IN 2 LIFTS
4. SEE CITY OF SHERWOOD ENGINEERING DESIGN STANDARD MANUAL FOR ADDITIONAL INFORMATION ON PLACEMENT AND GRADE REQUIREMENTS OF HMAC.
5. SUBRAGE COMPACTED TO 95% OF AASHTO T-99.

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Exhibit A2

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Schnitzer PROPERTIES

PROJECT NAME
CITY OF SHERWOOD PUBLIC WORKS PLANS FOR SW LAUREL WOOD WAY, "EAST-WEST" ROAD, & PUBLIC UTILITIES

SHERWOOD, OREGON

CUP APPLICATION

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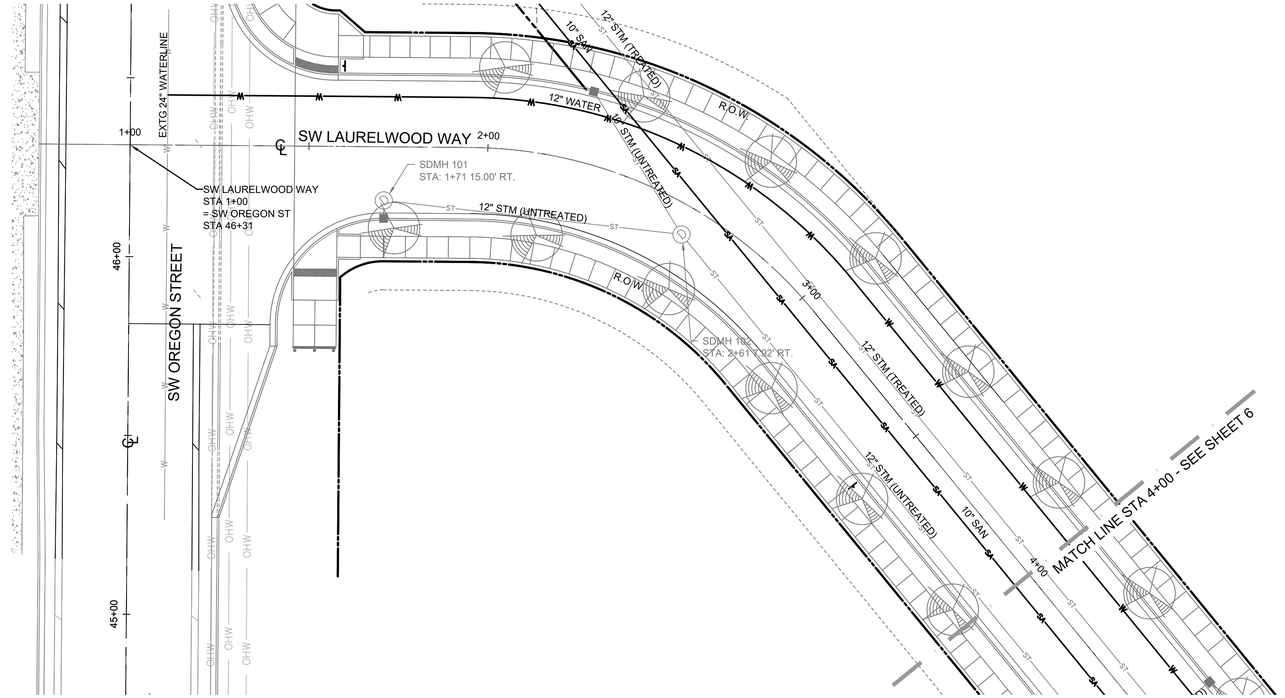
CJM	JAB

TYPICAL ROAD SECTIONS

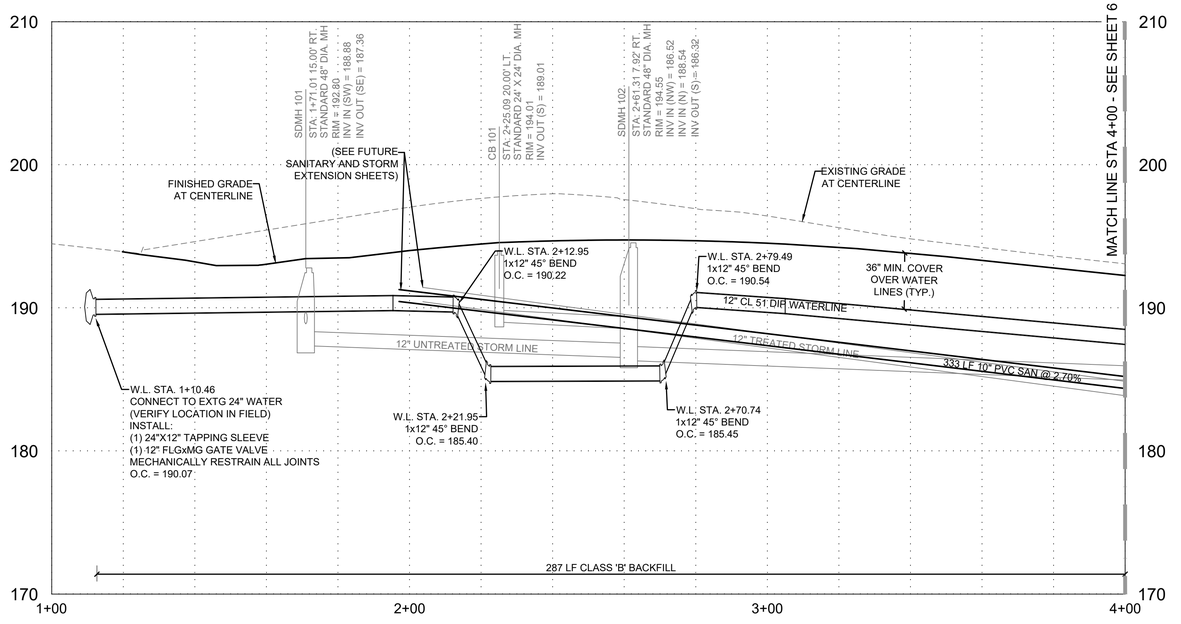
Exhibit A2



SW LAUREL WOOD WAY SAN-WATER
PLAN & PROFILE STA 1+00 TO STA 4+00

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

20 0 20 40 60



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PLANS FOR SW
LAUREL WOOD WAY,
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SHERWOOD, OREGON

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SW LAUREL WOOD
WAY SAN-WATER
PLAN & PROFILE STA
1+00 TO STA 4+00

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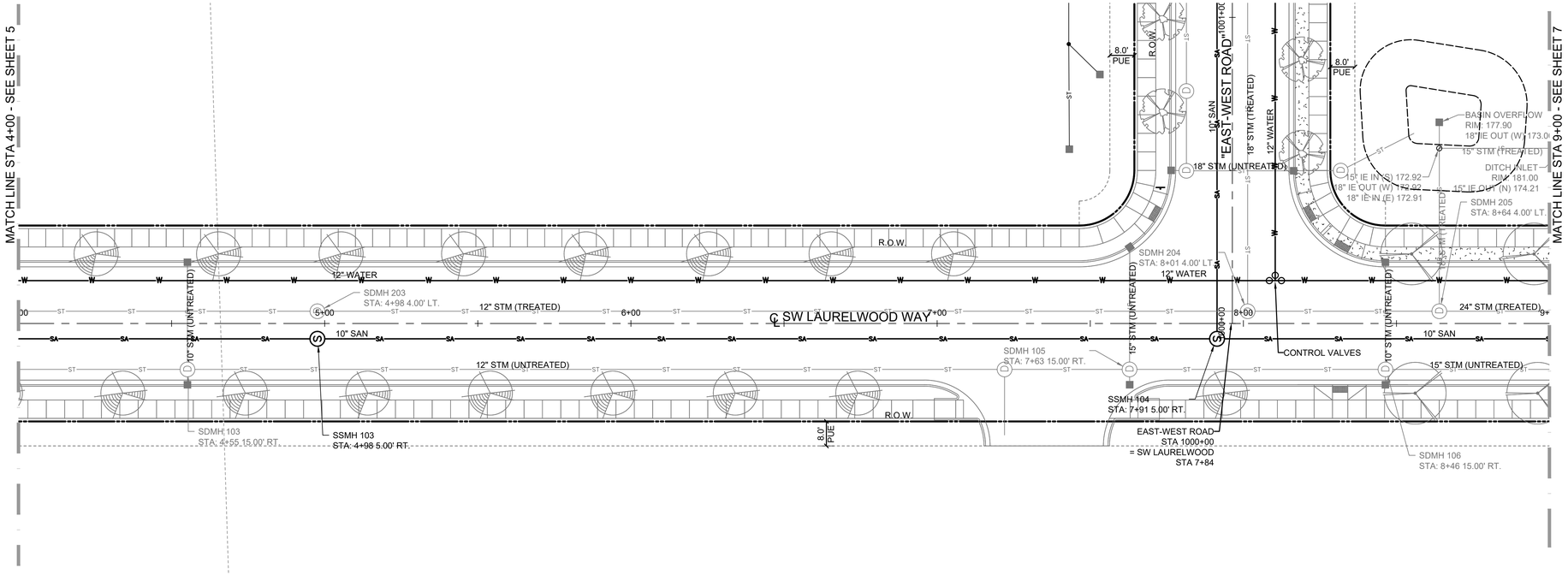
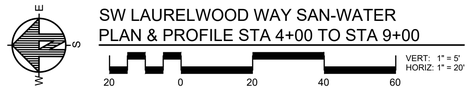
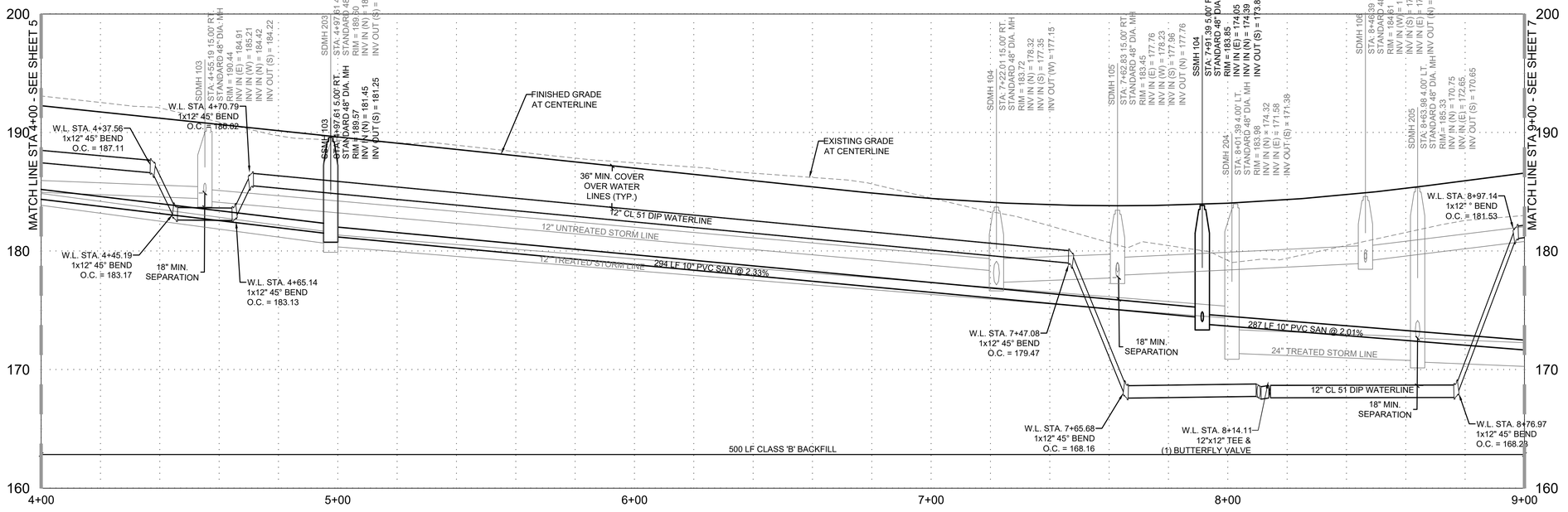
Exhibit A2







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SW LAUREL WOOD WAY SAN-WATER PLAN & PROFILE STA 4+00 TO STA 9+00

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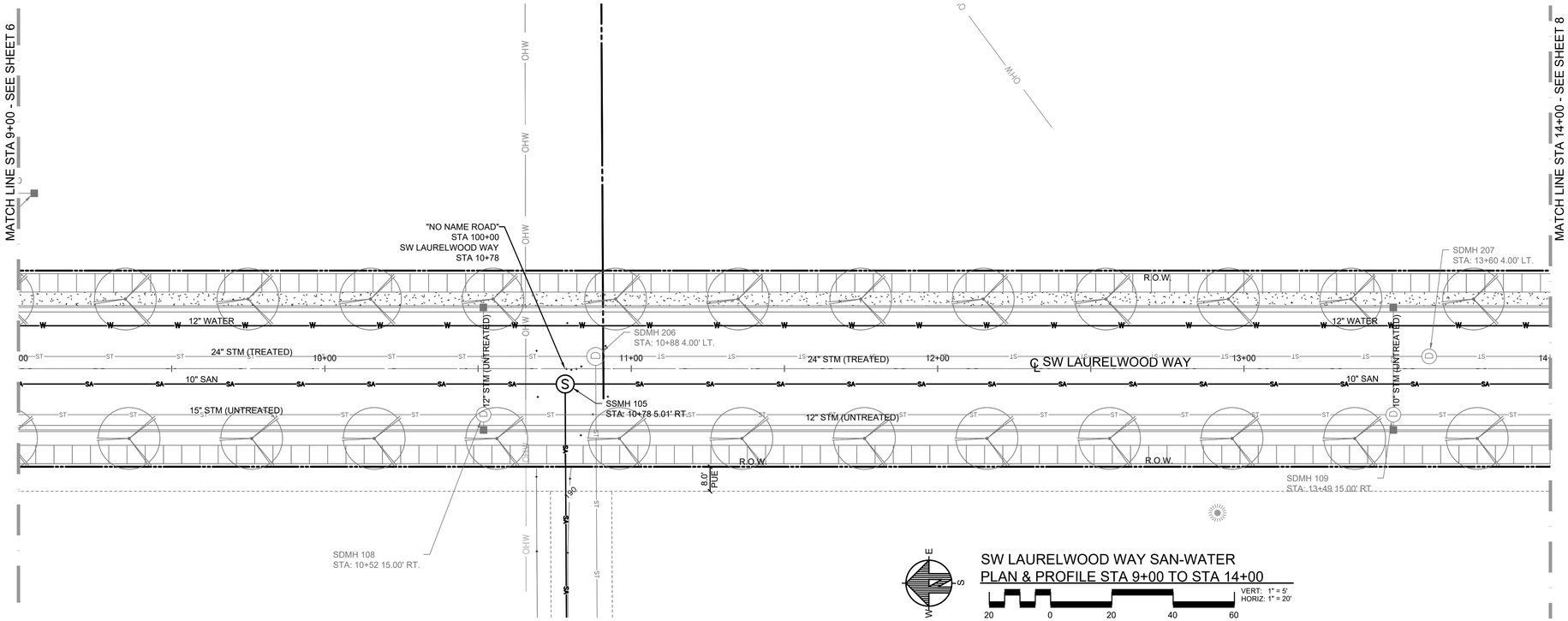
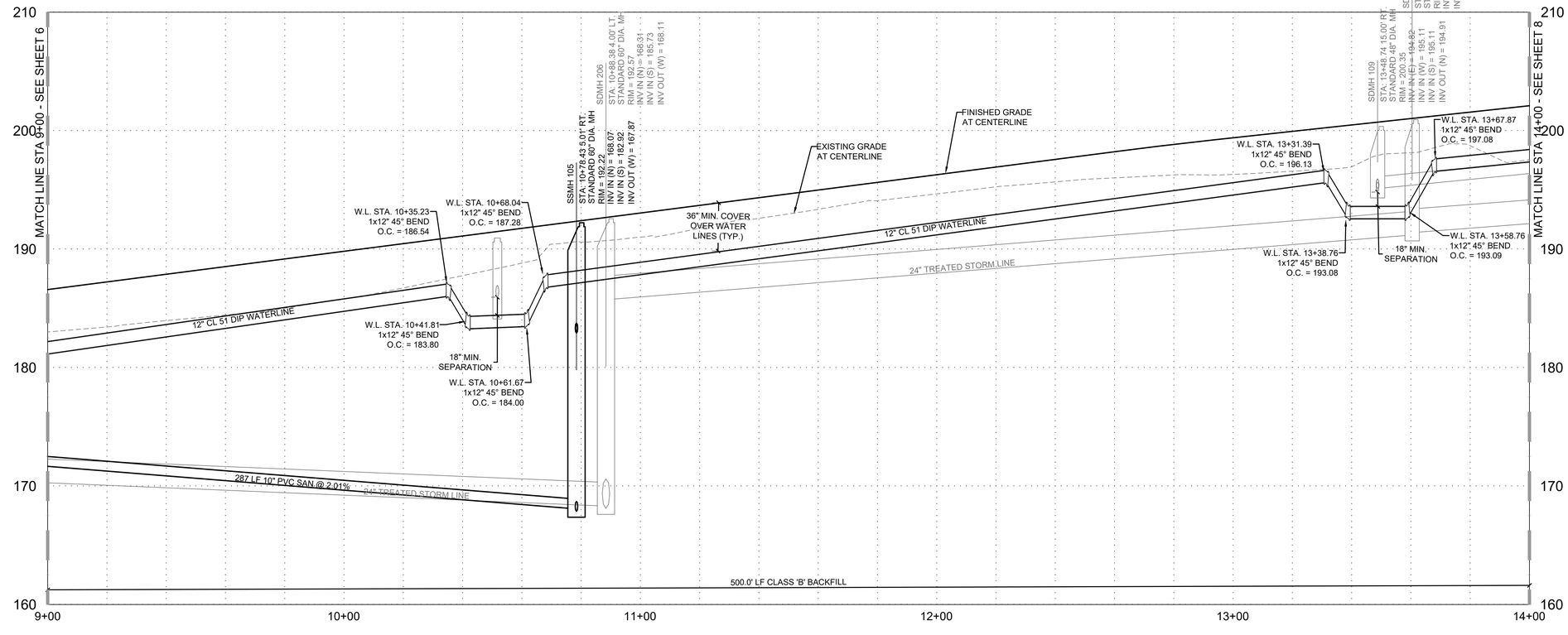
Exhibit A2





SW LAURELWOOD WAY SAN-WATER
PLAN & PROFILE STA 9+00 TO STA 14+00

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

20 0 20 40 60

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PROJECT NAME
CITY OF SHERWOOD PUBLIC WORKS PLANS FOR SW LAURELWOOD WAY, "EAST-WEST" ROAD, & PUBLIC UTILITIES

SHERWOOD, OREGON

CUP APPLICATION

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY
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AS NOTED	20210190
DRAWN MMG	CHECKED BMD

SW LAURELWOOD WAY SAN-WATER PLAN & PROFILE STA 9+00 TO STA 14+00

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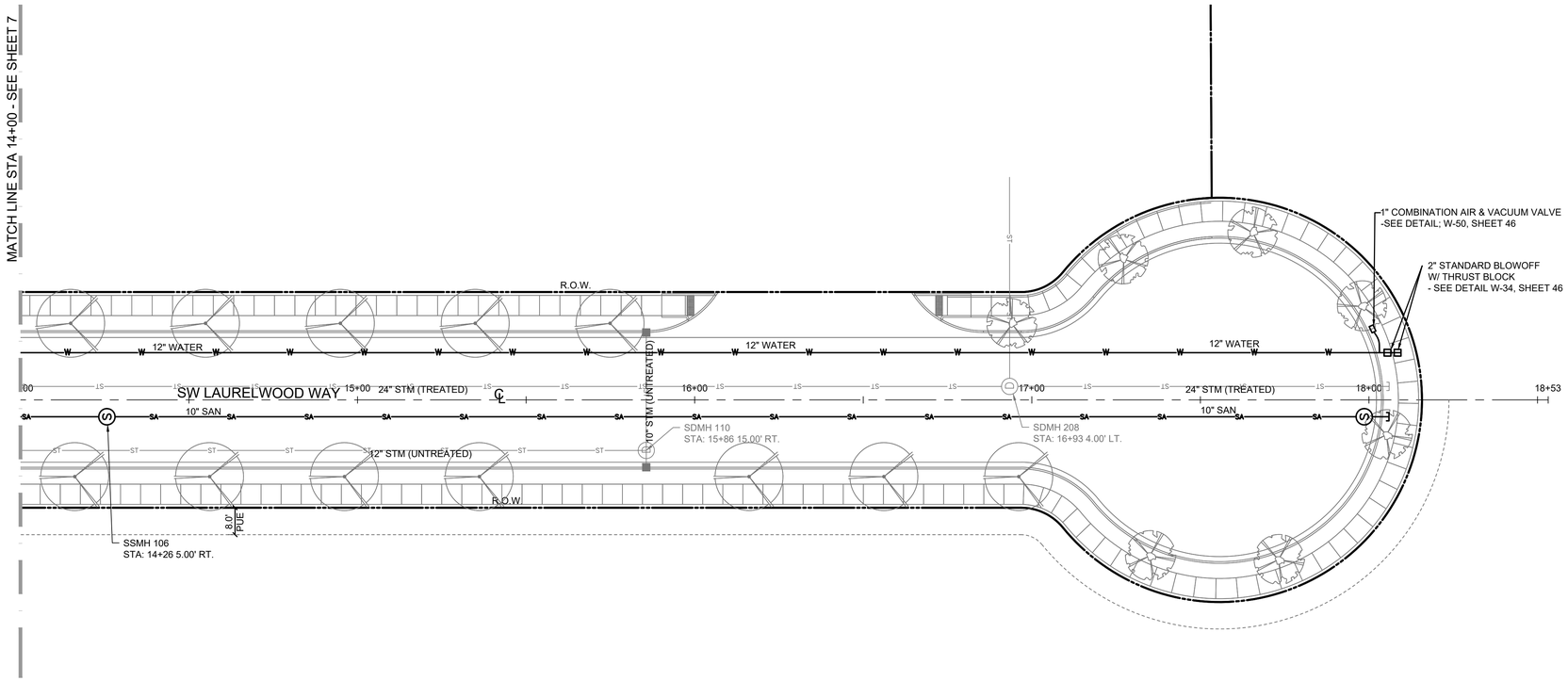

SW LAURELWOOD WAY SAN-WATER
PLAN & PROFILE STA 14+00 TO STA18+00

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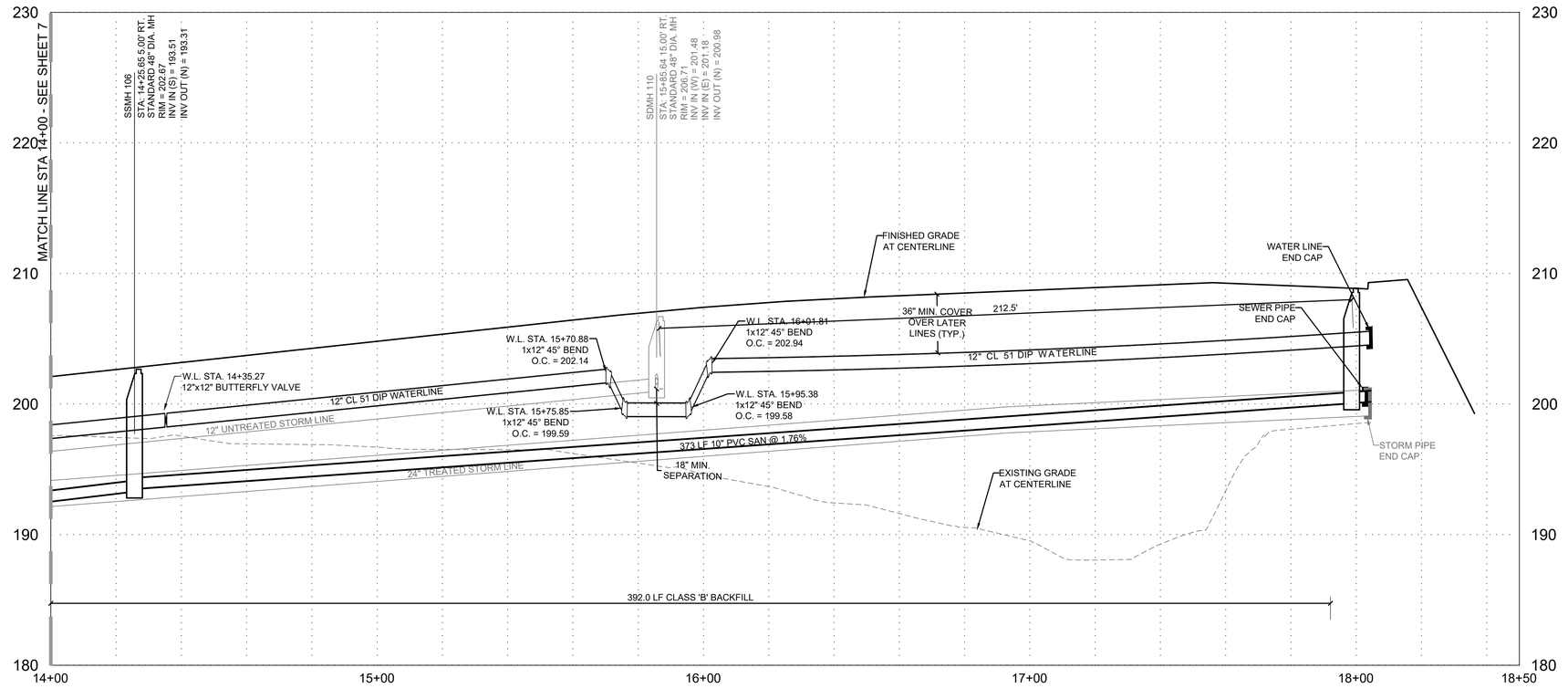

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PROJECT NAME

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SW LAURELWOOD
WAY SAN-WATER
PLAN & PROFILE STA
14+00 TO STA18+00

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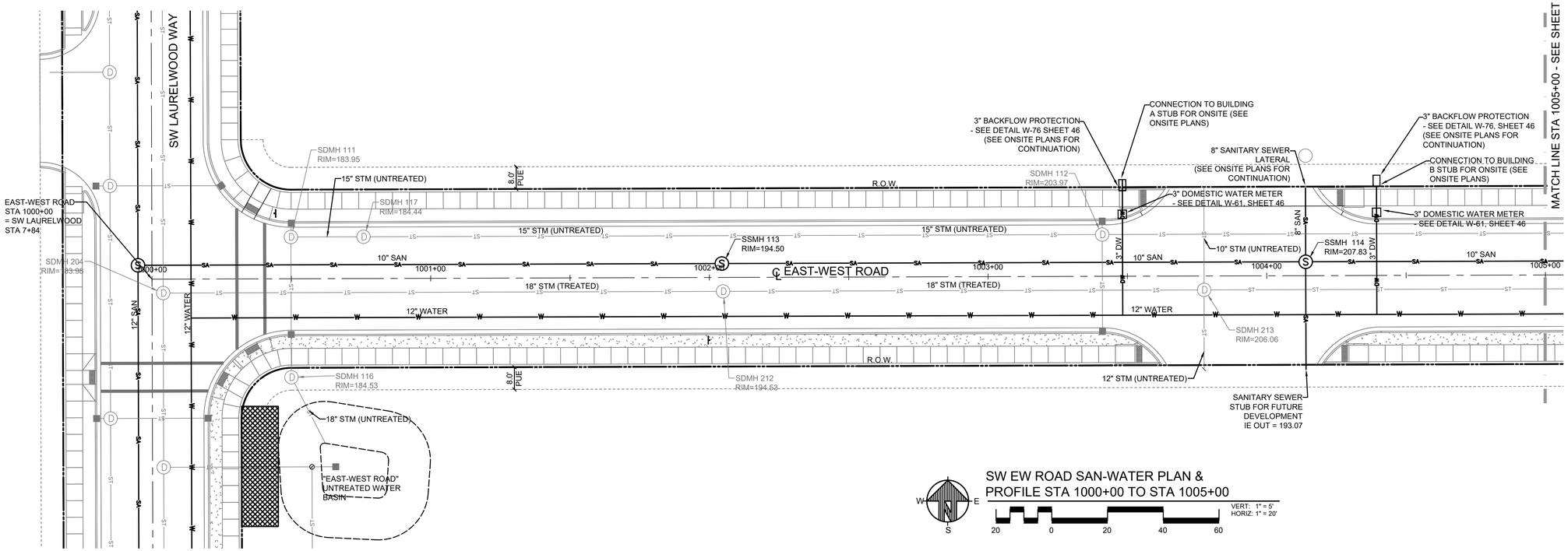

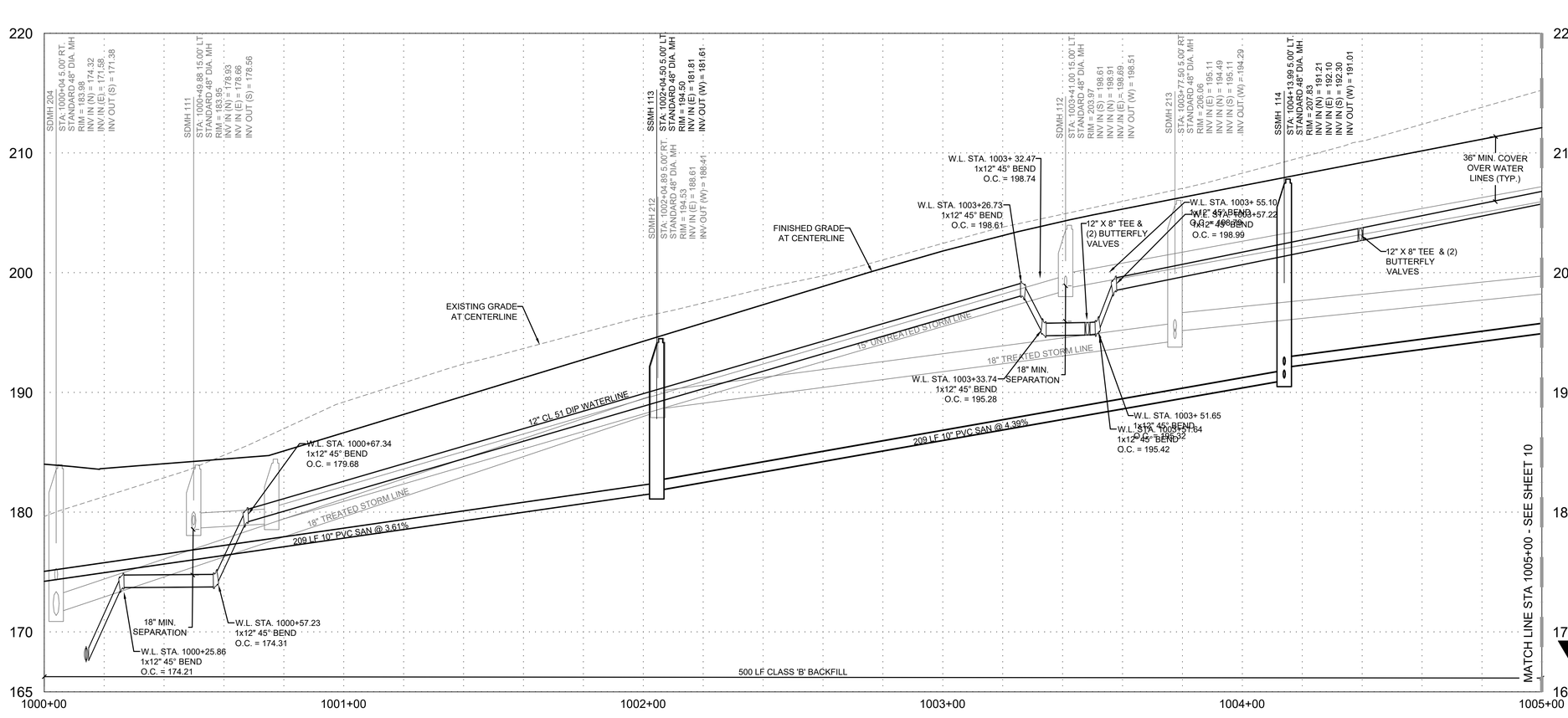

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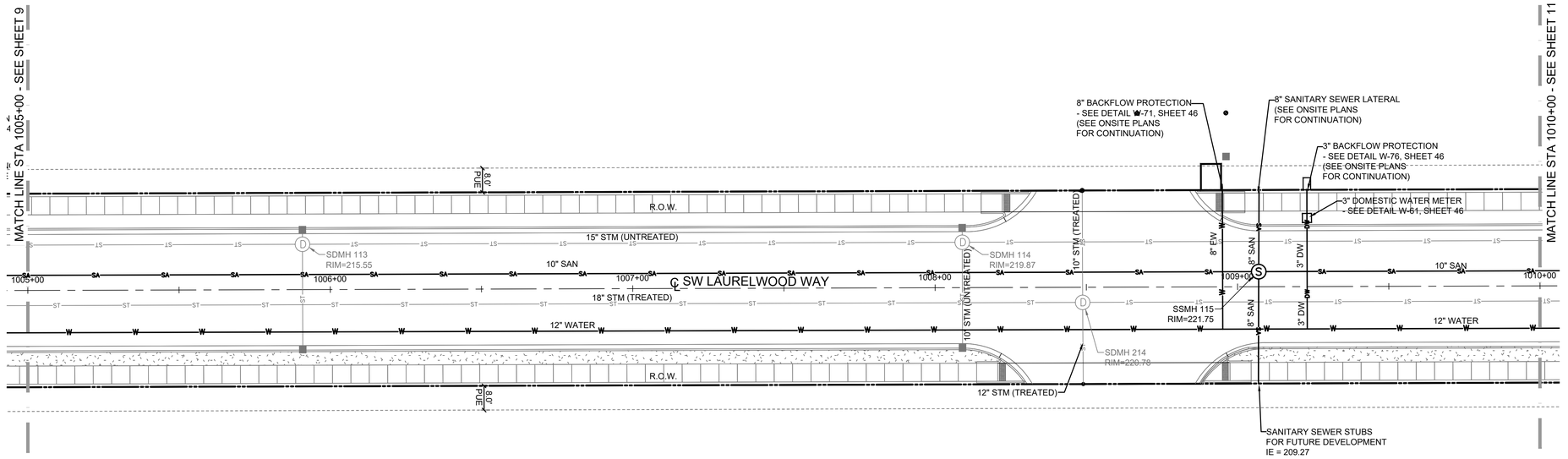
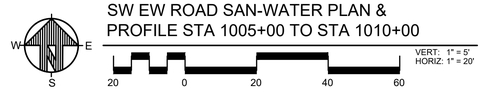
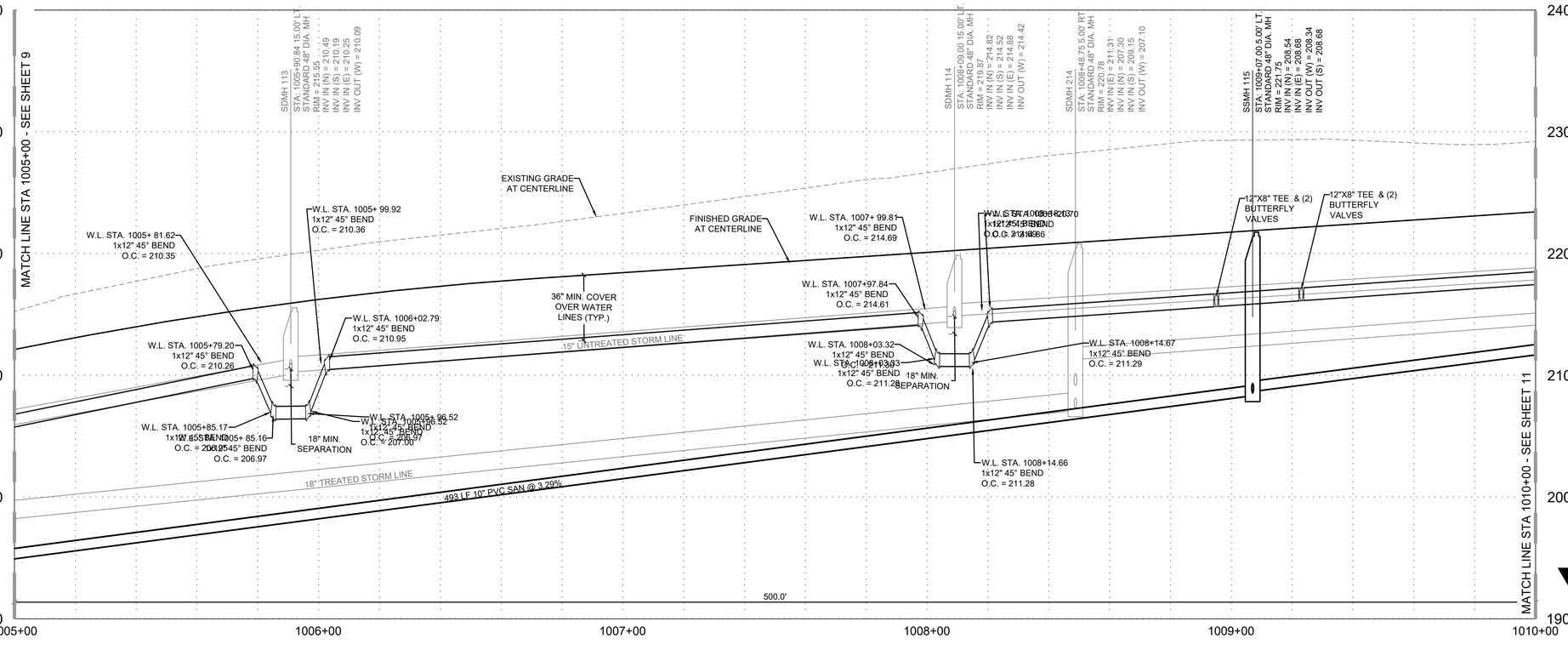
SW EW ROAD SAN-WATER PLAN & PROFILE STA 1000+00 TO STA 1005+00

Exhibit A2





SW EW ROAD SAN-WATER PLAN &
PROFILE STA 1005+00 TO STA 1010+00



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XXX	XXX

SW EW ROAD
SAN-WATER PLAN &
PROFILE STA
1005+00 TO STA
1010+00

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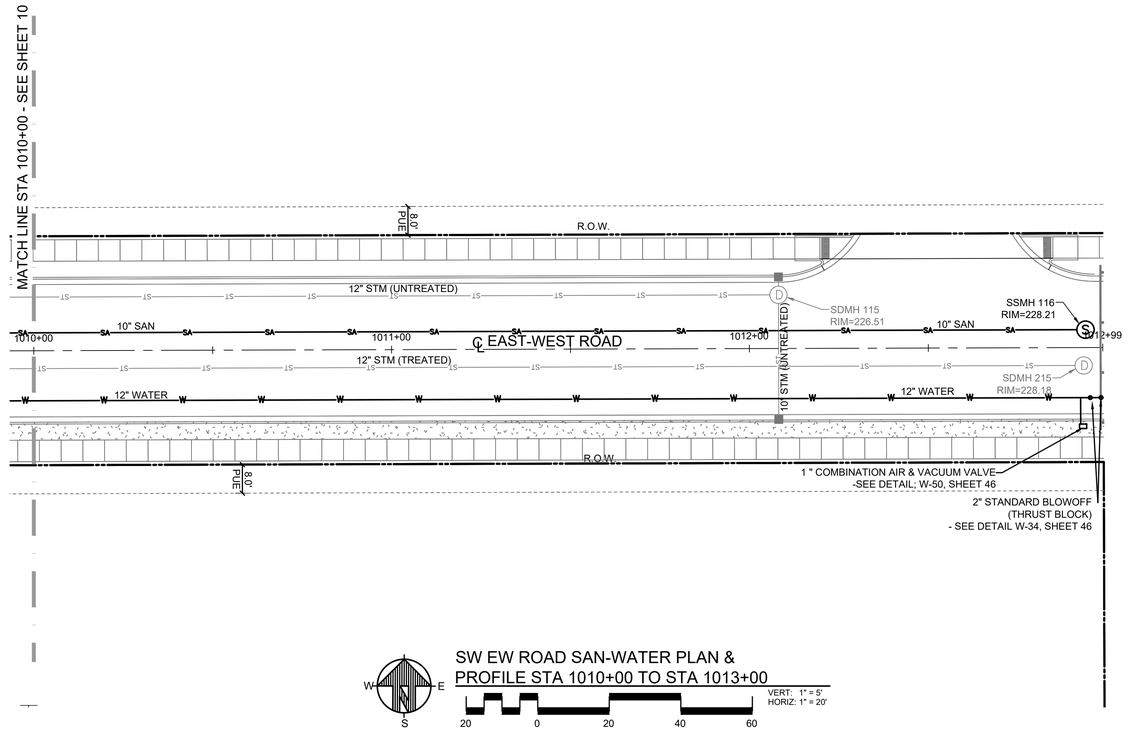

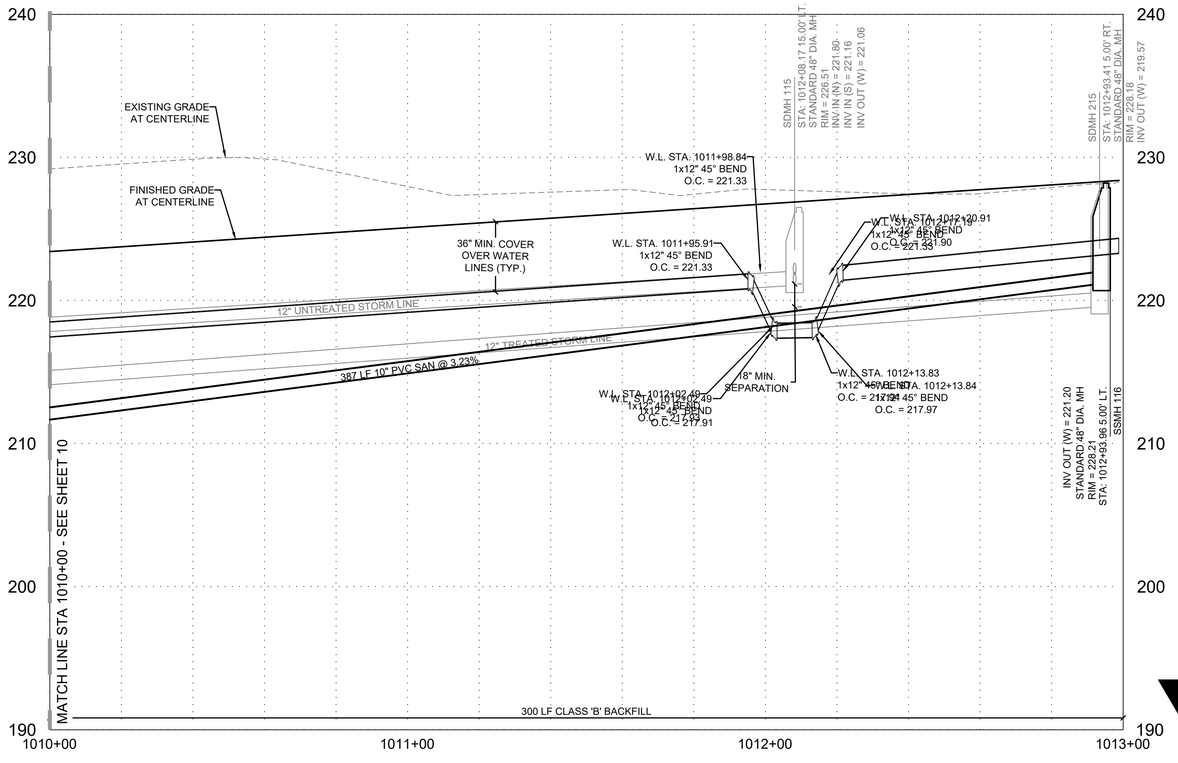

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Exhibit A2

PROJECT NAME
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SHERWOOD, OREGON

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SW EW ROAD SAN-WATER PLAN & PROFILE STA 1010+00 TO STA 1013+00

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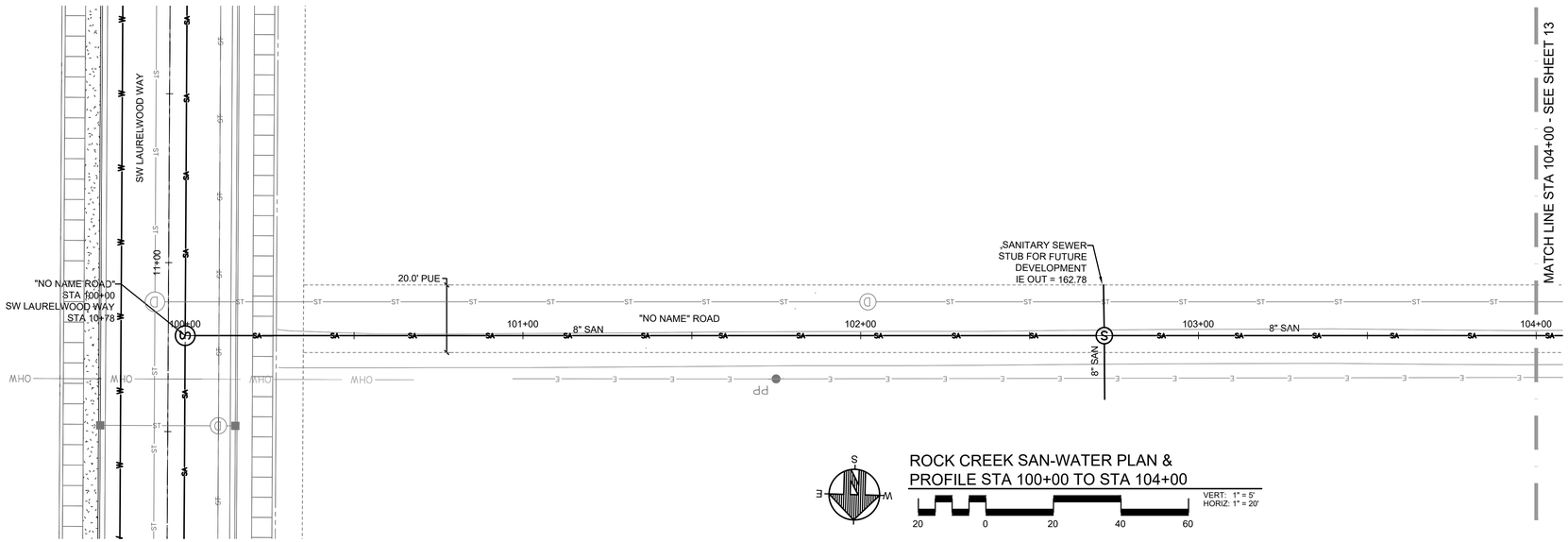

ROCK CREEK SAN-WATER PLAN &
PROFILE STA 100+00 TO STA 104+00

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HORIZ: 1" = 20'

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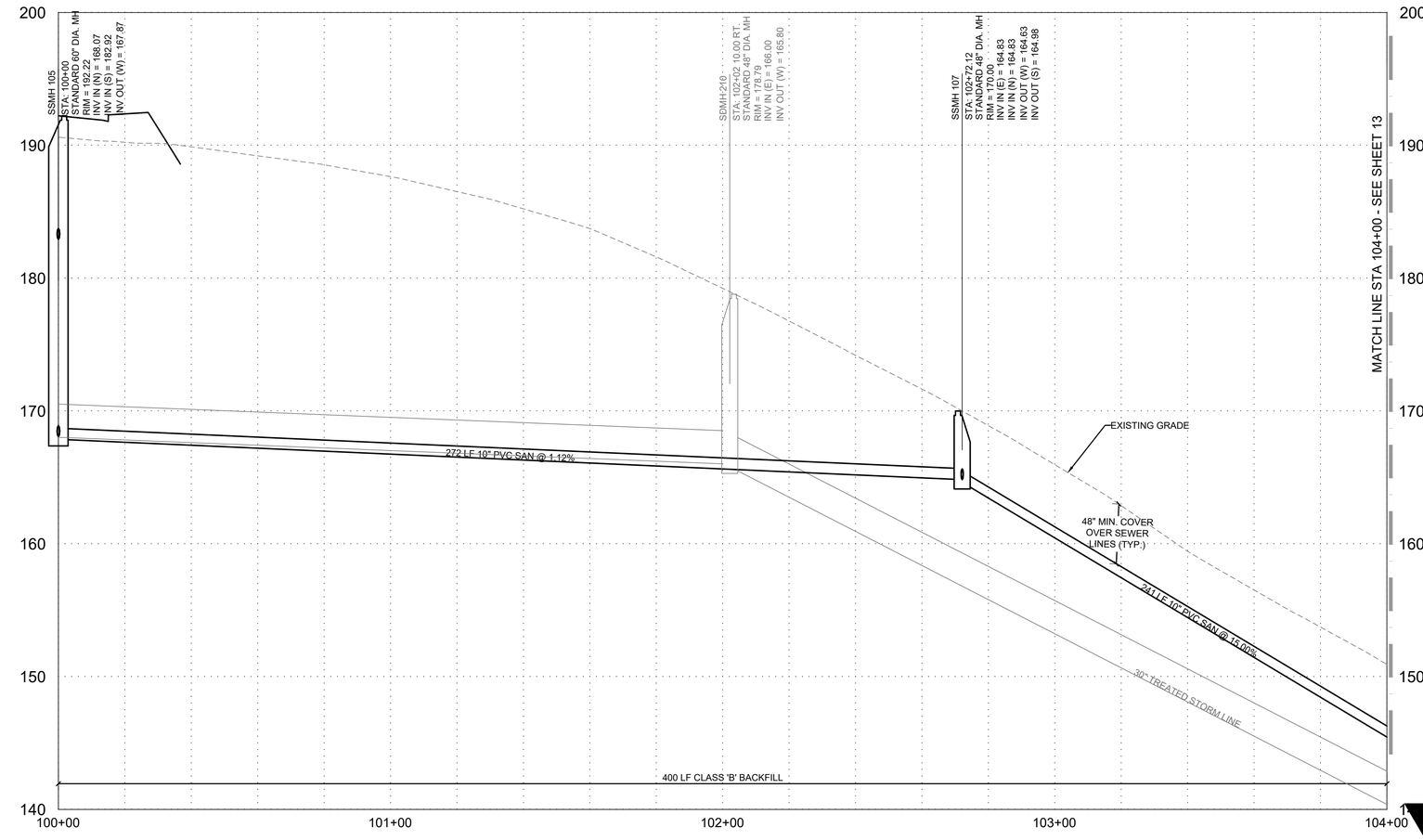

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ROCK CREEK SAN-WATER PLAN & PROFILE STA 100+00 TO STA 104+00

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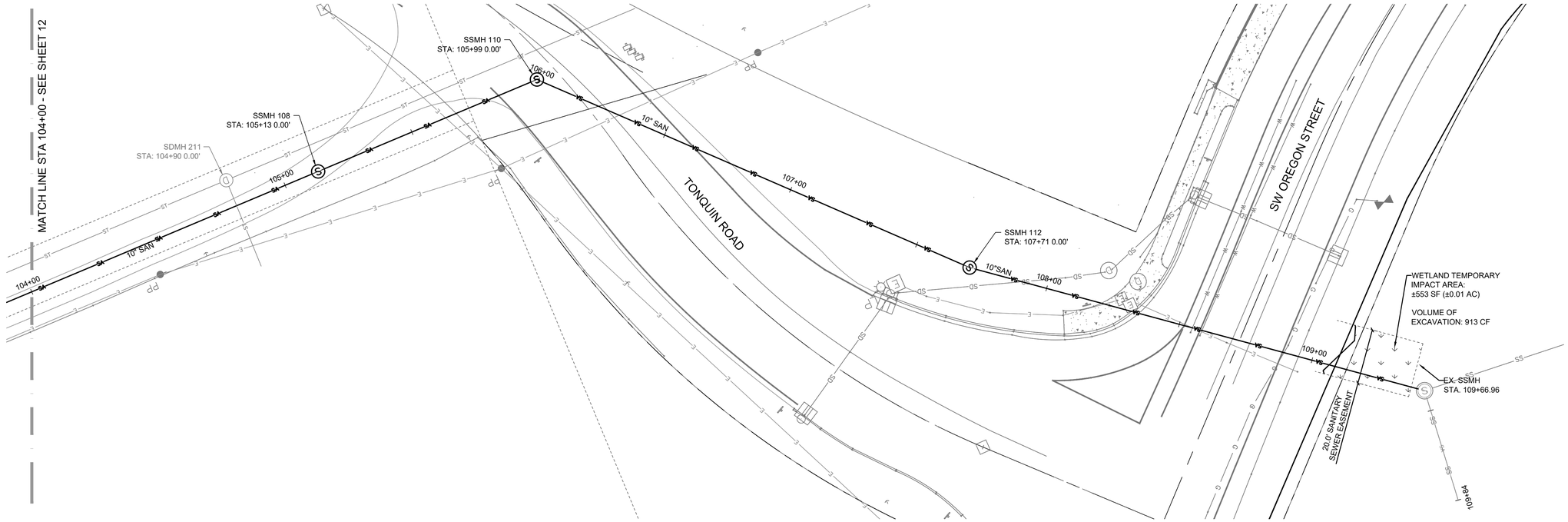

ROCK CREEK SAN-WATER PLAN &
PROFILE STA 104+00 TO STA 110+00

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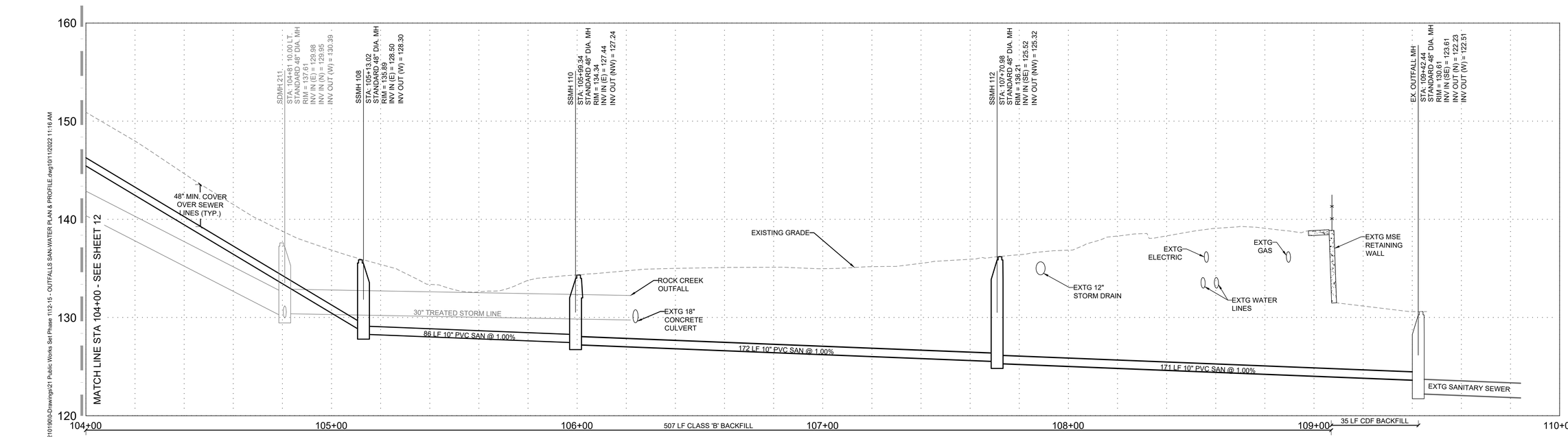

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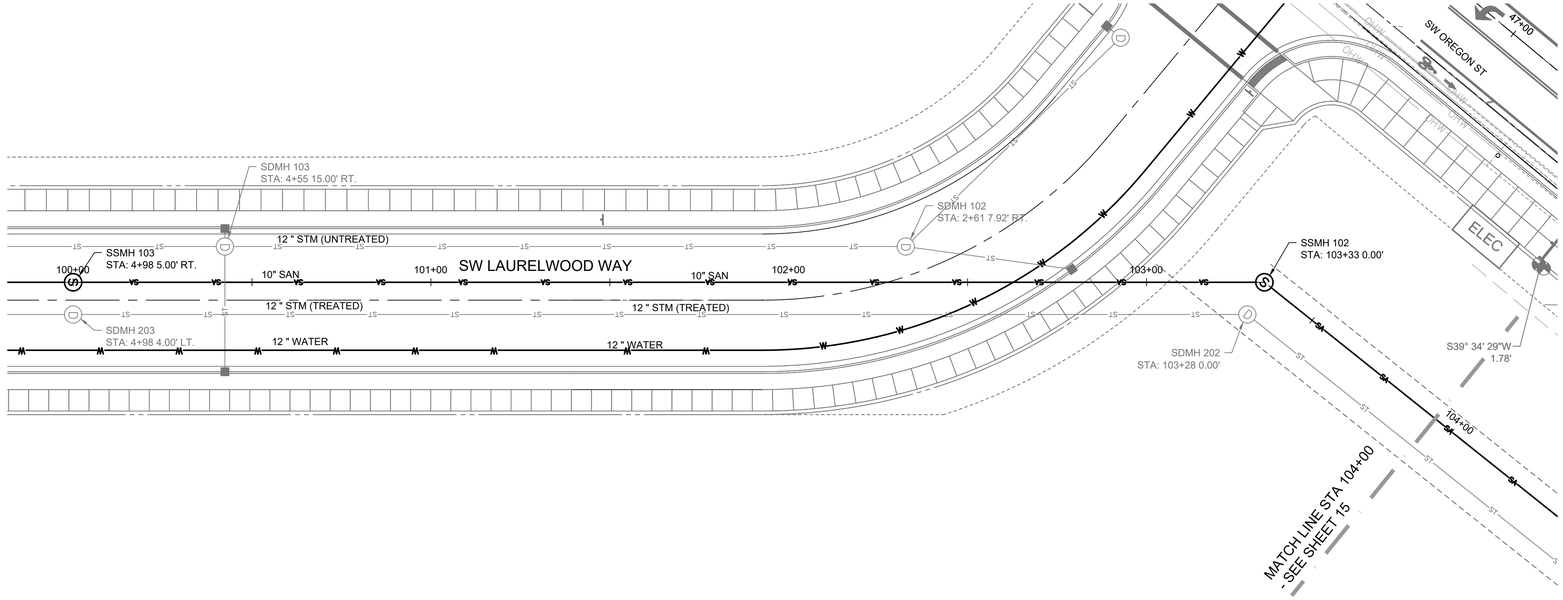
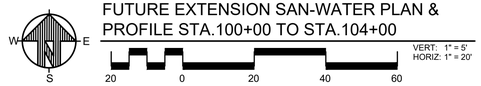
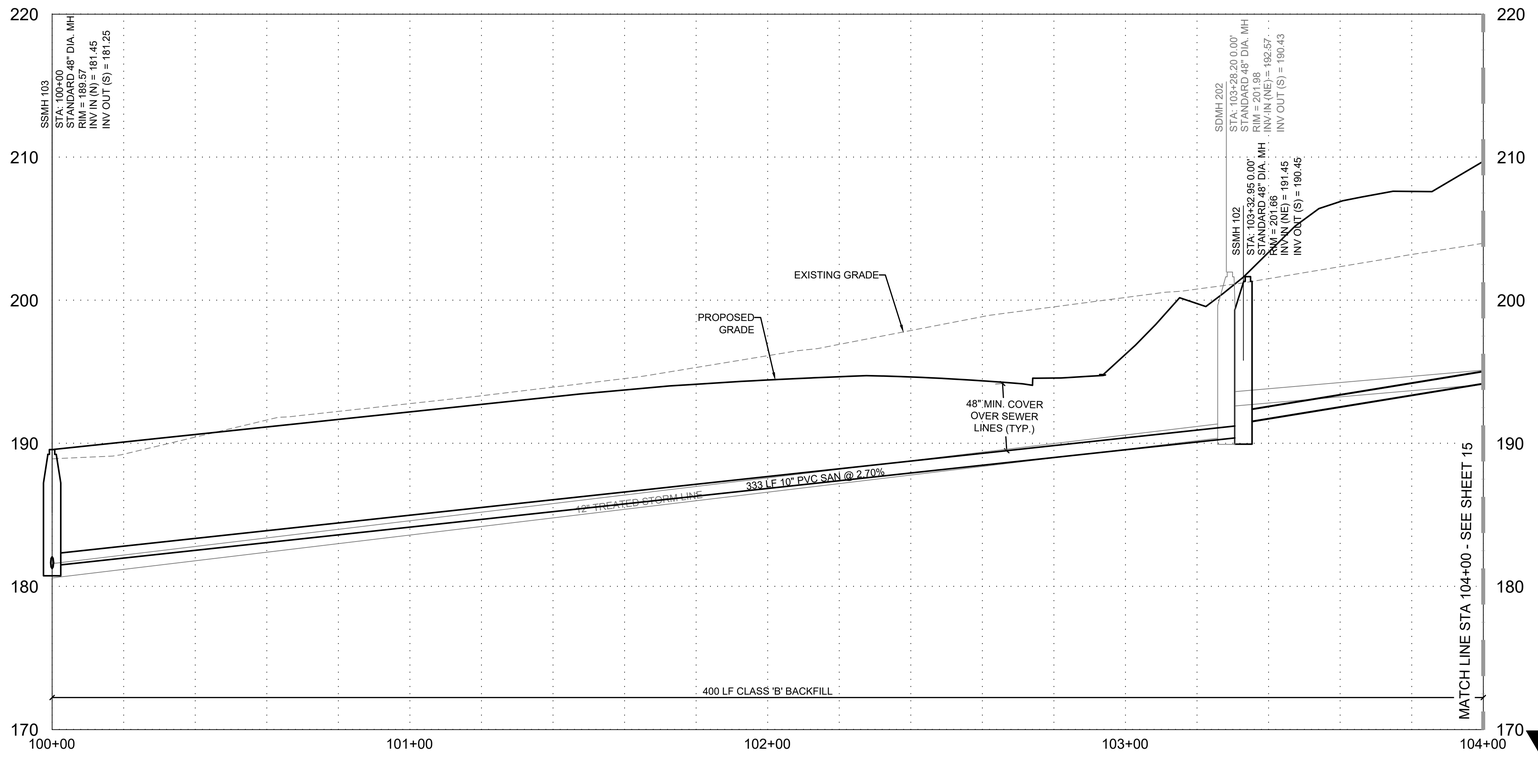
ROCK CREEK SAN-WATER PLAN & PROFILE STA 104+00 TO STA 110+00

Exhibit A2







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FUTURE EXTENSION SAN-WATER PLAN & PROFILE STA100+00 TO STA104+00

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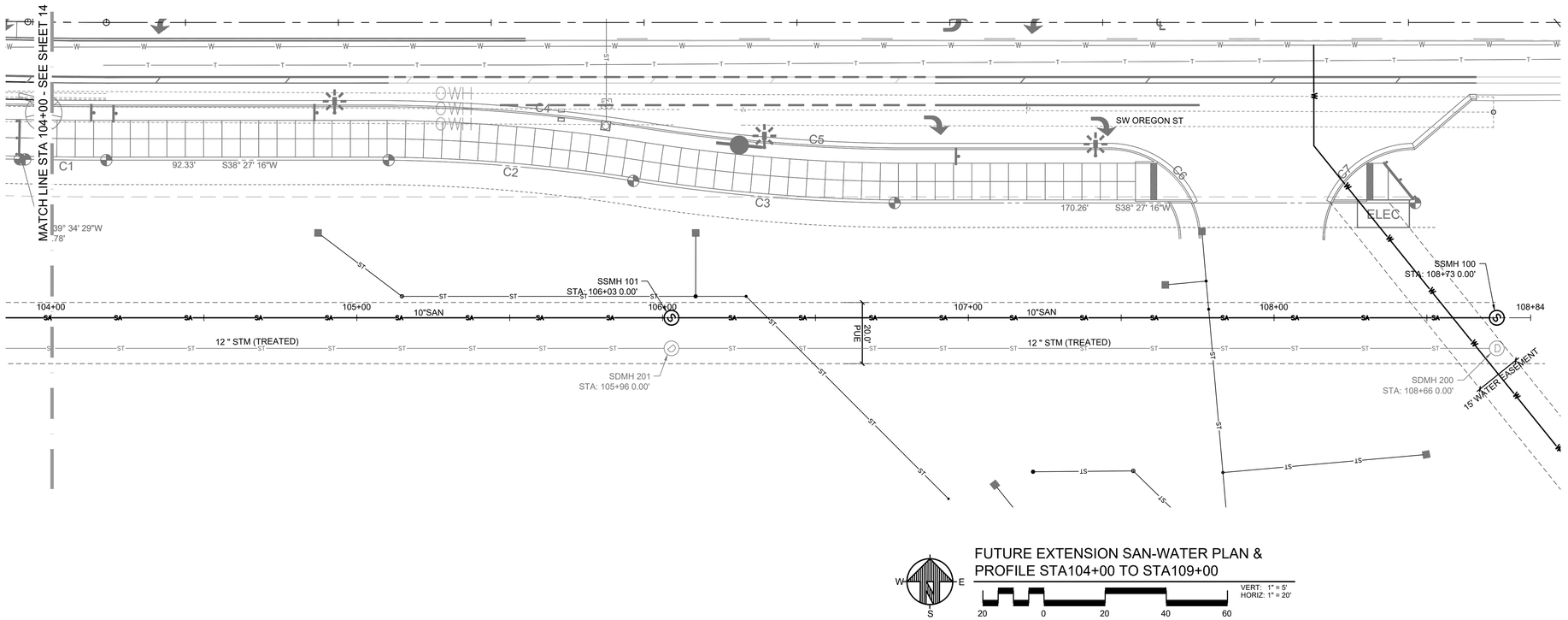
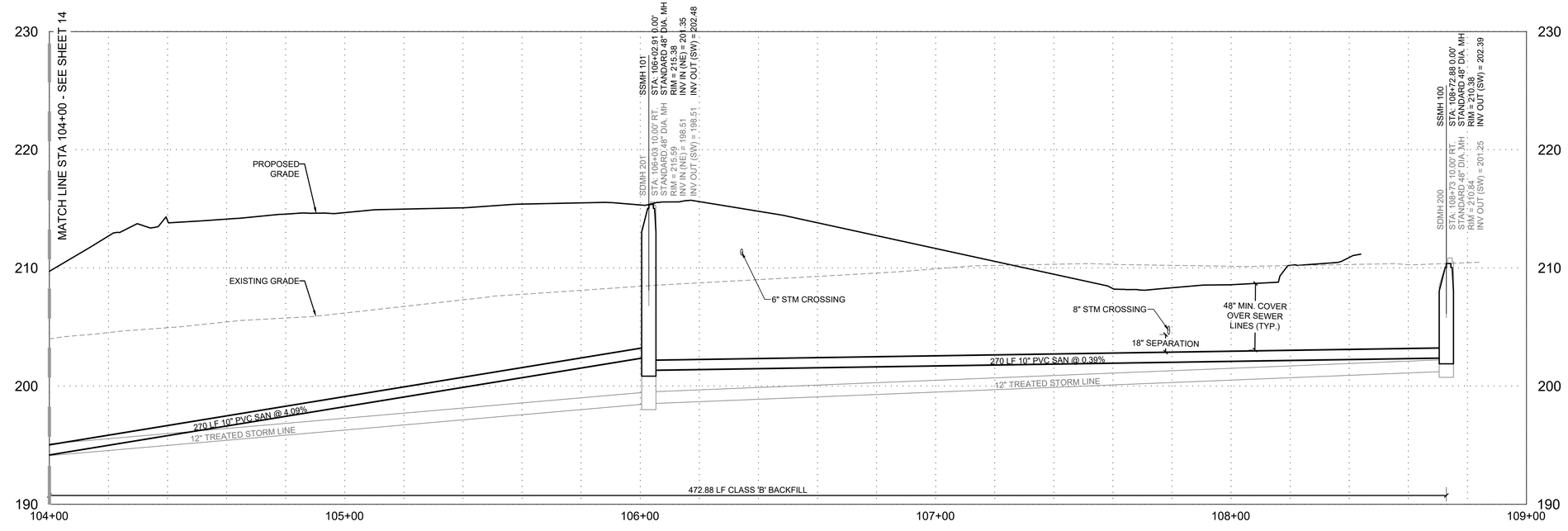


FUTURE EXTENSION SAN-WATER PLAN & PROFILE STA104+00 TO STA109+00



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FUTURE EXTENSION SAN-WATER PLAN & PROFILE STA104+00 TO STA109+00

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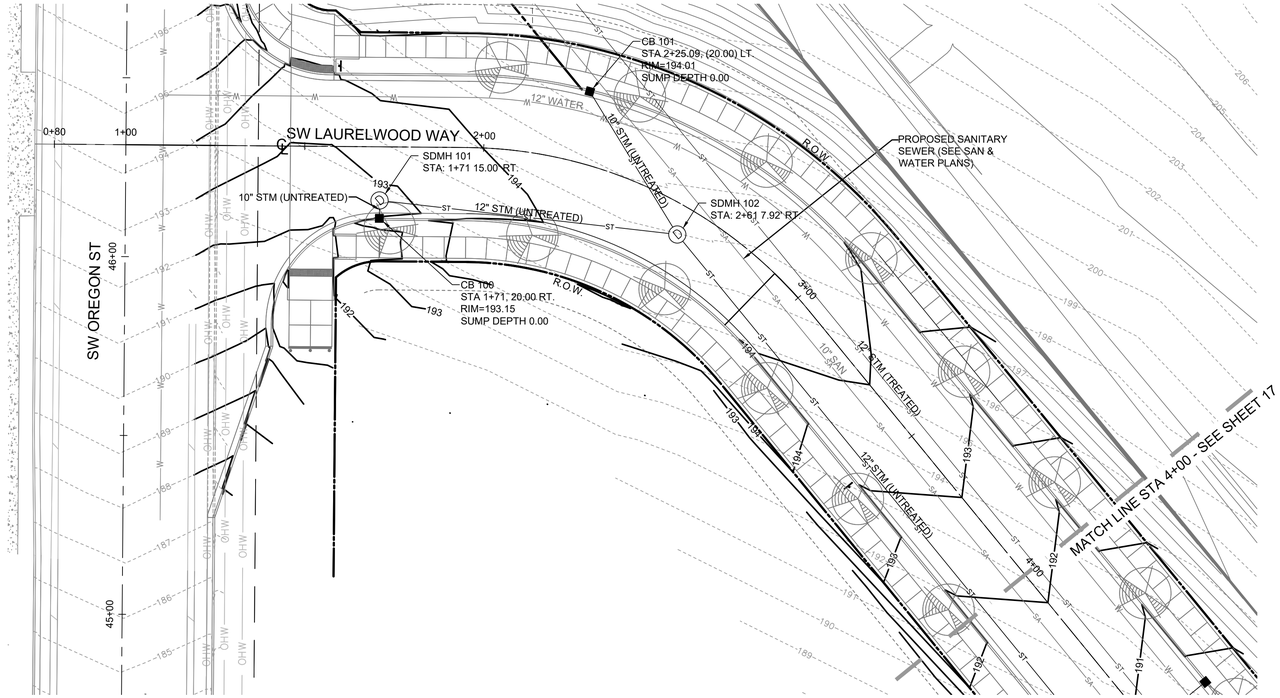

SW LAURELWOOD GRADING-STORM
PLAN & PROFILE STA 1+00 TO STA 4+00

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HORIZ: 1" = 20'

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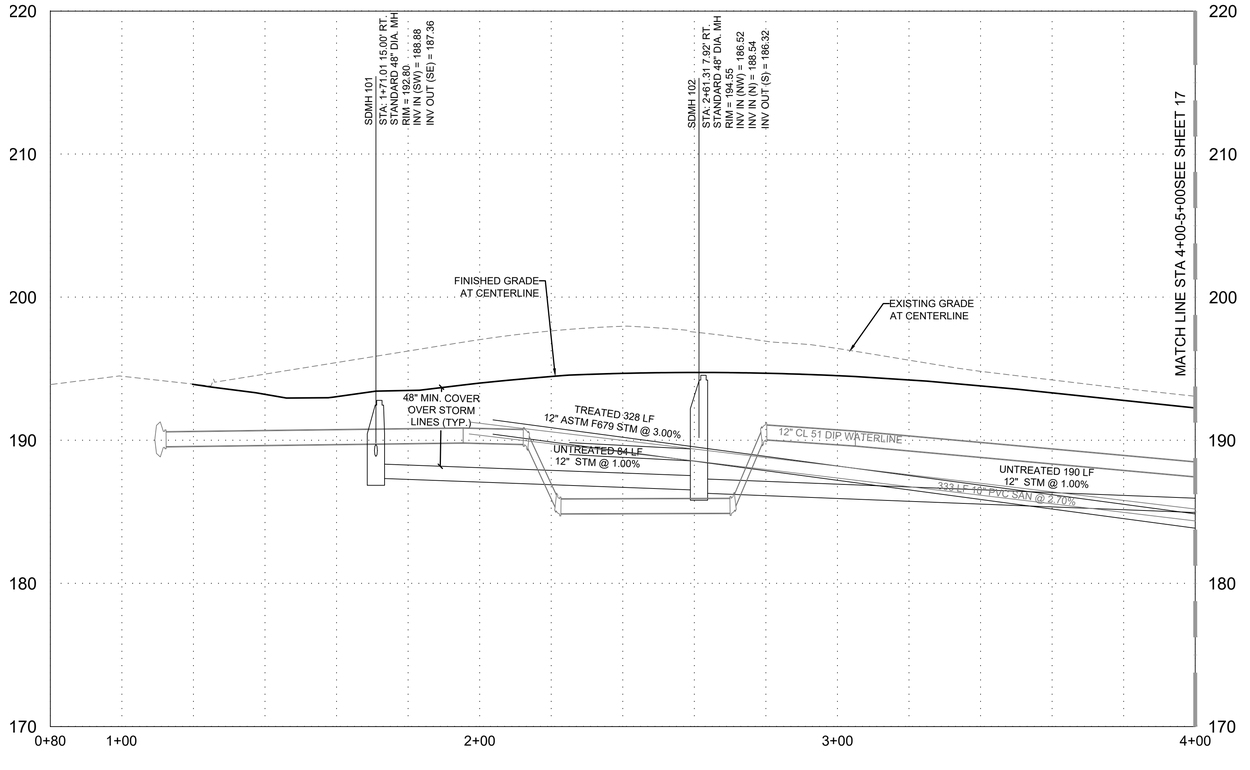

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SW LAURELWOOD GRADING-STORM PLAN & PROFILE STA 1+00 TO STA 4+00

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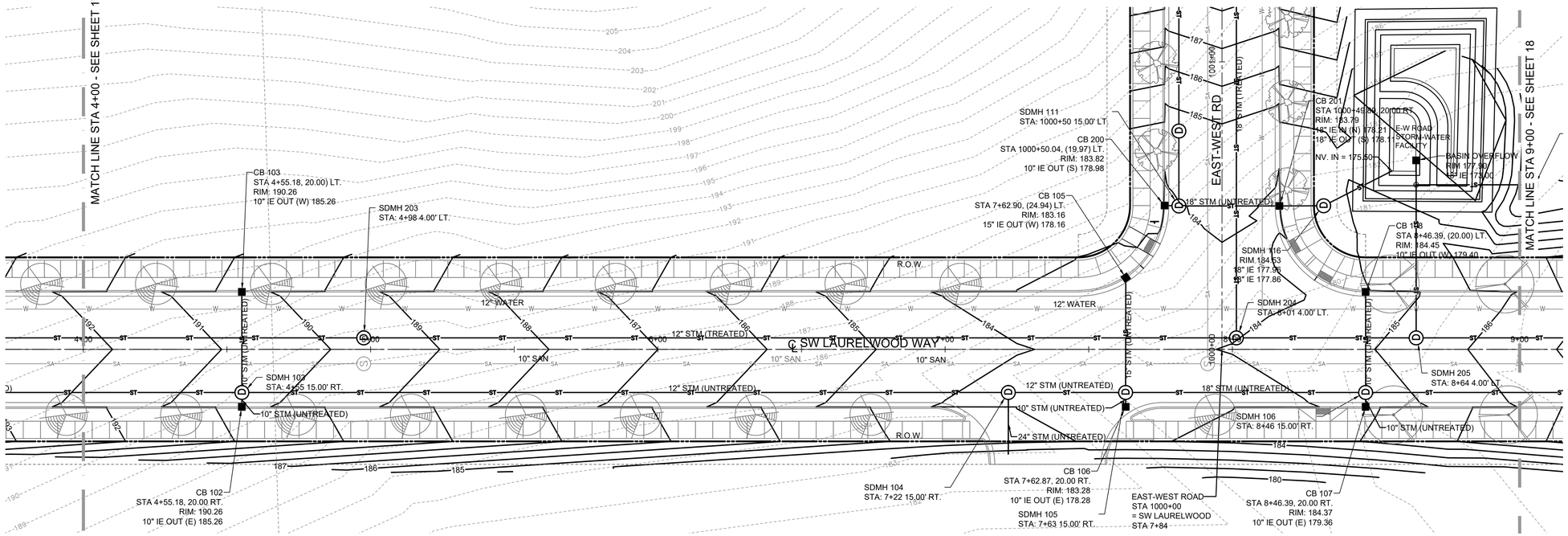

SW LAURELWOOD GRADING-STORM
PLAN & PROFILE STA 4+00 TO STA 9+00

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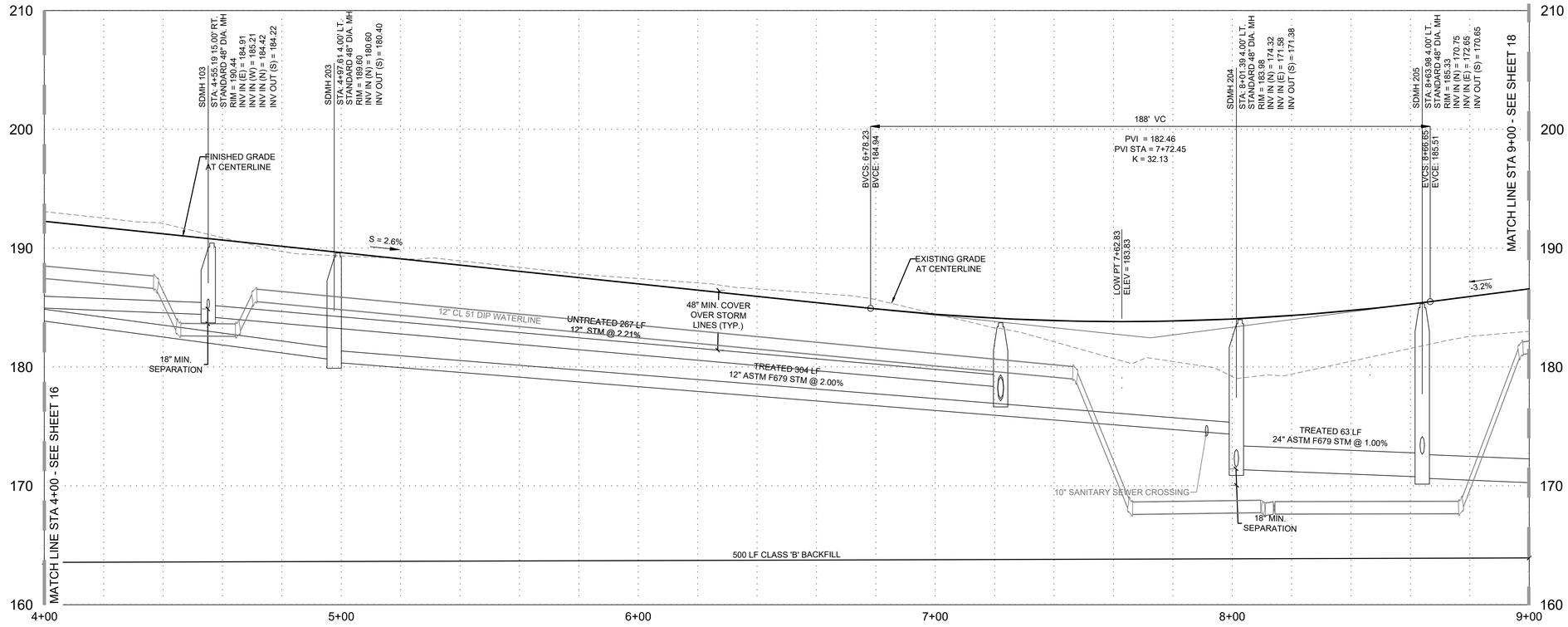

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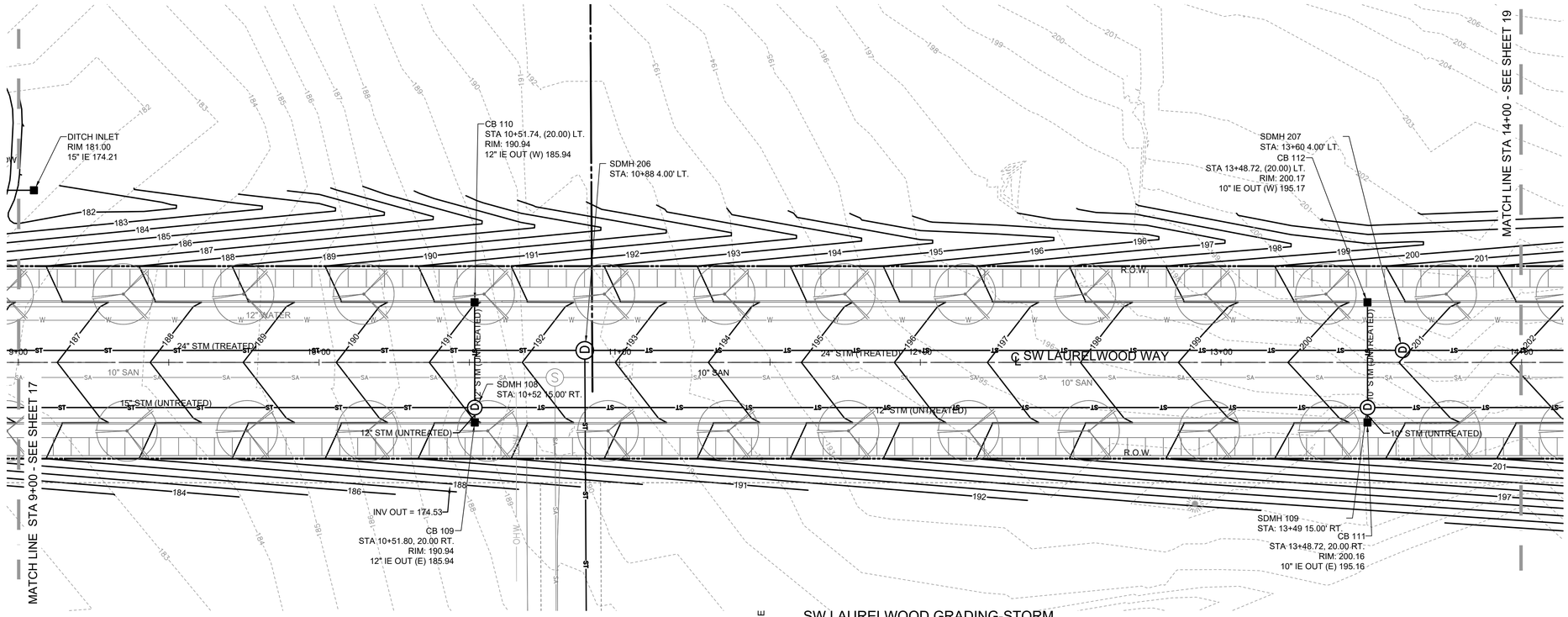

SW LAURELWOOD GRADING-STORM
PLAN & PROFILE STA 9+00 TO STA 14+00

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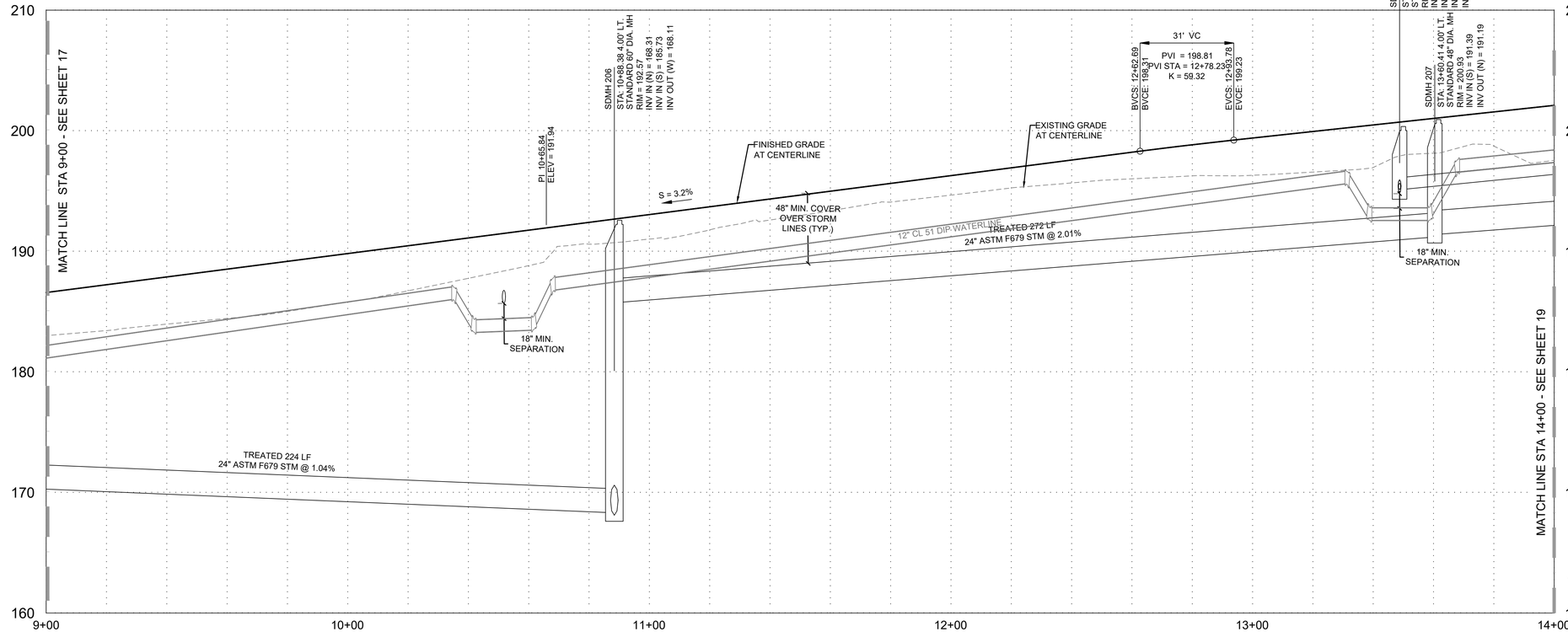

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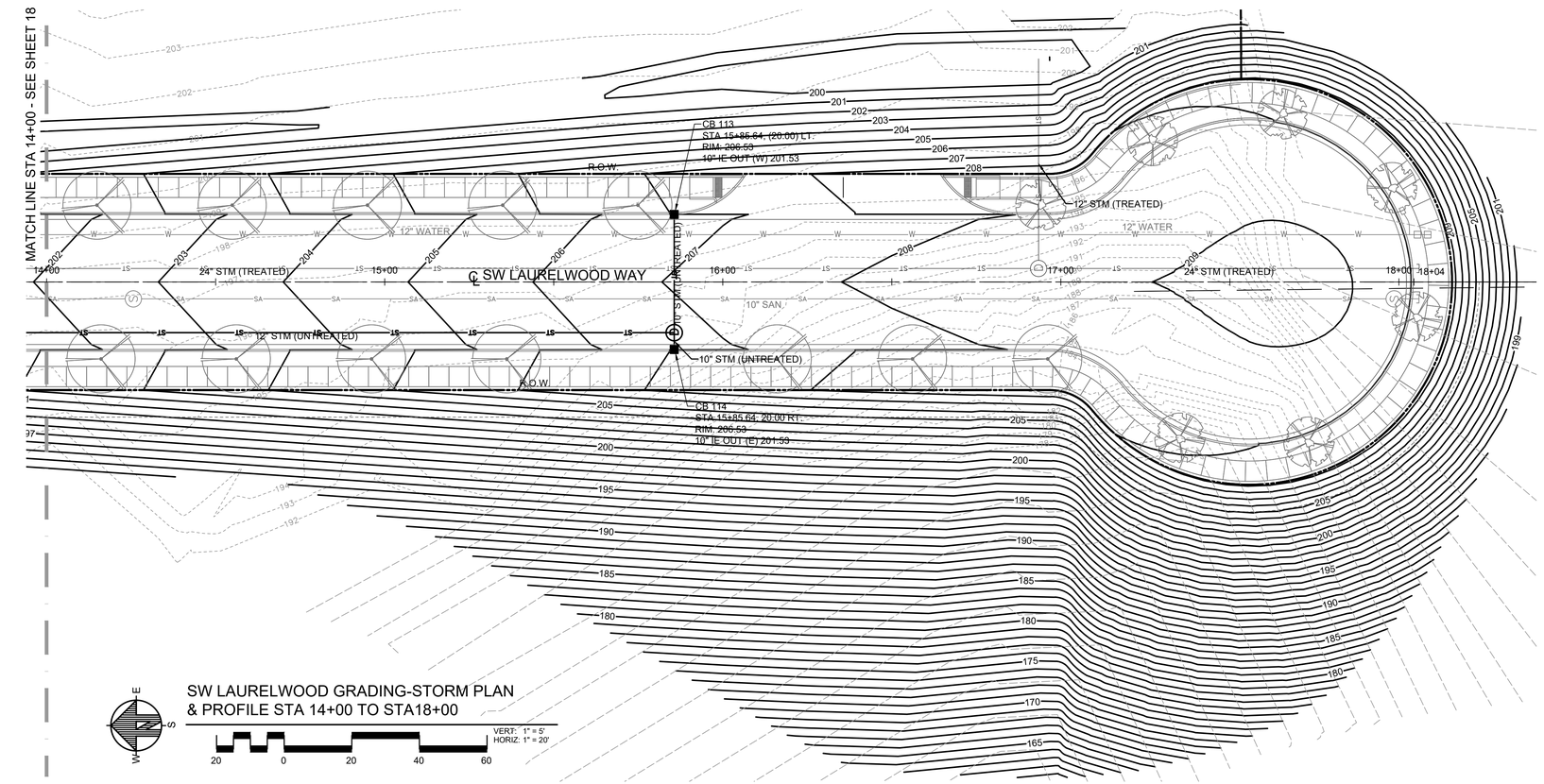

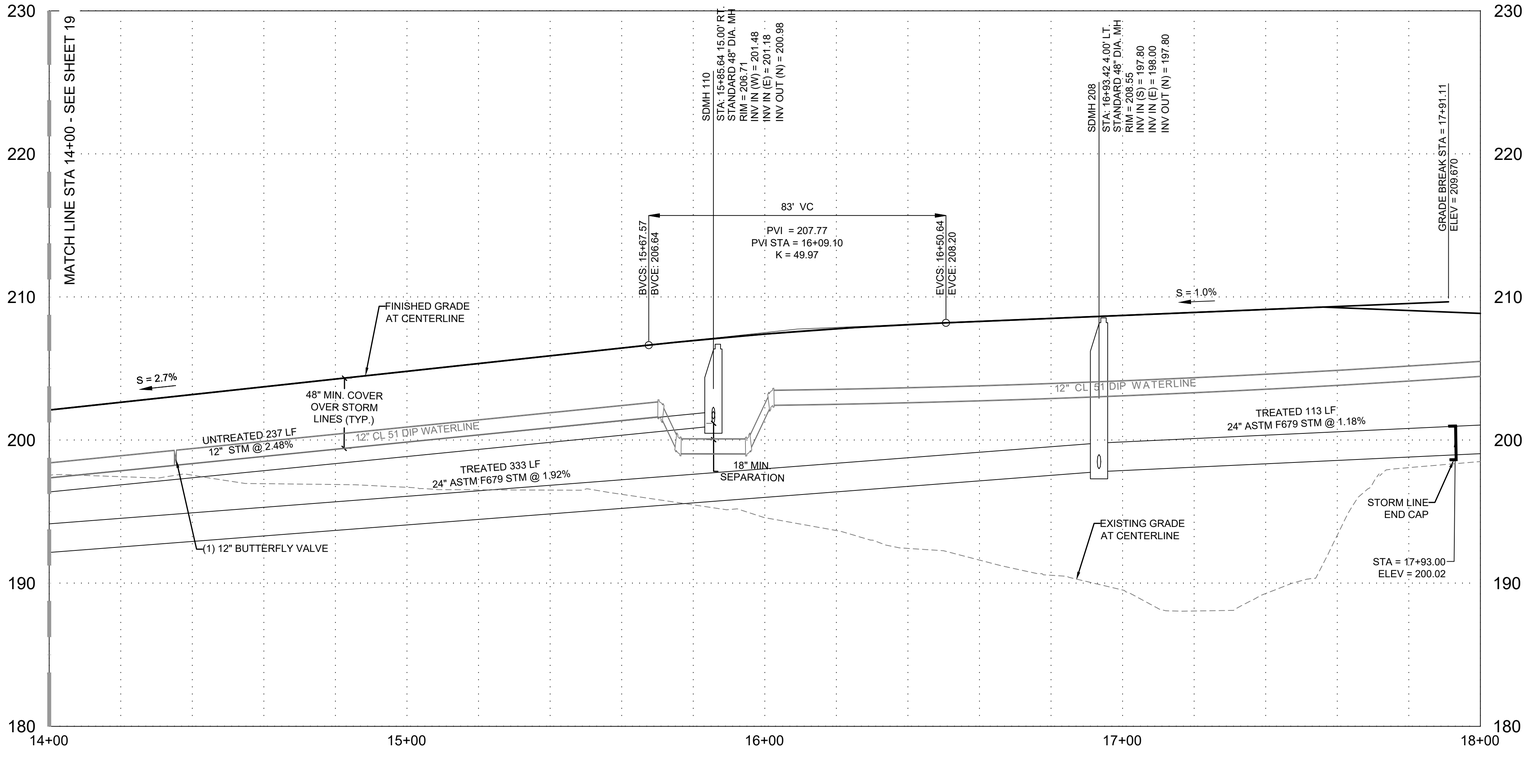

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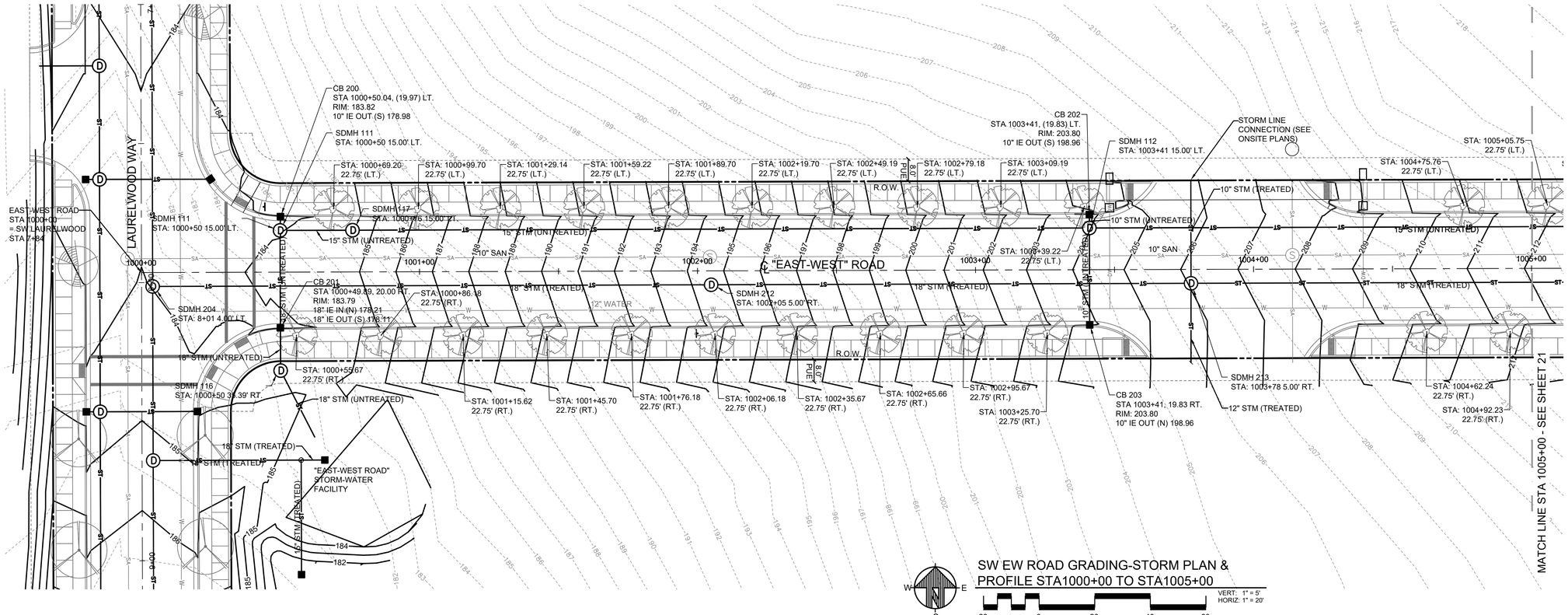
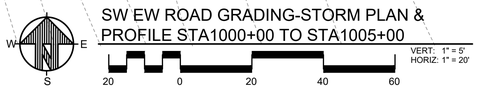
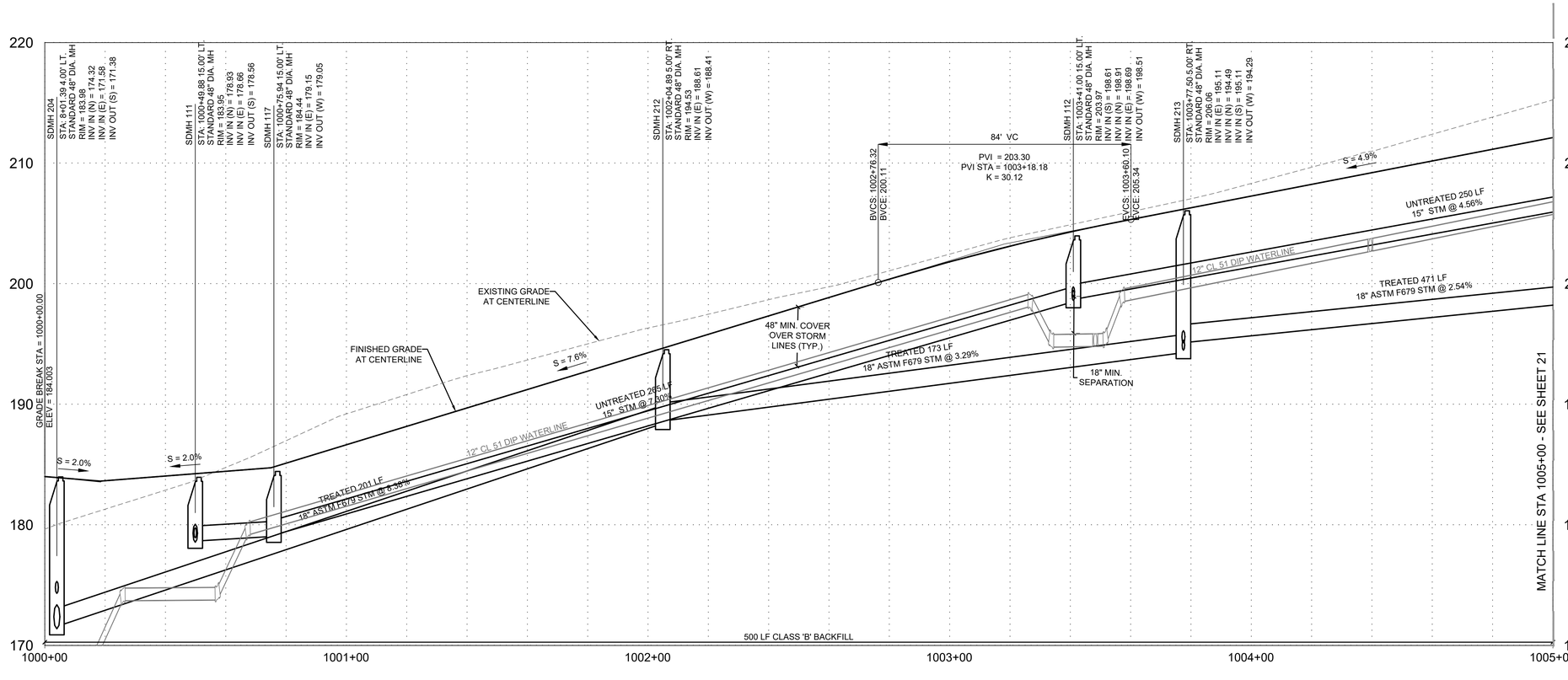




SW EW ROAD GRADING-STORM PLAN & PROFILE STA1000+00 TO STA1005+00



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MMG	BMD

SW EW ROAD GRADING-STORM PLAN & PROFILE STA1000+00 TO STA1005+00

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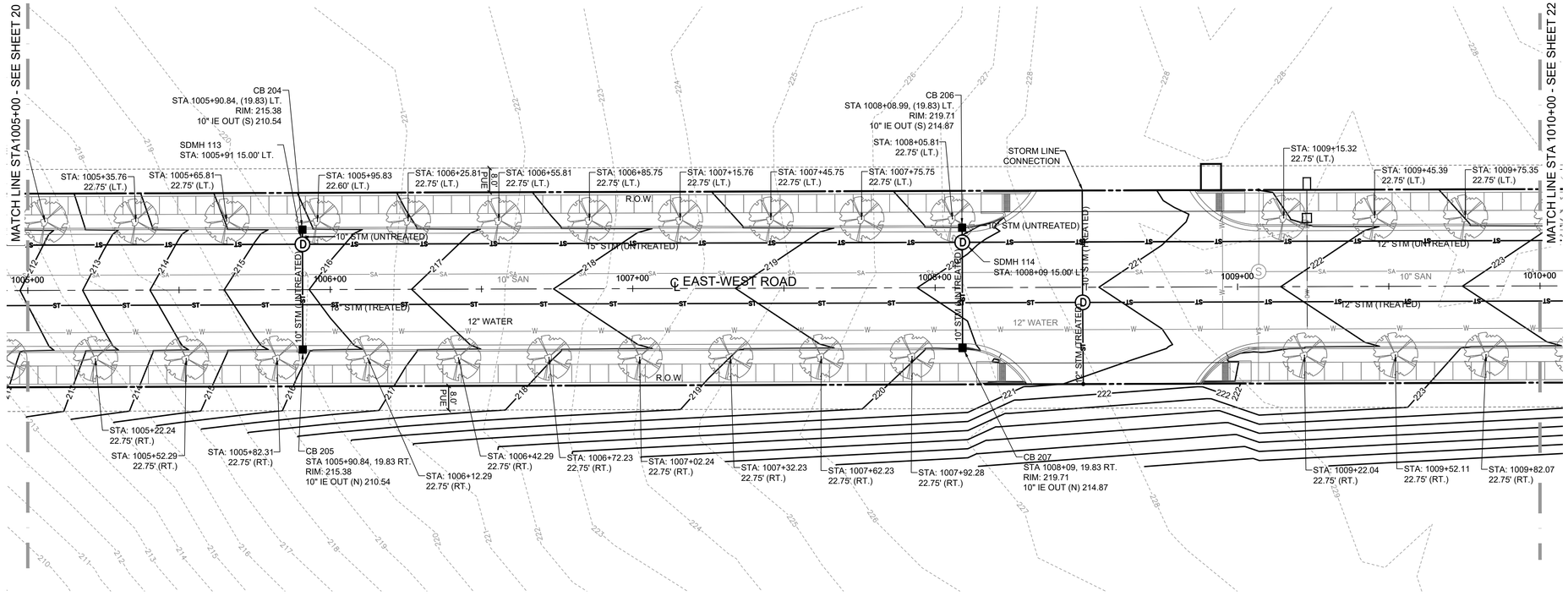

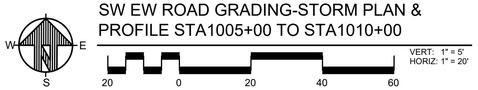

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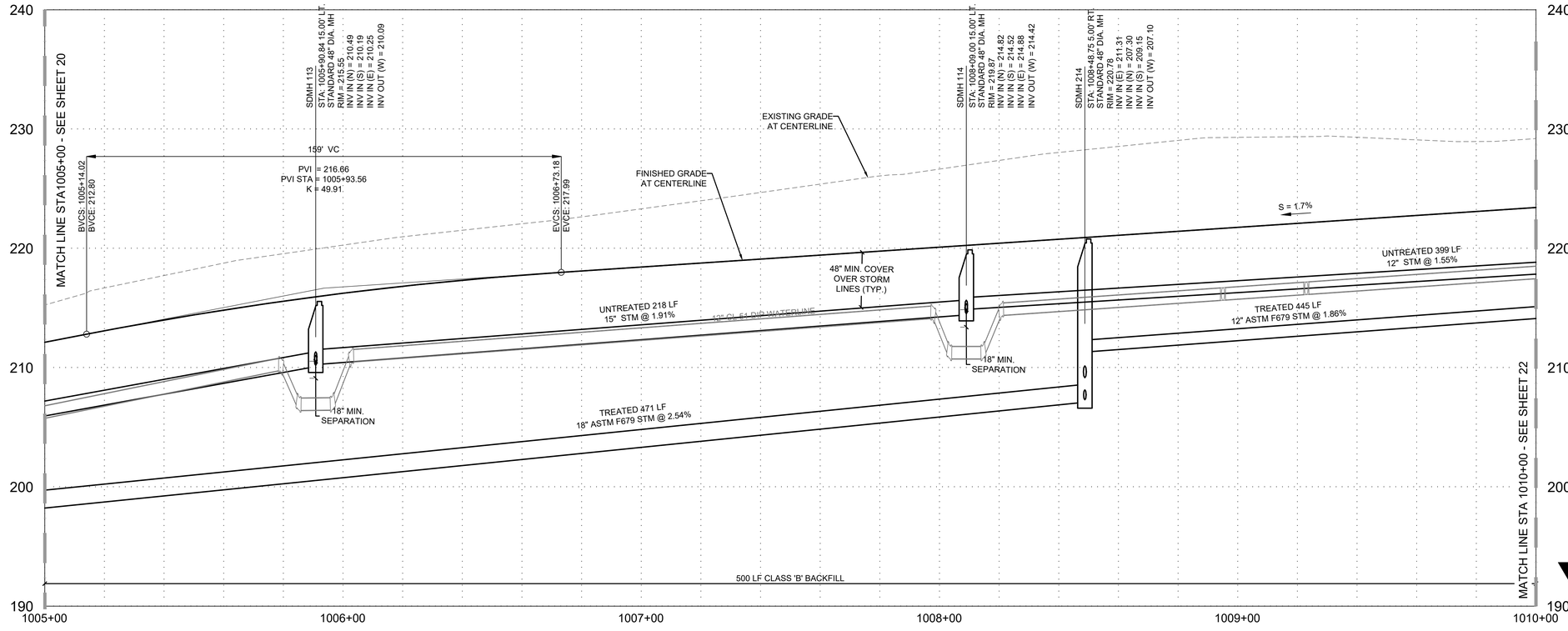

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Schnitzer PROPERTIES

PROJECT NAME

CITY OF SHERWOOD PUBLIC WORKS PLANS FOR SW LAURELWOOD WAY, "EAST-WEST" ROAD, & PUBLIC UTILITIES

SHERWOOD, OREGON

CUP APPLICATION

REVISIONS

Δ	DATE	DESCRIPTION

PRELIMINARY
NOT FOR CONSTRUCTION

DATE	OCTOBER 11, 2022
SCALE	AS NOTED
PROJ. NO.	20210190
DRAWN	MMG
CHECKED	BMD

SW EW ROAD GRADING-STORM PLAN & PROFILE STA1005+00 TO STA1010+00

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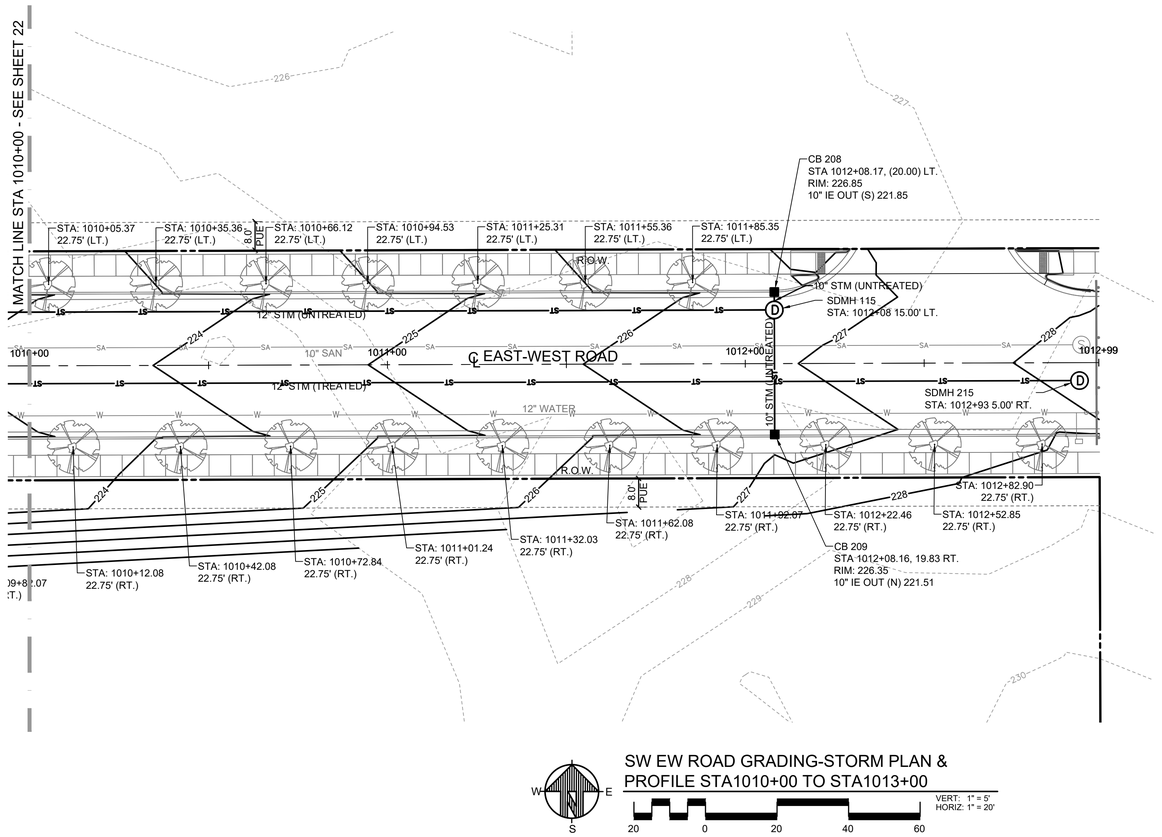

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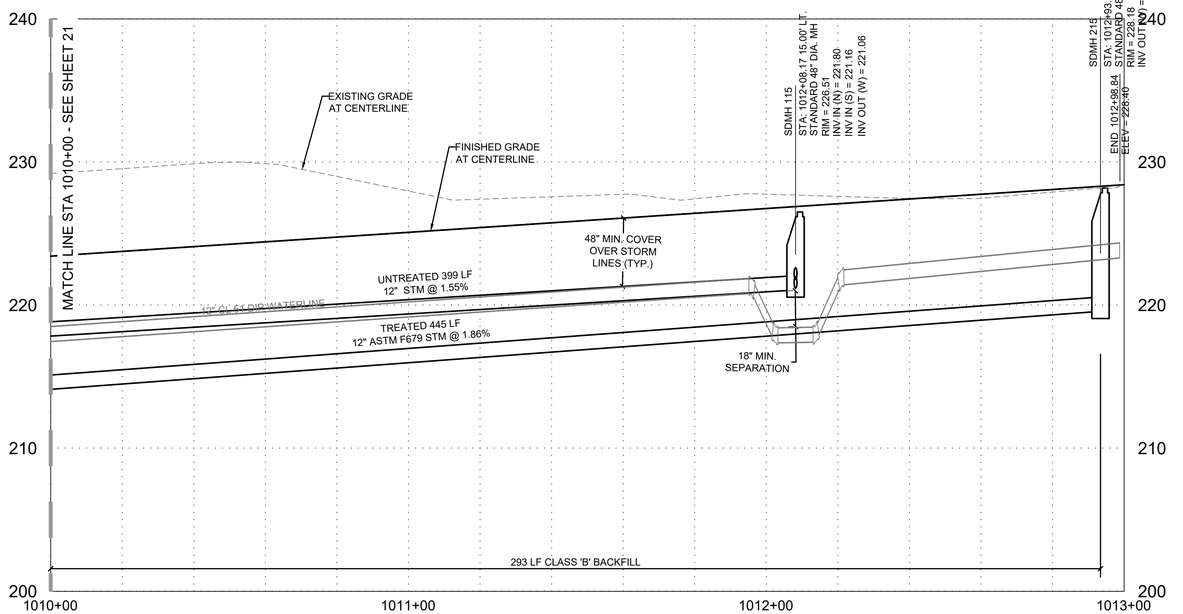

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SW EW ROAD GRADING-STORM PLAN & PROFILE STA1010+00 TO STA1013+00

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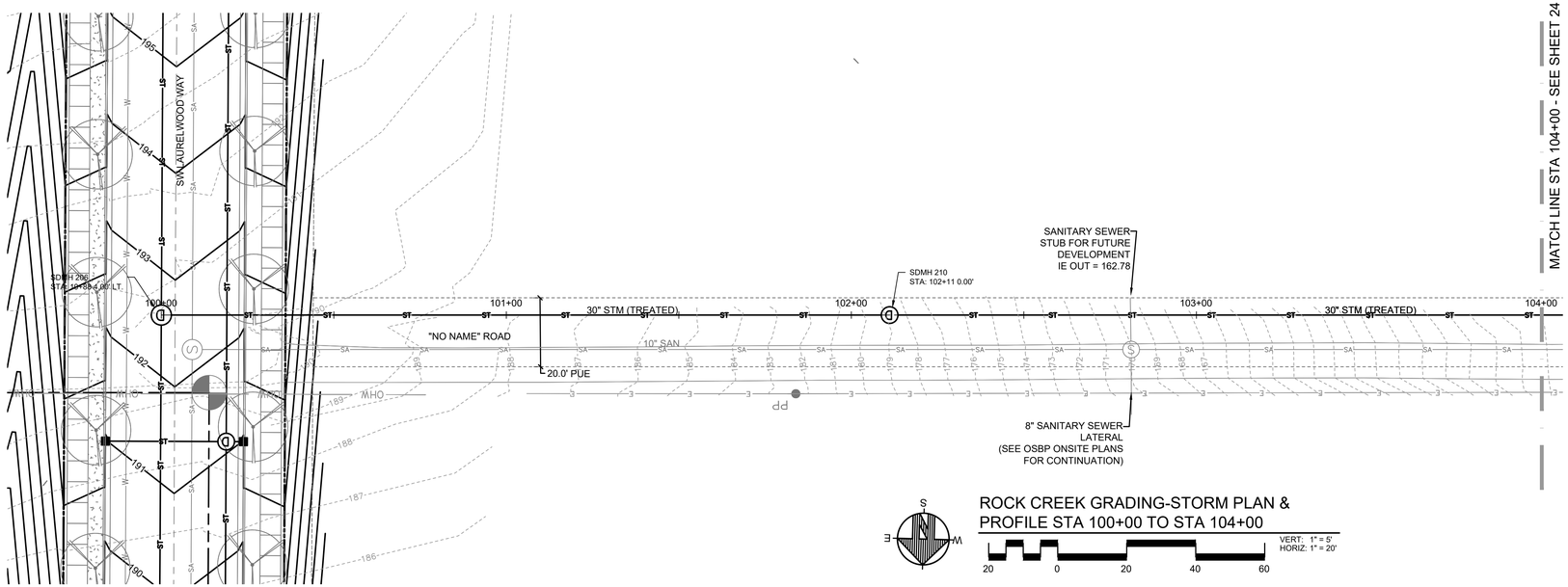

ROCK CREEK GRADING-STORM PLAN & PROFILE STA 100+00 TO STA 104+00

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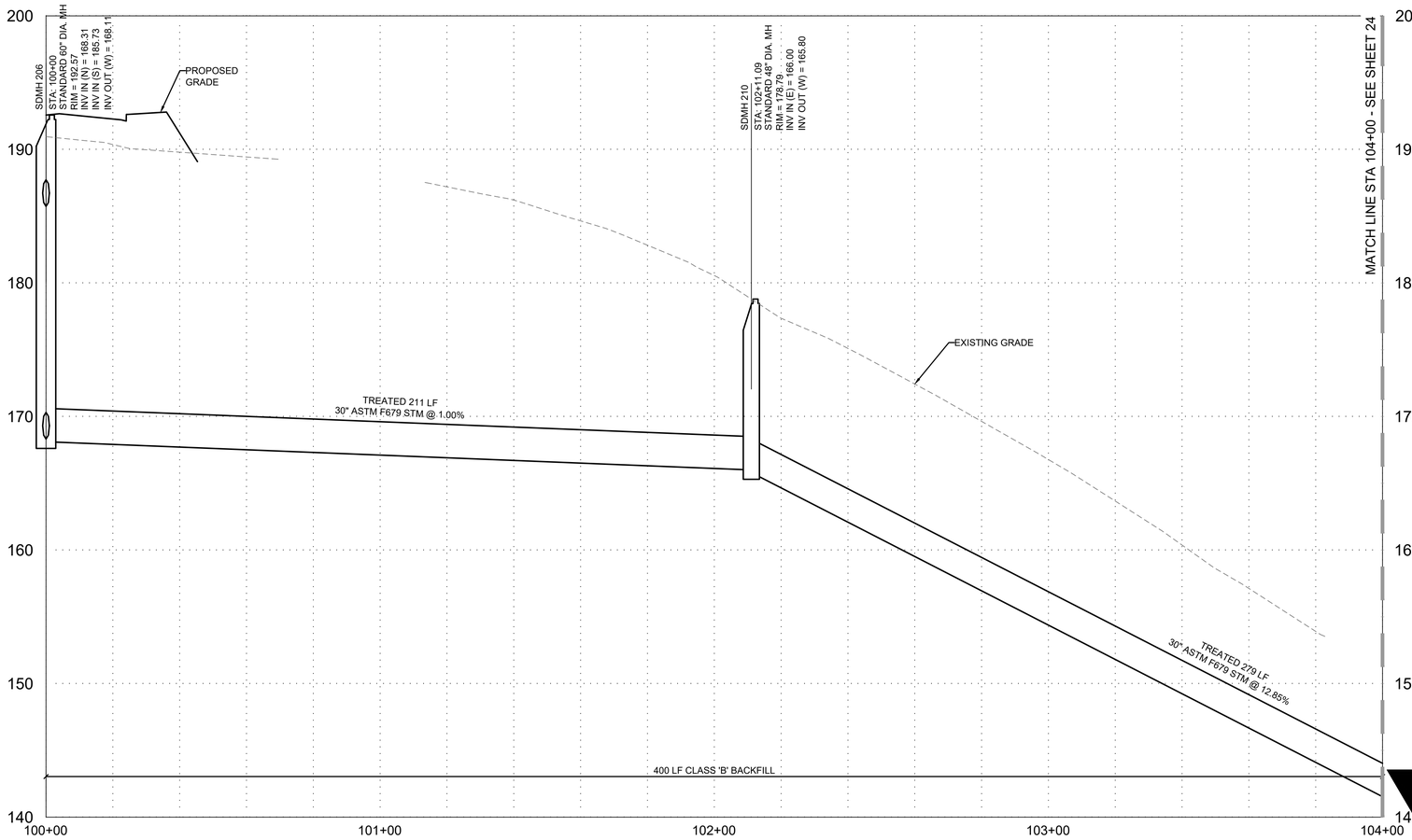

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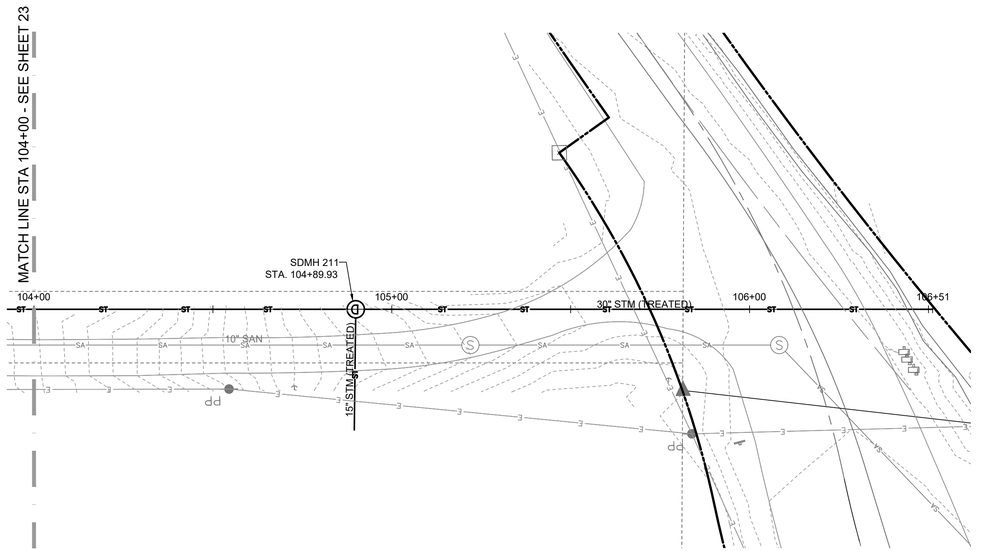
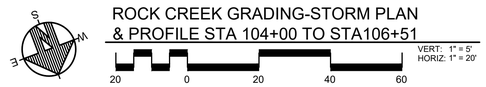
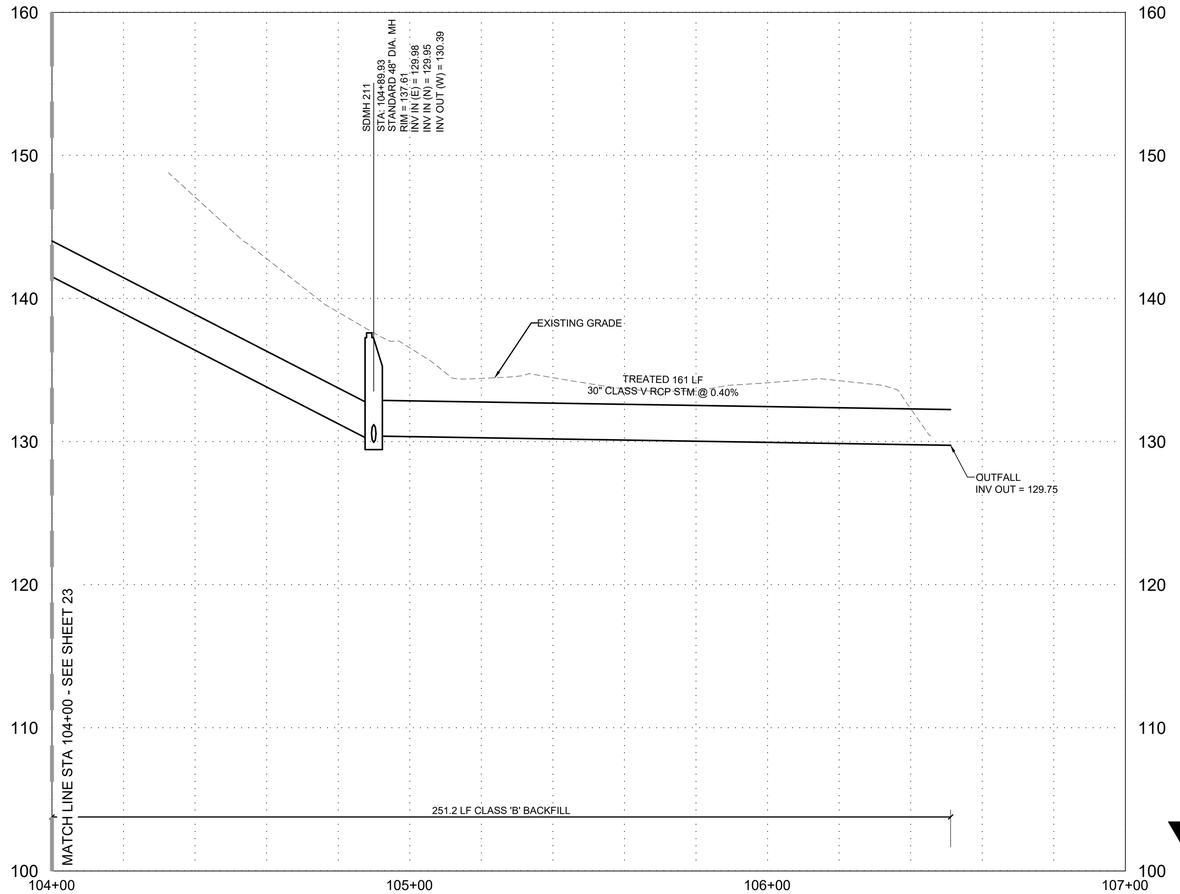
ROCK CREEK GRADING-STORM PLAN & PROFILE STA 100+00 TO STA 104+00







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ROCK CREEK GRADING-STORM PLAN & PROFILE STA 104+00 TO STA106+51

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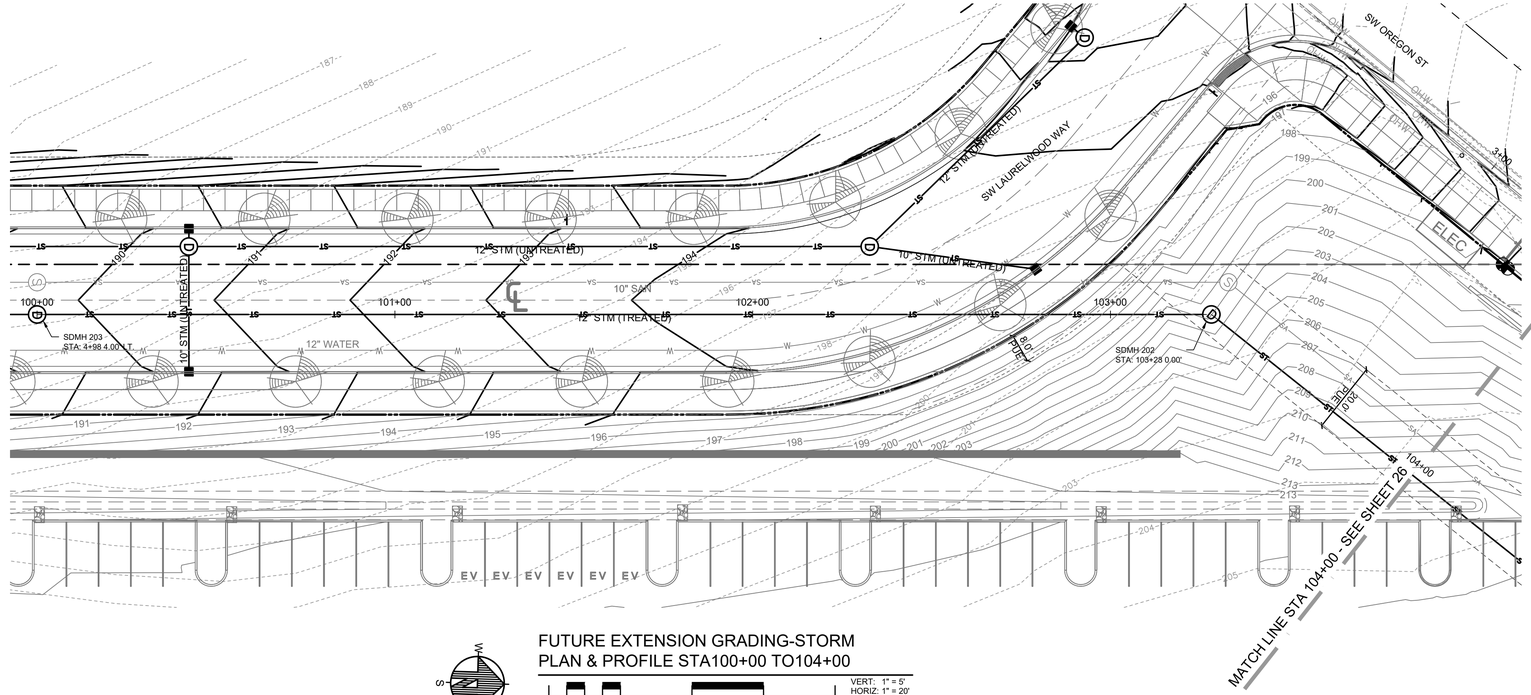

FUTURE EXTENSION GRADING-STORM PLAN & PROFILE STA100+00 TO104+00

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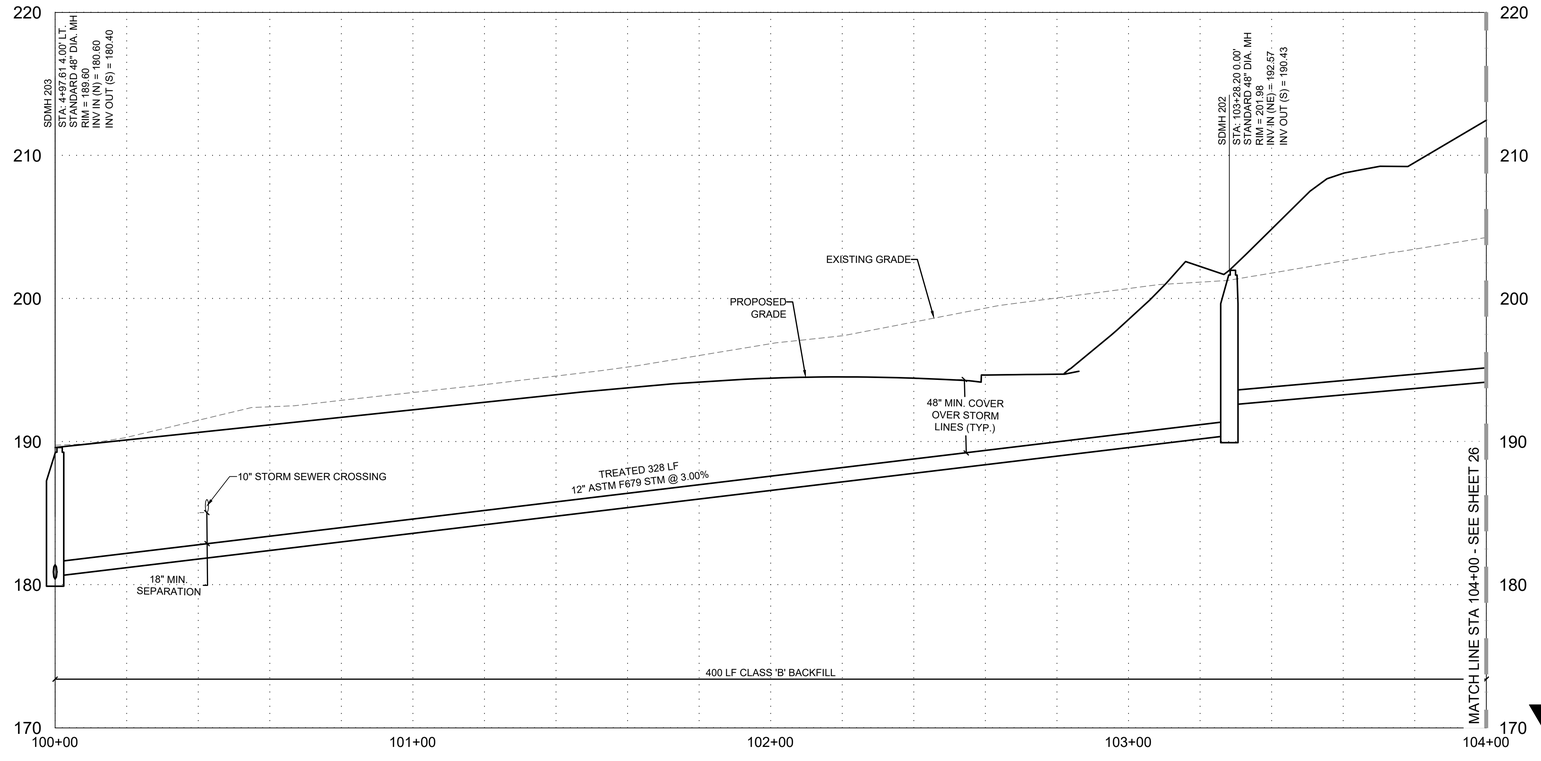

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FUTURE EXTENSION GRADING-STORM PLAN & PROFILE STA100+00 TO104+00

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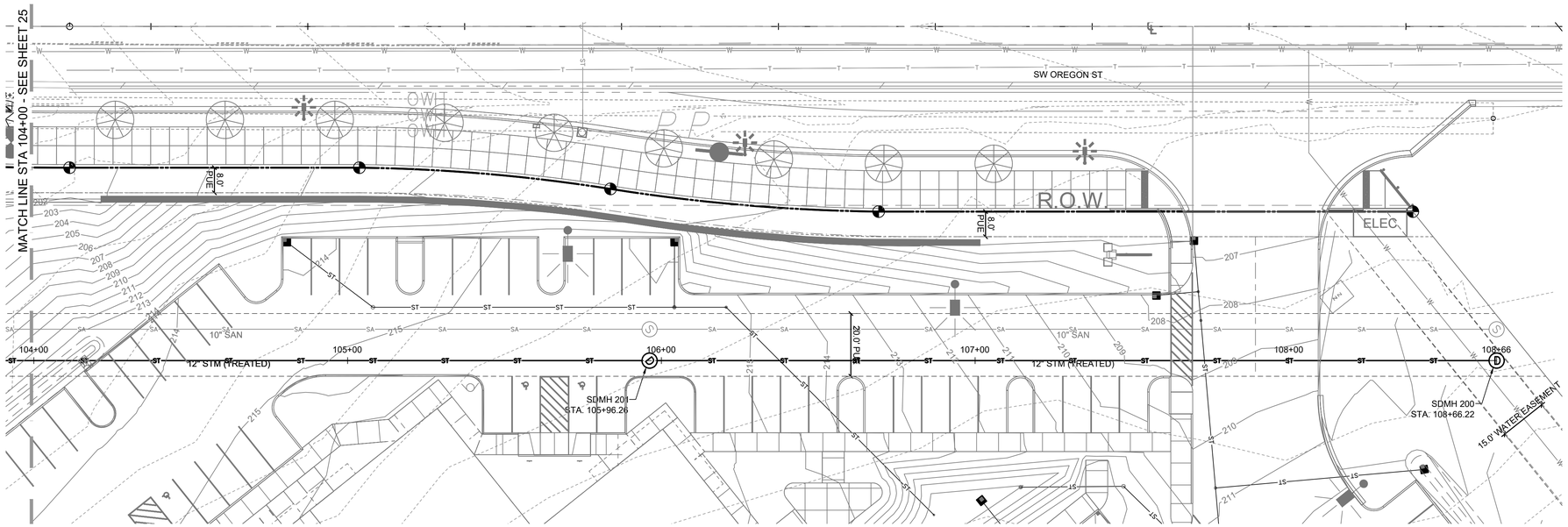

FUTURE EXTENSION GRADING-STORM
PLAN & PROFILE STA104+00 TO109+00

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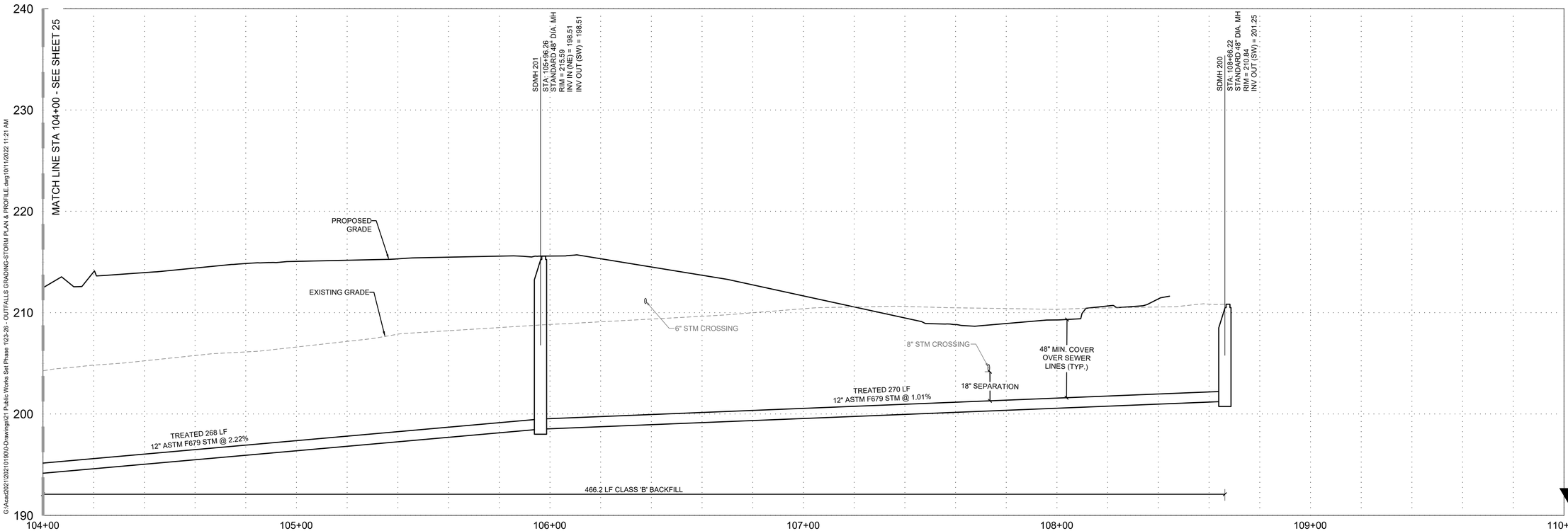

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PLANS FOR SW
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FUTURE EXTENSION
GRADING-STORM
PLAN & PROFILE
STA104+00 TO109+00

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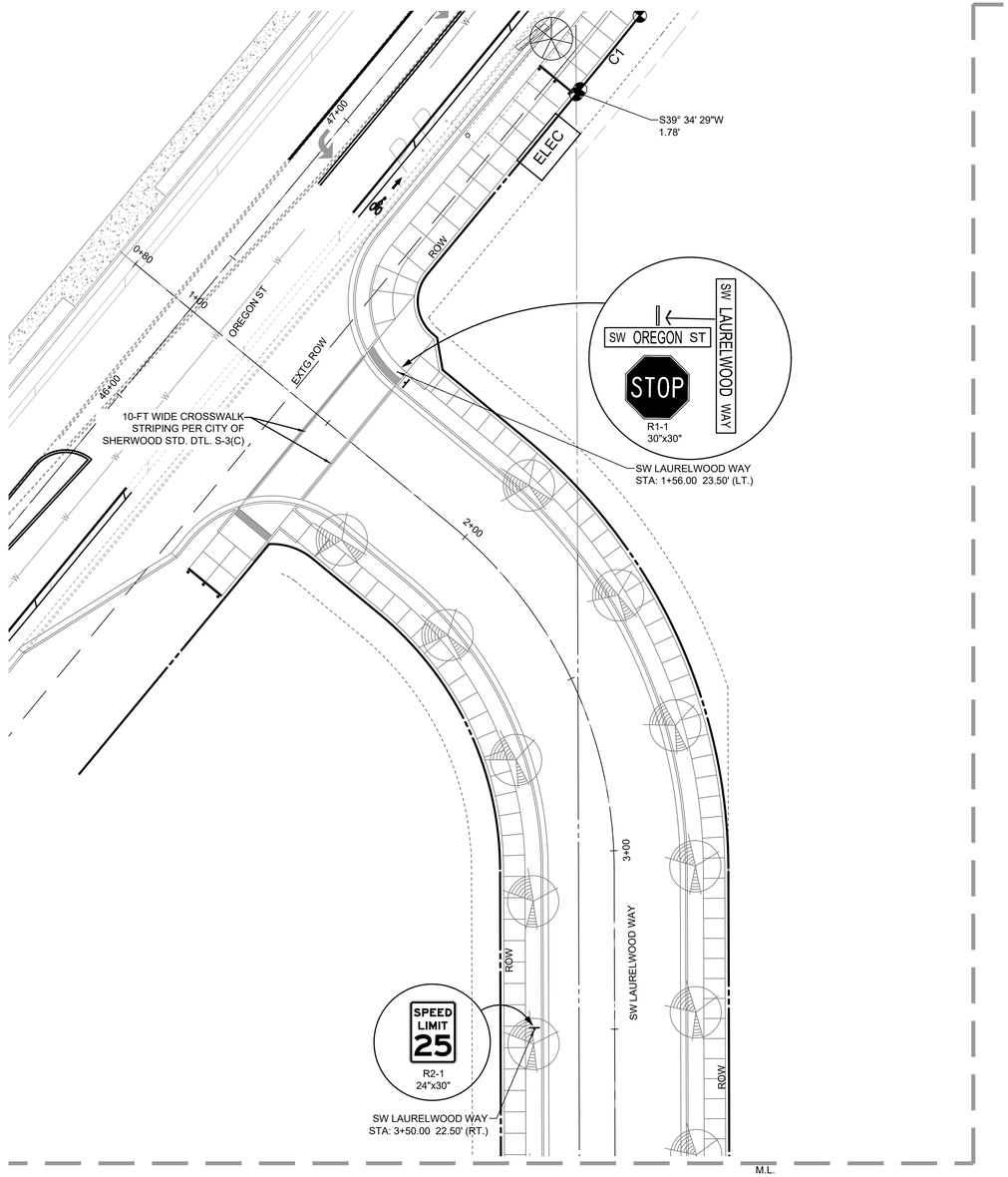

1 / 27 SIGNING & STRIPING PLAN 1" = 60'

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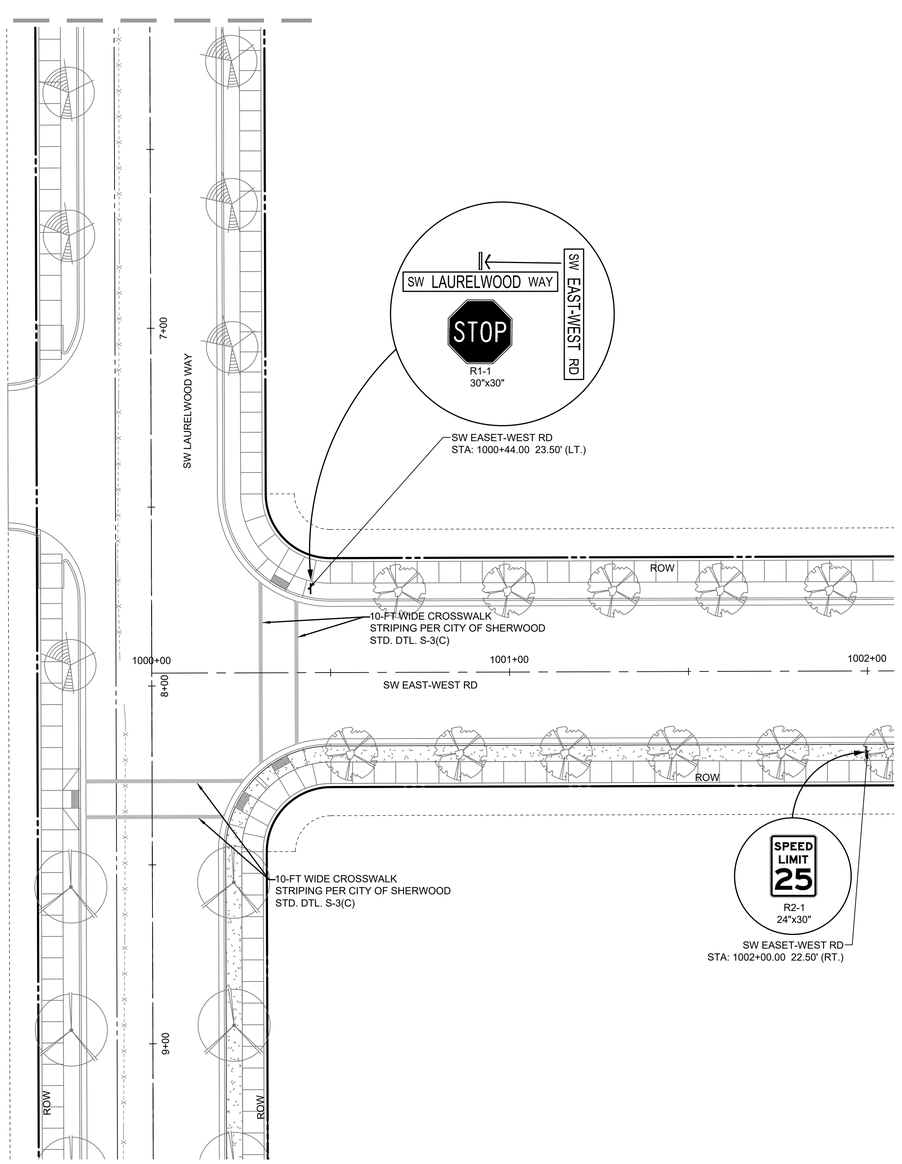

2 / 27 SIGNING & STRIPING PLAN 1" = 60'

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NOTES:

1. SEE FOR CITY OF SHERWOOD STANDARD SIGNING AND STRIPING DETAILS, SHEET 35

Exhibit A2

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DRAWN: CJM	CHECKED: JAB

SIGNING & STRIPING PLAN

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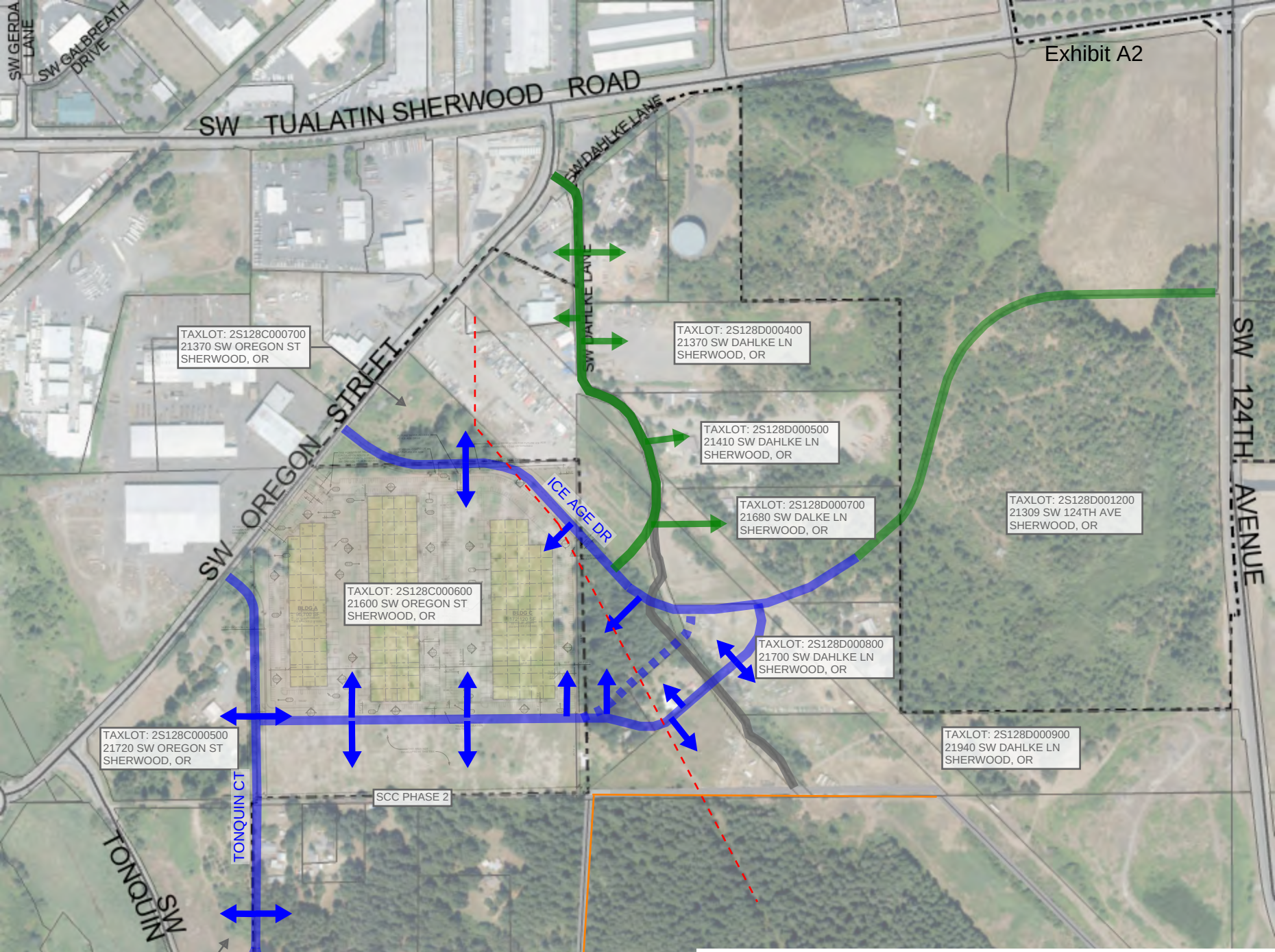
APPENDIX E – FUTURE STREET CONNECTIVITY MAP



DRAFT FUTURE ROAD CONNECTIVITY DIAGRAM

TONQUIN EMPLOYMENT AREA

Schnitzer PROPERTIES

DRAFT
SEPTEMBER 2022

VLMK ENGINEERING + DESIGN

APPENDIX F – COOPERATIVE DEVELOPMENT AGREEMENT

COOPERATIVE DEVELOPMENT AGREEMENT

This Cooperative Development Agreement (the "Agreement"), dated as of March 30, 2022 (the "Effective Date"), by and among Sherwood Commerce Center, LLC, an Oregon limited liability company ("SCC"), Bruce Polley and Karen Polley, each an individual (collectively, the "Polleys") and Tonquin Industrial Complex, LLC, an Oregon limited liability company ("TIC"), each a "Party", and together with SCC and the Polleys, the "Parties".

Recitals

A. The Polleys own certain real property located in the City of Sherwood, Oregon (the "City"), Washington County Tax Lot No. 2S128C000500 (the "Polley Property").

B. The Polleys have submitted a land use application (LU 2021-015 SP) (the "Polley Application") to the City Planning Commission (the "PC"), which remains subject to approval by the PC, pursuant to which the Polleys have proposed an industrial development (the "OSBP") on the Polley Property.

C. SCC owns certain real property located in the City, Washington County Tax Lot Nos. 2S128C000600, 2S1330000401, 2S1330000403, 2S1330000200, 2S1330000300, and 2S1330000201 (collectively, the "SCC Property").

D. SCC has (i) submitted a land use application (LU 2021-012 SP / CUP / VAR) (the "SCC Phase 1 Application") to the PC, which was approved by the PC on February 22, 2022, pursuant to which SCC will construct an industrial development (the "Sherwood Commerce Center Phase 1") on SCC Property and (ii) intends to submit a land use application (the "SCC Phase 2 Application", and together with SCC Phase 1 Application, the "SCC Application") to the PC with respect to Phase 2 of the Sherwood Commerce Center (the "Sherwood Commerce Center Phase 2", and together with the Sherwood Commerce Center Phase 1, the "Sherwood Commerce Center"), to be located on SCC Property.

E. TIC owns certain real property located in the City, Washington County Tax Lot No. 2S133BB00100, 2S1330000400, and 2S1330000600 (the "TIC Property").

F. TIC intends to submit a land use application (the "TIC Application") to the PC, which remains subject to approval by the PC, pursuant to which TIC has proposed an industrial development (the "Tonquin Industrial Complex" and together with the Sherwood Commerce Center and OSBP, each a "Project" and collectively the "Projects") on the TIC Property.

G. The Parties desire to enter into this Agreement for the mutual development of the Projects and hereby acknowledge due consideration in exchange for the obligations, covenants, promises, and rights set forth herein.

Cooperative Agreement

In consideration of the mutual recitals and covenants contained herein, the Parties agree as follows:

1. Tonquin Court and Related Improvements. The Parties agree that Tonquin Court shall be constructed as follows:

a. TIC and SCC agree to design and construct the road currently known as Tonquin Court (or any successor, referred to herein as "Tonquin Court"), as depicted on Exhibit A attached hereto and as further described in the City's Tonquin Employment Area Concept Plan. All costs associated with the design, planning and construction of Tonquin Court shall be borne by TIC and SCC pursuant to a separate agreement. Construction of Tonquin Court shall be completed on or prior to September 1, 2023.

b. The costs of the design, planning and construction of any sanitary, sewer, storm sewer and water utilities, gas, electric, telecommunications, and similar costs, including any late-comer fees, credits, and similar amounts, associated with Tonquin Court or which serve the Parties (collectively, the "Utilities") shall be borne on a pro rata basis (the "Proportional Share") amongst the Parties based on each Party's respective square footage of the constructed Sherwood Commerce Center, OSBP, and Tonquin Industrial Complex. By way of example, assuming (i) the Sherwood Commerce Center is comprised of 934,000 square feet, (ii) the Tonquin Industrial Complex is comprised of 355,000 square feet and (iii) the OSBP is comprised of 120,000 square feet, then SCC, TIC, and the Polleys shall be responsible, respectively, for 66.29%, 25.2%, and 8.51% of the Proportional Share. SCC shall construct or caused to be constructed the Utilities. A Party's Proportional Share shall be adjusted based on the square footage of each Project as fully constructed. The location of the Utilities is depicted generally on Exhibit B. The Parties shall obtain up to three (3) bids for the Utilities and shall mutually agree upon which bid to utilize in construction of the Utilities.

c. The approximately 25-foot easement/right-of-way between OSBP and Tonquin Industrial Complex will be legally modified to allow their joint use (including, but not limited to, joint access from Tonquin Ct, site traffic flow, Utilities, and a utility easement for SCC).

d. In connection with and furtherance of the foregoing, the Polleys shall promptly, and no later than prior to the permit approval for Tonquin Court being issued, dedicate a portion of the Polley Property (generally as depicted on Exhibit C attached hereto) for the construction of Tonquin Court. The Polleys shall grant SCC and TIC any and all necessary Temporary Construction Easements, and any similar or related documents, in a form satisfactory to SCC and TIC in their discretion.

e. Any costs contemplated to be shared as set forth in this Section 1 shall be promptly paid by a Party when due and payable and within thirty (30) days of written demand by another Party. For the avoidance of doubt, each Party shall be responsible for the frontage (except the frontage at the intersection of Tonquin Court and Oregon Street) associated with their respective Project.

2. Detention Pond. The Parties agree that a storm detention pond (the "Detention Pond"), shall be constructed as follows:

a. The Polleys shall design and construct the Detention Pond on the southwest corner of the Polley Property in a manner that will serve the capacity needs of the OSBP and Tonquin Court in its entirety. Construction of the Detention Pond shall be completed on or prior to September 1, 2023.

b. The construction costs directly related to the Detention Pond shall be borne by TIC and SCC in accordance with a separate agreement; provided, however, that the Polleys shall pay the aforementioned costs and shall be reimbursed by TIC and SCC within thirty (30) days' written notice. For the avoidance of doubt, the costs contemplated in the first sentence of this section 2(b) do not include any retaining walls, related grading work, environmental impact, wetlands mitigation, or similar work or improvements specifically related to the OSBP. All other costs associated with the Detention Pond shall be borne solely by the Polleys. If there is excess capacity in the Detention Pond and either TIC or SCC elect to utilize such capacity upon written notice to the Polleys, TIC and/or SCC shall pay the costs associated with their respective use of the Detention Pond. All proportional use shall be based on the impervious square footage of OSBP and Tonquin Court that drain to the Detention Pond.

c. The design for the Detention Pond shall be subject to the written approval of all Parties. The Parties shall obtain up to three (3) bids for the Detention Pond and shall mutually agree upon which bid to utilize in construction of the Detention Pond.

d. The Parties shall use best efforts in collaborating with the Authorities Having Jurisdiction ("AHJ") so that the Detention Pond is a public pond that is operated, maintained, and otherwise controlled by the AHJ.

e. The Polleys will promptly, and prior to the permits being issued for Tonquin Court, dedicate land or grant an easement to the City for maintenance of the Detention Pond. The Polleys will work collaboratively and expeditiously with the City to make the Detention Pond a regional facility that will be owned and maintained by the City. Except as expressly set forth in this Section 2, TIC and SCC shall have no liability with respect to the Detention Pond.

3. OSBP. The Polleys hereby agree to, within sixty (60) days of the Effective Date, amend the Polley Application and submit the same to the PC for approval, in a form substantially in compliance with the depiction attached hereto as Exhibit D. The Parties hereby agree that neither TIC nor SCC shall have any liability with respect to the Polley Application or the OSBP; nor shall TIC nor SCC make any guarantee as to (i) approval by the City of the OSBP or (ii) any square footage desired by the Polleys with respect to OSBP.

4. Cooperative Development of the Projects. With respect to the approval, design, and construction of the Projects, the Parties hereby agree as follows:

a. The Parties shall promptly grant to the other Parties, as is reasonably necessary, any temporary construction easements or other access required for any work associated with grading or other development of a Project.

b. The Parties hereby approve the development and construction of the Sherwood Commerce Center and any conditions imposed thereon by the PC as of the Effective Date.

c. The Parties agree that any decision of the PC or other body with respect to a Project shall be final, binding and conclusive on the Parties and cannot be reviewed or appealed for any reason by any party.

d. The Parties agree that they shall not in any way, either directly or indirectly, oppose, threaten to oppose, disparage, or otherwise delay any planning, design, or construction efforts (including any permitting process), associated with any Project. Any appeals or opposition shall be rescinded prior to the date hereof.

e. The Parties agree that they shall not seek to amend, modify, supplement, or otherwise change any planning documentation, policy, ordinance, law, rule, regulation, or resolution of any AHJ that would adversely affect the development of any Project as described herein.

f. The Parties agree that they shall not encourage any third party to act in violation of this Section 4. The Parties further agree that this Section 4 shall be binding on any affiliate, consultant, successor or assign of any Party.

5. General.

a. Cooperative Nature. The Parties agree that they shall promptly execute and deliver any applications, permits, documents required by the City or the County of Washington, Oregon (the "County"), and any other reasonably requested document, certificate, application, or instrument (including any such requirement by a Party's lending institution) related to the terms described herein in furtherance of the rights and obligations to be performed hereunder. The Parties further agree to work collaboratively and diligently with the City and County in furtherance of the obligations required to be performed hereunder.

b. Effect of Agreement; Severability; Amendment; Assignment. The terms of this Agreement shall be effective immediately and shall supersede any previous agreements (whether verbal or in writing) amongst any Party. Any such previous agreement is hereby deemed null and void *ab initio*. Should any provision of this Agreement be determined to be void, invalid, unenforceable or illegal for whatever reason, or otherwise not approved by the City, the County, or any other applicable governing body, such provision(s) shall be null and void; provided, however, that the remaining provisions of this Agreement shall be unaffected thereby and shall continue to be valid and enforceable. This Agreement (including the Exhibits

attached hereto) constitutes the entire agreement amongst the Parties with respect to each Party's respective Project described herein. This Agreement may not be amended, modified, or supplemented unless expressly done so in a writing executed by all Parties. This Agreement may not be assigned, by operation of law or otherwise by any Party, without the written consent of the non-assigning Parties.

c. Indemnity. To the fullest extent permitted by law and except as limited hereunder, each Party releases and shall indemnify, defend and hold harmless the other Parties, their affiliates and lenders and each of their respective officers, agents, employees, representatives, consultants and contractors, from and against any and all claims, damages, losses and expenses, including, but not limited to, reasonable attorney's fees, which arise out of or result from any act or conduct of the given Party, its employees, agents, breach of this Agreement or any negligent, reckless or illegal act or omission of the given Party, any subcontractor or independent contractor engaged by a Party, anyone directly or indirectly employed by them or anyone for whose acts any of them may be liable.

d. Dispute Resolution. The Parties shall be permitted to, as set forth herein, pursue any remedy at law or equity upon a breach of this Agreement by any Party; provided, however, that no Party shall be entitled to seek or recover special, punitive, incidental, consequential damages, or any similar damages (including loss of rent or building square footage) except as explicitly set forth herein. In the event of a dispute between the Parties hereto as to a breach of this Agreement, the Parties agree to first attempt to mediate their dispute. Each party shall bear its own cost of counsel in the mediation effort, but they shall each bear the cost of the mediator and the mediation facilities equally. If the dispute cannot be resolved through mediation, any Party may initiate litigation. If mediation is not successful and any action, or other proceeding (other than mediation) is brought in connection with this Agreement, the substantially prevailing party, as determined by a final non-appealable judgment of a court of competent jurisdiction, shall be entitled to recover from the other party the reasonable costs, expenses and attorneys' fees incurred in such action.

e. Authority to Execute Agreement; Conflicts. Each Party acknowledges and confirms that it has full and lawful authority to execute this Agreement and perform as contemplated hereunder. Each Party further hereby represents and warrants that the execution and delivery of this Agreement, and performance of the terms hereunder, does not and will not result in a violation of any other agreement (either verbal or in writing), mortgage, administrative action, governmental approval, legal judgment, or similar action. Each Party hereby represents and warrants that there are no pending actions or claims related to each Party's respective project described herein.

f. Time of the Essence. The obligations contained in this Agreement are time sensitive and require the prompt attention, delivery, and efforts of all Parties and their consultants. Time is of the essence for this Agreement.

g. Counterparts. This Agreement may be signed on any number of counterparts with the same effect as if the signatures were on the same instrument when counterparts containing signatures from all of the Parties are obtained by SCC. A signed

counterpart transmitted by electronic means or facsimile shall be deemed sufficient to bind the transmitting party when sent, but any party submitting its signature in that fashion shall also be obligated to mail an originally signed counterpart to the other party promptly thereafter.

h. Confidentiality. The Parties and any affiliates, owners, members, agents, consultants, or other third parties shall keep confidential all matters concerning the terms of this Agreement and the negotiations which led to it and shall not disclose the fact or substance of the negotiations or the terms to anyone without the prior written consent of all Parties. Notwithstanding the foregoing, the provisions and preceding negotiations may (i) be revealed to a Party's consultants, attorneys and lenders so long as each such recipient is advised of the necessity for them to also maintain the confidentiality of the information and (ii) be disclosed to the City for the limited purposes of the City's involvement and approval as described herein.

i. Binding Effect. This Agreement shall be binding on the Parties and all affiliates, successors, and assigns, including any transferee of any Party's respective property as described herein. Except as set forth herein, this Agreement shall not create any rights or benefits to parties other than the Parties. Nothing contained in this Agreement shall be deemed to create a relationship of partnership, joint venture or any other relationship between the Parties except as explicitly set forth herein.

j. Miscellaneous. Preparation of this document by either Party or their agent and its submittal to the other party shall not be deemed to impose any obligation or legal liability from either party to the other. This Agreement is not intended to be binding until it is executed and delivered by all parties hereto.

[Signature Page to Immediately Follow.]

Sherwood Commerce Center, LLC, an
Oregon limited liability company

By: _____
Name: Jeffrey F. Nudelman
Title: Vice President, Secretary

Tonquin Industrial Complex, LLC, an Oregon limited liability company

By: _____
Name: Tim Kerr
Title: Member

_____
Bruce Polley

_____
Karen Polley

Exhibit A

Tonquin Court

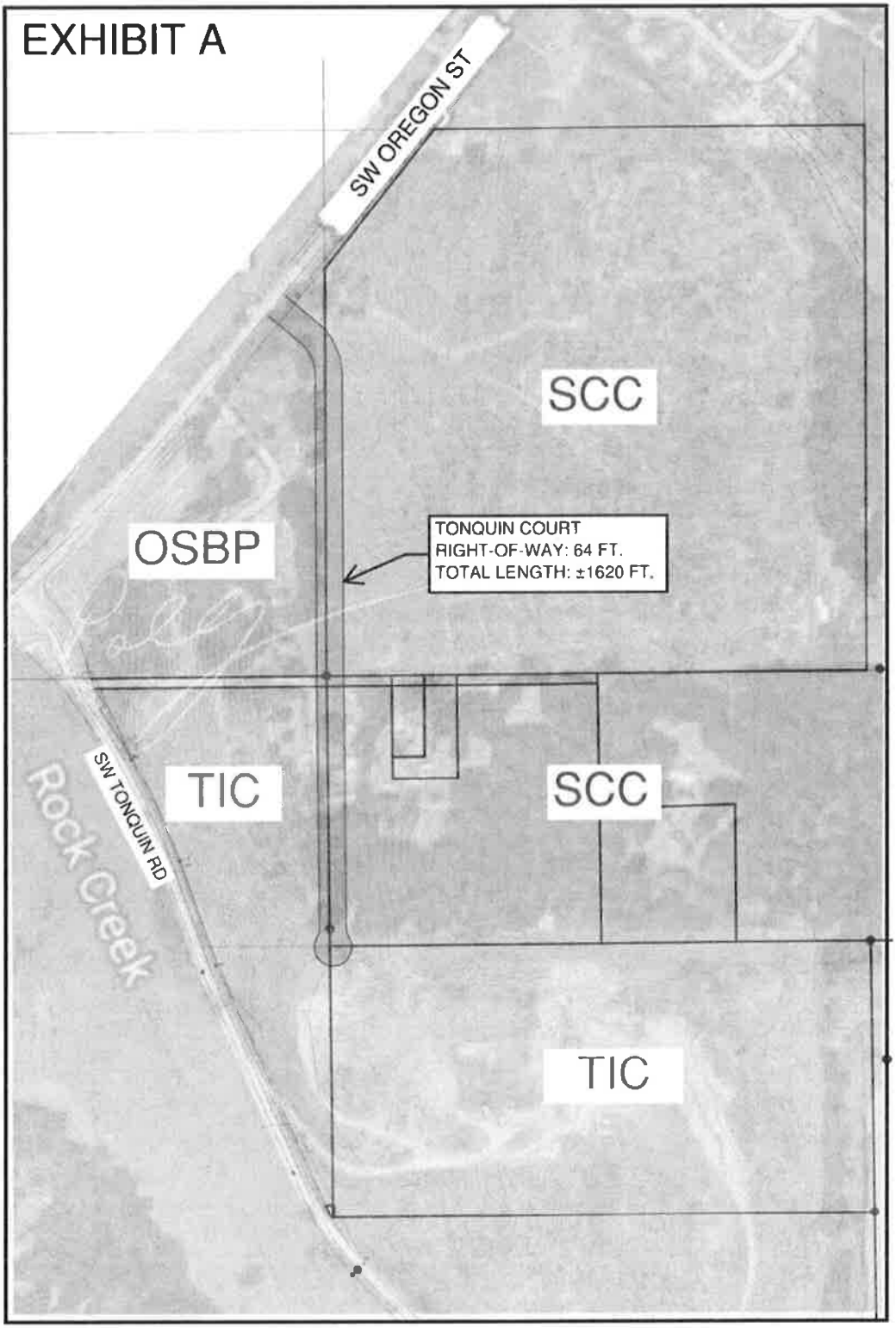
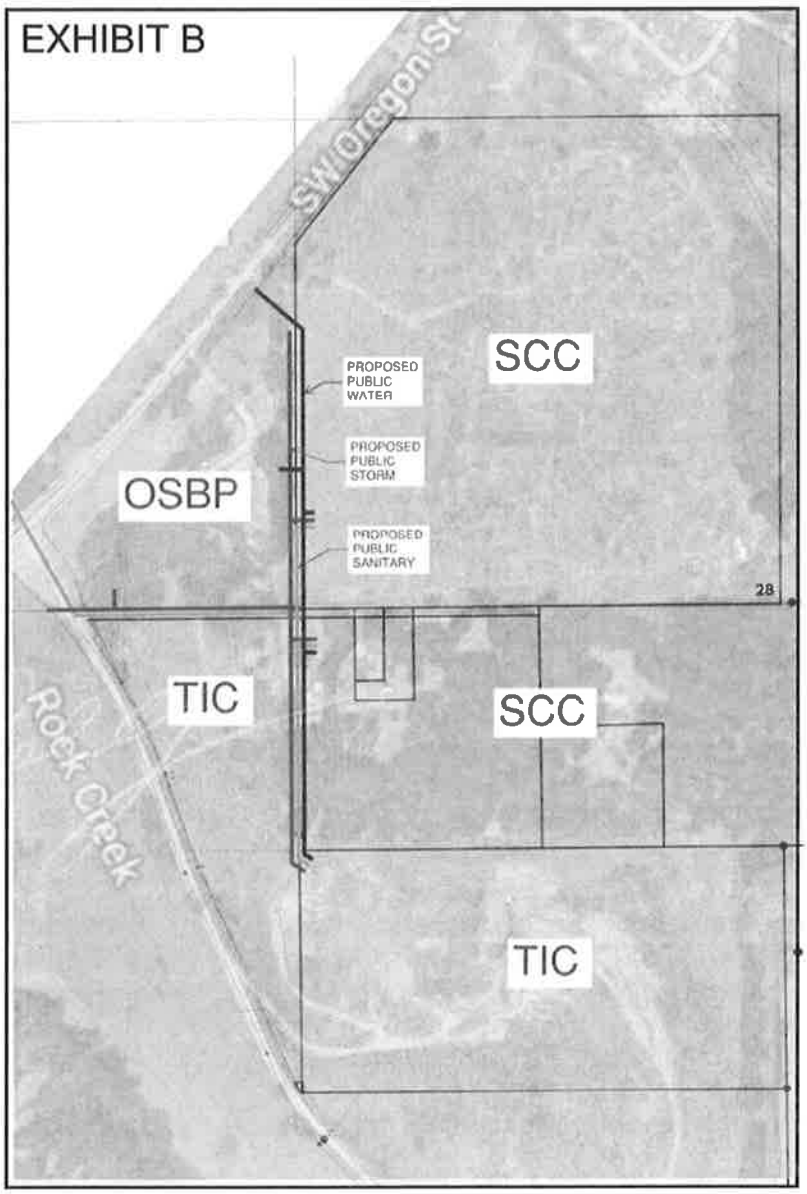


Exhibit B

Utilities[1]



[1] Utilities also include gas, electric, telecommunications, and similar costs.

Exhibit C

Dedication Area

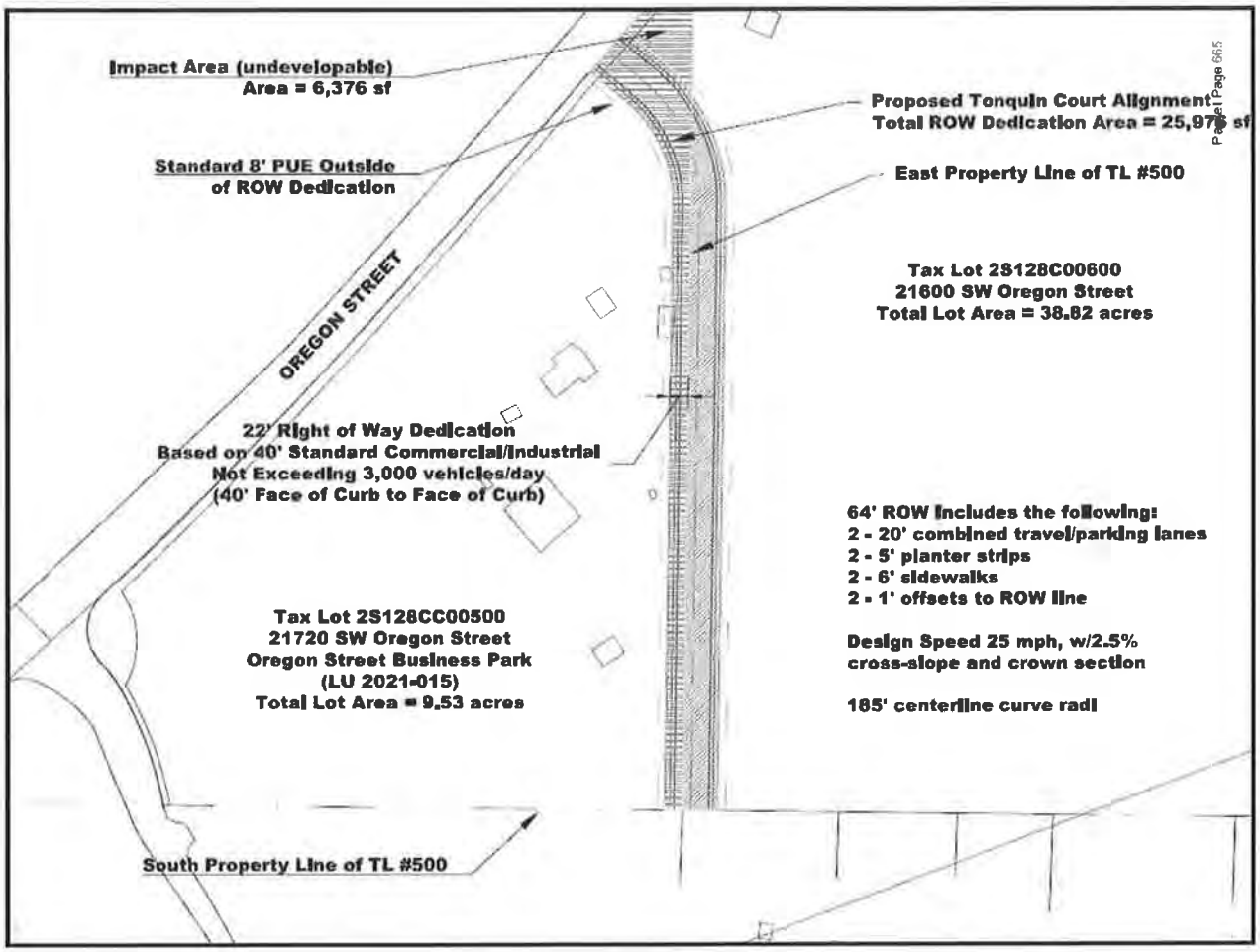
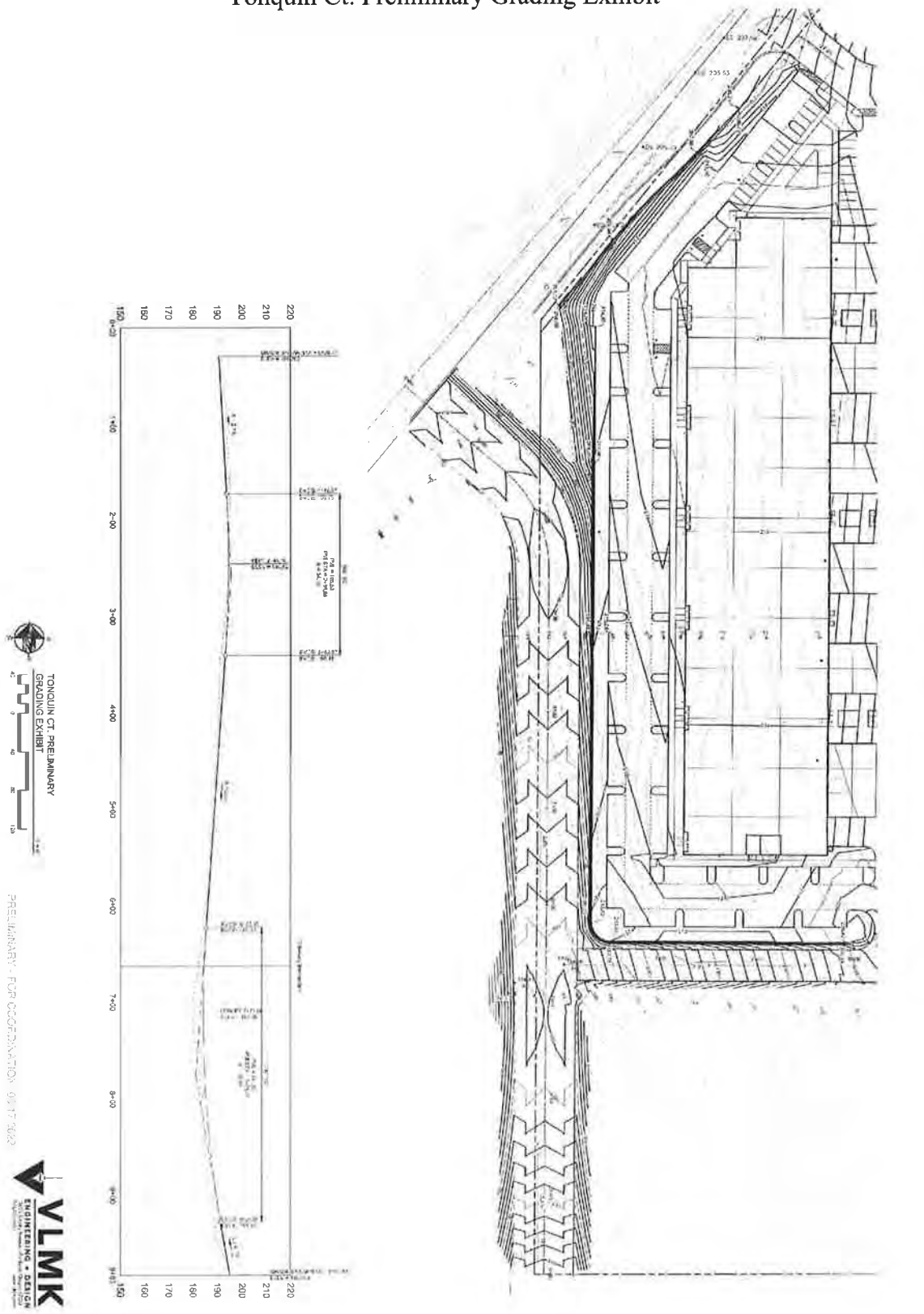


Exhibit D

Tonquin Ct. Preliminary Grading Exhibit



APPENDIX G – MAILING LABELS

WOODS CINDY R
PO BOX 1488
SHERWOOD OR 97140

WOODBURN INDUSTRIAL
CAPITAL GROUP LLC
395 SHENANDOAH LN
WOODBURN OR 97071

WOODBURN INDUSTRIAL
CAPITAL GROUP LLC
PO BOX 1060
WOODBURN OR 97071

WOODBURN INDUSTRIAL
CAPITAL GROUP LLC
PO BOX 1060
WOODBURN OR 97071

WILSHIRE SHERWOOD OWNER LLC
100 WILSHIRE BLVD STE 940
SANTA MONICA CA 90401

WASHINGTON COUNTY FACILITIES MGMT
169 N 1ST AVE #42
HILLSBORO OR 97124

VANDOMELEN JOINT TRUST
4825 SW EVANS ST
PORTLAND OR 97219

UNITED STATES OF AMERICA
DEPT OF INTERIOR
911 NE 11TH AVE
PORTLAND OR 97232

UNITED STATES OF AMERICA
DEPT OF INTERIOR
911 NE 11TH AVE
PORTLAND OR 97232

UNITED STATES OF AMERICA
DEPT OF INTERIOR
911 NE 11TH AVE
PORTLAND OR 97232

UNITED STATES OF AMERICA
DEPT OF INTERIOR
911 NE 11TH AVE
PORTLAND OR 97232

TUALATIN CITY OF
18880 SW MARTINAZZI AVE
TUALATIN OR 97062

TUALATIN VALLEY SPORTSMENS CLUB
7430 SW VARNS ST
TIGARD OR 97223

TUALATIN VALLEY SPORTSMENS CLUB
7430 SW VARNS ST
TIGARD OR 97223

SPARKS FAMILY LIV TRUST
22520 SW FAIROAKS CT
SHERWOOD OR 97140

SNYDER LLC
10175 SW MARJORIE LN
BEAVERTON OR 97008

SHERWOOD COMMERCE CENTER LLC
1121 SW SALMON ST STE 500
PORTLAND OR 97205

SHERWOOD COMMERCE CENTER LLC
1121 SW SALMON ST STE 500
PORTLAND OR 97205

SHERWOOD COMMERCE CENTER LLC
1121 SW SALMON ST STE 500
PORTLAND OR 97205

SHERWOOD COMMERCE CENTER LLC
1121 SW SALMON ST STE 500
PORTLAND OR 97205

SHERWOOD COMMERCE CENTER LLC
1121 SW SALMON ST STE 500
PORTLAND OR 97205

SHERWOOD COMMERCE CENTER LLC
1121 SW SALMON ST STE 500
PORTLAND OR 97205

SHERWOOD CITY OF
22560 SW PINE ST
SHERWOOD OR 97140

RIVERA RICHARD & RIVERA CARLA
PO BOX 688
SHERWOOD OR 97140

PRIDE PROPERTIES INVESTMENTS LLC
PO BOX 820
SHERWOOD OR 97140

PRIDE WEST LLC
PO BOX 820
SHERWOOD OR 97140

PRIDE WEST LLC
PO BOX 820
SHERWOOD OR 97140

PRIDE EAST LLC
PO BOX 820
SHERWOOD OR 97140

POLLEY BRUCE D & POLLEY KAREN M
PO BOX 1489
SHERWOOD OR 97140

ORWA SHERWOOD LLC
8320 NE HIGHWAY 99
VANCOUVER WA 98665

Exhibit A2

OREGON ASPHALTIC PAVING LLC
PO BOX 4810
TUALATIN OR 97062

NORTHSTAR CHEMICAL INC
14200 SW TUALATIN SHERWOOD RD
BLDG B
SHERWOOD OR 97140

MUNGER DOUGLAS S REV LIV TRUST
21775 SW DAHLKE LN
SHERWOOD OR 97140

MOREY DON F & MOREY CORBY A
21825 SW DAHLKE LN
SHERWOOD OR 97140

LIZARRAGA ULDO GEOVANNI
21905 SW DAHLKE LN
SHERWOOD OR 97140

LEICHNER TRUST
PO BOX 820
SHERWOOD OR 97140

J & L RINK LLC
21433 SW OREGON ST
SHERWOOD OR 97140

HEINTZ CURTIS & HEINTZ DEBRA L
PO BOX 1105
SHERWOOD OR 97140

GRONLI STEVE & WILDER RENEE
21700 SW DAHLKE LN
SHERWOOD OR 97140

FITCH PROPERTIES LLC
PO BOX 701
SHERWOOD OR 97140

ENDICOTT RONALD LESLIE
& PEGGY ANN KERN FAM TRUST
21050 SW DAHLKE LN
SHERWOOD OR 97140

ENDICOTT WOODS ENTERPRISES INC
PO BOX 1537
TUALATIN OR 97062

DAHLKE LANE PROPERTIES LLC
4677 SE CONCORD RD
MILWAUKIE OR 97267

CONROW DEREK & CONROW MONICA
22500 SW FAIROAKS CT
SHERWOOD OR 97140

BAYNE BROOKS & BAYNE ANNALISA M
22515 SW FAIROAKS CT
SHERWOOD OR 97140

ALLIED SYSTEMS COMPANY
21433 SW OREGON ST
SHERWOOD OR 97140

ALLIED SYSTEMS COMPANY
21433 SW OREGON ST
SHERWOOD OR 97140

APPENDIX H – PRELIMINARY STORM REPORT

SHERWOOD COMMERCE CENTER EAST-WEST ROAD LU2022-022

21600 SW Oregon Street
Sherwood, Oregon

PRELIMINARY STORMWATER REPORT

VLMK Project Number: 20210190

Schnitzer Properties
1121 SW Salmon Street
Portland, Oregon 97205

VLMK
ENGINEERING + DESIGN

Prepared By: Jacob Bubacz, PE
October 6, 2022

3933 S Kelly Avenue Portland, OR 97239 tel: 503.222.4453 VLMK.COM

Project:	Sherwood Commerce Center East-West Road Preliminary Stormwater	*Project Number:*	20210190
Project Address:	21600 SW Oregon Street Sherwood, Oregon		

TABLE OF CONTENTS

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A. East-West Road Vicinity Map 2

B. East-West Road Project Information & Stormwater Narrative 3

C. Hydromodification 4

D. Water Quality Treatment 5

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Basin Maps + Areas .....

Water Quality Calculations .....

HydroCAD Calculations .....

Operations and Maintenance Recommendations.....

III. ATTACHMENTS.....

Geotechnical Report .....

I. SITE AND PROJECT INFORMATION

A. East-West Road Vicinity Map

VICINITY MAP NOT TO SCALE

B. East-West Road Project Information & Stormwater Narrative

The East-West Road public improvement project is proposing to create a new road that will begin at a new intersection with Laurelwood Road and travel east approximately 1,309 feet to the eastern boundary of the Sherwood Commerce Center (SCC LU 2021-12 SP/CUP/VAR) property. This road and related infrastructure will require approximately 2.17 acres of property dedicated to the City of Sherwood. This preliminary stormwater report will demonstrate how all applicable stormwater regulations will be addressed by the drainage improvements proposed with this project.

The western portion of the Tonquin Employment Area is currently proposing the development of 8 potential future lots. The future lots will require roadway access and utility services. This report analyzes the stormwater design for East-West Road which will provide connectivity between Laurelwood Road and the future Ice Age Drive Capital Improvement Project. East-West Road will include design for water, sewer, and stormwater networks for the public roadways, including the contribution from treated and detained on-site development into the system. The Sherwood Phase I onsite and public runoff from East-West Road will combine into one storm network and flow into a flow splitter manhole which is designed to divert the water quality storm and any additional flow required for attenuation. The untreated water from East-West Road will be treated in an engineered extended dry basin, a local stormwater management facility which is designed to provide water quality treatment and water quantity control for East-West Road per Clean Water Services Resolution & Order 19-22. The treatment and attenuation of Laurelwood Road is proposed on Lot A by the Tonquin Business Park LLC in a detention pond; the Laurelwood Road scope of work is covered under different land use and permit reviews.

All stormwater facilities and conveyance systems for this development have been designed to meet or exceed the standards set forth by the City of Sherwood and Clean Water Services.

Additional design information used was obtained from:
- USDA SCS "Soil Survey of Washington County"
- USDA SCS TR-55 "Urban Hydrology for Small Watersheds" (2nd Ed., June 1986)

Software used in design:
- HydroCAD Stormwater Modeling Software
- Microsoft Excel 2022
- AutoCAD Civil 3D 2022

C. Hydromodification

First, a Hydromodification Assessment was completed in order to determine the Reach-Specific Risk Level, Development Class, and Project Size Category. This project is classified as Category 3 as it is a "large project" (>80,000sf) and it is located within an "Expansion" area. Per section 4.03.5.c, there are two options available to address hydromodification: (1.) Peak-Flow Matching Detention and LIDA or (2.) Flow Duration Curve Matching Detention. This project will be satisfying the hydromodification requirements by addressing option (1.).

All Sherwood onsite LIDA Facilities and Underground Detention Facilities, East-West Road, and Lot H which flows into East-West Road are modeled together in one HydroCAD model. The Pre-development Map displays one Point of Analysis (POA) for the combined areas. This POA was used for the detention design in order to achieve compliance with the hydromodification requirements.

The water quantity peak flow requirement (Section 4.08.6, Table 4-7) for the post-development flow rate is 50% less than the 2-year storm pre-development rate. Additionally, the post development flow rates for the 10 and 25 -year storms are under the pre-development rates. The post development flows are calculated using a minimum Time of Concentration value of 5.0 minutes. SBUH Events hydrographs were routed through the BMP's model using HydroCAD. Calculations can be found in Appendix A.

The stormwater management facility is designed to control the flow for the 2, 5, and 10-year storm to remain under the pre-development conditions and allow at least 1 foot of freeboard for the 100-year storm.

TABLE 4-7

Post-Development Peak Runoff Rate	**Pre-Development Peak Runoff Rate Target**
2-year, 24-hour	50% of 2-year, 24-hour
5-year, 24-hour	5-year, 24 hour
10-year, 24-hour	10-year, 24-hour

24-hr Return Period (yr)	Pre-Dev. Peak Runoff	Post-Dev. Peak Runoff
2	1.85	0.54 (<50% Pre-Dev.)
5	4.21	1.07
10	5.87	3.16

D. Water Quality Treatment

This report demonstrates how the proposed Extended Dry Basin accomplishes the water quality requirement in Section 4.08.2 using the design storm for water quality evaluation of 0.36 inches of precipitation falling in 4 hours with an average storm return period of 96 hours.

This project has been designed to treat 1.64 ac impervious area using the LIDA Extended Dry Basin. The runoff will be treated through plantings and a 48-hour retention time. The basin has been sized in accordance with Section 4.08.5 and designed and sized as described in Section 4.09.5.

$$\text{Water Quality Volume (cu.ft.)} = \frac{0.36\text{ (in.)} \times \text{Area (sq.ft.)}}{12\text{ (in./ft.)}}$$

East-West Road Impervious Area = 71,621 sf

Water Quality Volume = **2,149 cf** (minimum required treatment volume)

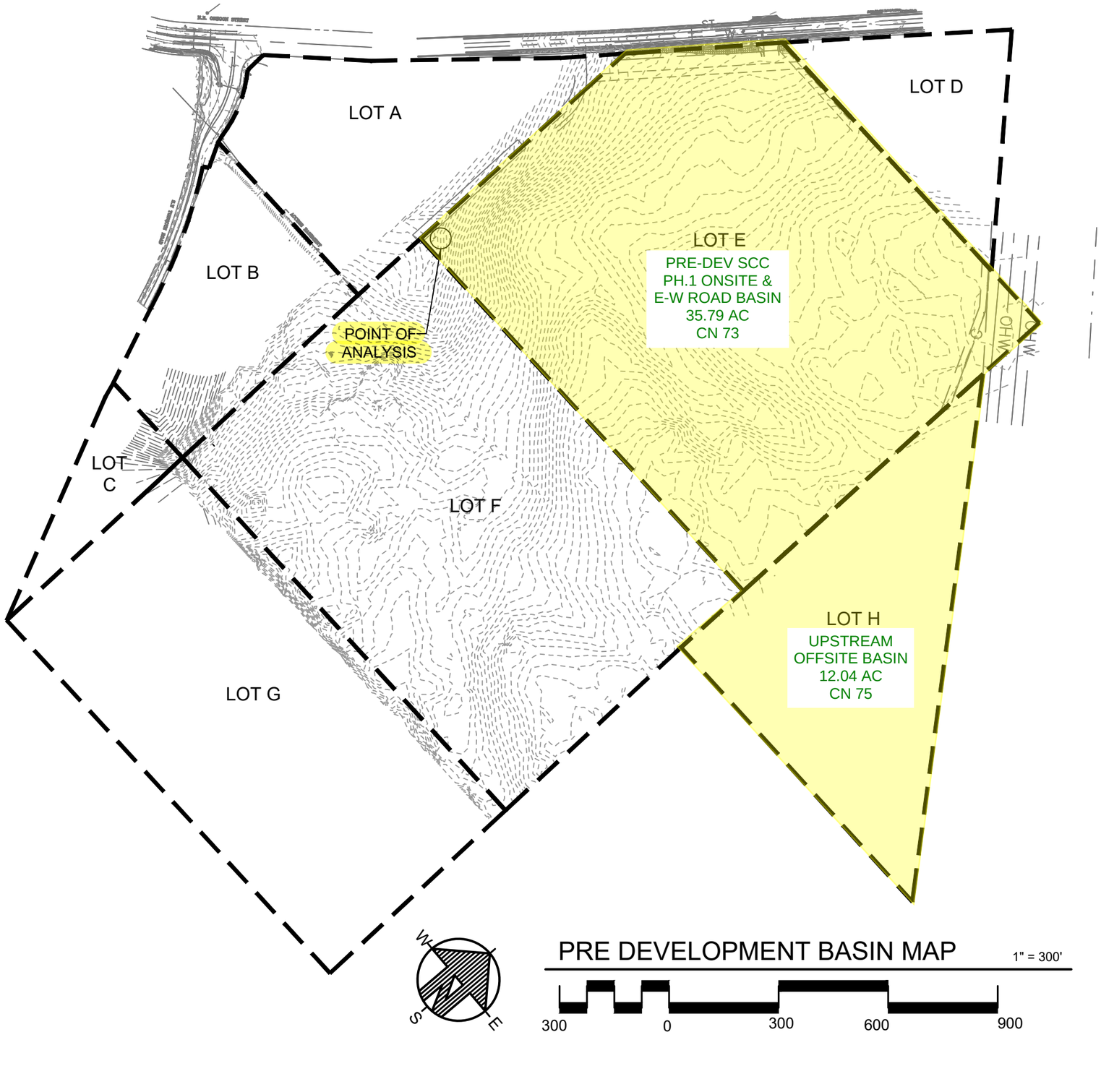
Water Quality Volume = **3,154 cf** (provided by the proposed facility)

Please see Appendix for Excel spreadsheet calculations which include the stage-storage tables illustrating adequate water quality volume and the water quality orifice sizing for minimum retention time. The HydroCAD Report is also within the appendix which includes the hydrology and routing of the 2, 5, and 10-year storm events.

II. APPENDIX A

Basin Maps + Areas
Water Quality Calculations
HydroCAD Calculations
Operations and Maintenance Recommendations

Exhibit A2



PRE DEVELOPMENT BASIN MAP 1" = 300'

300 0 300 600 900

VLMK ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

SHERWOOD COMMERCE CENTER
PUBLIC WORKS
SHERWOOD, OREGON

PRE DEVELOPMENT BASIN MAP

DATE: AUGUST 2022
SCALE: AS NOTED
PROJ. NO.: 20210190
DRAWN: MG
CHECKED: JB

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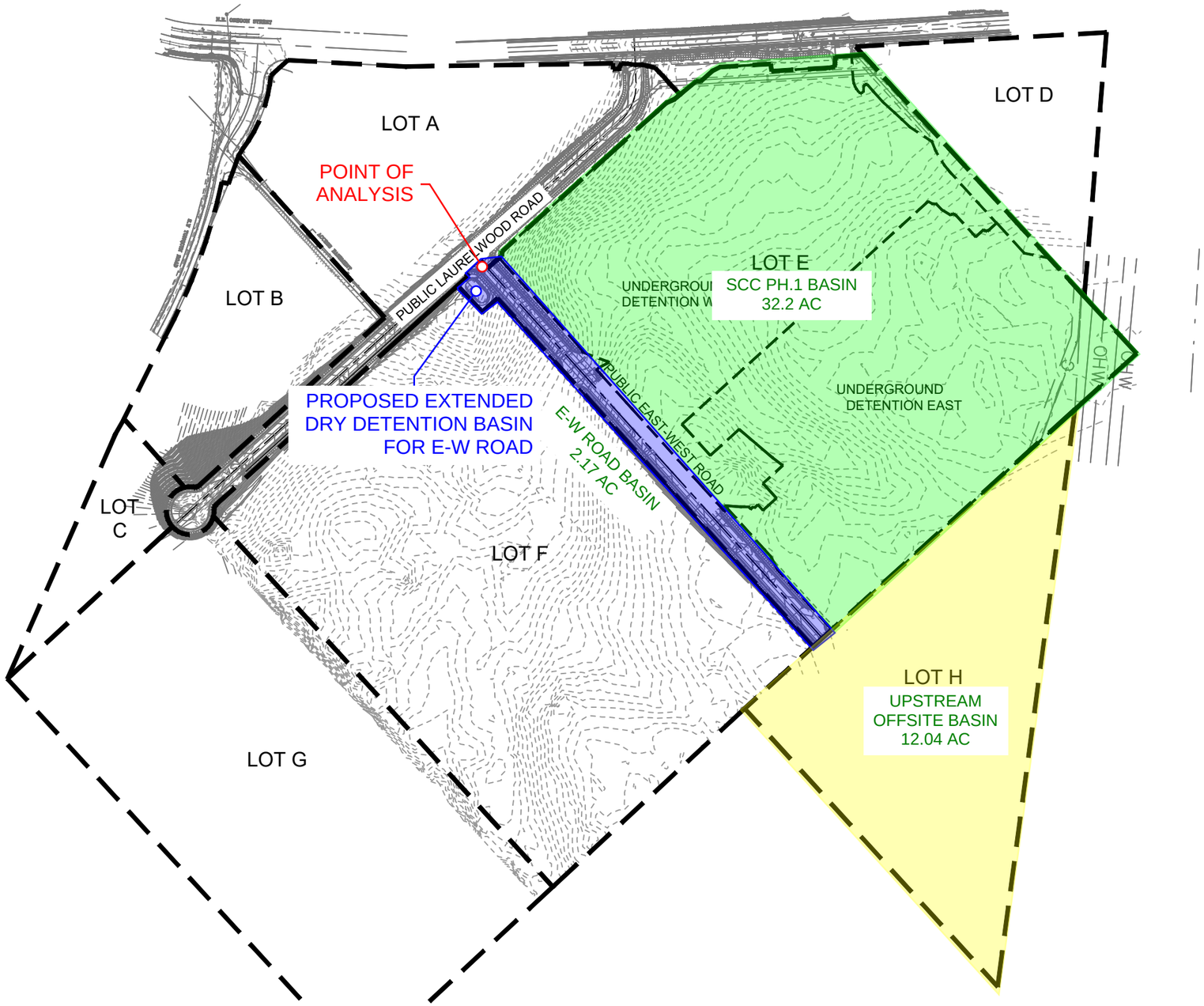
Exhibit A2



POST DEVELOPMENT BASIN MAP 1" = 300'

300 0 300 600 900

VLMK ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

SHERWOOD COMMERCE CENTER
PUBLIC WORKS
SHERWOOD, OREGON

POST DEVELOPMENT BASIN MAP

DATE: AUGUST 2022
SCALE: AS NOTED
PROJ. NO.: 20210190
DRAWN: MG
CHECKED: JB

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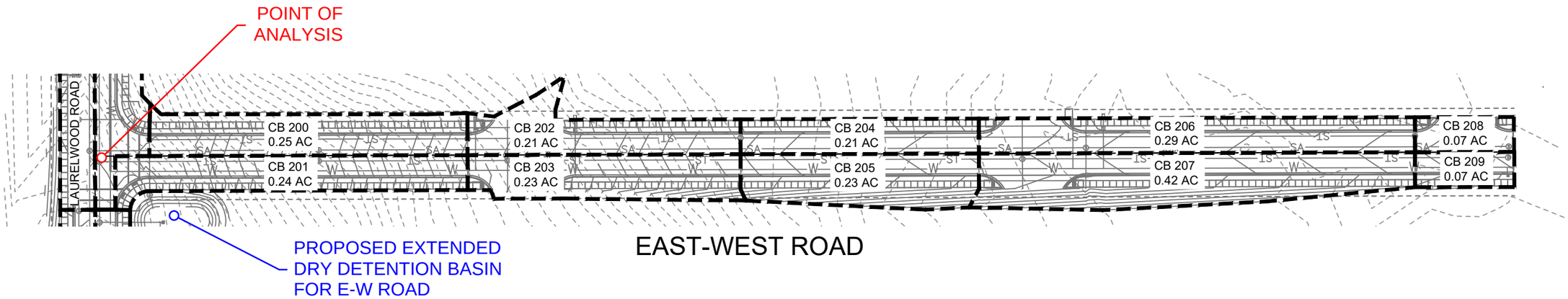
Exhibit A2



INLET BASIN MAP

1" = 100'

100 0 100 200 300

VLMK ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

SHERWOOD COMMERCE CENTER
PUBLIC WORKS
SHERWOOD, OREGON

INLET BASIN MAP

DATE: AUGUST 2022
SCALE: AS NOTED
PROJ. NO.: 20210190
DRAWN: MG
CHECKED: JB

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VLMK ENGINEERING + DESIGN

Project: Sherwood CC Job #: 20210190 By: MMG Date: 10-06-2022 Sheet #:

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Water Quality Calculations

Based on the CWS R&O 19-5 (April '19) Design and Construction Standards

71,621 sf of Impervious Surface Area

Water Quality Volume (WQV):

WQV = Impervious Area • 0.36"

WQV = 71,621 sf • 0.36 in • 1/12 ft/in

WQV = 2,149 cf

Water Quality Drawdown (Q)

Q = WQV / 48 hours

Q = 0.012 cfs

Water Quality Pond Orifice (D):

$$D = 24 * \left[\frac{\left(Q / C[2gH]^{0.5}\right)}{\pi}\right]^{0.5}$$

Where:

C = 0.6 (coefficient)

g = 32.2 ft/s^2

H = 0.5 [2/3*temporary detention height]

D= 0.818 in –> Use 0.875" Orifice

VLMK ENGINEERING + DESIGN

Project: E-W Rd Public Job #: 20210190 By: MMG Date: 10-07-2022 Sheet #:

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Water Quality/Water Quantity Control Pond
Stage/Storage/Volume Summary

Basin Data - Pond A						
Stage (ft)	Elevation (ft)	Area (sf)	Volume (cf)	Volume (Ac-ft)	Storage (cf)	
0.00	177.10	151	0	0.00	0	FOREBAY
0.20	177.30	192	34	0.00	34	FOREBAY
0.40	177.50	237	43	0.00	77	FOREBAY
1.40	178.50	519	378	0.01	455	FOREBAY
0.00	177.10	319	0	0.00	0	DEAD STORAGE
0.40	177.50	999	264	0.01	264	DEAD STORAGE
0.40	177.50	471	0	0.00	0	LIVE STORAGE
0.90	178.00	678	287	0.01	287	LIVE STORAGE
1.40	178.50	999	419	0.01	707	LIVE STORAGE
1.90	179.00	1,943	736	0.02	1,442	LIVE STORAGE
2.83	179.93	2,481	2,068	0.05	2,148	**PEAK WQ VOLUME** **2148**
2.90	180.00	2,648	2,296	0.05	3,738	LIVE STORAGE
3.90	181.00	3,458	3,053	0.07	6,791	LIVE STORAGE

STAGE ELEVATIONS REFERENCE ROUTING CALCULATIONS:

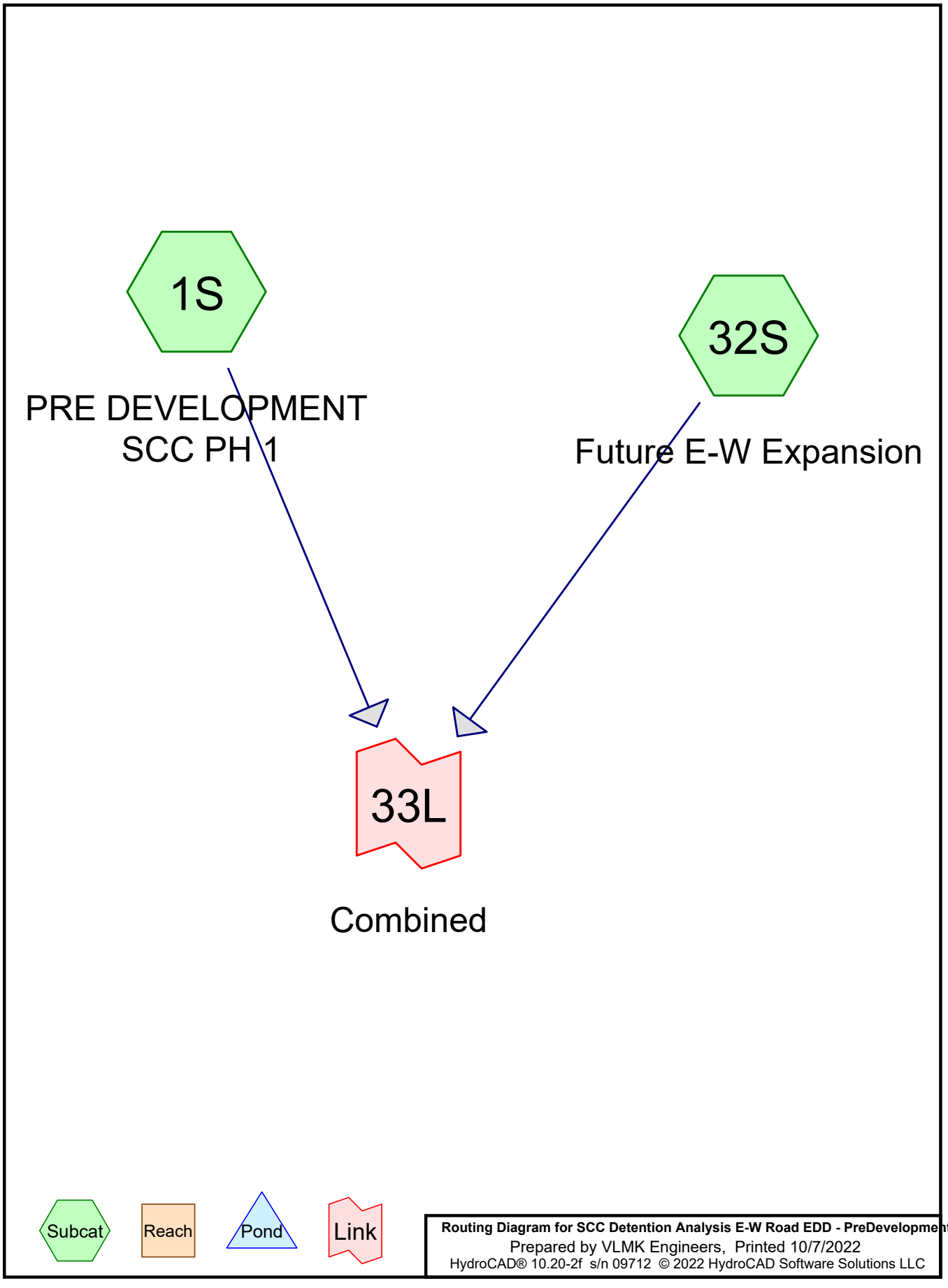
STAGE 0.00 = C.L. BOTTOM ORIFICE = 179.93

STAGE 3.90 = TOP OF LIVE STORAGE = 183.83 +/-

V_{WQ} = 2,148 cf

FOREBAY AREA = 519 sf = 19.6% POND AREA

FOREBAY VOLUME = 455 cf = 21.2% WQ VOLUME


1S
PRE DEVELOPMENT
SCC PH 1
32S
Future E-W Expansion
33L
Combined
Subcat
Reach
Pond
Link
Routing Diagram for SCC Detention Analysis E-W Road EDD - PreDevelopment
Prepared by VLMK Engineers, Printed 10/7/2022
HydroCAD® 10.20-2f s/n 09712 © 2022 HydroCAD Software Solutions LLC

SCC Detention Analysis E-W Road EDD - PreDevelopment
Prepared by VLMK Engineers
Printed 10/7/2022
HydroCAD® 10.20-2f s/n 09712 © 2022 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	Type IA 24-hr		Default	24.00	1	2.50	2
2	5 year	Type IA 24-hr		Default	24.00	1	3.10	2
3	10 year	Type IA 24-hr		Default	24.00	1	3.45	2
4	25 year	Type IA 24-hr		Default	24.00	1	3.90	2
5	100 year	Type IA 24-hr		Default	24.00	1	4.50	2

Summary for Subcatchment 1S: PRE DEVELOPMENT SCC PH 1

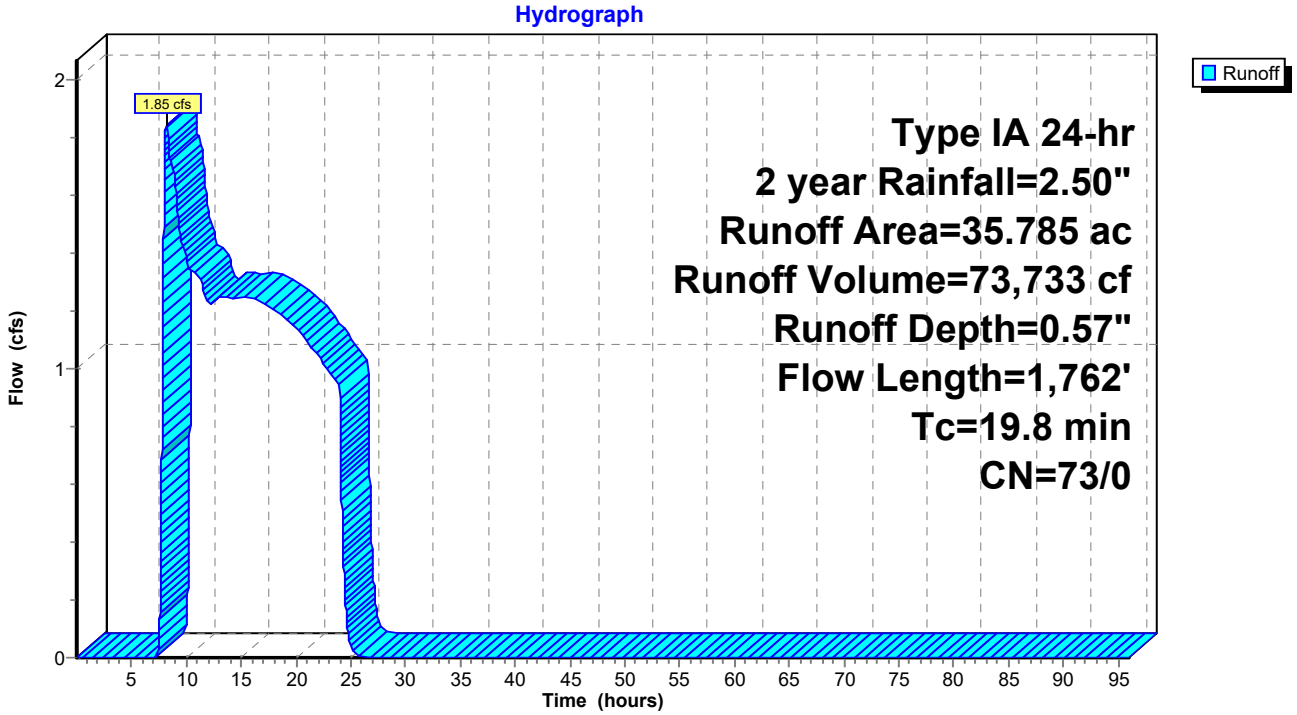
Runoff = 1.85 cfs @ 8.22 hrs, Volume= 73,733 cf, Depth= 0.57"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 year Rainfall=2.50"

Area (ac)	CN	Description
23.443	67	Brush, Poor, HSG B
12.342	83	Brush, Poor, HSG D
35.785	73	Weighted Average
35.785	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0138	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
4.5	506	0.0138	1.89		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.4	1,156	0.0192	8.13	975.72	**Channel Flow,** Area= 120.0 sf Perim= 109.0' r= 1.10' n= 0.027
19.8	1,762	Total			

Subcatchment 1S: PRE DEVELOPMENT SCC PH 1



Summary for Subcatchment 32S: Future E-W Expansion

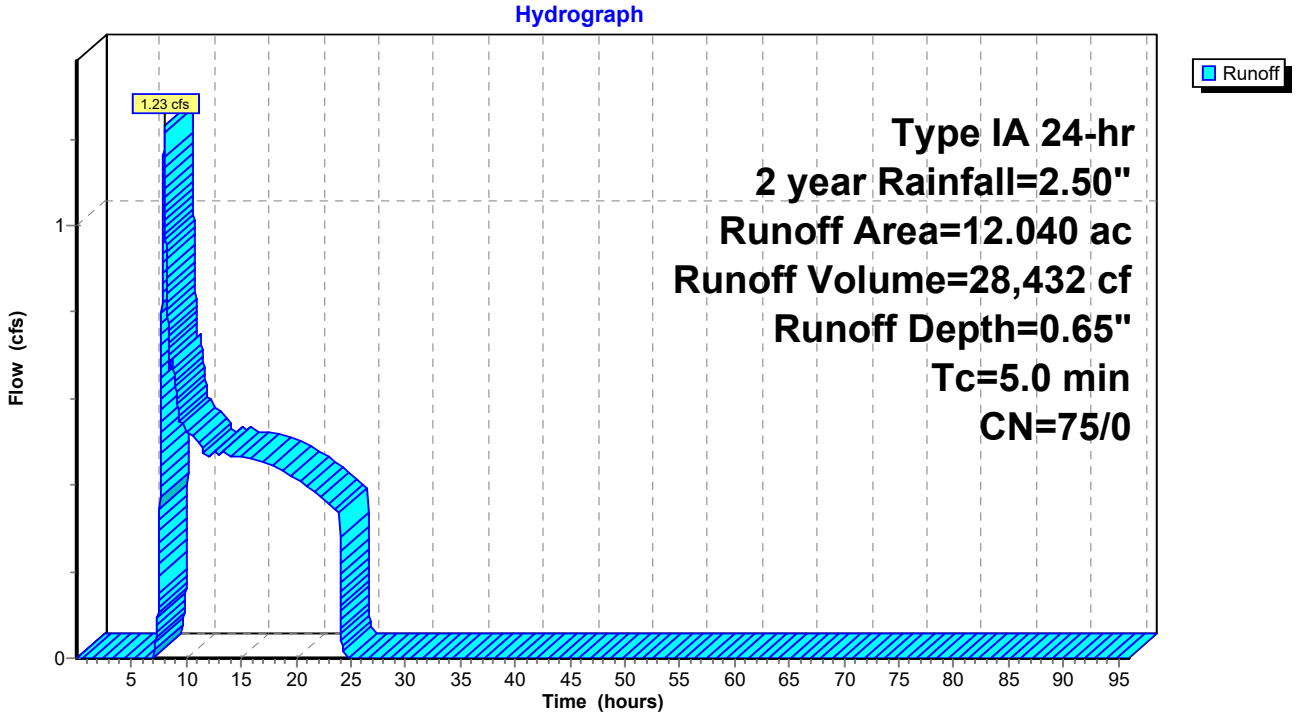
Runoff = 1.23 cfs @ 8.00 hrs, Volume= 28,432 cf, Depth= 0.65"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 year Rainfall=2.50"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 32S: Future E-W Expansion

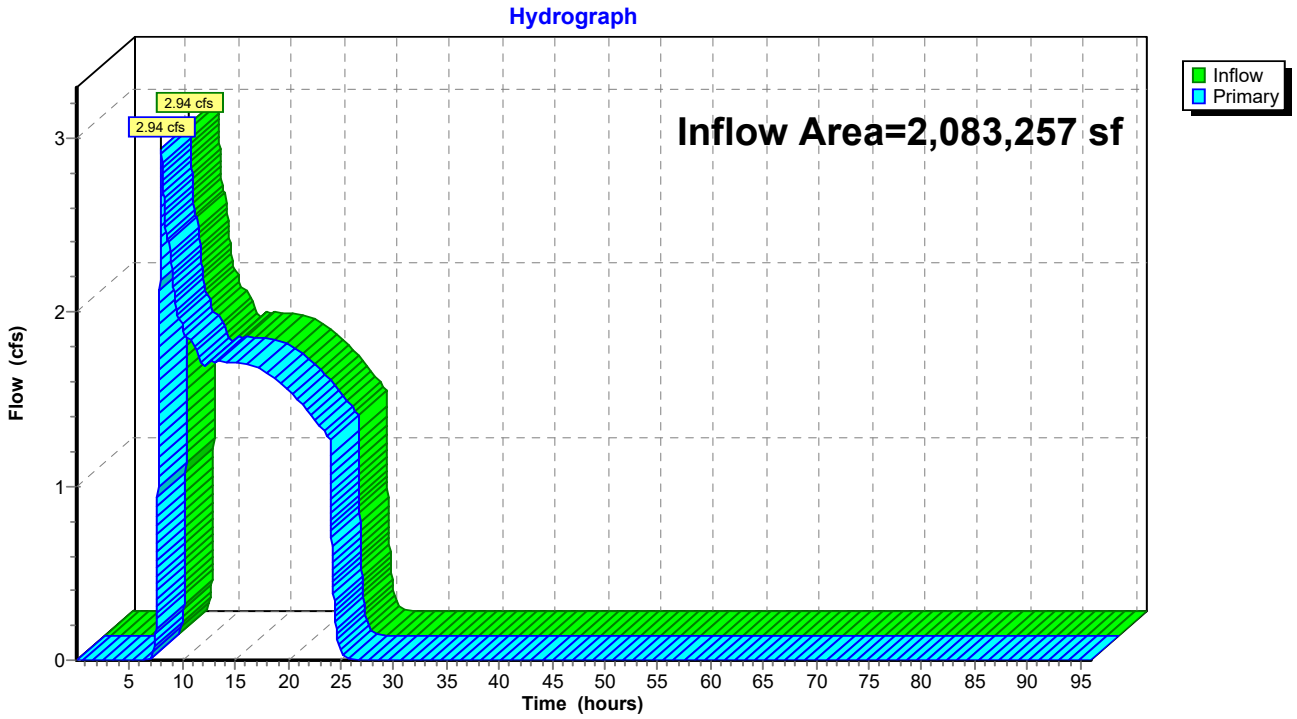


Summary for Link 33L: Combined

Inflow Area = 2,083,257 sf, 0.00% Impervious, Inflow Depth = 0.59" for 2 year event
Inflow = 2.94 cfs @ 8.01 hrs, Volume= 102,165 cf
Primary = 2.94 cfs @ 8.01 hrs, Volume= 102,165 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 33L: Combined



Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPMENT Runoff Area=35.785 ac 0.00% Impervious Runoff Depth=0.92"
Flow Length=1,762' Tc=19.8 min CN=73/0 Runoff=4.21 cfs 119,437 cf

Subcatchment32S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=1.03"
Tc=5.0 min CN=75/0 Runoff=2.37 cfs 44,876 cf

Link 33L: Combined Inflow=6.55 cfs 164,313 cf
Primary=6.55 cfs 164,313 cf

Total Runoff Area = 2,083,257 sf Runoff Volume = 164,313 cf Average Runoff Depth = 0.95"
100.00% Pervious = 2,083,257 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 1S: PRE DEVELOPMENT SCC PH 1

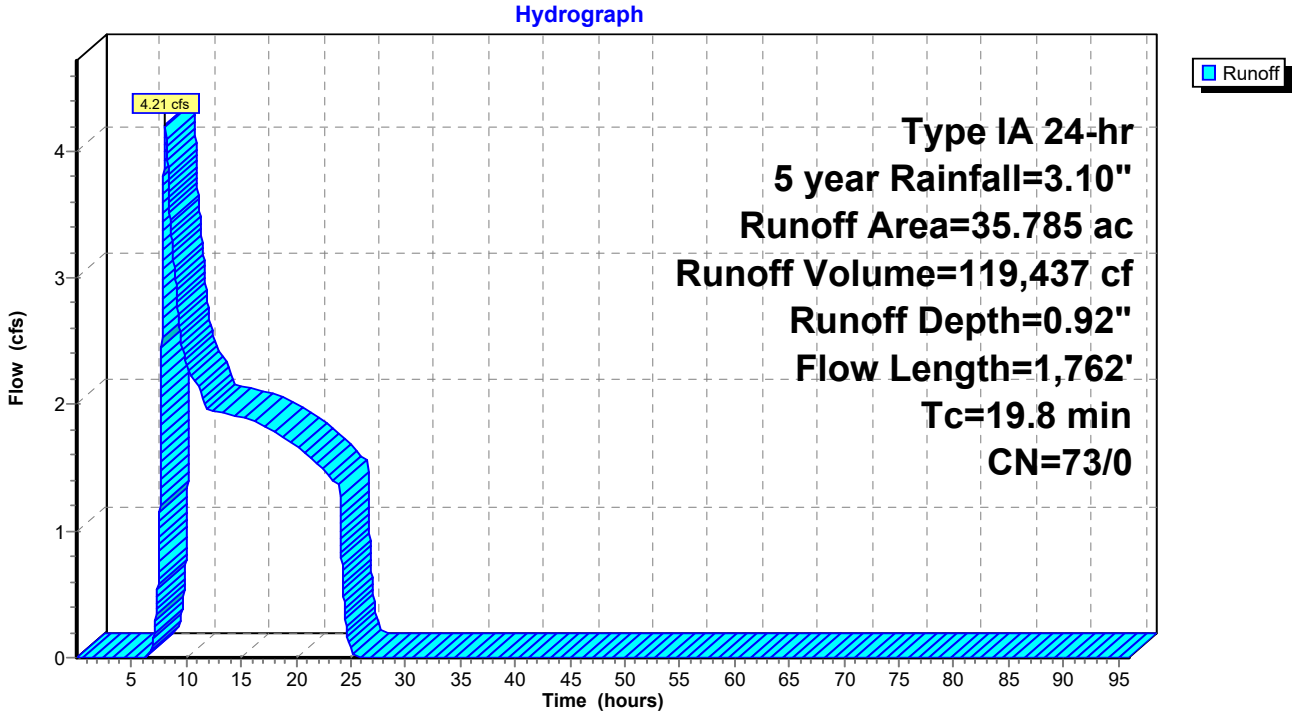
Runoff = 4.21 cfs @ 8.05 hrs, Volume= 119,437 cf, Depth= 0.92"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 5 year Rainfall=3.10"

Area (ac)	CN	Description
23.443	67	Brush, Poor, HSG B
12.342	83	Brush, Poor, HSG D
35.785	73	Weighted Average
35.785	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0138	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
4.5	506	0.0138	1.89		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.4	1,156	0.0192	8.13	975.72	**Channel Flow,** Area= 120.0 sf Perim= 109.0' r= 1.10' n= 0.027
19.8	1,762	Total			

Subcatchment 1S: PRE DEVELOPMENT SCC PH 1



Summary for Subcatchment 32S: Future E-W Expansion

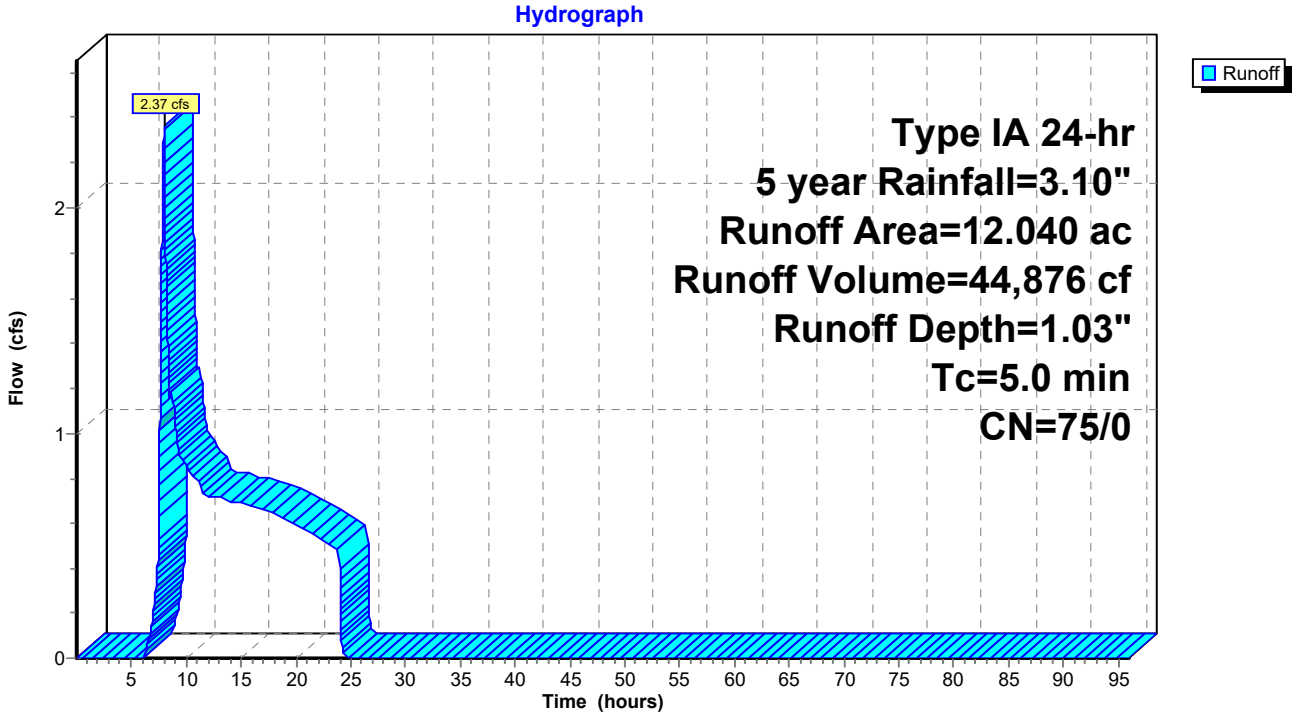
Runoff = 2.37 cfs @ 8.00 hrs, Volume= 44,876 cf, Depth= 1.03"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 5 year Rainfall=3.10"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 32S: Future E-W Expansion

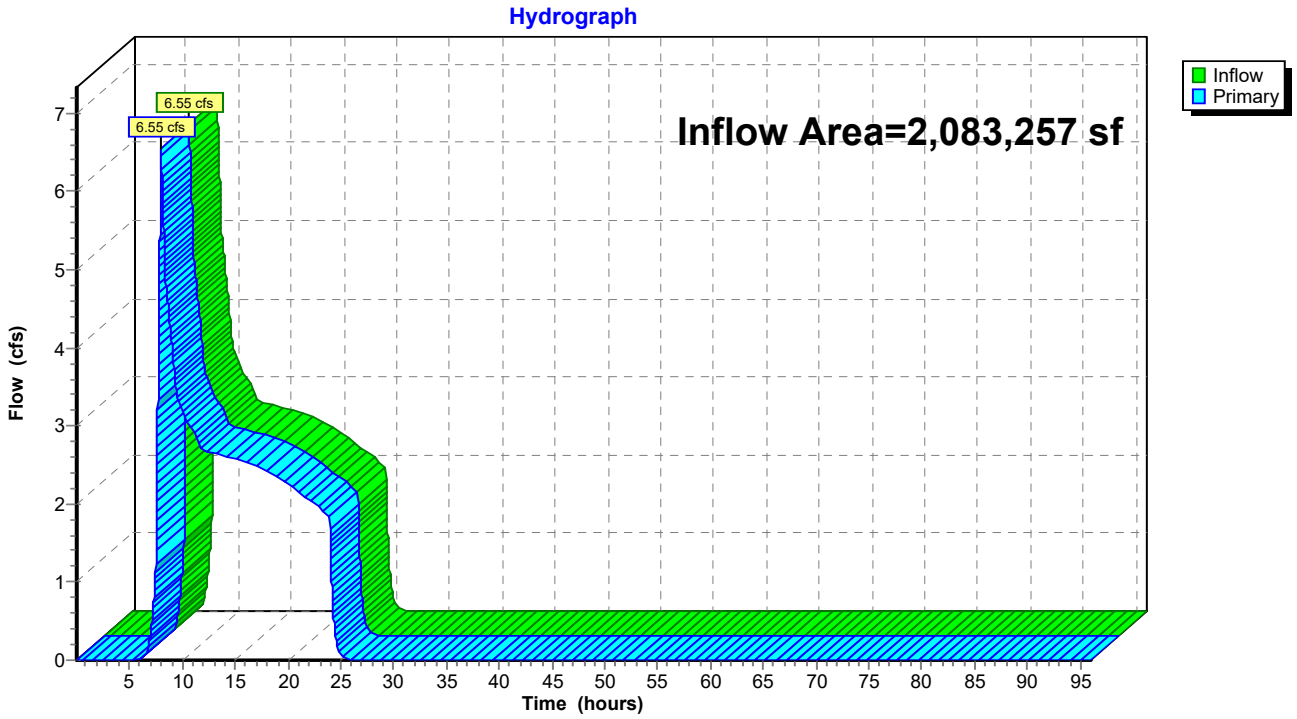


Summary for Link 33L: Combined

Inflow Area = 2,083,257 sf, 0.00% Impervious, Inflow Depth = 0.95" for 5 year event
Inflow = 6.55 cfs @ 8.00 hrs, Volume= 164,313 cf
Primary = 6.55 cfs @ 8.00 hrs, Volume= 164,313 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 33L: Combined



Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPMENT Runoff Area=35.785 ac 0.00% Impervious Runoff Depth=1.15"
Flow Length=1,762' Tc=19.8 min CN=73/0 Runoff=5.87 cfs 148,885 cf

Subcatchment32S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=1.27"
Tc=5.0 min CN=75/0 Runoff=3.11 cfs 55,354 cf

Link 33L: Combined Inflow=8.95 cfs 204,239 cf
Primary=8.95 cfs 204,239 cf

Total Runoff Area = 2,083,257 sf Runoff Volume = 204,239 cf Average Runoff Depth = 1.18"
100.00% Pervious = 2,083,257 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 1S: PRE DEVELOPMENT SCC PH 1

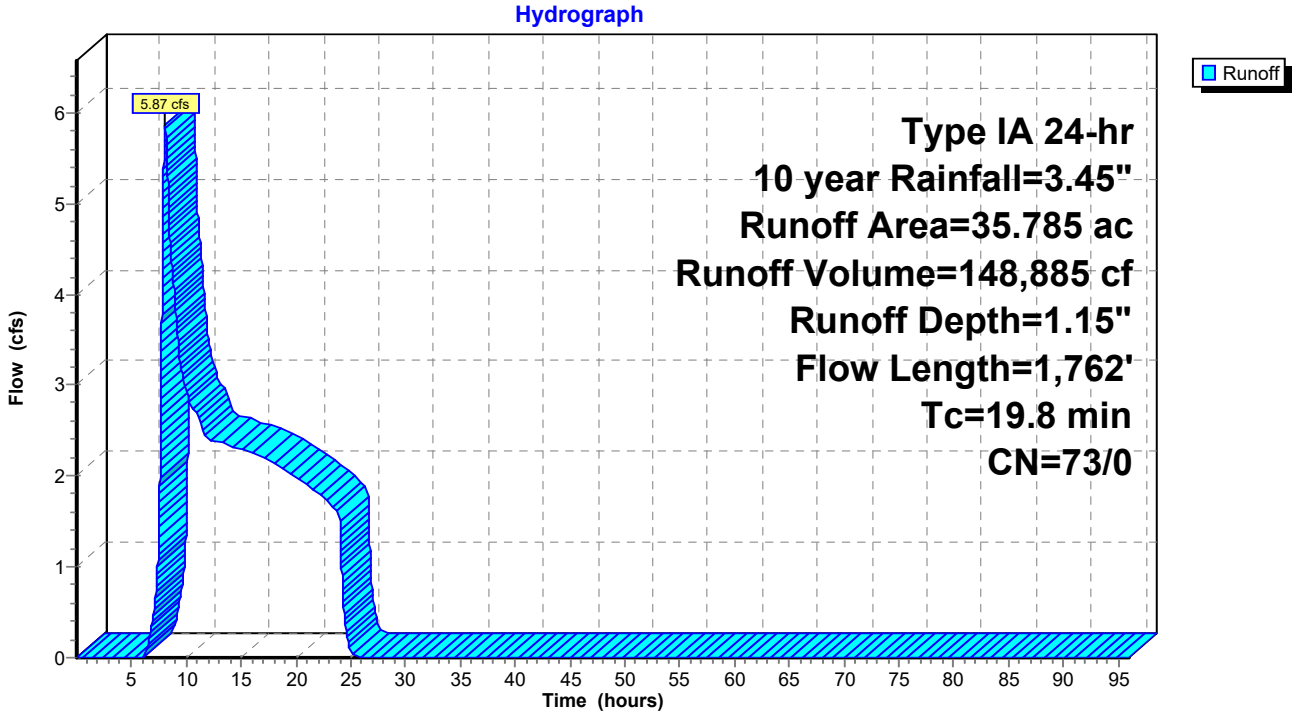
Runoff = 5.87 cfs @ 8.01 hrs, Volume= 148,885 cf, Depth= 1.15"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 year Rainfall=3.45"

Area (ac)	CN	Description
23.443	67	Brush, Poor, HSG B
12.342	83	Brush, Poor, HSG D
35.785	73	Weighted Average
35.785	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0138	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
4.5	506	0.0138	1.89		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.4	1,156	0.0192	8.13	975.72	**Channel Flow,** Area= 120.0 sf Perim= 109.0' r= 1.10' n= 0.027
19.8	1,762	Total			

Subcatchment 1S: PRE DEVELOPMENT SCC PH 1



Summary for Subcatchment 32S: Future E-W Expansion

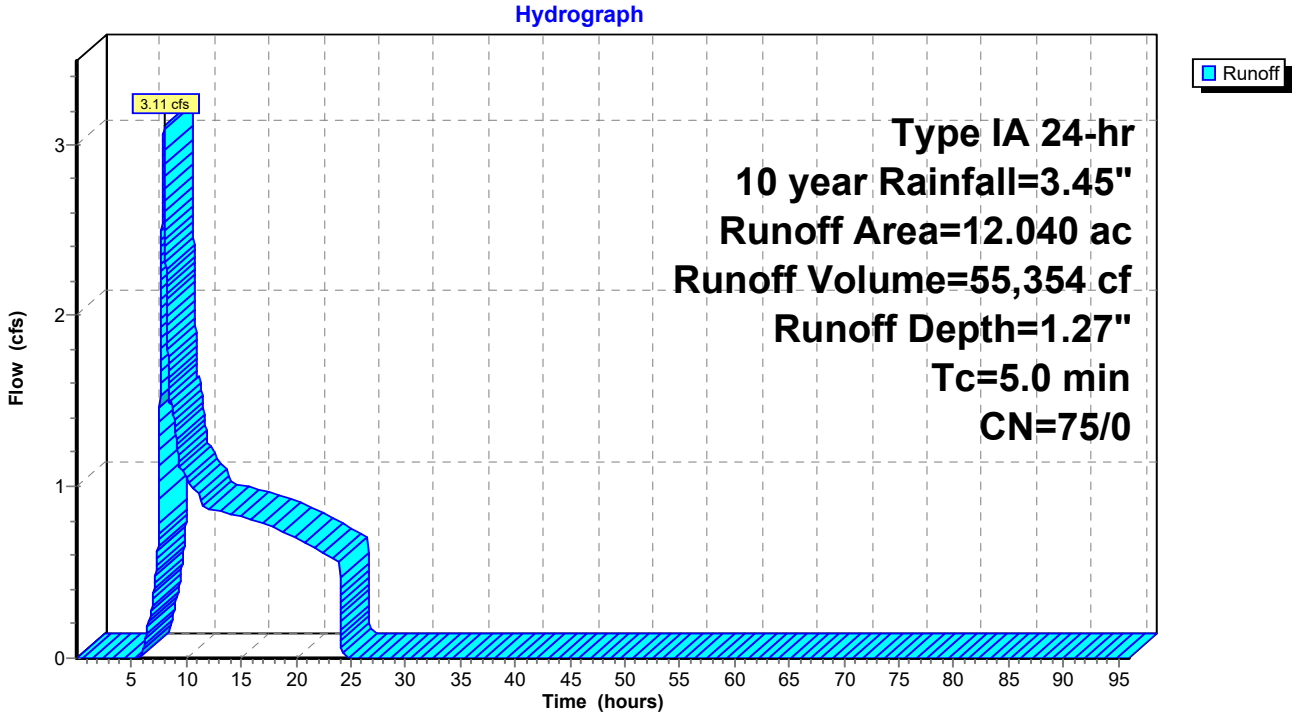
Runoff = 3.11 cfs @ 8.00 hrs, Volume= 55,354 cf, Depth= 1.27"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 year Rainfall=3.45"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 32S: Future E-W Expansion

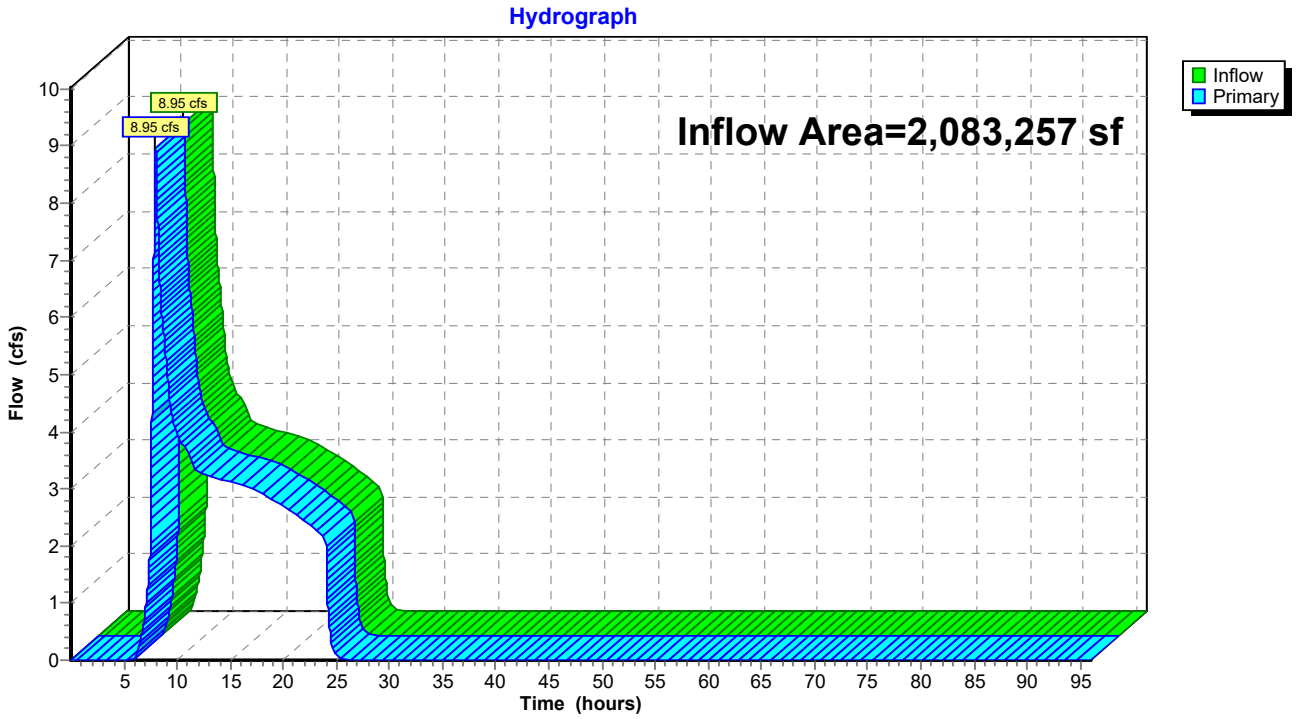


Summary for Link 33L: Combined

Inflow Area = 2,083,257 sf, 0.00% Impervious, Inflow Depth = 1.18" for 10 year event
Inflow = 8.95 cfs @ 8.00 hrs, Volume= 204,239 cf
Primary = 8.95 cfs @ 8.00 hrs, Volume= 204,239 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 33L: Combined



Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPMENT Runoff Area=35.785 ac 0.00% Impervious Runoff Depth=1.46"
Flow Length=1,762' Tc=19.8 min CN=73/0 Runoff=8.20 cfs 189,148 cf

Subcatchment32S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=1.59"
Tc=5.0 min CN=75/0 Runoff=4.12 cfs 69,581 cf

Link 33L: Combined Inflow=12.29 cfs 258,729 cf
Primary=12.29 cfs 258,729 cf

Total Runoff Area = 2,083,257 sf Runoff Volume = 258,729 cf Average Runoff Depth = 1.49"
100.00% Pervious = 2,083,257 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 1S: PRE DEVELOPMENT SCC PH 1

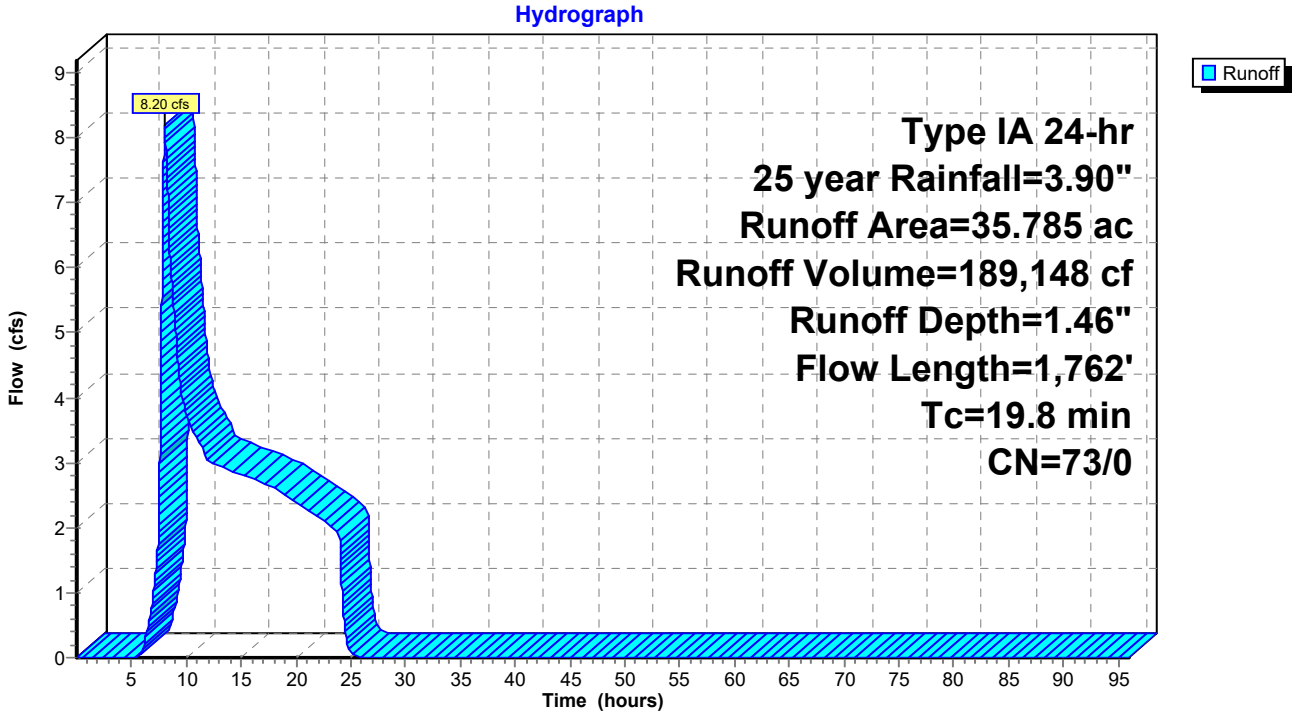
Runoff = 8.20 cfs @ 8.01 hrs, Volume= 189,148 cf, Depth= 1.46"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 year Rainfall=3.90"

Area (ac)	CN	Description
23.443	67	Brush, Poor, HSG B
12.342	83	Brush, Poor, HSG D
35.785	73	Weighted Average
35.785	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0138	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
4.5	506	0.0138	1.89		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.4	1,156	0.0192	8.13	975.72	**Channel Flow,** Area= 120.0 sf Perim= 109.0' r= 1.10' n= 0.027
19.8	1,762	Total			

Subcatchment 1S: PRE DEVELOPMENT SCC PH 1



Summary for Subcatchment 32S: Future E-W Expansion

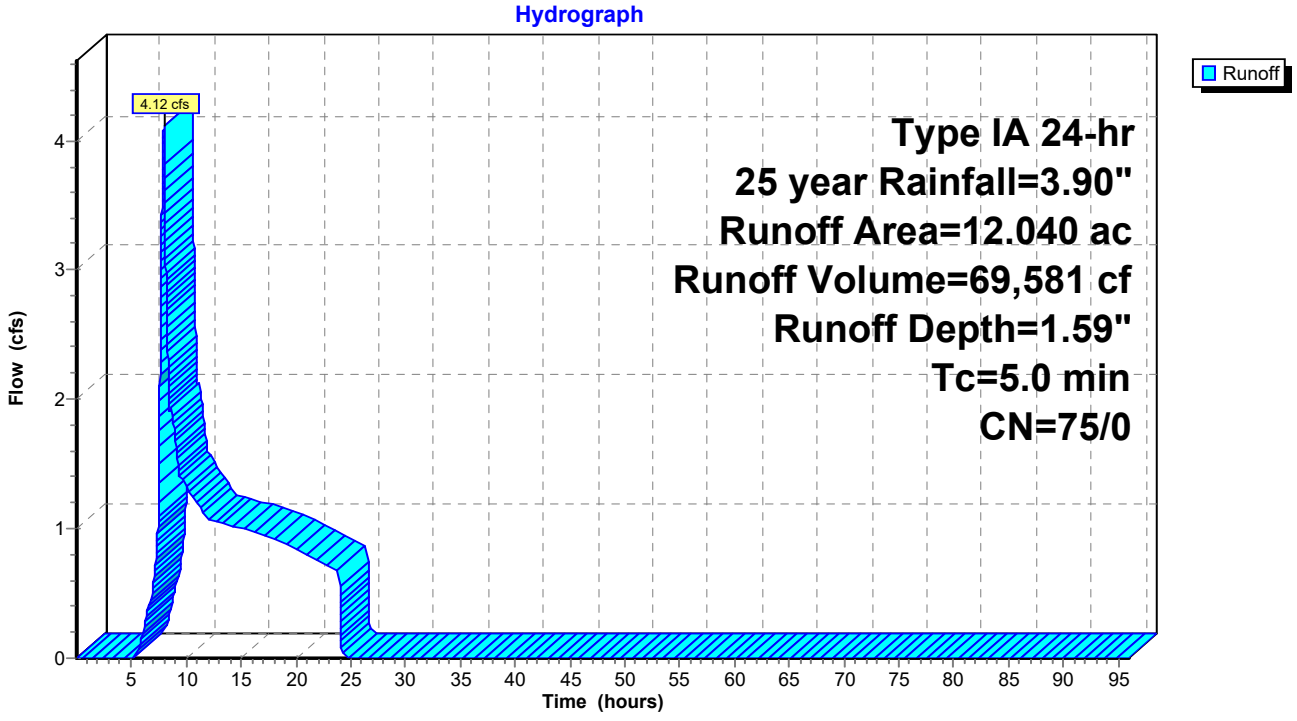
Runoff = 4.12 cfs @ 8.00 hrs, Volume= 69,581 cf, Depth= 1.59"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 year Rainfall=3.90"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 32S: Future E-W Expansion

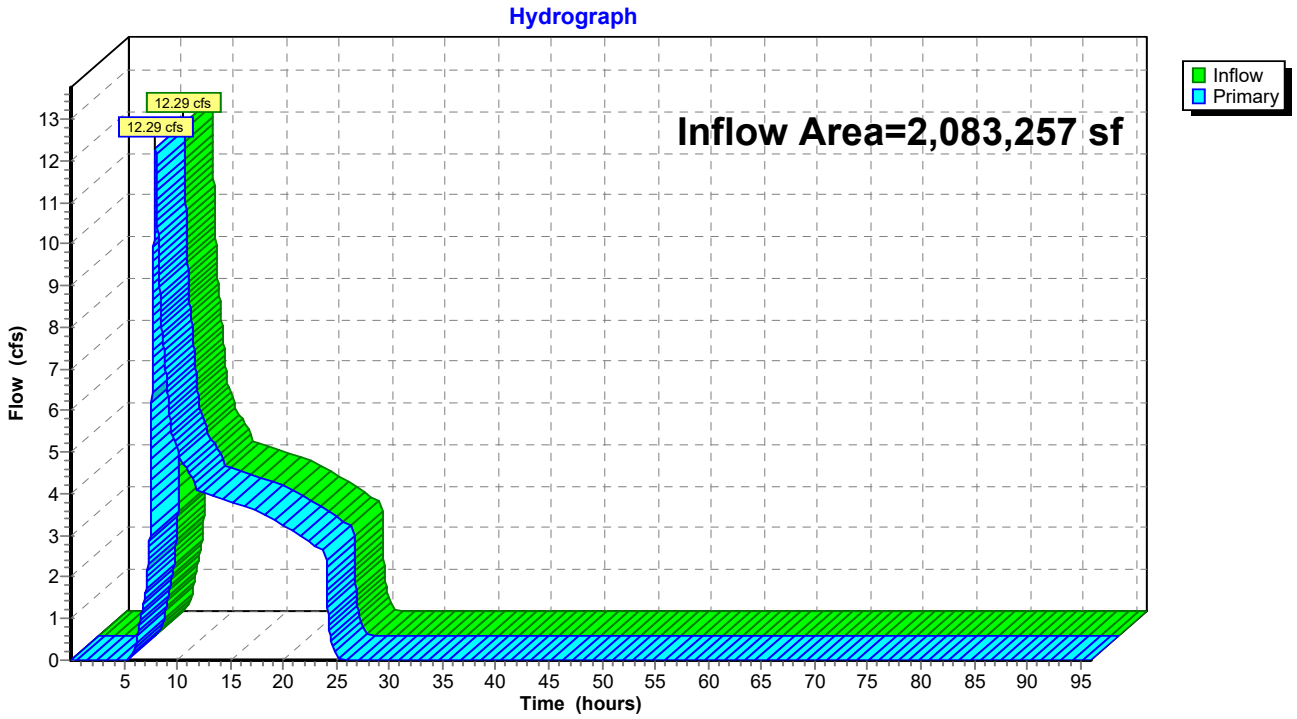


Summary for Link 33L: Combined

Inflow Area = 2,083,257 sf, 0.00% Impervious, Inflow Depth = 1.49" for 25 year event
Inflow = 12.29 cfs @ 8.00 hrs, Volume= 258,729 cf
Primary = 12.29 cfs @ 8.00 hrs, Volume= 258,729 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 33L: Combined



Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPMENT Runoff Area=35.785 ac 0.00% Impervious Runoff Depth=1.90"
Flow Length=1,762' Tc=19.8 min CN=73/0 Runoff=11.57 cfs 246,247 cf

Subcatchment32S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=2.05"
Tc=5.0 min CN=75/0 Runoff=5.57 cfs 89,613 cf

Link 33L: Combined Inflow=17.10 cfs 335,860 cf
Primary=17.10 cfs 335,860 cf

Total Runoff Area = 2,083,257 sf Runoff Volume = 335,860 cf Average Runoff Depth = 1.93"
100.00% Pervious = 2,083,257 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 1S: PRE DEVELOPMENT SCC PH 1

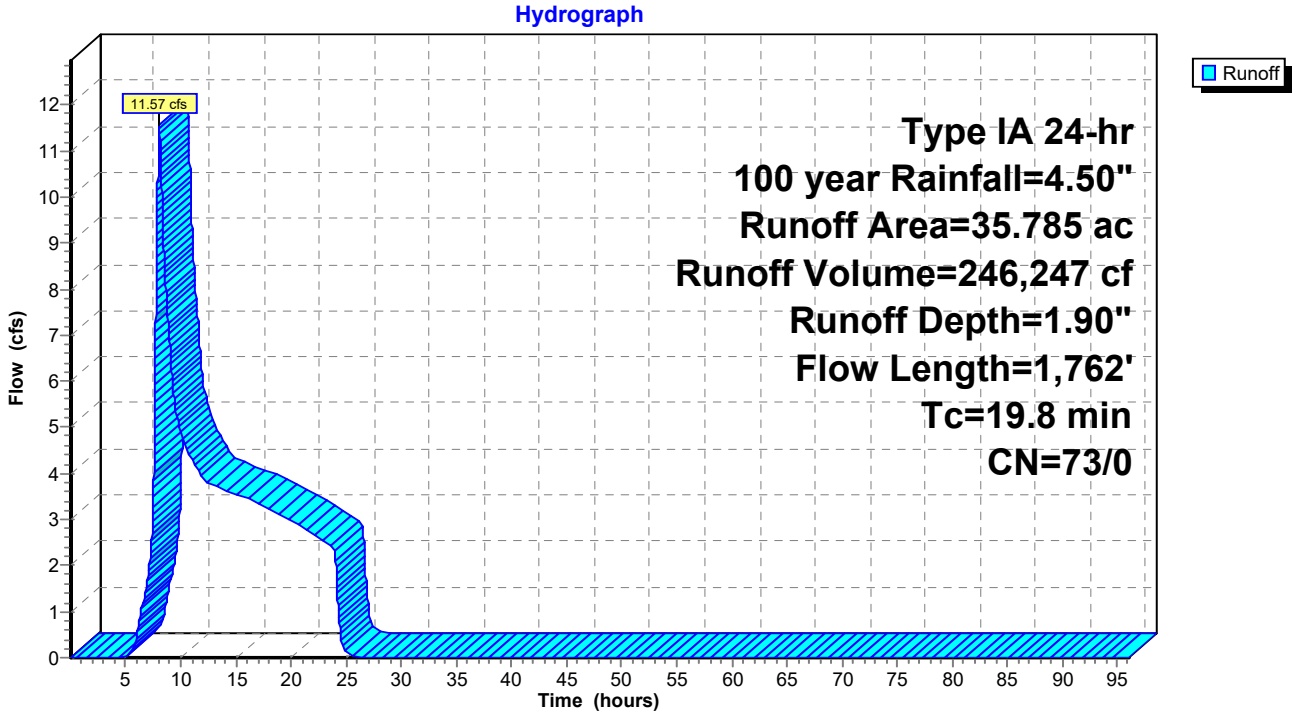
Runoff = 11.57 cfs @ 8.01 hrs, Volume= 246,247 cf, Depth= 1.90"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 100 year Rainfall=4.50"

Area (ac)	CN	Description
23.443	67	Brush, Poor, HSG B
12.342	83	Brush, Poor, HSG D
35.785	73	Weighted Average
35.785	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0138	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
4.5	506	0.0138	1.89		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.4	1,156	0.0192	8.13	975.72	**Channel Flow,** Area= 120.0 sf Perim= 109.0' r= 1.10' n= 0.027
19.8	1,762	Total			

Subcatchment 1S: PRE DEVELOPMENT SCC PH 1



Summary for Subcatchment 32S: Future E-W Expansion

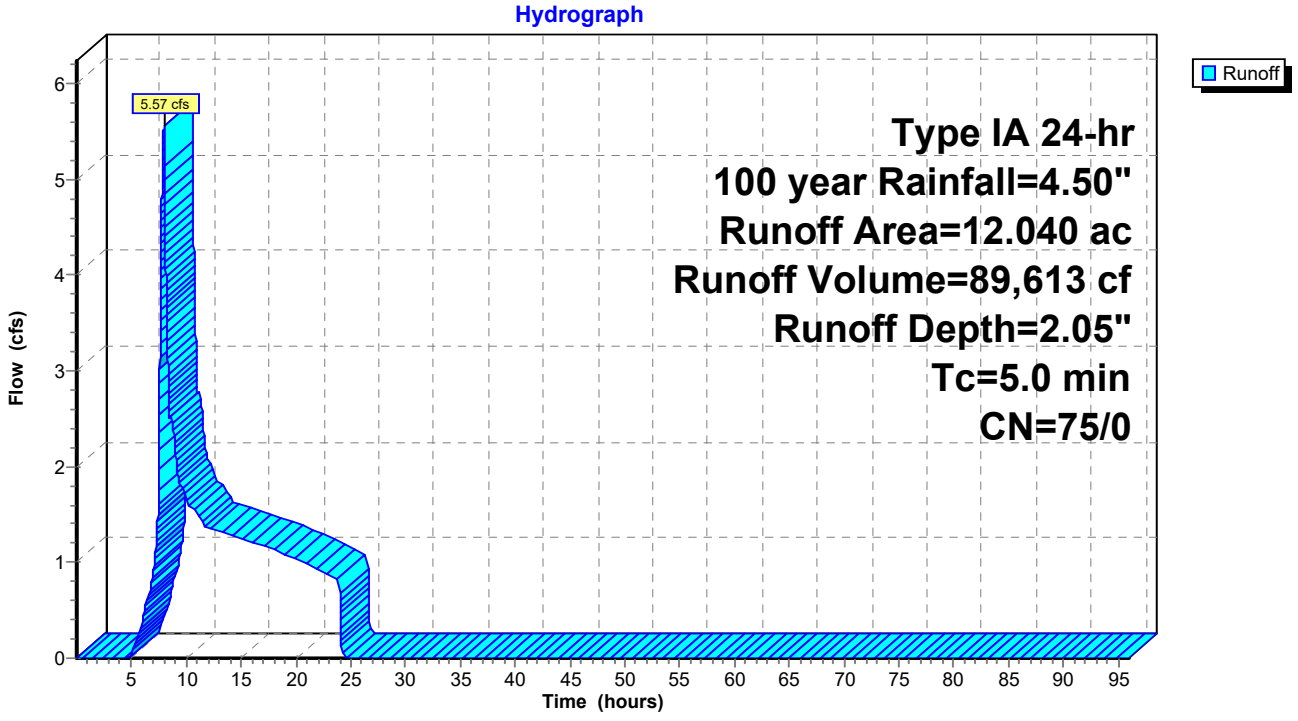
Runoff = 5.57 cfs @ 7.99 hrs, Volume= 89,613 cf, Depth= 2.05"
Routed to Link 33L : Combined

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 100 year Rainfall=4.50"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 32S: Future E-W Expansion

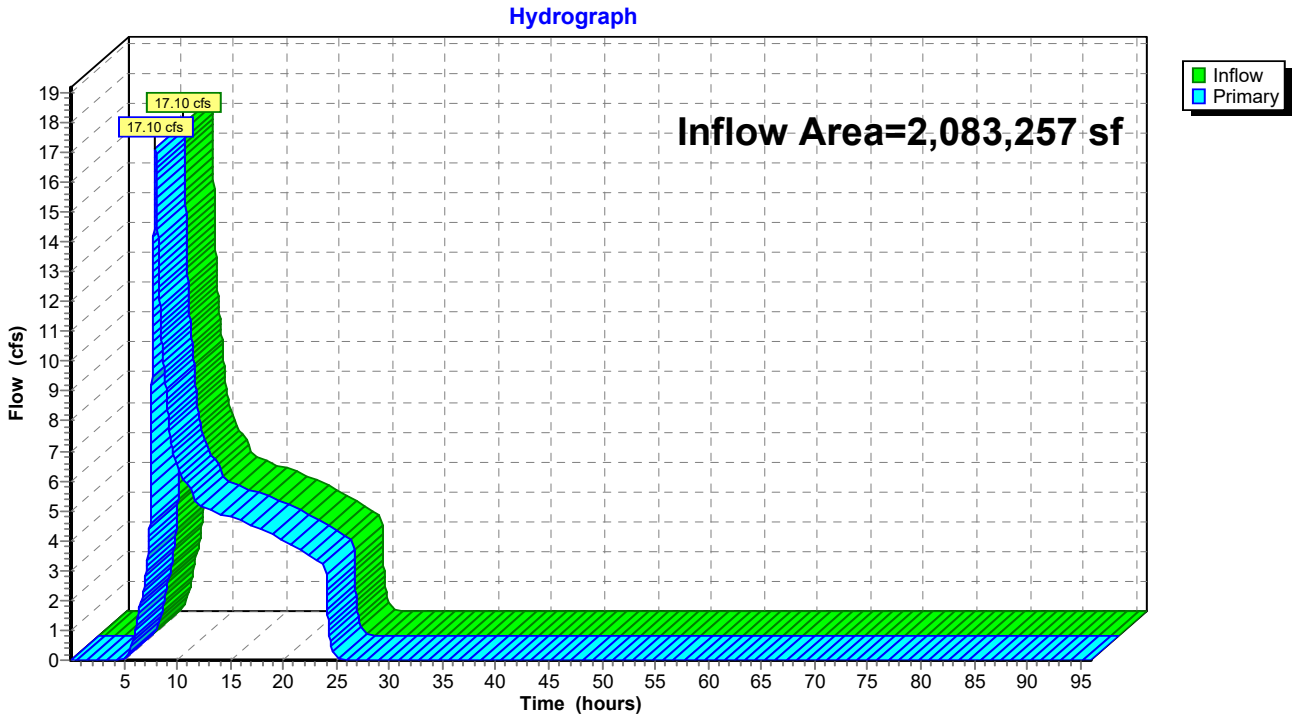


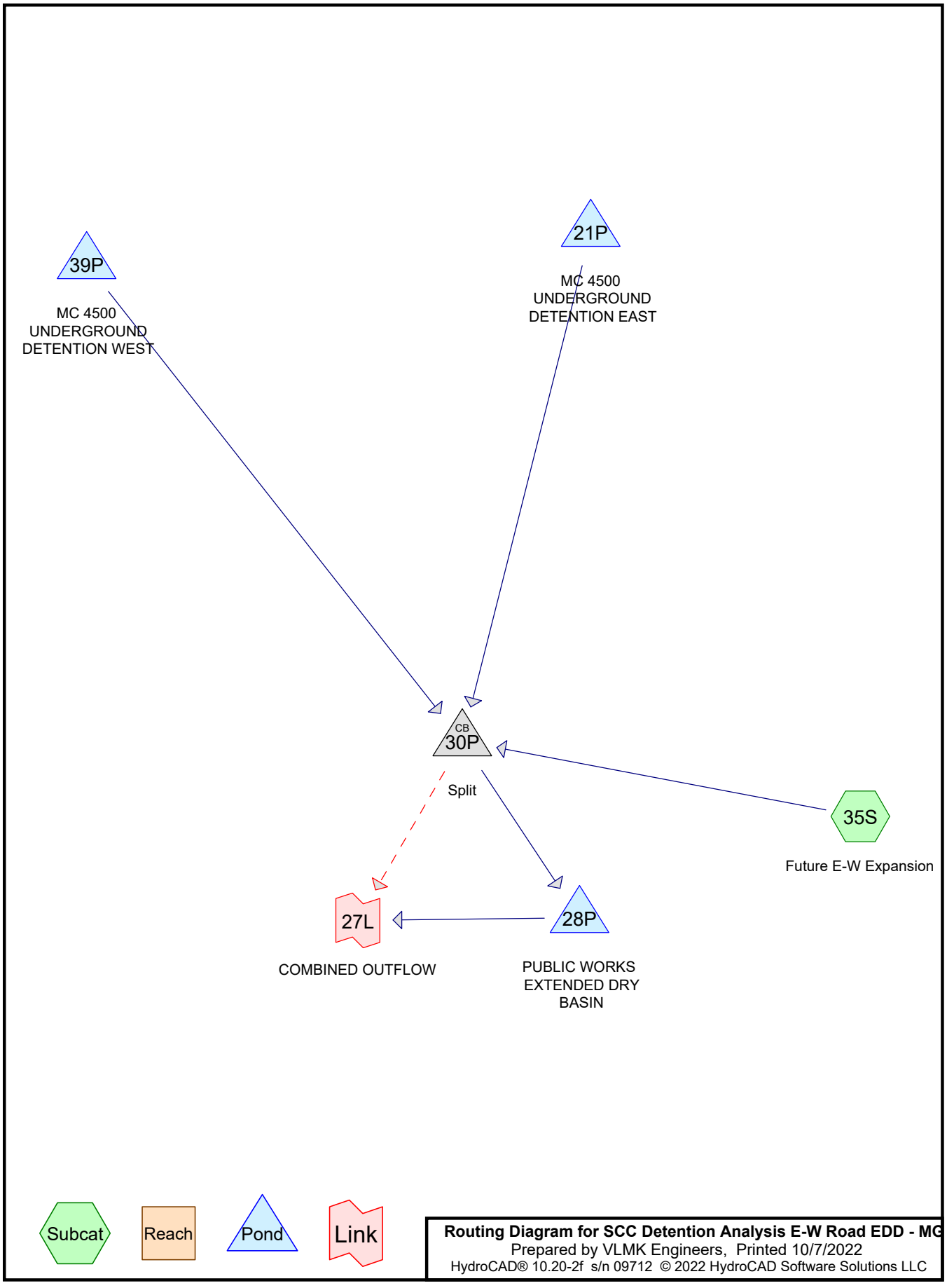
Summary for Link 33L: Combined

Inflow Area = 2,083,257 sf, 0.00% Impervious, Inflow Depth = 1.93" for 100 year event
Inflow = 17.10 cfs @ 8.00 hrs, Volume= 335,860 cf
Primary = 17.10 cfs @ 8.00 hrs, Volume= 335,860 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 33L: Combined





Routing Diagram for SCC Detention Analysis E-W Road EDD - MG
Prepared by VLMK Engineers, Printed 10/7/2022
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SCC Detention Analysis E-W Road EDD - MG
Prepared by VLMK Engineers
Printed 10/7/2022
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	Type IA 24-hr		Default	24.00	1	2.50	2
2	5 year	Type IA 24-hr		Default	24.00	1	3.10	2
3	10 year	Type IA 24-hr		Default	24.00	1	3.45	2
4	25 year	Type IA 24-hr		Default	24.00	1	3.90	2
5	100 year	Type IA 24-hr		Default	24.00	1	4.50	2

Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment35S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=0.65"
Tc=5.0 min CN=75/0 Runoff=1.23 cfs 28,432 cf

Pond 21P: MC 4500 UNDERGROUND Peak Elev=210.44' Storage=0.280 af Inflow=5.79 cfs 87,252 cf
Discarded=1.33 cfs 84,615 cf Primary=0.12 cfs 2,637 cf Outflow=1.45 cfs 87,252 cf

Pond 28P: PUBLIC WORKS EXTENDED Peak Elev=180.66' Storage=6,200 cf Inflow=2.19 cfs 48,836 cf
Outflow=1.70 cfs 47,741 cf

Pond 30P: Split Peak Elev=178.72' Inflow=2.19 cfs 48,836 cf
Primary=2.19 cfs 48,836 cf Secondary=0.00 cfs 0 cf Outflow=2.19 cfs 48,836 cf

Pond 39P: MC 4500 UNDERGROUND Peak Elev=197.60' Storage=20,040 cf Inflow=6.83 cfs 123,448 cf
Discarded=1.68 cfs 119,610 cf Primary=0.14 cfs 3,838 cf Outflow=1.82 cfs 123,448 cf

Link 27L: COMBINED OUTFLOW Inflow=1.70 cfs 47,741 cf
Primary=1.70 cfs 47,741 cf

Total Runoff Area = 524,462 sf Runoff Volume = 28,432 cf Average Runoff Depth = 0.65"
100.00% Pervious = 524,462 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 35S: Future E-W Expansion

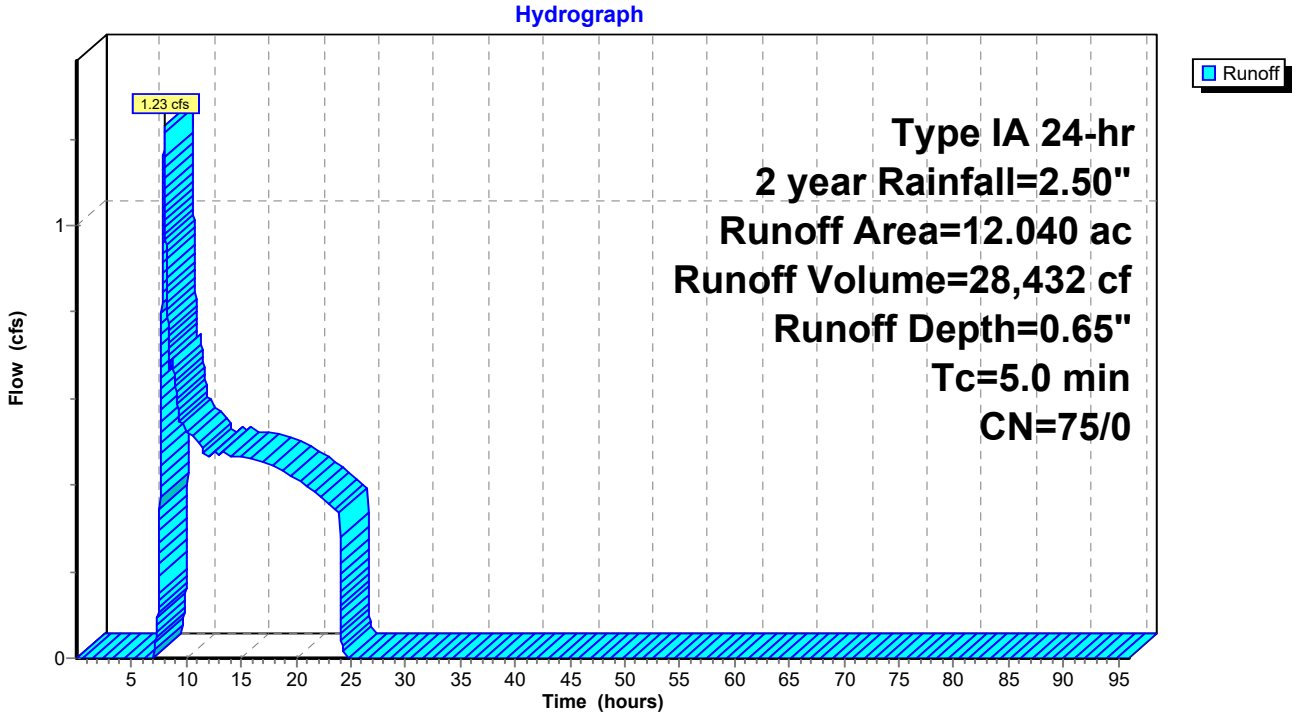
Runoff = 1.23 cfs @ 8.00 hrs, Volume= 28,432 cf, Depth= 0.65"
Routed to Pond 30P : Split

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 year Rainfall=2.50"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 35S: Future E-W Expansion



Summary for Pond 21P: MC 4500 UNDERGROUND DETENTION EAST

Inflow Area = 691,085 sf, 58.52% Impervious, Inflow Depth = 1.52" for 2 year event
Inflow = 5.79 cfs @ 7.95 hrs, Volume= 87,252 cf
Outflow = 1.45 cfs @ 9.98 hrs, Volume= 87,252 cf, Atten= 75%, Lag= 122.2 min
Discarded = 1.33 cfs @ 7.12 hrs, Volume= 84,615 cf
Primary = 0.12 cfs @ 9.98 hrs, Volume= 2,637 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 210.44' @ 9.98 hrs Surf.Area= 0.131 ac Storage= 0.280 af

Plug-Flow detention time= 61.2 min calculated for 87,242 cf (100% of inflow)
Center-of-Mass det. time= 61.2 min (796.6 - 735.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	206.75'	0.290 af	**37.58'W x 152.37'L x 8.25'H Field A** 1.085 af Overall - 0.359 af Embedded = 0.725 af x 40.0% Voids
#2A	209.00'	0.359 af	**ADS_StormTech MC-4500 b +Cap**x 144 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 144 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		0.649 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**15.0" Round Culvert** L= 17.4' Ke= 0.600 Inlet / Outlet Invert= 209.00' / 208.54' S= 0.0264 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	209.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	214.20'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	206.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.33 cfs @ 7.12 hrs HW=206.83' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.33 cfs)

Primary OutFlow Max=0.12 cfs @ 9.98 hrs HW=210.44' (Free Discharge)
└**1=Culvert** (Passes 0.12 cfs of 5.02 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.62 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 21P: MC 4500 UNDERGROUND DETENTION EAST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

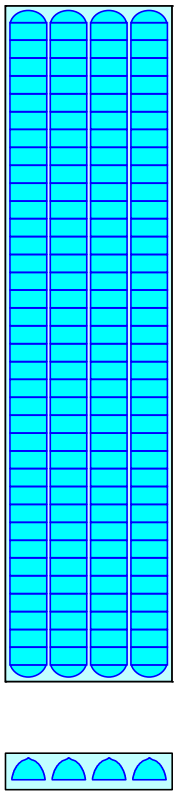
36 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 150.37' Row Length +12.0" End Stone x 2 = 152.37' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
27.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 8.25' Field Height

144 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 15,650.6 cf Chamber Storage

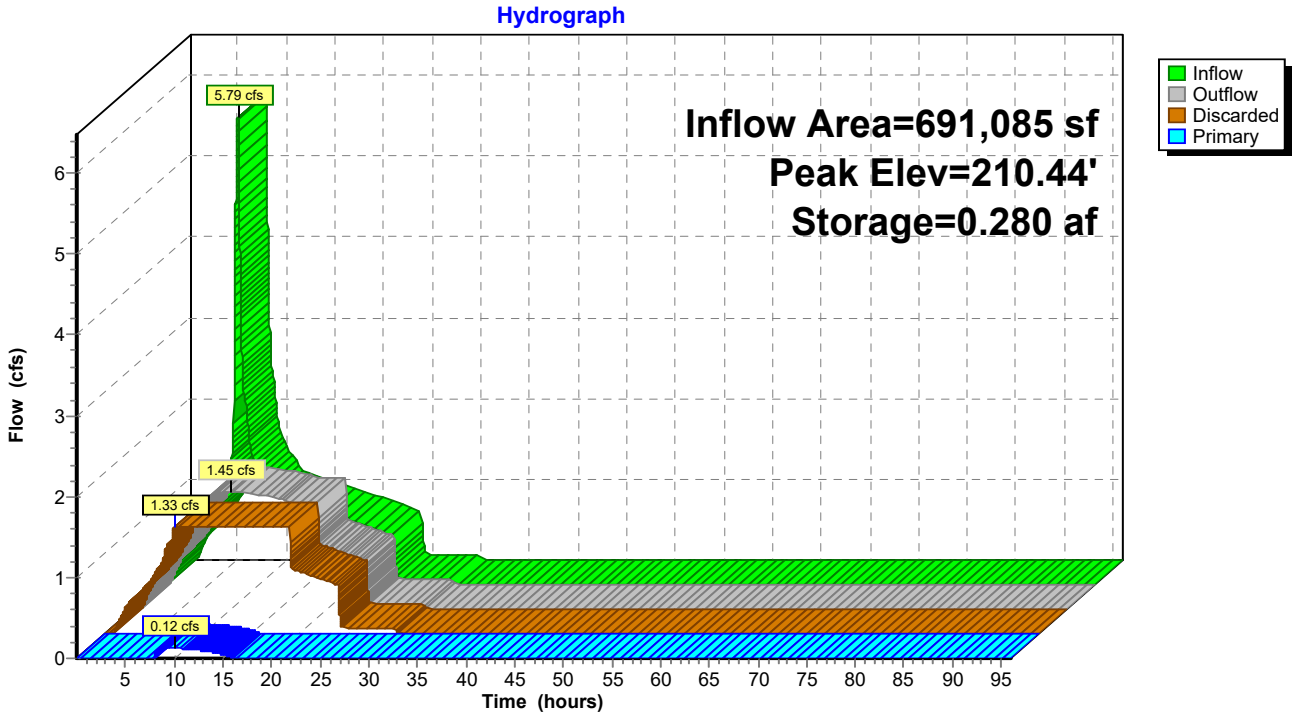
47,243.2 cf Field - 15,650.6 cf Chambers = 31,592.6 cf Stone x 40.0% Voids = 12,637.0 cf Stone Storage

Chamber Storage + Stone Storage = 28,287.6 cf = 0.649 af
Overall Storage Efficiency = 59.9%
Overall System Size = 152.37' x 37.58' x 8.25'

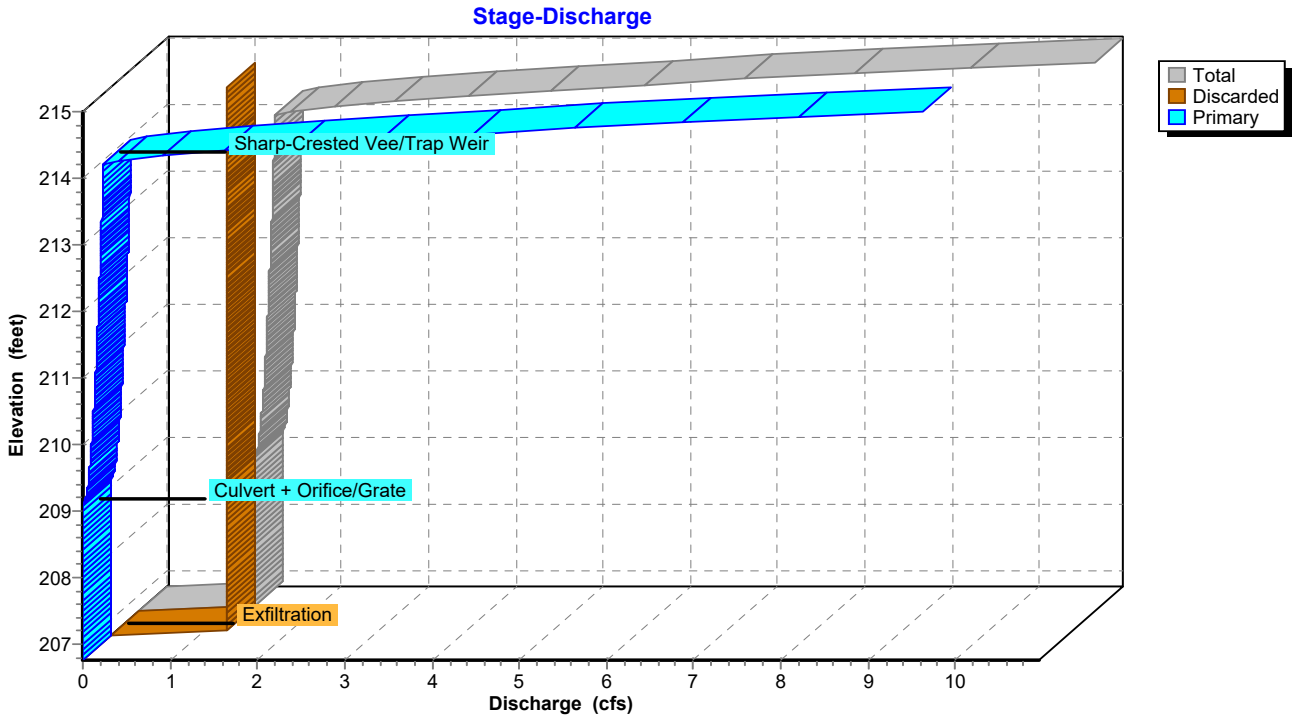
144 Chambers
1,749.7 cy Field
1,170.1 cy Stone



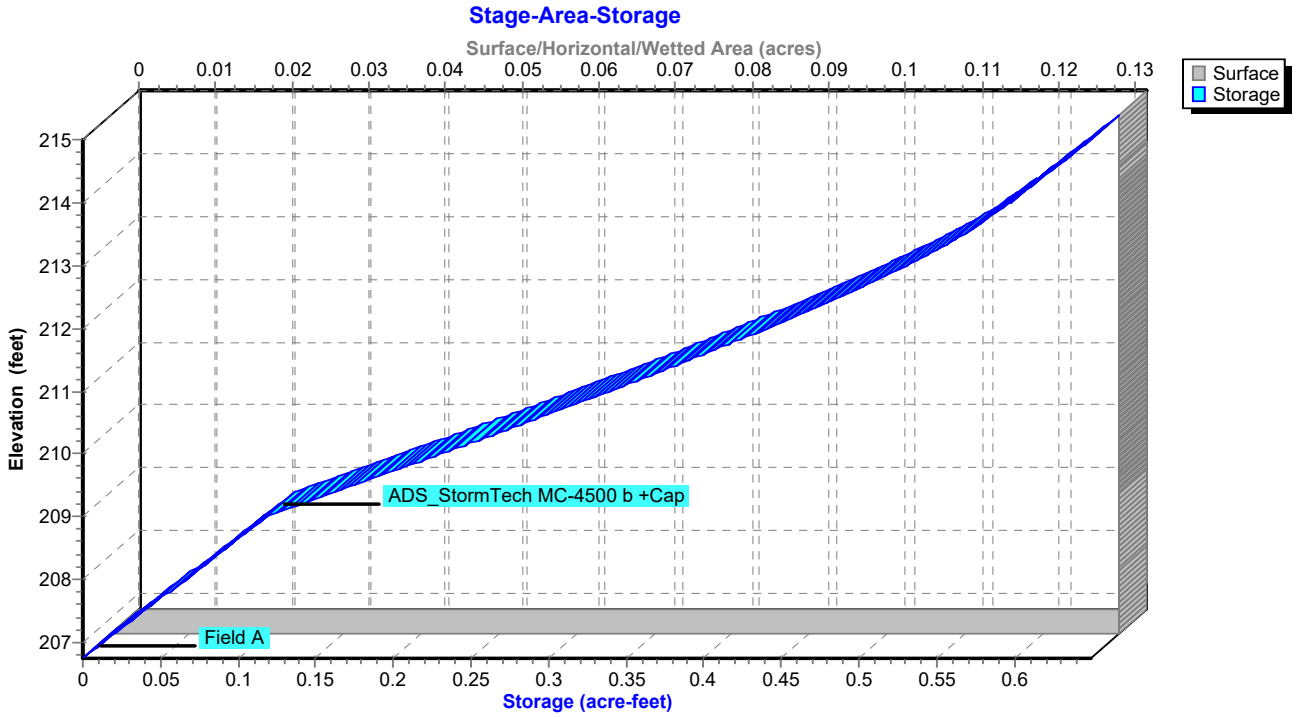
Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Summary for Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN

[81] Warning: Exceeded Pond 30P by 2.64' @ 24.69 hrs

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 0.29" for 2 year event
Inflow = 2.19 cfs @ 8.00 hrs, Volume= 48,836 cf
Outflow = 1.70 cfs @ 8.14 hrs, Volume= 47,741 cf, Atten= 22%, Lag= 8.6 min
Primary = 1.70 cfs @ 8.14 hrs, Volume= 47,741 cf
Routed to Link 27L : COMBINED OUTFLOW

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 180.66' @ 8.14 hrs Surf.Area= 3,183 sf Storage= 6,200 cf

Plug-Flow detention time= 323.2 min calculated for 47,741 cf (98% of inflow)
Center-of-Mass det. time= 309.2 min (1,119.5 - 810.3)

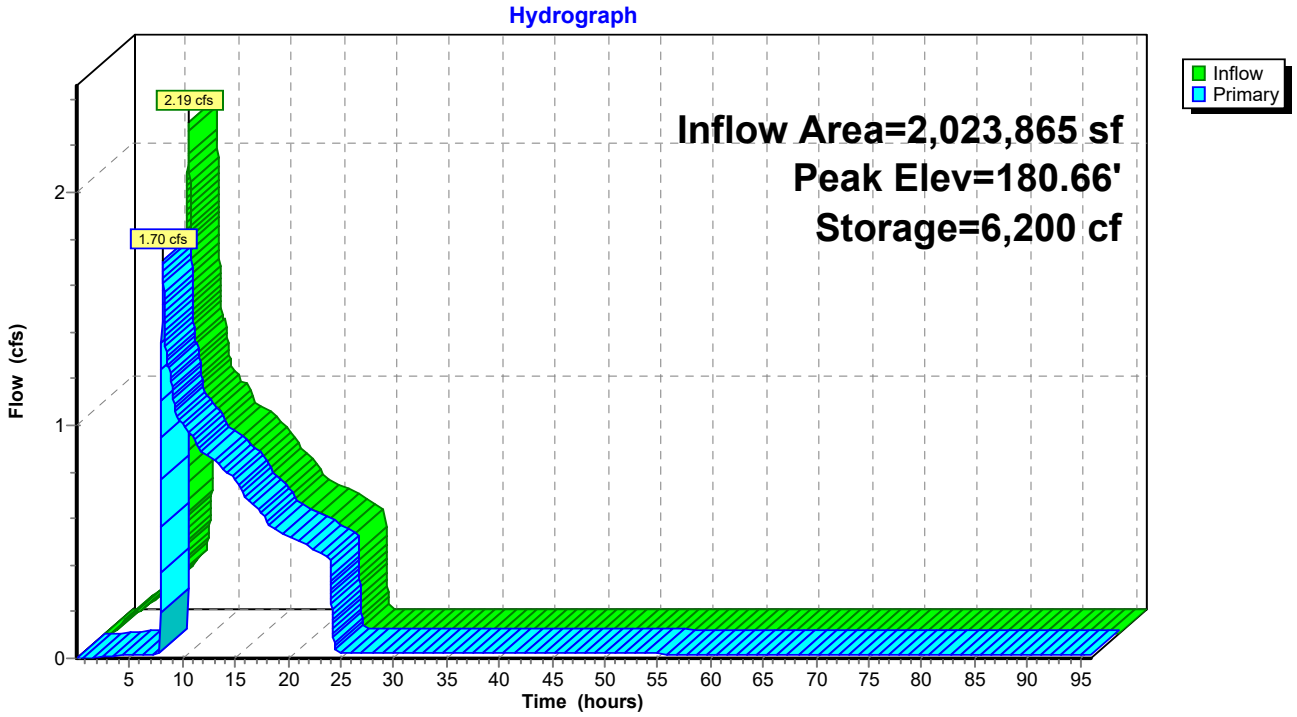
Volume	Invert	Avail.Storage	Storage Description
#1	177.50'	7,328 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	708	0	0
178.50	1,519	1,114	1,114
179.00	1,943	866	1,979
180.00	2,648	2,296	4,275
181.00	3,458	3,053	7,328

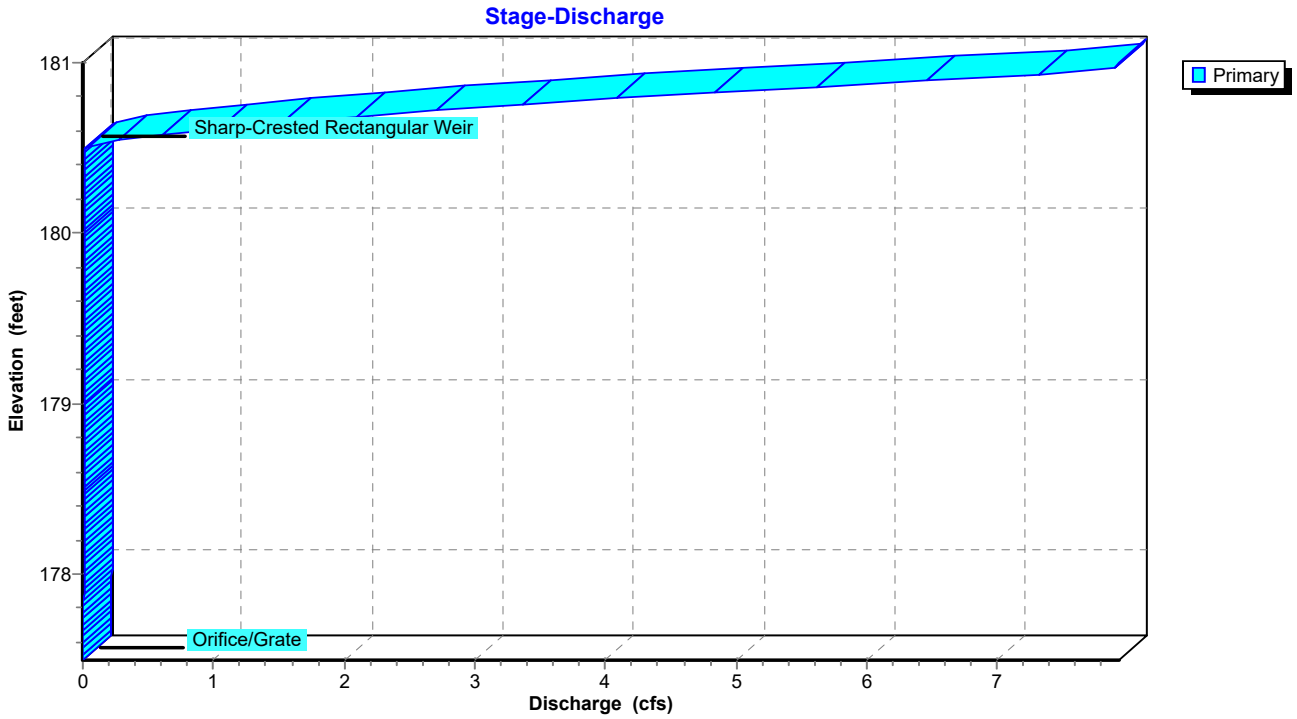
Device	Routing	Invert	Outlet Devices
#1	Primary	175.50'	**12.0" Round Culvert** L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 175.50' / 174.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	177.50'	**0.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	180.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.70 cfs @ 8.14 hrs HW=180.66' (Free Discharge)
↑└**1=Culvert** (Passes 1.70 cfs of 7.65 cfs potential flow)
↑└**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 8.52 fps)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.67 cfs @ 1.31 fps)

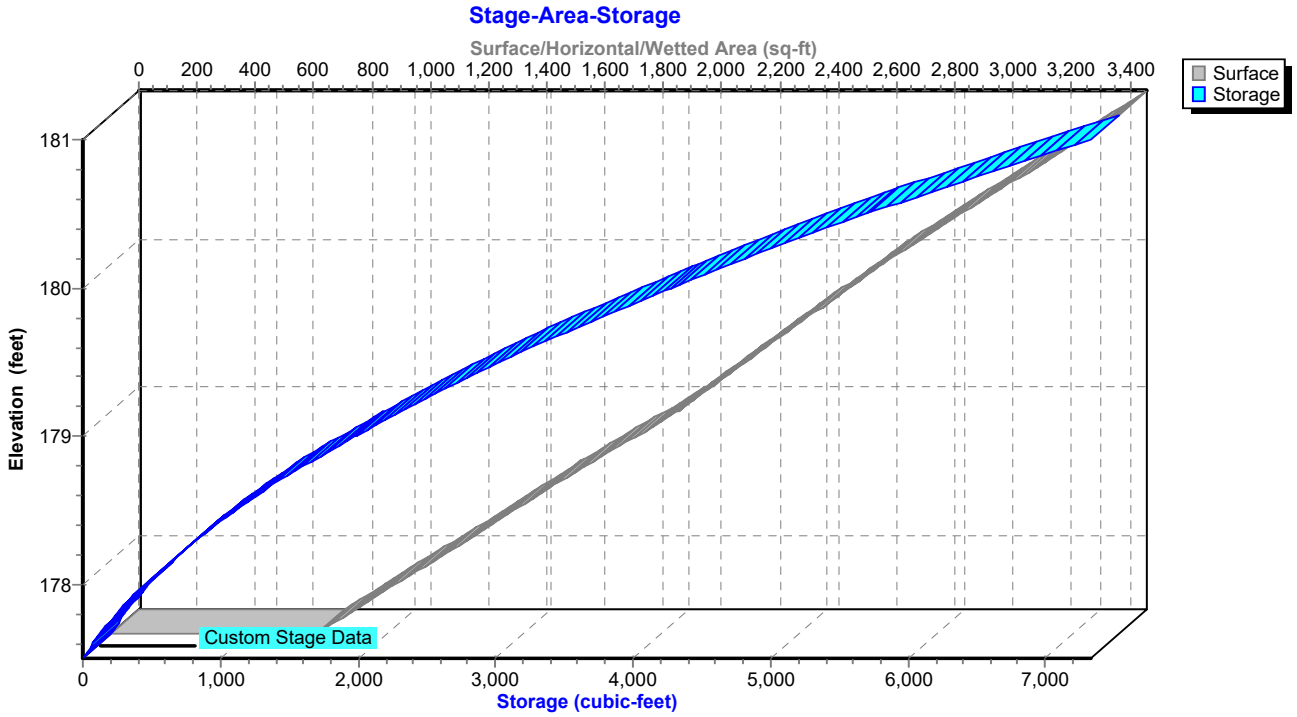
Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Summary for Pond 30P: Split

[57] Hint: Peaked at 178.72' (Flood elevation advised)

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 0.29" for 2 year event
Inflow = 2.19 cfs @ 8.00 hrs, Volume= 48,836 cf
Outflow = 2.19 cfs @ 8.00 hrs, Volume= 48,836 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.19 cfs @ 8.00 hrs, Volume= 48,836 cf
Routed to Pond 28P : PUBLIC WORKS EXTENDED DRY BASIN
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0 cf
Routed to Link 27L : COMBINED OUTFLOW

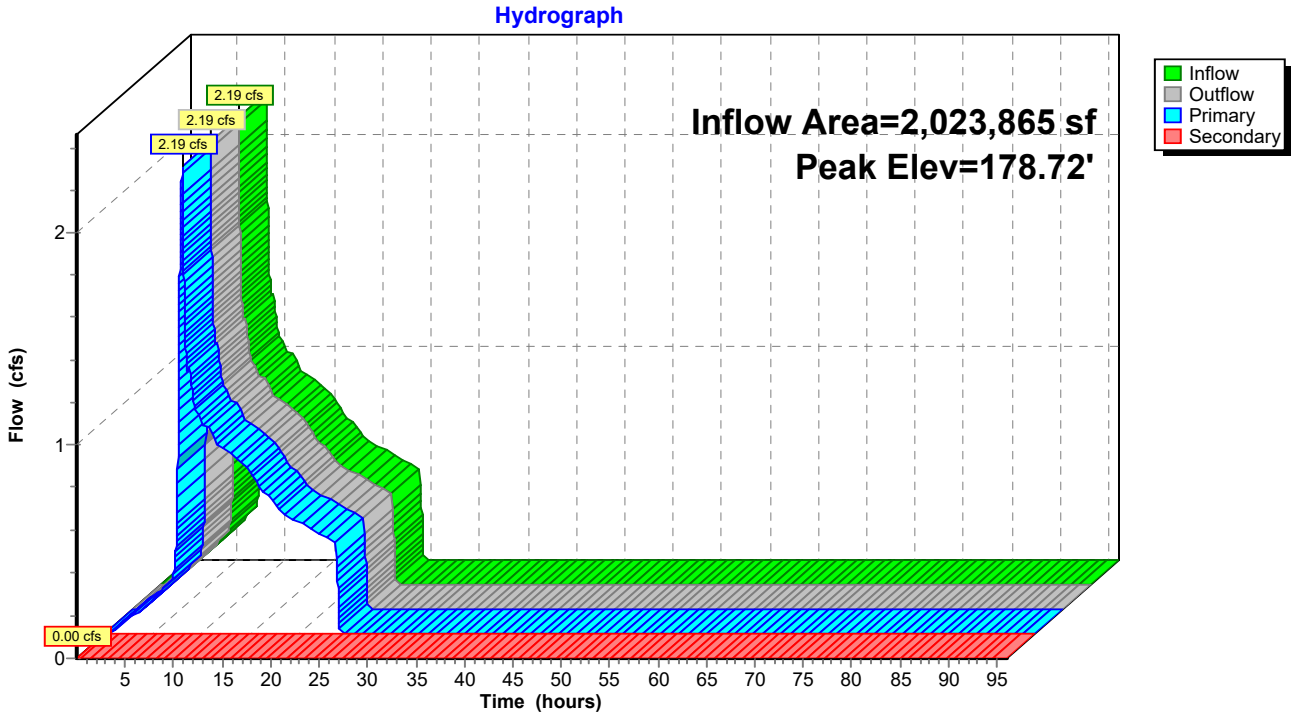
Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 178.72' @ 8.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	177.86'	**12.0" Round Culvert-E-W pond** L= 26.8' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0134 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	177.86'	**18.0" Round Culvert-Bypass** L= 26.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0136 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	179.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

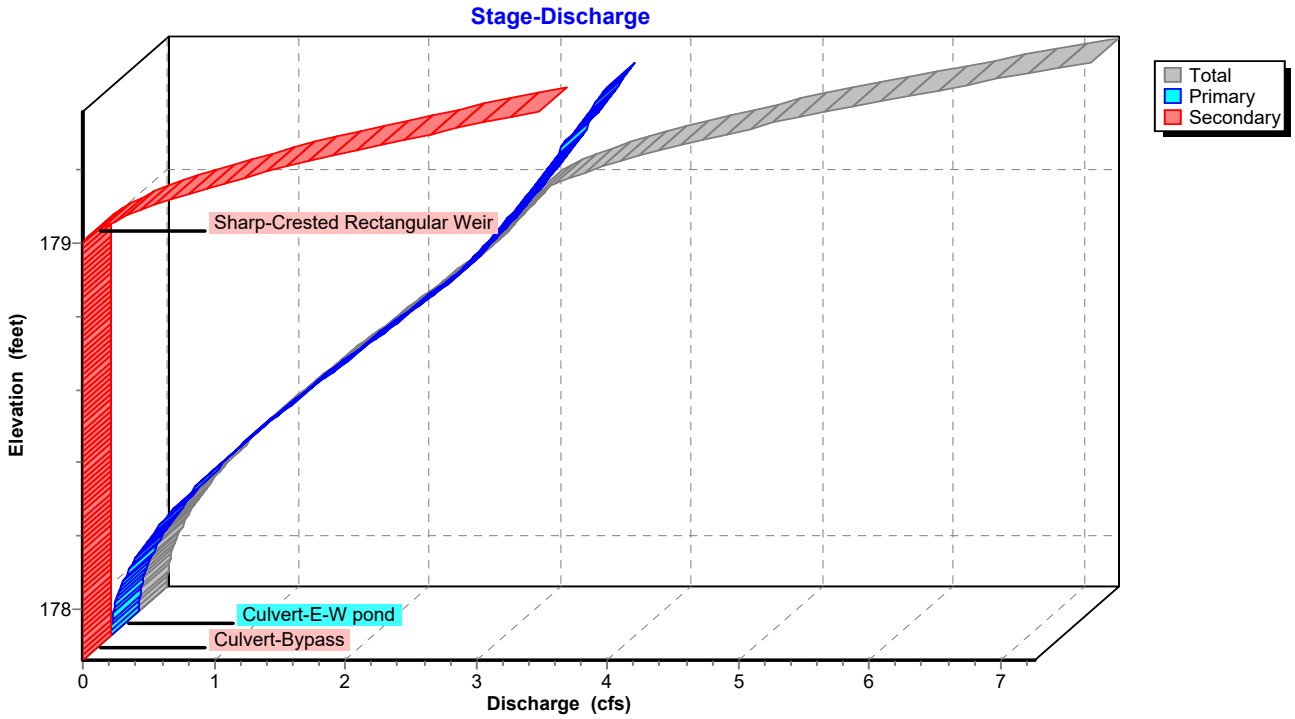
Primary OutFlow Max=2.19 cfs @ 8.00 hrs HW=178.72' (Free Discharge)
└**1=Culvert-E-W pond** (Barrel Controls 2.19 cfs @ 4.10 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=177.86' (Free Discharge)
└**2=Culvert-Bypass** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

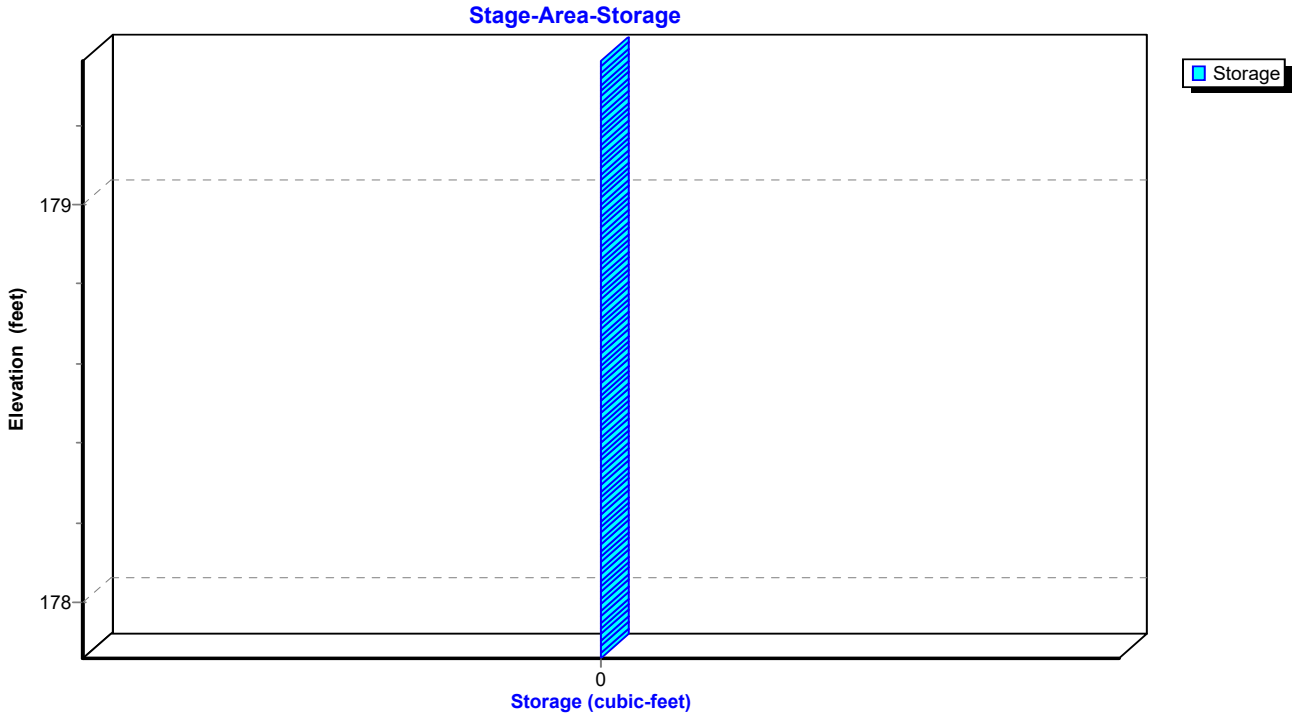
Pond 30P: Split



Pond 30P: Split



Pond 30P: Split



Summary for Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

Inflow Area = 713,673 sf, 87.08% Impervious, Inflow Depth = 2.08" for 2 year event
Inflow = 6.83 cfs @ 7.97 hrs, Volume= 123,448 cf
Outflow = 1.82 cfs @ 11.07 hrs, Volume= 123,448 cf, Atten= 73%, Lag= 185.9 min
Discarded = 1.68 cfs @ 6.32 hrs, Volume= 119,610 cf
Primary = 0.14 cfs @ 11.07 hrs, Volume= 3,838 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 197.60' @ 11.07 hrs Surf.Area= 7,239 sf Storage= 20,040 cf

Plug-Flow detention time= 89.7 min calculated for 123,448 cf (100% of inflow)
Center-of-Mass det. time= 89.7 min (821.8 - 732.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	192.75'	18,097 cf	**37.58'W x 192.62'L x 9.00'H Field A** 65,153 cf Overall - 19,910 cf Embedded = 45,242 cf x 40.0% Voids
#2A	195.75'	19,910 cf	**ADS_StormTech MC-4500 b +Cap**x 184 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 184 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		38,007 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.75'	**15.0" Round Culvert** L= 14.6' Ke= 0.600 Inlet / Outlet Invert= 195.75' / 195.60' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	195.75'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	201.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	192.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 6.32 hrs HW=192.84' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.68 cfs)

Primary OutFlow Max=0.14 cfs @ 11.07 hrs HW=197.60' (Free Discharge)
└**1=Culvert** (Passes 0.14 cfs of 6.14 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.41 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 39P: MC 4500 UNDERGROUND DETENTION WEST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

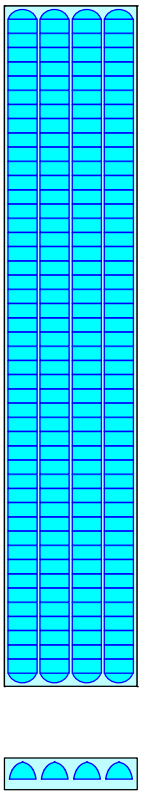
46 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 190.62' Row Length +12.0" End Stone x 2 = 192.62' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
36.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 9.00' Field Height

184 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 19,910.2 cf Chamber Storage

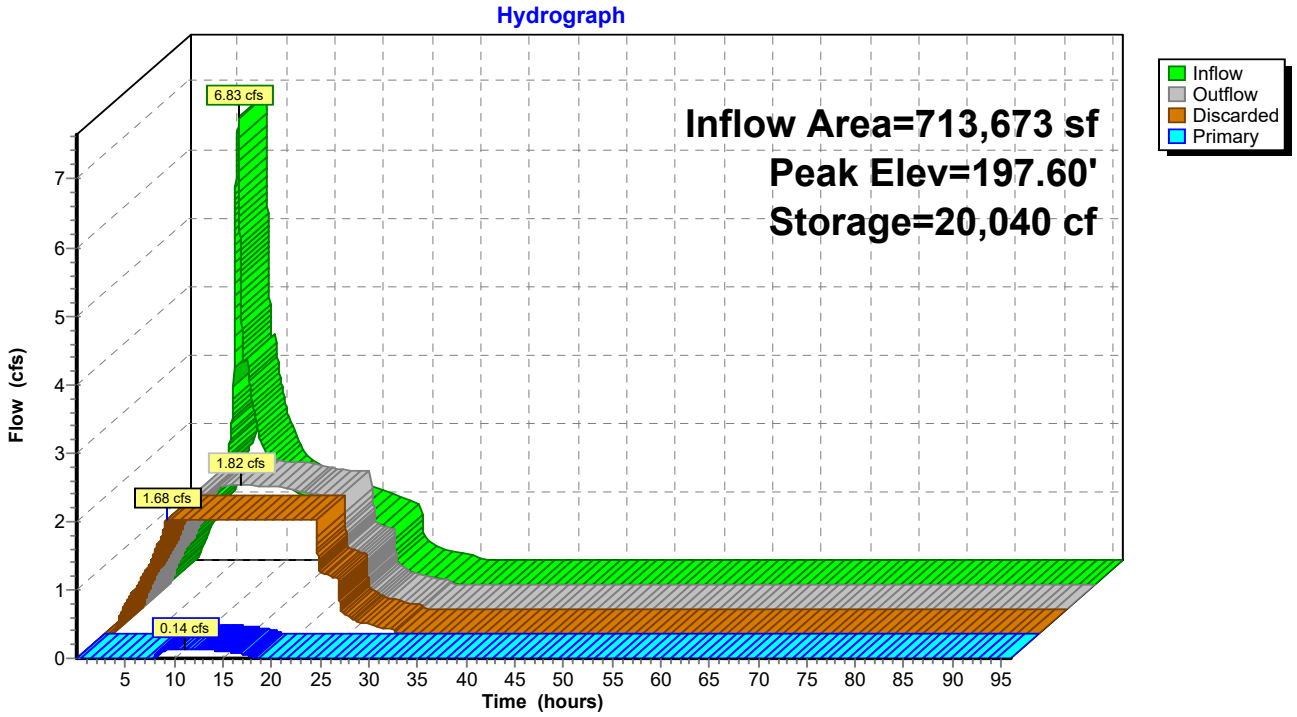
65,152.6 cf Field - 19,910.2 cf Chambers = 45,242.3 cf Stone x 40.0% Voids = 18,096.9 cf Stone Storage

Chamber Storage + Stone Storage = 38,007.2 cf = 0.873 af
Overall Storage Efficiency = 58.3%
Overall System Size = 192.62' x 37.58' x 9.00'

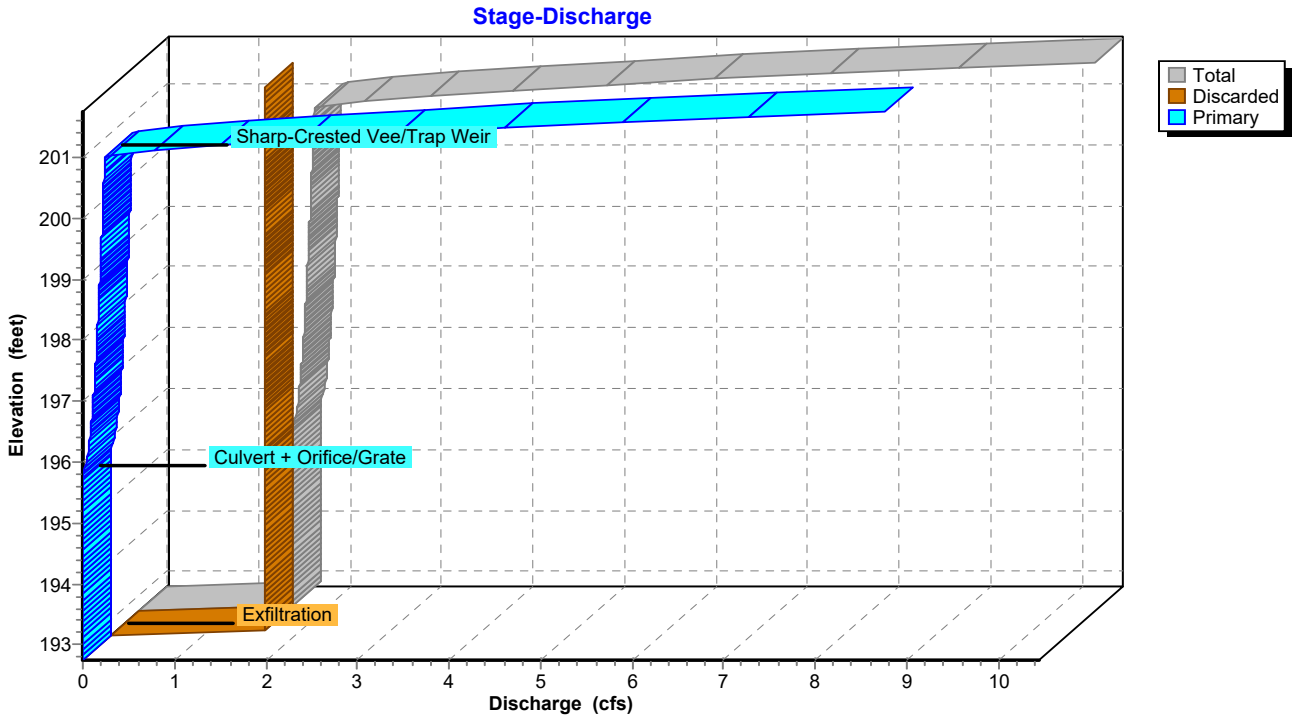
184 Chambers
2,413.1 cy Field
1,675.6 cy Stone



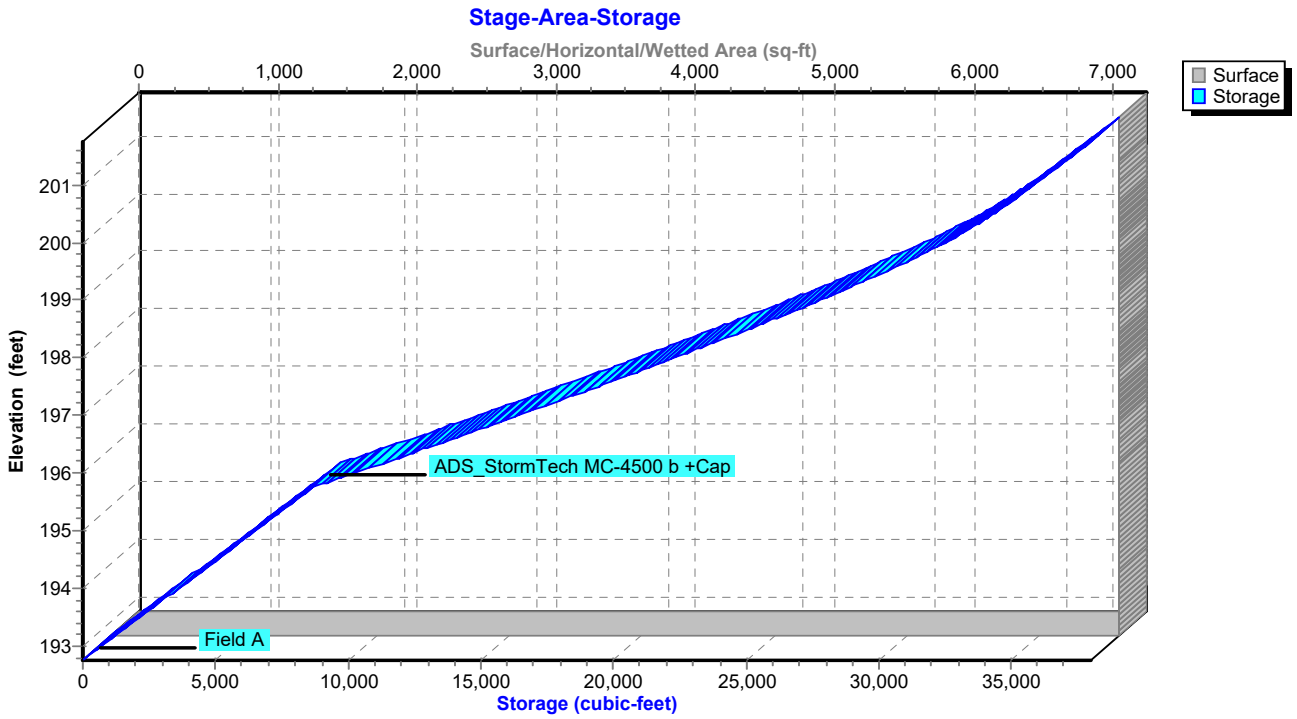
Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

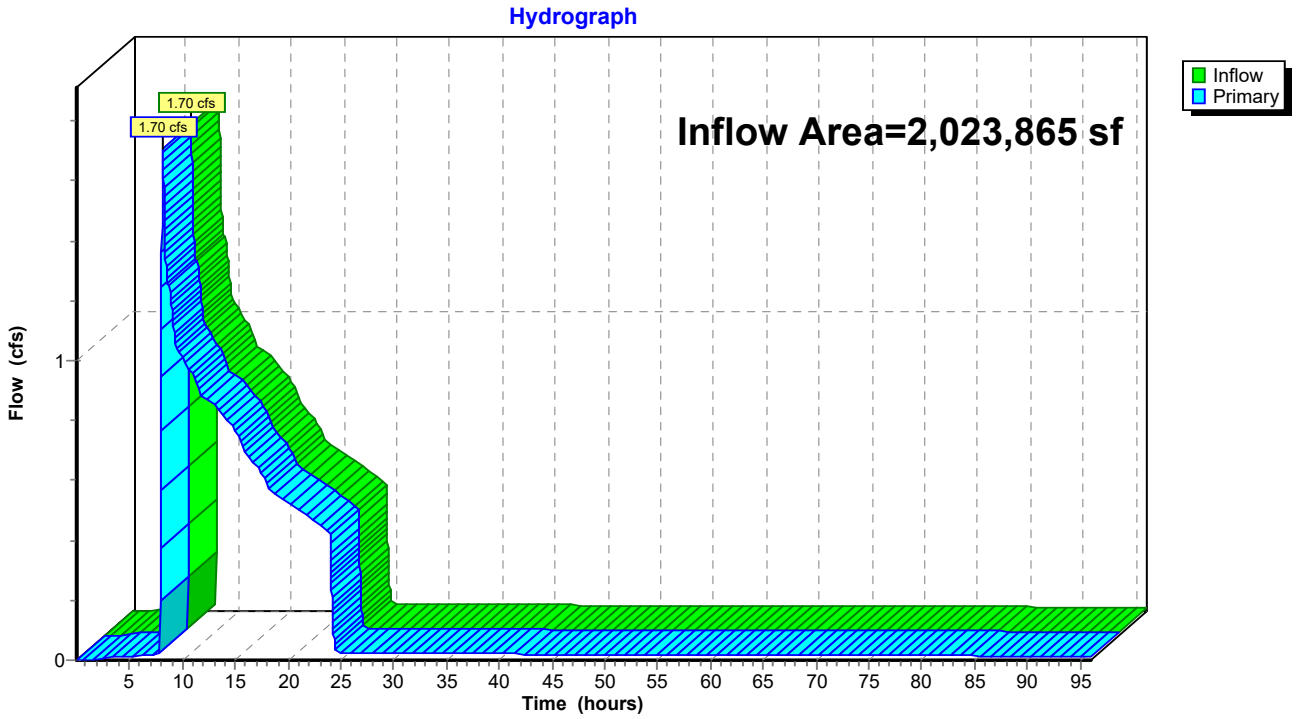


Summary for Link 27L: COMBINED OUTFLOW

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth > 0.28" for 2 year event
Inflow = 1.70 cfs @ 8.14 hrs, Volume= 47,741 cf
Primary = 1.70 cfs @ 8.14 hrs, Volume= 47,741 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 27L: COMBINED OUTFLOW



Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment35S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=1.03"
Tc=5.0 min CN=75/0 Runoff=2.37 cfs 44,876 cf

Pond 21P: MC 4500 UNDERGROUND Peak Elev=212.89' Storage=0.521 af Inflow=7.64 cfs 114,847 cf
Discarded=1.33 cfs 105,468 cf Primary=0.20 cfs 9,379 cf Outflow=1.53 cfs 114,847 cf

Pond 28P: PUBLIC WORKS EXTENDED Peak Elev=180.75' Storage=6,480 cf Inflow=3.25 cfs 83,309 cf
Outflow=3.23 cfs 82,176 cf

Pond 30P: Split Peak Elev=179.10' Inflow=3.74 cfs 83,644 cf
Primary=3.25 cfs 83,309 cf Secondary=0.50 cfs 335 cf Outflow=3.74 cfs 83,644 cf

Pond 39P: MC 4500 UNDERGROUND Peak Elev=200.81' Storage=35,283 cf Inflow=8.82 cfs 157,727 cf
Discarded=1.68 cfs 146,230 cf Primary=0.23 cfs 11,498 cf Outflow=1.91 cfs 157,727 cf

Link 27L: COMBINED OUTFLOW Inflow=3.72 cfs 82,511 cf
Primary=3.72 cfs 82,511 cf

Total Runoff Area = 524,462 sf Runoff Volume = 44,876 cf Average Runoff Depth = 1.03"
100.00% Pervious = 524,462 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 35S: Future E-W Expansion

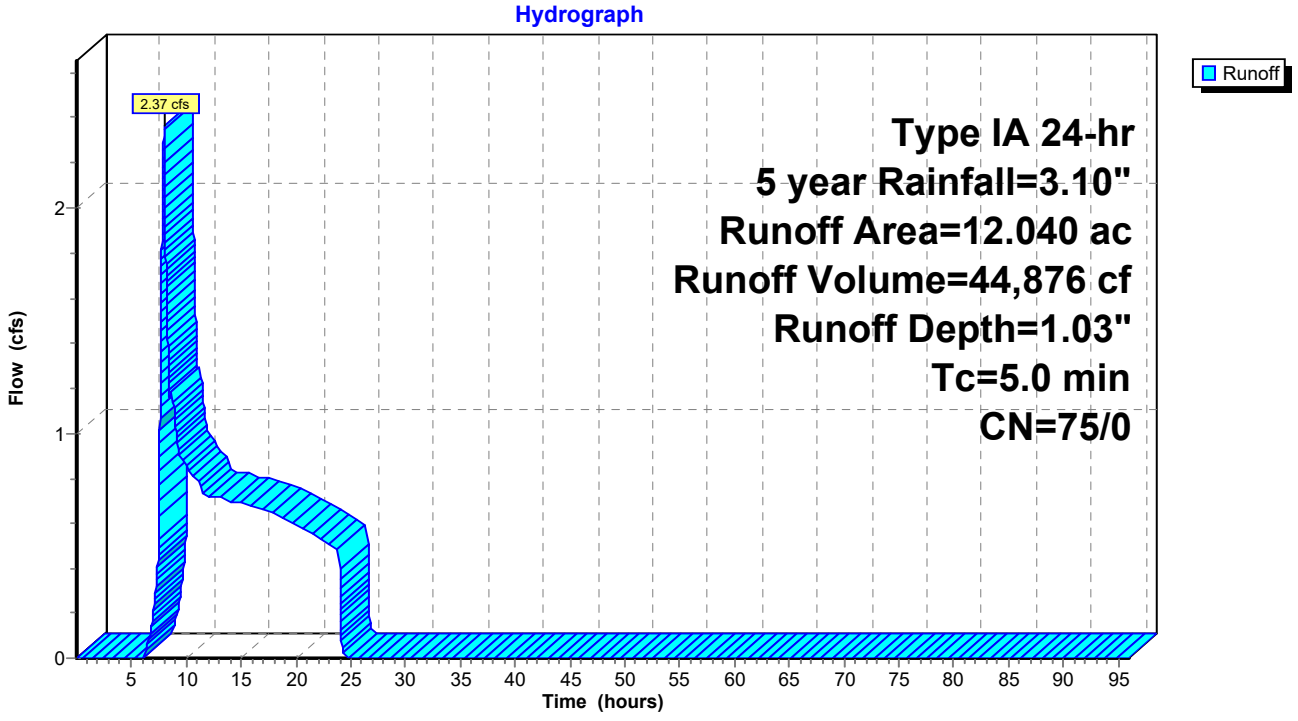
Runoff = 2.37 cfs @ 8.00 hrs, Volume= 44,876 cf, Depth= 1.03"
Routed to Pond 30P : Split

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 5 year Rainfall=3.10"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 35S: Future E-W Expansion



Summary for Pond 21P: MC 4500 UNDERGROUND DETENTION EAST

Inflow Area = 691,085 sf, 58.52% Impervious, Inflow Depth = 1.99" for 5 year event
Inflow = 7.64 cfs @ 7.91 hrs, Volume= 114,847 cf
Outflow = 1.53 cfs @ 11.44 hrs, Volume= 114,847 cf, Atten= 80%, Lag= 211.7 min
Discarded = 1.33 cfs @ 6.11 hrs, Volume= 105,468 cf
Primary = 0.20 cfs @ 11.44 hrs, Volume= 9,379 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 212.89' @ 11.44 hrs Surf.Area= 0.131 ac Storage= 0.521 af

Plug-Flow detention time= 149.1 min calculated for 114,835 cf (100% of inflow)
Center-of-Mass det. time= 149.1 min (874.5 - 725.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	206.75'	0.290 af	**37.58'W x 152.37'L x 8.25'H Field A** 1.085 af Overall - 0.359 af Embedded = 0.725 af x 40.0% Voids
#2A	209.00'	0.359 af	**ADS_StormTech MC-4500 b +Cap**x 144 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 144 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		0.649 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**15.0" Round Culvert** L= 17.4' Ke= 0.600 Inlet / Outlet Invert= 209.00' / 208.54' S= 0.0264 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	209.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	214.20'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	206.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.33 cfs @ 6.11 hrs HW=206.83' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.33 cfs)

Primary OutFlow Max=0.20 cfs @ 11.44 hrs HW=212.89' (Free Discharge)
└**1=Culvert** (Passes 0.20 cfs of 10.01 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.20 cfs @ 9.39 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 21P: MC 4500 UNDERGROUND DETENTION EAST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

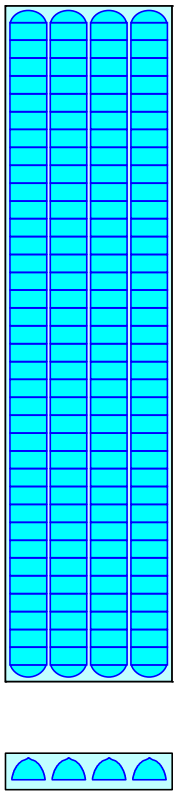
36 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 150.37' Row Length +12.0" End Stone x 2 = 152.37' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
27.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 8.25' Field Height

144 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 15,650.6 cf Chamber Storage

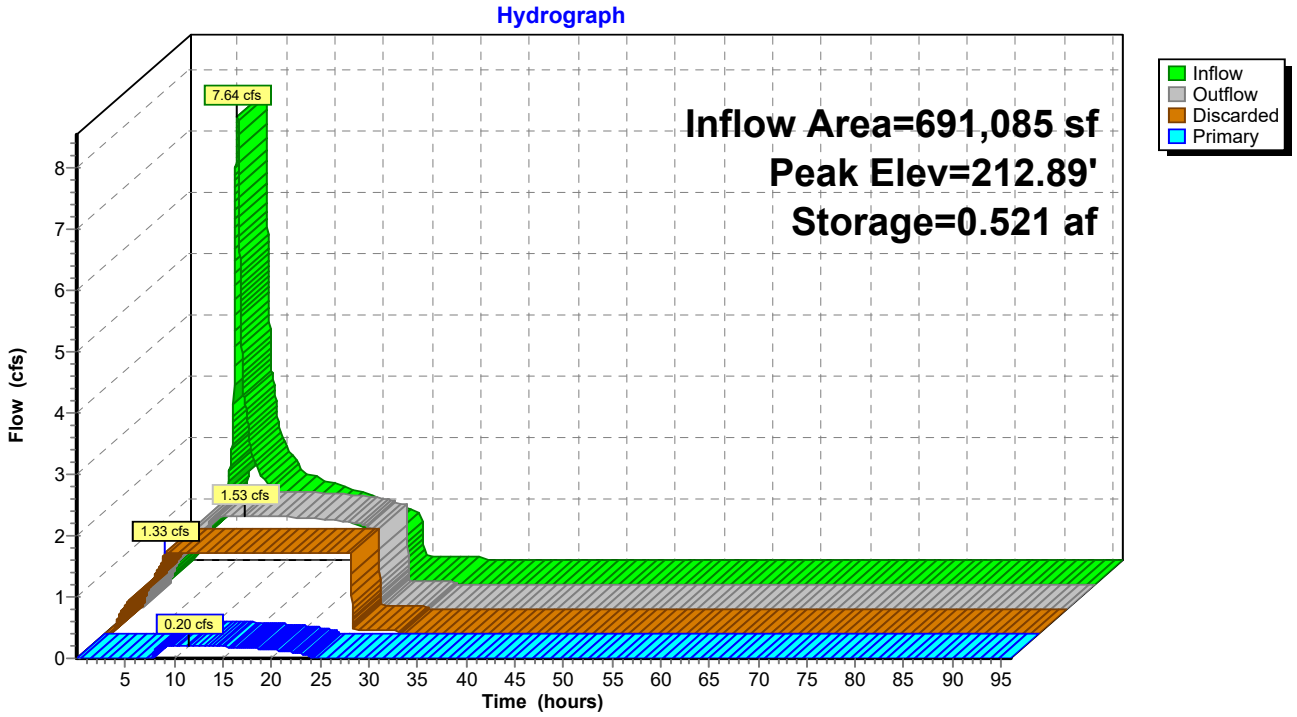
47,243.2 cf Field - 15,650.6 cf Chambers = 31,592.6 cf Stone x 40.0% Voids = 12,637.0 cf Stone Storage

Chamber Storage + Stone Storage = 28,287.6 cf = 0.649 af
Overall Storage Efficiency = 59.9%
Overall System Size = 152.37' x 37.58' x 8.25'

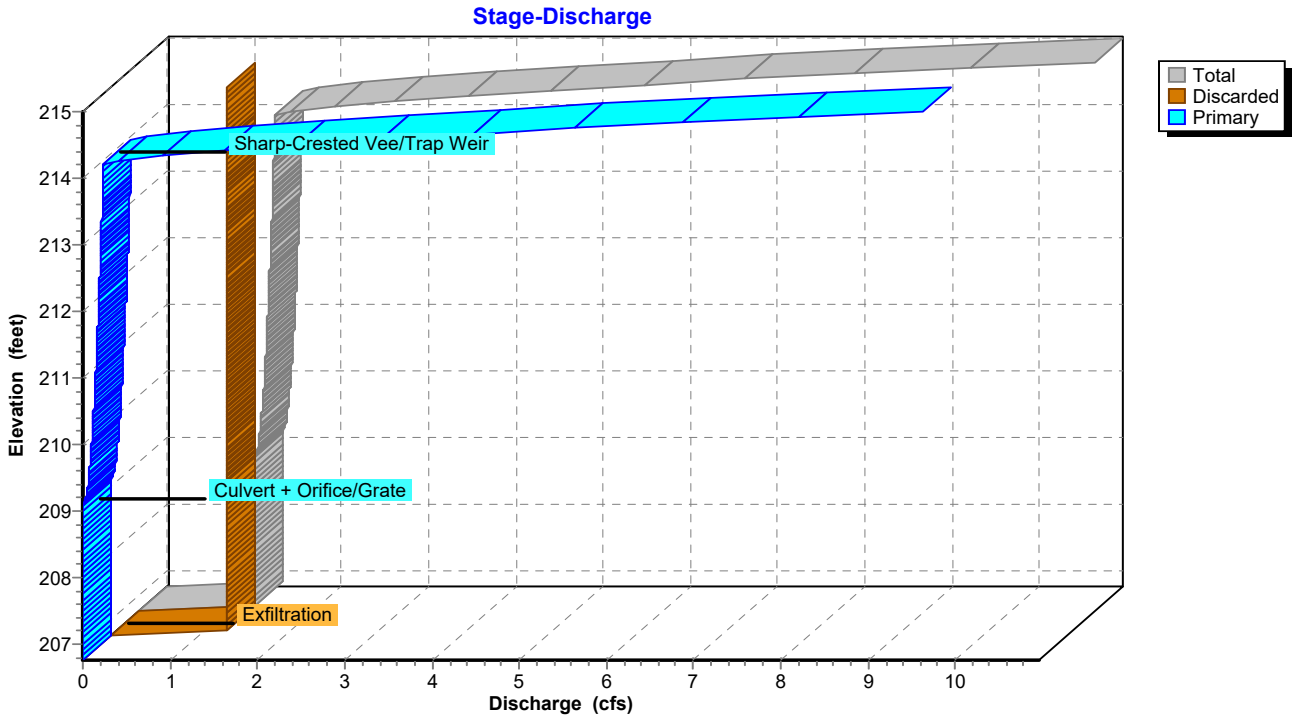
144 Chambers
1,749.7 cy Field
1,170.1 cy Stone



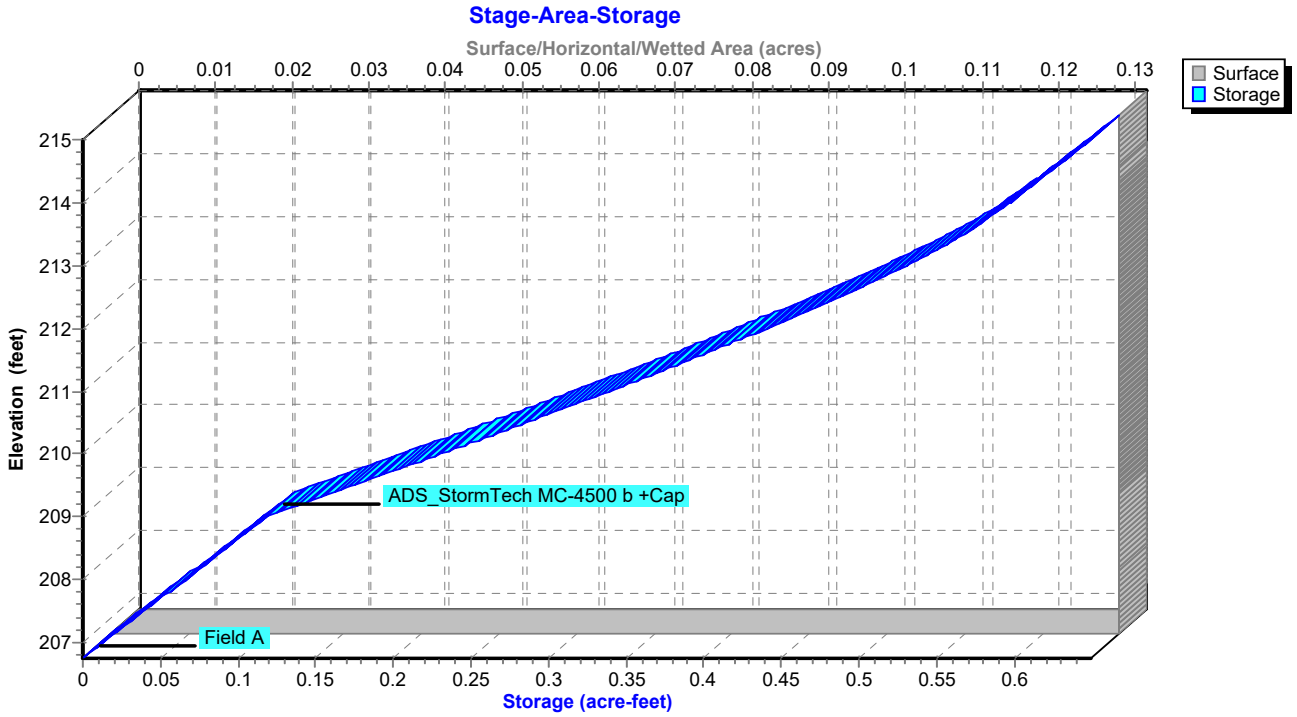
Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Summary for Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN

[81] Warning: Exceeded Pond 30P by 2.64' @ 25.41 hrs

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 0.49" for 5 year event
Inflow = 3.25 cfs @ 8.00 hrs, Volume= 83,309 cf
Outflow = 3.23 cfs @ 8.01 hrs, Volume= 82,176 cf, Atten= 1%, Lag= 1.0 min
Primary = 3.23 cfs @ 8.01 hrs, Volume= 82,176 cf
Routed to Link 27L : COMBINED OUTFLOW

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 180.75' @ 8.01 hrs Surf.Area= 3,253 sf Storage= 6,480 cf

Plug-Flow detention time= 192.8 min calculated for 82,167 cf (99% of inflow)
Center-of-Mass det. time= 184.8 min (1,023.3 - 838.5)

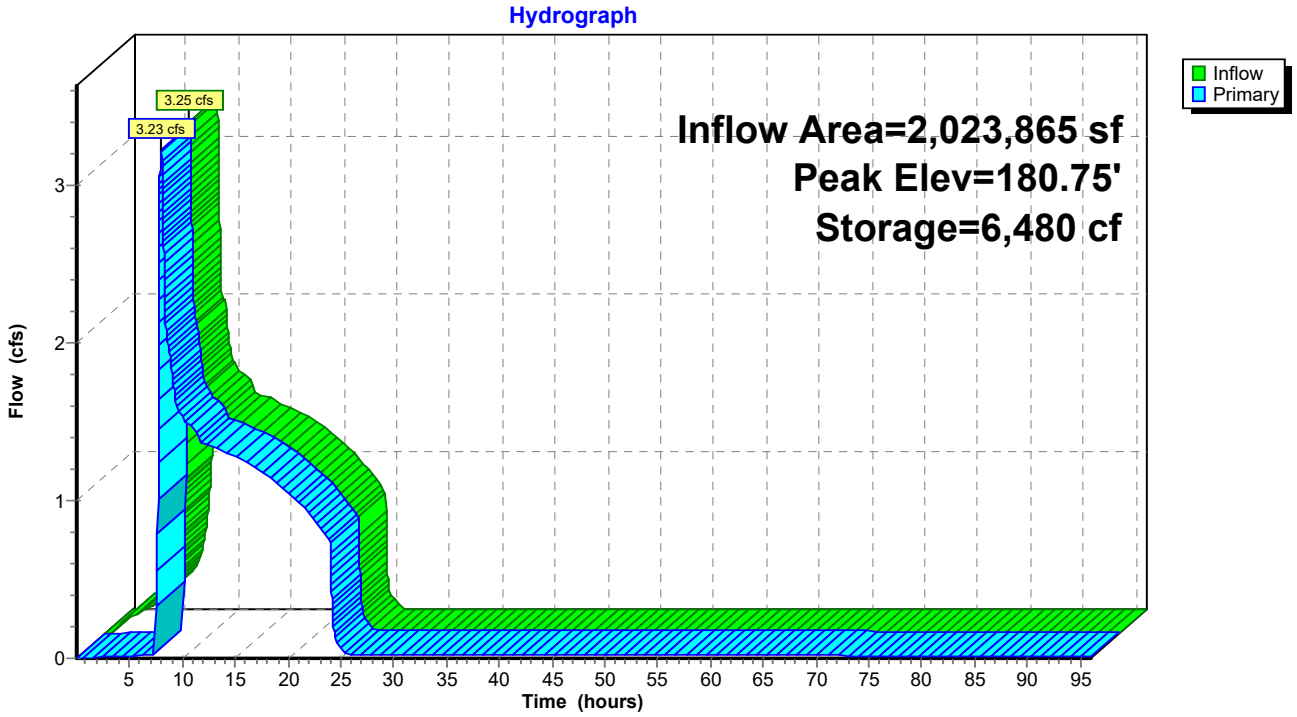
Volume	Invert	Avail.Storage	Storage Description
#1	177.50'	7,328 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	708	0	0
178.50	1,519	1,114	1,114
179.00	1,943	866	1,979
180.00	2,648	2,296	4,275
181.00	3,458	3,053	7,328

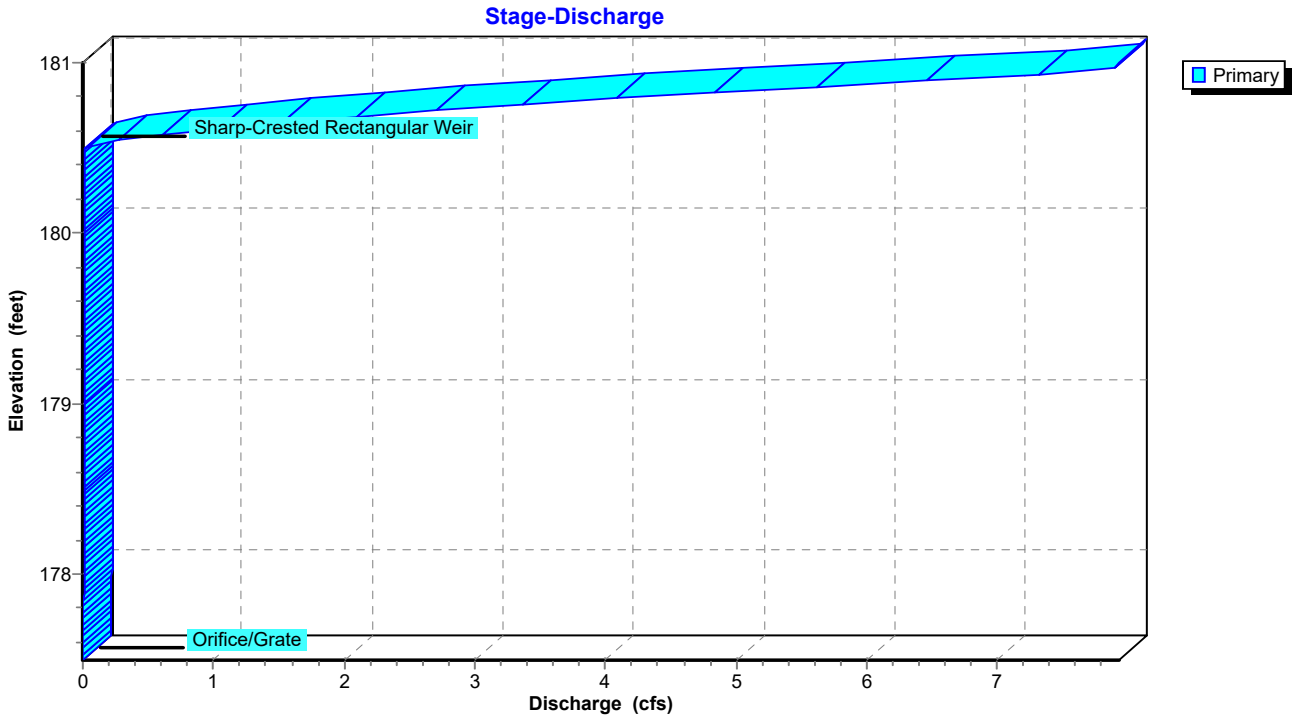
Device	Routing	Invert	Outlet Devices
#1	Primary	175.50'	**12.0" Round Culvert** L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 175.50' / 174.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	177.50'	**0.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	180.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=3.22 cfs @ 8.01 hrs HW=180.75' (Free Discharge)
└**1=Culvert** (Passes 3.22 cfs of 7.72 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 8.64 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 3.20 cfs @ 1.63 fps)

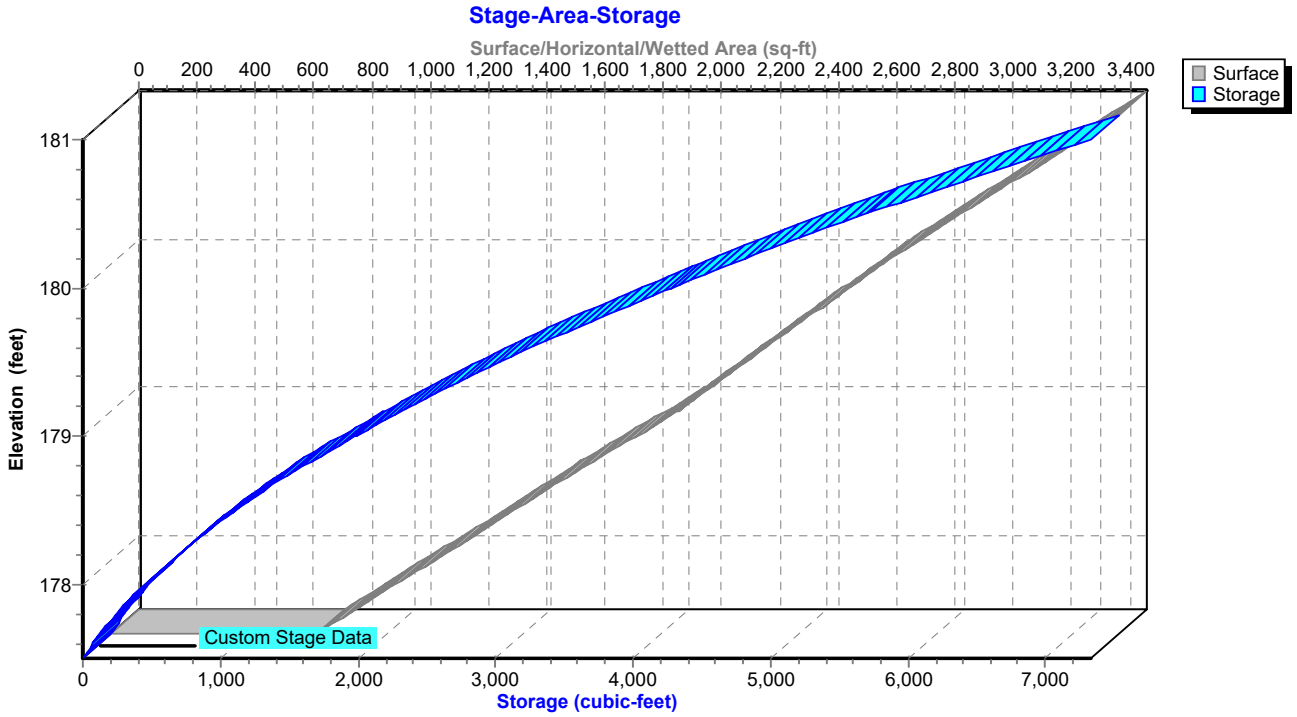
Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Summary for Pond 30P: Split

[57] Hint: Peaked at 179.10' (Flood elevation advised)

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 0.50" for 5 year event
Inflow = 3.74 cfs @ 8.00 hrs, Volume= 83,644 cf
Outflow = 3.74 cfs @ 8.00 hrs, Volume= 83,644 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.25 cfs @ 8.00 hrs, Volume= 83,309 cf
Routed to Pond 28P : PUBLIC WORKS EXTENDED DRY BASIN
Secondary = 0.50 cfs @ 8.00 hrs, Volume= 335 cf
Routed to Link 27L : COMBINED OUTFLOW

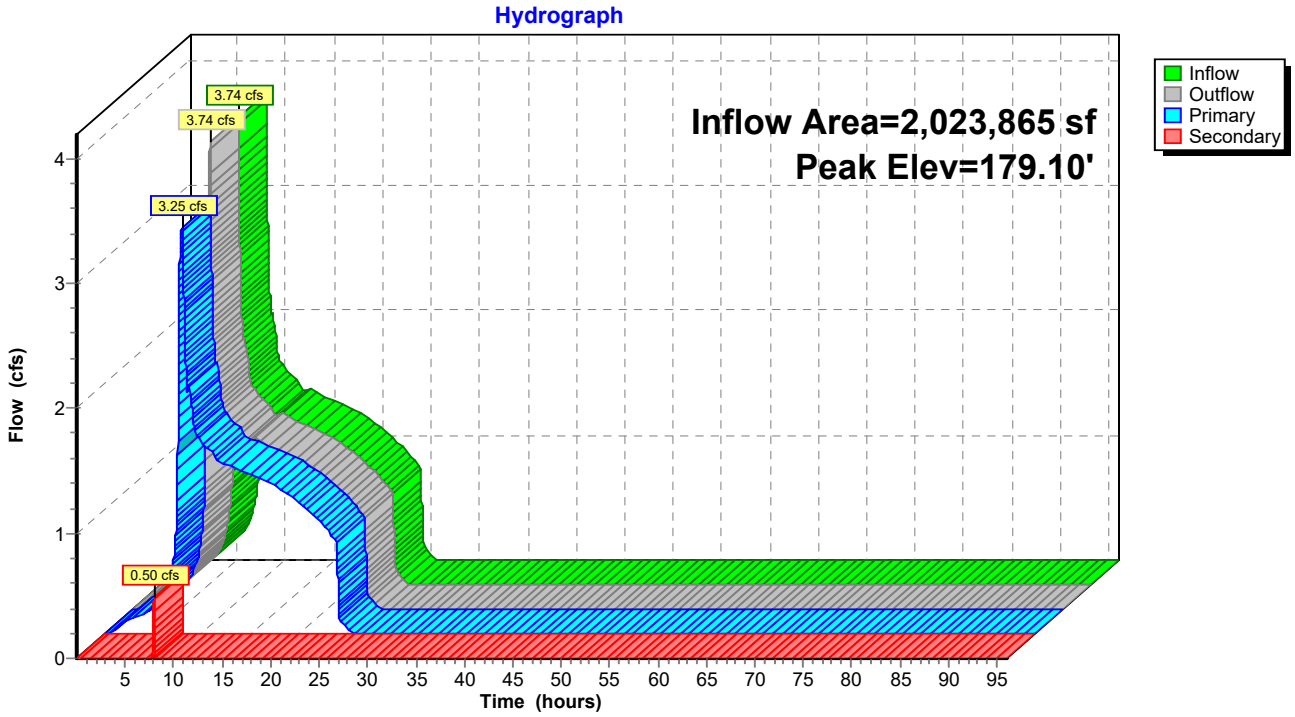
Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 179.10' @ 8.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	177.86'	**12.0" Round Culvert-E-W pond** L= 26.8' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0134 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	177.86'	**18.0" Round Culvert-Bypass** L= 26.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0136 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	179.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

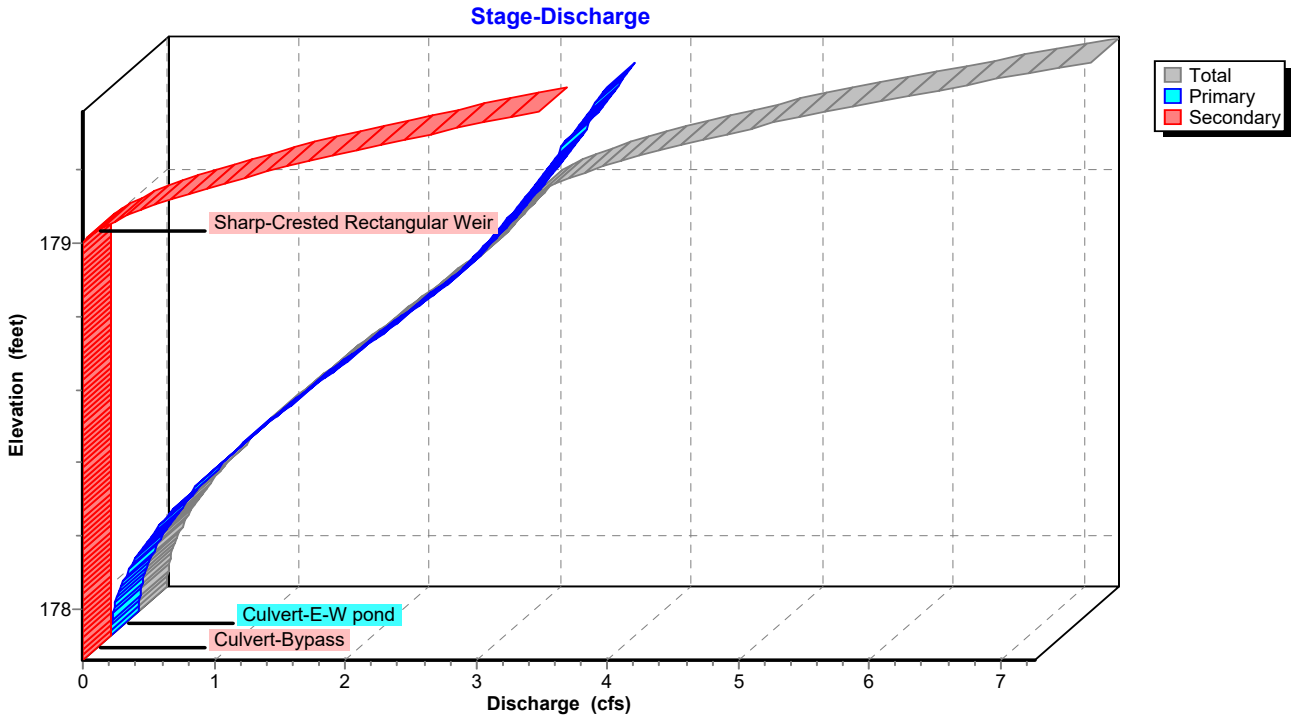
Primary OutFlow Max=3.25 cfs @ 8.00 hrs HW=179.10' (Free Discharge)
↑—**1=Culvert-E-W pond** (Inlet Controls 3.25 cfs @ 4.13 fps)

Secondary OutFlow Max=0.49 cfs @ 8.00 hrs HW=179.10' (Free Discharge)
↑—**2=Culvert-Bypass** (Passes 0.49 cfs of 5.44 cfs potential flow)
↑—**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.49 cfs @ 1.02 fps)

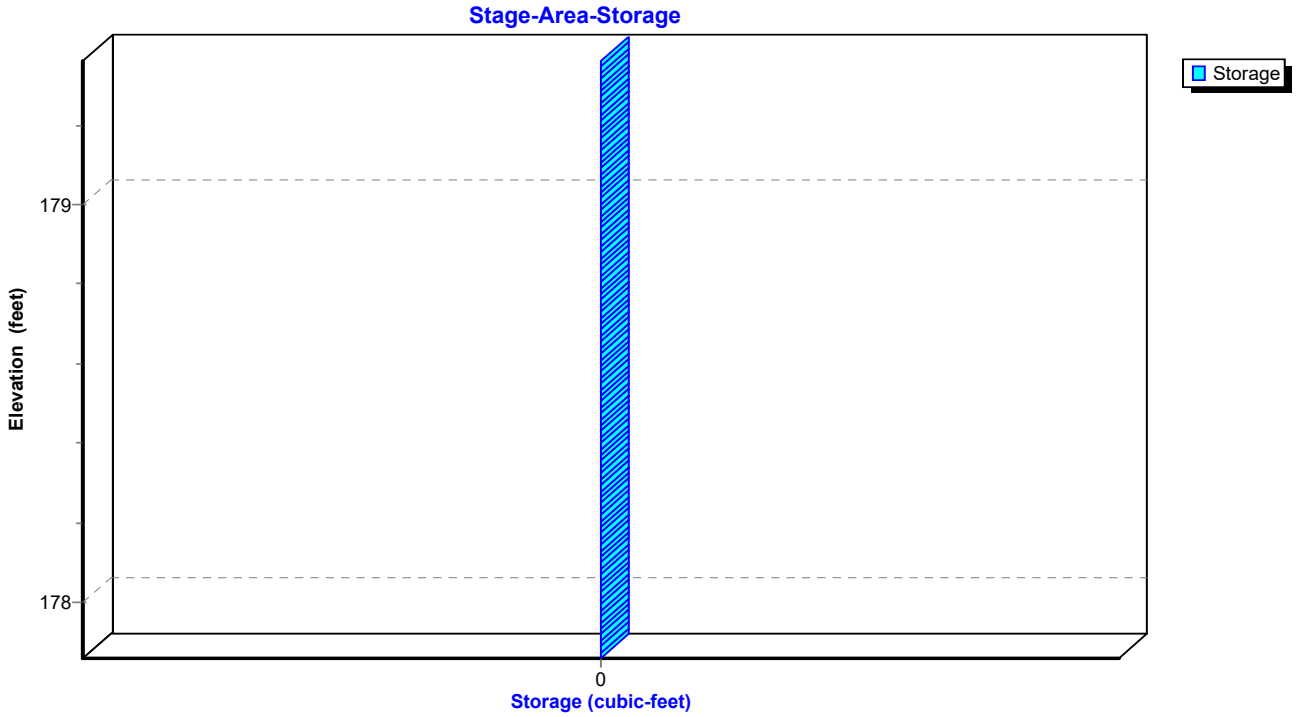
Pond 30P: Split



Pond 30P: Split



Pond 30P: Split



Summary for Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

Inflow Area = 713,673 sf, 87.08% Impervious, Inflow Depth = 2.65" for 5 year event
Inflow = 8.82 cfs @ 7.91 hrs, Volume= 157,727 cf
Outflow = 1.91 cfs @ 12.10 hrs, Volume= 157,727 cf, Atten= 78%, Lag= 251.6 min
Discarded = 1.68 cfs @ 5.50 hrs, Volume= 146,230 cf
Primary = 0.23 cfs @ 12.10 hrs, Volume= 11,498 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 200.81' @ 12.10 hrs Surf.Area= 7,239 sf Storage= 35,283 cf

Plug-Flow detention time= 187.6 min calculated for 157,727 cf (100% of inflow)
Center-of-Mass det. time= 187.6 min (908.7 - 721.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	192.75'	18,097 cf	**37.58'W x 192.62'L x 9.00'H Field A** 65,153 cf Overall - 19,910 cf Embedded = 45,242 cf x 40.0% Voids
#2A	195.75'	19,910 cf	**ADS_StormTech MC-4500 b +Cap**x 184 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 184 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		38,007 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.75'	**15.0" Round Culvert** L= 14.6' Ke= 0.600 Inlet / Outlet Invert= 195.75' / 195.60' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	195.75'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	201.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	192.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 5.50 hrs HW=192.84' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.68 cfs)

Primary OutFlow Max=0.23 cfs @ 12.10 hrs HW=200.81' (Free Discharge)
└**1=Culvert** (Passes 0.23 cfs of 11.66 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.23 cfs @ 10.74 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 39P: MC 4500 UNDERGROUND DETENTION WEST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

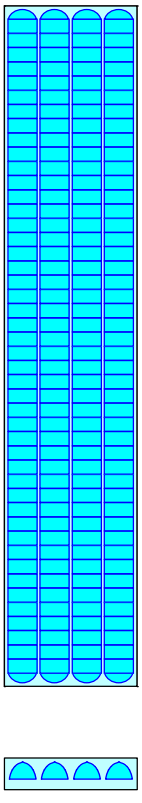
46 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 190.62' Row Length +12.0" End Stone x 2 = 192.62' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
36.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 9.00' Field Height

184 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 19,910.2 cf Chamber Storage

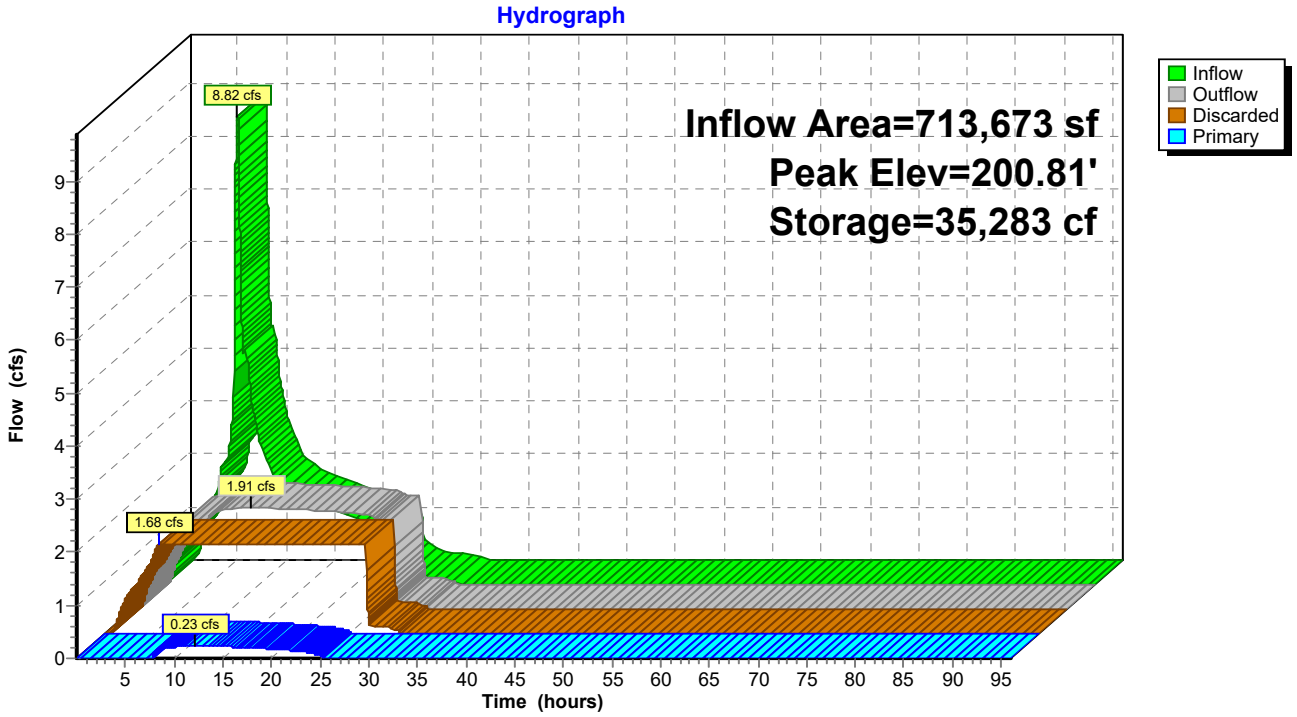
65,152.6 cf Field - 19,910.2 cf Chambers = 45,242.3 cf Stone x 40.0% Voids = 18,096.9 cf Stone Storage

Chamber Storage + Stone Storage = 38,007.2 cf = 0.873 af
Overall Storage Efficiency = 58.3%
Overall System Size = 192.62' x 37.58' x 9.00'

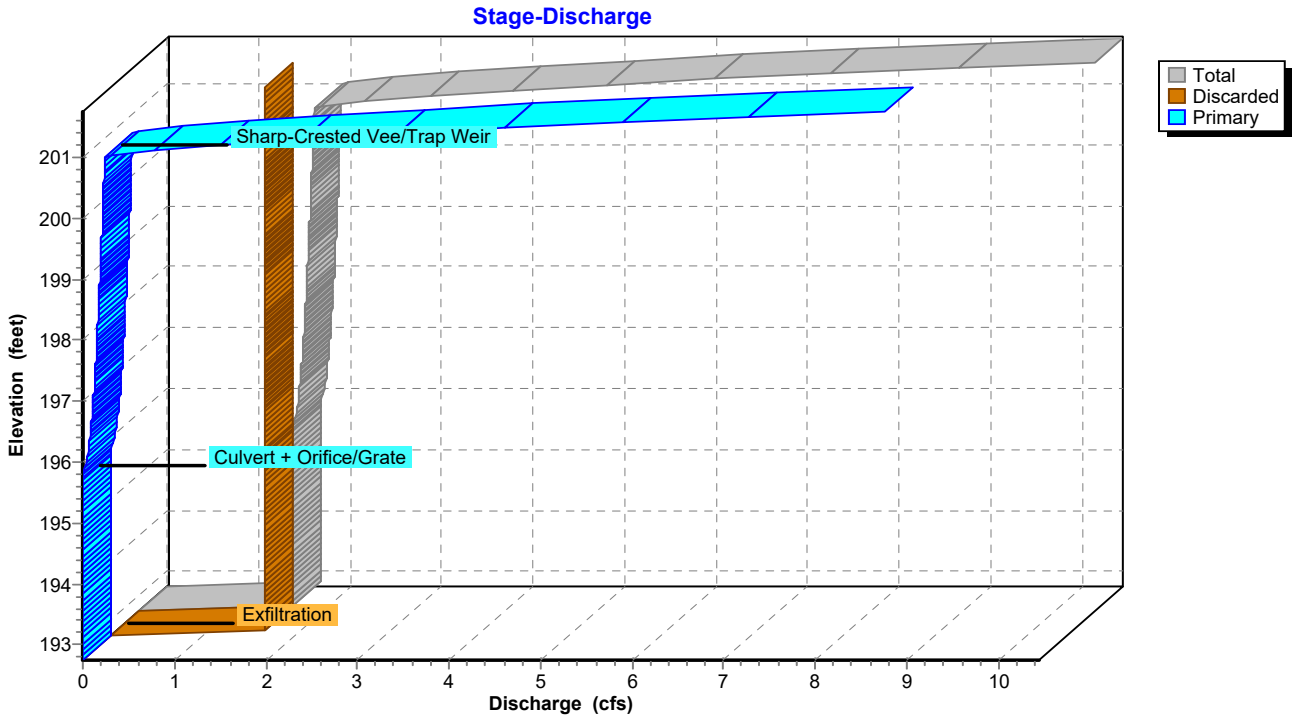
184 Chambers
2,413.1 cy Field
1,675.6 cy Stone



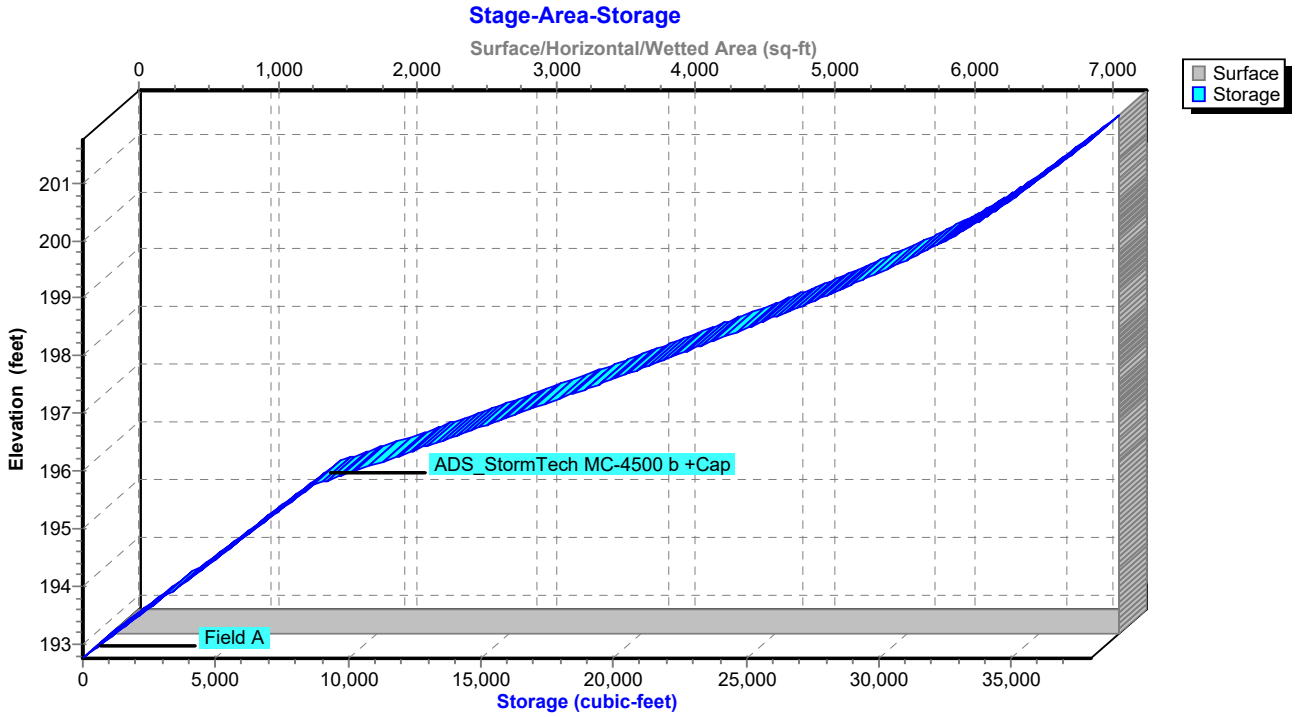
Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

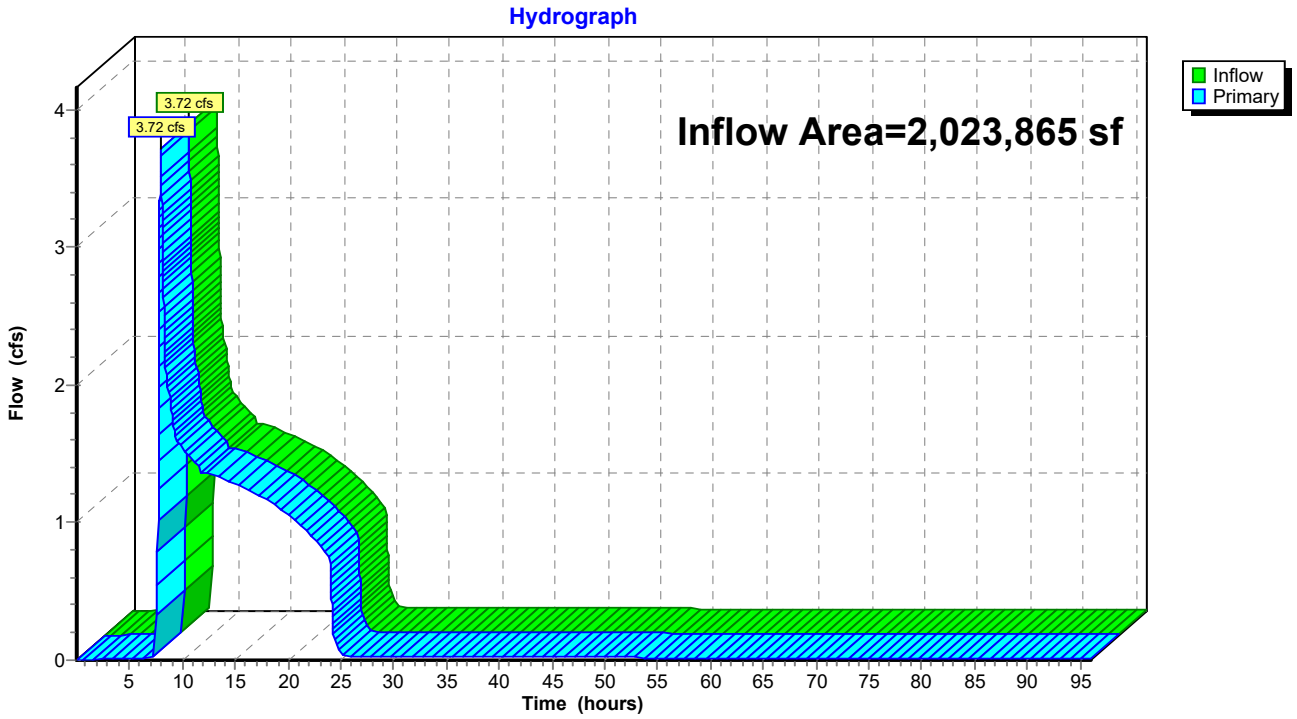


Summary for Link 27L: COMBINED OUTFLOW

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth > 0.49" for 5 year event
Inflow = 3.72 cfs @ 8.00 hrs, Volume= 82,511 cf
Primary = 3.72 cfs @ 8.00 hrs, Volume= 82,511 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 27L: COMBINED OUTFLOW



Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment35S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=1.27"
Tc=5.0 min CN=75/0 Runoff=3.11 cfs 55,354 cf

Pond 21P: MC 4500 UNDERGROUND Peak Elev=214.34' Storage=0.615 af Inflow=8.72 cfs 131,362 cf
Discarded=1.33 cfs 114,648 cf Primary=0.95 cfs 16,714 cf Outflow=2.27 cfs 131,362 cf

Pond 28P: PUBLIC WORKS EXTENDED Peak Elev=180.76' Storage=6,512 cf Inflow=3.43 cfs 112,349 cf
Outflow=3.42 cfs 111,167 cf

Pond 30P: Split Peak Elev=179.18' Inflow=4.69 cfs 116,112 cf
Primary=3.43 cfs 112,349 cf Secondary=1.26 cfs 3,763 cf Outflow=4.69 cfs 116,112 cf

Pond 39P: MC 4500 UNDERGROUND Peak Elev=201.26' Storage=36,584 cf Inflow=10.21 cfs 177,874 cf
Discarded=1.68 cfs 154,084 cf Primary=1.98 cfs 23,790 cf Outflow=3.66 cfs 177,874 cf

Link 27L: COMBINED OUTFLOW Inflow=4.69 cfs 114,930 cf
Primary=4.69 cfs 114,930 cf

Total Runoff Area = 524,462 sf Runoff Volume = 55,354 cf Average Runoff Depth = 1.27"
100.00% Pervious = 524,462 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 35S: Future E-W Expansion

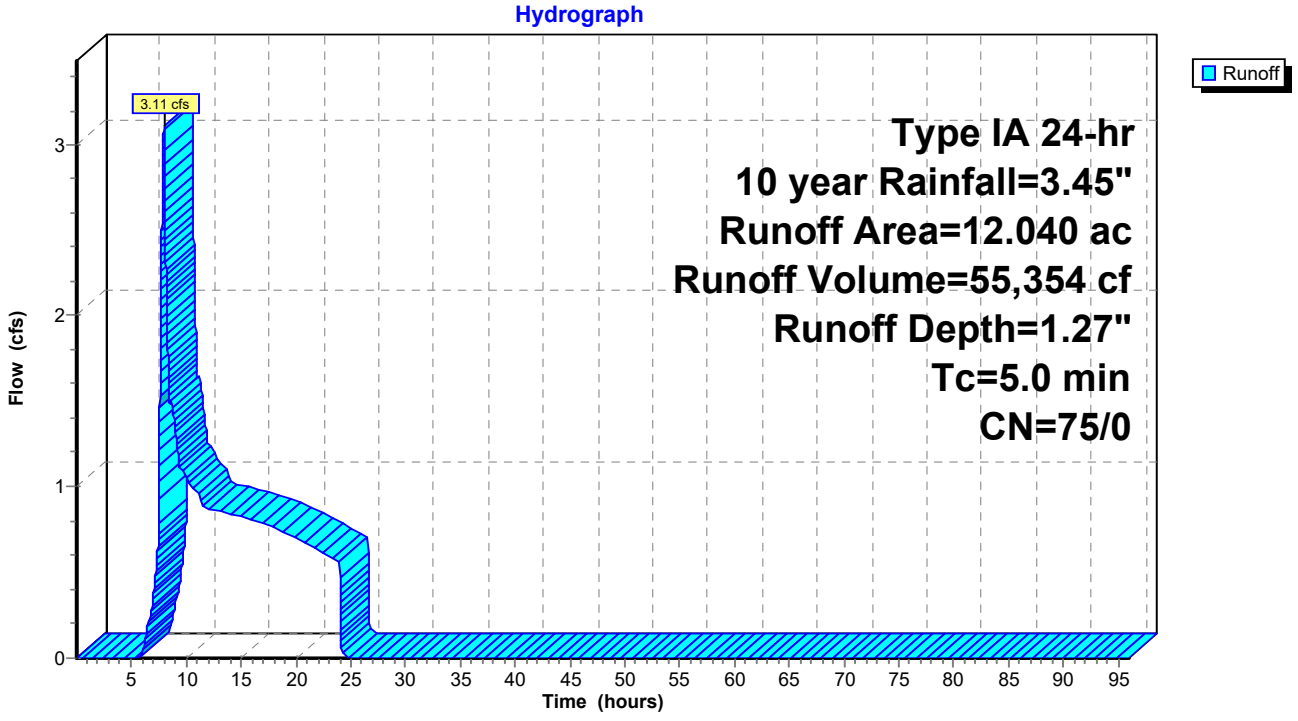
Runoff = 3.11 cfs @ 8.00 hrs, Volume= 55,354 cf, Depth= 1.27"
Routed to Pond 30P : Split

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 year Rainfall=3.45"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 35S: Future E-W Expansion



Summary for Pond 21P: MC 4500 UNDERGROUND DETENTION EAST

Inflow Area = 691,085 sf, 58.52% Impervious, Inflow Depth = 2.28" for 10 year event
Inflow = 8.72 cfs @ 7.91 hrs, Volume= 131,362 cf
Outflow = 2.27 cfs @ 9.71 hrs, Volume= 131,362 cf, Atten= 74%, Lag= 107.9 min
Discarded = 1.33 cfs @ 5.73 hrs, Volume= 114,648 cf
Primary = 0.95 cfs @ 9.71 hrs, Volume= 16,714 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 214.34' @ 9.71 hrs Surf.Area= 0.131 ac Storage= 0.615 af

Plug-Flow detention time= 182.6 min calculated for 131,349 cf (100% of inflow)
Center-of-Mass det. time= 182.5 min (903.1 - 720.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	206.75'	0.290 af	**37.58'W x 152.37'L x 8.25'H Field A** 1.085 af Overall - 0.359 af Embedded = 0.725 af x 40.0% Voids
#2A	209.00'	0.359 af	**ADS_StormTech MC-4500 b +Cap**x 144 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 144 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		0.649 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**15.0" Round Culvert** L= 17.4' Ke= 0.600 Inlet / Outlet Invert= 209.00' / 208.54' S= 0.0264 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	209.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	214.20'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	206.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.33 cfs @ 5.73 hrs HW=206.83' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.33 cfs)

Primary OutFlow Max=0.94 cfs @ 9.71 hrs HW=214.34' (Free Discharge)
└**1=Culvert** (Passes 0.94 cfs of 12.03 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.24 cfs @ 11.04 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.70 cfs @ 1.24 fps)

Pond 21P: MC 4500 UNDERGROUND DETENTION EAST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

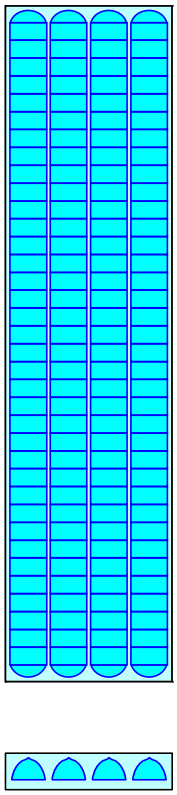
36 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 150.37' Row Length +12.0" End Stone x 2 = 152.37' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
27.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 8.25' Field Height

144 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 15,650.6 cf Chamber Storage

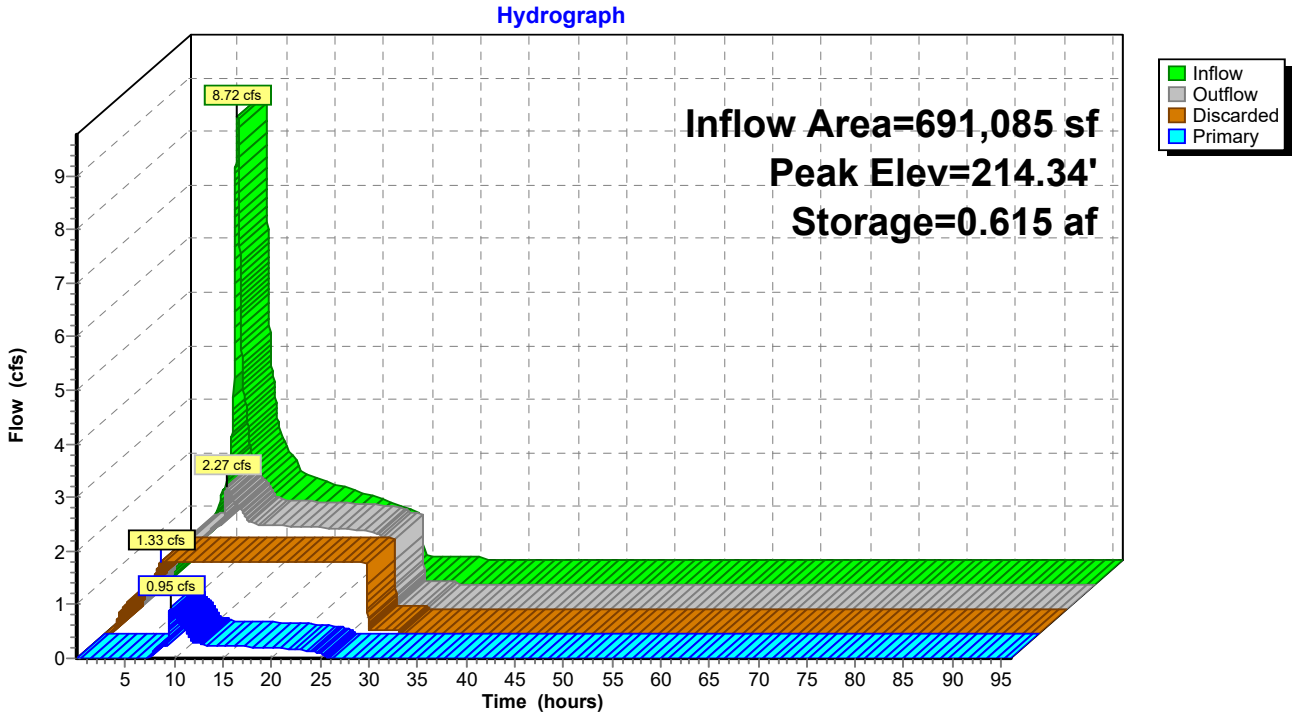
47,243.2 cf Field - 15,650.6 cf Chambers = 31,592.6 cf Stone x 40.0% Voids = 12,637.0 cf Stone Storage

Chamber Storage + Stone Storage = 28,287.6 cf = 0.649 af
Overall Storage Efficiency = 59.9%
Overall System Size = 152.37' x 37.58' x 8.25'

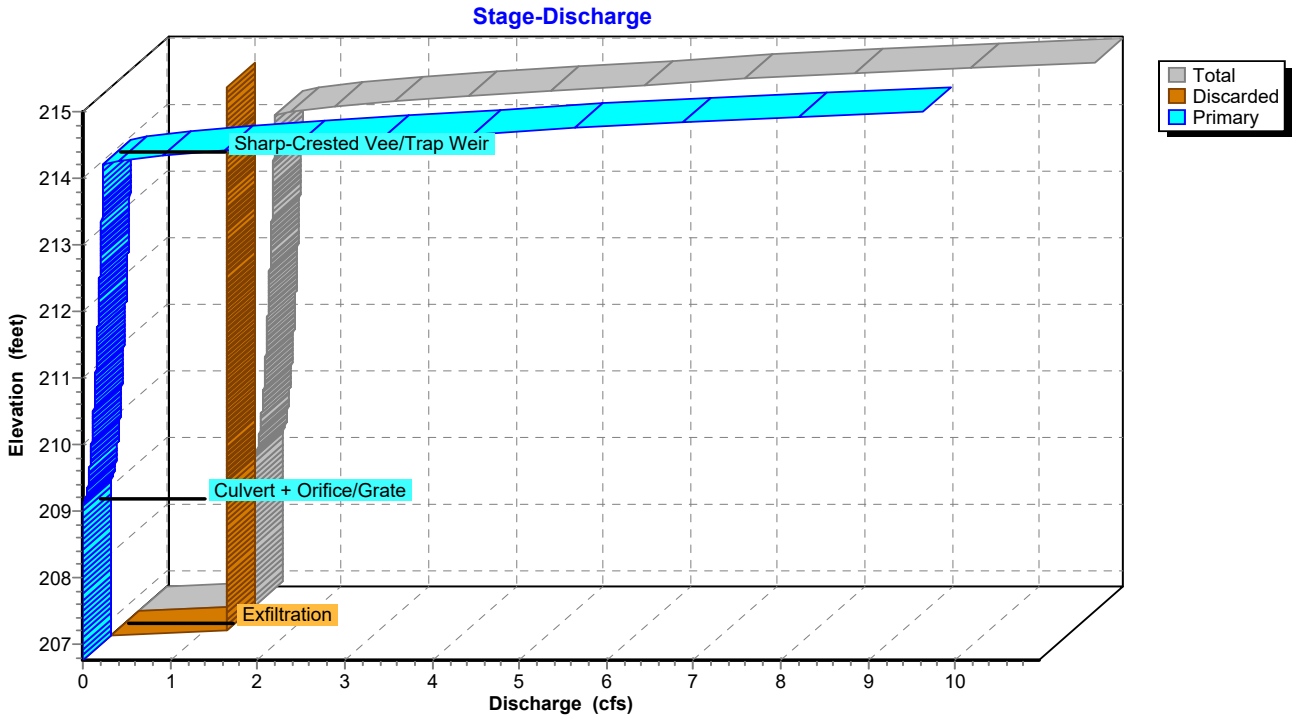
144 Chambers
1,749.7 cy Field
1,170.1 cy Stone



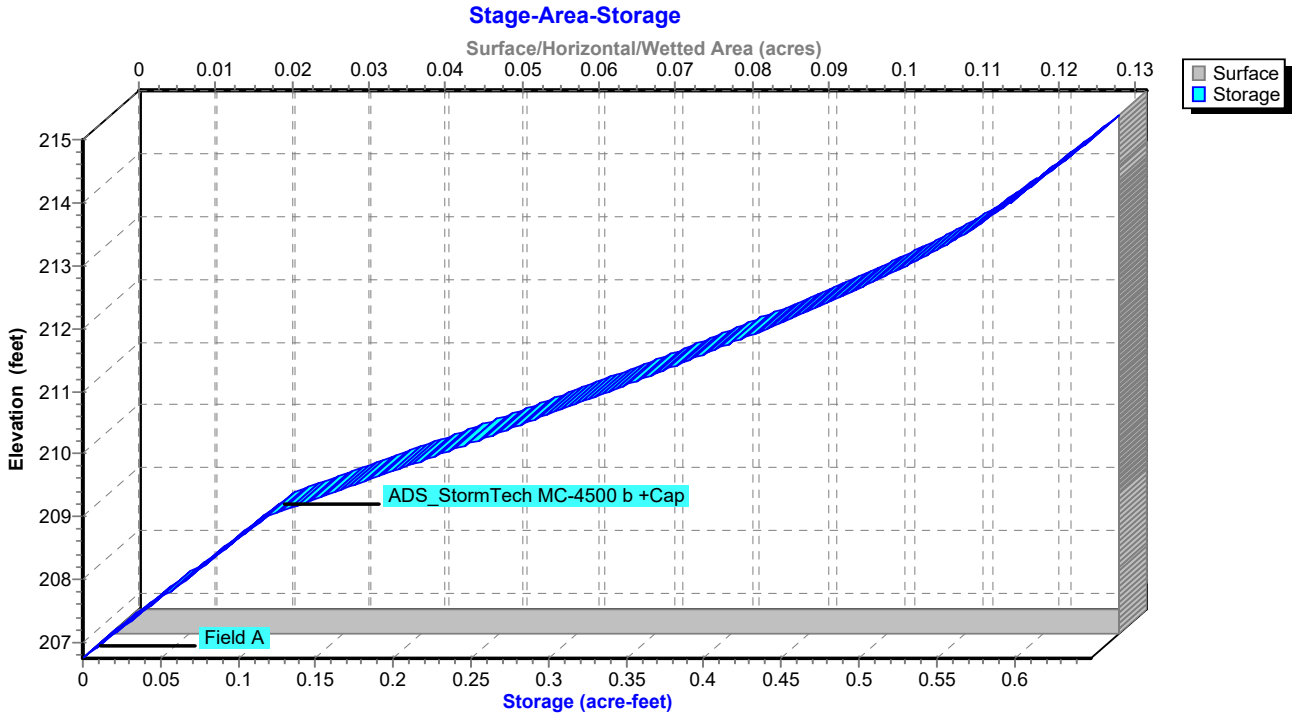
Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Summary for Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN

[81] Warning: Exceeded Pond 30P by 2.64' @ 26.45 hrs

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 0.67" for 10 year event
Inflow = 3.43 cfs @ 8.00 hrs, Volume= 112,349 cf
Outflow = 3.42 cfs @ 8.01 hrs, Volume= 111,167 cf, Atten= 0%, Lag= 0.5 min
Primary = 3.42 cfs @ 8.01 hrs, Volume= 111,167 cf
Routed to Link 27L : COMBINED OUTFLOW

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 180.76' @ 8.01 hrs Surf.Area= 3,261 sf Storage= 6,512 cf

Plug-Flow detention time= 145.7 min calculated for 111,155 cf (99% of inflow)
Center-of-Mass det. time= 139.0 min (963.9 - 825.0)

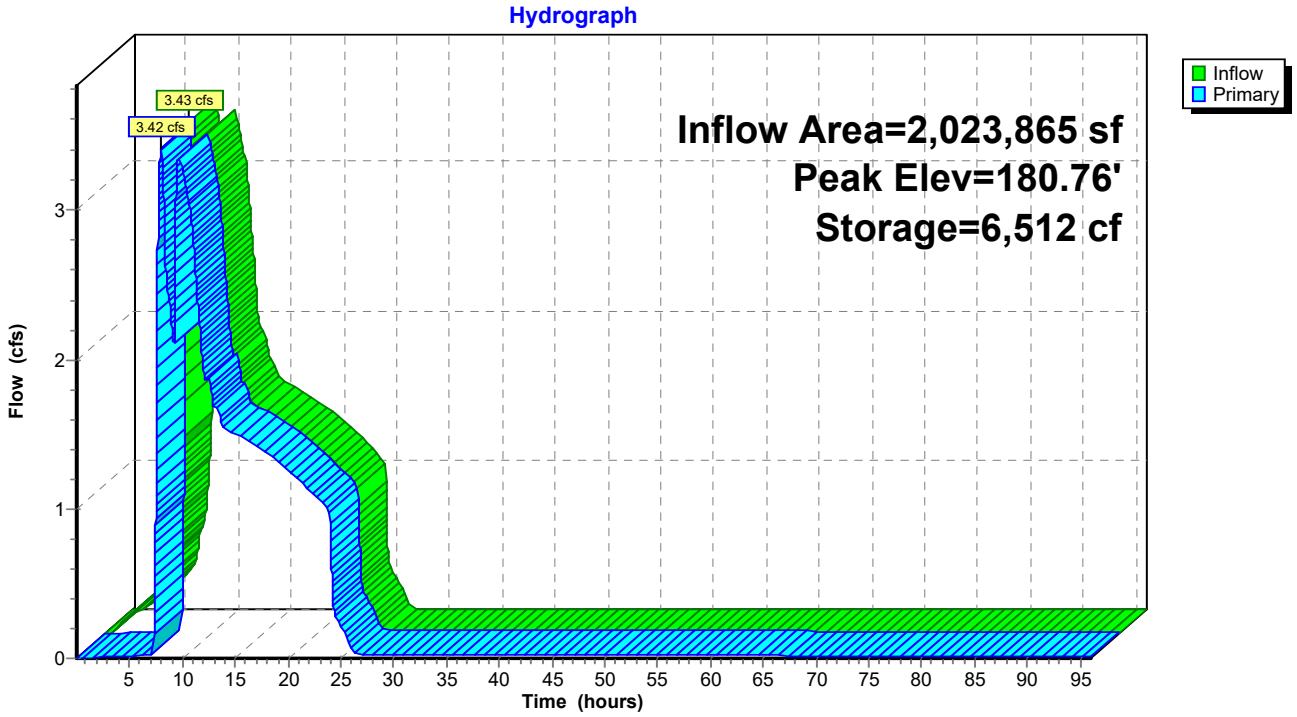
Volume	Invert	Avail.Storage	Storage Description
#1	177.50'	7,328 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	708	0	0
178.50	1,519	1,114	1,114
179.00	1,943	866	1,979
180.00	2,648	2,296	4,275
181.00	3,458	3,053	7,328

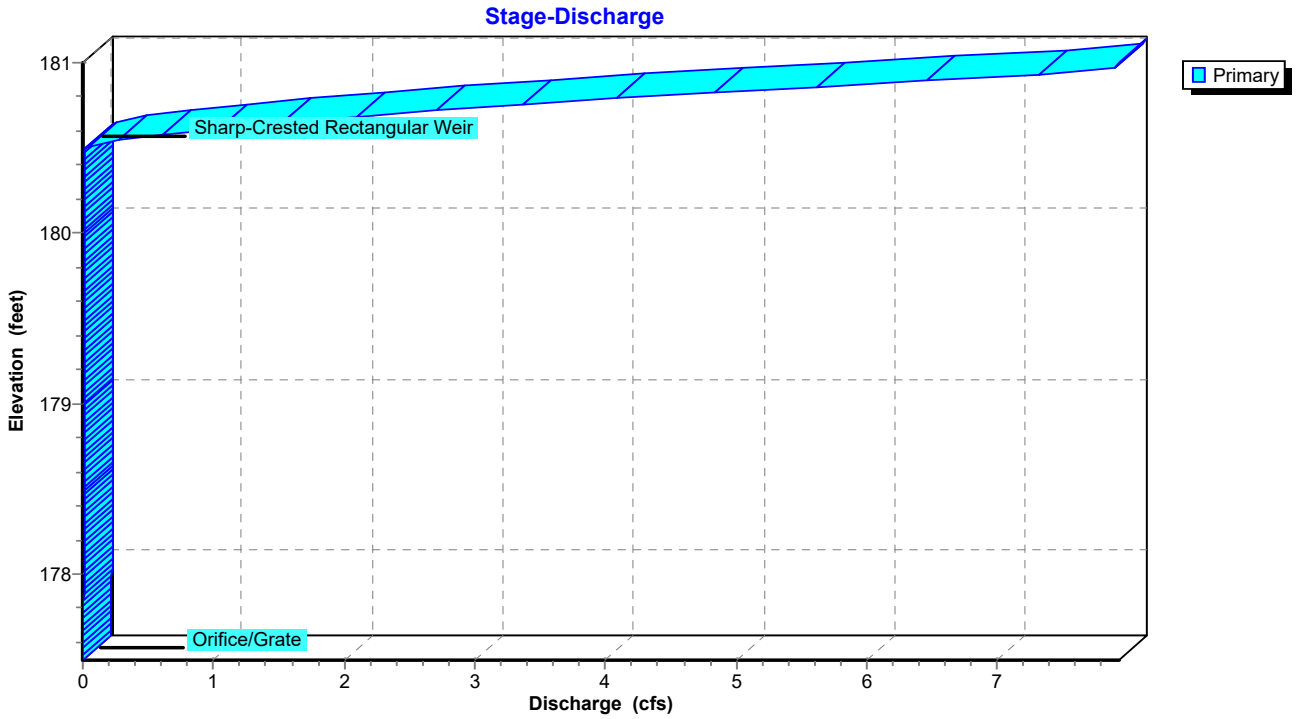
Device	Routing	Invert	Outlet Devices
#1	Primary	175.50'	**12.0" Round Culvert** L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 175.50' / 174.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	177.50'	**0.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	180.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=3.42 cfs @ 8.01 hrs HW=180.76' (Free Discharge)
└**1=Culvert** (Passes 3.42 cfs of 7.73 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 8.65 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 3.39 cfs @ 1.66 fps)

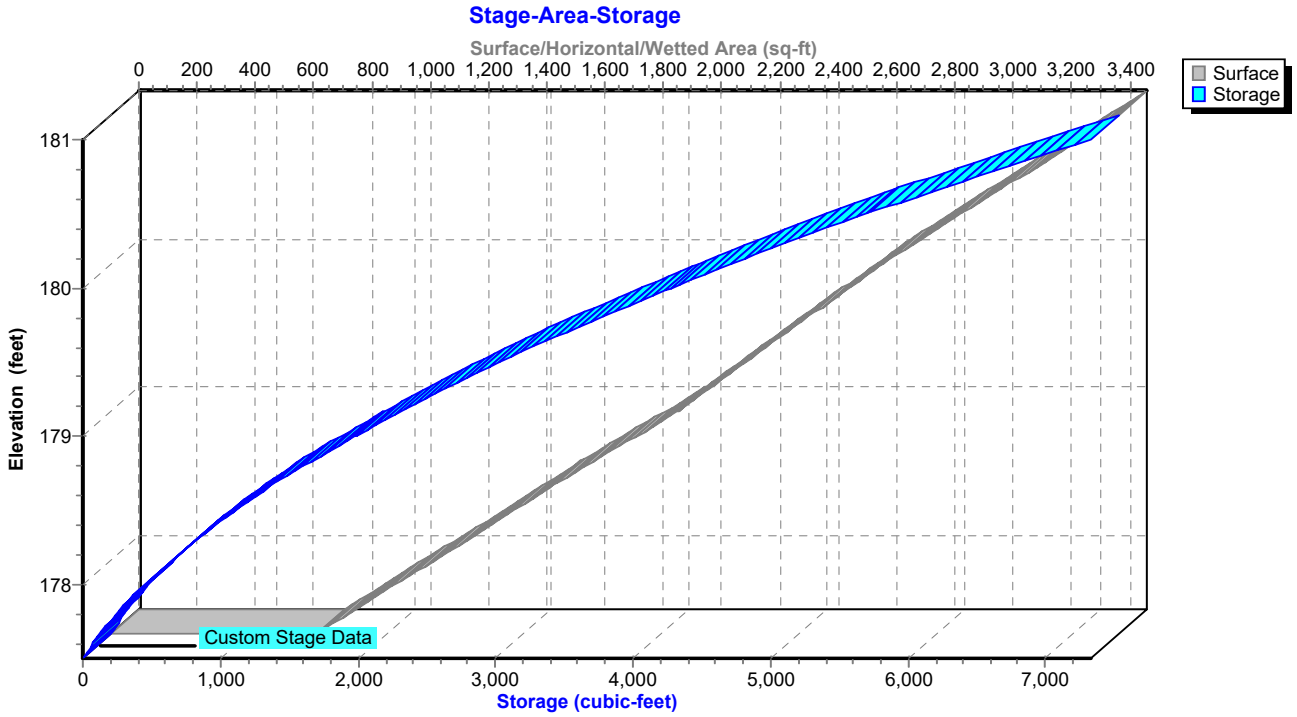
Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Summary for Pond 30P: Split

[57] Hint: Peaked at 179.18' (Flood elevation advised)

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 0.69" for 10 year event
Inflow = 4.69 cfs @ 8.00 hrs, Volume= 116,112 cf
Outflow = 4.69 cfs @ 8.00 hrs, Volume= 116,112 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.43 cfs @ 8.00 hrs, Volume= 112,349 cf
Routed to Pond 28P : PUBLIC WORKS EXTENDED DRY BASIN
Secondary = 1.26 cfs @ 8.00 hrs, Volume= 3,763 cf
Routed to Link 27L : COMBINED OUTFLOW

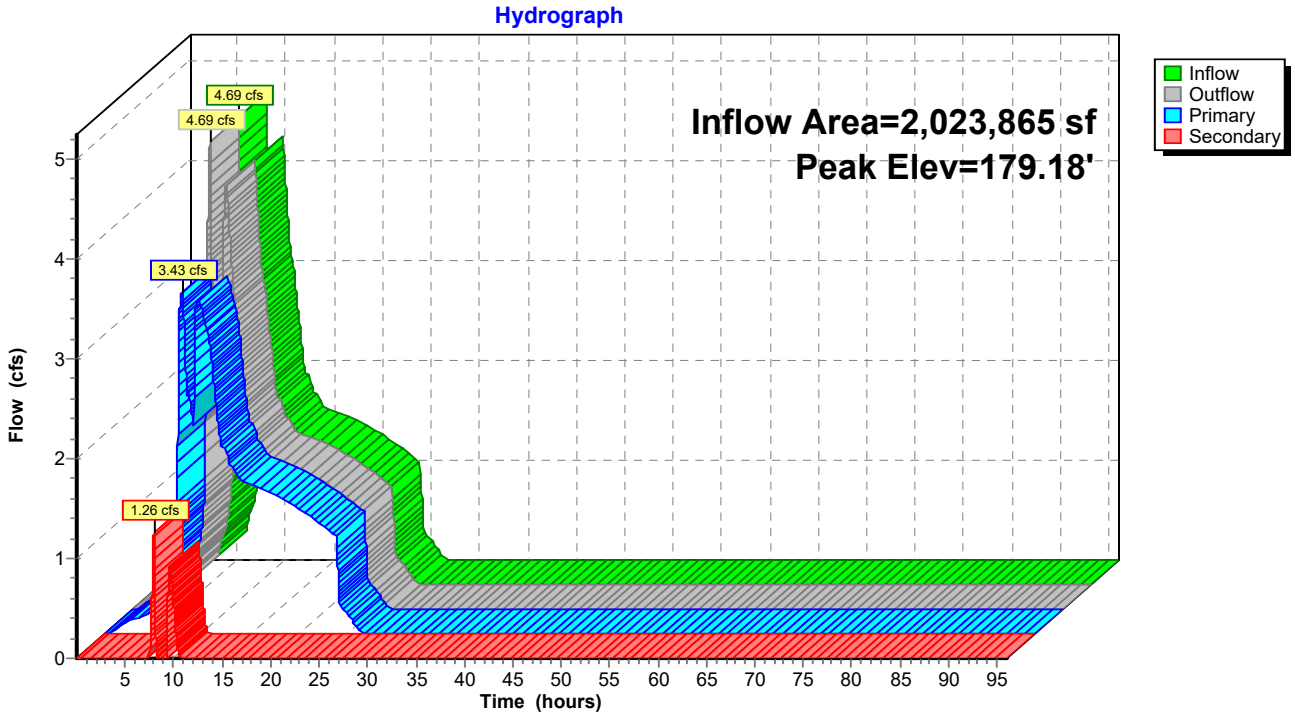
Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 179.18' @ 8.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	177.86'	**12.0" Round Culvert-E-W pond** L= 26.8' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0134 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	177.86'	**18.0" Round Culvert-Bypass** L= 26.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0136 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	179.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

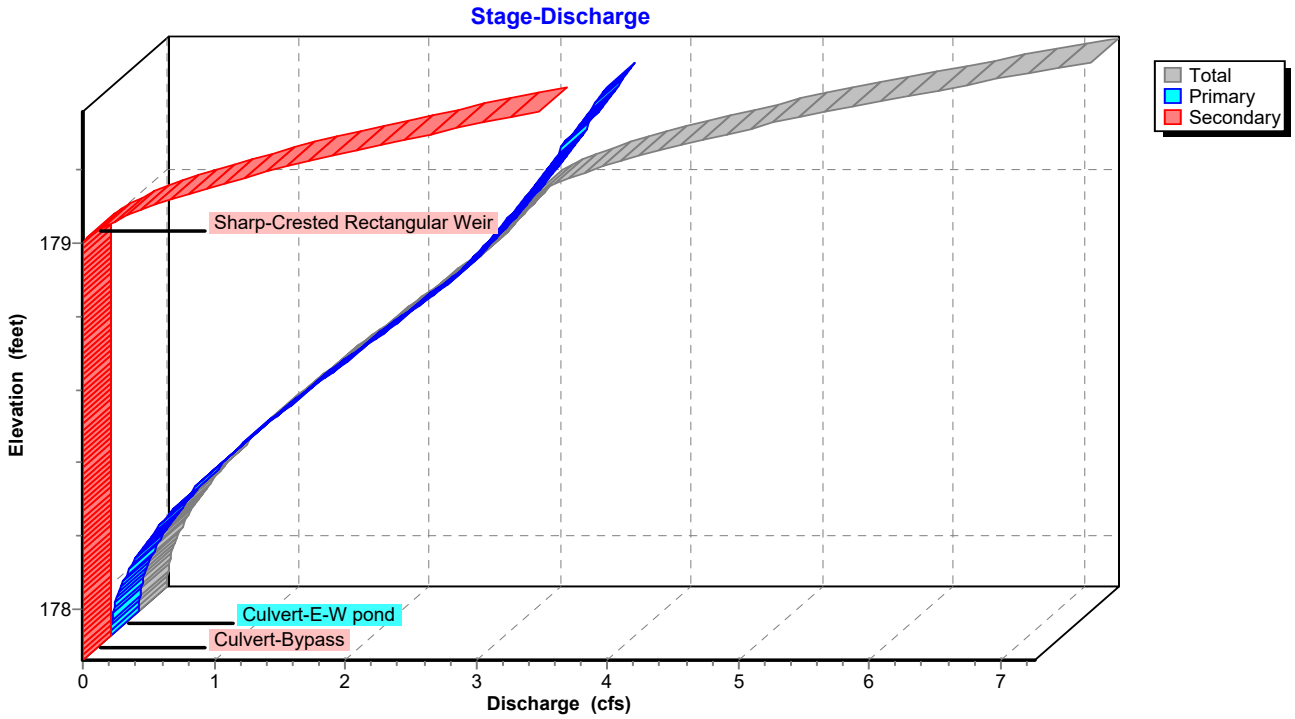
Primary OutFlow Max=3.43 cfs @ 8.00 hrs HW=179.18' (Free Discharge)
└**1=Culvert-E-W pond** (Inlet Controls 3.43 cfs @ 4.37 fps)

Secondary OutFlow Max=1.26 cfs @ 8.00 hrs HW=179.18' (Free Discharge)
└**2=Culvert-Bypass** (Passes 1.26 cfs of 6.00 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.26 cfs @ 1.40 fps)

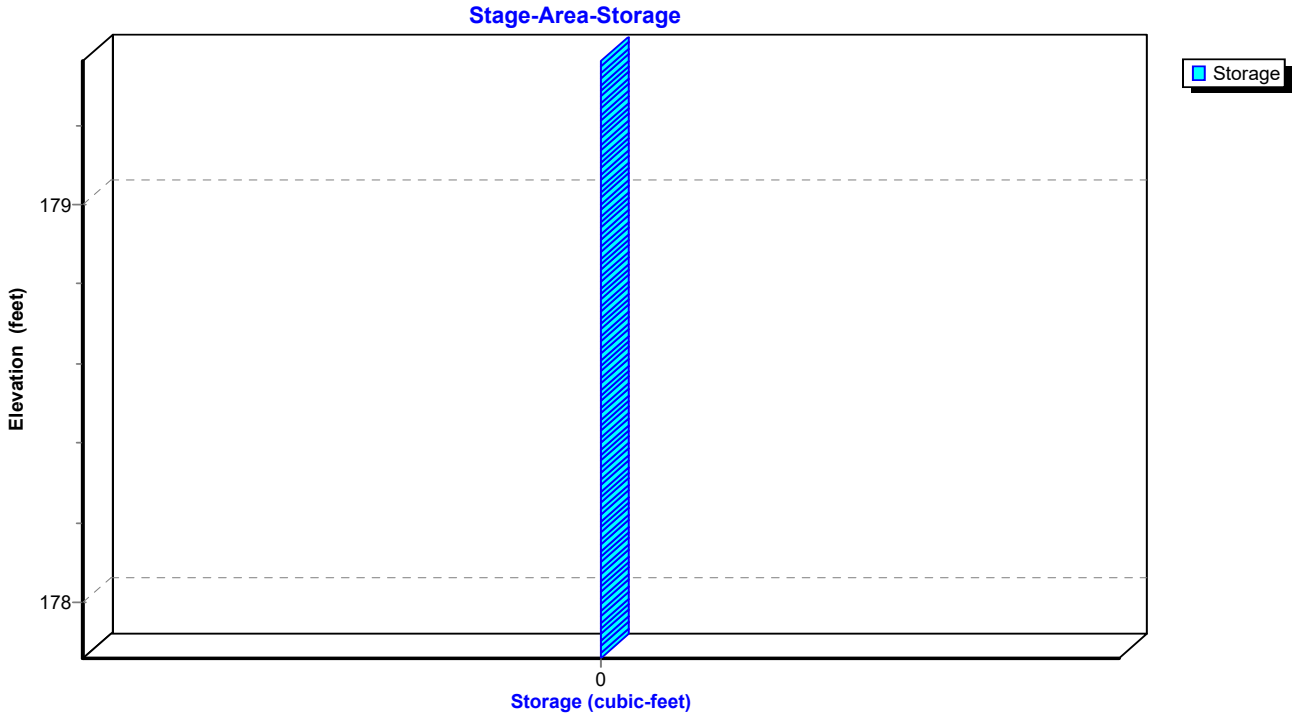
Pond 30P: Split



Pond 30P: Split



Pond 30P: Split



Summary for Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

Inflow Area = 713,673 sf, 87.08% Impervious, Inflow Depth = 2.99" for 10 year event
Inflow = 10.21 cfs @ 7.94 hrs, Volume= 177,874 cf
Outflow = 3.66 cfs @ 9.47 hrs, Volume= 177,874 cf, Atten= 64%, Lag= 91.6 min
Discarded = 1.68 cfs @ 5.06 hrs, Volume= 154,084 cf
Primary = 1.98 cfs @ 9.47 hrs, Volume= 23,790 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 201.26' @ 9.47 hrs Surf.Area= 7,239 sf Storage= 36,584 cf

Plug-Flow detention time= 194.0 min calculated for 177,874 cf (100% of inflow)
Center-of-Mass det. time= 194.0 min (909.9 - 715.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	192.75'	18,097 cf	**37.58'W x 192.62'L x 9.00'H Field A** 65,153 cf Overall - 19,910 cf Embedded = 45,242 cf x 40.0% Voids
#2A	195.75'	19,910 cf	**ADS_StormTech MC-4500 b +Cap**x 184 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 184 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		38,007 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.75'	**15.0" Round Culvert** L= 14.6' Ke= 0.600 Inlet / Outlet Invert= 195.75' / 195.60' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	195.75'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	201.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	192.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 5.06 hrs HW=192.84' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.68 cfs)

Primary OutFlow Max=1.97 cfs @ 9.47 hrs HW=201.26' (Free Discharge)
└**1=Culvert** (Passes 1.97 cfs of 12.24 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 0.24 cfs @ 11.21 fps)
└**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.72 cfs @ 1.66 fps)

Pond 39P: MC 4500 UNDERGROUND DETENTION WEST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

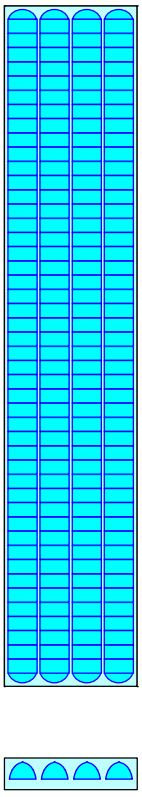
46 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 190.62' Row Length +12.0" End Stone x 2 = 192.62' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
36.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 9.00' Field Height

184 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 19,910.2 cf Chamber Storage

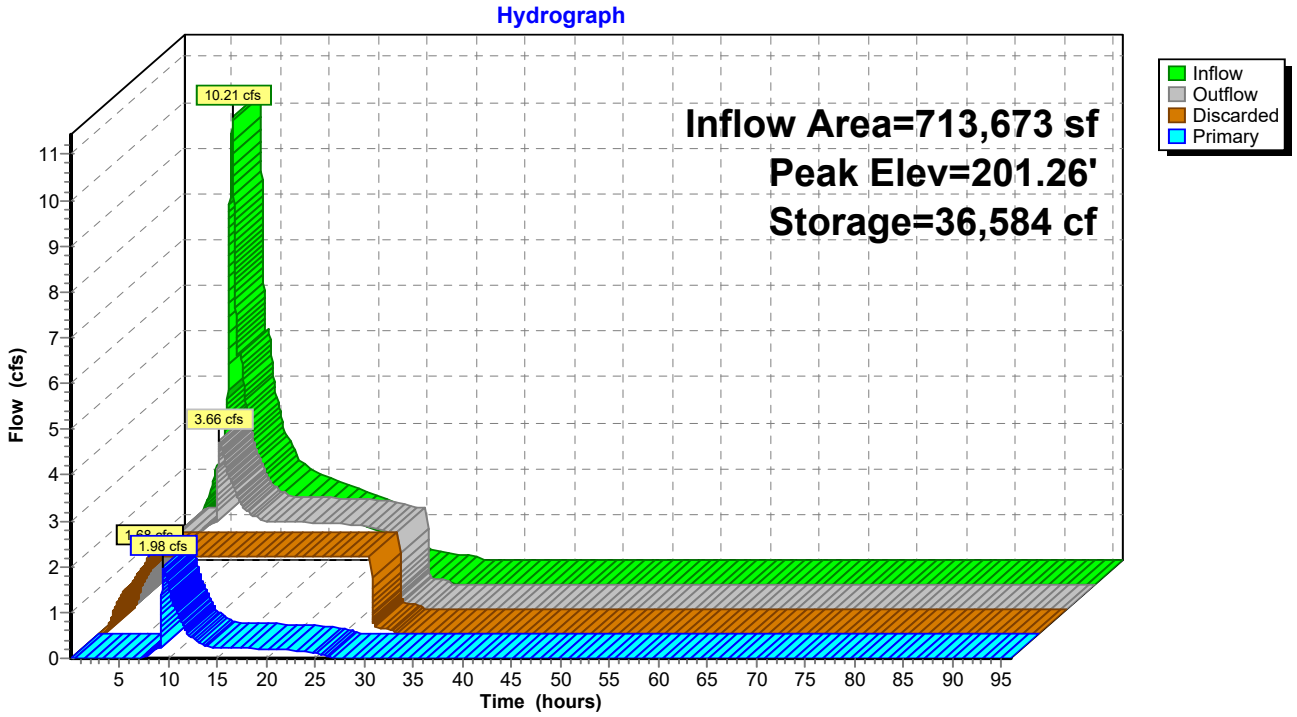
65,152.6 cf Field - 19,910.2 cf Chambers = 45,242.3 cf Stone x 40.0% Voids = 18,096.9 cf Stone Storage

Chamber Storage + Stone Storage = 38,007.2 cf = 0.873 af
Overall Storage Efficiency = 58.3%
Overall System Size = 192.62' x 37.58' x 9.00'

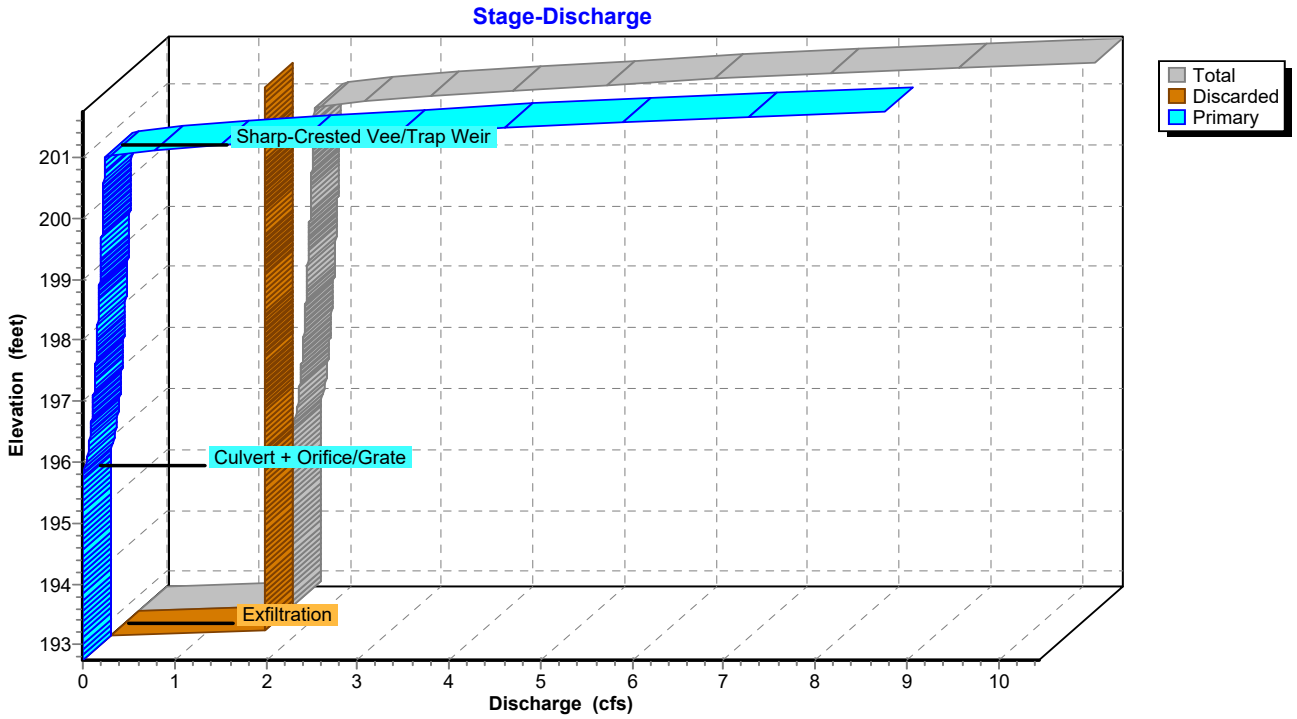
184 Chambers
2,413.1 cy Field
1,675.6 cy Stone



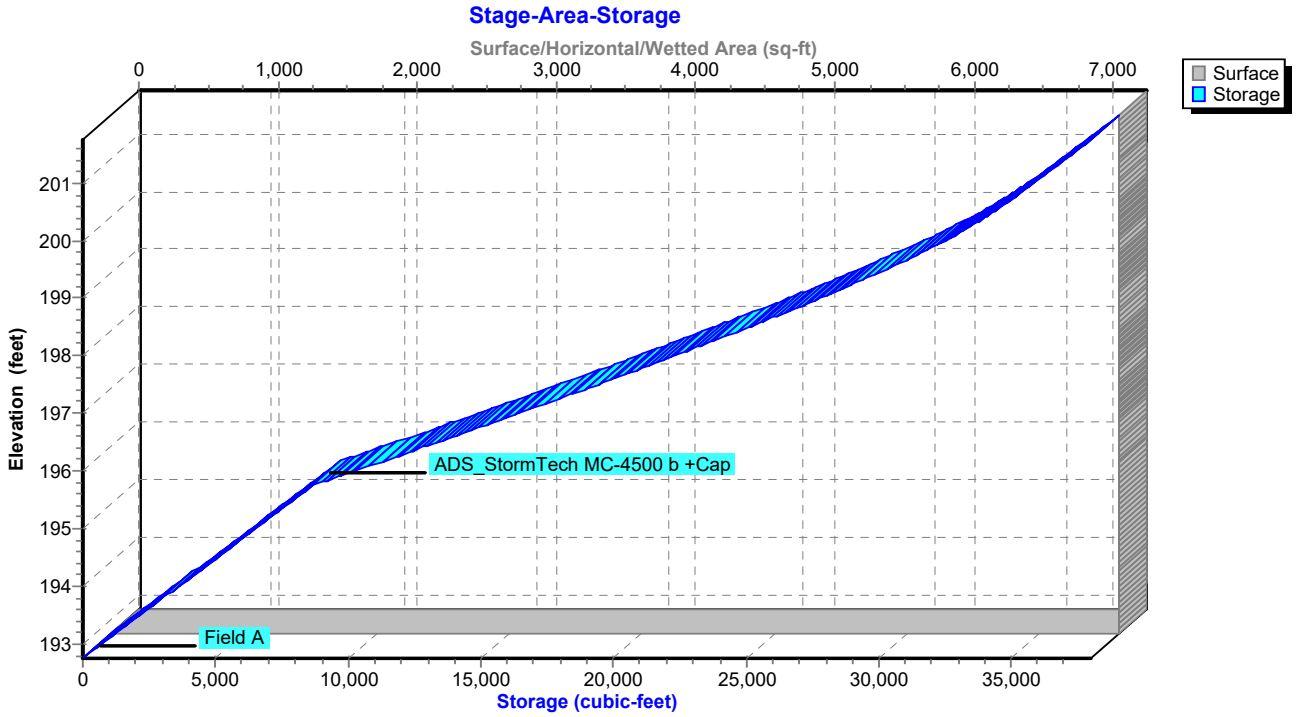
Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

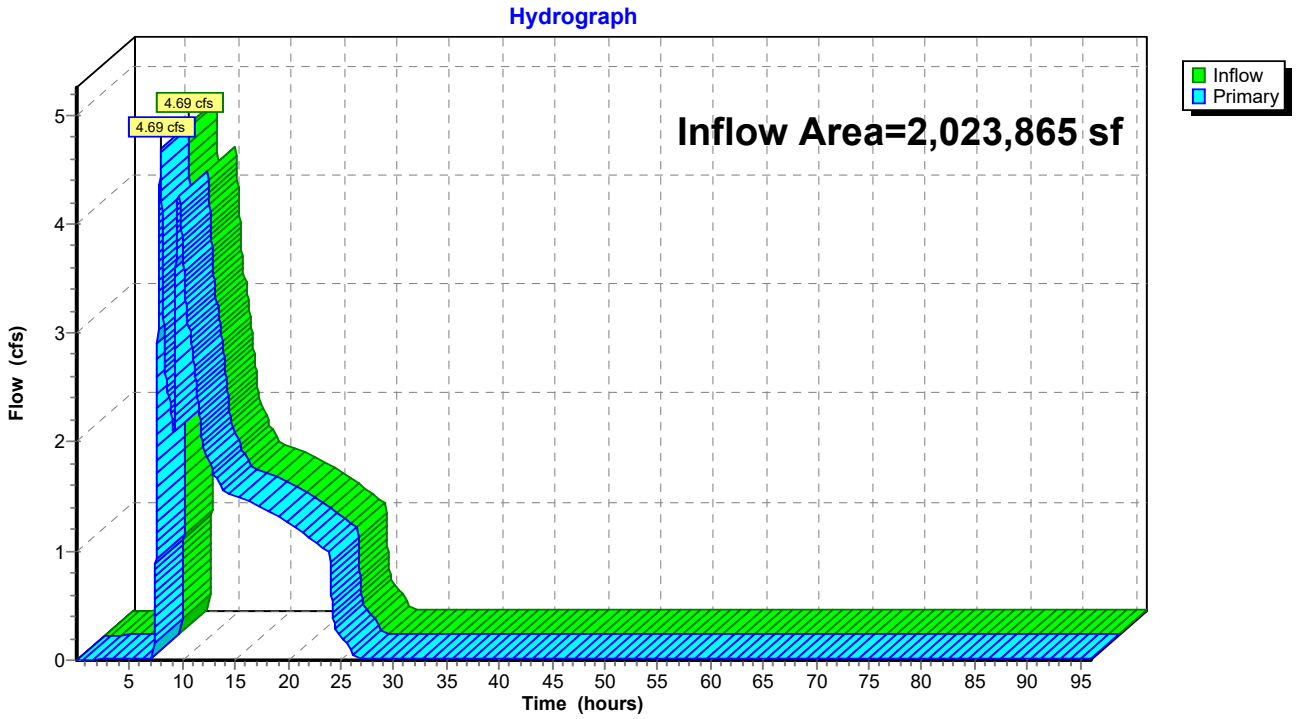


Summary for Link 27L: COMBINED OUTFLOW

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth > 0.68" for 10 year event
Inflow = 4.69 cfs @ 8.00 hrs, Volume= 114,930 cf
Primary = 4.69 cfs @ 8.00 hrs, Volume= 114,930 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 27L: COMBINED OUTFLOW



Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment35S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=1.59"
Tc=5.0 min CN=75/0 Runoff=4.12 cfs 69,581 cf

Pond 21P: MC 4500 UNDERGROUND Peak Elev=214.54' Storage=0.625 af Inflow=10.28 cfs 152,950 cf
Discarded=1.33 cfs 121,352 cf Primary=2.89 cfs 31,599 cf Outflow=4.22 cfs 152,950 cf

Pond 28P: PUBLIC WORKS EXTENDED Peak Elev=180.79' Storage=6,605 cf Inflow=4.00 cfs 140,718 cf
Outflow=3.99 cfs 139,492 cf

Pond 30P: Split Peak Elev=179.48' Inflow=9.32 cfs 166,711 cf
Primary=4.00 cfs 140,718 cf Secondary=5.32 cfs 25,992 cf Outflow=9.32 cfs 166,711 cf

Pond 39P: MC 4500 UNDERGROUND Peak Elev=201.45' Storage=37,128 cf Inflow=11.76 cfs 203,899 cf
Discarded=1.68 cfs 161,706 cf Primary=4.17 cfs 42,193 cf Outflow=5.84 cfs 203,899 cf

Link 27L: COMBINED OUTFLOW Inflow=9.30 cfs 165,484 cf
Primary=9.30 cfs 165,484 cf

Total Runoff Area = 524,462 sf Runoff Volume = 69,581 cf Average Runoff Depth = 1.59"
100.00% Pervious = 524,462 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 35S: Future E-W Expansion

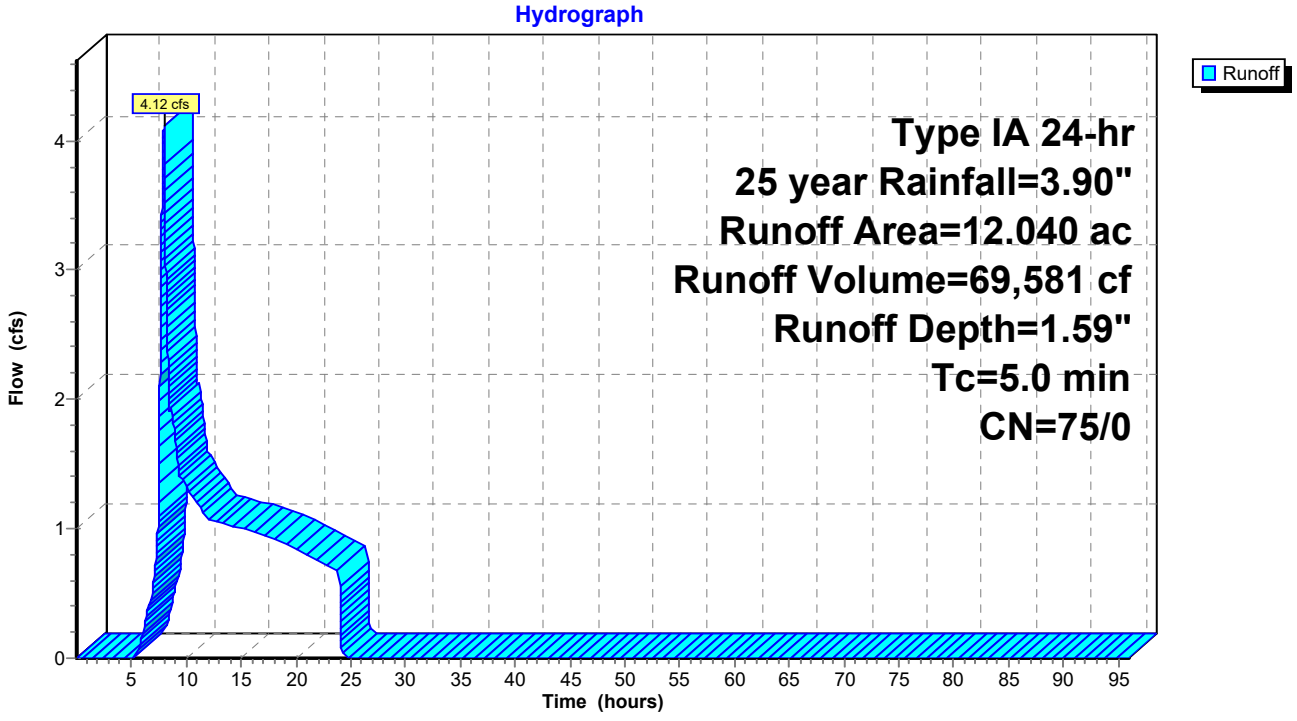
Runoff = 4.12 cfs @ 8.00 hrs, Volume= 69,581 cf, Depth= 1.59"
Routed to Pond 30P : Split

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 year Rainfall=3.90"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 35S: Future E-W Expansion



Summary for Pond 21P: MC 4500 UNDERGROUND DETENTION EAST

Inflow Area = 691,085 sf, 58.52% Impervious, Inflow Depth = 2.66" for 25 year event
Inflow = 10.28 cfs @ 7.91 hrs, Volume= 152,950 cf
Outflow = 4.22 cfs @ 8.47 hrs, Volume= 152,950 cf, Atten= 59%, Lag= 33.6 min
Discarded = 1.33 cfs @ 5.15 hrs, Volume= 121,352 cf
Primary = 2.89 cfs @ 8.47 hrs, Volume= 31,599 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 214.54' @ 8.47 hrs Surf.Area= 0.131 ac Storage= 0.625 af

Plug-Flow detention time= 179.1 min calculated for 152,934 cf (100% of inflow)
Center-of-Mass det. time= 179.1 min (894.5 - 715.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	206.75'	0.290 af	**37.58'W x 152.37'L x 8.25'H Field A** 1.085 af Overall - 0.359 af Embedded = 0.725 af x 40.0% Voids
#2A	209.00'	0.359 af	**ADS_StormTech MC-4500 b +Cap**x 144 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 144 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		0.649 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**15.0" Round Culvert** L= 17.4' Ke= 0.600 Inlet / Outlet Invert= 209.00' / 208.54' S= 0.0264 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	209.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	214.20'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	206.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.33 cfs @ 5.15 hrs HW=206.83' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.33 cfs)

Primary OutFlow Max=2.88 cfs @ 8.47 hrs HW=214.54' (Free Discharge)
└**1=Culvert** (Passes 2.88 cfs of 12.28 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.25 cfs @ 11.25 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 2.63 cfs @ 1.92 fps)

Pond 21P: MC 4500 UNDERGROUND DETENTION EAST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

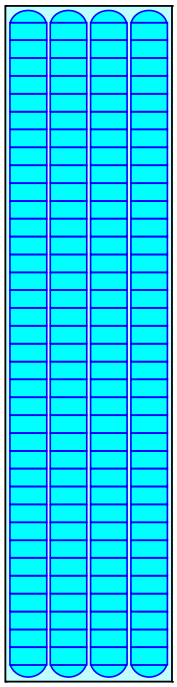
36 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 150.37' Row Length +12.0" End Stone x 2 = 152.37' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
27.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 8.25' Field Height

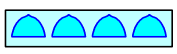
144 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 15,650.6 cf Chamber Storage

47,243.2 cf Field - 15,650.6 cf Chambers = 31,592.6 cf Stone x 40.0% Voids = 12,637.0 cf Stone Storage

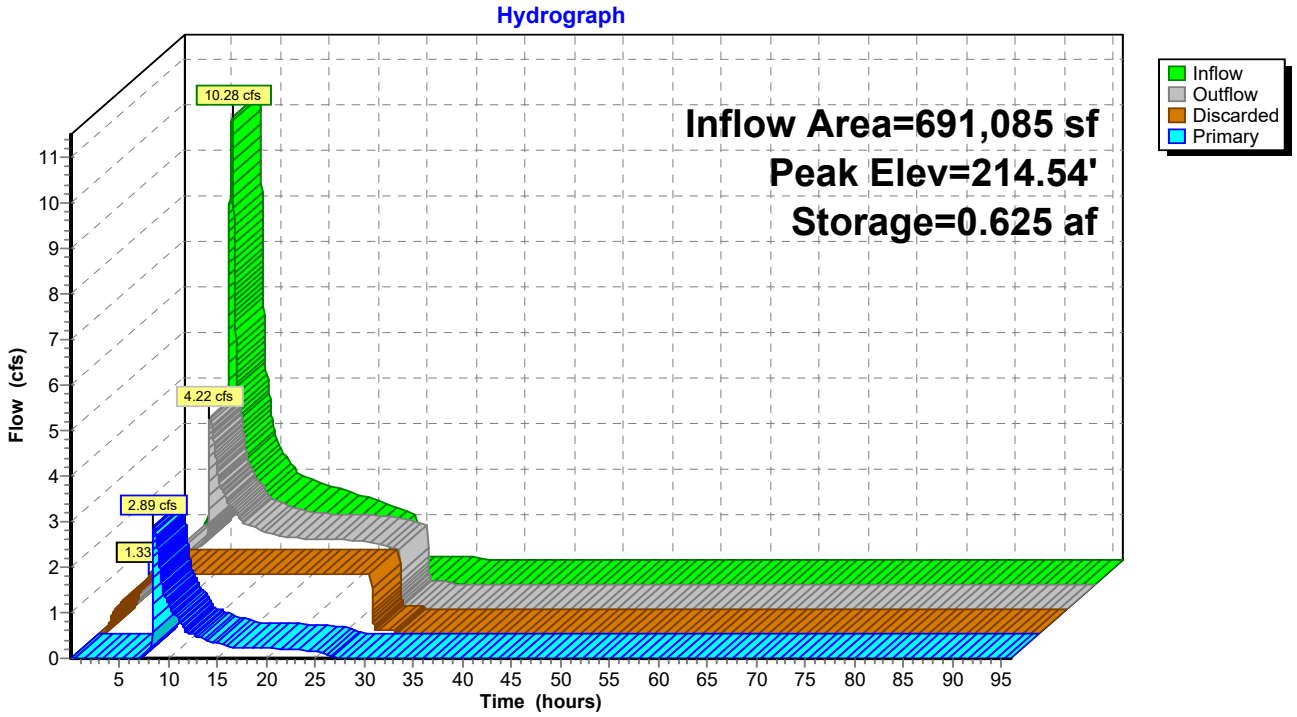
Chamber Storage + Stone Storage = 28,287.6 cf = 0.649 af
Overall Storage Efficiency = 59.9%
Overall System Size = 152.37' x 37.58' x 8.25'

144 Chambers
1,749.7 cy Field
1,170.1 cy Stone

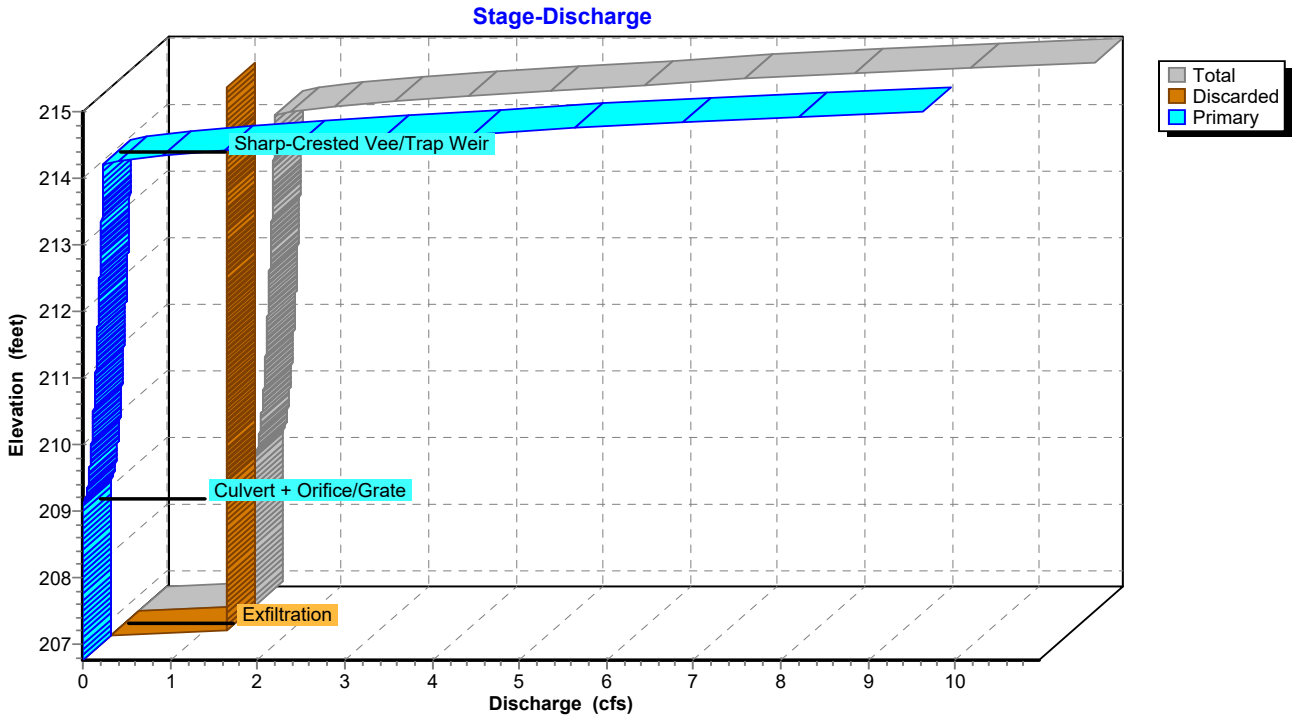




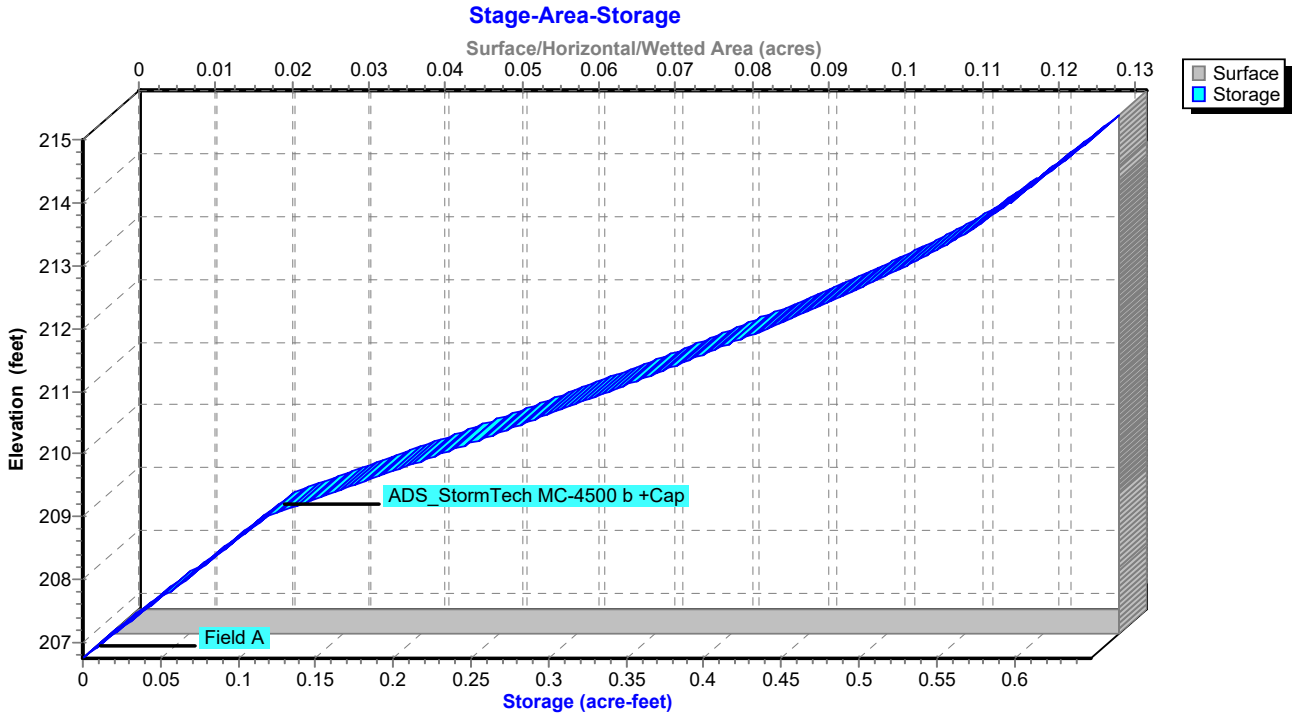
Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Summary for Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN

[81] Warning: Exceeded Pond 30P by 2.64' @ 27.39 hrs

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 0.83" for 25 year event
Inflow = 4.00 cfs @ 8.70 hrs, Volume= 140,718 cf
Outflow = 3.99 cfs @ 8.76 hrs, Volume= 139,492 cf, Atten= 0%, Lag= 3.5 min
Primary = 3.99 cfs @ 8.76 hrs, Volume= 139,492 cf
Routed to Link 27L : COMBINED OUTFLOW

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 180.79' @ 8.76 hrs Surf.Area= 3,284 sf Storage= 6,605 cf

Plug-Flow detention time= 118.8 min calculated for 139,477 cf (99% of inflow)
Center-of-Mass det. time= 112.7 min (935.3 - 822.6)

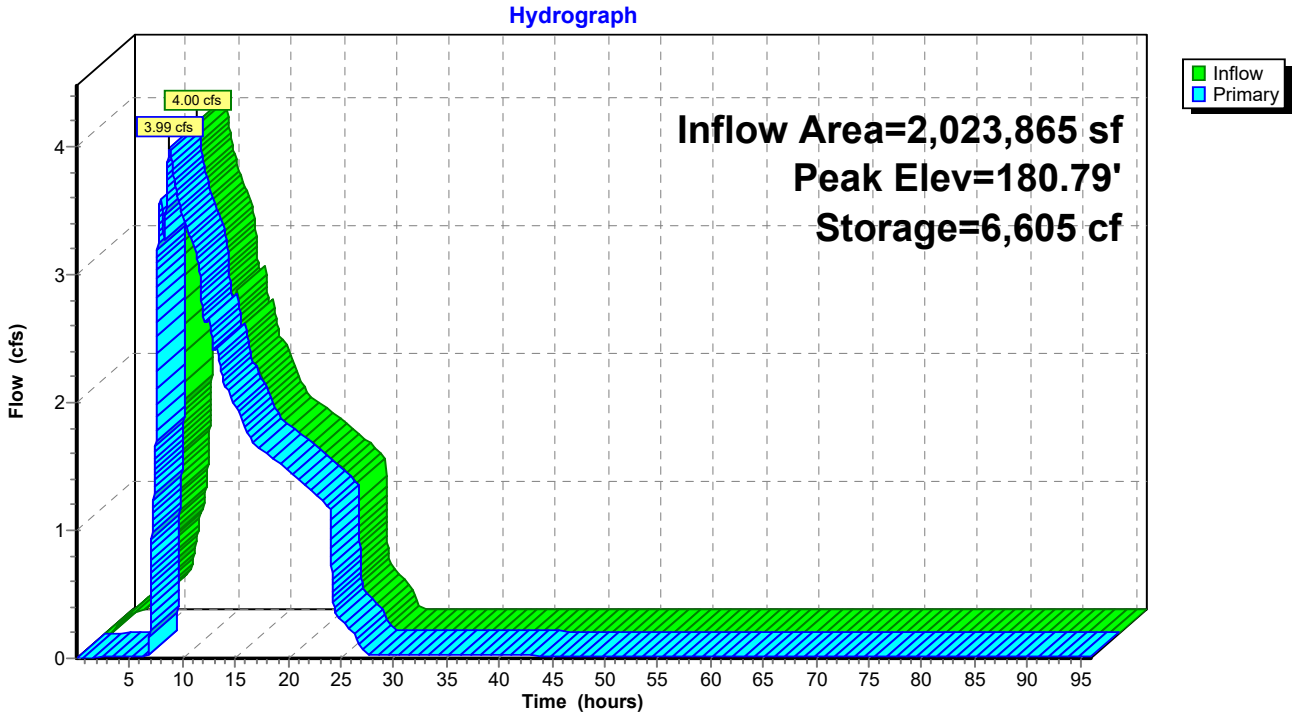
Volume	Invert	Avail.Storage	Storage Description
#1	177.50'	7,328 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	708	0	0
178.50	1,519	1,114	1,114
179.00	1,943	866	1,979
180.00	2,648	2,296	4,275
181.00	3,458	3,053	7,328

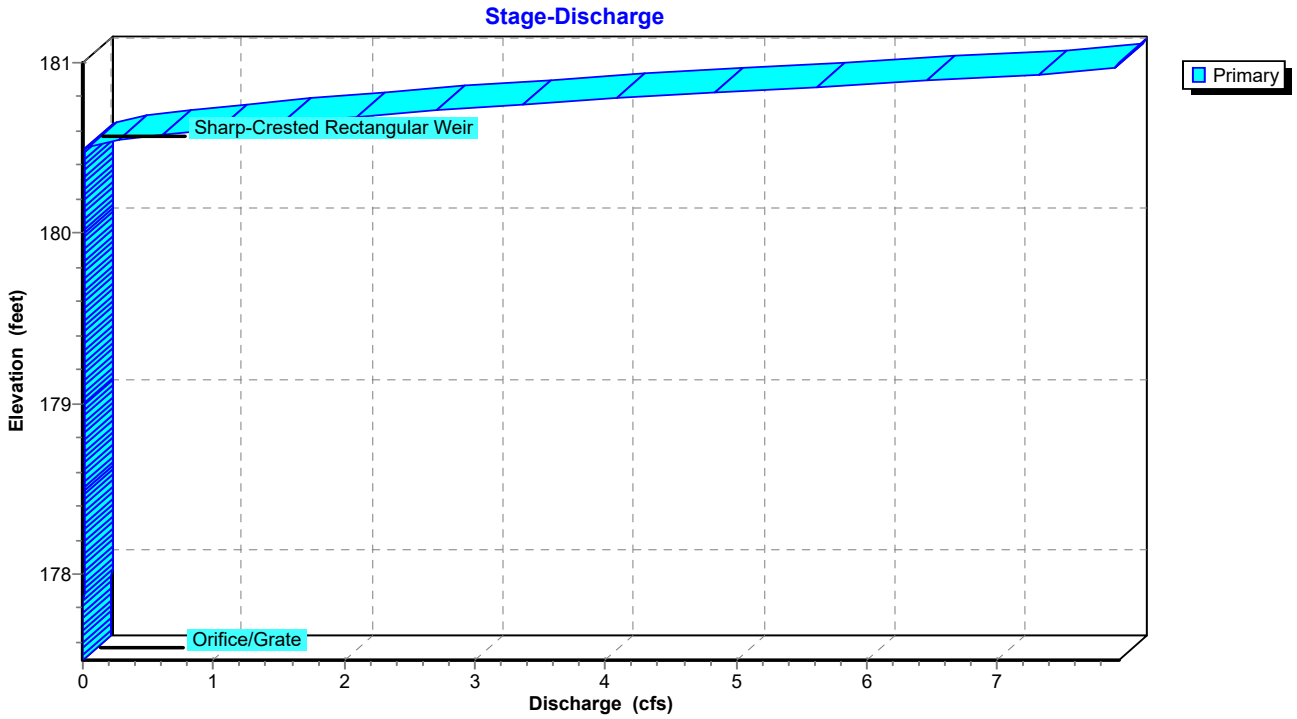
Device	Routing	Invert	Outlet Devices
#1	Primary	175.50'	**12.0" Round Culvert** L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 175.50' / 174.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	177.50'	**0.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	180.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=3.99 cfs @ 8.76 hrs HW=180.79' (Free Discharge)
└**1=Culvert** (Passes 3.99 cfs of 7.76 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 8.69 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 3.97 cfs @ 1.75 fps)

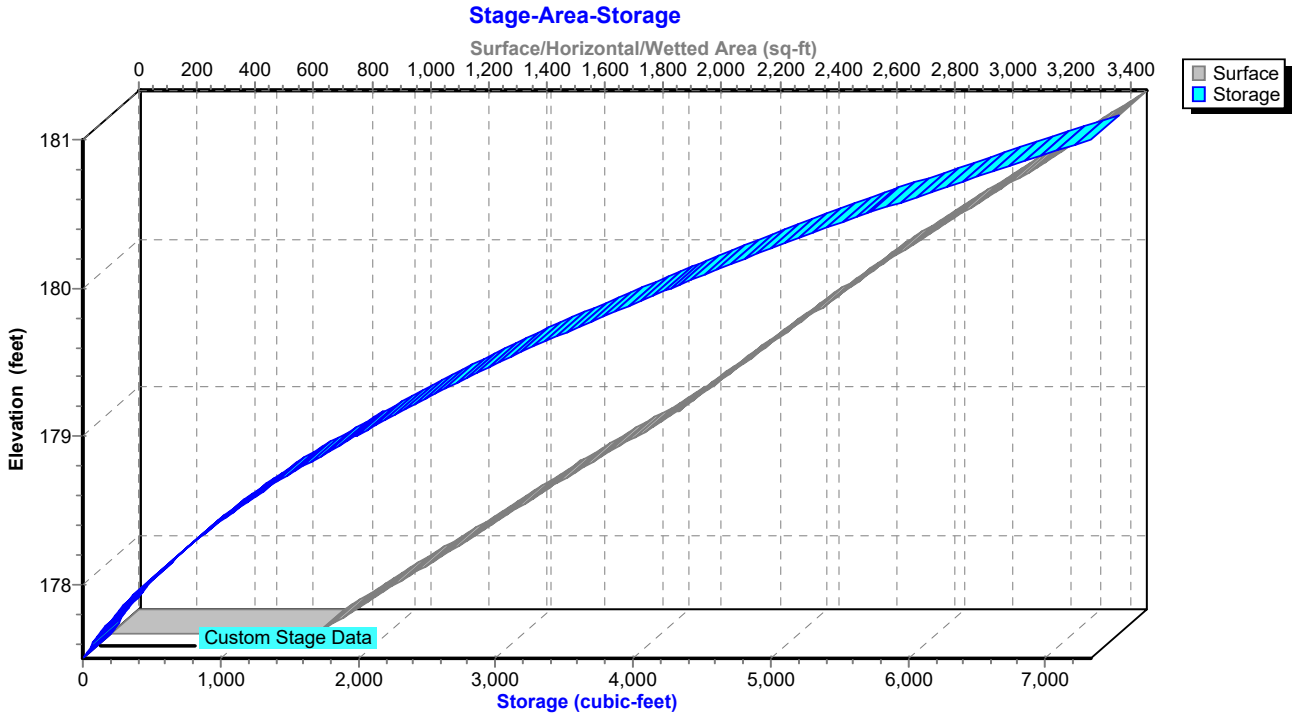
Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Summary for Pond 30P: Split

[57] Hint: Peaked at 179.48' (Flood elevation advised)

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 0.99" for 25 year event
Inflow = 9.32 cfs @ 8.70 hrs, Volume= 166,711 cf
Outflow = 9.32 cfs @ 8.70 hrs, Volume= 166,711 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.00 cfs @ 8.70 hrs, Volume= 140,718 cf
Routed to Pond 28P : PUBLIC WORKS EXTENDED DRY BASIN
Secondary = 5.32 cfs @ 8.70 hrs, Volume= 25,992 cf
Routed to Link 27L : COMBINED OUTFLOW

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 179.48' @ 8.70 hrs

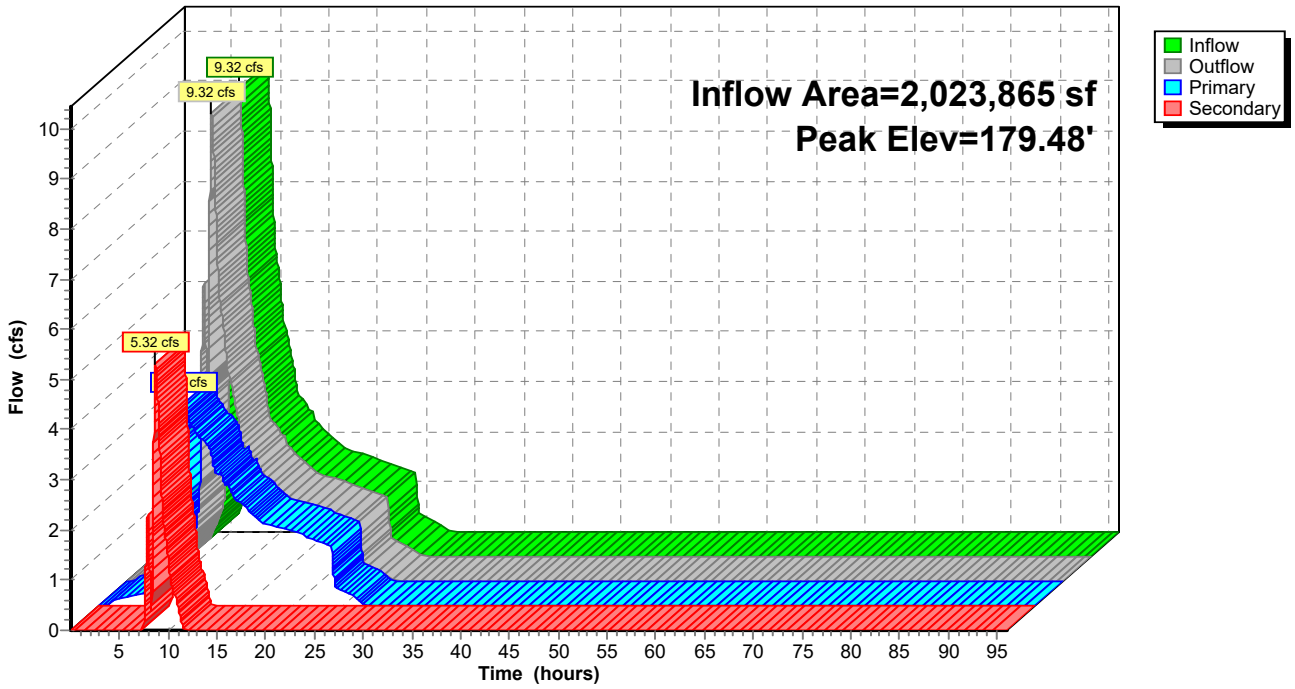
Device	Routing	Invert	Outlet Devices
#1	Primary	177.86'	**12.0" Round Culvert-E-W pond** L= 26.8' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0134 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	177.86'	**18.0" Round Culvert-Bypass** L= 26.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0136 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	179.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=4.00 cfs @ 8.70 hrs HW=179.48' (Free Discharge)
↑—**1=Culvert-E-W pond** (Inlet Controls 4.00 cfs @ 5.09 fps)

Secondary OutFlow Max=5.32 cfs @ 8.70 hrs HW=179.48' (Free Discharge)
↑—**2=Culvert-Bypass** (Passes 5.32 cfs of 7.86 cfs potential flow)
↑—**3=Sharp-Crested Rectangular Weir** (Weir Controls 5.32 cfs @ 2.26 fps)

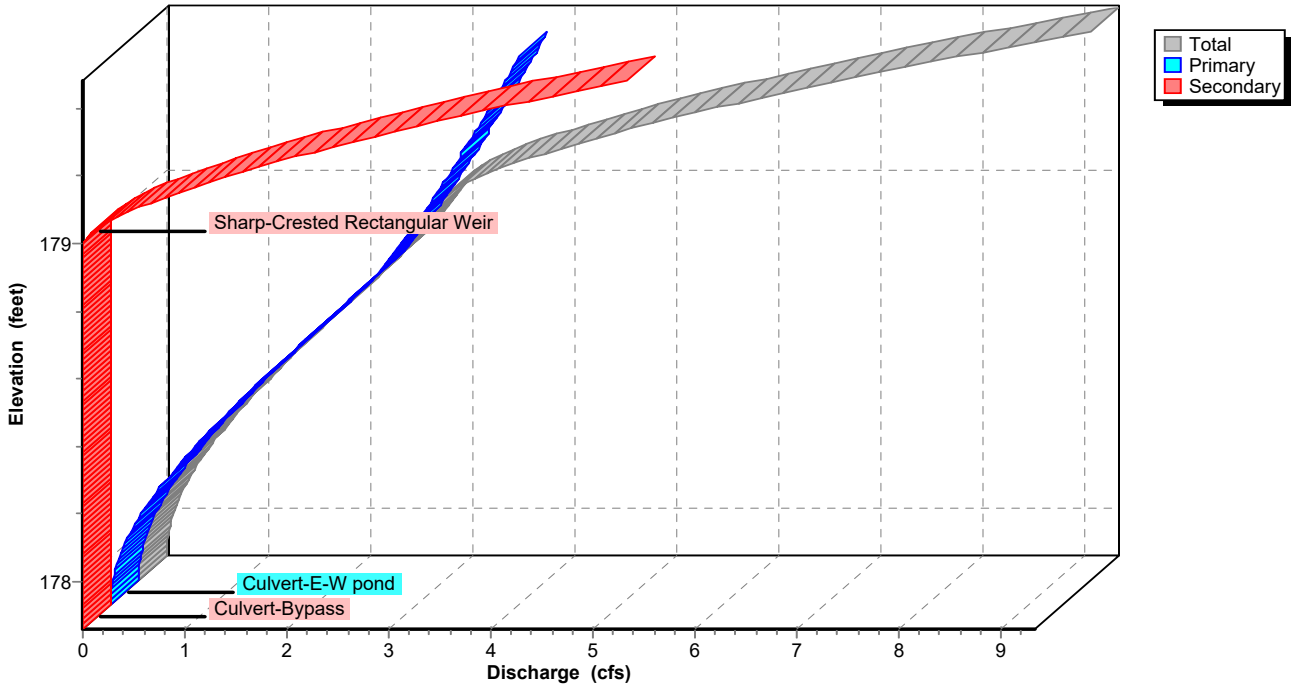
Pond 30P: Split

Hydrograph

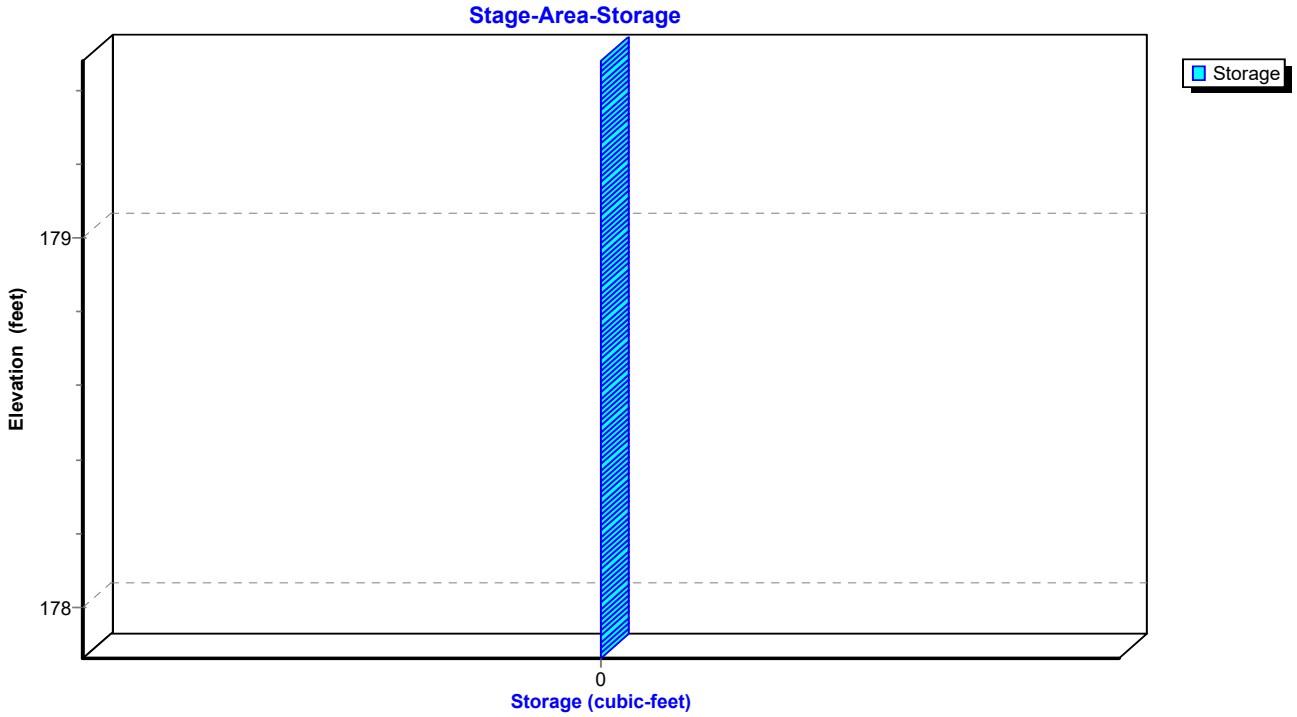


Pond 30P: Split

Stage-Discharge



Pond 30P: Split



Summary for Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

Inflow Area = 713,673 sf, 87.08% Impervious, Inflow Depth = 3.43" for 25 year event
Inflow = 11.76 cfs @ 7.91 hrs, Volume= 203,899 cf
Outflow = 5.84 cfs @ 8.77 hrs, Volume= 203,899 cf, Atten= 50%, Lag= 51.7 min
Discarded = 1.68 cfs @ 4.54 hrs, Volume= 161,706 cf
Primary = 4.17 cfs @ 8.77 hrs, Volume= 42,193 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 201.45' @ 8.77 hrs Surf.Area= 7,239 sf Storage= 37,128 cf

Plug-Flow detention time= 189.1 min calculated for 203,877 cf (100% of inflow)
Center-of-Mass det. time= 189.1 min (899.2 - 710.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	192.75'	18,097 cf	**37.58'W x 192.62'L x 9.00'H Field A** 65,153 cf Overall - 19,910 cf Embedded = 45,242 cf x 40.0% Voids
#2A	195.75'	19,910 cf	**ADS_StormTech MC-4500 b +Cap**x 184 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 184 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		38,007 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.75'	**15.0" Round Culvert** L= 14.6' Ke= 0.600 Inlet / Outlet Invert= 195.75' / 195.60' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	195.75'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	201.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	192.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 4.54 hrs HW=192.84' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.68 cfs)

Primary OutFlow Max=4.15 cfs @ 8.77 hrs HW=201.45' (Free Discharge)
└**1=Culvert** (Passes 4.15 cfs of 12.47 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.25 cfs @ 11.41 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 3.91 cfs @ 2.19 fps)

Pond 39P: MC 4500 UNDERGROUND DETENTION WEST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

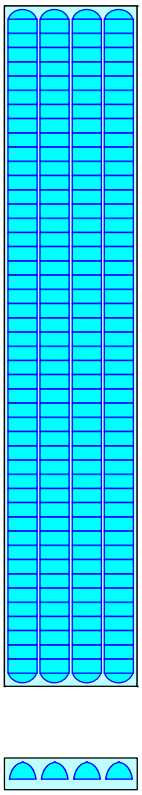
46 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 190.62' Row Length +12.0" End Stone x 2 = 192.62' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
36.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 9.00' Field Height

184 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 19,910.2 cf Chamber Storage

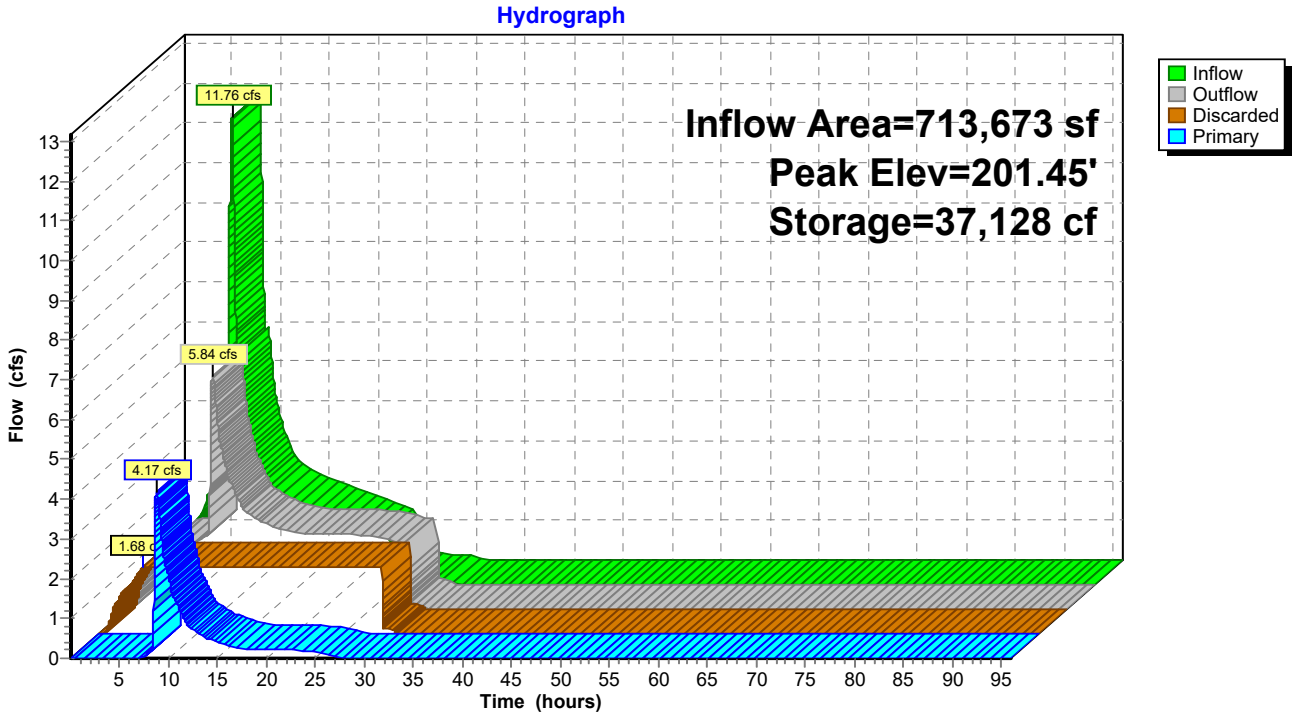
65,152.6 cf Field - 19,910.2 cf Chambers = 45,242.3 cf Stone x 40.0% Voids = 18,096.9 cf Stone Storage

Chamber Storage + Stone Storage = 38,007.2 cf = 0.873 af
Overall Storage Efficiency = 58.3%
Overall System Size = 192.62' x 37.58' x 9.00'

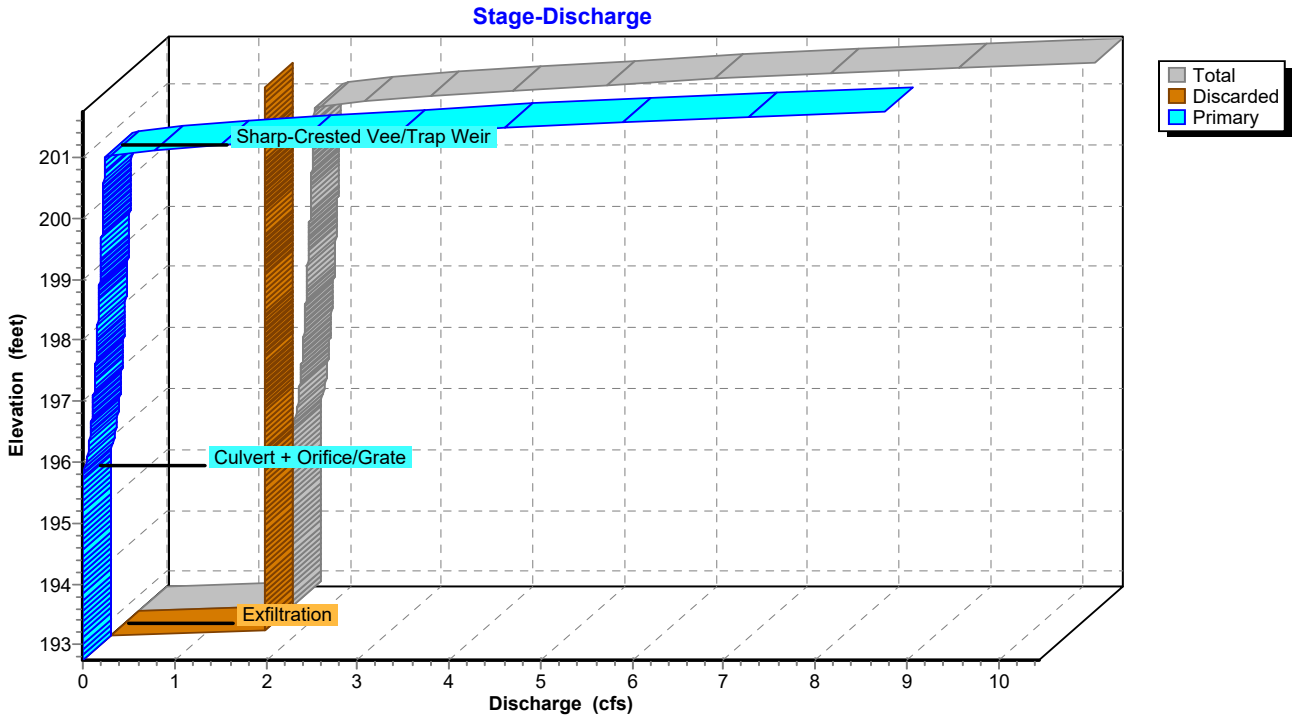
184 Chambers
2,413.1 cy Field
1,675.6 cy Stone



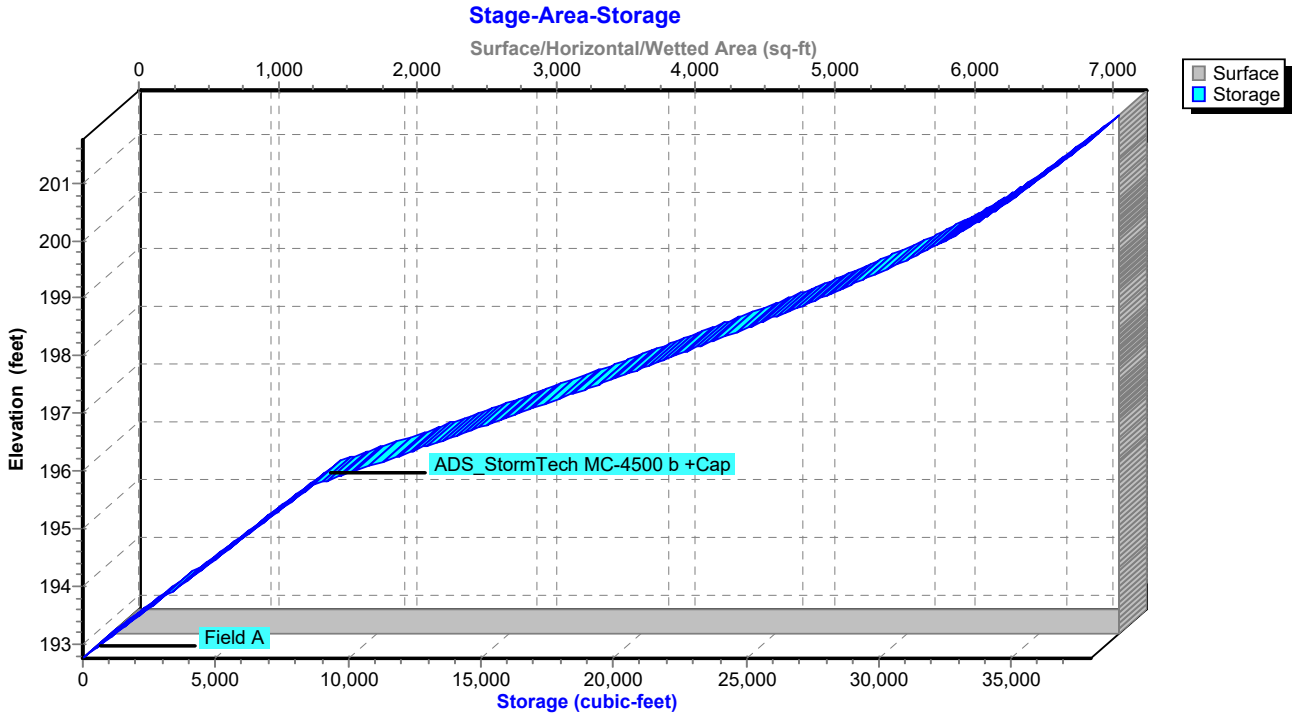
Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

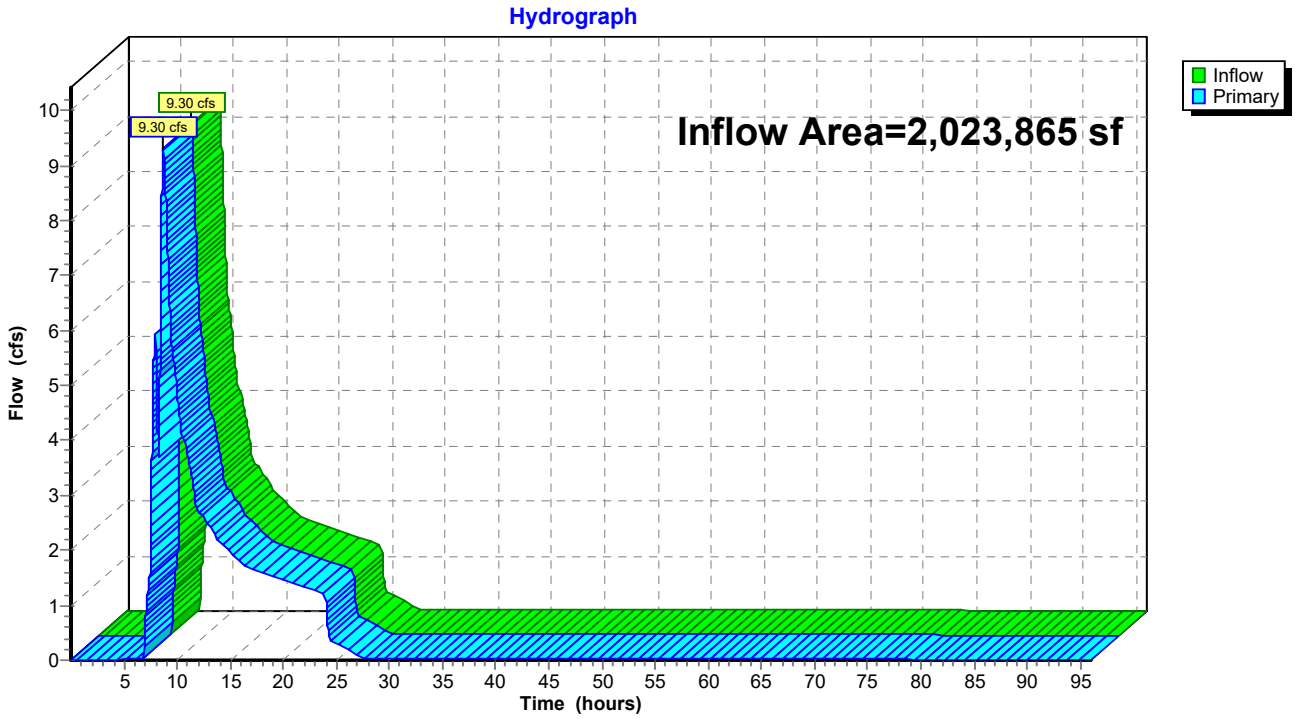


Summary for Link 27L: COMBINED OUTFLOW

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth > 0.98" for 25 year event
Inflow = 9.30 cfs @ 8.71 hrs, Volume= 165,484 cf
Primary = 9.30 cfs @ 8.71 hrs, Volume= 165,484 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 27L: COMBINED OUTFLOW



Time span=0.01-96.00 hrs, dt=0.01 hrs, 9600 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment35S: Future E-W Expansion Runoff Area=12.040 ac 0.00% Impervious Runoff Depth=2.05"
Tc=5.0 min CN=75/0 Runoff=5.57 cfs 89,613 cf

Pond 21P: MC 4500 UNDERGROUND Peak Elev=214.93' Storage=0.646 af Inflow=12.29 cfs 182,234 cf
Discarded=1.33 cfs 127,353 cf Primary=8.51 cfs 54,881 cf Outflow=9.83 cfs 182,234 cf

Pond 28P: PUBLIC WORKS EXTENDED Peak Elev=180.90' Storage=6,989 cf Inflow=6.87 cfs 176,497 cf
Outflow=6.60 cfs 175,233 cf

Pond 30P: Split Peak Elev=181.66' Inflow=21.73 cfs 242,103 cf
Primary=6.87 cfs 176,497 cf Secondary=14.86 cfs 65,605 cf Outflow=21.73 cfs 242,103 cf

Pond 39P: MC 4500 UNDERGROUND Peak Elev=201.71' Storage=37,905 cf Inflow=13.73 cfs 238,763 cf
Discarded=1.68 cfs 168,674 cf Primary=8.18 cfs 70,089 cf Outflow=9.86 cfs 238,763 cf

Link 27L: COMBINED OUTFLOW Inflow=21.22 cfs 240,838 cf
Primary=21.22 cfs 240,838 cf

Total Runoff Area = 524,462 sf Runoff Volume = 89,613 cf Average Runoff Depth = 2.05"
100.00% Pervious = 524,462 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 35S: Future E-W Expansion

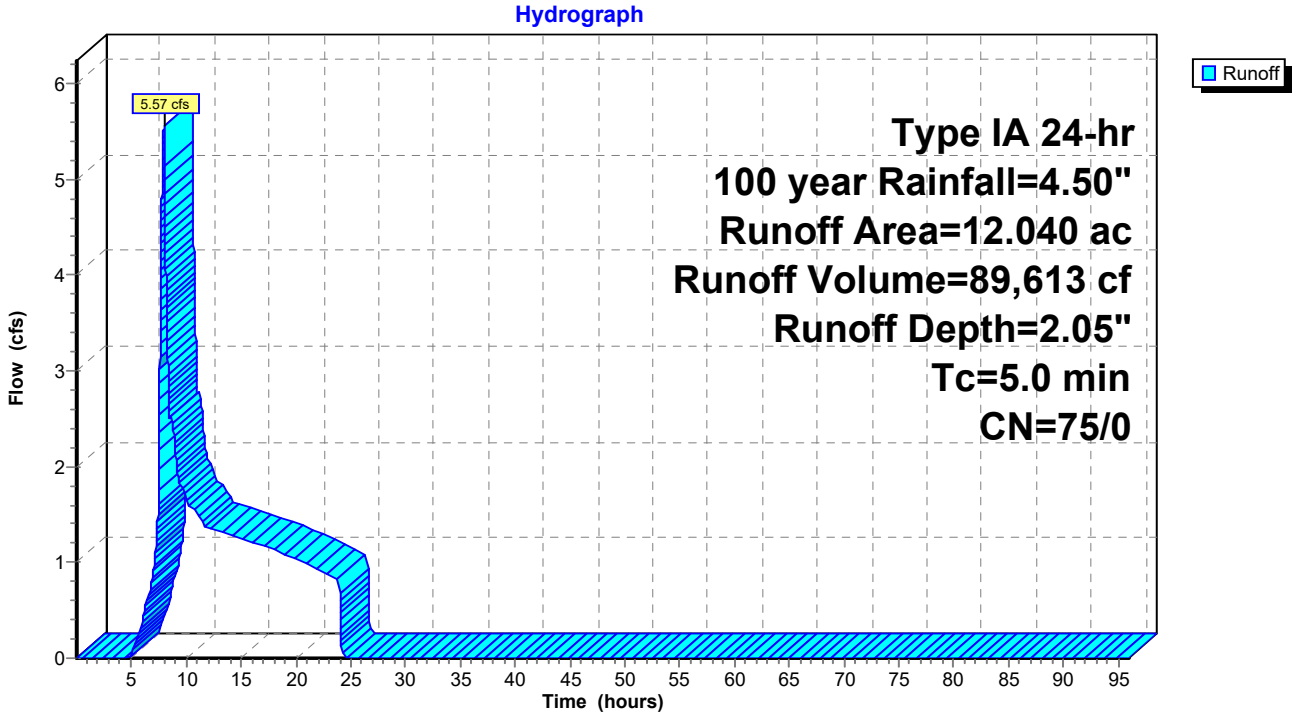
Runoff = 5.57 cfs @ 7.99 hrs, Volume= 89,613 cf, Depth= 2.05"
Routed to Pond 30P : Split

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Type IA 24-hr 100 year Rainfall=4.50"

	Area (ac)	CN	Description
*	5.390	83	
*	0.630	83	
*	6.020	67	
	12.040	75	Weighted Average
	12.040	75	100.00% Pervious Area

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

Subcatchment 35S: Future E-W Expansion



Summary for Pond 21P: MC 4500 UNDERGROUND DETENTION EAST

Inflow Area = 691,085 sf, 58.52% Impervious, Inflow Depth = 3.16" for 100 year event
Inflow = 12.29 cfs @ 7.91 hrs, Volume= 182,234 cf
Outflow = 9.83 cfs @ 8.07 hrs, Volume= 182,234 cf, Atten= 20%, Lag= 10.0 min
Discarded = 1.33 cfs @ 4.58 hrs, Volume= 127,353 cf
Primary = 8.51 cfs @ 8.07 hrs, Volume= 54,881 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 214.93' @ 8.07 hrs Surf.Area= 0.131 ac Storage= 0.646 af

Plug-Flow detention time= 164.5 min calculated for 182,215 cf (100% of inflow)
Center-of-Mass det. time= 164.4 min (874.0 - 709.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	206.75'	0.290 af	**37.58'W x 152.37'L x 8.25'H Field A** 1.085 af Overall - 0.359 af Embedded = 0.725 af x 40.0% Voids
#2A	209.00'	0.359 af	**ADS_StormTech MC-4500 b +Cap**x 144 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 144 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		0.649 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**15.0" Round Culvert** L= 17.4' Ke= 0.600 Inlet / Outlet Invert= 209.00' / 208.54' S= 0.0264 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	209.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	214.20'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	206.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.33 cfs @ 4.58 hrs HW=206.83' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.33 cfs)

Primary OutFlow Max=8.49 cfs @ 8.07 hrs HW=214.93' (Free Discharge)
└**1=Culvert** (Passes 8.49 cfs of 12.76 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.25 cfs @ 11.65 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 8.24 cfs @ 2.81 fps)

Pond 21P: MC 4500 UNDERGROUND DETENTION EAST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

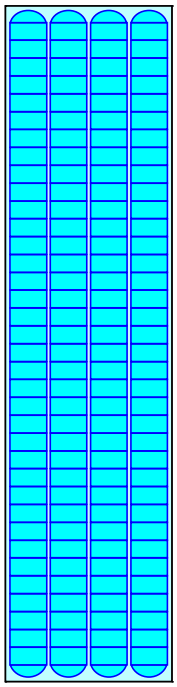
36 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 150.37' Row Length +12.0" End Stone x 2 = 152.37' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
27.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 8.25' Field Height

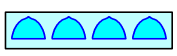
144 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 15,650.6 cf Chamber Storage

47,243.2 cf Field - 15,650.6 cf Chambers = 31,592.6 cf Stone x 40.0% Voids = 12,637.0 cf Stone Storage

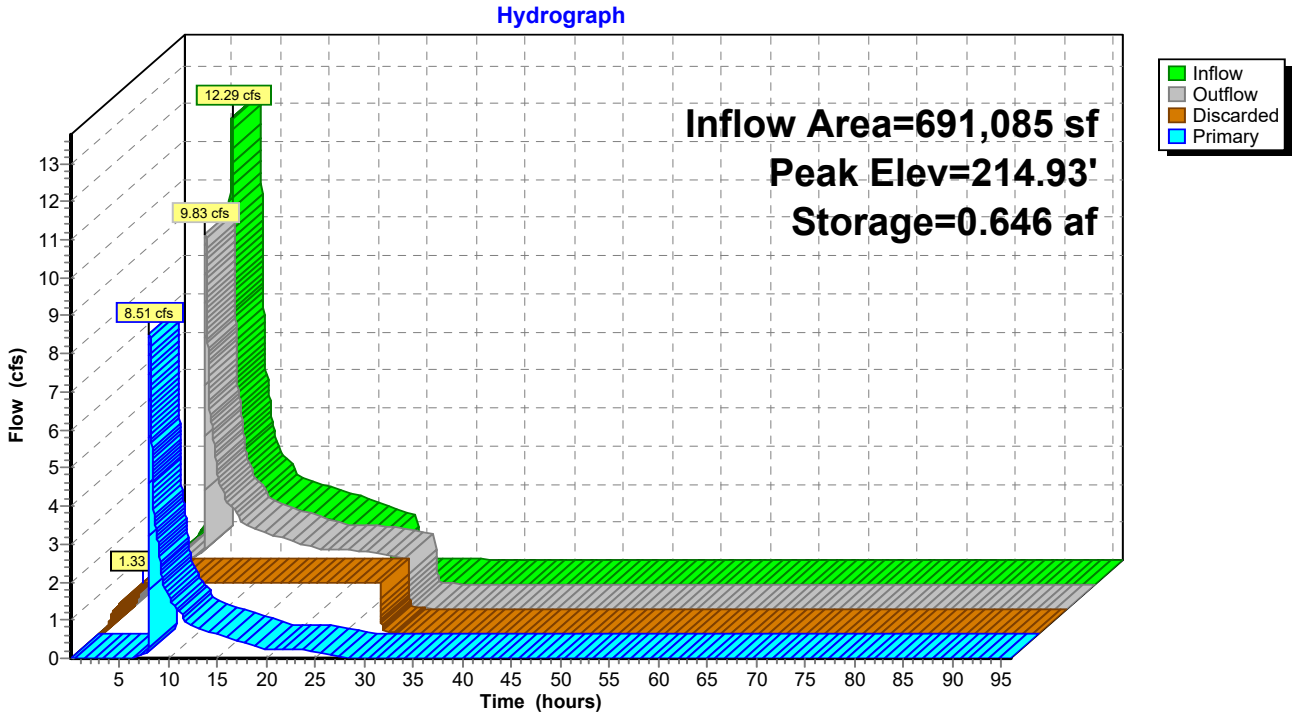
Chamber Storage + Stone Storage = 28,287.6 cf = 0.649 af
Overall Storage Efficiency = 59.9%
Overall System Size = 152.37' x 37.58' x 8.25'

144 Chambers
1,749.7 cy Field
1,170.1 cy Stone

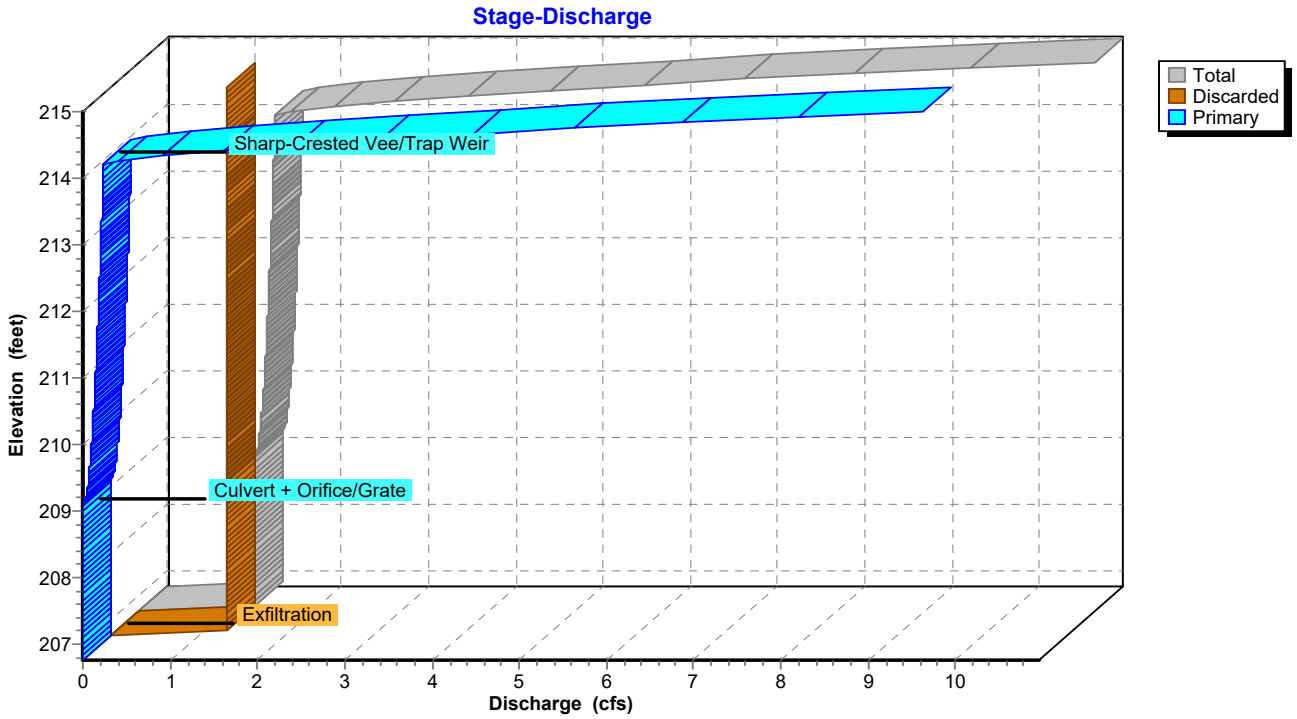




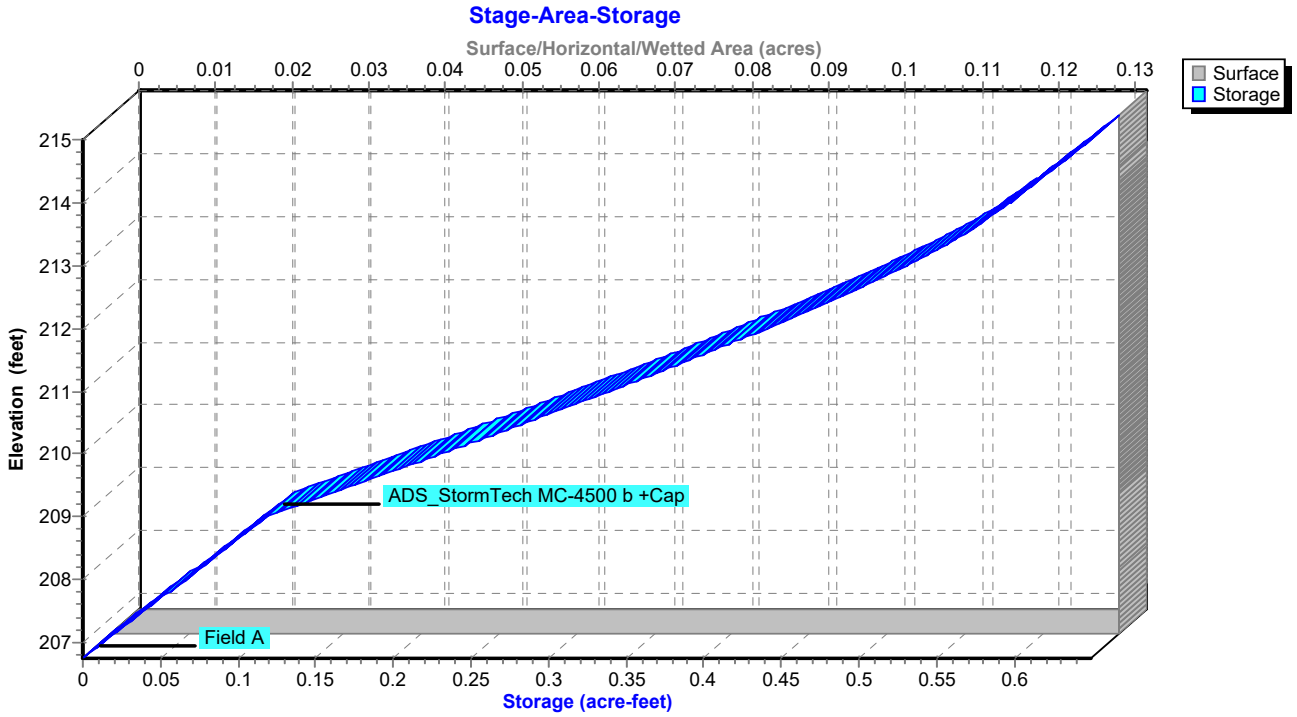
Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Pond 21P: MC 4500 UNDERGROUND DETENTION EAST



Summary for Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN

[81] Warning: Exceeded Pond 30P by 2.64' @ 28.18 hrs

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 1.05" for 100 year event
Inflow = 6.87 cfs @ 8.10 hrs, Volume= 176,497 cf
Outflow = 6.60 cfs @ 8.15 hrs, Volume= 175,233 cf, Atten= 4%, Lag= 3.0 min
Primary = 6.60 cfs @ 8.15 hrs, Volume= 175,233 cf
Routed to Link 27L : COMBINED OUTFLOW

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 180.90' @ 8.15 hrs Surf.Area= 3,378 sf Storage= 6,989 cf

Plug-Flow detention time= 97.1 min calculated for 175,233 cf (99% of inflow)
Center-of-Mass det. time= 91.5 min (920.4 - 828.9)

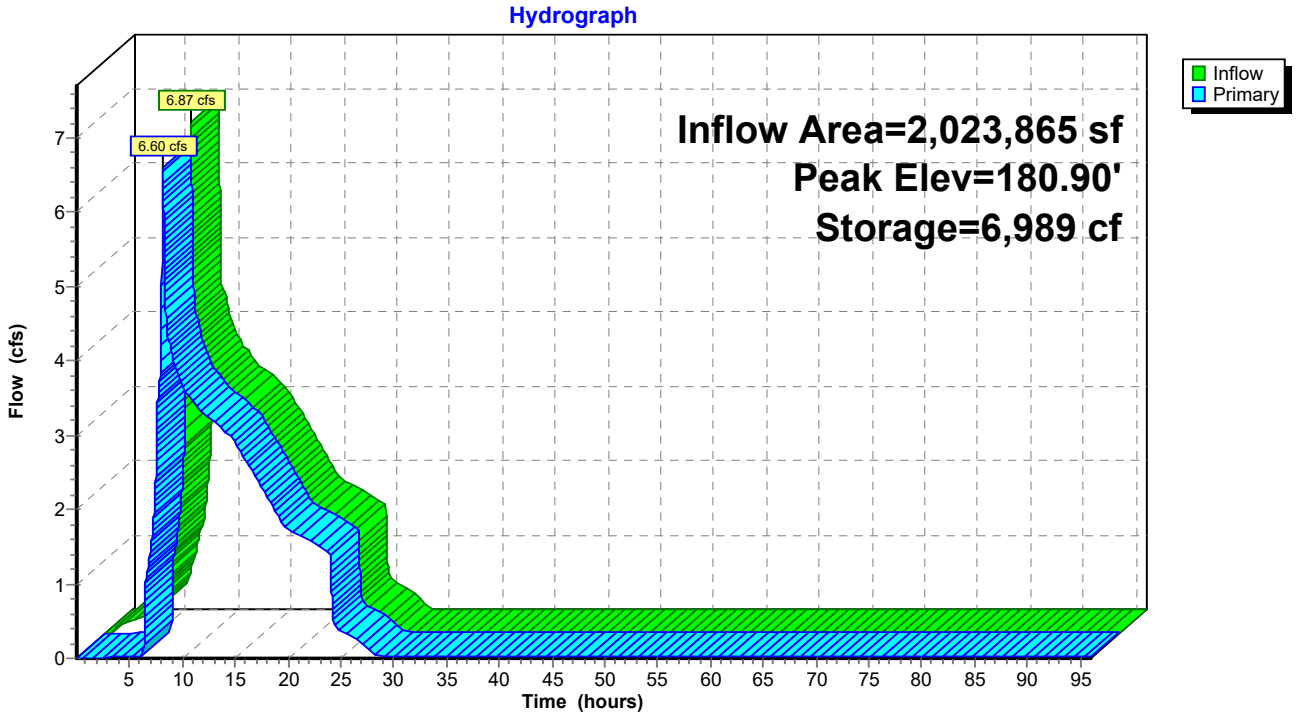
Volume	Invert	Avail.Storage	Storage Description
#1	177.50'	7,328 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	708	0	0
178.50	1,519	1,114	1,114
179.00	1,943	866	1,979
180.00	2,648	2,296	4,275
181.00	3,458	3,053	7,328

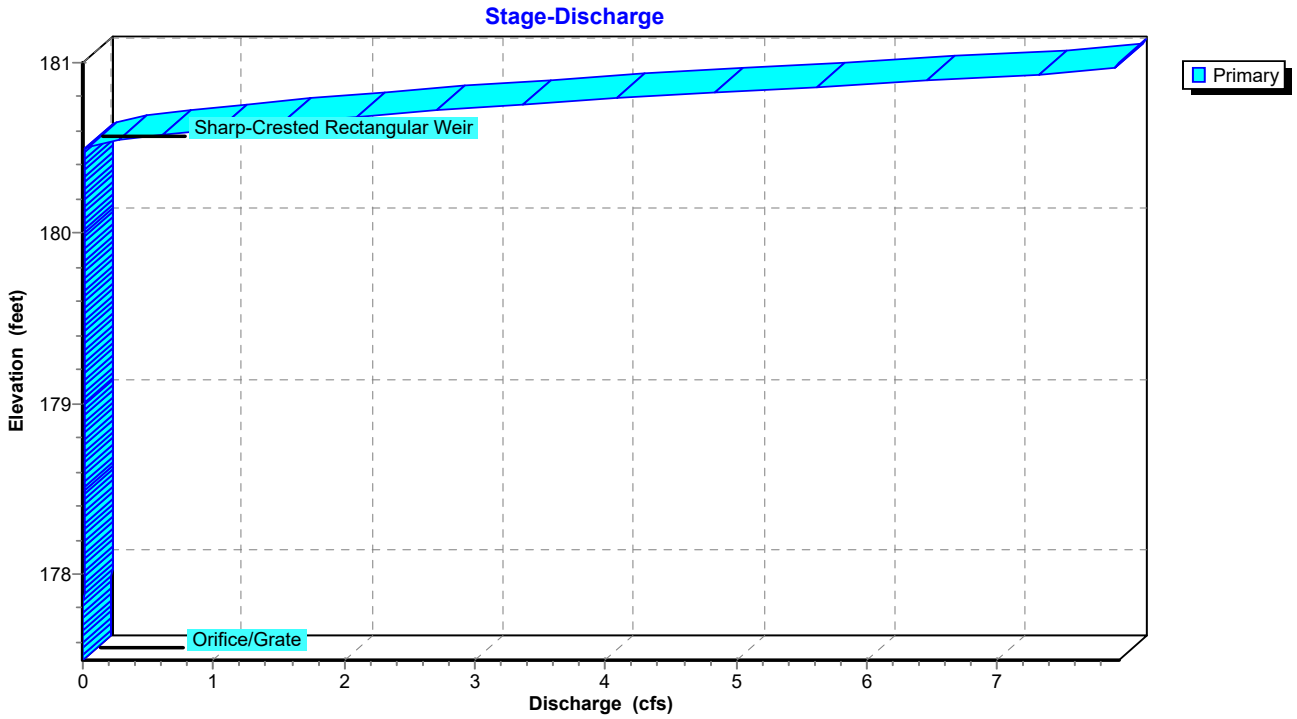
Device	Routing	Invert	Outlet Devices
#1	Primary	175.50'	**12.0" Round Culvert** L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 175.50' / 174.50' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	177.50'	**0.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	180.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=6.60 cfs @ 8.15 hrs HW=180.90' (Free Discharge)
└**1=Culvert** (Passes 6.60 cfs of 7.85 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 8.84 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 6.57 cfs @ 2.07 fps)

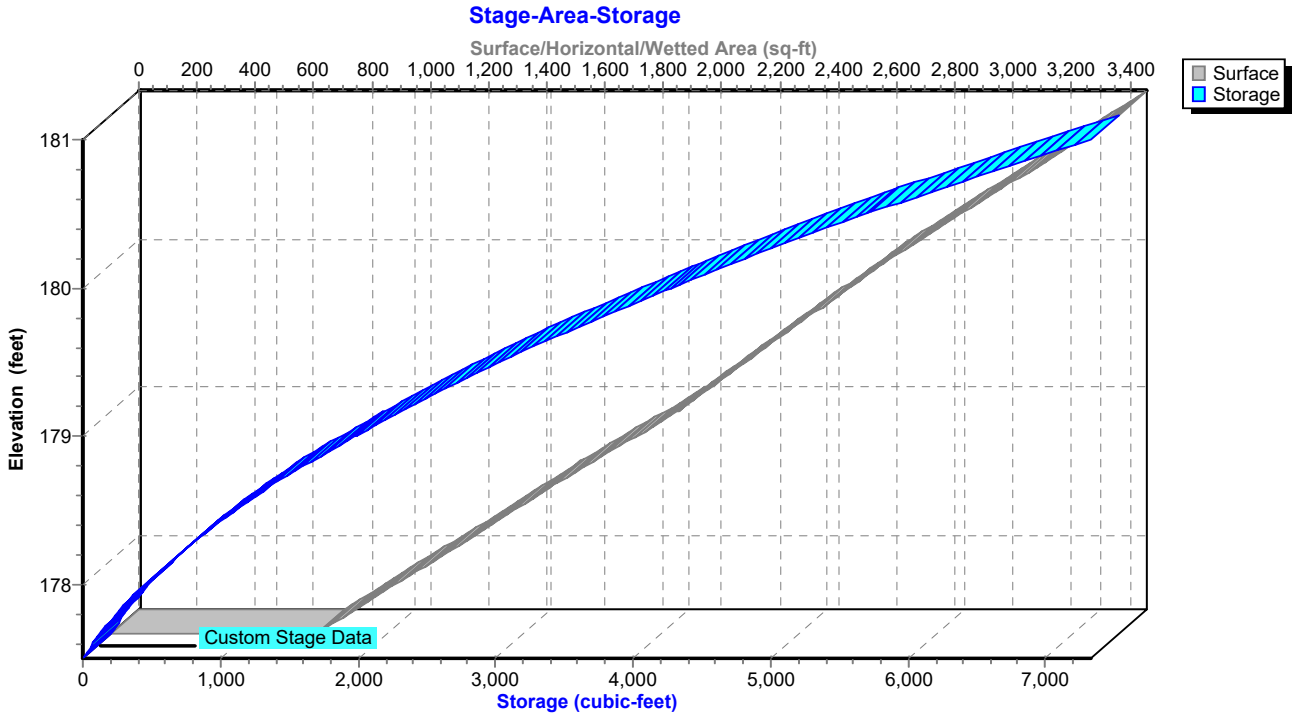
Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Pond 28P: PUBLIC WORKS EXTENDED DRY BASIN



Summary for Pond 30P: Split

[57] Hint: Peaked at 181.66' (Flood elevation advised)

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth = 1.44" for 100 year event
Inflow = 21.73 cfs @ 8.10 hrs, Volume= 242,103 cf
Outflow = 21.73 cfs @ 8.10 hrs, Volume= 242,103 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.87 cfs @ 8.10 hrs, Volume= 176,497 cf
Routed to Pond 28P : PUBLIC WORKS EXTENDED DRY BASIN
Secondary = 14.86 cfs @ 8.10 hrs, Volume= 65,605 cf
Routed to Link 27L : COMBINED OUTFLOW

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 181.66' @ 8.10 hrs

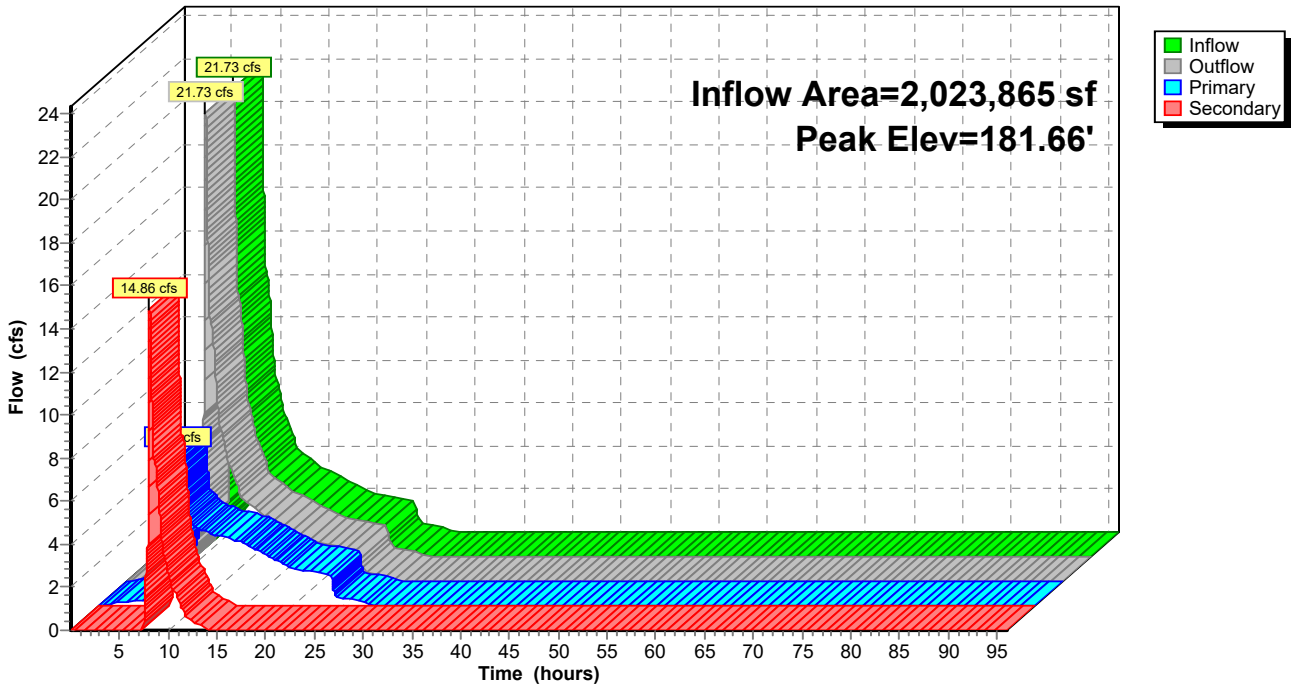
Device	Routing	Invert	Outlet Devices
#1	Primary	177.86'	**12.0" Round Culvert-E-W pond** L= 26.8' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0134 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	177.86'	**18.0" Round Culvert-Bypass** L= 26.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 177.86' / 177.50' S= 0.0136 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	179.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=6.87 cfs @ 8.10 hrs HW=181.66' (Free Discharge)
↑—**1=Culvert-E-W pond** (Inlet Controls 6.87 cfs @ 8.75 fps)

Secondary OutFlow Max=14.86 cfs @ 8.10 hrs HW=181.66' (Free Discharge)
↑—**2=Culvert-Bypass** (Inlet Controls 14.86 cfs @ 8.41 fps)
↑—**3=Sharp-Crested Rectangular Weir** (Passes 14.86 cfs of 63.39 cfs potential flow)

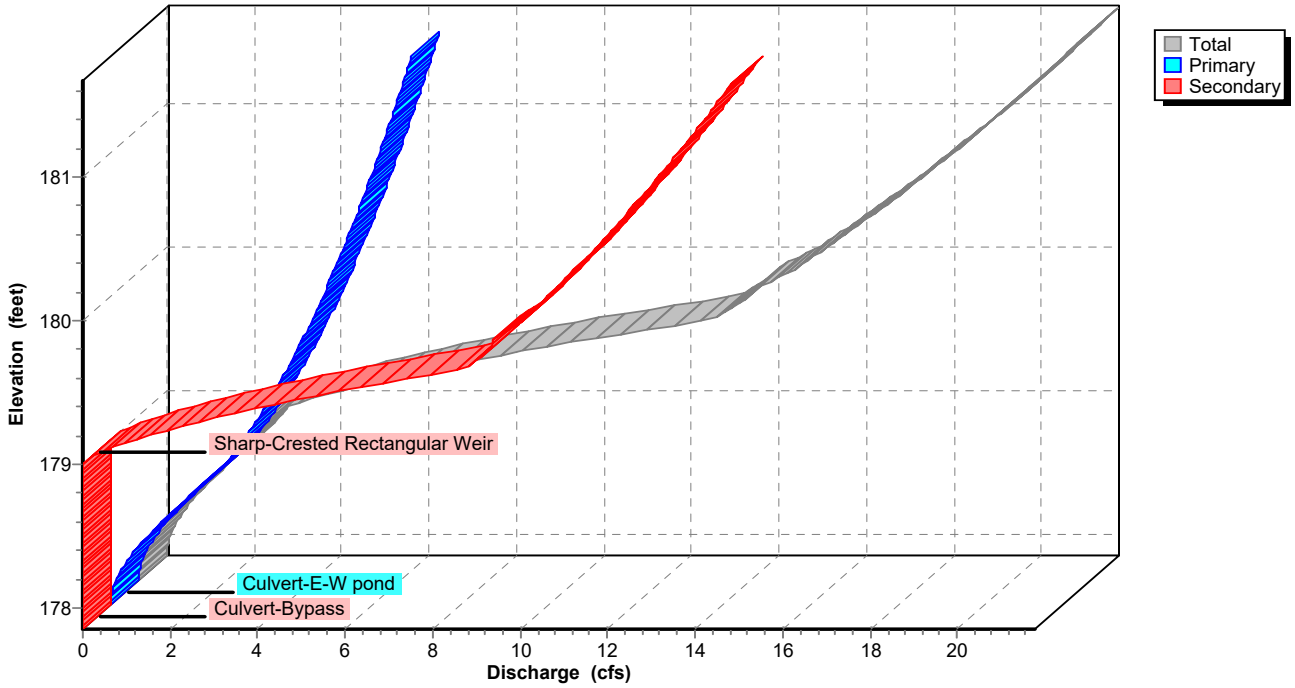
Pond 30P: Split

Hydrograph

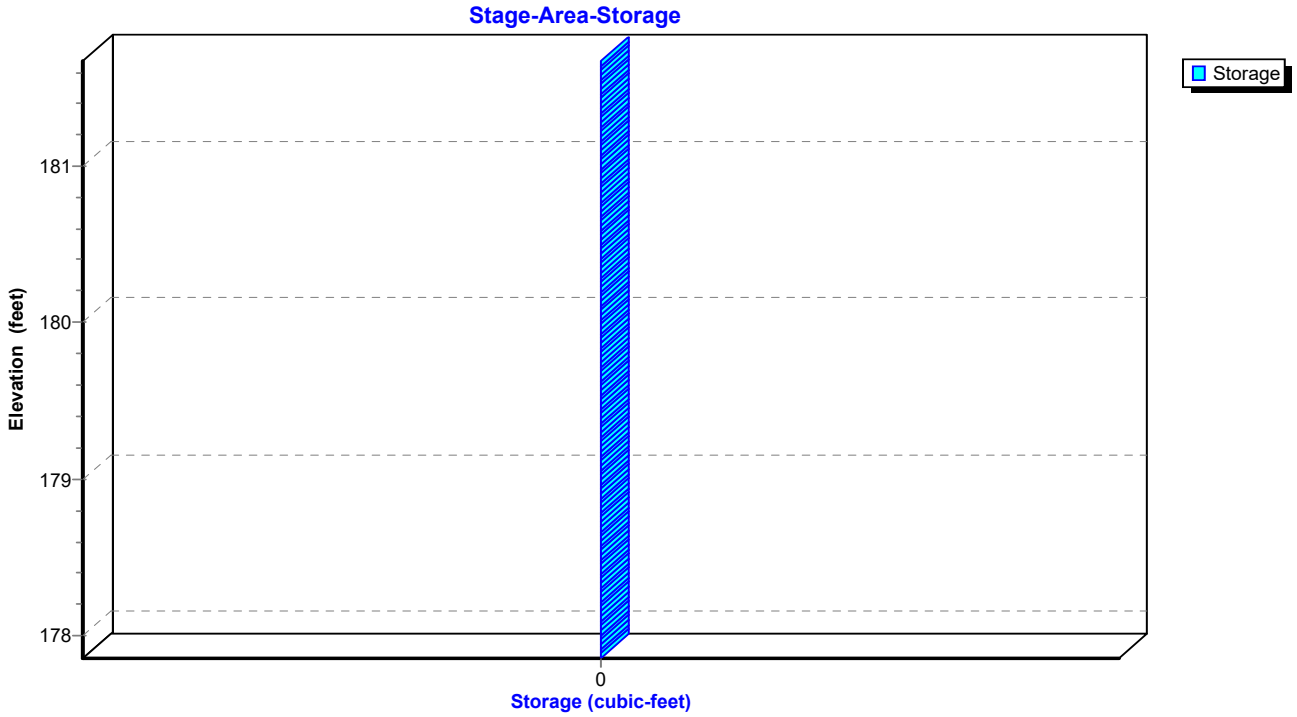


Pond 30P: Split

Stage-Discharge



Pond 30P: Split



Summary for Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

Inflow Area = 713,673 sf, 87.08% Impervious, Inflow Depth = 4.01" for 100 year event
Inflow = 13.73 cfs @ 7.91 hrs, Volume= 238,763 cf
Outflow = 9.86 cfs @ 8.14 hrs, Volume= 238,763 cf, Atten= 28%, Lag= 13.8 min
Discarded = 1.68 cfs @ 3.72 hrs, Volume= 168,674 cf
Primary = 8.18 cfs @ 8.14 hrs, Volume= 70,089 cf
Routed to Pond 30P : Split

Routing by Stor-Ind method, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs
Peak Elev= 201.71' @ 8.14 hrs Surf.Area= 7,239 sf Storage= 37,905 cf

Plug-Flow detention time= 176.0 min calculated for 238,763 cf (100% of inflow)
Center-of-Mass det. time= 176.0 min (880.0 - 704.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	192.75'	18,097 cf	**37.58'W x 192.62'L x 9.00'H Field A** 65,153 cf Overall - 19,910 cf Embedded = 45,242 cf x 40.0% Voids
#2A	195.75'	19,910 cf	**ADS_StormTech MC-4500 b +Cap**x 184 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 184 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		38,007 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.75'	**15.0" Round Culvert** L= 14.6' Ke= 0.600 Inlet / Outlet Invert= 195.75' / 195.60' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	195.75'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	201.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Discarded	192.75'	**10.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 3.72 hrs HW=192.84' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.68 cfs)

Primary OutFlow Max=8.17 cfs @ 8.14 hrs HW=201.71' (Free Discharge)
└**1=Culvert** (Passes 8.17 cfs of 12.80 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.25 cfs @ 11.68 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 7.91 cfs @ 2.77 fps)

Pond 39P: MC 4500 UNDERGROUND DETENTION WEST - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

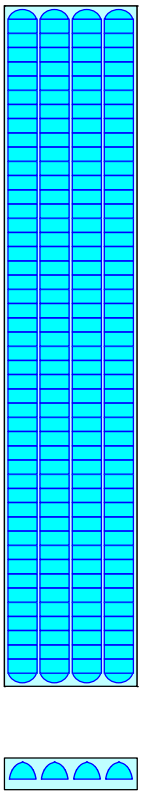
46 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 190.62' Row Length +12.0" End Stone x 2 = 192.62' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
36.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 9.00' Field Height

184 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 19,910.2 cf Chamber Storage

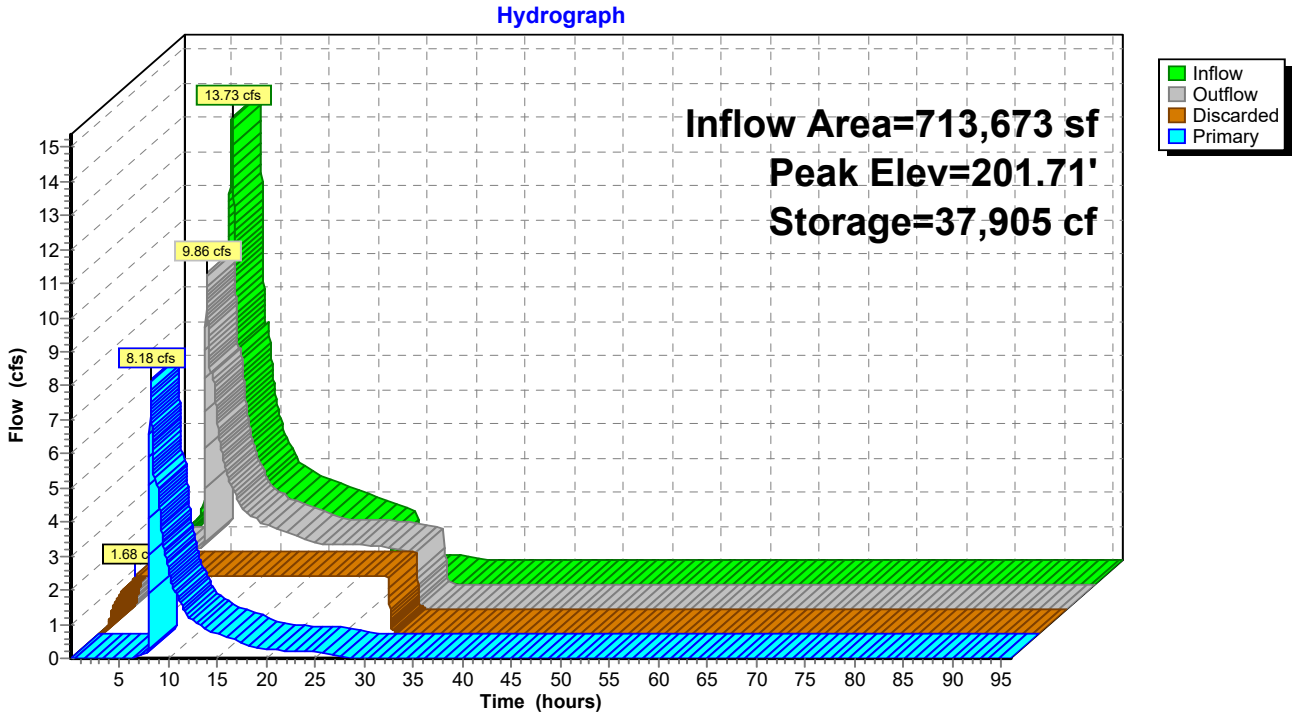
65,152.6 cf Field - 19,910.2 cf Chambers = 45,242.3 cf Stone x 40.0% Voids = 18,096.9 cf Stone Storage

Chamber Storage + Stone Storage = 38,007.2 cf = 0.873 af
Overall Storage Efficiency = 58.3%
Overall System Size = 192.62' x 37.58' x 9.00'

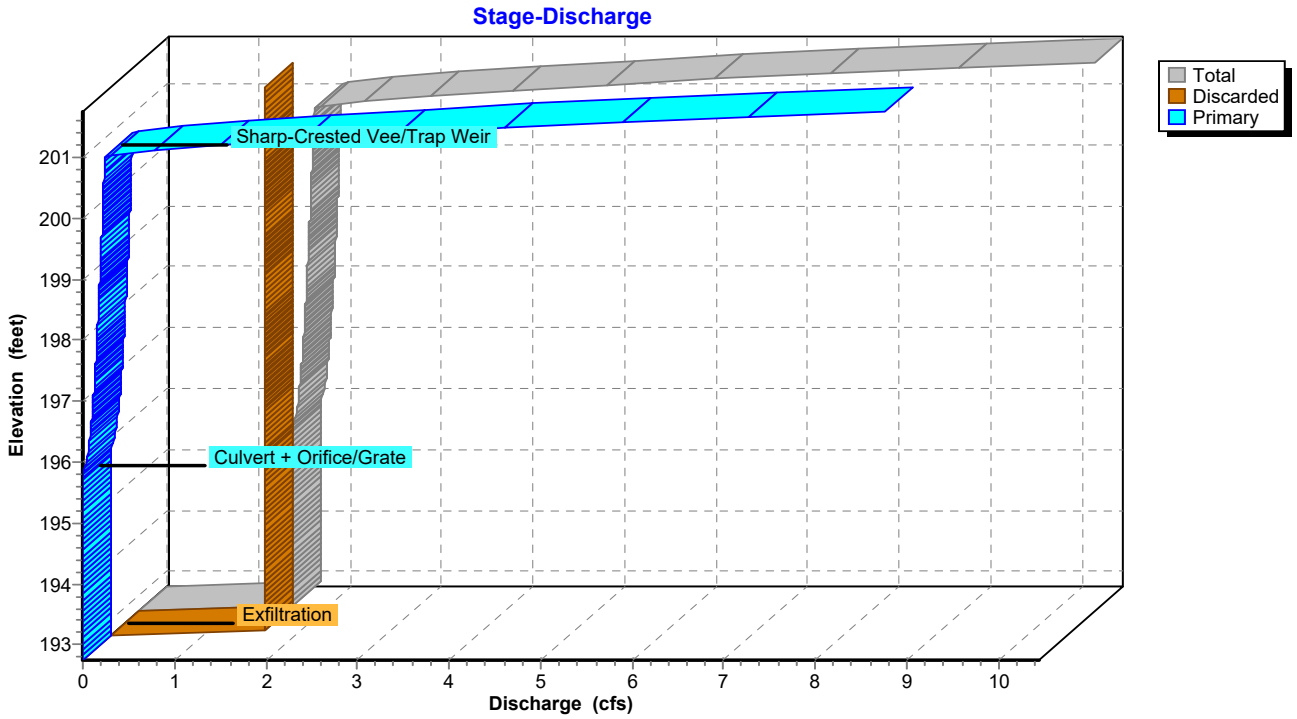
184 Chambers
2,413.1 cy Field
1,675.6 cy Stone



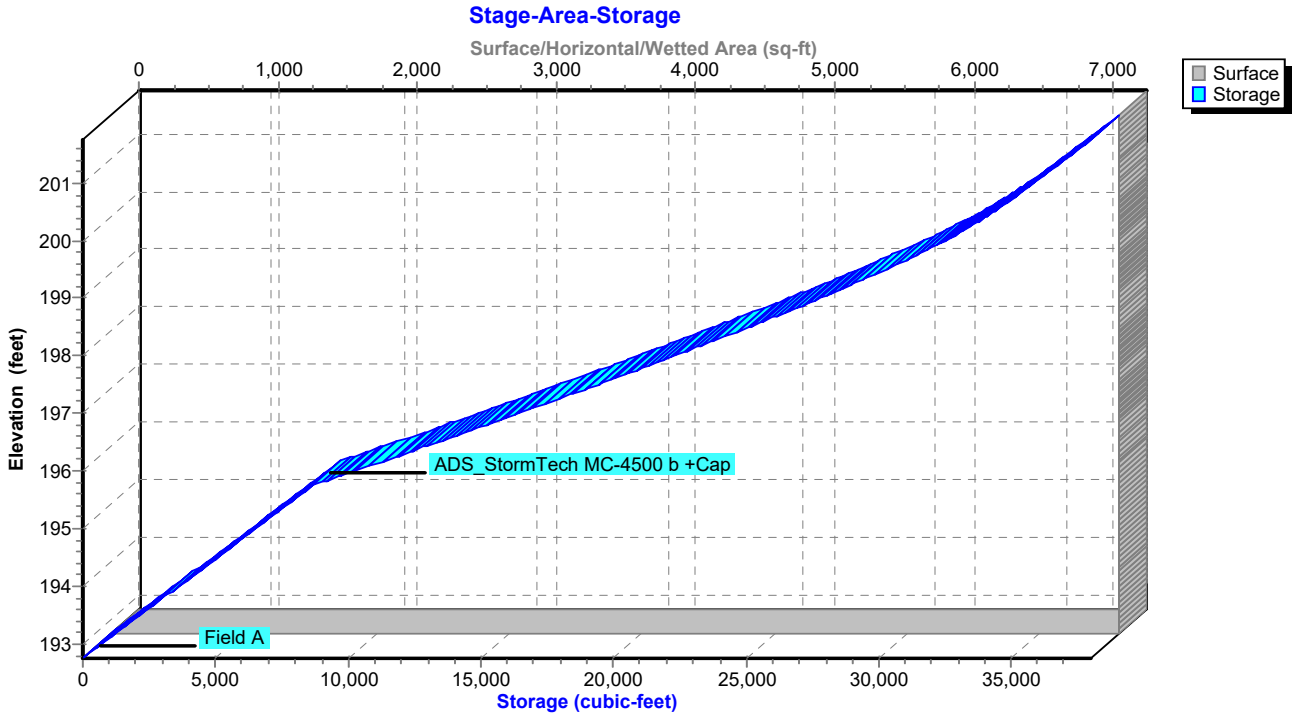
Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST



Pond 39P: MC 4500 UNDERGROUND DETENTION WEST

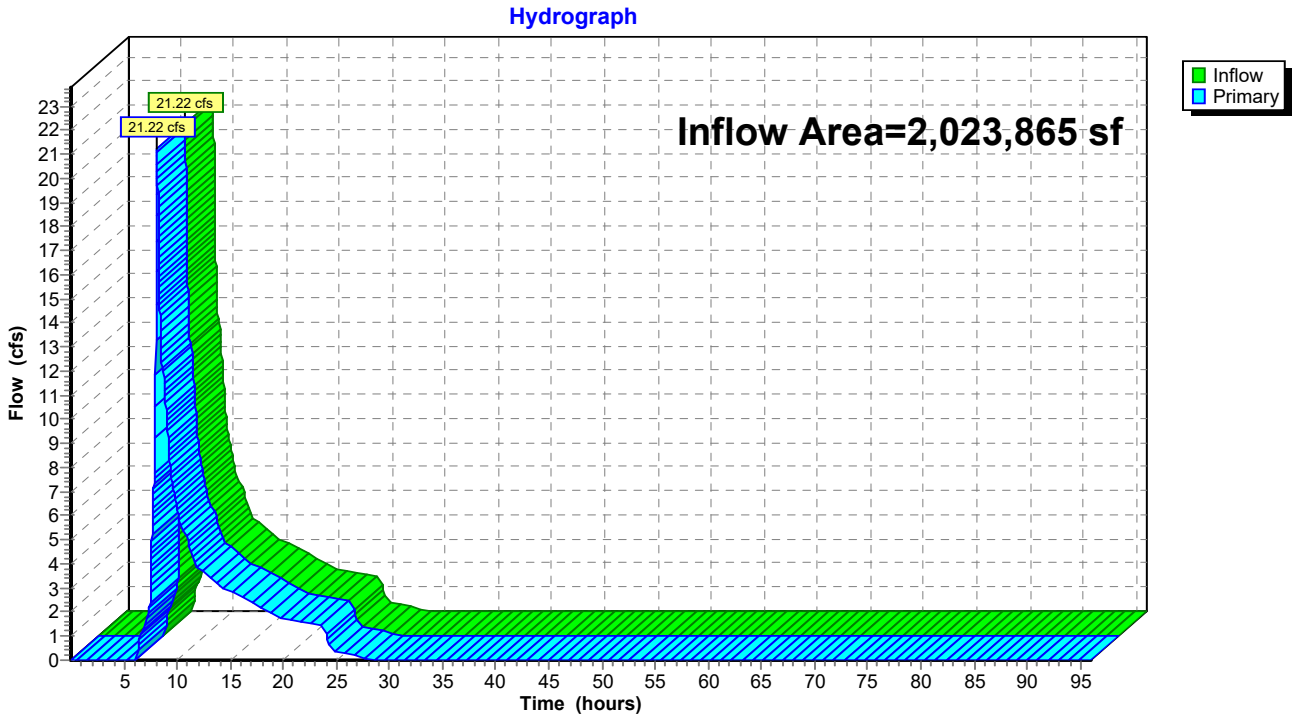


Summary for Link 27L: COMBINED OUTFLOW

Inflow Area = 2,023,865 sf, 54.23% Impervious, Inflow Depth > 1.43" for 100 year event
Inflow = 21.22 cfs @ 8.11 hrs, Volume= 240,838 cf
Primary = 21.22 cfs @ 8.11 hrs, Volume= 240,838 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-96.00 hrs, dt= 0.01 hrs

Link 27L: COMBINED OUTFLOW



Extended Dry Basin Operation and Maintenance Plan

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Trash and Debris	Visual evidence of trash, debris or dumping	Remove trash and debris from facility. Dispose of properly		
Contamination and Pollution	Evidence of oil, gasoline, contaminants, or other pollutants. Look for sheens, odor or signs of contamination	Locate source of contamination and correct. Remove oil using oil-absorbent pads or vactor truck. If low levels of oil persist plant wetland plants that can uptake small concentrations of oil such as Juncus effuses. (soft rush) If high levels of contaminants or pollutants are present, coordinate removal/ cleanup with local jurisdiction		
Invasive vegetation as outlined in Appendix A.	Invasive vegetation found in facility. Examples include: Himalayan Blackberry, Reed Canary Grass, Teasel, English Ivy, Nightshade, Clematis, Cattail, Thistle, Scotch Broom	Remove excessive weeds and all invasive plants. Attempt to control even if complete eradication is not feasible; refer to Clean Water Services Integrated Pest Management Plan for appropriate control methods, including proper use of chemical treatment		
Obstructed Inlet/Outlet	Material such as vegetation, trash, sediment is blocking more than 10% of inlet/outlet pipe or basin opening	Remove blockages from facility	Inspect after major storm (1-inch in 24 hours)	
Poor Vegetation Cover	80% survival of approved vegetation and no bare areas large enough to affect function of facility.	Determine cause of poor growth and correct the condition. Replant with plugs or containerized plants per the approved planting plan and applicable standards at time of construction. Remove excessive weeds and all invasive plants.	Ideal time to plant is spring and fall seasons	

Extended Dry Basin Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Vector Control	Evidence of rodents or water piping through facility via rodent holes. Harmful insects present such as wasps and hornets that interfere with maintenance/ inspection activities	Repair facility if damaged. Remove harmful insects, use professional if needed. Refer to Clean Water Services Integrated Pest Management Plan for management options	As Needed	
Tree/Shrub Growth	Tree/shrub growth shades out wetland/ emergent grass in treatment area. Interferes with access for maintenance/ inspection	Prune trees and shrubs that block sun from reaching treatment area. Remove trees that block access points. Do not remove trees that are not interfering with access or maintenance without first contacting Clean Water Services or local City	WINTER Ideal time for pruning is winter	
Hazard Trees	Observed dead, dying or diseased trees	Remove hazard trees. A certified Arborist may need to determine health of tree or removal requirements	As Needed	
Excessive Vegetation	Vegetation grows so tall that it competes with approved emergent wetland grass/shrubs, interferes with access or becomes a fire danger	Cut tall grass 4" to 6" and remove clippings. Prune emergent wetland grass/shrubs that have become overgrown.	SPRING Ideal time to prune emergent wetland grass is spring. Cut grass in dry months	
Erosion	Erosion or channelization that impacts or effects the function of the facility or creates a safety concern	Repair eroded areas and stabilize using proper erosion control measures. Establish appropriate vegetation as needed	FALL WINTER SPRING	

Extended Dry Basin Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Settlement of Pond Dike/ Berm	Look for any part of dike/berm that has settled 4 inches or more lower than the design elevation	Repair dike/berm to approved design specifications. A licensed civil engineer should be consulted to determine the source of the settlement	As Needed	
Blockage of Emergency Overflow/ Spillway	Blockage of overflow/ spillway by trees, vegetation or other material. Blockages may cause the berm to fail due to uncontrolled overtopping	Remove blockage. Small root system (base less than 4 inches) may be left in place; otherwise, roots are removed. A licensed civil engineer should be consulted for proper berm/spillway restoration.	Inspect after major storm (1-inch in 24 hours)	
Erosion of Emergency Overflow/Spillway	Native soil is exposed at the spillway, or there is only one layer of rock in an area of 5 square feet or larger	Restore rock and pad depth to appropriate depth. Refer to design specifications	Inspect after major storm (1-inch in 24 hours)	
Blockage of Overflow Structure/ Orifice Plate	Excessive standing water or water is not detained for required time.	Inspect and if needed clear orifice plate for proper drainage or re-install to ensure required detention.	Inspect after major storm (1-inch in 24 hours)	
Sediment Accumulation in Pond Bottom	Sediment accumulation in pond bottom exceeds 6 inches or affects facility inlet/ outlet or plant growth in treatment area	Remove sediment from pond bottom. Re-establish designed pond shape and depth. Establish appropriate vegetation in treatment area	Ideally in the dry season	

Extended Dry Basin Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Grate Damaged, missing or not in place	Grate is missing or only partially in place, may have missing or broken grate members.	Grate must be in place and meet design standards. Replace or repair any open structure, replace grate if missing	As Needed	
Damage to Outlet Structure	Damage to Frame or Top Slab. Frame not sitting flush on top slab (more than ¾ inch between frame and top slab); frame not securely attached	Ensure frame is firmly attached and sits flush on the riser rings or top slab	As Needed	
Damage to Outlet Structure	Fractures or Cracks in Walls or Bottom. Maintenance person determines the structure is unsound. Soil entering structure through cracks.	Structure replaced or repaired to design standards.	As Needed	
Damage to Outlet Structure	Settlement or Misalignment of Basin. Failure of basin has created a safety, function, or design problem	Structure replaced or repaired to design standards	As Needed	

III. ATTACHMENTS

Geotechnical Report

APPENDIX J – GEOTECHNICAL REPORT

GeoDesign Inc
An NV5 Company

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Sherwood Commerce Center North
21600 SW Oregon Street
Sherwood, Oregon

For
Harsch Investment Properties
September 8, 2020

GeoDesign Project: HarschInv-23-02

GeoDesign Inc
AN NV5 COMPANY

September 8, 2020

Harsch Investment Properties
1121 SW Salmon Street, Suite 500
Portland, OR 97205

Attention: Andrew Goodman

Report of Geotechnical Engineering Services
Sherwood Commerce Center North
21600 SW Oregon Street
Sherwood, Oregon
GeoDesign Project: HarschInv-23-02

GeoDesign, Inc. is pleased to submit this report of geotechnical engineering services for the proposed Sherwood Commerce Center North project in Sherwood, Oregon. Our services for this project were conducted in general accordance with our Professional Services Agreement dated July 31, 2020.

We appreciate the opportunity to be of continued service to you. Please call if you have questions regarding this report.

Sincerely,

GeoDesign, Inc.

George Saunders, P.E., G.E.
Principal Engineer

cc: Paul Richey, Harsch Investment Properties (via email only)

RTL:GPS:kt
Attachments
One copy submitted (via email only)
Document ID: HarschInv-23-02-090820-geor.docx
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EXECUTIVE SUMMARY

Based on our review of the available information and the results of our explorations, it is our opinion that the site can be developed as proposed. Our specific recommendations for site development and design are provided later in this report. The following items will have an impact on design and construction of the proposed project:

- Historical aerial photographs dating back to 1936 show that logging has periodically occurred at the site. As a result of the logging activity, there are wood chips and debris across much of the ground surface. This wood material will need to be removed, along with the underlying organic root zone, and possibly some of the topsoil if it contains significant roots.
- We encountered significant amounts of gravel, cobbles, and boulders in our test pits. This material will make mass grading and excavation work much more difficult. Significant amounts of screening will likely be necessary to allow the on-site material to be used as structural fill.
- There is frequently a layer of silt and clay at the ground surface, as well as interbedded layers within the gravel. It will be necessary to moisture-condition the silt and clay before it can be used as structural fill.
- We observed perched water in the northeast quadrant of the site at depths of 11 to 15.5 feet BGS while excavating test pits. This water could be encountered during mass grading or deeper excavations at the site.
- Based on the infiltration testing completed, it appears that on-site stormwater infiltration will likely be feasible. If on-site stormwater infiltration is used, we recommend that additional infiltration testing be performed during construction to verify that design infiltration rates can be achieved.
- The risks of liquefaction, lateral spreading, fault rupture, flooding, and landslides are low at this site.
- Based on the results of our explorations and analysis, we recommend that the proposed buildings be supported on spread footings that are underlain by firm/dense native soil or structural fill. It is likely that multiple subgrade soil conditions will be present beneath each building, and we anticipate that construction of the buildings can be greatly simplified by designing the footings for the worst-case subgrade soil.
- The foundation and floor slab subgrade soil will depend on the grading plan, where interbedded silt and clay layers are encountered within the overall gravel zone (see further discussions in the report), the building orientations, and the type of fill material that is imported to the site (if any). Depending on the above considerations, differential settlement could approach total settlements. We recommend that GeoDesign review the final grading plan to better establish foundation and floor slab settlement considerations.
- Our seismic analysis indicates that design levels of ground shaking can be computed assuming seismic Site Class C in accordance with the 2019 SOSSC.
- The pavement designs for this project will depend on the anticipated vehicle traffic and the final grading plans, which we understand are not known at this time. We recommend that user(s) of the proposed facility provide us with estimates of the daily car and truck traffic for each building so that we can prepare appropriate pavement designs. Thicker pavement sections will be required if construction traffic will be allowed on new pavement.

- The grading plans indicate that relatively high retaining walls of up to 24 feet may be required for this project. This report provides our typical recommendations for retaining walls up to 12 feet in height. When a final grading plan has been developed, we recommend that we be contacted to provide additional recommendations for taller retaining walls on a case-by-case basis.

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ACRONYMS AND ABBREVIATIONS

AC	asphalt concrete
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
BGS	below ground surface
CRBG	Columbia River Basalt Group
DOGAMI	Oregon Department of Geology and Mineral Industries
g	gravitational acceleration (32.2 feet/second^2)
GPS	global positioning system
H:V	horizontal to vertical
IBC	International Building Code
LiDAR	light detection and ranging
MCE	maximum considered earthquake
MCE_G	maximum considered earthquake geometric mean
MSE	mechanically stabilized earth
OSHA	Occupational Safety and Health Administration
OSHPD	Office of Statewide Health Planning and Development
pcf	pounds per cubic foot
pci	pounds per cubic inch
PGA	peak ground acceleration
PGA_M	maximum considered earthquake geometric mean peak ground acceleration adjusted for site affects
psf	pounds per square foot
SEAOC	Structural Engineers Association of California
SOSSC	State of Oregon Structural Specialty Code
USGS	U.S. Geological Survey

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering evaluation for the proposed Sherwood Commerce Center North project located at 21600 SW Oregon Street in Sherwood, Oregon. This project includes constructing three commercial/industrial buildings that vary in size between 167,200 and 208,000 square feet. We understand the buildings will likely be one-story, concrete tilt-up structures. The site consists of approximately 38.8 acres of land that is currently vacant. The site location relative to surrounding physical features is shown on Figure 1. Explorations (prior and recent) that we have performed on the site are shown on Figure 2. Acronyms and abbreviations used herein are defined above, immediately following the Table of Contents.

Foundation loads were not available at the time of this report; however, we have assumed maximum column loads will be less than 130 kips and maximum wall loads will be less than 4.5 kips per linear foot. We understand the distributed slab live load is unknown at this time; however, 250 psf is assumed and will be confirmed later by the proposed end user.

VLMK Engineering + Design prepared two grading plan options for this project that are currently being considered. According to the grading plans, current elevations range from approximately 180 feet at the southwest corner to 230 feet at the southeast corner and there is considerable undulating topography throughout the parcel. The proposed grading plans show cuts of up to approximately 15 feet and fills of up to approximately 30 feet. The two grading plans currently being considered are shown on Figures 3 and 4.

We should be contacted to re-evaluate our recommendations if the structural loads, cuts, or fills exceed these values we used in our design.

2.0 BACKGROUND

We previously excavated 15 test pits on the property in 2019 as part of a geotechnical evaluation for a different project. At your request, we asked for and received permission to use the previous subsurface information we collected. We then used the prior subsurface information to prepare a due diligence report for your project that was dated March 17, 2020 (GeoDesign, 2020a). Although the previous test pits provided a general indication of soil conditions on the property, they were concentrated toward the central portion of the property and did not provide information at locations where cuts and fill were greatest. Upon receiving the proposed grading plan options from VLMK Engineering + Design, we excavated additional test pits to supplement the previous subsurface information. We also performed infiltration tests at locations where stormwater infiltration is being considered.

We also previously performed a due diligence geotechnical evaluation for Harsch Investment Properties of the property south of the site (GeoDesign, 2020b). This evaluation included excavating eight test pits and performing infiltration tests.

3.0 PURPOSE AND SCOPE

The purpose of this evaluation was to provide geotechnical engineering recommendations for use in design and construction of the proposed development. Specifically, we completed the following scope of services:

- Performed a reconnaissance visit of the site to determine how to best perform the explorations.
- Reviewed readily available, published geologic data and our in-house files for existing information on subsurface conditions in the site vicinity.
- Coordinated and managed the field explorations, including utility locates, coordination with existing property owners, and scheduling the explorations.
- Conducted a subsurface exploration program that consisted of excavating 11 test pits to depths between 14.5 and 17 feet BGS.
- Maintained continuous logs of the explorations and collected samples at representative intervals.
- Performed six infiltration tests at depths between 3 and 14 feet BGS.
- Conducted a laboratory testing program that consisted of the following tests:
  - Ten moisture content determinations in general accordance with ASTM D2216
  - Nine particle-size analyses in general accordance with ASTM C117 or ASTM D1140
  - One Atterberg limits test in general accordance with ASTM D4318
- Provided recommendations for site preparation and grading, including temporary and permanent slopes, fill placement criteria, suitability of on-site soil for fill, subgrade preparation, and paving.
- Provided recommendations for wet weather construction.
- Provided foundation support recommendations for the proposed buildings, including preferred foundation type, allowable bearing pressure, lateral resistance parameters, and settlement estimates.
- Provided recommendations for use in design of conventional retaining walls, including backfill and drainage requirements and lateral earth pressures.
- Evaluated groundwater conditions at the site and provided general recommendations for dewatering during construction and subsurface drainage (if required).
- Provided seismic design recommendations in accordance with the procedures outlined in the 2018 IBC and 2019 SOSSC.
- Prepared this geotechnical engineering report that presents our findings, conclusions, and recommendations.

4.0 SITE CONDITIONS

4.1 GEOLOGY

4.1.1 Regional Geology

The site is located in the Tualatin Basin physiographic province, which is a northwest-southeast trending, pull-apart sub-basin of the Willamette Valley (Wilson, 1998). The Tualatin Basin is separated from adjacent sub-basins of the Willamette Valley by slightly folded and faulted basalt flows of the CRBG, which form topographic divides between adjacent basins (Popowski, 1997). The Coast Range and Chehalem Mountains bound the Tualatin Basin to the west and south,

respectively, and the Tualatin Mountains (Portland Hills) bound the Portland Basin to the north and east. The region has undergone large-scale and localized tectonic activity, which has contributed to form the hills and valleys in the Willamette Valley.

4.1.2 Seismicity

The site is located in a seismically active region. Subduction of the Juan de Fuca Plate beneath the west margin of the North American Plate presents the potential for great plate-interface earthquakes (magnitude greater than 8). Paleoseismic investigations indicate that plate interface earthquakes have an average recurrence of 500 to 600 years (Atwater and Hemphill-Haley, 1997; Goldfinger et al., 2003) and that the last subduction zone earthquake occurred in the year 1700 (Satake et al., 1996). Moderate intensity and long duration ground shaking would be expected at the site in the event of a large magnitude Cascadia plate-interface earthquake.

Crustal faults have also been mapped in the site vicinity. The closest crustal fault to the site is the Canby-Molalla fault, which is located approximately 4 miles from the site (USGS, 2020).

4.1.3 Site Geology

The generalized mapped geologic profile of the site consists of a thin layer of forest duff and topsoil that overlies basalt bedrock of the CRBG. The mapped geologic unit across most of the site is undifferentiated CRBG (Burns et al., 1997; Schlicker and Deacon, 1967). Fine-grained Missoula flood deposits are mapped along the west boundary of the site.

4.1.3.1 Missoula Flood Deposits

The Pleistocene Age (15,500 to 13,000 years before present) catastrophic Missoula flood deposits consist of poorly consolidated, fine- to coarse-grained sand, silt, and clay. The Missoula flood deposits resulted from a series of catastrophic late Pleistocene glacial outburst floods. During this time interval, enormous floods would periodically flow across eastern Washington and down the Columbia River Valley caused by failures of a glacial ice dam that impounded a large lake located in southwestern Montana (Lake Missoula). Floodwater would inundate the Willamette Valley and Tualatin Basin, leaving deposits of gravel, sand, and silt to elevations ranging from 250 to 400 feet.

In the general vicinity of the site, the Missoula floodwaters were large enough to overtop the pre-existing topographic divide between the Tualatin Valley and Willamette Valley near Sherwood, Oregon. High velocity floodwaters carved deep channels into the CRBG in the area, creating what is known as the Tonquin Scablands (Wilson, 1998). In places, the floodwaters removed decomposed and weathered basalt and eventually down cut and entrenched into less weathered material. Evidence of numerous scoured bedrock channels near the site are identifiable using LiDAR data.

Based on mapping in the area, Missoula flood deposits are anticipated along the west boundary of the site. The flood deposits are generally thin and lap onto the weathered surface of the CRBG, which occupies higher elevations at the site.

4.1.3.2 CRBG

The middle Miocene Age (20 million to 10 million years before present) CRBG represents the oldest geologic unit encountered at the site, which is exposed in outcrops on the site and forms many of the topographic highlands within the Tualatin Valley (Wilson, 1998). The CRBG is up to 1,000 feet thick within the Tualatin Valley (Schlicker and Deacon, 1967) with individual flows ranging between 10 to 100 feet thick. The CRBG is composed of a series of basalt flows erupted from linear vent systems in southeastern Washington that flowed down the course of the ancestral Columbia River until reaching the Pacific Ocean. Some of these lava flows ponded and cooled in the northern Willamette Valley, resulting in a stacked series of basalt units. Sediments deposited on the surface of an individual basalt flow would be covered by subsequent flows, resulting in a stacked sequence of basalt flows and sedimentary interbeds. These thick flows were subsequently folded and faulted by compressional tectonics in the region.

An idealized CRBG lava flow consists of two sub-units, termed the flow top and flow interior. The flow top is often a porous, vesicular zone resulting from gas bubbles trapped during rapid cooling of the lava surface. This zone is typically intensely to moderately fractured or brecciated, the result of rapid cooling, and both vesicles and fractures may be partially filled by secondary mineralization. The flow bottom is similar to the flow top, except the weathering may not be as severe. The flow interior typically consists of very dense, moderately fractured basalt with a high mechanical strength due to crystalline mineral formation resulting from slower cooling of the lava.

A hiatus between lava flow emplacements can create conditions of deep weathering of the basalt, resulting in a breakdown of the rock minerals to clay components forming a soil horizon (saprolite). The hiatus periods may have resulted in thick sections of severely weathered basalt and deposition of sedimentary interbeds between basalt flow units. Unweathered exposures of Columbia River basalt flow interiors are excellent sources of crushed aggregate. Several active quarries in the CRBG are located east and southeast of the study area (Tigard Sand and Gravel Quarry and Knife River-Coffee Lake Quarry). Where the CRBG was exposed for an extensive period of time, the rock is decomposed to form a thick, lateritic soil consisting of clayey gravel or clayey sand containing cobbles and boulders.

4.2 SURFACE CONDITIONS

The site consists of 38.8 acres of land that is bound by fields and residences on all sides, as well as SW Oregon Street to the northwest. The site is currently vacant. A residence was previously located in the northwest portion of the site until it was demolished in approximately 2008. Current elevations at the site range from approximately 180 feet at the southwest corner to 230 feet at the southeast corner, and there is considerable undulating topography throughout the parcel. Vegetation at the site consists primarily of grass, brush, and shrubs. There are large trees in the northwest portion of the site near the former residence. There are also scattered small trees across the site. This site was previously used for commercial logging, with the most recent clearing occurring in approximately 2004. Historical aerial photographs dating back to 1936 show that logging has periodically occurred on the property. There is currently a significant amount of wood chips and debris across the ground surface that was generated during previous logging activity.

4.3 SUBSURFACE CONDITIONS

We conducted a subsurface exploration program that consisted of excavating 11 test pits (TP-1 through TP-11) to depths between 14.5 and 17 feet BGS at the approximate locations shown on Figure 2. Figures 3 and 4 show the locations of the test pits relative to the grading plans currently being considered. Descriptions of the field exploration and laboratory testing programs, logs of the explorations, and laboratory test results are presented in Appendix A. Representative photographs of our test pit explorations are presented in Appendix B. We previously excavated 15 test pits on the site for a previous project. The logs of our previous explorations are presented in Appendix C and the locations of our previous explorations are shown on Figures 2 through 4. The historical aerial photographs of the property that we reviewed are presented in Appendix D.

Subsurface conditions generally consist of forest duff and topsoil, which is underlain by silt and clay, which overlies gravel with variable amounts of cobbles and boulders. We note that fill was encountered in one test pit (TP-11 from 2019) and consists of medium stiff silt with cobbles and boulders. Fill was not encountered in nearby test pits, so it appears that fill is not widespread. The following sections provide a summary of each the subsurface units we encountered.

4.3.1 Forest Duff/Topsoil

A 2- to 6-inch-thick forest duff layer was encountered at the ground surface at several of the explorations; however, observations during traversing the site indicate that thicker accumulations of duff are present. The forest duff primarily consists of wood chips and wood debris from previous logging activity. In addition, the surface soil generally includes a 12- to 22-inch-thick topsoil layer as well as a 4- to 8-inch-thick root zone. The topsoil generally consists of medium stiff to stiff silt and includes variable amounts of organics, sand, gravel, clay, cobbles, and boulders. Soil of this type and consistency generally exhibits relatively low strength and high compressibility.

4.3.2 Silt and Clay

The forest duff and topsoil are frequently underlain by silt or clay. Where observed, the silt or clay extends to depths of between 1 foot and 6 feet BGS; however, we observed it as deep as 11.5 feet BGS in one test pit (TP-9 from 2019). The silt and clay are generally medium stiff to very stiff and typically include sand, gravel, cobbles, and boulders. We also encountered layers of silt and clay within the gravel as discussed below.

Laboratory testing indicates that the moisture content in this layer was approximately 15 to 26 percent at the time of the explorations. Soil of this type and consistency generally exhibits relatively moderate strength and moderate compressibility.

4.3.3 Gravel

Gravel is present below the silt and clay in some of the test pits and is directly below the forest duff and topsoil in other test pits. We observed this gravel layer in all the test pits we excavated on the property. The gravel is medium dense to dense with a fines content (silt or clay) between with silt/clay to silty/clayey. The gravel includes variable amounts (sometimes relatively high

amounts) of cobbles and boulders. We observed boulders that were up to approximately 3 feet in diameter. Soil of this type and consistency generally exhibits relatively high strength and low compressibility.

We also encountered layers of clay, silt, and sand within the gravel at TP-5, TP-8, and TP-9 in the recent explorations and at TP-3, TP-4, TP-6, TP-7, TP-11, and TP-13 in the 2019 explorations.

The gravel is likely derived from decomposed CRBG. The decomposed basalt may have been generated through a variety of processes, including weathering of in-place basalt, weathering of flow top breccia derived from the CRBG, and erosion and deposition of CRBG material close to the original flow. The weathering of this material is variable and dependent on the ability of surface water and groundwater to penetrate the unit and chemically break it down. The decomposition process can include highly variable amounts of relatively resistant gravel- to boulder-sized clasts in a matrix of silt and clay. We did not encounter hard, intact CRBG and excavation refusal in the test pits we excavated on the property.

4.3.4 Groundwater

We typically observed water seepage in the test pits we excavated in the northeast quadrant of the site. We noted the seepage at depths ranging between 11 and 15.5 feet BGS. We did not observe seepage at any other locations on the property. Nearby depth to groundwater mapping suggests that groundwater in the area may be present at an elevation of approximately 170 feet (Snyder, 2008), which is well below most of the site. In our opinion, the water seepage observed is perched water. Perched groundwater zones are likely to occur along the top of the intact CRBG, particularly during extended periods of wet weather. The depth to groundwater may fluctuate in response to prolonged rainfall, seasonal changes, changes in surface topography, and other factors not observed during this study.

4.3.5 Caving

Minor to severe caving was encountered in most of the test pits between depths of 0 and 17 feet BGS.

4.4 INFILTRATION TESTING

We performed six falling head infiltration tests to evaluate infiltration rates at the site. We performed the tests at various depths and locations where the civil engineer is considering stormwater infiltration. We performed infiltration tests in silt using the encased falling head test method. We performed infiltration tests in gravel using the open pit falling head test method. We used a head of approximately 1 foot to 2 feet of water and used automatic data loggers or an electronic water level indicator to track the gradual drop in water levels, except in test pit TP-2 where infiltration was too rapid for us to develop a head of water. We estimated the infiltration rate in test pit TP-2 by measuring the amount of time necessary for 100 gallons of water to infiltrate into the open pit. Representative soil samples were collected below the infiltration test depths for grain-size analysis. Table 1 summarizes the infiltration test results and fines content determinations of the representative soil samples collected below the infiltration test. The exploration logs and laboratory test results are presented in Attachment A. Plots of the infiltration data we collected are presented in Appendix E.

Table 1. Measured Infiltration Rates

Location	Depth (feet BGS)	Material	Infiltration Rate[1] (inches per hour)		Fines Content[2] (percent)
			Tested Range	Recommended Maximum	
TP-1	14	Gravel	10 – 60	30	12
TP-2	5	Silty gravel	> 100	100	18
TP-3	3	Sandy silt	1	1	58
TP-3	12	Silty gravel	40 – 50	40	15
TP-4	4	Sandy silt	10 – 70	20	64
TP-4	7	Silty gravel	30 – 50	40	17

1. Infiltration rates are not factored.
2. Fines content: material passing the U.S. Standard No. 200 sieve

The infiltration rates provided in Table 1 are measured rates and are unfactored. We recommend against attempting to infiltrate in silt (such as at TP-3 at 3 feet BGS and TP-4 at 4 feet BGS and recommend that infiltration systems extend to the underlying gravel.

Factors of safety should be applied to the measured infiltration rates by the civil engineer during design to account for soil variations, the potential for long-term clogging due to siltation and buildup of organic material, maintenance, influent/pre-treatment control, and consequences of failure. We recommend that a factor of safety of at least 2.0 be applied to the field-measured infiltration rates.

Based on the relatively high infiltration rates we measured, it appears that on-site stormwater infiltration will likely be feasible. If on-site stormwater infiltration is used, we recommend that additional infiltration testing be performed during construction to verify that design infiltration rates can be achieved. We note that the infiltration rates on this property are considerably higher than the infiltration rates we measured on the adjacent property to the south where an additional phase of this project may be constructed. If adequate infiltration cannot be achieved on the property to the south, the design team could consider transporting stormwater from the south property to the north property for infiltration.

5.0 GEOLOGIC HAZARDS

We evaluated the presence of geologic hazards in the site vicinity based on a review of published literature and our experience with nearby projects. Individual geologic hazards are summarized in the following sections.

5.1 SEISMIC

5.1.1 Liquefaction

Liquefaction is a phenomenon caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. The excessive buildup of pore water pressure results in the sudden loss of shear strength in a soil. Granular soil, which relies on interparticle

friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. Sand boils and flows observed at the ground surface after an earthquake are the result of excess pore pressures dissipating upwards, carrying soil particles with the draining water. In general, loose, saturated sand soil with low silt and clay content is the most susceptible to liquefaction. Low plasticity silty sand and silt may be moderately susceptible to liquefaction under relatively higher levels of ground shaking. Liquefaction can densify subsurface soil, which can result in settlement at the ground surface. Hazard mapping does not identify liquefaction as being a hazard at this site (DOGAMI, 2018). Based on the shallow dense gravel across the site and the relatively deep groundwater level, it is our opinion that liquefaction is not a hazard at this site.

5.1.2 Lateral Spreading

Lateral spreading is a liquefaction-related seismic hazard and occurs on gently sloping sites or flat sites underlain by liquefiable sediment adjacent to an open face, such as a riverbank. Liquefied soil on a sloping site can flow downhill or a site adjacent to an open face can flow toward the open face, resulting in lateral ground displacement. Since liquefaction is not a hazard at this site, it is our opinion that lateral spreading is also not a hazard at this site.

5.1.3 Surface Fault Rupture

As discussed in the "Seismicity" section, there are no mapped active faults within approximately 4 miles of the site (USGS, 2020). In our opinion, the risk of surface fault rupture at this site is low.

5.2 FLOODING

Hazard mapping for the site does not show flooding as a potential hazard (DOGAMI, 2018). In our opinion, the risk of flooding at this site is low.

5.3 LANDSLIDES

Hazard mapping for the site does not show any mapped landslides in the site vicinity (DOGAMI, 2018). The site is generally gently sloped. In our opinion, the risk of landslides at this site is low.

6.0 DESIGN RECOMMENDATIONS

6.1 FOUNDATION SUPPORT

6.1.1 General

Based on the relatively large cuts and fills shown on the proposed grading plans, it appears likely that building footing subgrade soil will consist of a combination of native gravel, native silt and clay, structural fill overlying gravel, and structural fill overlying silt and clay. Based on the results of our explorations and analysis, we recommend that the proposed buildings be supported on spread footings that are underlain by firm/dense native soil or structural fill. Given the relatively light building loads, we recommend that the buildings be designed for the worst-case subgrade soil allowable bearing pressure, which is 2,500 psf for the native silt and clay. This value may be increased by one-half for short-term loads such as wind and seismic forces. Although compacted structural fill and dense native gravel can support higher bearing pressures, we likely will not be able to accurately predict what the subgrade soil will be at specific footings. The subgrade soil will depend on the grading plan, where interbedded silt and clay layers are encountered within

the overall gravel zone, the building orientations, and the type of fill material that is imported to the site (if any). As a result, it is likely that multiple subgrade soil conditions will be present beneath each building, and we anticipate that construction of the buildings can be greatly simplified by designing the footings for the worst-case subgrade soil.

We recommend that the forest duff, organic root zone, and topsoil that contains significant roots be removed from beneath buildings, pavement, and other hardscapes. We also recommend that any undocumented fill and debris (if any) that is encountered beneath these areas be removed and replaced with structural fill. Our recommendations for suitable types of structural fill are presented in the "Structural Fill" section.

We recommend that isolated column and continuous wall footings have minimum widths of 24 and 18 inches, respectively. The bottom of exterior footings should be founded at least 18 inches below the lowest adjacent grade. Interior footings should be founded at least 12 inches below the bottom of the floor slab.

All footing subgrade should be evaluated by the project geotechnical engineer or their representative to evaluate bearing conditions. Observations should determine whether all loose or soft material, organic material, unsuitable fill, prior topsoil zones, and softened subgrades (if present) have been removed. Localized deepening of footing excavations may be required to penetrate unsuitable material.

6.1.2 Lateral Resistance

Lateral loads on footings can be resisted by passive earth pressure on the sides of the footings and by friction along the base of the footings. Our analysis indicates that the available passive earth pressure is 300 pcf modeled as an equivalent fluid pressure. The upper 12 inches of adjacent, unpaved areas should not be considered when calculating passive resistance. A coefficient of friction value equal to 0.30 may be used when calculating resistance to sliding for foundations bearing on silt or clay. A coefficient of friction value of 0.50 may be used when calculating resistance to sliding for foundations bearing on dense native gravel or crushed rock.

6.1.3 Settlement

The foundation subgrade soil will depend on the grading plan, where interbedded silt and clay layers are encountered within the overall gravel zone, the building orientations, and the type of fill material that is imported to the site (if any). We anticipate that footings supporting the anticipated design loads and constructed as recommended will experience less than 1½ inches of total post-construction settlement; however, depending on the above considerations, differential settlement between similarly loaded footings could approach total settlements. We recommend that GeoDesign review the final grading plan to better establish foundation settlement considerations.

6.2 SLABS ON GRADE

We anticipate that concrete floor slabs will generally be supported on native soil or structural fill. If any loose undocumented fill is present beneath the floor slabs, the subgrade soil should be evaluated during construction to determine if re-compaction or over-excavation is required. The subgrade should be prepared in accordance with the recommendations in this report. A

modulus of subgrade reaction of 100 pci can be used for design of the floor slabs, provided the subgrade is prepared in accordance with the recommendations presented in this report.

Floor slab settlement will also be influenced by the same variables as foundation settlement (see "Foundation Support" section above) and similar to the amounts identified above. We recommend that GeoDesign review the final grading plan to better establish slab settlement considerations.

We recommend that floor slabs be supported on at least 6 inches of imported granular material to aid as a capillary break and to provide uniform support. The imported granular material should have a maximum particle size of 1½ inches, should have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, and should have at least two mechanically fractured faces. The imported granular material should be placed in one lift and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

Vapor barriers beneath floor slabs are typically required by flooring manufactures to maintain the warranty on their products. In our experience, adequate performance of floor adhesives can be achieved by using a clean base rock (less than 5 percent fines) beneath the floor slab with no vapor barrier. In fact, vapor barriers can frequently cause moisture problems by trapping water beneath the floor slab that is introduced during construction. If a vapor barrier is used, water should not be applied to the base rock prior to pouring the slab and the work should be completed during extended dry weather so that rainfall is not trapped on top of the vapor barrier. Selection and design of an appropriate vapor barrier, if needed, should be based on discussions among members of the design team. If requested, we can provide additional information to assist you with your decision.

6.3 SEISMIC DESIGN PARAMETERS

We understand this project will be designed and constructed in accordance with the 2018 IBC and 2019 SOSSC. Based on the soil present at this site, it is our opinion that a seismic Site Class C designation should be used to compute design levels of ground shaking. Base shear forces can be computed using the seismic parameters provided in Table 2. These parameters were obtained from the SEAOC/OSHPD seismic design map tool recommended by USGS (SEAOC/OSHPD, 2020).

Table 2. IBC Seismic Design Parameters

Parameter	Short Period (T_s = 0.2 second)	1 Second Period (T_1 = 1.0 second)
Spectral Acceleration (MCE)	S_s = 0.832 g	S_1 = 0.391 g
Site Class	C	
Site Coefficient	F_a = 1.200	F_v = 1.500
Spectral Acceleration Parameters	S_{MS} = 0.999 g	S_{M1} = 0.586 g
Design Spectral Acceleration Parameters	S_{DS} = 0.666 g	S_{D1} = 0.391 g
Spectral PGA	0.380 g	
Design Spectral PGA	0.253 g	
MCE_G PGA Adjusted for Site Class Effects[1]	PGA_M = 0.456 g	

1. From ASCE 7-16. Minimum PGA value to use when evaluating liquefaction and soil strength loss, as required by ASCE 7-16 Section 11.8.3.

6.4 RETAINING WALLS

6.4.1 Overview

We anticipate that retaining structures could include conventional cantilevered walls and/or MSE walls. Our recommendations for various walls are provided below.

6.4.2 General Wall Design Parameters

Our retaining wall design recommendations are based on the following assumptions: (1) the walls consist of conventional, cantilevered retaining walls, (2) the walls are less than 12 feet in height, (3) the backfill is drained and consists of imported granular material, and (4) the backfill is level. Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project varies from these assumptions. Once a final grading plan has been prepared, we should review the grading plan and provide additional recommendations on a case-by-case basis for retaining walls taller than 12 feet.

6.4.3 Wall Design Parameters

For unrestrained retaining walls, an active equivalent fluid pressure of 35 pcf should be used for design. Where retaining walls are restrained from rotation prior to being backfilled, an equivalent fluid pressure of 55 pcf should be used for design. A superimposed seismic lateral force should be calculated based on a dynamic force of $7H^2$ pounds per linear foot of wall (where H is the height of the wall in feet). The load should be applied as a distributed load with the centroid located at a distance of 0.6H above the base of the wall.

If surcharges (e.g., retained slopes, building foundations, vehicles, terraced walls, etc.) are located within a horizontal distance from the back of a wall equal to the height of the wall, additional pressures will need to be accounted for in the wall design. Figure 5 presents additional pressures resulting from some common loading scenarios. Our office should be

contacted for additional pressures resulting from alternate loading scenarios. We recommend a vertical live load of 250 psf be applied at the surface of the retained soil where the wall retains roadways.

The base of the wall footing excavations should extend a minimum of 18 inches below the lowest adjacent grade. The wall footings should be designed in accordance with the guidelines in the "Foundation Support" section. At locations where there is a slope in front of the retaining wall, we recommend that a minimum 5-foot-wide, horizontal bench be placed between the wall and the top of the slope.

6.4.4 Wall Drainage and Backfill

The above design parameters have been provided assuming drains will be installed behind the walls to prevent buildup of hydrostatic pressures. Backfill material placed behind retaining walls and extending a horizontal distance of ½H (where H is the height of the retaining wall) should consist of Select Granular Wall Backfill meeting the requirements described in the "Structural Fill" section. Alternatively, the native soil can be used as backfill material, provided oversized material is removed and a minimum 2-foot-wide column of angular drain rock wrapped in a drainage geotextile is placed against the wall and the native soil can be adequately moisture conditioned for compaction. The rock column should extend from the perforated drainpipe or foundation drains to within approximately 1 foot of the ground surface. The angular drain rock should have a maximum particle size of 2 inches, should have less than 2 percent by dry weight passing the U.S. Standard No. 200 sieve, should have at least two mechanically fractured faces, and should be free of organic material and other unsuitable materials.

Perforated collector pipes should be placed at the base of the granular backfill behind the walls. The pipe should be embedded in a minimum 2-foot-wide zone of angular drain rock wrapped in a drainage geotextile fabric. The collector pipes should discharge at an appropriate location away from the base of the wall. Unless measures are taken to prevent backflow into the drainage system of the wall, the discharge pipe should not be tied directly into stormwater drain systems.

Backfill should be placed and compacted as recommended for Select Granular Wall Backfill as described in the "Structural Fill" section.

Settlement of up to 1 percent of the wall height commonly occurs immediately adjacent to the wall as the wall rotates and develops active lateral earth pressures. Consequently, we recommend that construction of flatwork adjacent to retaining walls be postponed at least four weeks after construction, unless survey data indicates settlement is complete prior to that time.

6.4.5 MSE Wall Design

A live load of 250 psf should be assumed if traffic loading will behind the MSE walls. Seismic forces should be modeled using a seismic coefficient of 0.15 g. The live load may be removed for seismic analysis.

The final grading plan may change these recommendations; however, for preliminary planning, we recommend using the soil parameters for use in MSE wall design presented in Table 3.

Table 3. Recommended MSE Soil Parameters

Soil Type	Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)	Soil/Geosynthetic Interface Friction Angle (degrees)
Reinforcing Zone Backfill – Select Granular Wall Backfill[1]	140	35	0	21
Retained/Foundation Soil – Native Silt/Clay	100	28	0	17
Retained/Foundation Soil – Native Silty Gravel	120	32	0	19

1. Select Granular Wall Backfill, as described in the "Structural Fill" section of this report.

A suitable geosynthetic should be selected to resist the maximum tensile forces determined by the design engineer. The long-term design strength of the geosynthetic should be equal to or greater than the maximum tensile force. Unless manufacturer-specific reduction factors are applied, the ultimate tensile strength of the geosynthetic selected should be reduced by a factor of 7.0 to account for creep, installation damage, and chemical and biological degradation.

The wall design should account for the wall backslope and the slope extending beyond the toe of the wall. The wall design should include all internal and external stability requirements, as well as global slope stability requirements.

Excavation may be required to achieve internal and external stability, as well as global slope stability. All existing fill and topsoil should be removed from the wall and roadway alignment. This may locally require over-excavation of the wall base. The excavation subgrade should expose competent native soil, extend in front of the wall face for at least 3 horizontal feet before the slope breaks, and allow for a minimum of 24 inches of embedment of the toe of the wall. A geotextile fabric should be considered over the excavation backslope prior to backfilling in order to keep separate native soil from the granular backfill and to prevent silt migration.

All earthwork and excavation should be conducted in conformance with the "Structural Fill" section. If the wall is constructed during wet weather, measures should be taken to protect exposed subgrades from moisture. If sloughing of the backslope occurs during construction, granular wall backfill contaminated with silt or clay soil should be removed from the backfill zone. Spoils generated during excavation of the slope should not be placed on the slope but should rather be removed to a designated area away from the slope.
Wall backfill materials and placement should be in general conformance with "Wall Drainage and Backfill" section.

Gravel drains should be provided behind the wall facing and, if needed, behind the reinforced soil zone. Water collected by the drains should not be discharged onto the slope in a concentrated manner. Ideally, the discharge should be extended to the base of the slope.

6.5 PERMANENT SLOPES

Permanent cut or fill slopes should not exceed a gradient of 2H:1V, unless specifically evaluated for stability. Upslope buildings, access roads, and hardscapes should be set back a minimum of 5 feet from the crest of such slopes. Slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

6.6 DRAINAGE

6.6.1 Surface

The finished ground surface around the buildings should be sloped away from foundations at a minimum 2 percent gradient for a distance of at least 5 feet. Pavement surfaces and open space areas should be sloped such that surface water runoff is collected and routed to suitable discharge points. Runoff water should not be directed to the top of slopes.

6.6.2 Subsurface

In our opinion, it is not necessary to install footing drains for at-grade structures, such as the proposed buildings. Perimeter footing drains should be installed around buried structures if any are proposed. We recommend that footing drains (if used) and roof downspouts or scuppers discharge to a solid pipe that carries the collected water to an appropriate stormwater system that is designed to prevent backflow.

6.6.3 Temporary

During grading the contractor should be made responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface. During rough and finished grading of the building site, the contractor should keep all footing excavations and building pads free of water.

6.7 PAVEMENT

The pavement designs for this project will depend on the anticipated vehicle traffic and the final grading plans, which we understand are not known at this time. We recommend that user(s) of this proposed facility provide us with estimates of the daily car and truck traffic for each building. Pavement loads for trucks are much higher than for cars, so it will be necessary to get an estimate of both the daily truck traffic and the size distribution of trucks that the pavement should be designed for. We anticipate that both AC and concrete pavement may be used for this project, but this should be confirmed at the time we prepare our pavement recommendations. Once all this information is available, we can provide pavement recommendations for drive aisles, parking areas, loading docks, and other areas that may be requested. Thicker pavement sections will be required if construction traffic will be allowed on new pavement.

7.0 CONSTRUCTION RECOMMENDATIONS

7.1 SITE PREPARATION

7.1.1 Stripping and Grubbing

A 2- to 6-inch-thick forest duff layer was encountered at the ground surface at several of the explorations; however, observations during traversing the site indicate that thicker

accumulations of duff are present. The forest duff primarily consists of wood chips and wood debris from previous logging activity. In addition, the surface soil generally includes a 12- to 22-inch-thick topsoil layer as well as a 4- to 8-inch-thick root zone.

Stripping and grubbing will be required to remove any vegetation that remains after cuts are performed. Root zones and organic material should be stripped and removed from all building, pavement, and structural fill areas. Including the forest duff and root zone, we anticipate stripping depths of approximately 6 to 9 inches will generally be adequate. Greater depths may be necessary to remove localized zones of organic material, forest duff, or deeper tree and shrub root zones. The actual stripping and grubbing depth should be based on field observations at the time of construction. Stripping and grubbing should extend at least 5 feet beyond the limits of proposed building and pavement areas. Stripped material should be transported off site for disposal or used as fill in landscaping areas.

7.1.2 Demolition

We are not aware of any demolition that will be needed to construct the proposed project. However, if any abandoned footings, walls, slabs, utilities, basements, or other foundation elements are encountered during construction beneath new structures, they should be completely removed. Any abandoned monitoring wells or underground storage tanks that are encountered should be decommissioned in accordance with state and local regulations prior to site development. Excavations resulting from demolition of existing improvements should be backfilled with compacted structural fill as recommended in this report. The bottom of the excavations should expose firm subgrade. The sides of the temporary excavations should be cut into firm material and sloped no steeper than 1½H:1V.

7.1.3 Subgrade Evaluation

A member of our geotechnical staff should observe all footing, floor slab, and hardscape subgrade after stripping, excavation, scarifying and compaction, and placement of structural fill have been completed to confirm that there are no areas of unsuitable or unstable soil. The subgrade should be evaluated using moisture-density testing, a hand probe, or proof rolling with a fully loaded dump truck (or similar heavy, rubber tire construction equipment). Soft, loose, or unsuitable soil found at the subgrade level should be over-excavated and replaced with structural fill.

7.2 EXCAVATION

7.2.1 General

Conventional earthmoving equipment in proper working condition should generally be capable of making the necessary excavations, although the presence of many large cobbles and boulders will likely require larger excavation equipment. Excavations in the gravel, sand, cobbles, and boulders will be prone to raveling and slow excavation rates and larger backfill volumes should be assumed.

Excavations deeper than 4 feet will require shoring or should be sloped. Sloped excavations may be used to vertical depths of 10 feet BGS and should have side slopes no steeper than 1½H:1V, provided groundwater seepage does not occur. We recommend a minimum horizontal distance of 5 feet from the edge of the existing improvements to the top of any temporary slope. All cut

slopes should be protected from erosion by covering them during wet weather. If seepage, sloughing, or instability is observed, the slope should be flattened or shored. Shoring will be required where slopes are not possible. We can provide additional shoring recommendations if shoring will be used on this project. The contractor should be responsible for selecting the appropriate shoring system.

Excavations should not be allowed to undermine adjacent improvements. If existing roads or structures are located near a proposed excavation, unsupported excavations can be maintained outside of a 1H:1V downward projection that starts 5 feet from the base of the existing footings. Excavations that must be inside of this zone should be supported by temporary or permanent shoring designed for moment resistance for the full height of the excavation, including kick-out for the full buried depth of the retaining system.

While we have described certain approaches to performing excavations, it is the contractor's responsibility to select the excavation and dewatering methods, monitor the excavations for safety, and provide any shoring required to protect personnel and adjacent improvements. All excavations should be in accordance with applicable OSHA and state regulations.

7.2.2 Dewatering

Excavations will be above the groundwater level. However, some perched water could still seep into the site excavations, especially after periods of heavy rain. We anticipate that dewatering methods consisting of pumping water from excavation sumps will generally be adequate. If possible, we recommend that construction be scheduled for the dry season. Water generated during dewatering operations should be treated, if necessary, and pumped to a suitable disposal point.

Where groundwater seepage occurs in excavations, we recommend placing at least 1 foot of stabilization material at the base of the excavations. The stabilization material should consist of 4- or 6-inch-minus pit- or quarry-run rock, crushed rock, or crushed gravel and sand. The material should have a maximum particle size of 6 inches, should have less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve, and should have at least two mechanically fractured faces. The material should be free of organic material and other deleterious materials.

We note that these recommendations are for guidance only. Dewatering of excavations is the sole responsibility of the contractor, as the contractor is in the best position to select the appropriate system based on their means and methods.

7.3 STRUCTURAL FILL

Structural fill includes fill beneath foundations, slabs, hardscapes, and other structures. Structural fill should generally consist of particles no larger than 6 inches in diameter and should be free of organic material and other deleterious materials. Recommendations for suitable fill material are provided in the following sections.

7.3.1 On-Site Soil

The on-site silt and clay will be suitable for use as structural fill only if it can be moisture conditioned and it is screened to remove oversized material. Based on our experience, this soil

will be sensitive to small changes in moisture content and may be difficult, if not impossible, to compact adequately during wet weather or when the moisture content is more than a few percentage points above optimum. The soil may require extensive drying before it can be used as structural fill. The on-site silt and clay should be placed in lifts with a maximum uncompacted thickness of 8 inches and compacted to not less than 92 percent of the material's maximum dry density, as determined by ASTM D1557. We recommend using imported granular material for structural fill if the moisture content of the on-site soil cannot be reduced.

The on-site coarse-grained soil will be suitable for use as structural fill only if it can be moisture conditioned and it is screened to remove oversized material. The soil may require extensive drying before it can be used as structural fill. The on-site coarse-grained soil should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the material's maximum dry density, as determined by ASTM D1557. We recommend using imported granular material for structural fill if the moisture content of the on-site soil cannot be reduced.

7.3.2 Imported Granular Material

Imported granular material should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand that is fairly well graded between coarse and fine and has less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve. All granular material must be durable such that there is no degradation of the material during and after installation as structural fill. The material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557. During the wet season or when wet subgrade conditions exist, the initial lift should have a maximum thickness of 18 inches and should be compacted by rolling with a smooth-drum, non-vibratory roller.

7.3.3 Recycled Concrete

Recycled concrete can be used for structural fill, provided the concrete is broken to a maximum particle size of 3 inches. This material must be durable such that there is no degradation of the material during and after installation as structural fill. Recycled concrete can be used as trench backfill if it meets the size requirements for that application and the requirements for imported granular material. The material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

7.3.4 Trench Backfill Material

Local jurisdiction trench backfill requirements should be followed for any public utilities that are installed. Our trench backfill recommendations for private utilities are provided below.

Trench backfill for the utility pipe base and pipe zone should consist of durable, well-graded granular material that has a maximum particle size of 1 inch, has less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, and contains no organic material or other deleterious materials. Backfill above the pipe zone should meet the requirements above, except that the maximum particle size may be increased to 1½ inches.

Backfill for the pipe base and within the pipe zone should be placed in maximum 12-inch-thick lifts and compacted to not less than 90 percent of the maximum dry density, as determined by ASTM D1557, or as recommended by the pipe manufacturer. Backfill above the pipe zone should be placed in maximum 12-inch-thick lifts and compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D1557. Trench backfill located within 2 feet of finish subgrade elevation should be placed in maximum 12-inch-thick lifts and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557. Outside of structural areas, trench backfill material should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D1557.

7.3.5 Stabilization Material

Stabilization material used in staging or haul road areas or in trenches should consist of 4- or 6-inch-minus pit- or quarry-run rock, crushed rock, or crushed gravel and sand. The material should have a maximum particle size of 6 inches, should have less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve, and should have at least two mechanically fractured faces. The material should be free of organic material and other deleterious materials. Stabilization material should be placed in lifts between 12 and 24 inches thick and compacted to a well-keyed, firm condition.

7.3.6 Select Granular Wall Backfill

Backfill material placed behind retaining walls and extending a horizontal distance of ½H (where H is the height of the retaining wall) should consist of imported granular material. We recommend the granular backfill be separated from general fill, native soil, and/or topsoil using a geotextile fabric that meets the specifications provided below for drainage geotextiles.

The wall backfill should be compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D1557. However, backfill located within a horizontal distance of 3 feet from a retaining wall should only be compacted to approximately 90 percent of the maximum dry density, as determined by ASTM D1557. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (such as a jumping jack or vibratory plate compactor). If flatwork (sidewalks or pavement) will be placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 95 percent of the maximum dry density, as determined by ASTM D1557.

7.3.7 Cement Amending

As an alternative to the use of imported granular material for wet weather structural fill, an experienced contractor may be able to amend on-site or imported fine-grained soil with portland cement to obtain suitable support properties. Successful use of soil amendment depends on the use of correct mixing techniques, soil moisture content, and amendment quantities. A considerable amount of screening will likely be required for on-site soil to remove large rocks that could damage the cement amending equipment. We can provide specific cement amending recommendations if this is a construction method that will be considered for this project.

7.4 EROSION CONTROL

The on-site soil is susceptible to erosion. Consequently, we recommend that slopes be covered with an appropriate erosion control product if construction occurs during periods of wet weather.

We recommend that all slope surfaces be planted as soon as practical to minimize erosion. Surface water runoff should be collected and directed away from slopes to prevent water from running down the slope face. Erosion control measures such as straw bales, sediment fences, and temporary detention and settling basins should be used in accordance with local and state ordinances.

7.5 WET WEATHER CONSTRUCTION

Trafficability of soil at the ground surface may be difficult during extended wet periods or when the moisture content of the surface soil is more than a few percentage points above optimum. If not carefully executed, earthwork activities can create extensive soft areas, resulting in significant repair costs.

When the subgrade is wet of optimum, site preparation may need to be accomplished using track-mounted equipment loading into trucks supported on granular haul roads or working blankets. Based on our experience, at least 12 inches of granular material is typically required for light staging areas and at least 18 inches of granular material for haul roads subject to repeated equipment traffic. We typically recommend that imported granular material for haul roads and working blankets consist of durable crushed rock that is well graded and has less than 8 percent by dry weight passing the U.S. Standard No. 200 sieve. Where silt or clay is exposed at the ground surface, the performance of haul roads can typically be improved by placing a geotextile on the subgrade before placing the granular material. The granular material should be placed in a single lift and the surface compacted until well keyed. Although we have presented typical recommendations for haul road and working blankets, the actual thickness and material should be determined by the contractor based on their sequencing of the project and the type and frequency of construction equipment. The base rock thickness for building slab areas is intended to support post-construction design loads and will not support construction traffic when the subgrade soil is wet. If construction is planned for periods when the subgrade soil is wet, an increased thickness of base rock will be required.

8.0 OBSERVATION OF CONSTRUCTION

Satisfactory foundation and earthwork performance depends to a large degree on quality of construction. Sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface exploration. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect if subsurface conditions change significantly from those anticipated.

We recommend that GeoDesign be retained to observe earthwork activities. We anticipate this will consist of evaluating footing and floor slab subgrade, observing the placement of structural fill during mass grading and repair of soft subgrade areas, observing the installation of AC pavement, observing retaining wall construction, and performing laboratory compaction and field moisture-density tests.

9.0 LIMITATIONS

We have prepared this report for use by Harsch Investment Properties and their design and construction teams for the proposed project. The data and report can be used for bidding or estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to other sites.

Soil explorations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary.

If there are changes in the site grades or location, configuration, design loads, or type of construction, the conclusions and recommendations presented may not be applicable. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written verification or modification.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in this report for consideration in design.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

♦ ♦ ♦

We appreciate the opportunity to be of continued service to you. Please call if you have questions concerning this report or if we can provide additional services.

Sincerely,

GeoDesign, Inc.

Ryan Lawrence

Ryan T. Lawrence, P.E.
Associate Engineer

George Saunders, P.E., G.E.
Principal Engineer

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FIGURES

Exhibit A2

GEODESIGN INC AN NV5 COMPANY	HARSCHINV-23-02	**VICINITY MAP**	
	SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR	**FIGURE 1**

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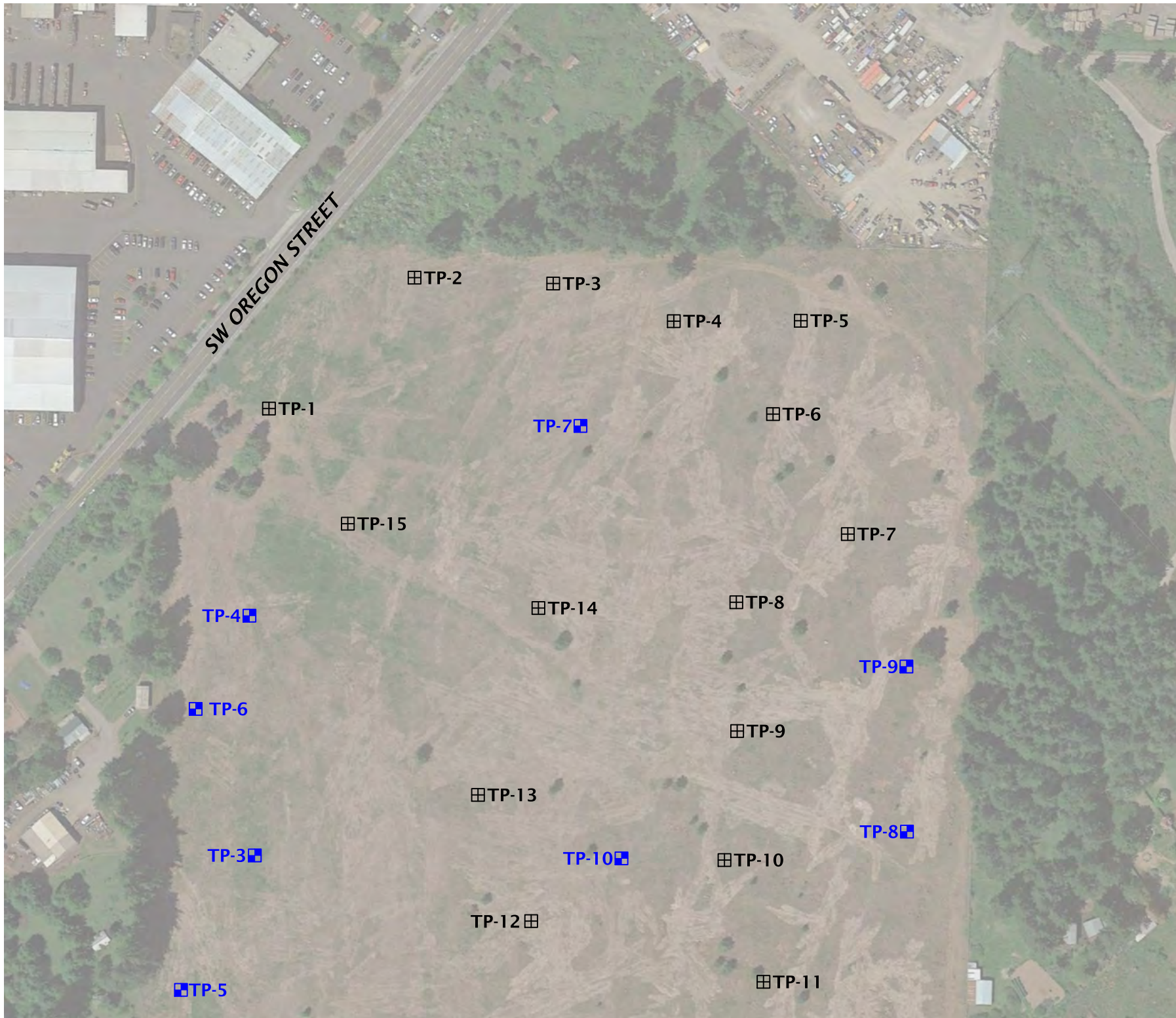
Exhibit A2



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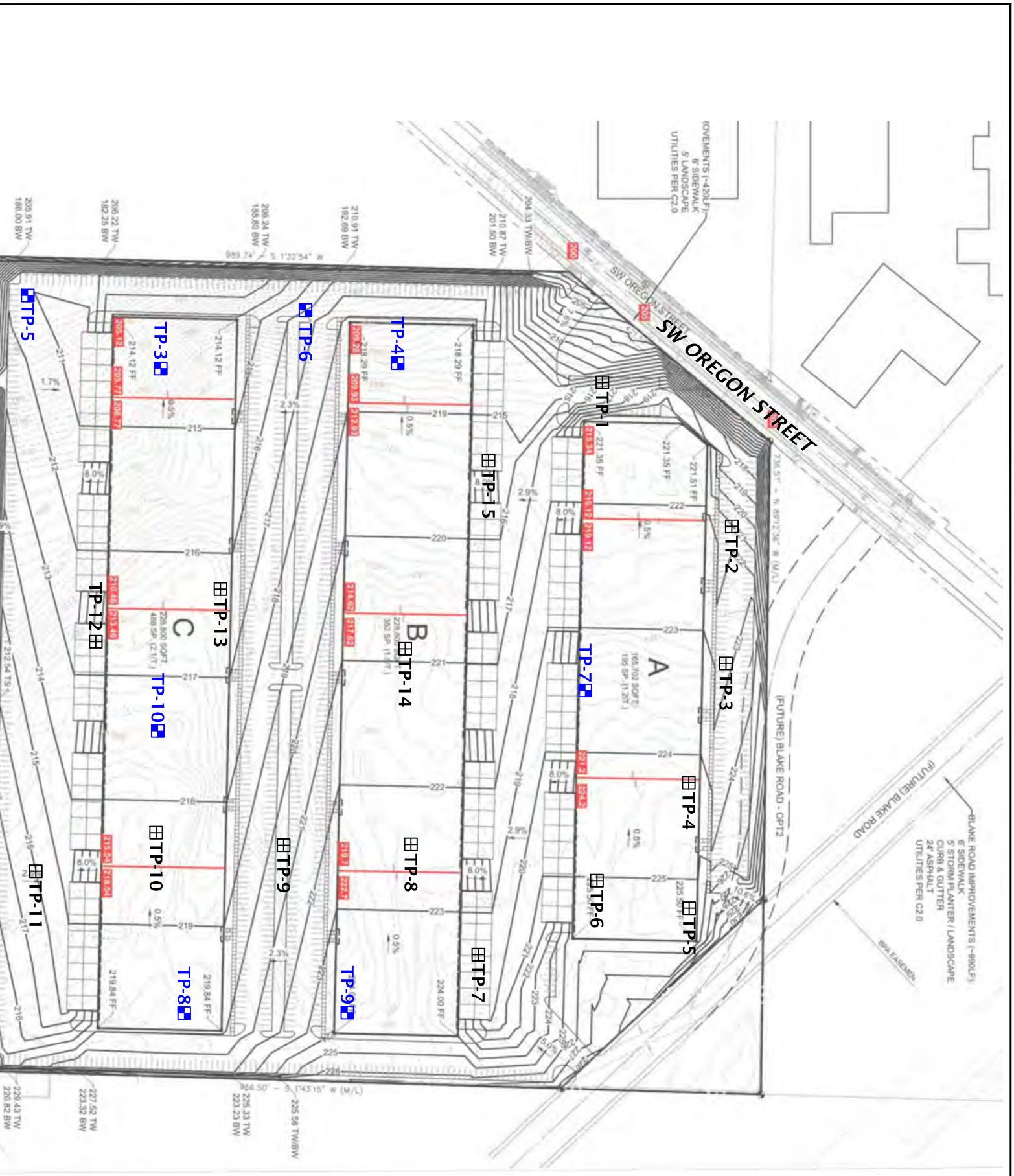
nv-23-02\Figures\CAD\HarschInv-23-02-SP01.dwg | Layout: FIGURE 2


SW OREGON STREET
(FUTURE) BLAKE ROAD - OPT2
(FUTURE) BLAKE ROAD IMPROVEMENTS (~990LF)
6' SIDEWALK
5' STORM PLANTER / LANDSCAPE
CURB & GUTTER
24' ASPHALT
UTILITIES PER C2.0
IMPROVEMENTS (~420LF)
6' SIDEWALK
5' LANDSCAPE
UTILITIES PER C2.0
TP-1
TP-2
TP-3
TP-4
TP-5
TP-6
TP-7
TP-8
TP-9
TP-10
TP-11
TP-12
TP-13
TP-14
TP-15
A
B
C

SW OREGON STREET
(FUTURE) TONQUIN CT.
(FUTURE) BLAKE ROAD - OPT2
BLAKE ROAD IMPROVEMENTS (~990LF):
6' SIDEWALK
5' STORM PLANTER / LANDSCAPE
CURB & GUTTER
24' ASPHALT
UTILITIES PER C2.0
IMPROVEMENTS (~420LF):
6' SIDEWALK
5' LANDSCAPE
UTILITIES PER C2.0
BPA EASEMENT
TP-1
TP-2
TP-3
TP-4
TP-5
TP-6
TP-7
TP-8
TP-9
TP-10
TP-11
TP-12
TP-13
TP-14
TP-15
A
196,400 SQFT.
408 SP. (2.1/T.)
B
195,560 SQFT.
388 SP. (2.0/T.)
C
133,000 SQFT.
302 SP. (2.3/T.)
472.52' - S 1°32'54" W (M/L)
736.57' - N 89°12'36" W (M/L)
956.50' - S 1°43'15" W (M/L)

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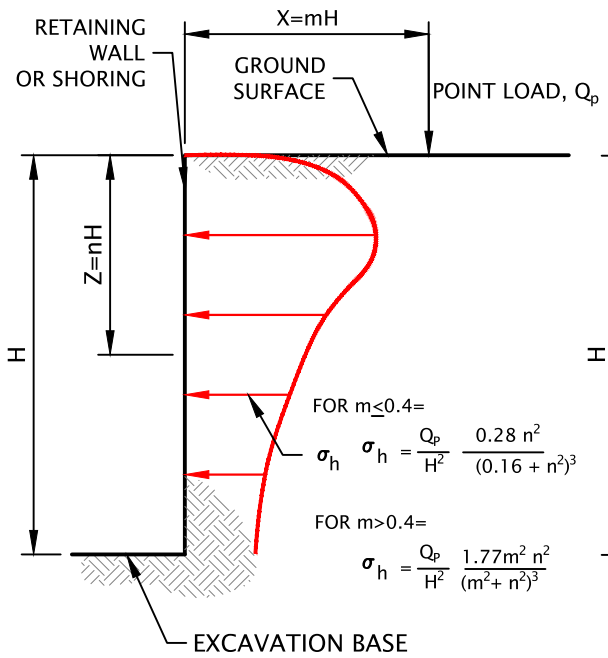
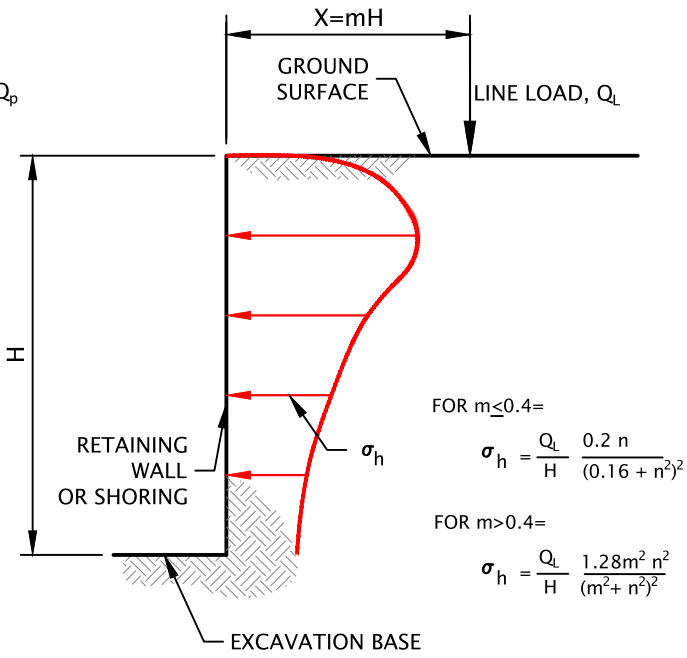
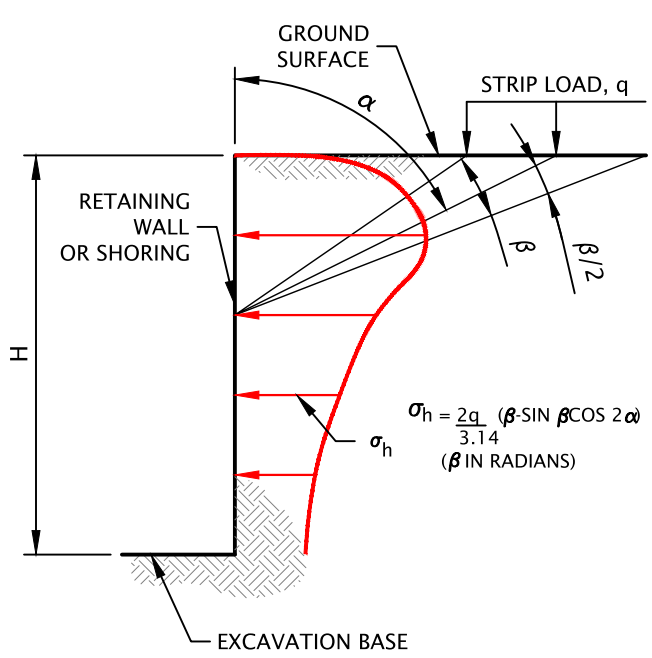
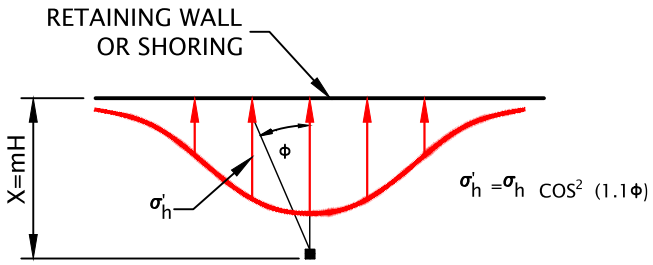




LINE LOAD PARALLEL TO WALL



STRIP LOAD PARALLEL TO WALL



DISTRIBUTION OF HORIZONTAL PRESSURES

VERTICAL POINT LOAD

NOT TO SCALE

NOTES:

1. FIGURE SHOULD BE USED IN CONJUNCTION WITH REPORT TEXT.
2. THESE GUIDELINES APPLY TO RIGID WALLS WITH POISSON'S RATIO ASSUMED TO BE 0.5 FOR BACKFILL MATERIALS.
3. LATERAL PRESSURES FROM ANY COMBINATION OF ABOVE LOADS MAY BE DETERMINED BY THE PRINCIPLE OF SUPERPOSITION.

GEODESIGN INC AN NV5 COMPANY	HARSCHINV-23-02	**SURCHARGE-INDUCED LATERAL EARTH PRESSURES**
	SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR — **FIGURE 5**

APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

We excavated 11 test pits (TP-1 through TP-11) at the site to depths between 14.5 and 17 feet BGS. Excavation services were provided by Dan J. Fischer Excavating, Inc. of Forest Grove, Oregon, on August 3 through 6, 2020 using a Case CX130D excavator. A member of our geology or geotechnical staff observed the explorations. The exploration logs are presented in this appendix.

The approximate exploration locations are shown on Figure 2. Exploration locations were selected by GeoDesign based on the proposed development plans. The locations of the explorations were marked in the field using a hand-held differential GPS device.

SOIL SAMPLING

We collected representative samples of the various soils encountered in the explorations for visual classification and laboratory testing. We collected these samples from the test pit walls and/or base using the excavator bucket. Sampling intervals are shown on the exploration logs.

SOIL CLASSIFICATION

The soil samples were classified in accordance with the "Exploration Key" (Table A-1) and "Soil Classification System" (Table A-2), which are presented in this appendix. The exploration logs indicate the depths at which the soils or their characteristics change, although the change could be gradual. A horizontal line between soil types indicates an observed (visual or digging action) change. If the change occurred between sample locations and was not observed or obvious, the depth was interpreted and the change is indicated using a dashed line. Classifications are shown on the exploration logs.

LABORATORY TESTING

We visually examined soil samples collected from the explorations to confirm field classifications. We also performed the following laboratory testing.

MOISTURE CONTENT

We determined the natural moisture content of select soil samples in general accordance with ASTM D2216. The natural moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage. The test results are presented in this appendix.

PARTICLE-SIZE ANALYSIS

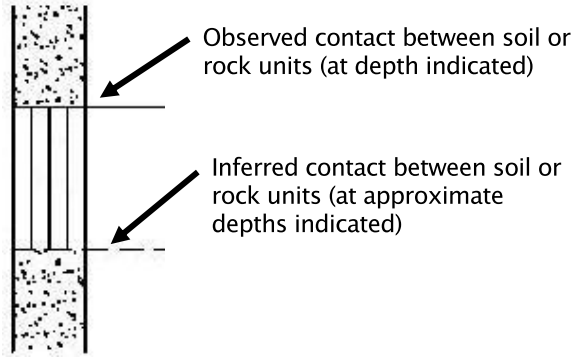
Particle-size analysis was performed on select soil samples to determine the distribution of soil particle sizes. The testing consisted of percent fines determination (percent passing the U.S. Standard No. 200 sieve) analyses completed in general accordance with ASTM C117 or ASTM D1140 (P200). The test results are presented in this appendix.

ATTERBERG LIMITS TEST

We determined the Atterberg limits of a select soil sample in general accordance with ASTM D4318. Atterberg limits include the liquid limit, plastic limit, and the plasticity index of soil. These index properties are used to classify soil and for correlation with other engineering properties of soil. The test results are presented in this appendix.

SYMBOL	SAMPLING DESCRIPTION
	Location of sample collected in general accordance with ASTM D1586 using Standard Penetration Test with recovery
	Location of sample collected using thin-wall Shelby tube or Geoprobe® sampler in general accordance with ASTM D1587 with recovery
	Location of sample collected using Dames & Moore sampler and 300-pound hammer or pushed with recovery
	Location of sample collected using Dames & Moore sampler and 140-pound hammer or pushed with recovery
	Location of sample collected using 3-inch-O.D. California split-spoon sampler and 140-pound hammer with recovery
	Location of grab sample
	Rock coring interval
	Water level during drilling
	Water level taken on date shown

Graphic Log of Soil and Rock Types



GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits	P	Pushed Sample
CBR	California Bearing Ratio	PP	Pocket Penetrometer
CON	Consolidation	P200	Percent Passing U.S. Standard No. 200 Sieve
DD	Dry Density		
DS	Direct Shear	RES	Resilient Modulus
HYD	Hydrometer Gradation	SIEV	Sieve Gradation
MC	Moisture Content	TOR	Torvane
MD	Moisture-Density Relationship	UC	Unconfined Compressive Strength
NP	Non-Plastic	VS	Vane Shear
OC	Organic Content	kPa	Kilopascal

ENVIRONMENTAL TESTING EXPLANATIONS

CA	Sample Submitted for Chemical Analysis	ND	Not Detected
P	Pushed Sample	NS	No Visible Sheen
PID	Photoionization Detector Headspace Analysis	SS	Slight Sheen
		MS	Moderate Sheen
ppm	Parts per Million	HS	Heavy Sheen

RELATIVE DENSITY - COARSE-GRAINED SOIL

Relative Density	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)
Very Loose	0 – 4	0 – 11	0 – 4
Loose	4 – 10	11 – 26	4 – 10
Medium Dense	10 – 30	26 – 74	10 – 30
Dense	30 – 50	74 – 120	30 – 47
Very Dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOIL

Consistency	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)	Unconfined Compressive Strength (tsf)
Very Soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 – 4	3 – 6	2 – 5	0.25 – 0.50
Medium Stiff	4 – 8	6 – 12	5 – 9	0.50 – 1.0
Stiff	8 – 15	12 – 25	9 – 19	1.0 – 2.0
Very Stiff	15 – 30	25 – 65	19 – 31	2.0 – 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOIL (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVEL WITH FINES (> 12% fines)	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SAND (<5% fines)	SW or SP	SAND
		SAND WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SAND WITH FINES (> 12% fines)	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOIL (50% or more passing No. 200 sieve)	SILT AND CLAY	Liquid limit less than 50	ML	SILT
			CL	CLAY
			CL-ML	silty CLAY
			OL	ORGANIC SILT or ORGANIC CLAY
		Liquid limit 50 or greater	MH	SILT
			CH	CLAY
			OH	ORGANIC SILT or ORGANIC CLAY
HIGHLY ORGANIC SOIL			PT	PEAT

MOISTURE CLASSIFICATION

Term	Field Test
dry	very low moisture, dry to touch
moist	damp, without visible moisture
wet	visible free water, usually saturated

ADDITIONAL CONSTITUENTS

Secondary granular components or other materials such as organics, man-made debris, etc.

Percent	Silt and Clay In: Fine-Grained Soil	Silt and Clay In: Coarse-Grained Soil	Percent	Sand and Gravel In: Fine-Grained Soil	Sand and Gravel In: Coarse-Grained Soil
< 5	trace	trace	< 5	trace	trace
5 – 12	minor	with	5 – 15	minor	minor
> 12	some	silty/clayey	15 – 30	with	with
			> 30	sandy/gravelly	Indicate %

GEODESIGN INC AN NV5 COMPANY

SOIL CLASSIFICATION SYSTEM

TABLE A-2

Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium dense, brown, silty GRAVEL with cobbles and boulders (GM), minor sand, trace organics (roots); dry to moist, organics are up to 1 1/4-inch in diameter (topsoil, 3.5-inch-thick root zone).	224.0				Minor caving observed from 0.0 to 15.5 feet.
		222.5 / 1.5				Thick roots up to 1 1/4-inch in diameter to 2.0 feet.
2.5	Medium dense, brown, silty GRAVEL with cobbles and boulders (GM), minor sand, trace organics (roots); moist, gravel is approximately 25 to 30%, cobbles are approximately 30 to 35%, boulders are approximately 20 to 25%, organics are up to 1 inch in diameter. without organics at 2.5 feet			☒		
5.0		218.5 / 5.5				
	Medium dense, gray-brown GRAVEL with silt, sand, cobbles, and boulders (GP-GM); moist, gravel is approximately 30 to 35%, cobbles are approximately 35%, boulders are approximately 10 to 15% and up to 18 inches in diameter.					
7.5				☒		
10.0						
12.5	grades to increased silt content; moist to wet at 12.5 feet					
			P200	☒	●	Open pit infiltration test at 14.0 feet. Approximate dimensions are 4 feet by 3 feet. P200 = 12%
15.0		208.5 / 15.5				Hard digging at 15.5 feet.
	Exploration completed at a depth of 15.5 feet.					No groundwater seepage observed to the depth explored.
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: J. Heidgerken COMPLETED: 08/04/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc — An NV5 Company

HARSCHINV-23-02

TEST PIT TP-1

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-1

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0			206.0				
		Medium dense, brown, silty GRAVEL with sand, cobbles, and boulders (GM), trace organics (roots); dry to moist, organics are up to 1/2-inch in diameter (topsoil, 3-inch-thick root zone).	204.7 / 1.3				Minor caving observed from 0.0 to 8.0 feet.
2.5		Medium dense, brown, silty GRAVEL with sand, cobbles, and boulders (GM); moist, gravel is approximately 20 to 30%, cobbles are approximately 30 to 40%, boulders are approximately 20% and 12 to 16 inches in diameter.			☒		Fairly thick roots up to 1/2-inch in diameter to 2.7 feet.
5.0		boulders are up to 2 feet in diameter at 5.0 feet		P200	☒	●	Open pit infiltration test at 5.0 feet. Approximate dimensions are 1 foot by 1.5 feet. P200 = 18%
7.5							Severe caving observed below 8.0 feet.
10.0					☒		
12.5		boulder is up to 3.5 feet in diameter at 12.0 feet					
			191.5 / 14.5		☒		
15.0		Exploration completed at a depth of 14.5 feet.					No groundwater seepage observed to the depth explored.
17.5							
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: J. Heidgerken COMPLETED: 08/04/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc — An NV5 Company

HARSCHINV-23-02

TEST PIT TP-2

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-2

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 – 50 – 100)	COMMENTS
0.0	Medium stiff, brown SILT with sand (ML); moist, sand is fine (topsoil to 4 inches).	200.0	PP			PP = 0.75 tsf
2.5						
	Medium stiff, brown, sandy SILT (ML); moist, silt has low plasticity, sand is fine to medium.	197.0 / 3.0	P200 PP	X	●	Infiltration test at 3.0 feet. P200 = 58% PP = 1.0 tsf
5.0						
	Loose, brown to gray SAND with silt (SP-SM), minor gravel; moist, sand is medium.	194.0 / 6.0		X		
7.5						
	Medium dense, brown to gray, silty GRAVEL with sand and cobbles (GM); moist, gravel is coarse, cobbles are approximately 20%.	191.0 / 9.0	P200	X	●	Minor caving observed from 9.0 to 17.0 feet. P200 = 15%
10.0						
12.5	cobbles are approximately 30 to 40% at 13.0 feet					Open pit infiltration test at 12.0 feet. Approximate dimensions are 3 feet by 3.5 feet.
15.0						
	Exploration completed at a depth of 17.0 feet.	183.0 / 17.0		X		No groundwater seepage observed to the depth explored.
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: Z. Rogers COMPLETED: 08/03/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc — An NV5 Company

HARSCHINV-23-02

TEST PIT TP-3

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-3

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Very stiff to hard, light brown, sandy SILT (ML); moist, sand is fine (topsoil to approximately 6 inches).	205.0	PP			PP = 4.0 tsf
2.5						
	trace gravel at 4.0 feet		P200 PP		●	Infiltration test at 4.0 feet. P200 = 64% PP = 4.0 tsf
5.0						
	Medium dense, dark brown, silty GRAVEL with sand and cobbles (GM); moist to wet, gravel is coarse, sand is medium to coarse, cobbles are approximately 20%.	199.0 / 6.0	P200		●	Open pit infiltration test at 7.0 feet. Approximate dimensions are 3.5 feet by 4 feet. P200 = 17%
7.5						
	with boulders; boulders are approximately 10 to 20% at 9.0 feet					Minor caving observed from 9.0 to 16.0 feet.
10.0						
12.5						
15.0						
	Exploration completed at a depth of 16.0 feet.	189.0 / 16.0				No groundwater seepage observed to the depth explored.
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: Z. Rogers COMPLETED: 08/03/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc
AN NV5 COMPANY

HARSCHINV-23-02

TEST PIT TP-4

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-4

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Stiff, brown SILT with sand (ML); moist, sand is fine (topsoil to approximately 8 inches).	184.0	PP	☒		PP = 1.0 tsf
2.5	Medium dense brown, silty GRAVEL with sand and cobbles (GM); moist, gravel is coarse, sand is medium, cobbles are approximately 20 to 30%.	181.0 / 3.0	P200 PP	☒	●	P200 = 36% PP = 1.5 tsf
5.0						
7.5	Medium dense, brown-gray GRAVEL with silt, sand , and cobbles (GP-GM); moist to wet, gravel is coarse, sand is medium to coarse, cobbles are approximately 30 to 40%.	177.0 / 7.0		☒		Minor caving observed from 7.0 to 16.0 feet.
10.0	with boulders; cobbles are approximately 40%, boulders are approximately 10 to 20% at 10.0 feet					
	Medium stiff, brown with gray and orange mottled CLAY (CL); moist, wet, clay has medium plasticity.	173.0 / 11.0	PP	☒		PP = 0.75 tsf
12.5	Medium dense, brown with gray to brown-orange mottled GRAVEL with clay, cobbles, and boulders (GP-GC); moist to wet; cobbles are approximately 40%, boulders are approximately 10 to 20% (decomposed basalt).	171.0 / 13.0				
15.0	Exploration completed at a depth of 16.0 feet.	168.0 / 16.0				No groundwater seepage observed to the depth explored.
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: Z. Rogers COMPLETED: 08/03/20

EXCAVATION METHOD: excavator (see document text)

GEODESIGN INC AN NV5 COMPANY

HARSCHINV-23-02

TEST PIT TP-5

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-5

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Very stiff, brown, sandy SILT (ML); moist, sand is fine (topsoil to 8 inches).	193.0	PP			PP = 3.5 tsf
2.5			P200 PP	☒	●	P200 = 59% PP = 3.5 tsf
	medium stiff, trace gravel at 3.0 feet		PP			PP = 0.75 tsf
			PP	☒		PP = 1.0 tsf
5.0						
		187.0 / 6.0		☒		
7.5	Medium dense, brown GRAVEL with silt, sand, and cobbles (GP-GM); moist to wet, sand is medium to coarse and approximately 30 to 35%, cobbles are approximately 20%. with boulders; boulders are approximately 10% at 8.0 feet					Minor caving observed from 8.0 to 15.0 feet. Intermittent zones of wet material from 8.0 feet to the bottom of the test pit.
10.0				☒		
12.5						
		178.0 / 15.0				
15.0	Exploration completed at a depth of 15.0 feet.					No groundwater seepage observed to the depth explored.
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: Z. Rogers COMPLETED: 08/03/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc — An NV5 Company

HARSCHINV-23-02

TEST PIT TP-6

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-6

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0			224.0				
		Very stiff, brown SILT with sand, gravel, and cobbles (ML); moist, sand is fine to medium, gravel is coarse, cobbles are approximately 30 to 40% (topsoil to approximately 4 inches, 3- to 4-inch-thick root zone).		PP			PP = 2.5 tsf
2.5							
			221.0 / 3.0				
		Medium dense, brown GRAVEL with silt, sand, cobbles, and boulders (GP-GM); moist, gravel is coarse, sand is fine to medium, cobbles are approximately 30 to 40%, boulders are approximately 20%.					
5.0		light brown, cobbles are approximately 40 to 50% at 5.0 feet					
7.5		light brown; cobbles are approximately 40%, boulders are approximately 20 to 30% at 8.0 feet					
10.0		wet at 11.0 feet					
12.5							
15.0							
			207.0 / 17.0				
17.5		Exploration completed at a depth of 17.0 feet.					No groundwater seepage observed to the depth explored. No caving observed to the depth explored.
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: Z. Rogers COMPLETED: 08/03/20

EXCAVATION METHOD: excavator (see document text)

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

GeoDesign Inc
AN NV5 COMPANY

HARSCHINV-23-02

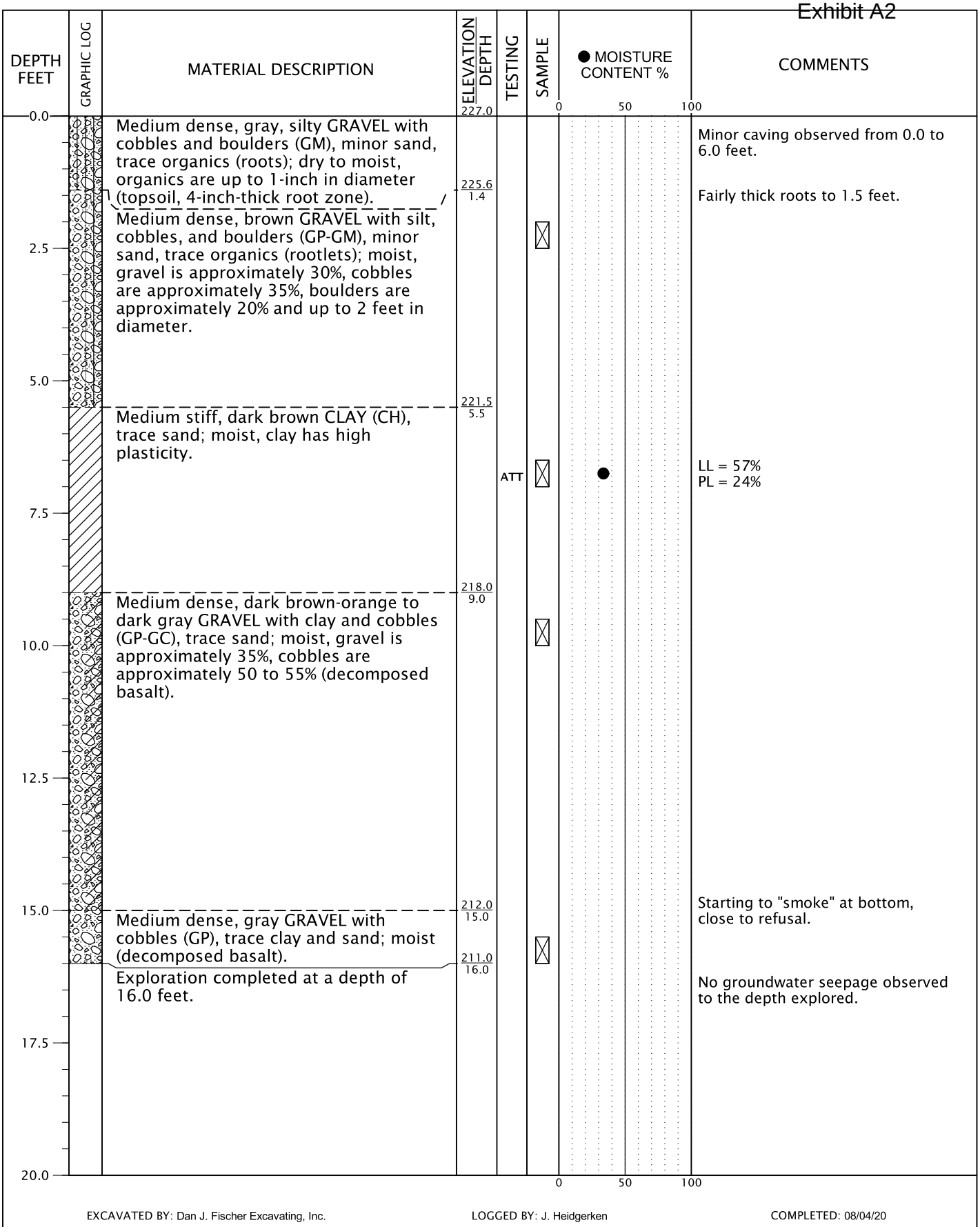
TEST PIT TP-7

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-7

Exhibit A2



EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: J. Heidgerken COMPLETED: 08/04/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc
AN NV5 COMPANY

HARSCHINV-23-02	**TEST PIT TP-8**	
SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR	**FIGURE A-8**

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium dense, gray, silty GRAVEL with cobbles and boulders (GM), trace organics (roots); dry to moist, organics are up to 3/8-inch in diameter (topsoil, 4-inch-thick root zone).	223.0				Moderate to severe caving observed from 0.0 to 6.5 feet.
			221.8 / 1.2				
2.5		Medium dense, brown, silty GRAVEL with cobbles and boulders (GM), minor sand, trace organics (rootlets); moist, gravel is approximately 25 to 30%, cobbles are approximately 30%, boulders are approximately 30% and up to 3.5 feet in diameter.			☒		
5.0			217.5 / 5.5				
		Medium stiff, brown SILT (ML), some clay, minor sand; moist, silty has low plasticity.		P200	☒	●	P200 = 93%
7.5			215.0 / 8.0				Large (3-foot plus-diameter) boulder on east side of pit at 8.0 feet
		Medium dense, dark brown-orange to gray GRAVEL with cobbles (GP), minor clay; moist, gravel is approximately 30%, cobbles are approximately 55 to 60% (decomposed basalt).			☒		
10.0							
12.5		moist to wet at 12.0 feet					
		wet at 13.0 feet					Slow to moderate groundwater seepage observed at 13.0 feet.
							Harder at 14.0 feet. Excavator Comment: close to refusal.
15.0		Exploration completed at a depth of 15.0 feet.	208.0 / 15.0				
17.5							
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: J. Heidgerken COMPLETED: 08/04/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc — An NV5 Company

HARSCHINV-23-02

TEST PIT TP-9

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-9

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium stiff, light brown SILT with cobbles and boulders (ML), minor sand, trace organics (roots); dry to moist, organics are up to 3/4-inch in diameter (topsoil, 3-inch-thick root zone).	225.0				Minor caving observed from 0.0 to 15.5 feet.
			223.7 / 1.3				
2.5		Medium dense, brown-gray, silty GRAVEL with cobbles and boulders (GM), minor sand, trace organics (roots); moist, organics are up to 3/4-inch in diameter, boulders are up to 2.5 feet in diameter.	222.0 / 3.0				Organics/roots are up to 3/4-inch in diameter to 2.0 feet.
5.0		Medium dense, brown-gray GRAVEL with silt, sand, cobbles, and boulders (GP-GM); moist, gravel is subangular to subrounded and approximately 25 to 30%, cobbles are approximately 35%, boulders are approximately 20%, weakly cemented.					Only occasional boulders greater than 2 feet in diameter from 3.5 to 4.0 feet.
7.5							
10.0		Medium dense, brown-gray, silty GRAVEL with sand and cobbles (GM); moist to wet, gravel is subrounded and approximately 35%, cobbles are approximately 35 to 40%.	215.0 / 10.0				
12.5							
15.0		Exploration completed at a depth of 15.5 feet.	209.5 / 15.5				No groundwater seepage observed to the depth explored.
17.5							
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: J. Heidgerken COMPLETED: 08/04/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc — An NV5 Company

HARSCHINV-23-02

TEST PIT TP-10

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-10

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT

Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium dense, brown GRAVEL with silt, cobbles, and boulders (GP-GM), minor sand, trace organics (roots); moist, gravel is approximately 25 to 30%, cobbles are approximately 30 to 35%, boulders are approximately 25 to 30% and up to 2.5 feet in diameter, organics are up to 1/2-inch in diameter (4-inch-thick root zone).	229.0				No real topsoil. Minor caving observed from 0.0 to 15.0 feet. Fairly thick roots to 1.5 feet.
2.5							
		Medium dense, gray-brown GRAVEL with silt, sand, cobbles, and boulders (GW-GM); moist, gravel is approximately 30 to 35%, cobbles are approximately 30 to 35%, boulders are approximately 25% and up to 2 feet in diameter.	225.5 / 3.5		☒		
5.0							
7.5					☒		
10.0		Medium dense, dark brown-orange GRAVEL with cobbles and boulders (GP), trace silt, clay, and sand; moist, gravel is approximately 25 to 30%, cobbles are approximately 35 to 40%, boulders are approximately 15% (decomposed basalt).	219.0 / 10.0		☒		Boulder (2.5-foot in diameter) at 12.0 feet.
12.5							
15.0		Exploration completed at a depth of 15.0 feet.	214.0 / 15.0		☒		No groundwater seepage observed to the depth explored.
17.5							
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: J. Heidgerken COMPLETED: 08/06/20

EXCAVATION METHOD: excavator (see document text)

GeoDesign Inc — An NV5 Company

HARSCHINV-23-02

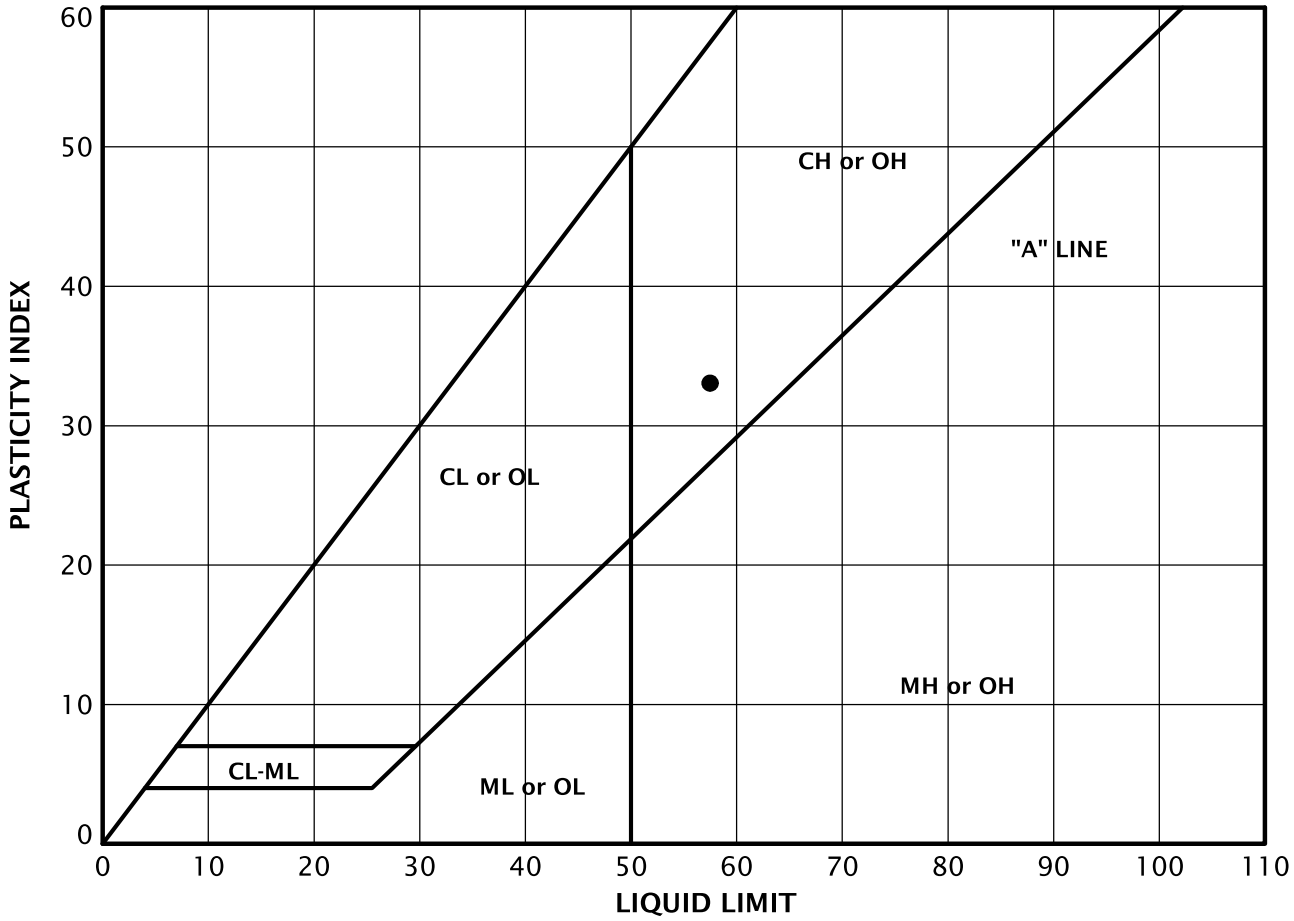
TEST PIT TP-11

SEPTEMBER 2020

SHERWOOD COMMERCE CENTER NORTH
SHERWOOD, OR

FIGURE A-11

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-02-TP1_11.GPJ GDI_NV5.GDT PRINT DATE: 9/1/20:KT



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
●	TP-8	6.5	34	57	24	33

GEODESIGN INC AN NV5 COMPANY	HARSCHINV-23-02	ATTERBERG LIMITS TEST RESULTS	
	SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR	FIGURE A-12

ATTERBERG_LIMITS 7 HARSCHINV-23-02-TP1_11.GPJ GEODESIGN.GDT PRINT DATE: 9/1/20:KT

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
TP-1	14.0	210.0	16				12			
TP-2	5.0	201.0	12				18			
TP-3	3.0	197.0	23				58			
TP-3	9.0	191.0	15				15			
TP-4	4.0	201.0	26				64			
TP-4	7.0	198.0	21				17			
TP-5	3.0	181.0	16				36			
TP-6	2.0	191.0	15				59			
TP-8	6.5	220.5	34					57	24	33
TP-9	6.0	217.0	26				93			

APPENDIX B

APPENDIX B

TEST PIT PHOTOGRAPHS

Representative photographs of our test pit explorations are presented in this appendix. Additional photographs are on file in our office and are available upon request.

TEST PIT TP-1: VIEW INSIDE TEST PIT.

TEST PIT TP-1: EXCAVATED SOIL.

GeoDesign Inc an NV5 company	HARSCHINV-23-02	**TEST PIT PHOTOGRAPHS**	
	SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR	**FIGURE B-1**

TEST PIT TP-2: VIEW INSIDE TEST PIT.

TEST PIT TP-2: EXCAVATED SOIL.

TEST PIT TP-3: VIEW INSIDE TEST PIT.

TEST PIT TP-3: EXCAVATED SOIL.

TEST PIT TP-4: VIEW INSIDE TEST PIT.

TEST PIT TP-4: VIEW INSIDE TEST PIT.

GEODESIGN INC AN NV5 COMPANY	HARSCHINV-23-02	**TEST PIT PHOTOGRAPHS**	
	SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR	**FIGURE B-4**

TEST PIT TP-5: VIEW INSIDE TEST PIT.

TEST PIT TP-5: EXCAVATED SOIL.

GEODESIGN INC AN NV5 COMPANY	HARSCHINV-23-02	**TEST PIT PHOTOGRAPHS**	
	SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR	**FIGURE B-5**

TEST PIT TP-6: VIEW INSIDE TEST PIT.

TEST PIT TP-6: EXCAVATED SOIL.

TEST PIT TP-7: VIEW INSIDE TEST PIT.

TEST PIT TP-7: EXCAVATED SOIL.

TEST PIT TP-8: VIEW INSIDE TEST PIT.

TEST PIT TP-8: EXCAVATED SOIL.

GEODESIGN INC AN NV5 COMPANY	HARSCHINV-23-02	**TEST PIT PHOTOGRAPHS**	
	SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR	**FIGURE B-8**

TEST PIT TP-9: VIEW INSIDE TEST PIT.

TEST PIT TP-9: EXCAVATED SOIL.

TEST PIT TP-10: VIEW INSIDE TEST PIT.

TEST PIT TP-10: EXCAVATED SOIL.

GeoDesign Inc An NV5 Company	HARSCHINV-23-02	**TEST PIT PHOTOGRAPHS**	
	SEPTEMBER 2020	SHERWOOD COMMERCE CENTER NORTH SHERWOOD, OR	**FIGURE B-10**

TEST PIT TP-11: VIEW INSIDE TEST PIT.

TEST PIT TP-11: EXCAVATED SOIL.

APPENDIX C

APPENDIX C

PREVIOUS EXPLORATIONS

A site plan and exploration logs from the 2019 field exploration program we performed on the site for a different project are presented in this appendix.

7 PM
nv-23-01\Figures\CAD\HarschInv-23-01-SP01.dwg | Layout: FIGURE 2

DRAFT

Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	SAMPLE	COMMENTS
0.0	Medium stiff, light brown SILT (ML), minor sand, trace clay, gravel, and organics (rootlets); moist (topsoil to 12.0 inches, 4-inch-thick root zone).	208.0		
	Stiff, red-brown SILT/CLAY with cobbles and boulders (ML/CL), minor to with gravel and sand; moist, cobbles are approximately 10%, boulders are approximately 10%.	207.0 / 1.0		
2.5	Dense, red-brown, clayey GRAVEL with cobbles (GC), minor to with sand; moist, cobbles are approximately 10%.	205.0 / 3.0		Average gravel size is 3 to 6 inches at 3.0 feet.
5.0	light brown, with sand at 5.0 feet			Moderate to severe caving observed at 6.0 feet.
	Dense, light brown GRAVEL with clay, sand, and cobbles (GP-GC); moist, gravel is subrounded, cobbles are approximately 10 to 15%.	201.0 / 7.0		
7.5	with boulders; boulders are approximately 5% at 9.0 feet			Boulder (1 foot by 2 feet) at 9.0 feet.
10.0	with cobbles; cobbles are approximately 5% at 12.0 feet			Boulder (1 foot by 1 foot) at 12.0 feet.
12.5	light gray-brown with orange mottles at 13.0 feet			
15.0	Exploration completed at a depth of 15.5 feet.	192.5 / 15.5		No groundwater seepage observed to the depth explored.
17.5				Surface elevation estimated from site survey.
20.0				

GRAPHIC LOG

TESTING

● MOISTURE CONTENT %: 0 50 100

EXCAVATED BY: Northwest Earthmovers, Inc.

LOGGED BY: J. Hook

COMPLETED: 08/08/19

EXCAVATION METHOD: mini excavator (see document text)

GeoDesign Inc
AN NV5 COMPANY

HARSCHINV-23-01

TEST PIT TP-1

MARCH 2020

SHERWOOD COMMERCE CENTER
WASHINGTON COUNTY, OR

FIGURE A-1

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

DRAFT

Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 – 50 – 100)	COMMENTS
0.0	FOREST DUFF (wood chips, wood debris) (4.0 to 6.0 inches).	213.0				
	Medium stiff, brown SILT (ML), minor clay and sand, trace organics (roots, rootlets); moist (topsoil/tilled zone to 22.0 inches, 6-inch-thick root zone).	212.5 / 0.5	PP	☒		PP = 2.25 tsf
		211.1 / 1.9	PP			PP = 1.5 tsf
2.5	Medium stiff to stiff, red-brown SILT (ML), minor clay and sand; moist, silt has medium plasticity.	210.0 / 3.0	PP	☒		PP = 1.75 tsf
	Medium dense, red-brown, clayey GRAVEL (GC), minor sand; moist, gravel is subrounded.					
5.0	with cobbles; cobbles are approximately 15% at 5.0 feet			☒		
7.5						
	light gray-brown, with sand and cobbles; gravel is fine and subrounded, cobbles are approximately 5 to 10% at 9.0 feet					Minor caving observed from 9.0 to 16.5 feet.
10.0				☒		
12.5	gravel is coarse, cobbles are approximately 10 to 20% at 12.0 feet					
15.0						
	Exploration completed at a depth of 16.5 feet.	196.5 / 16.5				No groundwater seepage observed to the depth explored.
17.5						Surface elevation estimated from site survey.
20.0						

EXCAVATED BY: Northwest Earthmovers, Inc. LOGGED BY: J. Hook COMPLETED: 08/08/19

EXCAVATION METHOD: mini excavator (see document text)

GeoDesign Inc an NV5 company

HARSCHINV-23-01

TEST PIT TP-2

MARCH 2020

SHERWOOD COMMERCE CENTER
WASHINGTON COUNTY, OR

FIGURE A-2

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

DRAFT

Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		FOREST DUFF (wood, chips) (2.0 inches).	220.5 / 220.3 / 0.2				
		Medium stiff, brown SILT (ML), minor clay and sand, trace gravel and organics (roots, rootlets); moist (topsoil to 14.0 inches, 6-inch-thick root zone).	219.3 / 1.2	PP			PP = 1.75 tsf
2.5		Stiff, light red-brown CLAY with cobbles and boulders (CL), minor sand, trace organics (rootlets); moist, clay has low plasticity, cobbles are approximately 10%, boulders are approximately 5%.	218.0 / 2.5	PP PP	☒		PP = 2.5 tsf PP = 3.0 tsf
		Medium dense to dense, red-brown, clayey GRAVEL with sand, cobbles, and boulders (GC); moist, gravel is subrounded to subangular, cobbles are approximately 20%, boulders are approximately 5 to 10%.					
5.0					☒		
7.5		without boulders; gravel is fine and subrounded, cobbles are approximately 5% at 7.5 feet					
		Stiff, red-brown CLAY (CL), minor sand, trace silt; moist, clay has medium plasticity.	212.0 / 8.5				Moderate caving observed at 8.5 feet.
				PP	☒		PP = 2.0 tsf
10.0		Medium dense, red-brown, clayey GRAVEL (GC), minor sand; moist, gravel is angular (decomposed basalt).	209.5 / 11.0				Approximately 70% of rocks broken by hand.
12.5					☒		
		Exploration completed at a depth of 14.0 feet.	206.5 / 14.0				No groundwater seepage observed to the depth explored.
15.0							Surface elevation estimated from site survey.
17.5							
20.0							

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EXCAVATION METHOD: mini excavator (see document text)

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FIGURE A-3

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	FOREST DUFF (wood debris) (3.0 inches).	228.0 / 227.7 / 0.3	PP			Moderate to severe caving observed from 0.0 to 6.0 feet. PP = 2.25 tsf
	Medium stiff, brown SILT (ML), minor sand, gravel, and clay, trace organics (roots, rootlets); moist (topsoil to 15.0 inches, 4-inch-thick root zone).	226.7 / 1.3				
2.5	Medium dense, red-brown, clayey GRAVEL with cobbles and boulders (GC), minor sand; moist, cobbles are approximately 15%, boulders are approximately 10%.			☒		
5.0						
7.5						
	Medium stiff, light brown SILT (ML), trace to minor sand, trace clay; moist, silt has low plasticity.	219.5 / 8.5				
10.0			PP	☒		PP = 1.0 tsf
12.5						
	Medium dense, gray with red and brown mottled, clayey GRAVEL (GC), minor sand; moist.	214.0 / 14.0				
15.0						
	Exploration completed at a depth of 16.0 feet.	212.0 / 16.0				No groundwater seepage observed to the depth explored. Surface elevation estimated from site survey.
17.5						
20.0						

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EXCAVATION METHOD: mini excavator (see document text)

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FIGURE A-4

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	FOREST DUFF (woody debris) (4.0 inches).	230.0 / 229.7 / 0.3	PP			Moderate to severe caving observed from 0.0 to 7.5 feet. PP = 1.25 tsf
	Medium stiff, dark brown SILT (ML), minor organics (roots, rootlets, woody debris), minor clay, trace to minor sand and gravel; moist (topsoil to 18.0 inches, 8-inch-thick-root zone).	228.5 / 1.5				
2.5	Medium dense, red-brown, clayey GRAVEL with cobbles and boulders (GC), minor sand; moist, cobbles are approximately 20%, boulders are approximately 15%.					
5.0	cobbles are approximately 10%, boulders are approximately 5% at 5.0 feet					
7.5	Very dense, red-brown with gray mottled GRAVEL with clay (GP-GC), minor sand; moist (weathered basalt).	222.5 / 7.5				Moderate caving observed from 7.5 to 15.0 feet. Gravel after 7.5 feet is angular and moderately weathered. Approximately 10% of rocks broken by hand.
10.0						
12.5	cobbles are approximately 20%, boulders are approximately 5% at 12.0 feet					
	cobbles are approximately 40%, boulders are approximately 10% at 14.0 feet					Slow groundwater seepage observed at 14.5 feet.
15.0	Exploration completed at a depth of 15.0 feet.	215.0 / 15.0				Surface elevation estimated from site survey.
17.5						
20.0						

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EXCAVATION METHOD: mini excavator (see document text)

GeoDesign Inc an NV5 company

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FIGURE A-5

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0			227.5				
		FOREST DUFF (woody debris) (3.0 inches).	227.2 / 0.3	PP			Moderate caving observed from 0.0 to 8.0 feet. PP = 1.0 tsf
		Medium stiff, brown SILT (ML), minor clay, sand, and gravel, trace organics (roots, rootlets); moist (15-inch-thick tilled zone, 4-inch-thick root zone).	226.2 / 1.3				
2.5		Medium dense, red-brown, clayey GRAVEL with cobbles and boulders (GC), minor sand; moist, cobbles are approximately 20%, boulders are approximately 5 to 10%.			☒		
5.0		without boulders; cobbles approximately 10% at 5.0 feet					
7.5			219.0 / 8.5		☒		
		Medium dense, red-brown, silty SAND with gravel (SM); moist, sand is medium.	218.0 / 9.5				
10.0		Medium stiff, light brown with orange mottled SILT (ML), minor sand, trace clay; moist, silt has low plasticity.		PP	☒		PP = 1.25 tsf
		Medium stiff to stiff, red-brown CLAY with cobbles (CL), minor to with sand and gravel, minor silt; moist, clay has medium plasticity, cobbles are approximately 5%.	216.0 / 11.5		☒		Slow groundwater seepage observed at 12.0 feet.
12.5		Medium dense, red-brown, clayey GRAVEL with cobbles (GC), minor sand; moist (weathered basalt).	215.0 / 12.5				
15.0		Exploration completed at a depth of 15.5 feet.	212.0 / 15.5				Surface elevation estimated from site survey.
17.5							
20.0							

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FIGURE A-6

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0			229.0				
		FOREST DUFF (woody debris) (4.0 inches).	228.7 / 0.3	PP			Moderate caving observed from 0.0 to 8.0 feet. PP = 2.0 tsf
		Medium stiff, brown SILT (ML), minor gravel and sand, trace clay and organics (roots, rootlets); moist (topsoil to 16.0 inches, 5-inch-thick root zone).	227.7 / 1.3				
2.5		Medium dense, orange-brown, clayey GRAVEL with cobbles and boulders (GC), minor sand; moist, cobbles are approximately 25%, boulders are approximately 10%.			☒		
5.0							
7.5		gray-brown, with sand; cobbles are approximately 20%, boulders are approximately 5% at 8.0 feet			☒		
10.0					☒		
12.5					☒		
			216.0 / 13.0	PP			PP = 1.25 tsf
		Medium stiff, light brown with orange mottled SILT (ML), minor sand, trace clay and gravel; moist, silt has low plasticity.	215.5 / 13.5				
15.0		Medium dense, light gray-brown, clayey SAND (SC), minor to with gravel; moist, sand is coarse.	214.0 / 15.0				No groundwater seepage observed to the depth explored.
		Exploration completed at a depth of 15.0 feet.					Surface elevation estimated from site survey.
17.5							
20.0							

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FIGURE A-7

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0			226.0				
		FOREST DUFF (woody debris) (2.0 inches).	225.8 / 0.2				
		Medium dense to dense, red-brown, clayey GRAVEL with sand, organics (roots, rootlets), cobbles, and boulders (GC); moist, cobbles are approximately 35%, boulders are approximately 5 to 10% (topsoil to 14.0 inches).		PP	☒		Moderate caving observed from 0.0 to 11.0 feet. PP = 2.5 tsf
2.5							
5.0					☒		
7.5		light-gray brown; cobbles are approximately 15% at 7.0 feet					
10.0							
		Medium dense, light gray GRAVEL with silt, sand, and cobbles (GP-GM), moist, cobbles are approximately 10%.	215.0 / 11.0		☒		
12.5							
		Medium dense, gray, clayey GRAVEL with sand (GC); moist, gravel is subrounded.	213.0 / 13.0				Approximately 30% of rocks broken by hand.
15.0					☒		Slow groundwater seepage observed at 15.5 feet.
		Exploration completed at a depth of 16.0 feet.	210.0 / 16.0				Surface elevation estimated from site survey.
17.5							
20.0							

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TEST PIT TP-8

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FIGURE A-8

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		217.0				
	FOREST DUFF (woody debris) (3.0 inches).	216.7 / 0.3	PP			PP = 1.75 tsf
	Stiff, orange-brown SILT (ML), minor clay, trace to minor sand, trace gravel and organics (rootlets, roots); moist.					
	trace charcoal at 2.0 feet		PP	☒		PP = 2.25 tsf
2.5	Stiff, light brown SILT (ML), minor clay, trace to minor sand; moist, silt has low plasticity.	214.5 / 2.5	PP			PP = 2.5 tsf
	trace gravel at 4.0 feet		PP	☒		PP = 3.0 tsf
5.0						
7.5	light gray-brown at 8.0 feet					
10.0	with gravel and cobbles; cobbles are approximately 5% at 10.0 feet					Moderate groundwater seepage observed from 11.0 to 15.0 feet.
	Medium dense, gray with brown-orange mottled, clayey GRAVEL with sand, cobbles, and boulders (GC); wet, cobbles are approximately 10%, boulders are approximately 5% (decomposed basalt).	205.5 / 11.5		☒		
12.5						Excavator notes harder digging at 14.0 feet. Approximately 50% of rocks broken by hand.
	Dense, gray-brown GRAVEL with clay and sand (GP-GC); wet (decomposed basalt).	203.0 / 14.0				
15.0	Exploration completed at a depth of 15.0 feet.	202.0 / 15.0				No caving observed to the depth explored.
						Surface elevation estimated from site survey.
17.5						
20.0						

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EXCAVATION METHOD: mini excavator (see document text)

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FIGURE A-9

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	SAMPLE	COMMENTS
0.0	Medium stiff, light brown SILT (ML), minor sand, trace gravel and organics (roots, rootlets); dry to moist (topsoil to 12.0 inches, 5-inch-thick root zone).	227.5		
	Stiff, red-brown CLAY (CL), minor sand and gravel; moist, clay has medium plasticity.	226.5 / 1.0		
2.5				
	with cobbles and boulders; cobbles are approximately 10%, boulders are approximately 5% at 4.0 feet	223.0 / 4.5		
5.0	Dense, red-brown, clayey GRAVEL with cobbles (GC), minor sand; moist, cobbles are approximately 10%. light gray-brown at 6.0 feet			
7.5				
	Dense, red-brown GRAVEL with silt, sand, and cobbles (GP-GM); moist, cobbles are approximately 10%.	219.0 / 8.5		Severe caving observed from 8.5 to 15.0 feet.
10.0				
	with boulders; boulders are approximately 5% at 12.0 feet			
12.5	Medium dense, gray-brown GRAVEL with clay, sand, and cobbles (GP-GC); moist to wet.	214.5 / 13.0		
15.0	Exploration completed at a depth of 15.0 feet.	212.5 / 15.0		No groundwater seepage observed to the depth explored. Surface elevation estimated from site survey.
17.5				
20.0				

MOISTURE CONTENT %: 0 50 100

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EXCAVATION METHOD: mini excavator (see document text)

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FIGURE A-10

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, light brown SILT with cobbles and boulders (ML), minor clay, sand, and gravel, trace organics (rootlets); moist, cobbles are approximately 15%, boulders are approximately 5% (topsoil to 8.0 inches, 3-inch-thick root zone) - **FILL**.	230.0	PP			PP = 2.25 tsf
2.5	Medium dense, orange-brown, clayey GRAVEL with cobbles and boulders (GC), minor sand; moist, cobbles are approximately 25%, boulders are approximately 10%.	229.0 / 1.0				
5.0	Medium dense to dense, light gray GRAVEL with silt, sand, cobbles, and boulders (GP-GM); moist, cobbles are approximately 40%, boulders are approximately 10%.	225.0 / 5.0				
7.5						
10.0						
12.5	Medium dense, light yellow-brown SAND with silt (SP-SM), minor to with gravel; moist.	218.5 / 11.5				
15.0	Dense, gray-brown GRAVEL with silt and sand (GP-GM); moist, gravel is subrounded.	216.0 / 14.0				
	Exploration completed at a depth of 15.0 feet.	215.0 / 15.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation estimated from site survey.
17.5						
20.0						

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EXCAVATION METHOD: mini excavator (see document text)

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FIGURE A-11

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0			221.0				
		FOREST DUFF (wood debris) (3.0 inches).	220.7 / 0.3	PP			PP = 1.75 tsf
		Medium stiff, light brown SILT (ML), minor sand and gravel; trace clay and organics (roots, rootlets); moist (topsoil to 12.0 inches).	220.0 / 1.0				
2.5		Medium dense, orange-brown, clayey GRAVEL with cobbles and boulders (GC), minor sand; moist, cobbles are approximately 25 to 30%, boulders are approximately 10%.					
5.0							
		Medium dense to dense, light gray-brown GRAVEL with silt, sand, and cobbles (GP-GM); moist, gravel is subrounded.	215.0 / 6.0		☒		
7.5							
10.0							Severe caving observed from 11.0 to 16.0 feet.
12.5		with boulders; cobbles are approximately 20%, boulders are approximately 5% at 12.0 feet					
15.0					☒		
		Exploration completed at a depth of 16.0 feet.	205.0 / 16.0				No groundwater seepage observed to the depth explored.
17.5							Surface elevation estimated from site survey.
20.0							

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EXCAVATION METHOD: mini excavator (see document text)

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FIGURE A-12

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	FOREST DUFF (wood debris) (3.0 inches).	220.0				
	Medium stiff, light brown SILT (ML), minor sand and gravel, trace clay and organics (roots, rootlets); moist (topsoil to 12.0 inches).	219.7 / 0.3	PP			Minor caving observed from 0.0 to 5.5 feet. PP = 1.5 tsf
		219.0 / 1.0				
2.5	Medium dense, orange-brown, clayey GRAVEL with cobbles and boulders (GC), minor sand; moist, cobbles are approximately 15%, boulders are approximately 5%.			☒		
5.0		215.0 / 5.0				
	Medium dense, light brown SAND with silt (SP-SM), minor gravel; moist, sand is fine to medium.			☒		Old tree stump at 6.0 feet.
7.5						
		211.5 / 8.5				
	Dense, light brown GRAVEL with silt, sand, and cobbles (GP-GM); moist, gravel is subrounded, sand is fine to medium.					
10.0						
12.5				☒		
15.0						
		204.0 / 16.0				
	Exploration completed at a depth of 16.0 feet.					No groundwater seepage observed to the depth explored.
17.5						Surface elevation estimated from site survey.
20.0						

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EXCAVATION METHOD: mini excavator (see document text)

GeoDesign Inc an NV5 company

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FIGURE A-13

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, light brown SILT (ML), minor sand, gravel, and clay, trace organics (roots, rootlets); moist (topsoil to 12.0 inches, 5-inch-thick root zone).	224.0	PP			PP = 1.0 tsf
		223.0 / 1.0				
2.5	Medium dense, red-brown, clayey GRAVEL with cobbles and boulders (GC), minor sand; moist, cobbles are approximately 20%, boulders are approximately 10%.			☒		
5.0						
7.5		216.5 / 7.5				Minor caving observed from 7.5 to 14.0 feet.
	Medium dense, light gray-brown GRAVEL with silt, sand, cobbles, and boulders (GP-GM); moist, gravel is subrounded, cobbles are approximately 25%, boulders are approximately 5%.			☒		
10.0						
12.5						
		210.0 / 14.0				
	Exploration completed at a depth of 14.0 feet.					No groundwater seepage observed to the depth explored.
15.0						Surface elevation estimated from site survey.
17.5						
20.0						

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EXCAVATION METHOD: mini excavator (see document text)

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FIGURE A-14

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

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Exhibit A2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, light brown SILT (ML), minor sand, trace clay, gravel, and organics (roots, rootlets); moist (topsoil to 12.0 inches, 4-inch-thick root zone).	214.0				
		213.0 / 1.0				
2.5	Medium dense, red-brown, clayey GRAVEL with sand, cobbles, and boulders (GC); moist, cobbles are approximately 10%, boulders are approximately 5%.					
		209.5 / 4.5				
5.0	Medium dense, brown GRAVEL with clay, sand, cobbles, and boulders; moist, cobbles are approximately 15%, boulders are approximately 5%.					
7.5						
10.0						
		202.0 / 12.0				
12.5	Exploration completed at a depth of 12.0 feet.					No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation estimated from site survey.
15.0						
17.5						
20.0						

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EXCAVATION METHOD: mini excavator (see document text)

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FIGURE A-15

TEST PIT LOG - GDI-NV5 - 1 PER PAGE HARSCHINV-23-01-TP1_15.GPJ GDI_NV5.GDT PRINT DATE: 3/10/20:KM

APPENDIX D

APPENDIX D

HISTORICAL AERIAL PHOTOGRAPHS

Historical aerial photographs of the site dating from 1936 through 2016 are presented in this appendix.

Exhibit A2

21600 SW OREGON ST

21600 SW OREGON ST

Sherwood, OR 97140

Inquiry Number: 5748189.1

August 12, 2019

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Exhibit A2 08/12/19

Site Name:

21600 SW OREGON ST
21600 SW OREGON ST
Sherwood, OR 97140
EDR Inquiry # 5748189.1

Client Name:

GeoDesign Inc.
9450 SW Commerce Circle Suite 300
Wilsonville, OR 97070
Contact: John Hook

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2000	1"=500'	Acquisition Date: July 24, 2000	USGS/DOQQ
1995	1"=500'	Flight Date: June 29, 1995	USGS
1981	1"=500'	Flight Date: August 22, 1981	USDA
1975	1"=500'	Flight Date: September 13, 1975	USGS
1970	1"=500'	Flight Date: July 05, 1970	USGS
1963	1"=500'	Flight Date: June 14, 1963	USDA
1960	1"=500'	Flight Date: July 17, 1960	USGS
1952	1"=500'	Flight Date: July 13, 1952	USGS
1948	1"=500'	Flight Date: July 12, 1948	USDA
1936	1"=500'	Flight Date: May 12, 1936	ACOE

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Exhibit A2

INQUIRY #: 5748189.1

YEAR: 2016

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 2012

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 2009

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 2006

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 2000

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 1995

= 500'

N

EDR

Exhibit A2
INQUIRY #: 5748189.1
YEAR: 1981
= 500'
N
EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 1975

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 1970

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 1963

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 1960

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 1952

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 1948

= 500'

N

EDR

Exhibit A2

INQUIRY #: 5748189.1

YEAR: 1936

= 500'

N

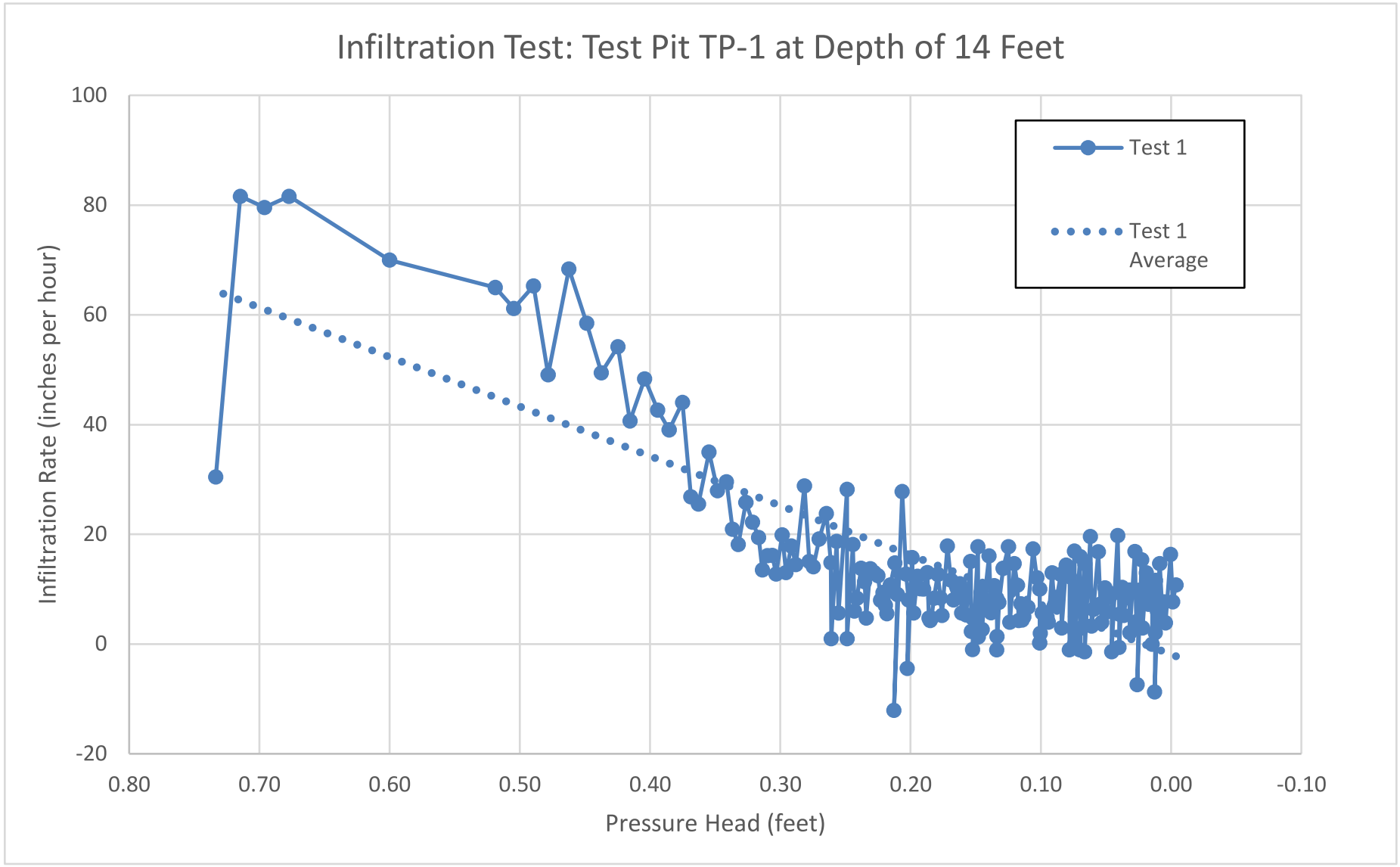
EDR

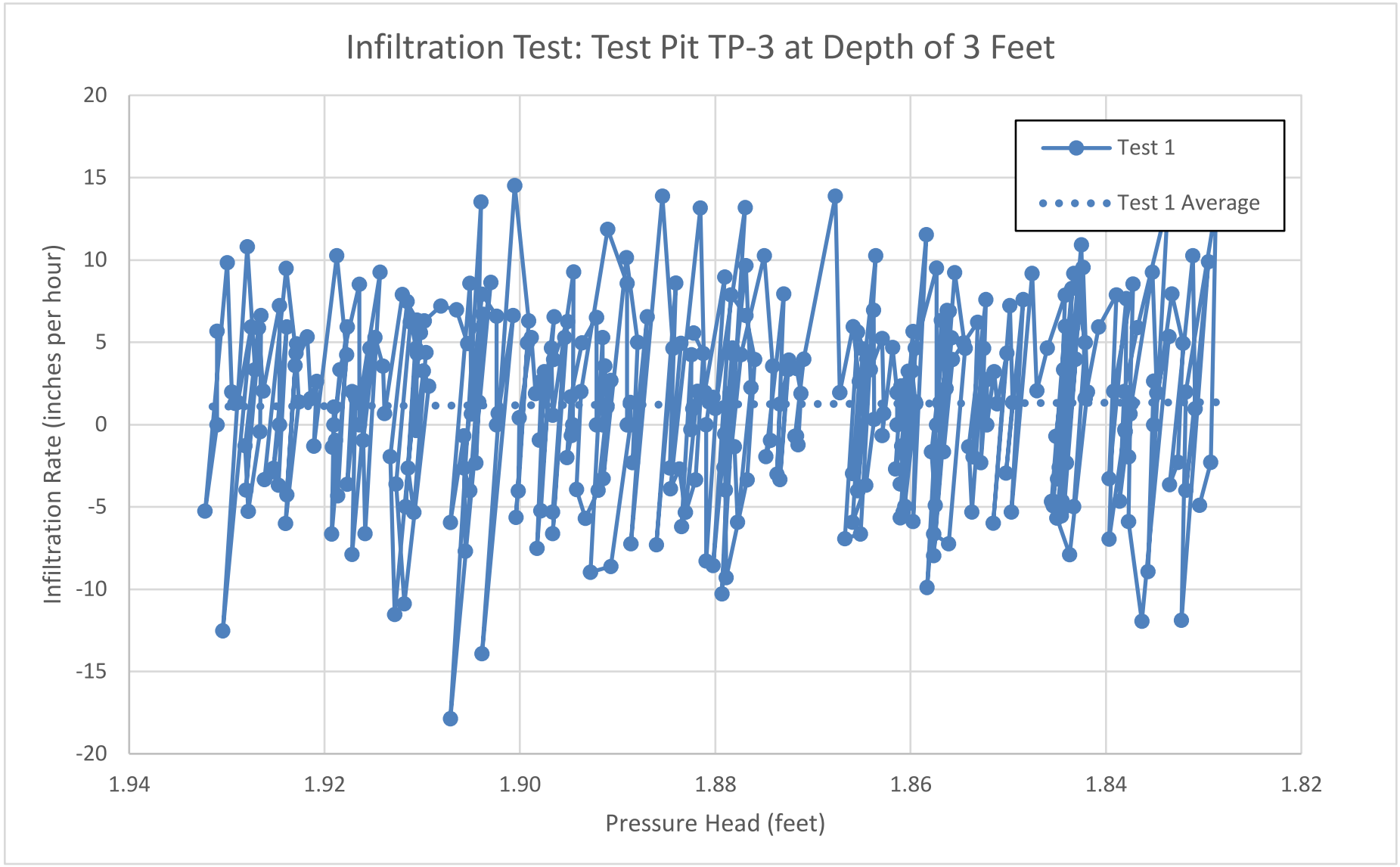
APPENDIX E

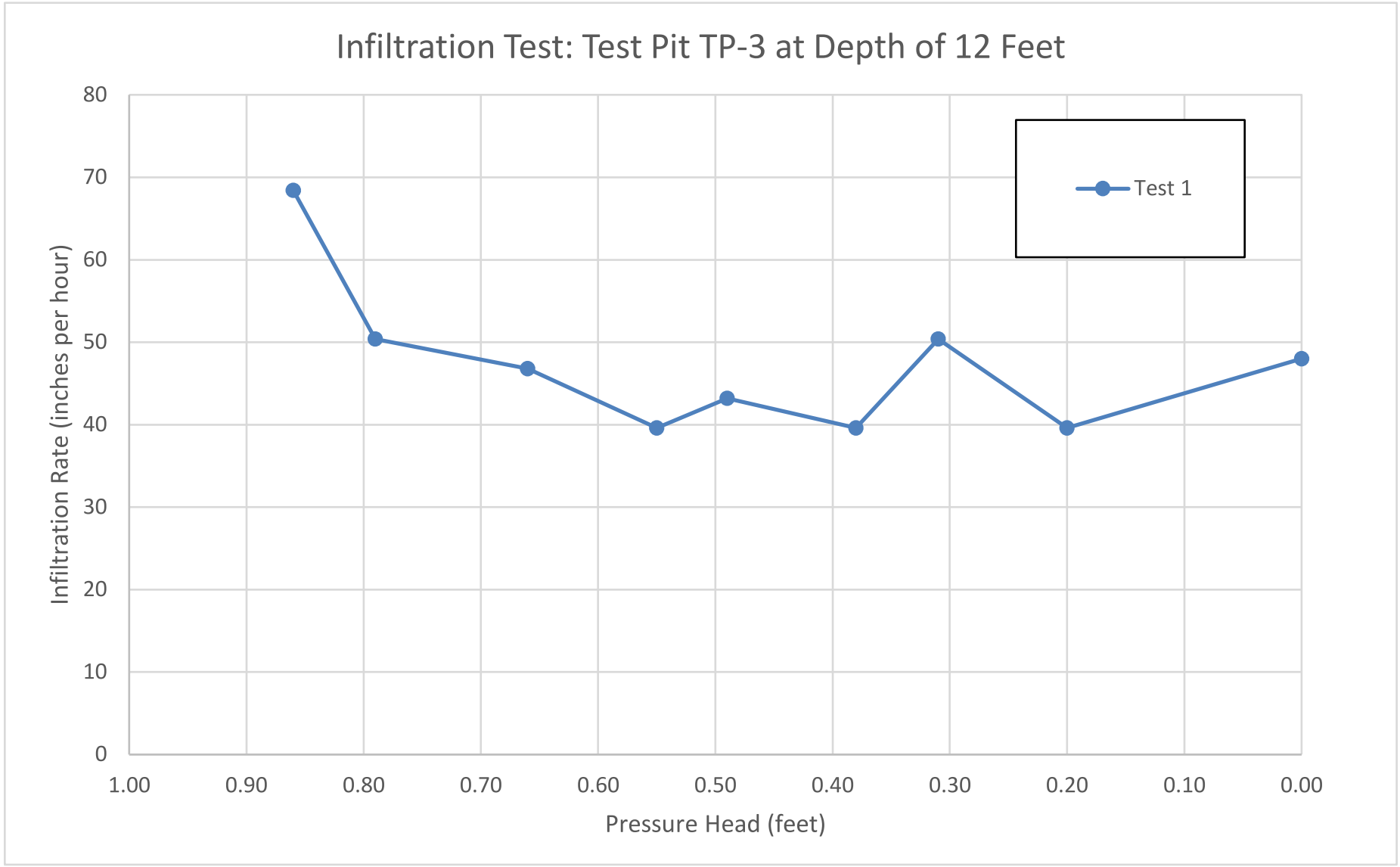
APPENDIX E

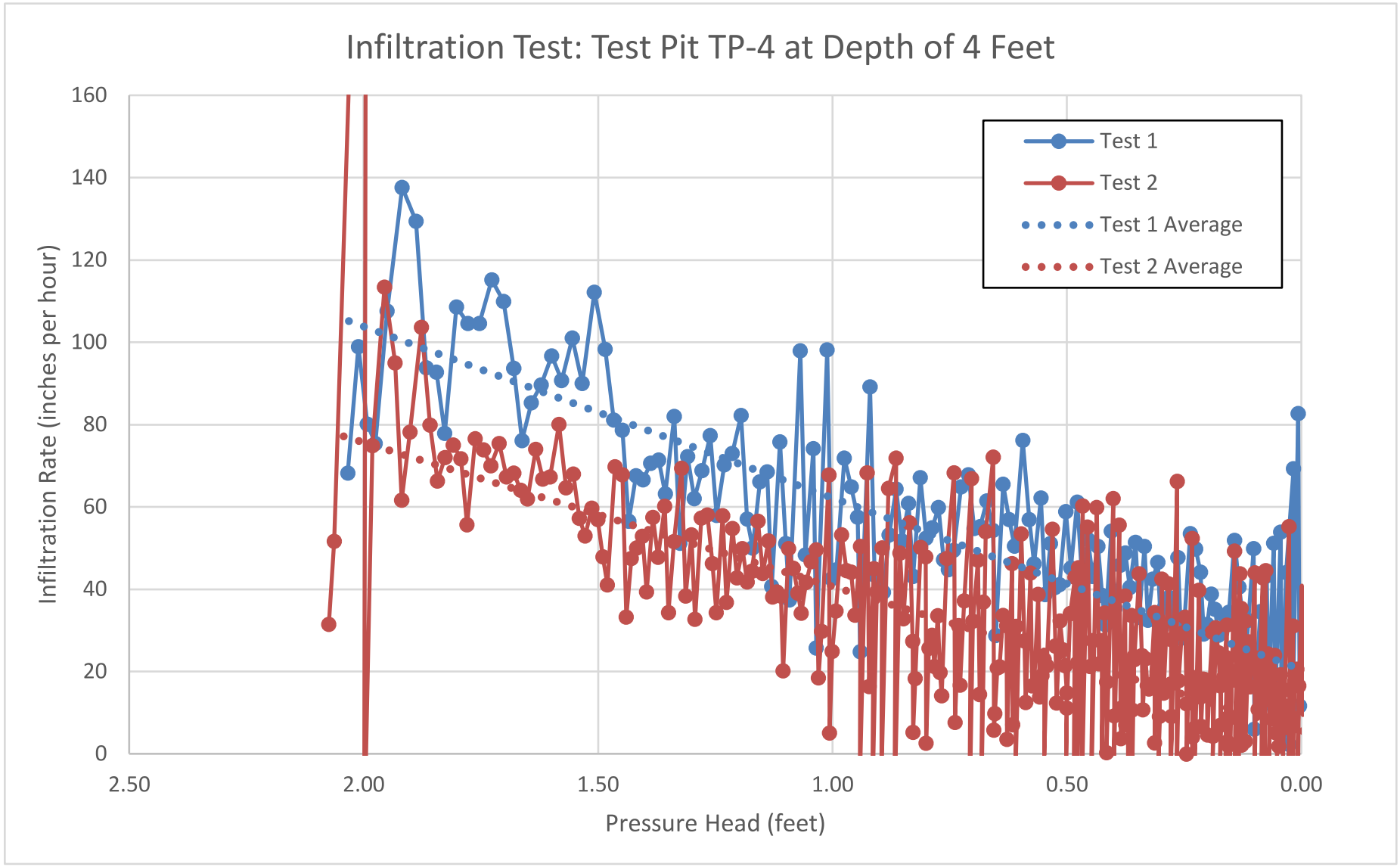
INFILTRATION TEST PLOTS

Plots of the infiltration test data we collected are presented in this appendix.


Infiltration Test: Test Pit TP-1 at Depth of 14 Feet
Infiltration Rate (inches per hour)
100
80
60
40
20
0
-20
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
Pressure Head (feet)
Test 1
Test 1 Average


Infiltration Test: Test Pit TP-3 at Depth of 3 Feet
Infiltration Rate (inches per hour)
20
15
10
5
0
-5
-10
-15
-20
1.94
1.92
1.90
1.88
1.86
1.84
1.82
Pressure Head (feet)
Test 1
Test 1 Average


Infiltration Test: Test Pit TP-3 at Depth of 12 Feet
Infiltration Rate (inches per hour)
80
70
60
50
40
30
20
10
0
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Pressure Head (feet)
Test 1


Infiltration Test: Test Pit TP-4 at Depth of 4 Feet
Infiltration Rate (inches per hour)
160
140
120
100
80
60
40
20
0
2.50
2.00
1.50
1.00
0.50
0.00
Pressure Head (feet)
Test 1
Test 2
Test 1 Average
Test 2 Average

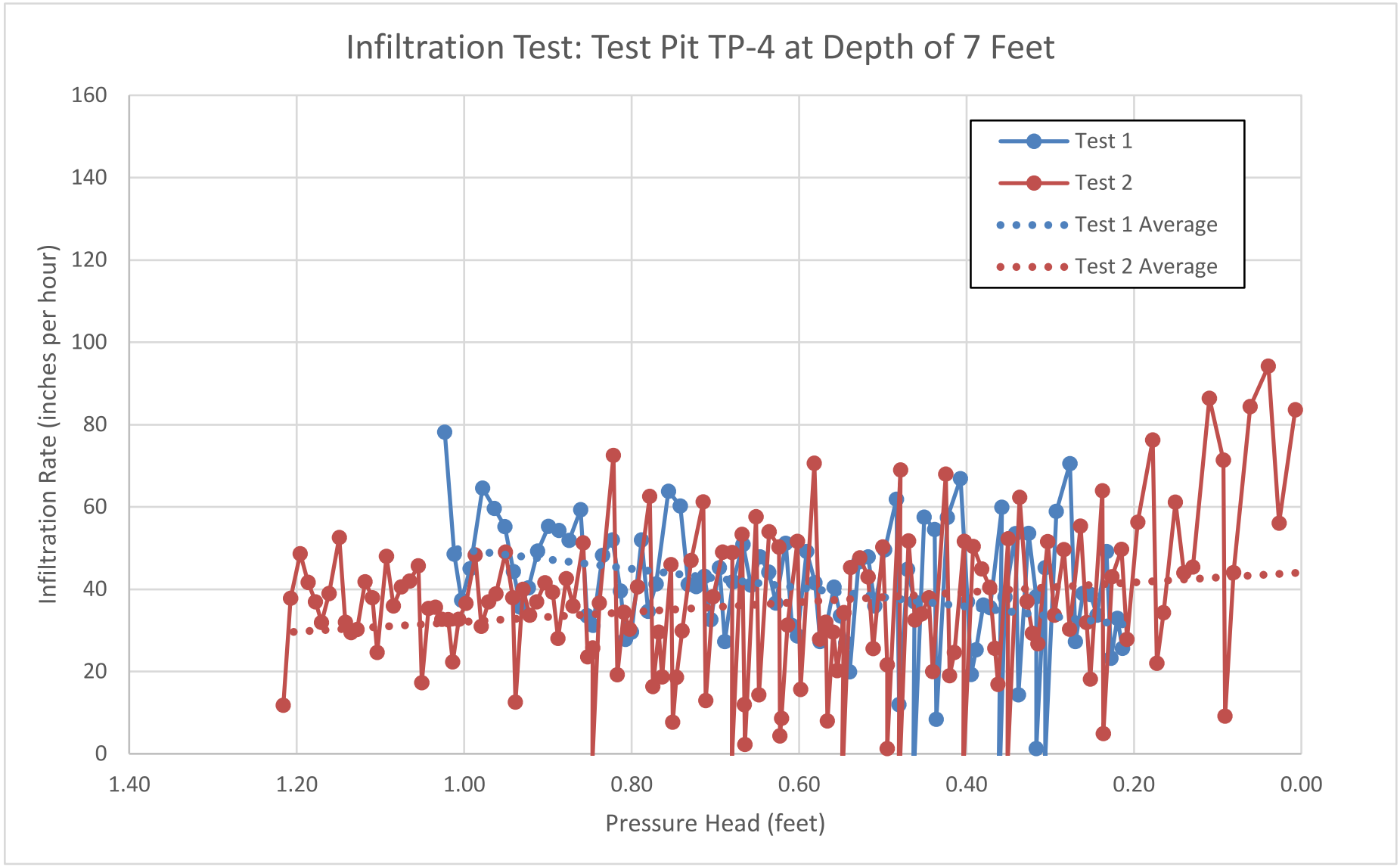

Infiltration Test: Test Pit TP-4 at Depth of 7 Feet
Infiltration Rate (inches per hour)
160
140
120
100
80
60
40
20
0
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Pressure Head (feet)
Test 1
Test 2
Test 1 Average
Test 2 Average

Exhibit A2

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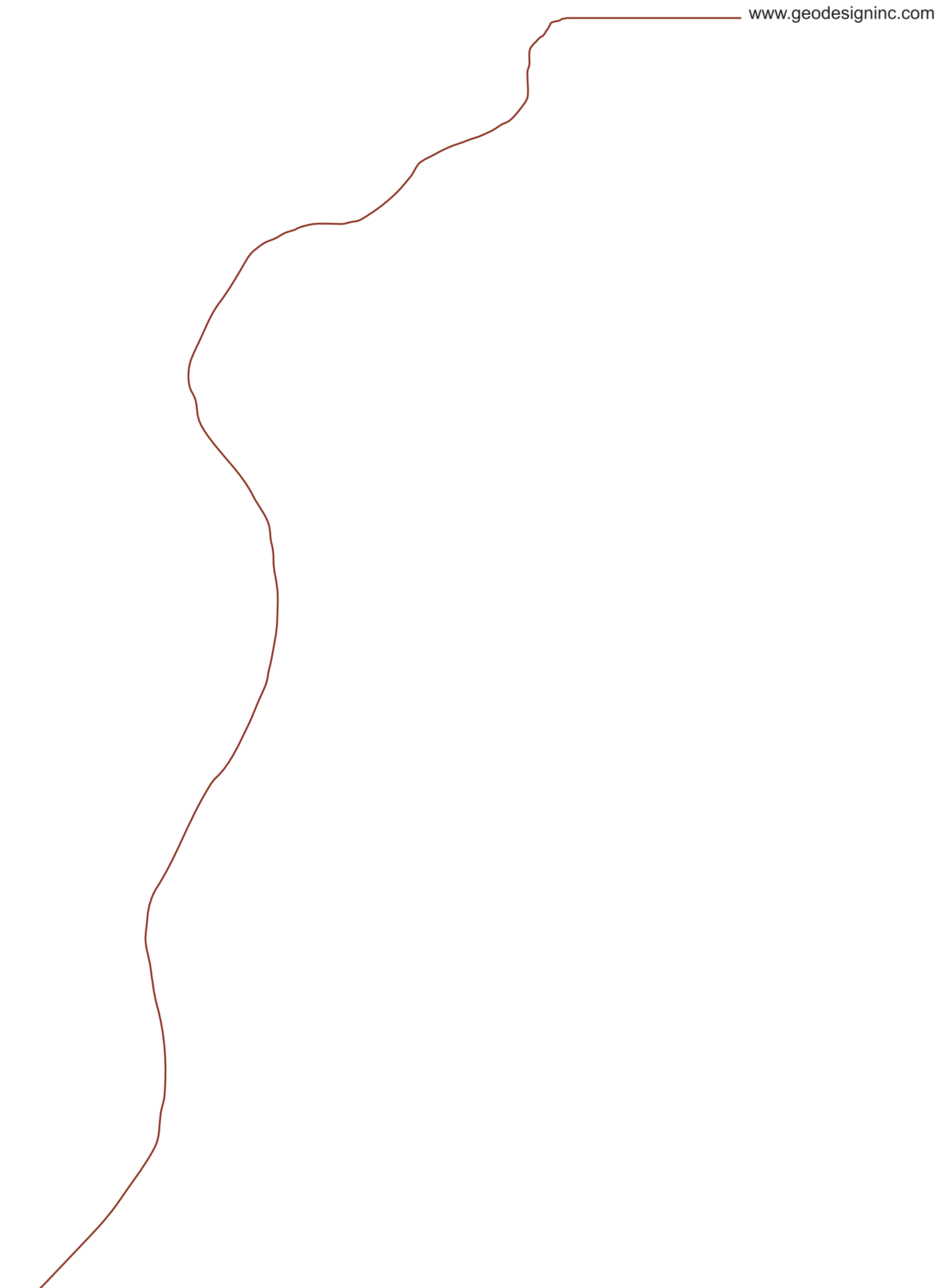

APPENDIX K – TITLE REPORTS

OWNER'S POLICY OF TITLE INSURANCE

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Policy Number:

36261908180

Any notice of claim and any other notice or statement in writing required to be given to the Company under this Policy must be given to the Company at the address shown in Section 18 of the Conditions.

COVERED RISKS

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE CONTAINED IN SCHEDULE B, AND THE CONDITIONS, CHICAGO TITLE INSURANCE COMPANY, a Florida corporation (the "Company") insures, as of Date of Policy and, to the extent stated in Covered Risks 9 and 10, after Date of Policy, against loss or damage, not exceeding the Amount of Insurance, sustained or incurred by the Insured by reason of:

1. Title being vested other than as stated in Schedule A.
2. Any defect in or lien or encumbrance on the Title. This Covered Risk includes but is not limited to insurance against loss from
   (a) A defect in the Title caused by
      (i) forgery, fraud, undue influence, duress, incompetency, incapacity, or impersonation;
      (ii) failure of any person or Entity to have authorized a transfer or conveyance;
      (iii) a document affecting Title not properly created, executed, witnessed, sealed, acknowledged, notarized, or delivered;
      (iv) failure to perform those acts necessary to create a document by electronic means authorized by law;
      (v) a document executed under a falsified, expired, or otherwise invalid power of attorney;
      (vi) a document not properly filed, recorded, or indexed in the Public Records including failure to perform those acts by electronic means authorized by law; or
      (vii) a defective judicial or administrative proceeding.
   (b) The lien of real estate taxes or assessments imposed on the Title by a governmental authority due or payable, but unpaid.
   (c) 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.
3. Unmarketable Title.
4. No right of access to and from the Land.
5. The violation or enforcement of any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (a) the occupancy, use, or enjoyment of the Land;
   (b) the character, dimensions, or location of any improvement erected on the Land;
   (c) the subdivision of land; or
   (d) environmental protection

   if a notice, describing any part of the Land, is recorded in the Public Records setting forth the violation or intention to enforce, but only to the extent of the violation or enforcement referred to in that notice.

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AMERICAN LAND TITLE ASSOCIATION

6. An enforcement action based on the exercise of a governmental police power not covered by Covered Risk 5 if a notice of the enforcement action, describing any part of the Land, is recorded in the Public Records, but only to the extent of the enforcement referred to in that notice.
7. The exercise of the rights of eminent domain if a notice of the exercise, describing any part of the Land, is recorded in the Public Records.
8. Any taking by a governmental body that has occurred and is binding on the rights of a purchaser for value without Knowledge.
9. Title being vested other than as stated in Schedule A or being defective
   (a) as a result of the avoidance in whole or in part, or from a court order providing an alternative remedy, of a transfer of all or any part of the title to or any interest in the Land occurring prior to the transaction vesting Title as shown in Schedule A because that prior transfer constituted a fraudulent or preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws; or
   (b) because the instrument of transfer vesting Title as shown in Schedule A constitutes a preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws by reason of the failure of its recording in the Public Records
      (i) to be timely, or
      (ii) to impart notice of its existence to a purchaser for value or to a judgment or lien creditor.
10. Any defect in or lien or encumbrance on the Title or other matter included in Covered Risks 1 through 9 that has been created or attached or has been filed or recorded in the Public Records subsequent to Date of Policy and prior to the recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The Company will also pay the costs, attorneys' fees, and expenses incurred in defense of any matter insured against by this Policy, but only to the extent provided in the Conditions.

IN WITNESS WHEREOF, CHICAGO TITLE INSURANCE COMPANY has caused this policy to be signed and sealed by its duly authorized officers.

Issuing Office or Agent:
Ticor Title Company of Oregon
1433 SW 6th Avenue
Portland, OR 97201
(503)646-4444 FAX (503)219-9984

Countersigned By:

Maggie Metcalf

Authorized Officer or Agent

Chicago Title Insurance Company

By:

President

Attest:

Secretary

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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, permit, or governmental regulation (including those relating 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 vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. 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.

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SCHEDULE A

Name and Address of Title Insurance Company: Chicago Title Insurance Company
c/o Mark Davison
Ticor Title Company of Oregon
1433 SW 6th Avenue
Portland, OR 97201

Address Reference: 21600 SW Oregon Street, Sherwood, OR 97140

Date of Policy	Amount of Insurance	Premium
June 4, 2020 at 10:48 AM	$9,300,945.60	$10,914.00

1. Name of Insured:

   Sherwood Commerce Center, LLC, an Oregon limited liability company

2. The estate or interest in the Land that is insured by this policy is:

   A Fee

3. Title is vested in:

   Sherwood Commerce Center, LLC, an Oregon limited liability company

4. The Land referred to in this policy is described as follows:

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

THIS POLICY VALID ONLY IF SCHEDULE B IS ATTACHED

END OF SCHEDULE A

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SCHEDULE B
EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses that 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. 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. Rights of the public to any portion of the Land lying within SW Oregon Street

7. Easement for the purpose shown below and rights incidental thereto, as granted in a document:
   Granted to: The United States of America
   Purpose: Transmission line
   Recording Date: November 27, 1956
   Book: 388, Page: 444
   Affects: The Northeasterly portion

8. Easement for the purpose shown below and rights incidental thereto, as granted in a document:
   Granted to: Southern Pacific Pipe Lines, Inc.
   Purpose: Pipe lines and appurtenances
   Recording Date: May 3, 1962
   Book: 462, Page: 264
   Affects: A 20 foot wide strip through the Northeasterly portion

9. 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 2020-2021.

END OF SCHEDULE B

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EXHIBIT "A"
LEGAL DESCRIPTION

That portion of the Southeast one-quarter of the Southwest one-quarter of Section 28, Township 2 South, Range 1 West of the Willamette Meridian, in the County of Washington and State of Oregon, which lies South of County Road N. 492.

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CONDITIONS

1. DEFINITION OF TERMS

The following terms when used in this policy mean:

(a) "Amount of Insurance": The amount stated in Schedule A, as may be increased or decreased by endorsement to this policy, increased by Section 8(b), or decreased by Sections 10 and 11 of these Conditions.

(b) "Date of Policy": The date designated as "Date of Policy" in Schedule A.

(c) "Entity": A corporation, partnership, trust, limited liability company, or other similar legal entity.

(d) "Insured": The Insured named in Schedule A.

(i) The term "Insured" also includes

(A) successors to the Title of the Insured by operation of law as distinguished from purchase, including heirs, devisees, survivors, personal representatives, or next of kin;

(B) successors to an Insured by dissolution, merger, consolidation, distribution, or reorganization;

(C) successors to an Insured by its conversion to another kind of Entity;

(D) a grantee of an Insured under a deed delivered without payment of actual valuable consideration conveying the Title

(1) if the stock, shares, memberships, or other equity interests of the grantee are wholly-owned by the named Insured,

(2) if the grantee wholly owns the named Insured,

(3) if the grantee is wholly-owned by an affiliated Entity of the named Insured, provided the affiliated Entity and the named Insured are both wholly-owned by the same person or Entity, or

(4) if the grantee is a trustee or beneficiary of a trust created by a written instrument established by the Insured named in Schedule A for estate planning purposes.

(ii) With regard to (A), (B), (C), and (D) reserving, however, all rights and defenses as to any successor that the Company would have had against any predecessor Insured.

(e) "Insured Claimant": An Insured claiming loss or damage.

(f) "Knowledge" or "Known": Actual knowledge, not constructive knowledge or notice that may be imputed to an Insured by reason of the Public Records or any other records that impart constructive notice of matters affecting the Title.

(g) "Land": The land described in Schedule A, and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is insured by this policy.

(h) "Mortgage": Mortgage, deed of trust, trust deed, or other security instrument, including one evidenced by electronic means authorized by law.

(i) "Public Records": Records established under state statutes at Date of Policy for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge. With respect to Covered Risk 5(d), "Public Records" shall also include environmental protection liens filed in the records of the clerk of the United States District Court for the district where the Land is located.

(j) "Title": The estate or interest described in Schedule A.

(k) "Unmarketable Title": Title affected by an alleged or apparent matter that would permit a prospective purchaser or lessee of the Title or lender on the Title to be released from the obligation to purchase, lease, or lend if there is a contractual condition requiring the delivery of marketable title.

2. CONTINUATION OF INSURANCE

The coverage of this policy shall continue in force as of Date of Policy in favor of an Insured, but only so long as the Insured retains an estate or interest in the Land, or holds an obligation secured by a purchase money Mortgage given by a purchaser from the Insured, or only so long as the Insured shall have liability by reason of warranties in any transfer or conveyance of the Title. This policy shall not continue in force in favor of any purchaser from the Insured of either (i) an estate or interest in the Land, or (ii) an obligation secured by a purchase money Mortgage given to the Insured.

3. NOTICE OF CLAIM TO BE GIVEN BY INSURED CLAIMANT

The Insured shall notify the Company promptly in writing (i) in case of any litigation as set forth in Section 5(a) of these Conditions, (ii) in case Knowledge shall come to an Insured hereunder of any claim of title or interest that is adverse to the Title, as insured, and that might cause loss or damage for which the Company may be liable by virtue of this policy, or (iii) if the Title, as insured, is rejected as Unmarketable Title. If the Company is prejudiced by the failure of the Insured Claimant to provide prompt notice, the Company's liability to the Insured Claimant under the policy shall be reduced to the extent of the prejudice.

4. PROOF OF LOSS

In the event the Company is unable to determine the amount of loss or damage, the Company may, at its option, require as a condition of payment that the Insured Claimant furnish a signed proof of loss. The proof of loss must describe the defect, lien, encumbrance, or other matter insured against by this policy that constitutes the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage.

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(continued)

5. DEFENSE AND PROSECUTION OF ACTIONS

(a) Upon written request by the Insured, and subject to the options contained in Section 7 of these Conditions, the Company, at its own cost and without unreasonable delay, shall provide for the defense of an Insured in litigation in which any third party asserts a claim covered by this policy adverse to the Insured. This obligation is limited to only those stated causes of action alleging matters insured against by this policy. The Company shall have the right to select counsel of its choice (subject to the right of the Insured to object for reasonable cause) to represent the Insured as to those stated causes of action. It shall not be liable for and will not pay the fees of any other counsel. The Company will not pay any fees, costs, or expenses incurred by the Insured in the defense of those causes of action that allege matters not insured against by this policy.

(b) The Company shall have the right, in addition to the options contained in Section 7 of these Conditions, at its own cost, to institute and prosecute any action or proceeding or to do any other act that in its opinion may be necessary or desirable to establish the Title, as insured, or to prevent or reduce loss or damage to the Insured. The Company may take any appropriate action under the terms of this policy, whether or not it shall be liable to the Insured. The exercise of these rights shall not be an admission of liability or waiver of any provision of this policy. If the Company exercises its rights under this subsection, it must do so diligently.

(c) Whenever the Company brings an action or asserts a defense as required or permitted by this policy, the Company may pursue the litigation to a final determination by a court of competent jurisdiction, and it expressly reserves the right, in its sole discretion, to appeal from any adverse judgment or order.

6. DUTY OF INSURED CLAIMANT TO COOPERATE

(a) In all cases where this policy permits or requires the Company to prosecute or provide for the defense of any action or proceeding and any appeals, the Insured shall secure to the Company the right to so prosecute or provide defense in the action or proceeding, including the right to use, at its option, the name of the Insured for this purpose. Whenever requested by the Company, the Insured, at the Company's expense, shall give the Company all reasonable aid (i) in securing evidence, obtaining witnesses, prosecuting or defending the action or proceeding, or effecting settlement, and (ii) in any other lawful act that in the opinion of the Company may be necessary or desirable to establish the Title or any other matter as insured. If the Company is prejudiced by the failure of the Insured to furnish the required cooperation, the Company's obligations to the Insured under the policy shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation, with regard to the matter or matters requiring such cooperation.

(b) The Company may reasonably require the Insured Claimant to submit to examination under oath by any authorized representative of the Company and to produce for examination, inspection, and copying, at such reasonable times and places as may be designated by the authorized representative of the Company, all records, in whatever medium maintained, including books, ledgers, checks, memoranda, correspondence, reports, e-mails, disks, tapes, and videos whether bearing a date before or after Date of Policy, that reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Insured Claimant shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect, and copy all of these records in the custody or control of a third party that reasonably pertain to the loss or damage. All information designated as confidential by the Insured Claimant provided to the Company pursuant to this Section shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Insured Claimant to submit for examination under oath, produce any reasonably requested information, or grant permission to secure reasonably necessary information from third parties as required in this subsection, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this policy as to that claim.

7. OPTIONS TO PAY OR OTHERWISE SETTLE CLAIMS; TERMINATION OF LIABILITY

In case of a claim under this policy, the Company shall have the following additional options:

(a) To Pay or Tender Payment of the Amount of Insurance.

To pay or tender payment of the Amount of Insurance under this policy together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment or tender of payment and that the Company is obligated to pay.

Upon the exercise by the Company of this option, all liability and obligations of the Company to the Insured under this policy, other than to make the payment required in this subsection, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

(b) To Pay or Otherwise Settle With Parties Other Than the Insured or With the Insured Claimant.

(i) to pay or otherwise settle with other parties for or in the name of an Insured Claimant any claim insured against under this policy. In addition, the Company will pay any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay; or

(ii) to pay or otherwise settle with the Insured Claimant the loss or damage provided for under this policy, together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay.

Upon the exercise by the Company of either of the options provided for in subsections (b)(i) or (ii), the Company's obligations to the Insured under this policy for the claimed loss or damage, other than the payments required to be made, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

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(continued)

8. DETERMINATION AND EXTENT OF LIABILITY

This policy is a contract of indemnity against actual monetary loss or damage sustained or incurred by the Insured Claimant who has suffered loss or damage by reason of matters insured against by this policy.

(a) The extent of liability of the Company for loss or damage under this policy shall not exceed the lesser of

(i) the Amount of Insurance; or

(ii) the difference between the value of the Title as insured and the value of the Title subject to the risk insured against by this policy.

(b) If the Company pursues its rights under Section 5 of these Conditions and is unsuccessful in establishing the Title, as insured,

(i) the Amount of Insurance shall be increased by Ten percent (10%), and

(ii) the Insured Claimant shall have the right to have the loss or damage determined either as of the date the claim was made by the Insured Claimant or as of the date it is settled and paid.

(c) In addition to the extent of liability under (a) and (b), the Company will also pay those costs, attorneys' fees, and expenses incurred in accordance with Sections 5 and 7 of these Conditions.

9. LIMITATION OF LIABILITY

(a) If the Company establishes the Title, or removes the alleged defect, lien, or encumbrance, or cures the lack of a right of access to or from the Land, or cures the claim of Unmarketable Title, all as insured, in a reasonably diligent manner by any method, including litigation and the completion of any appeals, it shall have fully performed its obligations with respect to that matter and shall not be liable for any loss or damage caused to the Insured.

(b) In the event of any litigation, including litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals, adverse to the Title, as insured.

(c) The Company shall not be liable for loss or damage to the Insured for liability voluntarily assumed by the Insured in settling any claim or suit without the prior written consent of the Company.

10. REDUCTION OF INSURANCE; REDUCTION OR TERMINATION OF LIABILITY

All payments under this policy, except payments made for costs, attorneys' fees, and expenses, shall reduce the Amount of Insurance by the amount of the payment.

11. LIABILITY NONCUMULATIVE

The Amount of Insurance shall be reduced by any amount the Company pays under any policy insuring a Mortgage to which exception is taken in Schedule B or to which the Insured has agreed, assumed, or taken subject, or which is executed by an Insured after Date of Policy and which is a charge or lien on the Title, and the amount so paid shall be deemed a payment to the Insured under this policy.

12. PAYMENT OF LOSS

When liability and the extent of loss or damage have been definitely fixed in accordance with these Conditions, the payment shall be made within thirty (30) days.

13. RIGHTS OF RECOVERY UPON PAYMENT OR SETTLEMENT

(a) Whenever the Company shall have settled and paid a claim under this policy, it shall be subrogated and entitled to the rights of the Insured Claimant in the Title and all other rights and remedies in respect to the claim that the Insured Claimant has against any person or property, to the extent of the amount of any loss, costs, attorneys' fees, and expenses paid by the Company. If requested by the Company, the Insured Claimant shall execute documents to evidence the transfer to the Company of these rights and remedies. The Insured Claimant shall permit the Company to sue, compromise, or settle in the name of the Insured Claimant and to use the name of the Insured Claimant in any transaction or litigation involving these rights and remedies.

If a payment on account of a claim does not fully cover the loss of the Insured Claimant, the Company shall defer the exercise of its right to recover until after the Insured Claimant shall have recovered its loss.

(b) The Company's right of subrogation includes the rights of the Insured to indemnities, guaranties, other policies of insurance, or bonds, notwithstanding any terms or conditions contained in those instruments that address subrogation rights.

14. INTENTIONALLY DELETED

15. LIABILITY LIMITED TO THIS POLICY; POLICY ENTIRE CONTRACT

(a) This policy together with all endorsements, if any, attached to it by the Company is the entire policy and contract between the Insured and the Company. In interpreting any provision of this policy, this policy shall be construed as a whole.

(b) Any claim of loss or damage that arises out of the status of the Title or by any action asserting such claim shall be restricted to this policy.

(c) Any amendment of or endorsement to this policy must be in writing and authenticated by an authorized person, or expressly incorporated by Schedule A of this policy.

(d) Each endorsement to this policy issued at any time is made a part of this policy and is subject to all of its terms and provisions. Except as the endorsement expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsement, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance.

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(continued)

16. SEVERABILITY

In the event any provision of this policy, in whole or in part, is held invalid or unenforceable under applicable law, the policy shall be deemed not to include that provision or such part held to be invalid, but all other provisions shall remain in full force and effect.

17. CHOICE OF LAW; FORUM

(a) Choice of Law: The Insured acknowledges the Company has underwritten the risks covered by this policy and determined the premium charged therefor in reliance upon the law affecting interests in real property and applicable to the interpretation, rights, remedies, or enforcement of policies of title insurance of the jurisdiction where the Land is located.

Therefore, the court or an arbitrator shall apply the law of the jurisdiction where the Land is located to determine the validity of claims against the Title that are adverse to the Insured and to interpret and enforce the terms of this policy. In neither case shall the court or arbitrator apply its conflicts of law principles to determine the applicable law.

(b) Choice of Forum: Any litigation or other proceeding brought by the Insured against the Company must be filed only in a state or federal court within the United States of America or its territories having appropriate jurisdiction.

18. NOTICES, WHERE SENT

Any notice of claim and any other notice or statement in writing required to be given to the Company under this policy must be given to the Company at:

Chicago Title Insurance Company
P.O. Box 45023
Jacksonville, FL 32232-5023
Attn: Claims Department

END OF CONDITIONS

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ENDORSEMENT

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Attached to Policy Number:

36261908180

Date: June 4, 2020

Premium: $1,000.00

1. The Company insures against loss or damage sustained by the Insured in the event that, at Date of Policy,
   a. According to applicable zoning ordinances and amendments, the Land is not classified Zone EI, Employment Industrial;
   b. The following use or uses are not allowed under that classification:

      Undeveloped

2. There shall be no liability under this endorsement based on
   a. Lack of compliance with any conditions, restrictions, or requirements contained in the zoning ordinances and amendments, including but not limited to the failure to secure necessary consents or authorizations as a prerequisite to the use or uses. This paragraph 2.a. does not modify or limit the coverage provided in Covered Risk 5.
   b. The invalidity of the zoning ordinances and amendments until after a final decree of a court of competent jurisdiction adjudicating the invalidity, the effect of which is to prohibit the use or uses.
   c. The refusal of any person to purchase, lease or lend money on the Title covered by this policy.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Order Reference: Sherwood Commerce Center, LLC, an Oregon limited liability company

Chicago Title Insurance Company

Countersigned By:

Maggie Metcalf

Authorized Officer or Agent

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AMERICAN LAND TITLE ASSOCIATION

ENDORSEMENT

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Attached to Policy Number:

36261908180

Date: June 4, 2020

Premium: $100.00

The Company insures against loss or damage sustained by the Insured by reason of the failure of the Land as described in Schedule A to be the same as that identified on the survey made by Terramark dated March 20, 2020, and designated Job No. 20204194.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Order Reference: Sherwood Commerce Center, LLC, an Oregon limited liability company

Chicago Title Insurance Company

Countersigned By:

Maggie Metcalf

Authorized Officer or Agent

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ENDORSEMENT

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Attached to Policy Number:

36261908180

Date: June 4, 2020

Premium: $125.00

The Company insures against loss or damage sustained by the Insured if, at Date of Policy (i) the Land does not abut and have both actual vehicular and pedestrian access to and from N E. Oregon Street (the "Street"), (ii) the Street is not physically open and publicly maintained, or (iii) the Insured has no right to use existing curb cuts or entries along that portion of the Street abutting the Land.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Order Reference: Sherwood Commerce Center, LLC, an Oregon limited liability company

Chicago Title Insurance Company

Countersigned By:

Maggie Metcalf

Authorized Officer or Agent

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TICOR TITLE™
Company of Oregon

1433 SW 6th Avenue
Portland, OR 97201
Phone: (503)646-4444 / Fax: (503)219-9984

Harsch Invesetment Properties
1121 SW Salmon St, Fifth Floor
Portland, OR 97205

Date: September 13, 2020
Order No.: 36262004447-MD
Property: 2S1330-000401
Sherwood, OR 97140

Sherwood Commerce Center, LLC, an Oregon limited liability company

Thank you for choosing Ticor Title Company of Oregon to provide your title insurance. Attached, please find the following:

Owners Policy

Thank you for allowing us the opportunity to provide for your title and escrow needs. Please let us know if there is anything more we can do.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

Mark Davison
Title Officer
Mark.Davison@titlegroup.fntg.com

OWNER'S POLICY OF TITLE INSURANCE

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Policy Number:

36262004447

Any notice of claim and any other notice or statement in writing required to be given to the Company under this Policy must be given to the Company at the address shown in Section 18 of the Conditions.

COVERED RISKS

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE CONTAINED IN SCHEDULE B, AND THE CONDITIONS, CHICAGO TITLE INSURANCE COMPANY, a Florida corporation (the "Company") insures, as of Date of Policy and, to the extent stated in Covered Risks 9 and 10, after Date of Policy, against loss or damage, not exceeding the Amount of Insurance, sustained or incurred by the Insured by reason of:

1. Title being vested other than as stated in Schedule A.
2. Any defect in or lien or encumbrance on the Title. This Covered Risk includes but is not limited to insurance against loss from
   (a) A defect in the Title caused by
      (i) forgery, fraud, undue influence, duress, incompetency, incapacity, or impersonation;
      (ii) failure of any person or Entity to have authorized a transfer or conveyance;
      (iii) a document affecting Title not properly created, executed, witnessed, sealed, acknowledged, notarized, or delivered;
      (iv) failure to perform those acts necessary to create a document by electronic means authorized by law;
      (v) a document executed under a falsified, expired, or otherwise invalid power of attorney;
      (vi) a document not properly filed, recorded, or indexed in the Public Records including failure to perform those acts by electronic means authorized by law; or
      (vii) a defective judicial or administrative proceeding.
   (b) The lien of real estate taxes or assessments imposed on the Title by a governmental authority due or payable, but unpaid.
   (c) 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.
3. Unmarketable Title.
4. No right of access to and from the Land.
5. The violation or enforcement of any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (a) the occupancy, use, or enjoyment of the Land;
   (b) the character, dimensions, or location of any improvement erected on the Land;
   (c) the subdivision of land; or
   (d) environmental protection

   if a notice, describing any part of the Land, is recorded in the Public Records setting forth the violation or intention to enforce, but only to the extent of the violation or enforcement referred to in that notice.

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AMERICAN LAND TITLE ASSOCIATION

6. An enforcement action based on the exercise of a governmental police power not covered by Covered Risk 5 if a notice of the enforcement action, describing any part of the Land, is recorded in the Public Records, but only to the extent of the enforcement referred to in that notice.
7. The exercise of the rights of eminent domain if a notice of the exercise, describing any part of the Land, is recorded in the Public Records.
8. Any taking by a governmental body that has occurred and is binding on the rights of a purchaser for value without Knowledge.
9. Title being vested other than as stated in Schedule A or being defective
   (a) as a result of the avoidance in whole or in part, or from a court order providing an alternative remedy, of a transfer of all or any part of the title to or any interest in the Land occurring prior to the transaction vesting Title as shown in Schedule A because that prior transfer constituted a fraudulent or preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws; or
   (b) because the instrument of transfer vesting Title as shown in Schedule A constitutes a preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws by reason of the failure of its recording in the Public Records
      (i) to be timely, or
      (ii) to impart notice of its existence to a purchaser for value or to a judgment or lien creditor.
10. Any defect in or lien or encumbrance on the Title or other matter included in Covered Risks 1 through 9 that has been created or attached or has been filed or recorded in the Public Records subsequent to Date of Policy and prior to the recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The Company will also pay the costs, attorneys' fees, and expenses incurred in defense of any matter insured against by this Policy, but only to the extent provided in the Conditions.

IN WITNESS WHEREOF, CHICAGO TITLE INSURANCE COMPANY has caused this policy to be signed and sealed by its duly authorized officers.

Issuing Office or Agent:
Ticor Title Company of Oregon
1433 SW 6th Avenue
Portland, OR 97201
(503)646-4444 FAX (503)219-9984

Countersigned By:

Maggie McCall

Authorized Officer or Agent

Chicago Title Insurance Company

CHICAGO TITLE INSURANCE COMPANY CORPORATE SEAL

By:

President

Attest:

Secretary

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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, permit, or governmental regulation (including those relating 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 vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. 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.

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SCHEDULE A

Name and Address of Title Insurance Company: Chicago Title Insurance Company
c/o Mark Davison
Ticor Title Company of Oregon
1433 SW 6th Avenue
Portland, OR 97201

Address Reference: 2S1330-000401, Sherwood, OR 97140

Date of Policy	Amount of Insurance	Premium
September 10, 2020 at 12:38 PM	$1,300,000.00	$2,550.00

1. Name of Insured:

   Sherwood Commerce Center, LLC, an Oregon limited liability company

2. The estate or interest in the Land that is insured by this policy is:

   A Fee

3. Title is vested in:

   Sherwood Commerce Center, LLC, an Oregon limited liability company

4. The Land referred to in this policy is described as follows:

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

THIS POLICY VALID ONLY IF SCHEDULE B IS ATTACHED

END OF SCHEDULE A

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SCHEDULE B
EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses that 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. 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 2020-2021.

7. The Land has been classified as Forestland, as disclosed by the tax roll. If the Land becomes disqualified, said Land may be subject to additional taxes and/or penalties.

8. Rights of the public, riparian owners and governmental bodies as to the use of the waters of unnamed creek and the natural flow thereof on and across that portion of the subject land lying below the high water line of said waterway.

9. Reservation, exception or other severance of minerals, contained in or disclosed by instrument,

   In favor of: Oregon and California Railroad Company
   Reservation of: See document for details
   Recording Date: December 22, 1888
   Recording No.: Book "Z", Page 311

   The Company makes no representation as to the present ownership of this interest or its encumbrances.

END OF SCHEDULE B

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EXHIBIT "A"
LEGAL DESCRIPTION

A tract of land in the Northwest one-quarter of the Northeast one-quarter of the Northwest one-quarter of Section 33, Township 2 South, Range 1 West of the Willamette Meridian, in the County of Washington and State of Oregon, more particularly described as follows:

Beginning at the Northwest corner of said Northwest one-quarter of the Northeast one-quarter of the Northwest one-quarter of said Section 33; running thence East along the North line of said Section, 157-1/2 feet to the North line of said section; thence South and parallel with the West line of said Section, 250 feet; thence East and parallel with the North line of said Section, 157-1/2 feet; thence North and parallel with the West line of said section, 250 feet to the North line of said section; thence East along the North line of said section, 345 feet, more or less, to the Northwest corner of property conveyed to Harold E. Severson and Lorane R. Severson, by deed recorded at Deed Book 400, Page 106, Washington County, Oregon; thence South and parallel to the West line of said section, 660 feet, more or less, to the Southwest corner of the said Severson property; thence West and parallel to the North line of said section to a point, 660 feet, more or less, to a point South of the point of beginning of the tract herein conveyed; thence North and parallel to the West line of said section, 660 feet, more or less, to a point on the North line of said section and true point of beginning.

EXCEPTING THEREFROM the following described property: A portion of that tract of land in the Northwest one-quarter of the Northeast one-quarter of the Northwest one-quarter of Section 33, Township 2 South, Range 1 West of the Willamette Meridian, in the County of Washington and State of Oregon, conveyed to Ivan C. Reed, et ux, by deed recorded April 22, 1960, in Book 429, Page 692, in the County of Washington and State of Oregon, deed records; more particularly described as follows:

Beginning at the Southwest corner of that tract of land conveyed to John J. Gould, Jr., by deed recorded January 25, 1965, in Book 538, Page 438, Records of Washington County, Oregon; thence South parallel with the West line of said Reed tract, 75 feet; thence East parallel with the North line of said Section 33, a distance of 270 feet; thence North parallel with the West line of said Reed tract, 325 feet to the North line of said Reed tract; thence West along the North line of said Reed tract, 112.50 feet to the Northeast corner of said Gould tract; thence South along the East line of said Gould tract, 250 feet to the Southeast corner thereof; thence West along the South line of said Gould tract, 157.50 feet to the point of beginning.

ALSO EXCEPTING THEREFROM the North 25 feet thereof, being that portion dedicated to the public as public way by Dedication Deed recorded May 25, 1973 in Book 926, Page 721, Records of Washington County, Oregon.

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CONDITIONS

1. DEFINITION OF TERMS

The following terms when used in this policy mean:

(a) "Amount of Insurance": The amount stated in Schedule A, as may be increased or decreased by endorsement to this policy, increased by Section 8(b), or decreased by Sections 10 and 11 of these Conditions.

(b) "Date of Policy": The date designated as "Date of Policy" in Schedule A.

(c) "Entity": A corporation, partnership, trust, limited liability company, or other similar legal entity.

(d) "Insured": The Insured named in Schedule A.

(i) The term "Insured" also includes

(A) successors to the Title of the Insured by operation of law as distinguished from purchase, including heirs, devisees, survivors, personal representatives, or next of kin;

(B) successors to an Insured by dissolution, merger, consolidation, distribution, or reorganization;

(C) successors to an Insured by its conversion to another kind of Entity;

(D) a grantee of an Insured under a deed delivered without payment of actual valuable consideration conveying the Title

(1) if the stock, shares, memberships, or other equity interests of the grantee are wholly-owned by the named Insured,

(2) if the grantee wholly owns the named Insured,

(3) if the grantee is wholly-owned by an affiliated Entity of the named Insured, provided the affiliated Entity and the named Insured are both wholly-owned by the same person or Entity, or

(4) if the grantee is a trustee or beneficiary of a trust created by a written instrument established by the Insured named in Schedule A for estate planning purposes.

(ii) With regard to (A), (B), (C), and (D) reserving, however, all rights and defenses as to any successor that the Company would have had against any predecessor Insured.

(e) "Insured Claimant": An Insured claiming loss or damage.

(f) "Knowledge" or "Known": Actual knowledge, not constructive knowledge or notice that may be imputed to an Insured by reason of the Public Records or any other records that impart constructive notice of matters affecting the Title.

(g) "Land": The land described in Schedule A, and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is insured by this policy.

(h) "Mortgage": Mortgage, deed of trust, trust deed, or other security instrument, including one evidenced by electronic means authorized by law.

(i) "Public Records": Records established under state statutes at Date of Policy for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge. With respect to Covered Risk 5(d), "Public Records" shall also include environmental protection liens filed in the records of the clerk of the United States District Court for the district where the Land is located.

(j) "Title": The estate or interest described in Schedule A.

(k) "Unmarketable Title": Title affected by an alleged or apparent matter that would permit a prospective purchaser or lessee of the Title or lender on the Title to be released from the obligation to purchase, lease, or lend if there is a contractual condition requiring the delivery of marketable title.

2. CONTINUATION OF INSURANCE

The coverage of this policy shall continue in force as of Date of Policy in favor of an Insured, but only so long as the Insured retains an estate or interest in the Land, or holds an obligation secured by a purchase money Mortgage given by a purchaser from the Insured, or only so long as the Insured shall have liability by reason of warranties in any transfer or conveyance of the Title. This policy shall not continue in force in favor of any purchaser from the Insured of either (i) an estate or interest in the Land, or (ii) an obligation secured by a purchase money Mortgage given to the Insured.

3. NOTICE OF CLAIM TO BE GIVEN BY INSURED CLAIMANT

The Insured shall notify the Company promptly in writing (i) in case of any litigation as set forth in Section 5(a) of these Conditions, (ii) in case Knowledge shall come to an Insured hereunder of any claim of title or interest that is adverse to the Title, as insured, and that might cause loss or damage for which the Company may be liable by virtue of this policy, or (iii) if the Title, as insured, is rejected as Unmarketable Title. If the Company is prejudiced by the failure of the Insured Claimant to provide prompt notice, the Company's liability to the Insured Claimant under the policy shall be reduced to the extent of the prejudice.

4. PROOF OF LOSS

In the event the Company is unable to determine the amount of loss or damage, the Company may, at its option, require as a condition of payment that the Insured Claimant furnish a signed proof of loss. The proof of loss must describe the defect, lien, encumbrance, or other matter insured against by this policy that constitutes the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage.

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(continued)

5. DEFENSE AND PROSECUTION OF ACTIONS

(a) Upon written request by the Insured, and subject to the options contained in Section 7 of these Conditions, the Company, at its own cost and without unreasonable delay, shall provide for the defense of an Insured in litigation in which any third party asserts a claim covered by this policy adverse to the Insured. This obligation is limited to only those stated causes of action alleging matters insured against by this policy. The Company shall have the right to select counsel of its choice (subject to the right of the Insured to object for reasonable cause) to represent the Insured as to those stated causes of action. It shall not be liable for and will not pay the fees of any other counsel. The Company will not pay any fees, costs, or expenses incurred by the Insured in the defense of those causes of action that allege matters not insured against by this policy.

(b) The Company shall have the right, in addition to the options contained in Section 7 of these Conditions, at its own cost, to institute and prosecute any action or proceeding or to do any other act that in its opinion may be necessary or desirable to establish the Title, as insured, or to prevent or reduce loss or damage to the Insured. The Company may take any appropriate action under the terms of this policy, whether or not it shall be liable to the Insured. The exercise of these rights shall not be an admission of liability or waiver of any provision of this policy. If the Company exercises its rights under this subsection, it must do so diligently.

(c) Whenever the Company brings an action or asserts a defense as required or permitted by this policy, the Company may pursue the litigation to a final determination by a court of competent jurisdiction, and it expressly reserves the right, in its sole discretion, to appeal from any adverse judgment or order.

6. DUTY OF INSURED CLAIMANT TO COOPERATE

(a) In all cases where this policy permits or requires the Company to prosecute or provide for the defense of any action or proceeding and any appeals, the Insured shall secure to the Company the right to so prosecute or provide defense in the action or proceeding, including the right to use, at its option, the name of the Insured for this purpose. Whenever requested by the Company, the Insured, at the Company's expense, shall give the Company all reasonable aid (i) in securing evidence, obtaining witnesses, prosecuting or defending the action or proceeding, or effecting settlement, and (ii) in any other lawful act that in the opinion of the Company may be necessary or desirable to establish the Title or any other matter as insured. If the Company is prejudiced by the failure of the Insured to furnish the required cooperation, the Company's obligations to the Insured under the policy shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation, with regard to the matter or matters requiring such cooperation.

(b) The Company may reasonably require the Insured Claimant to submit to examination under oath by any authorized representative of the Company and to produce for examination, inspection, and copying, at such reasonable times and places as may be designated by the authorized representative of the Company, all records, in whatever medium maintained, including books, ledgers, checks, memoranda, correspondence, reports, e-mails, disks, tapes, and videos whether bearing a date before or after Date of Policy, that reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Insured Claimant shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect, and copy all of these records in the custody or control of a third party that reasonably pertain to the loss or damage. All information designated as confidential by the Insured Claimant provided to the Company pursuant to this Section shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Insured Claimant to submit for examination under oath, produce any reasonably requested information, or grant permission to secure reasonably necessary information from third parties as required in this subsection, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this policy as to that claim.

7. OPTIONS TO PAY OR OTHERWISE SETTLE CLAIMS; TERMINATION OF LIABILITY

In case of a claim under this policy, the Company shall have the following additional options:

(a) To Pay or Tender Payment of the Amount of Insurance.

To pay or tender payment of the Amount of Insurance under this policy together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment or tender of payment and that the Company is obligated to pay.

Upon the exercise by the Company of this option, all liability and obligations of the Company to the Insured under this policy, other than to make the payment required in this subsection, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

(b) To Pay or Otherwise Settle With Parties Other Than the Insured or With the Insured Claimant.

(i) to pay or otherwise settle with other parties for or in the name of an Insured Claimant any claim insured against under this policy. In addition, the Company will pay any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay; or

(ii) to pay or otherwise settle with the Insured Claimant the loss or damage provided for under this policy, together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay.

Upon the exercise by the Company of either of the options provided for in subsections (b)(i) or (ii), the Company's obligations to the Insured under this policy for the claimed loss or damage, other than the payments required to be made, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

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(continued)

8. DETERMINATION AND EXTENT OF LIABILITY

This policy is a contract of indemnity against actual monetary loss or damage sustained or incurred by the Insured Claimant who has suffered loss or damage by reason of matters insured against by this policy.

(a) The extent of liability of the Company for loss or damage under this policy shall not exceed the lesser of

(i) the Amount of Insurance; or

(ii) the difference between the value of the Title as insured and the value of the Title subject to the risk insured against by this policy.

(b) If the Company pursues its rights under Section 5 of these Conditions and is unsuccessful in establishing the Title, as insured,

(i) the Amount of Insurance shall be increased by Ten percent (10%), and

(ii) the Insured Claimant shall have the right to have the loss or damage determined either as of the date the claim was made by the Insured Claimant or as of the date it is settled and paid.

(c) In addition to the extent of liability under (a) and (b), the Company will also pay those costs, attorneys' fees, and expenses incurred in accordance with Sections 5 and 7 of these Conditions.

9. LIMITATION OF LIABILITY

(a) If the Company establishes the Title, or removes the alleged defect, lien, or encumbrance, or cures the lack of a right of access to or from the Land, or cures the claim of Unmarketable Title, all as insured, in a reasonably diligent manner by any method, including litigation and the completion of any appeals, it shall have fully performed its obligations with respect to that matter and shall not be liable for any loss or damage caused to the Insured.

(b) In the event of any litigation, including litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals, adverse to the Title, as insured.

(c) The Company shall not be liable for loss or damage to the Insured for liability voluntarily assumed by the Insured in settling any claim or suit without the prior written consent of the Company.

10. REDUCTION OF INSURANCE; REDUCTION OR TERMINATION OF LIABILITY

All payments under this policy, except payments made for costs, attorneys' fees, and expenses, shall reduce the Amount of Insurance by the amount of the payment.

11. LIABILITY NONCUMULATIVE

The Amount of Insurance shall be reduced by any amount the Company pays under any policy insuring a Mortgage to which exception is taken in Schedule B or to which the Insured has agreed, assumed, or taken subject, or which is executed by an Insured after Date of Policy and which is a charge or lien on the Title, and the amount so paid shall be deemed a payment to the Insured under this policy.

12. PAYMENT OF LOSS

When liability and the extent of loss or damage have been definitely fixed in accordance with these Conditions, the payment shall be made within thirty (30) days.

13. RIGHTS OF RECOVERY UPON PAYMENT OR SETTLEMENT

(a) Whenever the Company shall have settled and paid a claim under this policy, it shall be subrogated and entitled to the rights of the Insured Claimant in the Title and all other rights and remedies in respect to the claim that the Insured Claimant has against any person or property, to the extent of the amount of any loss, costs, attorneys' fees, and expenses paid by the Company. If requested by the Company, the Insured Claimant shall execute documents to evidence the transfer to the Company of these rights and remedies. The Insured Claimant shall permit the Company to sue, compromise, or settle in the name of the Insured Claimant and to use the name of the Insured Claimant in any transaction or litigation involving these rights and remedies.

If a payment on account of a claim does not fully cover the loss of the Insured Claimant, the Company shall defer the exercise of its right to recover until after the Insured Claimant shall have recovered its loss.

(b) The Company's right of subrogation includes the rights of the Insured to indemnities, guaranties, other policies of insurance, or bonds, notwithstanding any terms or conditions contained in those instruments that address subrogation rights.

14. INTENTIONALLY DELETED

15. LIABILITY LIMITED TO THIS POLICY; POLICY ENTIRE CONTRACT

(a) This policy together with all endorsements, if any, attached to it by the Company is the entire policy and contract between the Insured and the Company. In interpreting any provision of this policy, this policy shall be construed as a whole.

(b) Any claim of loss or damage that arises out of the status of the Title or by any action asserting such claim shall be restricted to this policy.

(c) Any amendment of or endorsement to this policy must be in writing and authenticated by an authorized person, or expressly incorporated by Schedule A of this policy.

(d) Each endorsement to this policy issued at any time is made a part of this policy and is subject to all of its terms and provisions. Except as the endorsement expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsement, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance.

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(continued)

16. SEVERABILITY

In the event any provision of this policy, in whole or in part, is held invalid or unenforceable under applicable law, the policy shall be deemed not to include that provision or such part held to be invalid, but all other provisions shall remain in full force and effect.

17. CHOICE OF LAW; FORUM

(a) Choice of Law: The Insured acknowledges the Company has underwritten the risks covered by this policy and determined the premium charged therefor in reliance upon the law affecting interests in real property and applicable to the interpretation, rights, remedies, or enforcement of policies of title insurance of the jurisdiction where the Land is located.

Therefore, the court or an arbitrator shall apply the law of the jurisdiction where the Land is located to determine the validity of claims against the Title that are adverse to the Insured and to interpret and enforce the terms of this policy. In neither case shall the court or arbitrator apply its conflicts of law principles to determine the applicable law.

(b) Choice of Forum: Any litigation or other proceeding brought by the Insured against the Company must be filed only in a state or federal court within the United States of America or its territories having appropriate jurisdiction.

18. NOTICES, WHERE SENT

Any notice of claim and any other notice or statement in writing required to be given to the Company under this policy must be given to the Company at:

Chicago Title Insurance Company
P.O. Box 45023
Jacksonville, FL 32232-5023
Attn: Claims Department

END OF CONDITIONS

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Exhibit A2

ENDORSEMENT

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Attached to Policy Number:

36262004447

Date: September 10, 2020

Premium: $100.00

The Company insures against loss or damage sustained by the Insured by reason of the failure of the Land as described in Schedule A to be the same as that identified as Legal Description (Title B) on the survey made by Michael A. Hoffmann, P.L.S. 57847 dated July 29, 2020, last revised August 4, 2020, and designated Job No. 20204285.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Order Reference: Sherwood Commerce Center, LLC, an Oregon limited liability company

Chicago Title Insurance Company

Countersigned By:

Maggie Metcalf

Authorized Officer or Agent

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ENDORSEMENT

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Attached to Policy Number:

36262004447

Date: September 10, 2020

Premium: $50.00

The Company hereby assures the Insured

That said Land abuts upon a physically open street known as un-named dedicated road, being a public right-of-way, gaining indirect access to/from SW Tonquin Road and the Company hereby insures said Assured against loss which said Assured shall sustain in the event said assurances herein shall prove to be incorrect.

The total liability of the Company under said policy and any endorsements therein shall not exceed, in the aggregate, the face amount of said policy and costs which the Company is obligated under the conditions and stipulations thereof to pay.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Order Reference: Sherwood Commerce Center, LLC, an Oregon limited liability company

Chicago Title Insurance Company

Countersigned By:

Maggie Metcalf

Authorized Officer or Agent

WFG National Title Insurance Company
a Williston Financial Group company

PROPERTY INFORMATION REPORT

Date: October 11, 2022

File No.: 22-432209
Property: XXXXX 2S133BB00100, Sherwood, OR 97140

Your Reference: Woodburn Industrial Capital Group **REPORT FEE:**

The information contained in this report is furnished by WFG National Title Insurance Company (the "Company") as an information service based on the records and the indices maintained by the Company for the county identified below. This report does not constitute title insurance and is not to be construed or used as a commitment for title insurance. The Company assumes and shall have no liability whatsoever for any errors or inaccuracies in this report. In the event any such liability is ever asserted or enforced, such liability shall in no event exceed the paid herein. No examination has been made of the Company's records, other than as specifically set forth in this report.

The effective date of this report is October 4, 2022

REPORT FINDINGS

A. The land referred to in this report is located in the county of Washington State of Oregon, and is described as follows:

See Attached Exhibit "A"

B. As of the Effective Date and according to the last deed of record, we find the title to the land to be vested as follows:

Woodburn Industrial Capital Group, LLC, an Oregon limited liability company

C. As of the Effective Date and according to the Public Records, the Land is subject to the following liens and encumbrances, which are not necessarily shown in the order of priority:

1. Rights of the public in and to any portion of the herein described premises lying within the boundaries of streets, roads or highways.

2. Easement, including the terms and provisions thereof:

For	:	Electric Power Transmission and appurtenances
Granted to	:	Portland General Electric Company, an Oregon corporation
Recorded	:	July 9, 1959
Recording No(s)	:	(book) 419 (page) 725
Affects	:	along the northerasterly line of County Road 1260 (aka Tonquin Road)

3. Easement, including the terms and provisions thereof:

For	:	Slope and public utilities
Granted to	:	Washington County, a political subdivisionof the State of Oregon
Recorded	:	October 7, 2002
Recording No(s)	:	2002-116985
Affects	:	a portion along SW Tonquin Road-see document for location

4. Easement and Maintenance Agreement, including the terms and provisions thereof:

For	:	Public access off a vehicle and pedestrian way
Between	:	Woodburn Industrial Capital Group, LLC
And	:	City of Sherwood
Recorded	:	July 31, 2020
Recording No(s)	:	2020-071204

5. Easement, including the terms and provisions thereof:

For	:	Woodburn Industrial Capital Group, LLC, its successors and assigns
Granted to	:	City of Sherwood, an Oregon municipal corporation, its successors and assign
Recorded	:	July 31, 2020
Recording No(s)	:	2020-071205

6. Unpaid Taxes for 2022 -2023

Levied Amount	:	$2,880.22, plus interest and fees, if any
Property ID No.	:	R558042
Levy Code	:	088.57
Map Tax Lot No.	:	2S133BB00100

7. Unpaid Taxes for 2022-2023

Levied Amount	:	$.52, plus interest and fees, if any
Property ID No.	:	R2222503
Levy Code	:	088.20
Map Tax Lot No.	:	2S133BB00100

8. NOTE: The Oregon Corporation Commission disclosed that Woodburn Industrial Capital Group, LLC. is an active Oregon limited liability company:

LINKS FOR ADDITIONAL SUPPORTING DOCUMENTS:
Aerial photograph
Assessor's map
Documents referenced in legal 804-898
Documents referenced in legal 2002-116985
Vesting deed

END OF EXCEPTIONS

NOTE: We find NO judgments or Federal Tax Liens against the name(s) of Woodburn Industrial Capital Group LLC.

END OF REPORT

Tammera Appel
WFG National Title Insurance Company
12909 SW 68th Pkwy., Suite 350
Portland, OR 97223
Phone: 503-431-8513
Email: **tappel@wfgnationaltitle.com**

EXHIBIT A
LEGAL DESCRIPTION

All of that certain Tract of land in the Northwest one-quarter of the Northwest one-quarter of Section 33, Township 2 South, Range 1 West of the Willamette Meridian, in the County of Washington and State of Oregon, lying Easterly and Northerly of the center line of County Road No. 1260, also Known as S.W. Tonquin Road.

Excepting therefrom that portion Dedicated to the Public recorded January 26, 1971 in Book 804, Page 898, Records of Washington County, Oregon.

FURTHER EXCEPTING THEREFROM that portion conveyed to Washington County, a Political Subdivision of the State of Oregon for Public Roadway by Dedication Deed recorded October 7, 2002, Recording No. 2002-116985.

WFG National Title Insurance Company
a Williston Financial Group company

PROPERTY INFORMATION REPORT

Date: October 10, 2022

File No.: 22-432187
Property: 13700 SW Tonquin Road, Sherwood, OR 97140

Glenn Furman
CFO
Kerr Contractors
P.O. Box 1060
Woodburn, OR 97071

Your Reference: 2S1330000400 **REPORT FEE:** $350.00

The information contained in this report is furnished by WFG National Title Insurance Company (the "Company") as an information service based on the records and the indices maintained by the Company for the county identified below. This report does not constitute title insurance and is not to be construed or used as a commitment for title insurance. The Company assumes and shall have no liability whatsoever for any errors or inaccuracies in this report. In the event any such liability is ever asserted or enforced, such liability shall in no event exceed the paid herein. No examination has been made of the Company's records, other than as specifically set forth in this report.

The effective date of this report is October 4, 2022

REPORT FINDINGS

A. The land referred to in this report is located in the county of Washington State of Oregon, and is described as follows:

See Attached Exhibit "A"

B. As of the Effective Date and according to the last deed of record, we find the title to the land to be vested as follows:

Woodburn Industrial Capital Group, an Oregon limited liability company

C. As of the Effective Date and according to the Public Records, the Land is subject to the following liens and encumbrances, which are not necessarily shown in the order of priority:

1. Mineral Reservation, other than cole or iron, including terms and provisions thereof:

Reserved by	:	Orgon and California Railroad Company, an Oregon corporation
Recorded	:	December 22, 1888
Recording No(s)	:	(book) Z (page) 311

2. Easement and Maintenance Agreement, including the terms and provisions thereof:

For	:	ingress and egress
And	:	Frank F Stiller and Edna May Stiller and Charles O. Steller and Reval L. Stiller, Know as Stiller Bros.
Recorded	:	September 17, 1975
Recording No(s)	:	(book) 1044 (page) 547

3. Unpaid Taxes for 2022 -2023

Levied Amount	:	$5,411.42, plus interest and fees, if any
Property ID No.	:	R558006
Levy Code	:	088.57
Map Tax Lot No.	:	2S1330000400

LINKS FOR ADDITIONAL SUPPORTING DOCUMENTS:
- Aerial photograph
- Assessor's map

Documents referenced in legal
- Vesting deed

END OF EXCEPTIONS

NOTE: We find NO judgments or Federal Tax Liens against the name(s) of Woodburn Industrial Capital Group LLC.

END OF REPORT

Tammera Appel
WFG National Title Insurance Company
12909 SW 68th Pkwy., Suite 350
Portland, OR 97223
Phone: 503-431-8513
Email: **tappel@wfgnationaltitle.com**

EXHIBIT A
LEGAL DESCRIPTION

The South one-half of the Northeast one-quarter of the Northwest one -quarter of Section 33, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon.

TOGETHER with an Easement for ingress and egress recorded September 17, 1975 in Book 1044, page 547, Records of Washington County Oregon.

APPENDIX L – TUALATIN VALLEY FIRE & RESCUE SERVICE PROVIDER LETTER

Exhibit A2

FIRE CODE / LAND USE / BUILDING REVIEW APPLICATION

Tualatin Valley Fire & Rescue

North Operating Center
11945 SW 70th Avenue
Tigard, OR 97223
Phone: 503-649-8577

South Operating Center
8445 SW Elligsen Rd
Wilsonville, OR 97070
Phone: 503-649-8577

REV 6-30-20

Project Information

Applicant Name: VLMK Engineering + Design
Address: 3933 S Kelly Avenue
Phone: 971.254.8300
Email: jenniferk@vlmk.com
Site Address: 21600 SW Oregon Street
City: Sherwood, Oregon
Map & Tax Lot #: 2S133; 403; 401; 300; 201; 200 & 2S128C; 600
Business Name: Sherwood Commerce Center
Land Use/Building Jurisdiction: City of Sherwood
Land Use/ Building Permit # LUP 2021-012/SP/CUP/VAR ~~LU 2022-022~~

Choose from: Beaverton, Tigard, Newberg, Tualatin, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

Project Description

Proposed construction of (3) Shell Buildings, and associated onsite/offsite work.

Permit/Review Type (check one):

- ☒ Land Use / Building Review - Service Provider Permit
- ☐ Emergency Radio Responder Coverage Install/Test
- ☐ LPG Tank (Greater than 2,000 gallons)
- ☐ Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - * Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- ☐ Explosives Blasting (Blasting plan is required)
- ☐ Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- ☐ Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- ☐ Temporary Haunted House or similar
- ☐ OLCC Cannabis Extraction License Review
- ☐ Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

For Fire Marshal's Office Use Only

TVFR Permit # 2022-0117
Permit Type: TVFR SPP-COS
Submittal Date: 10-04-22
Assigned To: DFM Arn
Due Date: NA
Fees Due: TBD
Fees Paid: $0.

Approval/Inspection Conditions

(For Fire Marshal's Office Use Only)

This section is for application approval only

Fire Marshal or Designee — Date: 10-11-22

Conditions:
Buildings will be required to test for Emergency Responder Radio Coverage or opt into our Mobile Emergency Radio program (MERRC). If the MERRC option is chosen, fees will need to be paid for each building to TVF&R prior to the issuance of a Building permit OFC 510.

See Attached Conditions: ☒ Yes ☐ No
Conditions noted on FS plans.
Site Inspection Required: ☒ Yes ☐ No

This section used when site inspection is required

Inspection Comments:

Final TVFR Approval Signature & Emp ID — Date

Exhibit A2

AREA SUMMARY:

Description	Area		
Overall Site	1,688,458 sqft	38.76 Acres	
ROW Dedication	168,146 sqft	3.86 Acres	
Impact Area (NE Triangle)	21,306 sqft	0.49 Acres	
Undeveloped Area	296,296 sqft	6.80 Acres	
Development Area	1,202,710 sqft	27.61 Acres	
Landscaping	194,675 sqft		16.19%
Sidewalks	40,285 sqft		3.35%
Concrete Aprons	72,756 sqft		6.05%
AC Paving (Approx.)	449,994 sqft		37.42%
Total Impervious	1,008,035 sqft		83.81%
Building A			
Building Area	106,600 sqft		
Parking Spaces	174 sp.	1.63 /1000 SF	
Building B			
Building Area	166,400 sqft		
Parking Spaces	238 sp.	1.43 /1000 SF	
Building C			
Building Area	172,000 sqft		
Parking Spaces	224 sp.	1.30 /1000 SF	
Total Building Footage	445,000 sqft		
Site Coverage	37.0%		

OFF-STREET PARKING CALCULATIONS

BUILDING	AREA (SQFT)		MINIMUM		MAXIMUM
BUILDING A	106,600				
INDUSTRIAL (ASSUMED 80%)	85,280	1 SPACE/ 625	136		NONE
WAREHOUSE (ASSUMED 20%)	21,320	0.3 SPACE/ 1,000	6	0.5 SPACE/ 1,000	11
BUILDING B	166,400				
INDUSTRIAL (ASSUMED 80%)	133,120	1 SPACE/ 625	213		NONE
WAREHOUSE (ASSUMED 20%)	33,280	0.3 SPACE/ 1,000	10	0.5 SPACE/ 1,000	17
BUILDING C	172,000				
INDUSTRIAL (ASSUMED 80%)	137,600	1 SPACE/ 625	220		NONE
WAREHOUSE (ASSUMED 20%)	34,400	0.3 SPACE/ 1,000	10	0.5 SPACE/ 1,000	17
TOTAL	445,000	MINIMUM REQ. =	596	MAX ALLOWED =	UNLIMITED
CODE SECTION:		TOTAL PROVIDED:		ADA PROVIDED:	
16.94.020: TABLE 1 MIN. & MAX. PARKING STANDARDS		633		(11) ADA SPACES (2) VAN ACCESSIBLE SPACES	

BICYCLE PARKING CALCULATIONS

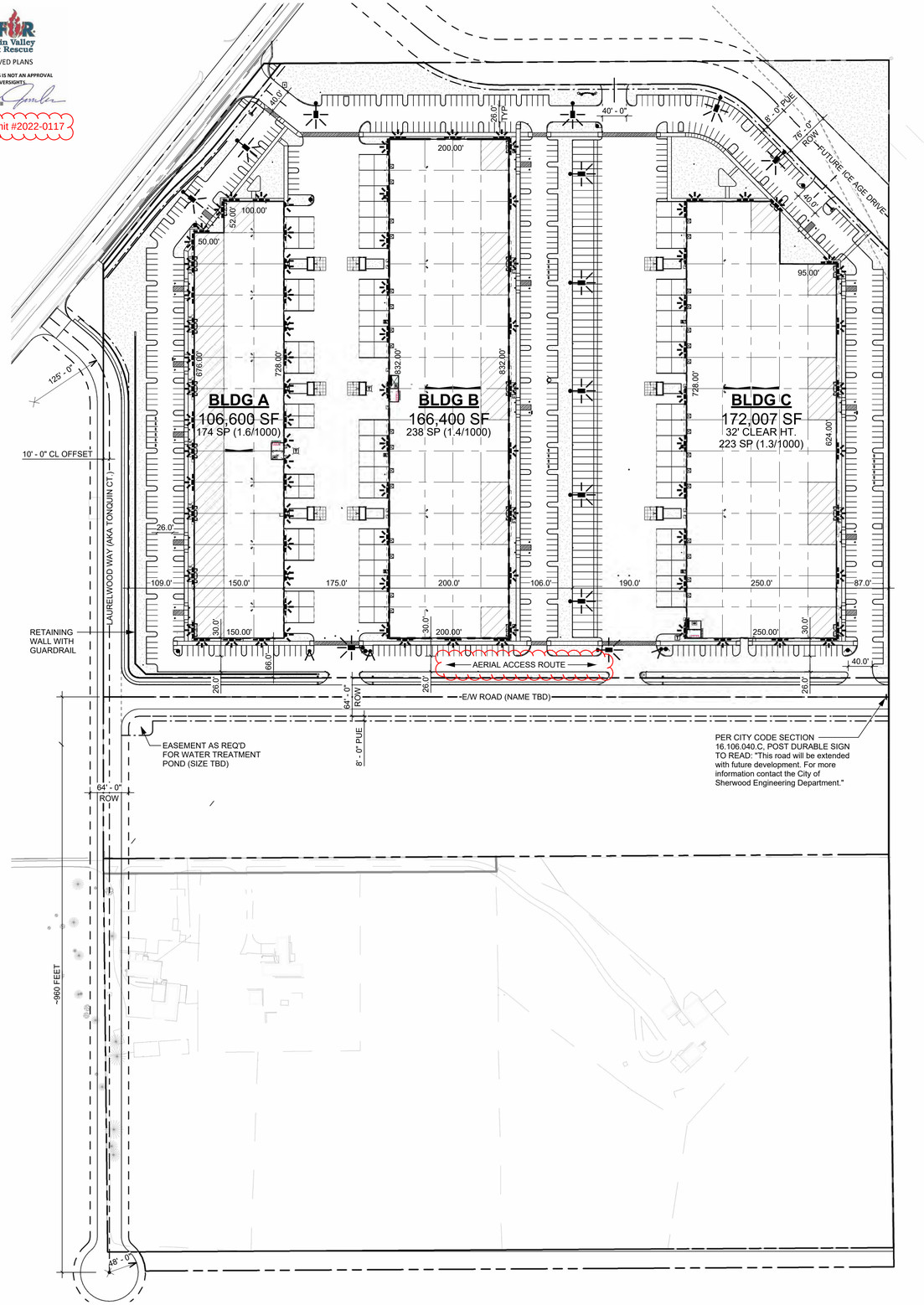
16.94.020: TABLE 1 MIN. & MAX. PARKING STANDARDS — MIN. (1) SPACE PER TENANT PROPOSED

BICYCLE PARKING REQUIRED (1 PER 40 AUTO STALLS): 16

TOTAL SHORT-TERM BICYCLE PARKING : 30

TOTAL LONG-TERM BICYCLE PARKING : 24

TVF&R
Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS
Deputy Fire Marshal II
TVFR Permit #2022-0117



SITE PLANNING SYMBOLS

- ASPHALT PAVING AS NOTED THIS SHEET
- LANDSCAPED AREA - SEE SHEET L1.0
- 6' - 1" — CONTROL DIMENSION
- GARB. — GARBAGE ENCLOSURE - SEE SITE DETAIL SHEET
- DISABLED PARKING STALL. 9.0' STALL WITH 6.0' STRIPED SIDE ACCESS. PROVIDE CODE APPROVED SIGN AT EACH STALL SEE STANDARD DETAIL AT SITE DETAIL SHEET.
- VAN — DISABLED VAN PARKING STALL. 9.0' STALL WITH 8.0' STRIPED SIDE ACCESS. PROVIDE CODE APPROVED SIGN AT EACH STALL SEE STANDARD DETAIL AT SITE DETAIL SHEET.
- # — NUMBER OF STANDARD PARKING STALLS 9.0' X 18.0'
- #c — NUMBER OF COMPACT PARKING STALLS 8.5' X 16.0'
- (6)SP. AT 9.0' = 54.0' — NUMBER AND WIDTH OF PARKING SPACES. (COMPACT SPACES ONLY AS NOTED)
- CATCH BASIN (CB) -OR- AREA DRAIN (AD)
- MANHOLE (MH)
- UTILITY POLE
- FIRE HYDRANT (FH)
- M — METER
- V — UTILITY VAULT
- T — TRANSFORMER AND PAD
- TRANSFORMER
- VALVE BOX COVER
- LIGHT POLE
- WALL MOUNTED LIGHT
- FIRE DEPARTMENT CONNECTION (FDC)
- GATE VALVE
- C.O. — CLEAN OUT (CO)

N

1 / FS-1 LAND USE MODIFICATION SITE PLAN
1" = 100'-0"

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FD Notes:

Buildings will be required to test for Emergency Responder Radio Coverage or opt into our Mobile Emergency Radio program (MERRC). If the MERRC option is chosen, fees will need to be paid for each building individually to TVF&R prior to the issuance of a Building permit OFC 510.

Fire Lane markings to be determined OFC 503.3.

Fire department final inspection required OFC 107.2.

PROJECT NAME
SHERWOOD COMMERCE CENTER
PHASE 1

21600 SW OREGON ST.
SHERWOOD, OR

PERMIT SET

REVISIONS

	DATE	DESCRIPTION

PRELIMINARY
NOT FOR CONSTRUCTION

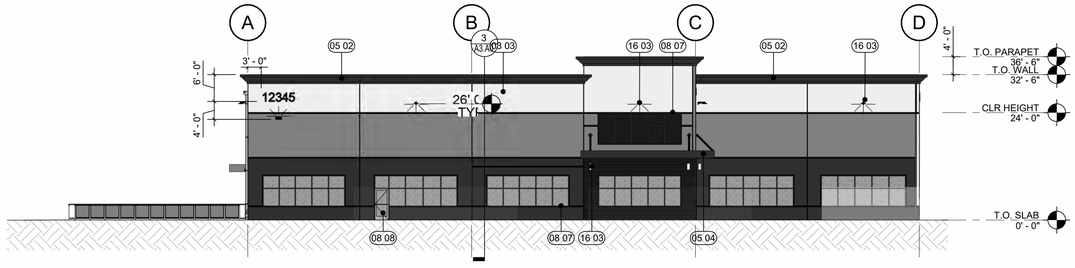
DATE JULY 18, 2022

SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN: CGA	CHECKED: CGA

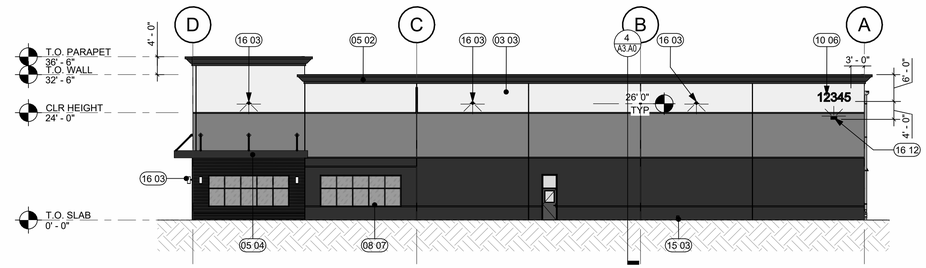
OVERALL FIRE SERVICE PLAN

FS-1

10/4/2022 7:03:25 AM

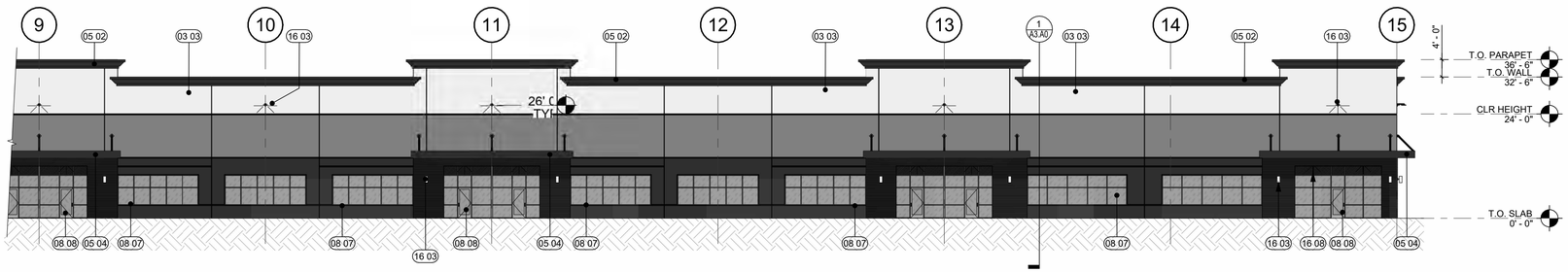


1 FS-2 NORTH ELEVATION
1/16" = 1'-0" NORTH ELEVATION - FS

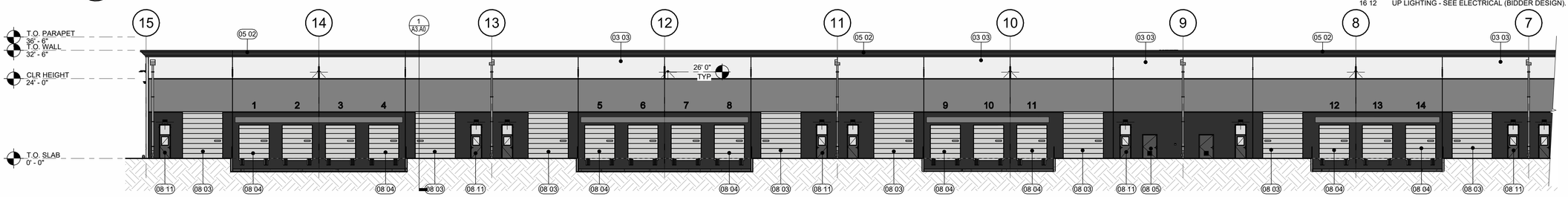


2 FS-2 SOUTH ELEVATION
1/16" = 1'-0" SOUTH ELEVATION - FS

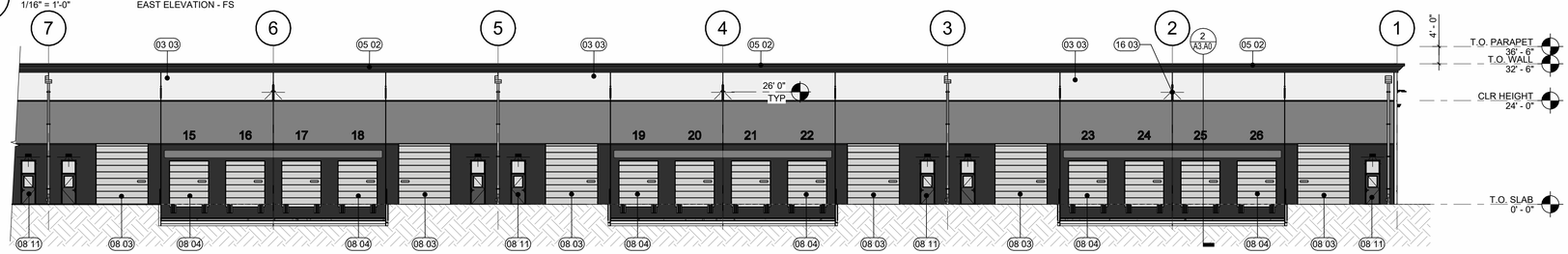
4 FS-2 WEST ELEVATION
1/16" = 1'-0" WEST ELEVATION - FS



5 FS-2 WEST ELEVATION
1/16" = 1'-0" WEST ELEVATION - Dependent 1 - FS



3 FS-2 EAST ELEVATION
1/16" = 1'-0" EAST ELEVATION - FS



6 FS-2 EAST ELEVATION
1/16" = 1'-0" EAST ELEVATION - Dependent 1 - FS

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
05 02	METAL CAP FLASHING TYPICAL AT PARAPET ON ALL SIDES. SEE SITE DETAIL SHEET
05 04	CANOPY PER PLANS AND DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
08 03	OVERHEAD DOOR AT GRADE LEVEL PER DOOR SCHEDULE.
08 04	OVERHEAD DOORS AT DOCK LEVEL PER DOOR SCHEDULE.
08 05	EXTERIOR MAN DOOR PER DOOR SCHEDULE.
08 07	ALUMINUM STOREFRONT GLAZING PER DETAILS AND SPECIFICATIONS.
08 08	ALUM. STOREFRONT VESTIBULE AT MAIN ENTRY PER ENERGY CODE.
08 11	CHAIN OPERATED ROTARY ROOF VENTILATORS ABOVE, SEE SPECIFICATIONS.
10 06	24" HIGH, 1/2" THICK BLACK ACCRYLIC BLOCK LETTERS/NUMBERS. PROVIDE UPLIGHTING AT AL LOCATIONS - SEE ELECTRICAL (BIDDER DESIGN). ALL ADDRESS NUMBERS TO BE OF CONTRASTING COLOR TO THE BUILDING AND MEET THE REQUIREMENTS OF THE FIRE MARSHAL.
15 03	GAS METERS TYPICAL - SEE MECHANICAL (BIDDER DESIGN).
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.
16 08	RECESSED LIGHTING, BY OTHERS (BIDDER DESIGN)
16 12	UP LIGHTING - SEE ELECTRICAL (BIDDER DESIGN).

GLAZING CALCULATIONS [PER CITY CODE 16.90.020(D)(7)(a)(1)]

ELEVATION	GLAZING CALCULATIONS	
NORTH ELEVATION	OVERALL ELEVATION AREA	4,975 SF
	GLAZING REQUIRED (15%)	746 SF
	GLAZING PROVIDED	**923 SF**
WEST ELEVATION (GRIDS 1-5, WITHIN 200' OF OREGON ST.)	OVERALL ELEVATION AREA	7,092 SF
	15% GLAZING REQUIRED	1,064 SF
	GLAZING PROVIDED	**1,461 SF**

Exhibit A2

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Schnitzer PROPERTIES

TVFR Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.
Jason Graf Deputy Fire Marshal II
TVFR Permit #2022-0117

PROJECT NAME
SHERWOOD COMMERCE CENTER
BUILDING A
21600 SW OREGON ST.
SHERWOOD, OR

PERMIT SET

REVISIONS

#	DATE	DESCRIPTION

PRELIMINARY NOT FOR CONSTRUCTION

DATE JULY 18, 2022

SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN JAB	CHECKED CGA

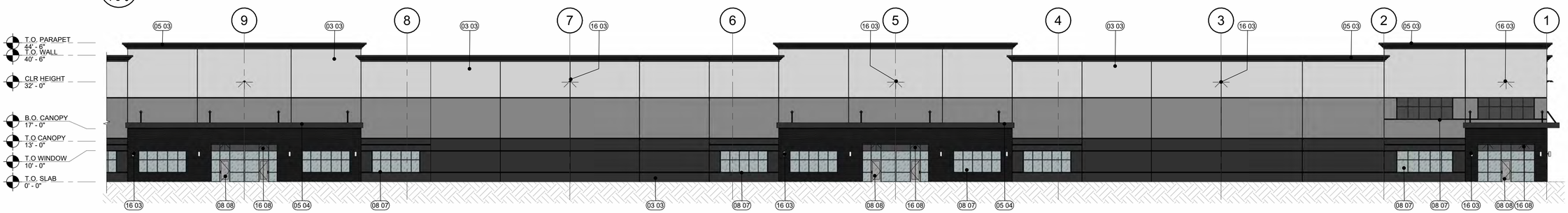
BLDG A - BUILDING ELEVATIONS

FS-2

10/4/2022 6:57:19 AM

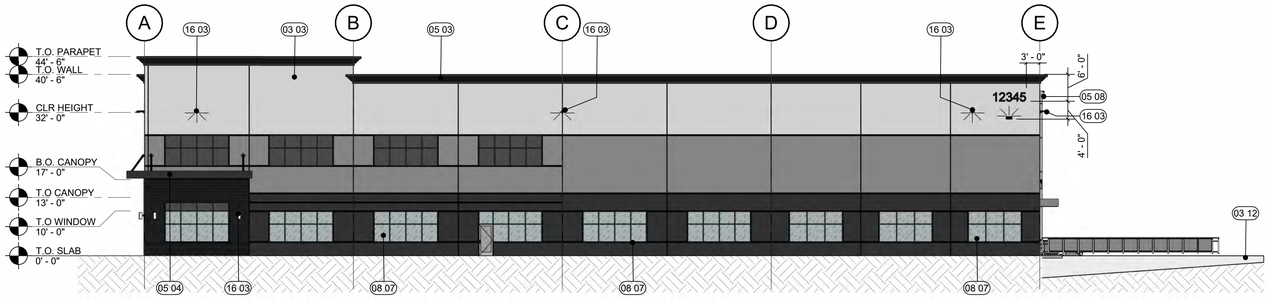
1 FS-3 EAST ELEVATION

1/16" = 1'-0" EAST ELEVATION - FS



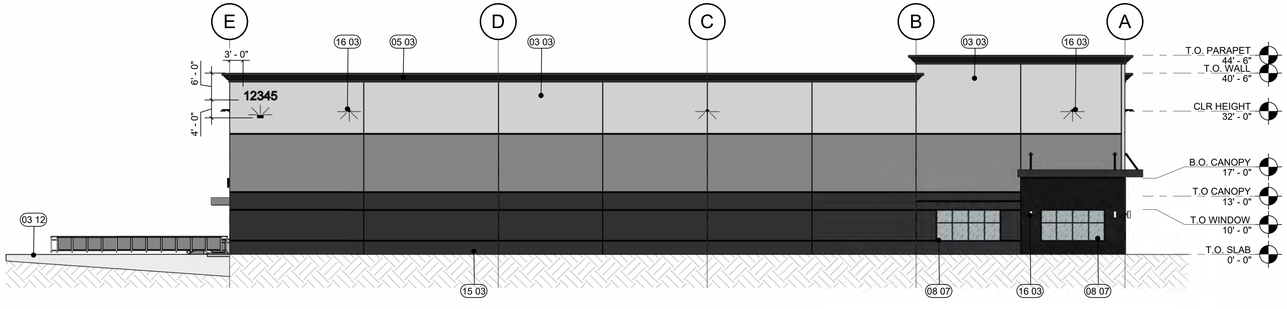
4 FS-3 EAST ELEVATION

1/16" = 1'-0" EAST ELEVATION - Dependent 1 - FS



2 FS-3 NORTH ELEVATION

1/16" = 1'-0" NORTH ELEVATION - FS



3 FS-3 SOUTH ELEVATION

1/16" = 1'-0" SOUTH ELEVATION - FS

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
03 12	CAST-IN-PLACE CONCRETE WALL, SEE STRUCTURAL.
05 03	BUILT-UP METAL CORNICE PER DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 04	CANOPY PER PLANS AND DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 08	DOWNSPOUTS WITH SCUPPER PER ROOF PLAN AND DETAIL. ALSO SEE SITE UTILITY PLAN FOR STORM TIE IN.
08 07	ALUMINUM STOREFRONT GLAZING PER DETAILS AND SPECIFICATIONS.
08 08	ALUM. STOREFRONT VESTIBULE AT MAIN ENTRY PER ENERGY CODE.
15 03	GAS METERS TYPICAL - SEE MECHANICAL (BIDDER DESIGN).
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.
16 08	RECESSED LIGHTING, BY OTHERS (BIDDER DESIGN)

GLAZING CALCULATIONS [PER CITY CODE 16.90.020(D)(7)(a)(1)]

ELEVATION	GLAZING CALCULATIONS	
NORTH ELEVATION	OVERALL ELEVATION AREA	8,287 SF
	GLAZING REQUIRED (15%)	1,243 SF
	GLAZING PROVIDED	**1,294 SF**

Exhibit A2

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Schnitzer PROPERTIES

TVFR Tualatin Valley Fire & Rescue

APPROVED PLANS

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Deputy Fire Marshal II

TVFR Permit #2022-0117

PROJECT NAME

SHERWOOD COMMERCE CENTER

BUILDING B

21600 SW OREGON ST.
SHERWOOD, OR

PERMIT SET

REVISIONS

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DATE JUNE 18, 2022

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AS NOTED	20210190
DRAWN JAB	CHECKED CGA

BLDG B - BUILDING ELEVATIONS

FS-3

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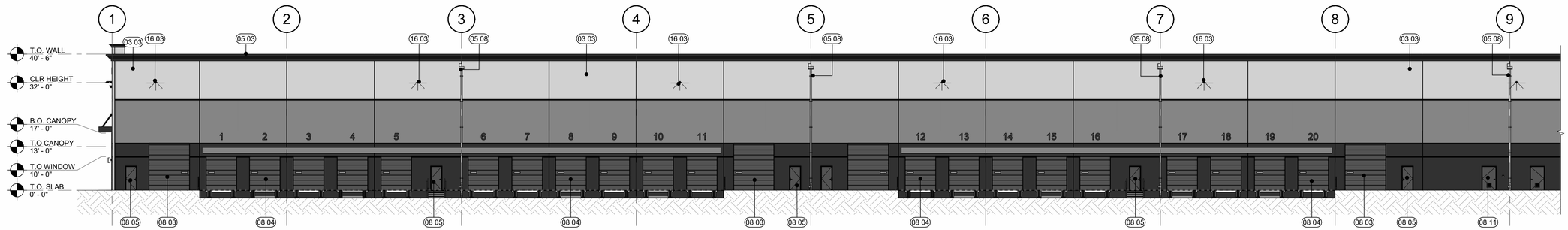
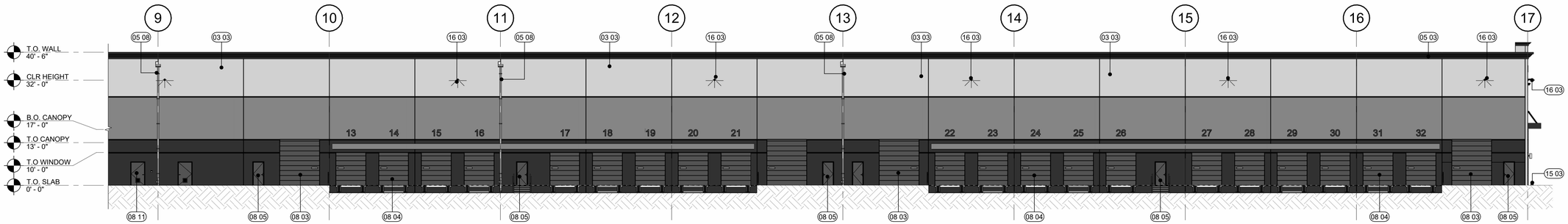


1 FS-4 **WEST ELEVATION**

1/16" = 1'-0" WEST ELEVATION - FS



2 FS-4 **WEST ELEVATION**

1/16" = 1'-0" WEST ELEVATION - Dependent 1 - FS

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
05 03	BUILT-UP METAL CORNICE PER DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 08	DOWNSPOUTS WITH SCUPPER PER ROOF PLAN AND DETAIL. ALSO SEE SITE UTILITY PLAN FOR STORM TIE IN.
08 03	OVERHEAD DOOR AT GRADE LEVEL PER DOOR SCHEDULE.
08 04	OVERHEAD DOORS AT DOCK LEVEL PER DOOR SCHEDULE.
08 05	EXTERIOR MAN DOOR PER DOOR SCHEDULE.
08 11	CHAIN OPERATED ROTARY ROOF VENTILATORS ABOVE, SEE SPECIFICATIONS.
15 03	GAS METERS TYPICAL - SEE MECHANICAL (BIDDER DESIGN).
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.

Exhibit A2

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Schnitzer PROPERTIES

TVFR Tualatin Valley Fire & Rescue

APPROVED PLANS

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Jason Arn
Deputy Fire Marshal II

TVFR Permit #2022-0117

PROJECT NAME

SHERWOOD COMMERCE CENTER

BUILDING B

21600 SW OREGON ST.
SHERWOOD, OR

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BLDG B - BUILDING ELEVATIONS

FS-4

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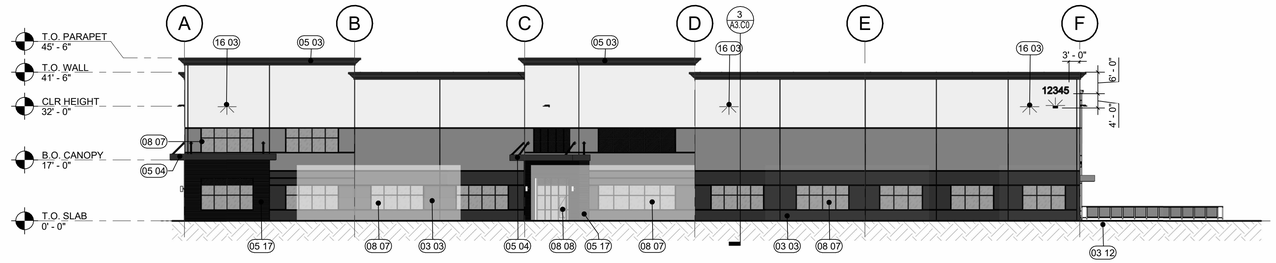
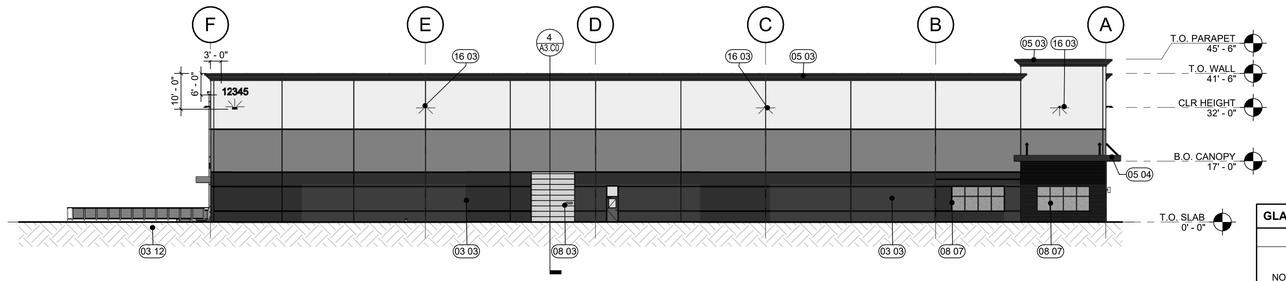


2 FS-5 NORTH ELEVATION

1" = 20'-0" NORTH ELEVATION - FS



3 FS-5 SOUTH ELEVATION

1" = 20'-0" SOUTH ELEVATION - FS

GENERAL ELEVATION NOTES

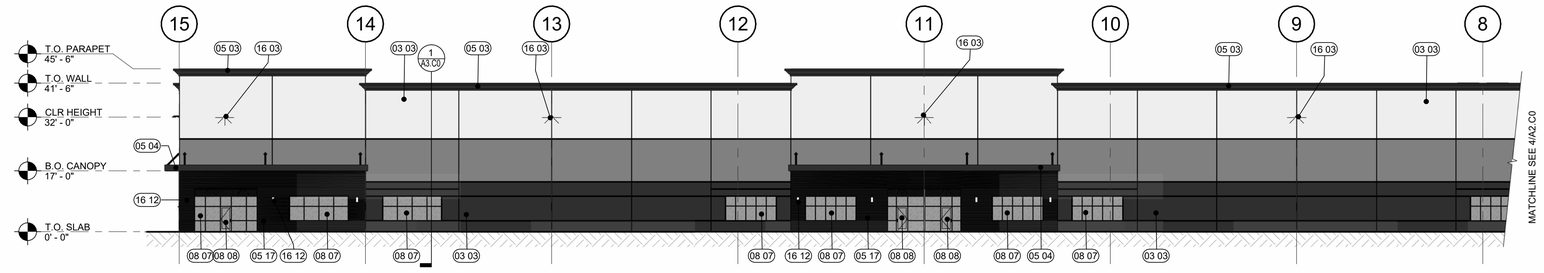
1. FOR ADDITIONAL INFORMATION SEE STRUCTURAL PANEL ELEVATIONS.
2. FOR PANEL REINFORCING, EMBED, AND CONNECTION INFORMATION, SEE STRUCTURAL PANEL ELEVATIONS.
3. ALL PANEL THICKNESS TO BE AS INDICATED ON THE STRUCTURAL ELEVATIONS.
4. ALL ARCHITECTURAL BUILDING ELEVATIONS ARE DRAWN FROM THE EXTERIOR FACE, U.O.N.
5. SEE FOUNDATION PLAN AND ARCHITECTURAL SHEETS TO DETERMINE PANEL DIMENSIONS AND ELEVATIONS.
6. SEE SPECIFICATIONS FOR PANEL CONCRETE MIX REQUIREMENTS.

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
03 12	CAST-IN-PLACE CONCRETE WALL, SEE STRUCTURAL.
05 03	BUILT-UP METAL CORNICE PER DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 04	CANOPY PER PLANS AND DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 17	ARCHITECTURAL METAL WALL PANEL, SEE DETAIL AND SPECIFICATIONS
08 03	OVERHEAD DOOR AT GRADE LEVEL PER DOOR SCHEDULE.
08 07	ALUMINUM STOREFRONT GLAZING PER DETAILS AND SPECIFICATIONS.
08 08	ALUM. STOREFRONT VESTIBULE AT MAIN ENTRY PER ENERGY CODE.
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.
16 12	UP LIGHTING - SEE ELECTRICAL (BIDDER DESIGN).

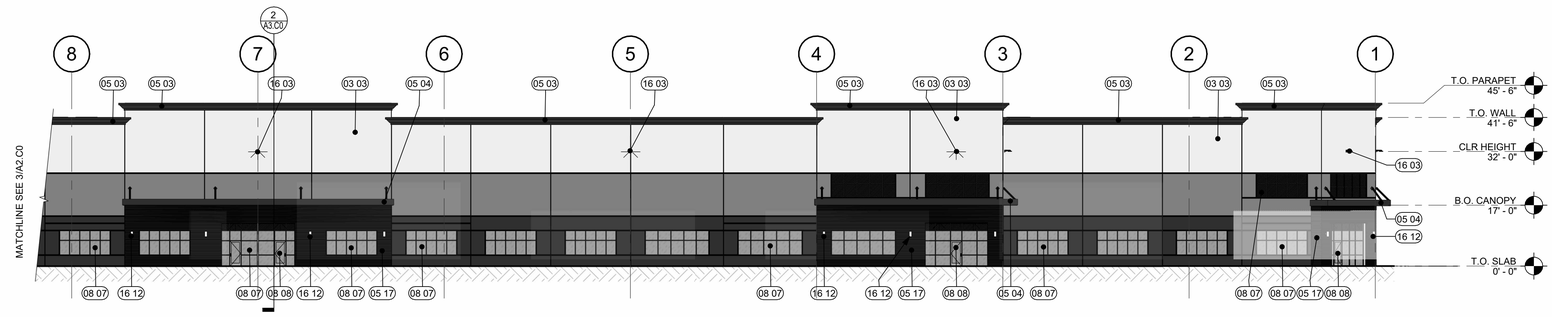
GLAZING CALCULATIONS [PER CITY CODE 16.90.020(D)(7)(a)(1)]

ELEVATION	GLAZING CALCULATIONS	
NORTH ELEVATION	OVERALL ELEVATION AREA	10,170 SF
	GLAZING REQUIRED (15%)	1,526 SF
	GLAZING PROVIDED	**1,560 SF**
EAST ELEVATION (GRIDS 1-6, WITHIN 200' OF ICE AGE DR.)	OVERALL ELEVATION AREA	11,147 SF
	15% GLAZING REQUIRED	1,672 SF
	GLAZING PROVIDED	**1,753 SF**



1 FS-5 EAST ELEVATION - SOUTH

1" = 20'-0" EAST ELEVATION - SOUTH - FS



4 FS-5 EAST ELEVATION - NORTH

1" = 20'-0" EAST ELEVATION - NORTH - FS

Exhibit A2

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Schnitzer PROPERTIES

TVFR Tualatin Valley Fire & Rescue

APPROVED PLANS

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Deputy Fire Marshal II

TVFR Permit #2022-0117

PROJECT NAME

SHERWOOD COMMERCE CENTER

BUILDING C

21600 SW OREGON ST.
SHERWOOD, OR

PERMIT SET

REVISIONS

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SCALE	PROJ. NO.
AS NOTED	20210190
DRAWN: JAB	CHECKED: CGA

BLDG C - BUILDING ELEVATIONS

FS-5

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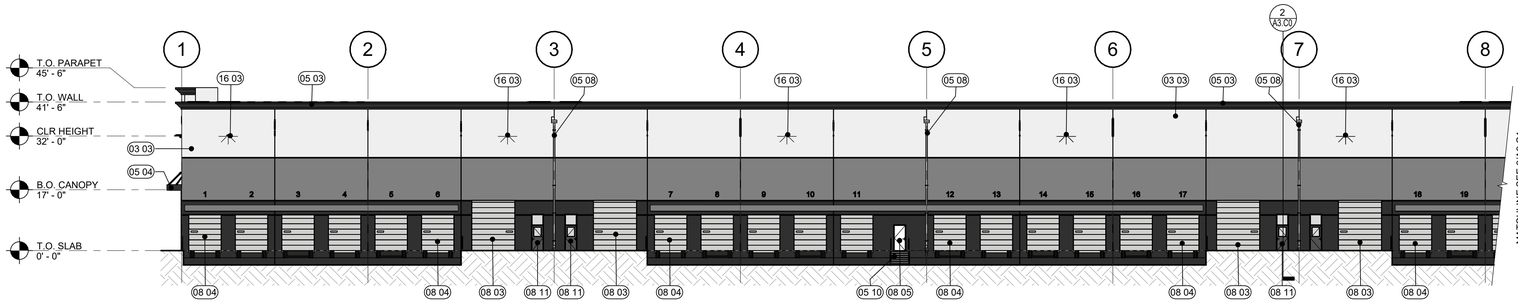
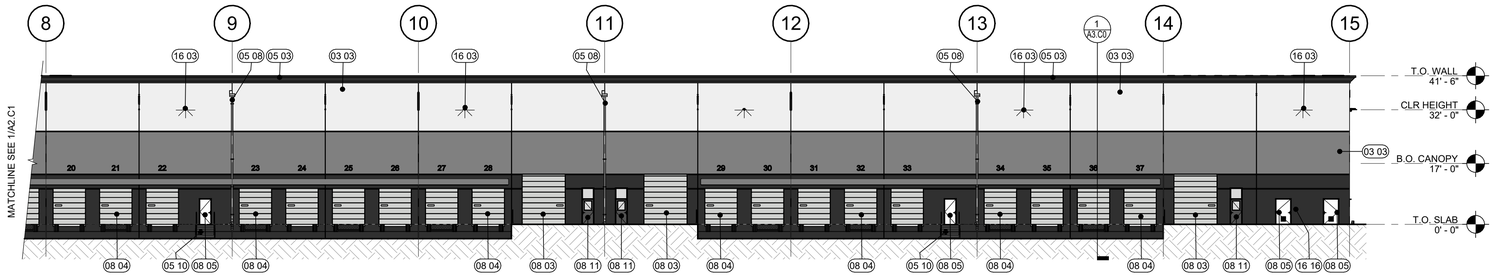


1 FS-6 **WEST ELEVATION - NORTH**

1" = 20'-0" WEST ELEVATION - NORTH - FS



2 FS-6 **WEST ELEVATION - SOUTH**

1" = 20'-0" WEST ELEVATION - SOUTH - FS

GENERAL ELEVATION NOTES

1. FOR ADDITIONAL INFORMATION SEE STRUCTURAL PANEL ELEVATIONS.
2. FOR PANEL REINFORCING, EMBED, AND CONNECTION INFORMATION, SEE STRUCTURAL PANEL ELEVATIONS.
3. ALL PANEL THICKNESS TO BE AS INDICATED ON THE STRUCTURAL ELEVATIONS.
4. ALL ARCHITECTURAL BUILDING ELEVATIONS ARE DRAWN FROM THE EXTERIOR FACE, U.O.N.
5. SEE FOUNDATION PLAN AND ARCHITECTURAL SHEETS TO DETERMINE PANEL DIMENSIONS AND ELEVATIONS.
6. SEE SPECIFICATIONS FOR PANEL CONCRETE MIX REQUIREMENTS.

KEYNOTE LEGEND

03 03	CONCRETE TILT-UP PANELS TYPICAL ON ALL SIDES. SEE STRUCTURAL FOR THICKNESS AND DETAILS.
05 03	BUILT-UP METAL CORNICE PER DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 04	CANOPY PER PLANS AND DETAILS, SEE STRUCTURAL FOR MORE INFORMATION
05 08	DOWNSPOUTS WITH SCUPPER PER ROOF PLAN AND DETAIL. ALSO SEE SITE UTILITY PLAN FOR STORM TIE IN.
05 10	STAIRS AND LANDING PER SITE DETAIL SHEET, TYPICAL
08 03	OVERHEAD DOOR AT GRADE LEVEL PER DOOR SCHEDULE.
08 04	OVERHEAD DOORS AT DOCK LEVEL PER DOOR SCHEDULE.
08 05	EXTERIOR MAN DOOR PER DOOR SCHEDULE.
08 11	CHAIN OPERATED ROTARY ROOF VENTILATORS ABOVE, SEE SPECIFICATIONS.
16 03	WALL LIGHT - PER ELECTRICAL DRAWINGS.
16 16	KNOX BOX PER FIRE MARSHAL REQUIREMENTS.

Exhibit A2

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Schnitzer PROPERTIES

TVFR Tualatin Valley Fire & Rescue

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TVFR Permit #2022-0117

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BUILDING C

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BLDG C - BUILDING ELEVATIONS

FS-6

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