Exhibit A

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TO: **City of Cornelius**
Barbara Fryer, AICP

FROM: **Harper Houf Peterson Righellis, Inc.**
Hillary Harris, AICP

DATE: **July 7, 2025**

RE: **Response to Incompletion of Submission**
Haney Apartments

Harper Houf Peterson Righellis Inc.
ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS
205 SE Spokane Street, Suite 200, Portland, OR 97202
PHONE: 503.221.1131 www.hhpr.com FAX: 503.221.1171

Below are responses to all of the items included on the City's Notice Regarding Incompletion of Submission for the Haney Apartment Complex project issued on June 26, 2025. The required information can be found in the responses below and the updated attachments.

1. *Please address CMC 17.05.020, Lot Line Adjustment standards.*

   Response: Section 17.05.020 (Lot Line Adjustment) has been added to the revised narrative. Please reference the narrative for details on compliance with lot line adjustment standards and approval criteria.

2. *Please address CMC 18.155, Solar Access for New Development.*

   Response: Section 18.155 (Solar Access for New Development) has been added to the revised narrative. In addition, the project architect, Abbasi Design Works LLC, has provided a Shading Study to provide additional details on compliance with the standards of that section. Please reference the narrative and attached Shading Study (Sheet A1.1) for details.

3. *Please provide details on the proposed fencing and gates.*

   Response: Details on the proposed perimeter fencing and gates has been provided by the project architect, Abbasi Design Works LLC. This includes the six foot tall metal swimming pool fence, the six foot tall chain link fence running around the perimeter of the project site, as well as the sliding gate and fence details for the two access driveways into the site. Please reference the attached Fencing Details Sheet (Sheet A8.1) for details.

4. *Please address CMC 18.150.070, Clear vision zones, and show them on the site plan.*

   Response: Section 18.150.070 (Clear Vision Zones) has been added to the revised narrative and the revised Civil Plan Set. Please reference the narrative for details on compliance with clear vision zone standards.

5. *Please provide a letter from the local garbage hauler (Evergreen Disposal and Recycling Inc. 503-357-3510) that they have reviewed your site plan and that the site of the trash enclosure is sufficient for the waste anticipated for your site and that the location is sufficient for efficient hauler maneuvering.*

   Response: Evergreen Disposal and Recycling has been unresponsive with our requests for a formal letter that they have reviewed the site plan and trash enclosure design. However, throughout the design process in April and May, the project team has exchanged emails with Tim Brady of Evergreen Disposal to ensure the trash enclosures and containers were designed and chosen with their guidance. The email correspondence is included in the submittal folder for the City's reference.

6. *Provide a copy of the ODOT response letter from the pre-application conference, within your application package.*

   Response: The ODOT response letter provided to the client by the City of Cornelius and ODOT has been added to the submittal package.

7. *Please provide a reciprocal public access and utility easement on the lot line adjustment survey. The easement will need to be shown over the southern East/West drive-aisle form N 26th Avenue to the western property line and the North/South stub that crosses into Parcel I, to porkchop along Baseline. The easement will need to align with the easement on the abutting property to the west, as shown on Washington County Partition Plat No. 2025-013, Document No. 2025-024992.*

   Response: The applicant is fully aware of and intends to provide a reciprocal public access and utility easement on the project site over the southern east/west drive aisle from North 26th Avenue to the western property line. However, after coordination with the project surveyor, it was determined that easements of this nature cannot be shown or recorded with a property line adjustment but rather need to be a separate recording instrument. After speaking with the City of Cornelius, it was determined that this item can be a condition of approval of the land use application and will be recorded at a later date.

8. *The proposal includes a pool. Please address CMC 15.15 Swimming Pools.*

   Response: Section 15.15 (Swimming Pools) has been added to the revised narrative. Details applicable to the land use stage of the project, including perimeter fencing, are included within the responses. However, some of the standards do not apply at this moment and the project team will demonstrate compliance during the building permit phase. This includes items like pump details.

9. *Pay the following Land Use Application fees:*
   - *Type III Site Design Review, $3,918.00*
   - *Type I Lot Line Adjustment, $486.00*

   Response: A check totaling $4,404 for the two applications listed above has been provided to the City of Cornelius.

10. *Provide 5 additional copies of the complete application packet, as amended, per the information above (and below); one full electronic copy of the application packet (CD or thumb-drive with a PDF) and one copy of the application packet that is unbound and 8 1/2" x 11" in size.*

Response: A total of 5 copies of the complete application packet as amended, one unbound copy of the application packet, and one thumb drive with all application materials submitted in PDF format have bene provided to the City of Cornelius.

The applicant has provided all requested items, and respectfully requests the application be deemed complete and kept on the August 26, 2025 Planning Commission public hearing agenda. Thank you for your time, and do not hesitate to reach out with any questions or concerns.

Harper Houf Peterson Righellis, Inc



Hillary Harris, AICP
Senior Planner

Docusign Envelope ID: A0B842F2-E900-4C89-B5F8-82A67BDCA297

Cornelius
Oregon's Family Town

Land Use Application

Community Development
Located at 1300 S. Kodiak Circle, Cornelius, Oregon 97113
www.ci.cornelius.or.us

OFFICIAL USE ONLY

Date Received:_____ Date Complete:_____ ↓ File Number ↓

Application Fee: _____ Receipt Number:_____ _____

APPLICATION TYPE

Type I – *administrative review without public notice*

- ☐ **Design Review I**
- ■ **Lot Line Adjustment**
- ☐ **Administrative Relief**
- ☐ **Land Partition—Final Plat**
- ☐ **Subdivision—Final Plat**
- ☐ **Other *please describe:*** _____

Type II – *administrative review with public notice*

- ☐ **Design Review II**
- ☐ **Land Partition—Preliminary Plat**
- ☐ **Subdivision—Preliminary Plat**
- ☐ **Other *please describe:*** _____

Type III – *public hearing(s) required with public notice*

- ■ **Design Review III**
- ☐ **Conditional Use Permit**
- ☐ **Planned Unit Development**
- ☐ **Comprehensive Plan Amendment**
- ☐ **Zone Map Amendment**
- ☐ **Zone Text Amendment**
- ☐ **Annexation**
- ☐ **ROW/Easement Vacation**
- ☐ **Subdivision—Preliminary Plat**
- ☐ **Other *please describe:*** _____

APPLICANT INFORMATION

Name: Hillary Harris, HHPR Signature: _____

Mail Address: 205 SE Spokane Street, Suite 200 Portland OR 97202

Phone: 503-221-1131 Fax: _____ E-mail: hillaryh@hhpr.com

PROPERTY OWNER INFORMATION

Name: Haney Industrial Properties Inc Signature: DocuSigned by: Tom Moyer Jr. 160CF9155E46482...

Mail Address: 901 NE Glisan Street, Suite 200 Portland OR 97232

Phone: 805- 452-1944 Fax: _____ E-mail: tommoyerjr@gmail.com

SUBJECT SITE INFORMATION

Property Address: 85 North 26th Avenue

Map & Tax Lot Number(s): 1N334DC04500 and 04600

Current Zoning: Gateway Mixed Use (GMU) Total Size of Site: 10.01 acres

Existing Use: Industrial

Proposed Use: Multi-Family Residential

Cornelius
Oregon's Family Town

Design Review – Type II or III Submittal Checklist

Community Development
Located at 1300 S. Kodiak Circle, Cornelius, Oregon 97113
www.ci.cornelius.or.us

Written Narrative Requirements

X
A. **Checklist.** Please provide one completed copy of this six-page checklist.

X
B. **Description of proposal**. Please describe what changes are proposed to the site, structure, landscaping, parking, and land use. Provide findings verifying that the intended use is allowed by the City's *Development Code* (Chapter 18).

X
C. **Approval criteria findings**: Please provide findings verifying that the proposal meets the Code's requirements found in *Section 18.100,* Land Use & Zoning Site Design Review, Development Requirements & Standards of the applicable zone, and the off-street parking and loading requirements of *Section 18.145.,* in addition, provide findings for any other applicable Code requirements. Specify conformance or proposed variance request from those requirements.

X
D. **Technical and design standards.** Please provide findings specifically addressing each criteria found in *Section 18.100.040* of the City's *Development Code* (Chapter 18).

X
E. **Proposed Operations:** Please provide the hours of operation, total number of employees, and maximum number of employees per shift.

X
F. **Additional Requirements:** Please be advised that special studies, investigations and reports may be required to ensure that the proposal does not adversely affect the surrounding community, and does not create hazardous conditions for persons or improvements on the site. These studies may include investigations and reports on noise attenuation, air quality, traffic control, soil conditions, flooding of waters and storm water run-off, natural resources, tree preservation, and other concerns.

Written Narrative Requirements (cont.)

X

G. **Site Analysis Information:**

1. Existing building area: 279,595 sq. ft.
   Proposed building addition or subtraction: + 18,081 sq. ft.

2. Existing building height: Unknown (less than 40ft) ft.
   Proposed building height: 40 ft.

3. Existing parking area: 0 sq. ft.
   Existing number of parking spaces: 0 # sp.
   Proposed parking addition or subtraction: 426 sq. ft.
   Proposed number of parking spaces: 426 # sp.
   Proposed use: Residential
   Parking requirement: 1.0 / DU

4. Existing landscaped area: 0 sq. ft.
   Percentage of site: 0 %
   Proposed landscape addition or subtraction: 94,641 sq. ft.
   Percentage of site: 24 %

X

H. **Neighborhood Review Meeting:** information required (*Dev. Code Section 18.10.030.*). (Only required for Type III Reviews)

_____ 1. A copy of the notice sent to surrounding property owners.
_____ 2. A copy of the mailing list used to send out meeting notices.
_____ 3. An affidavit of mailing notice.
_____ 4. Representative copies of written materials and plans presented at the Neighborhood Review Meeting.
_____ 5. Notes of the meeting, including the meeting date, time, and location, the names and addresses of those who attended, and oral and written comments received.

X

I. **Other Requirements:** Please provide documentation that the requirements from other agencies and/or jurisdictions for your proposal have been permitted OR submit your schedule for application and approval of the required permits. If applicable, include a copy of a signed Sensitive Area Pre-Screening Letter from the City Engineer. Based upon the findings of the Sensitive Area Pre-Screening Letter, a **Clean Water Services Service Provider Letter may be required.**

N/A

J. **Temporary Construction Office.** Please provide information on the site plan showing the location and state the duration of the temporary construction office.

DESIGN REVIEW TYPE II & III

Plan Requirements

All plans, except architectural elevations, shall be presented at a minimum of 1" = 20' engineering scale and on a maximum sheet size of 24" x 36." Please also include one 'unbound' set that is 8 1/2" x 11" in size. Each of the following plans and drawings shall be submitted on separate sheets. Architectural elevations may be presented at an architectural scale. Please include all of the following information.

X A. **Existing Conditions Plan**:

_____ 1. North arrow, scale and date of plan.
_____ 2. Vicinity map.
_____ 3. The entire lot(s), including area and property lines dimensioned.
_____ 4. Points of existing access, interior streets, driveways, and parking areas.
_____ 5. Location of all existing buildings and structures.
_____ 6. Existing right-of-way and improvements.
_____ 7. Dimension from centerline to edge of existing right-of-way.
_____ 8. Existing topographical information, showing 2 ft. contours.
_____ 9. Surrounding development and conditions within 100 ft. of the property; such as zoning, land uses, buildings, driveways, and trees.
_____ 10. Location of existing public and private utilities, easements, and 100-year floodplain.
_____ 11. Sensitive areas, as defined by the Clean Water Services standards.
_____ 12. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated*.
_____ 13. Existing trees larger than 6" in dbh (diameter at breast height), including genus, species and size. Dbh is measured at 54" above grade.

X B. **Dimensioned Site Plan**:

_____ 1. North arrow, scale and date of plan.
_____ 2. The entire lot(s), including area, property lines dimensioned and labeled "front," "side," and "rear."
_____ 3. Proposed points of access, interior streets, driveways, and parking areas.
_____ 4. Proposed location of buildings and structures, including refuse storage locations, pedestrian/bike paths, swimming pools, tennis courts, and tot-lots.
_____ 5. Proposed right-of-way, dedications and improvements.
_____ 6. Dimension from centerline to edge of proposed right-of-way.
_____ 7. Dimensions of all improvements, including setbacks, parking spaces, driveways, and distance between buildings.
_____ 8. Location of storm water quality/detention facilities.
_____ 9. Boundaries of development phases, if applicable.
_____ 10. Sensitive areas, as defined by the Clean Water Services standards.

_____ 11. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated.*

X C. **Grading Plan**:

_____ 1. North arrow, scale and date of plan.
_____ 2. The entire lot(s).
_____ 3. Points of access, interior streets, driveways, and parking areas.
_____ 4. Location of buildings and structures, including refuse storage locations, pedestrian/bike paths, swimming pools, tennis courts, and tot-lots.
_____ 5. Proposed rights-of-way, dedications and improvements.
_____ 6. Dimension from centerline to edge of proposed right-of-way.
_____ 7. Existing and proposed topographical information, showing 2 ft. contours and appropriate spot elevations for features such as walls, retaining walls (top and bottom elevations), catch basins, stairs, sidewalks, and parking areas.
_____ 8. Location of 100-year flood plain.
_____ 9. Location of storm water quality/detention facilities.
_____ 10. Boundaries of development phases, if applicable.
_____ 11. Natural Resource Areas, Significant trees, and Historic trees, if applicable.
_____ 12. Sensitive areas, as defined by the Clean Water Services standards.
_____ 13. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated*.
_____ 14. Existing trees larger than 6" dbh. Indicate which trees are proposed to be saved and which are proposed to be removed.

X D. **Utility Plan**:

_____ 1. North arrow, scale and date of plan.
_____ 2. The entire lot(s).
_____ 3. Points of access, interior streets, driveways, and parking areas.
_____ 4. Location of buildings and structures, including refuse storage locations, pedestrian/bike paths, swimming pools, tennis courts, and tot lots.
_____ 5. Proposed right-of-way, dedications and improvements.
_____ 6. Proposed topographical information, showing 2 ft. contours.
_____ 7. Location of 100-year flood plain.
_____ 8. Location of existing and proposed public and private utilities, easements, surface water drainage patterns, and storm water quality/detention facilities.
_____ 9. Boundaries of development phases, if applicable.
_____ 10. Sensitive areas, as defined by the Clean Water Services standards.
_____ 11. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated.*

X E. **Landscape Plan**:

_____ 1. North arrow, scale and date of plan.
_____ 2. The entire lot(s).
_____ 3. Points of access, interior streets, driveways, and parking areas.
_____ 4. Location of buildings and structures, including refuse storage locations, pedestrian/bike paths, swimming pools, tennis courts, and tot lots.
_____ 5. Proposed right-of-way, dedications and improvements.
_____ 6. Boundaries of development phases, if applicable.
_____ 7. Sensitive areas, as defined by the Clean Water Services standards.
_____ 8. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated*.
_____ 9. Existing trees, larger than 6" dbh, proposed to be saved. Include genus, species, and size.
_____ 10. The location and design of proposed landscaped areas, indicating all plant materials, including genus, species, common name, plant sizes, and spacing.
_____ 11. List of plant materials, including genus, species, common name, size, quantity, spacing and condition.
_____ 12. Other pertinent landscape features, including walls, retaining walls, berms, fences, and fountains.
_____ 13. A note on the plan indicating that an irrigation system will be installed to maintain the landscape materials.

X F. **Lighting Plan**:

_____ 1. Location of all exterior lighting, including those mounted on poles, walls, bollards and the ground.
_____ 2. Type, style, height, and the number of fixtures per light.
_____ 3. Wattage per fixture and lamp type, such as sodium, mercury, and halide.
_____ 4. 8 ½" x 11" manufacturer's illustrations and specifications (cut sheets) of all proposed lighting poles and fixtures.
_____ 5. For all exterior lighting, indicate the area and pattern of illumination measured at ½-foot candlepower.

X G. **Architectural Renderings and Elevations, or both:** Please provide information that identifies the general character of the buildings and structures; indicate dimensions, materials, colors, and textures proposed for any structures. This includes buildings, retaining walls, refuse storage facilities, play structures, and fences

_____ H. **Materials Board**: Please provide one 8½" x 11" or 8½" x 14" Materials Board with examples of all building materials, colors, and textures of exterior surfaces.

Cornelius
Oregon's Family Town

Lot Line Adjustment Submittal Checklist

Community Development
Located at 1300 S. Kodiak Circle, Cornelius, Oregon 97113
www.ci.cornelius.or.us

Written Narrative Requirements

X
_____ A. **Checklist:** Please provide one completed and signed copy of this checklist.

X
_____ B. **Description of proposal:** Please describe the existing conditions on-site and the changes proposed to the site, structure, landscaping, parking, and land use, including the number of parcels created. Provide findings verifying that the intended use is allowed by the City's *Development Code*.

X
_____ C. **Approval criteria findings:** Please provide a narrative that evaluates and verifies the proposal meets the approval criteria identified below:

Section 17.05.020 of the Development Code

1. *An additional lot is not created by the lot line adjustment and the existing parcel reduced in size by the adjustments is not reduced below the minimum lot size established by the approved zoning for that district.*

2. *By reducing the lot size, the lot or structures(s) on the lot will not be in violation of the site development regulations for that district.*

X
_____ D. **Pre-Screening Site Assessment Letter:** Please provide a copy of a completed and signed Pre-Screening Site Assessment Letter. This letter may be obtained from the City Engineer. If a 'sensitive' area is on or nearby the subject site then documentation of a Service Provider Letter from Clean Water Services is required at the time of submittal.

X
_____ E. **Site Plan:** Please provide a detailed site plan as described in the 'Plans Requirements' section of this checklist.

Plan Requirements

All plans shall be presented at a minimum scale of 1" = 20', and on a maximum sheet size of 24" x 36", along with one copy that is 8 ½" x 11" in size. Please include all of the following information on the plan.

X A. **Existing Conditions Plan** includes the following:

_____ 1. North arrow, scale and date of plan.
_____ 2. Vicinity map.
_____ 3. All existing and proposed lot sizes, lot lines and dimensions.
_____ 4. Points of existing access, interior streets, driveways, and parking areas.
_____ 5. Location of all existing buildings and structures, including refuse storage locations and pedestrian/bike paths.
_____ 6. Existing right-of-way and improvements, including sidewalk dimensions.
_____ 7. Dimension from right-of-way centerline to edge of existing property line and to required right-of-way dedication.
_____ 8. Dimensions of all improvements, including setbacks.
_____ 9. Location of existing public and private utilities, and 100-year floodplain.

X B. **Proposed Preliminary Plat** includes the following:

_____ 1. Location, widths and names of all existing, proposed streets and public ways within or adjacent to the plat. Illustrate easements for utilities, other encumbrances and railroad right-of-ways. New streets shall be designated with proposed street names.
_____ 2. Dimension from right-of-way centerline to edge of existing property line and to required right-of-way dedication.
_____ 3. Location of existing and proposed easements.
_____ 4. Location of at least one temporary benchmark within the plat boundaries.
_____ 5. Square footage of all proposed lots.
_____ 6. The total gross acreage of the lots.

I have provided the items required in this submittal checklist. I understand that any missing information, omissions or both may deem my project incomplete, which may lengthen the time to process the request.

	6/2/2025
Signature	Date
Hillary Harris	503-221-1131 ext 190
Print Name	Telephone Number

I have provided the items required in this six-page submittal checklist. I understand that any missing information, omissions or both may deem my project incomplete, which may lengthen the time to process the request.

	6/2/2025
Signature	Date
Hillary Harris	503-221-1131 ext 190
Print Name	Telephone Number

Cornelius Multi-Family Apartments
REVISED Narrative & Findings Document

Type III Design Review and Property Line Adjustment

PROPERTY OWNER:
Haney Industrial Properties, Inc.
901 NE Glisan Street, Suite 200
Portland, O 97232

OWNER REPRESENTATIVE:
Jason Wald
Fore Property Company
1332 NW Kearney Street
Portland, OR 97209
(503) 964-5658
jwald@foreproperty.com

SITE LOCATION:
85 North 26th Avenue

TAX LOT:
1N334DC04500 and 04600

SIZE:
12.39 acres

ZONING:
Gateway Mixed Use (GMU)

SUMMARY OF REQUEST:
The property owner proposes a property line adjustment and development of a 240 unit apartment complex with associated improvements on site and within the right-of-way.

DATE:
July 7, 2025

Project Team

PLANNER/APPLICANT:

Hillary Harris, AICP
Harper Houf Peterson Righellis Inc
205 SE Spokane Street, Suite 200
Portland, OR 97202
(503) 221-1131
hillaryh@hhpr.com

ARCHITECT:

Rahim Abbasi
Abbasi Design Works
225 SW 1st Avenue
Portland, OR 97204
(503) 816-9466
rahim@abbasidesign.com

CIVIL ENGINEER:

Ryan Mosher, PE
Harper Houf Peterson Righellis Inc
205 SE Spokane Street, Suite 200
Portland, OR 97202
(503) 221-1131
ryanm@hhpr.com

LANDSCAPE ARCHITECT:

Jeff Creel, RLA
Harper Houf Peterson Righellis Inc
205 SE Spokane Street, Suite 200
Portland, OR 97202
(503) 221-1131
jeffc@hhpr.com

SURVEYOR:

Thom Walker, Survey Operations Manager
Harper Houf Peterson Righellis Inc
205 SE Spokane Street, Suite 200
Portland, OR 97202
(503) 221-1131
thomw@hhpr.com

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I. PROJECT OVERVIEW

EXISISTING SITE CONDITIONS

The project site is located at the northwest corner of E Baseline Street and N 26th Avenue and includes Tax Lots 1N334DC04500 and 04600. The site is zoned Gateway Mixed Use (GMU) and is currently developed with an assortment of industrial buildings with access from N 26th Avenue. The property line between the two tax lots bisects the development site north to south, with the western tax lot being 4.51 acres in size and the eastern tax lot being 7.88 acres in size.

VICINITY MAP



PROPOSED PROPERTY LINE ADJUSTMENT

The property owner proposes to perform a property line adjustment, creating a northern lot that is 9.65 acres and a southern lot that is 2.74 acres in size. Additionally, right-of-way will be dedicated on the northern property line (42 feet) for North Davis Street and on the eastern property line (10 feet) for North 26th Avenue.

EXISTING PROPERTY LINES



PROPOSED PROPERTY LINES



PROPOSED DEVELOPMENT

The property owner proposes to develop the site with a multi-family apartment development, including 10 apartment buildings and a total of 240 residential units. Associated site amenities will include a maintenance and leasing office, club house, open space and landscaping areas, utility connections, on-site stormwater detention facilities, off-street parking, and vehicle garages.

REQUESTED REVIEWS

The applicant is requesting the following reviews for the proposed project:

- Property Line Adjustment
- Type III Design Review

II. RESPONSE TO APPLICABLE DEVELOPMENT AND CODE STANDARDS

Note: Responses to all applicable development standards are included below. Sections that are not applicable or do not require a response may be omitted from the narrative text.

CHAPTER 15.15: SWIMMING POOLS

SECTION 15.15.020: PERMIT REQUIRED

No person shall construct, install, enlarge or remodel any swimming pool without first having obtained a permit from the city of Cornelius. This permit is in addition to any other permit or license required by the state or Washington County or any other governmental agency.

Response: As part of the proposed multi-family residential development, the applicant is proposing to construct a swimming pool on-site. Therefore, a permit is required from the City of Cornelius.

SECTION 15.15.030: APPLICATION FOR PERMIT

A) The application shall include:

1) Complete and accurate plans and specifications drawn to scale and as otherwise required by the building code, prepared or approved by a professional engineer or architect registered in the state.

Response: The civil and architectural plan sets included with the application materials include complete and accurate plans for the land use review. Additional detailed plans to comply with all applicable building code standards will be submitted at the time building permits are applied for by the applicant. These plans will be prepared by a professional licensed engineer or architect registered in the State of Oregon.

2) A description of the sources of water supply, amount and quality of water available and intended to be used, method and manner of water purification, treatment, disinfection, heating, regulation and cleaning, lifesaving apparatus and safety measures.

3) A description of storm and sanitary sewer service available at the site, including a subsurface disposal system plan if applicable.

4) Pump performance data for recirculation of swimming pool water.

Response: All of the above standards regarding swimming pool water supply and pump performance will be addressed during building permit by the applicant team, as discussed with City staff. All provided storm and sanitary sewer utilities and connections can be found on the attached Utility Plan within the Civil Plan Set.

B) The application must be accompanied by the permit fee in the amount of $45.00.

Response: All required fees will be paid by the property owner or applicant.

C) If the application is disapproved, the city recorder shall furnish a written statement to the applicant setting forth the reasons for disapproval and shall indicate, when feasible, what changes are necessary before the application can be approved. Denial may be appealed to the council; provided, that notice is given by the applicant to the city recorder within 10 days after denial.

Response: Acknowledged by the applicant.

D) Swimming pools shall be constructed in conformity with the approved plans.

Response: When the proposed swimming pool is constructed with the overall development, it will be built in conformity with the approved plans.

15.15.040 FENCE STANDARDS

All swimming pools constructed, installed, enlarged or remodeled within the city shall conform to and include the following pool fencing standards:

A) A fence shall surround all swimming pools and shall be constructed to conform with the requirements of this section.

Response: A six foot tall metal fence is proposed to be constructed around the perimeter of the swimming pool and comply with the standards outlined in Section (B) below. Please see details within that response, as well as Sheet A8.1 of the Architectural Plan Set.

B) The following materials shall be used for fencing purposes:

1) Wood. Redwood, cedar or pressure-treated posts not less than four inches by four inches, set not more than 10 feet apart, embedded at least 18 inches in the ground. Vertical boards at least one-half inch thick shall be fastened securely to and outside of not less than two horizontal rails at least two inches by four inches in dimension. The outside face of the fence shall have no horizontal projections or recesses.

2) Wire. Galvanized chain link fencing, minimum 11 gauge, with galvanized pipe posts of at least one-and-one-quarter-inch diameter, spaced not more than 10 feet apart. Posts shall be set not less than 12 inches in diameter and 18 inches deep.

3) Masonry. Solid walls of brick, concrete block or stone, with no projections, recesses or other openings less than four feet from the ground surface.

4) Wrought Iron. Steel tube posts with a minimum one-and-one-half-inch section and a minimum one-eighth inch steel shall be spaced not more than eight feet on center. Vertical steel bars of a minimum one-half inch section shall be spaced not more than four inches on center. Horizontal rails shall be at least one inch channel steel, with a minimum vertical separation of four feet.

Response: A wrought iron metal fence is proposed to be constructed around the perimeter of the swimming pool, meeting the dimensional standards outlined in Standard (B)(4) above. Please see Sheet A8.1 for details on site fencing.

5) Height. Fences shall be not less than four feet nor more than six feet in height, measured from the outside ground level at a point 12 inches horizontal from the base of the fence.

Response: The proposed swimming pool perimeter fence is six feet in height. Please see Sheet A8.1 for details on site fencing.

6) Any gate in a protective fence shall meet fence requirements for height and durability. It shall be equipped with a self-closing device and a self-latching device located not less than three feet, six inches above the ground.

Response: The swimming pool perimeter fence has a gate proposed that also meets the requirements for height and durability. The gate includes a self-closing device and panic bar for egress to ensure safety and access to residents. Please see Sheet A8.1 for details on site fencing and gates.

7) *Any fence material and method of construction other than specified above shall be submitted to the city manager for consideration prior to erection. If, in the opinion of the city manager, the material and method of construction conform to the general design for safety and durability as set forth in this section, the city manager may approve the fence.*

Response: All details on fencing and pool construction will be submitted during building permits and approved by the city manager for consideration prior to erection.

CHAPTER 17.05: LAND DIVISIONS

SECTION 17.05.020: LOT LINE ADJUSTMENTS

A) *Procedure Type.*
   1) *The community development director shall review the request for a lot line adjustment to determine compliance with the standards in subsection (C) of this section. The community development director shall approve or deny the request in writing based on the criteria in subsection (C) of this section, within 45 days of submittal of the request.*
   2) *If the applicant disagrees with the decision of the community development director, an appeal shall be filed in accordance with CMC 18.15.090(A) within 10 working days.*

Response: The applicant understands the community development director will review the lot line adjustment to determine compliance. Please see the responses in Section (C) below for details on how the project complies with all applicable standards.

B) *Application Requirements. The community development director shall provide forms that specify the information required for submission of lot line adjustments. The applicant shall prepare a map together with other supplementary material as may be required and shall submit the necessary number of copies to the community development director.*

Response: A proposed property line adjustment exhibit is included in the application package, including all listed items on the Lot Line Adjustment Checklist are included in the submittal package. Please see the Preliminary PLA and attached checklist for details.

C) *Approval Criteria. A request for a lot line adjustment must meet all of the following criteria:*
   1) *An additional lot is not created by the lot line adjustment and the existing parcel reduced in size by the adjustments is not reduced below the minimum lot size established by the approved zoning for that district.*

Response: The two lots on the project site are proposed to be adjusted, moving the shared lot line from running north-south to running east-west. The proposed adjustment will result in two lots meeting the minimum lot size in the GMU zoning district, and no additional lot will be created. Please see the attached civil plan set for details on the proposed lot line adjustment.

2) *By reducing the lot size, the lot or structure(s) on the lot will not be in violation of the site development regulations for that district.*

Response: All dimensional standards of the GMU zoning district are met by both lots after the proposed lot line adjustment. The GMU district does not have any minimum lot sizes (18.75.050.A) and all setback and coverage standards can reasonably be met on both lots after the adjustment.

D) Appeal of a Decision. Any person receiving notice who disagrees with the community development director's interpretation may appeal that interpretation to the planning commission at its next appropriate regularly scheduled meeting. Any party to the proceeding disagreeing with the planning commission interpretation may appeal that interpretation to the city council at its next appropriate regularly scheduled meeting.

Response: Acknowledged by the applicant.

CHAPTER 18.75: GATEWAY MIXED USE (GMU)

SECTION 18.75.020: PERMITTED USES

The following uses and their accessory uses are permitted outright:

A) General retail.
B) Indoor recreation and entertainment, including but not limited to pool hall, internet and video game center, dance hall or theater, fitness or sports facility, when enclosed in a building.
C) Service commercial, including but not limited to barbers, banks, laundry, or dry cleaning. Drive-up window, drive-in, or drive-through facilities in conjunction with these uses.
D) Sales, service or repair of nonmotorized sporting equipment, such as bicycles, skis, snowboards, skates, and general sporting goods, inclusive of electric bicycles and stationary exercise machines that incorporate motors such as treadmills.
E) Office, business, professional, medical/dental, or veterinarian.
F) Restaurant, eating and drinking establishments. May include drive-up window, drive-in, or drive-through facilities. May include outdoor seating areas, subject to CMC 18.75.060(G).
G) Commercial lodging, including hotel or motel.
H) Multi-family dwelling units, subject to CMC 18.75.065.
I) Single-family attached dwelling units, subject to CMC 18.75.065.
J) Theatrical arts or cultural performance center.
K) Health care and social service offices.
L) Certified child care center.
M) Type "A" or Type "B" mobile vendor, as described in Chapter 5.35 CMC.
N) Outdoor display and storage, subject to CMC 18.75.060(H).
O) Churches, and associated church activities.
P) Conversion of a hotel or motel to an emergency shelter or affordable housing.

Response: The applicant proposes to develop the site with multi-family dwelling units. This is a permitted use under Standard (H) above and is therefore allowed outright on the project site with their accessory uses. The applicable standards of Section 18.75.065 are met; please see the responses within that section of the narrative for details.

SECTION 18.75.045: APPLICABILITY OF DEVELOPMENT AND DESIGN STANDARDS

A) New buildings must meet all standards of this chapter.

B) Redevelopment valued at 50 percent of the building's assessed value or more or expansions of more than 50 percent of the building's gross floor area shall meet all standards for any expanded portions of the building and shall meet CMC 18.75.060(B) and (E) for the entire building.

C) Redevelopment valued at less than 50 percent of the building's assessed value that does not expand the gross floor area of the building by more than 10 percent shall be exempt from compliance with CMC 18.75.060 and the expanded portion shall use materials that substantially match the originals. CMC 18.135.020, Nonconforming structures, shall apply.

D) Redevelopment valued at less than 50 percent of the building's assessed value that includes expansions of existing gross floor area by 10 to 50 percent shall either: […]

Response: The proposed multi-family apartments are a new use and therefore must meet all standards of Chapter 18.75. Please see the responses within this narrative and the civil plan set for details on compliance.

SECTION 18.75.050: DEVELOPMENT REQUIREMENTS

Response: The proposed multi-family residential development has ground floor residential uses. Therefore, compliance with Section 18.75.065 takes the place of Section 18.75.050 of the code. Please see the responses within Section 065 of this chapter for details on compliance with applicable development requirements.

SECTION 18.75.060 DESIGN REQUIREMENTS

Response: The proposed multi-family residential development has ground floor residential uses. Therefore, compliance with Section 18.75.065 takes the place of this section of the code. Please see the responses within Section 065 of this chapter for details on compliance with applicable development requirements.

SECTION 18.75.065 RESIDENTIAL REQUIREMENTS

In lieu of compliance with CMC 18.75.050, 18.75.060 and 18.75.070, ground-floor residential uses shall comply with the standards of this section. Upper-story residential uses in a vertical mixed use building shall not be subject to this section.

Response: The proposed multi-family residential development has ground floor residential uses. Therefore, compliance with these standards is met in place of the standards in Section 050, 060, and 070 of Chapter 18.75.

A) Location of Residential Uses. Ground-floor residential uses are limited to a percentage of the total site area based on the three subdistricts shown in Figure 18.75.065-1.

1) In subdistrict A, up to 100 percent of a lot or multiple lots if developed concurrently may be developed as ground-floor residential uses, including parking to serve residential uses.

2) In subdistrict B, a range of residential and commercial uses may be allowed in a mix from 100 percent residential to 100 percent commercial, or any intervening ratio, at the request of the applicant, based on market conditions.

3) In subdistrict C, no ground floor residential uses are permitted.

Response: The project site is located in subdistrict B, which allows for 100% residential uses on the ground floor. The proposed development only includes residential uses, which is allowed on the site.

B) Location of Single-Family Attached Residential Uses. […]

Response: The proposed development does not include single-family attached residential units. Therefore, Standard (B) above does not apply, and the remaining code language has been omitted from this narrative.

C) Minimum density for ground-floor residential uses is 18 units per net acre. There is no maximum density.

Response: The subject property is approximately 9.6 acres in size and the proposed development includes 240 residential units. This comes to an approximate density of 25 units per net acre, complying with the above minimum density.

D) Open Space. Within residential developments containing 20 or more lots or units there shall be at least 150 square feet of open recreational space per unit provided in common open space. Such space will be considered part of the required landscaping, but must be designed in a manner that affords residents usable open area. Streets, access drives and parking lots shall not be considered open space. Open space must be a usable open recreational area, and may include a club house or indoor recreation facility. All outdoor area shall be landscaped and maintained by the owner, or a homeowners' association, according to the approved development plans, unless the open space is dedicated to and accepted by the city as a public park.

Response: As a residential development with more than 20 units, a minimum open space of 150 square feet per unit is required to be provided. The proposed multi-family development will have 240 resident units, requiring a total of 36,000 square feet of common open space. The site has been designed to provide 36,711 square feet of open space for residents, allocated between a club house, community garden, swimming pool, dog park, and playground. Please see the attached Landscape Plans (Sheets L100 to L105) and the attached Site Plan (Sheet C200) for details.

E) Landscaping. A minimum of 15 percent of each lot, or multiple lots if developed concurrently, shall be landscaped and maintained free of buildings, pavement, or any other form of impermeable cover. Open space designed to meet the requirements of subsection (D) of this section may be counted towards the required landscaping.

Response: The project site is 391,719 square feet in size, requiring a minimum of 58,758 square feet of landscaping (or 15%). Including site landscaping and open space provided, there is approximately 94,641 square feet of landscaping, or 24% of the overall property. Please see the attached Landscape Plans (Sheets L100 to L105) for details on the location and type of landscaping proposed on site.

1) All landscaped areas shall be planted with at least an 80 percent plant cover at maturity. Large areas of bark dust or other nonliving vegetative ground covers shall be avoided.

Response: All of the landscaped areas proposed on the project site have been designed to be at least 80% covered at plant maturity. All large landscaped areas include ground covering and/or shrubs to avoid any large areas of nonliving elements. Please see the attached Landscape Plans (Sheets L100 to L105) for details on the type of landscaping proposed on site.

2) The elements of landscaping include all forms of planting and vegetation, all adjustments, refinements, or designed developments in ground forms, rock groupings, or water patterns or

features, all construction other than completely enclosed buildings or primarily utilitarian engineering structures such as retaining walls. Particular attention shall be given to providing walkways, patios or plazas that create linkages between buildings, uses and activity areas. These are all elements used to develop and refine space between, around, or within buildings and pedestrian and vehicular circulation elements.

Response: The site landscaping has been selected and designed by a professional and licensed landscape architect to include different elements that are all suitable to for the specific site conditions. These include ground covering, shrubs, river rock, pathways, stormwater facility plantings, and both street trees and on-site trees. Please see the attached Landscape Plans (Sheets L100 to L105) for details on the location and type of landscaping proposed on site.

3) *Landscaping should be used to separate and buffer parking areas from pedestrian areas, and to accentuate building design and entrances. Landscaping is intended to provide visual relief, buffering from vehicles for pedestrian and bikeways, and accent or framing of buildings, plazas and other activity areas.*

Response: Landscaping is proposed around all residential buildings, as well as along all on-site pedestrian pathways. The type of landscaping has been selected to avoid any obstruction to building entrances or pathways, while extenuating direct routes and on-site amenities. Please see the attached Landscape Plans (Sheets L100 to L105) for details on proposed landscaping.

4) *Landscaping should be incorporated into plazas and courtyards to provide common spaces serving the development. Uses and buildings should be clustered around these common spaces whenever possible, with entries oriented to these spaces.*

Response: A majority of the common space on site is located interior to the site with the residential buildings oriented to face the area. The common space incorporates landscaping to provide visual interest and shade for residents to enjoy. Please see the attached Landscape Plans (Sheets L100 to L105) for details on the proposed landscaping and common open space.

5) *All vegetative landscaping shall be maintained with a functioning irrigation system.*

Response: All of the proposed vegetative landscaping will be irrigated to ensure adequate survival of the plantings. Please see the attached Irrigation Plan for details.

F) *Trail Corridor Landscaping. A 30-foot-wide landscaping buffer is required along the northern property line abutting the future Council Creek Regional Trail corridor to soften the transition between development and the trail. […]*

Response: The project site does not abut the future Council Creek Regional Trail corridor. Therefore, Standard (F) above does not apply and the remaining code language has been omitted form this narrative.

G) *Multi-family development shall comply with the following dimensional standards:*
   1) *The minimum lot size shall be 10,000 square feet.*

Response: The subject site lot size is approximately 9.6 acres, meeting the minimum lot size for multi-family development. Please see the attached Site Plan (Sheet C200) for details on lot dimensions.

2) *The minimum lot width shall be 30 feet.*

Response: The subject site lot width is approximately 570 feet, meeting the minimum lot width for multi-family development. Please see the attached Site Plan (Sheet C200) for details on lot dimensions.

3) *The maximum height shall be three stories or 45 feet in height, whichever is less. Building height may be increased to a maximum of four stories or 60 feet in height, whichever is less, for buildings or portions of buildings set back at least 30 feet from the eastern, western, and southern perimeters of the district, and set back at least 120 feet from the northern perimeter of the district, if approved as a conditional use consistent with Chapter 18.105 CMC.*

Response: At the average grade of the roof, the buildings are approximately 39 feet 10 inches in height. Please see the attached Architectural Elevations (Sheets A3.1 to A3.4) for details on building height.

4) *Front Yard. The front, as measured from the foundation of the structure, including porch or deck, shall not be less than five feet. Accessory structures, garages or carports shall not be less than 20 feet.*
5) *Rear Yard. No rear yard shall be less than 10 feet in depth as measured from the foundation of the structure.*
6) *Side Yard. The minimum width of side yards shall be not less than five feet in width as measured from the foundation of the structure.*

Response: The apartment buildings are oriented around the outside of the property and located approximately 10 feet from all property lines, complying with the front, rear, and side yard setbacks above. Please see the attached Site Plan (Sheet C200) for details on exact building location.

7) *Building Separation. Buildings within a complex shall be separated by at least six feet, subject to Oregon Residential Specialty Code and/or Oregon Structural Specialty Code requirements.*

Response: The site and buildings have been designed to comply with all structural code standards. The closest two buildings are together is approximately 25 feet. Please see the attached Site Plan (Sheet C200) for details on building separation and location.

H) *Single-family attached dwellings on individual lots shall comply with the following dimensional standards: […]*

Response: There are no single-family attached dwellings on individual lots with this development. Therefore, Standard (H) above does not apply, and the remaining code language has been omitted from this narrative.

I) *Vehicular Access, Internal Circulation and Clear Vision Areas.*
   1) *Where possible, vehicular access to residential subdivisions shall be from abutting arterial or collector streets. Access to individual lots shall be primarily from local streets or alleyways when the alleyway is developed to current public works standards. Direct lot access to arterials or*

collector streets shall not be permitted, unless there is no alternative as determined by the city engineer.

Response: The proposed multi-family development has two access points from the two adjacent pubic streets, both of them classified as collectors in the Cornelius Transportation Systems Plan. These are the only points of access available to the site from the public right-of-way. Please see the attached Site Plan (Sheet C200) for details on vehicular driveways and access points.

2) *The minimum public street width shall comply with the standards and design identified in CMC 18.143.040, Street design cross-sections per transportation system plan.*

Response: Right-of-way is proposed to be dedicated to construct North Davis Street north of the site as shown in the Transportation Systems Plan. Additional right-of-way is also proposed to be dedicated on North 26th Avenue to complete the minimum right-of-way needed for a industrial collector. Both streets have been designed by a licensed and professional engineer to meet all minimum public street design standards. Please see the attached Plan & Profiles (Sheets C800 to C808) for details.

3) *Internal Access. All internal roadways and drives shall be paved and maintained by the owner in accordance with city standards. No entrance or exit shall be located closer than 100 feet to any intersection of a public street, unless there is no reasonable alternative as determined by the city engineer. They shall have the following minimum unobstructed pavement width:*
    a) *Two-way traffic: 24 feet;*
    b) *One-way traffic: 15 feet.*

Response: The proposed internal vehicular drive aisles accommodate two way traffic and are 24 to 26 feet in width. These will be continuously paved and maintained by the owner of the property. Both the driveway on Davis Street and 26th Avenue are over 100 feet from an intersection. Please see the attached Site Plan (Sheet C200) for details on internal access and drive aisles.

4) *Internal sidewalks or pathways shall be provided to ensure safe and convenient pedestrian circulation throughout the development.*

Response: As part of the site design, extensive pedestrian pathways have been provided throughout the site. These pathways connect with the public right-of-way, building main entrances, site amenities, and the off-street parking area while providing adequate separation to ensure safety and direct access. Please see the attached the Pedestrian Circulation Exhibit for details on pedestrian pathways internal to the project site.

5) *Clear vision areas shall be provided at all roadway and driveway intersections in accordance with the vision clearance standards set forth in CMC 18.150.070.*

Response: The site has been designed by a licensed and professional engineer to ensure clear vision areas at all intersections of streets and driveways. Please see the responses in Section 18.150.070 of this narrative for details.

J) *Access Streets, Sidewalks, and Drainage.*
    1) *All streets shall be designed in accordance with standards set forth in Chapter 18.143 CMC, Transportation Facilities, and the subdivision code.*

Response: All adjacent street improvements has been designed by a licensed and professional engineer to ensure compliance with transportation standards and regulations. Please see the responses in Chapter 18.143 of this narrative for details.

2) *All driveways for new construction shall have minimum pavement width of 12 feet and shall not be more than 25 feet in width at the curb. Each driveway shall have a concrete curb apron designed to comply with public works standards, and not more than two residential lots may be served by one shared driveway.*

Response: Both driveways on the project site are 24 feet in width to accommodate two way traffic, and include a concrete curb apron where they connect with the public street and right-of-way. Please see the attached Site Plan (Sheet C200) for details.

3) *For all new construction, curbs, gutters, and a sidewalk subject to public works standards, offset from the curb, shall be provided along the entire lot frontage and shall meet ADA accessibility standards. In the case of remodels or garage additions to an existing use, no sidewalk shall be required if one does not exist, but the driveway apron and paved driveway shall be required. However, a curb tight sidewalk may be approved by the city engineer when it is impractical to provide the offset.*

Response: All required public improvements to the adjacent streets and rights-of-way, including stormwater facilities and sidewalks, will be installed along the street frontages of Davis Street and 26th Avenue. Please see the attached Plan & Profile (Sheets C800 to C808) for details on public street improvements.

4) *Storm drainage shall meet current public works standards and shall comply with Clean Water Services (CWS) standards for water quality and quantity.*

Response: Al storm drainage has been designed to meet current public works standards and complies with the CWS standards for water quality and quantity. Please see the attached Preliminary Stormwater Plan and the Utility Plan Sheets within the Civil Plan Set for details.

K) *Lighting Streets. Streets and walkways shall be lighted during the hours of darkness in accordance with public works standards.*

Response: All public streets, sidewalks, and internal pedestrian pathways have lighting provided during dark hours and meet all applicable public works standards. Please see the attached Lighting Plan (Sheet E0.0) for details on proposed lighting.

L) *Mailboxes. Single-family attached and multi-family developments with five or more units shall provide clustered mailboxes, consistent with the locational criteria set by the postmaster. They shall be of uniform style.*

Response: Mailboxes for all residential units are provided in a single location at the clubhouse. They will be located outside of the clubhouse, but under the roof to provide weather protection. They will be installed in a uniform

style and meet all location criteria set by the local postmaster. Please see the attached Site Plan (Sheet C200) for details on the location of the mailboxes.

M) Screening. Multi-family developments with five or more units shall provide the following types of screening:

1) Sight-obscuring screening shall be provided for all garbage and trash collection areas, approved outdoor storage, and parking lots abutting a low density residential development. Such screening shall be six feet in height, and shall consist of a wall of brick, stone, or other substantial material, or a densely planted evergreen hedge and chain link fence.

2) The review body may require non-sight-obscuring screening and/or fencing of parking lots abutting property lines, front yards abutting a public street, or other yards abutting a low density residential development.

Response: The trash enclosure and collection areas are proposed to be screened from view with six foot tall CMU wall. No other outdoor storage area is proposed and there are no low density residential developments adjacent to the site. Please refer to the attached Architectural Plans for details on proposed screening.

N) Off-Street Parking Requirements. Off-street parking shall be provided in accordance with the standards in Chapter 18.145 CMC, as adjusted by the following provisions:

1) Off-Street Parking.

a) Resident. One covered parking space shall be provided for each dwelling unit either on the individual lot or in an off-street parking bay within 100 feet from the lot being served.

Response: Under the state of Oregon's Climate Friendly and Equitable Communities, covered parking can not be required. Therefore, the above standard does not apply to this application. Please see the attached Site Plan (Sheet C200) for location and number of proposed off-street parking.

b) Storage of Recreational Vehicles. Recreational vehicles, such as camping trailers, boats, campers, motor homes, and other such vehicles shall only be parked or stored within an area fully on private property, and shall not be located in the public right-of-way.

Response: No storage of recreational vehicles will be located within the public right-of-way with this project. The development is providing adequate off-street parking spaces for residents of the development to park their personal vehicles.

2) Paving and Design. Off-street parking and maneuvering areas shall be paved with asphalt or concrete and designed in accordance with the standards of the off-street parking regulations of Chapter 18.145 CMC.

Response: All off-street parking and vehicle drive aisles/maneuvering areas are proposed to be paved with asphalt and meet all applicable standards of Chapter 18.145. Please see the attached Site Plan (Sheet C200) and the responses to Chapter 18.145 within this narrative for details on compliance.

3) Parking Lot Landscaping. For multi-family developments with five or more units, and all commercial development, there shall be a five-foot landscaped buffer at the perimeter of all

parking lot areas. Parking lots shall be designed and landscaped so as to break up large paved areas with landscaped islands, such as every 10 spaces. See CMC 18.145.050.

Response: As part of the parking lot and site landscaping, a five foot wide landscape strip is proposed between the buildings and the parking lot sidewalk. Where sidewalks are not directly adjacent to the parking lot, the five foot landscape strip is directly next to the parking areas. Additionally, a maximum of 10 parking spaces are located before a landscape island breaks up the spaces. Please see the attached Landscape Plan (Sheets L100 to L105) for details on proposed parking lot landscaping.

4) *Parking Lot Location. For multi-family developments with five or more units, off-street parking areas shall be located to the side or rear of individual lots and/or buildings. No parking areas shall be located between the front of a building and a public street or primary access road.*

Response: All off-street parking is located internal to the site and behind the proposed residential buildings. There is no parking proposed within a front setback or between the front of a building and the public right-of-way. Please see the attached Site Plan (Sheet C200) for details.

O) *On each home site, or on each individual dwelling within a complex, an address number of the home shall be provided in a manner that is clearly visible from the street, as approved by the fire department.*

Response: Addresses will be provided on each building and individual dwelling unit.

SECTION 18.75.070 PARKING AND ACCESS

Response: The proposed multi-family residential development has ground floor residential uses. Therefore, compliance with Section 18.75.065 takes the place of this section of the code. Please see the responses within Section 065 of this chapter for details on compliance with applicable development requirements.

CHAPTER 18.100: SITE DESIGN REVIEW

SECTION 18.100.040: APPROVAL CRITERIA

In addition to the other requirements of the zoning code and other city ordinances, a project submitted for design review shall comply with the standards and criteria in subsections (A) and (B) of this section; all applications for a sign permit subject to the provisions of the sign code, Chapter 18.175 CMC, inclusive, shall comply with the rules and regulations of the committee adopted under the provisions of Division III of this title and other applicable provisions of the Cornelius Municipal Code.

Response: The proposed development requires a Design Review and, therefore, the approval criteria in Section 18.100.040 are required to be met. Please see below for details on compliance with each approval criteria.

A) *Technical Standards. Where applicable, required off-site improvements shall be based on proportional analysis.*

1) *Facilities and Services. The public and private facilities and services provided by the development are adequate as to location, size, design and timing of construction in order to serve the residents or establishments to be accommodated and meet city standards and the policies and requirements of the comprehensive plan. The service provider is presumed correct in the evidence which they submit;*

Response: All facilities and services, including transportation improvements, water and sanitary sewer connections, stormwater detention facilities, fire access and connections, and others have been designed by a licensed and professional engineer in close coordination with the City and service providers to ensure adequate service to the site. Please see the attached Utility Plans (Sheets C400 to C404) for details on facilities and services provided with the development.

2) *Traffic Generation. Based on anticipated vehicular and pedestrian traffic generation and the standards and policies of the comprehensive plan, adequate right-of-way and improvements to streets, pedestrian ways, bikeways, transitways and other ways are provided by the development in order to promote safety, reduce congestion, conserve energy and resources, and encourage transit use, bicycling and walking. Consideration shall be given to the need for constructing, widening and/or improving, to the standards of the comprehensive plan and this code, public streets, bicycle, pedestrian, and other ways in the area of the proposed development impacted by the proposed development. This shall include, but not be limited to, improvements to the right-of-way, such as installation of lighting, signalization, turn lanes, median and parking strips, traffic islands, paving, curbs and gutters, sidewalks, bikeways, transit facilities, street drainage facilities, traffic calming devices, and other facilities needed because of anticipated vehicular, transit, bicycle, and pedestrian traffic generation. Access and street design shall comply with the standards identified in Chapter 18.143 CMC, Transportation Facilities, and Chapter 5 of the adopted public works standards. Street trees shall be installed to the standards identified in Chapter 5 of the adopted public works standards. In lieu of actual construction of off-site improvements, the committee may accept written waivers of remonstrance to the formation of local improvement districts for the purpose of providing the needed off-site improvements or cash payment to the city in an amount equal to the estimated cost of said off-site improvements;*

Response: Improvements are proposed within the rights-of-way on Davis Street and 26th Avenue have been designed to adequately serve the site and surrounding neighborhood based on anticipated vehicular and pedestrian traffic. The typical sections of each street comply with the improvements outlined in the City of Cornelius Transportation Systems Plan, and include vehicle travel lanes, landscape strips, and pedestrian sidewalks. Stormwater facilities and drainage will also be installed where needed. Please see the attached Site Plan (Sheet C200) and utility plans for details.

3) *Dedication. Adequate dedication or reservation of real property for public use, as well as easements and right of entry for construction, maintenance and future expansion of public facilities and services, shall be required to protect the public from any potentially deleterious effects resulting from the proposed use to fulfill the need for additional, improved services, whether on or off site, created by the proposed use, and to effect the implementation of the standards and policies of the comprehensive plan;*

Response: As part of the project, the applicant is dedicating 42 feet of right-of-way on the northern property line for the construction of Davis Street and an additional 10 feet of right-of-way dedication on 26th Avenue. All of the land dedicated is for the construction and maintenance of public facilities and services. Please see the attached Site Plan (Sheet C200) for details on right-of-way dedication.

4) *Internal Circulation. There is a safe and efficient circulation pattern within the boundaries of the site. Consideration shall include the layout of the site with respect to the location, number, design and dimensions of vehicular, transit, and pedestrian access, exits, drives, walkways, bikeways, transit stop s and facilities, building location and entrances, emergency equipment ways and other related on-site or off-site facilities so that there are adequate off-street parking and loading/unloading facilities provided in a safe, well designed and efficient manner. Consideration shall include the layout of parking, storage of all types of vehicles and trailers, shared parking lots and common driveways, garbage collection and storage points, as well as the surfacing, lighting, screening, landscaping, concealing and other treatment of the same. Developments shall provide a safe and reasonably direct pedestrian connection from the main entrance to the public right-of-way and/or the pedestrian system or both. The pedestrian connection shall be reasonably free of hazards from automobile traffic, so as to help encourage pedestrian and bicycle travel;*

Response: Safe and efficient internal circulation for both pedestrians and vehicles is provided as part of the development. This includes drive aisles and off-street parking complying with the standards of Chapter 18.145 and pedestrian pathways and crossings meeting all applicable design requirements. Pedestrian pathways are provided across the development site, running both north-south and east-west to allow safe crossing of vehicle drive aisles and visibility for cars driving through the site. Please see the attached Site Plan (Sheet C200) and the Pedestrian Circulation Exhibit for details on internal circulation provided.

5) *Maintenance of Private Facilities. Adequate means are provided to ensure continued maintenance and necessary normal replacement of private common facilities and areas, drainage ditches, streets and other ways, structures, recreation facilities, landscaping, fill and excavation areas, screening and fencing, ground cover, garbage storage areas and other facilities not subject to periodic maintenance by the city or other public agency. Materials, including wastes, shall be stored and managed, and grounds shall be maintained in a manner that will not attract or aid in the propagation of insects or rodents or cause a health hazard;*
6) *Public Facilities. The structures and public facilities and services serving the site are designed and constructed in accordance with adopted codes and/or city standards at a level which will provide adequate fire protection and protection from crime and accident, as well as protection from hazardous conditions due to inadequate, substandard or ill-designed development;*

Response: The property owner will maintain the entire project site, including private common facilities and landscape areas as well as public improvement and rights-of-way, to ensure usability and normal service for residents.

7) *Security. Adequate facilities shall be provided to prevent unauthorized entries to the property, facilitate the response of emergency personnel, and optimize fire protection for the building and its occupants. Adequate facilities may include, but not be limited to, the use of lighted house numbers and a project directory for multi-unit dwelling development;*

Response: The entire site will be fenced in and gated at the two driveways to prevent unauthorized entries to the property. Additionally, outdoor areas and building entrances will be well it to provide safe circulation for residents and visitors.

8) *Grading. The grading and contouring of the site takes place and site surface drainage and on-site storage of surface waters facilities are constructed so there is no adverse effect on neighboring properties, public rights-of-way or the public storm drainage system and that said site development work will take place in accordance with the city site development code;*

Response: The entire site will be graded to ensure adequate site surface drainage to the stormwater system and detention facility on-site. Please see the attached Utility Plans (Sheets C400 to C404) for details.

9) *Utilities. Prior to the development of a site, utilities shall be extended to serve the site or financially secured for extension to serve the site. Connection to city utilities shall be required prior to final inspection and occupancy. Electric, telephone, and other utility services to new development shall be located underground. New utilities for redeveloped parcels shall be located underground from the right-of-way to the redeveloped parcels;*

Response: All necessary utilities have been designed to extend and fully serve the development site. With the construction of Davis Street, stormwater and water will be put into the public street and connected to the site. Sanitary and additional stormwater is proposed to be extended from 26th Avenue and fire connection from Davis Street. Please see the attached Utility Plans (Sheet C400 to C404) for details on all proposed utilities.

10) *Accessibility. Access and facilities for physically handicapped people are incorporated into the site and building design with particular attention to providing continuous, uninterrupted access routes;*

Response: The site has been designed by a licensed and professional architect to incorporate elements to allow for accessible access and circulation on site. Theis includes curb cramps at pedestrian pathway corners and crossings, pathway width to allow for multi-modal access, and appropriate grading that is not too steep. Routes and wayfinding around the site is extensive to provide circulation of all residents and visitors. Please see the attached Site Plan (Sheet C200) for details.

11) *Bicycle Lanes and Sidewalks. Where street improvements on arterials and collectors are required as a condition of development approval, they shall include bicycle lanes or off-street multi-modal pathways, and sidewalks constructed in accordance with city standards.*

Response: The applicant proposes to construct a 12 foot wide multi-use path on Davis Street to provide pedestrian and bicycle travel lanes. North 26th Avenue is proposed to have a new six foot wide sidewalk along the property frontage. Please see the attached Typical Sections (Sheet C802) for details.

B) Nonresidential Design Standards. […]

Response: There are no non-residential uses proposed with this project. Therefore, Standard (B) does not apply, and the code language has been omitted from this narrative.

SECTION 18.100.050: SPECIAL CONDITIONS

A) Open Space, Parks and Recreation Areas. Major residential developments, 20 units or more, shall include park and recreation areas, or both. In all multi-family projects, the required park and recreation area shall include a children's play area and play equipment for the use of residents and occupants of the multi-

family project. The community development director shall have the power to approve plans for these recreation areas.

Response: As a multi-family residential project with more than 20 units, open space, parks, and recreation have been incorporated into the overall design of the site. This includes a children's play area, community pool, dog park, and community garden. Please see the attached Landscape Plans (Sheets L100 to L105) for details.

B) Objectionable Uses. Odor, dust, smoke, fumes, noise, glare, heat, and vibration from commercial and industrial uses, or both, which might create a nuisance or be offensive to other uses in the area or be incompatible with such other uses shall be adequately eliminated or controlled by authorized measures.

Response: The proposed residential use does not have any anticipated odor, dust, smoke, fumes, noise, glare, heat or vibrations as a result of the development.

SECTION 18.100.070: RESIDENTIAL DESIGN REQUIREMENTS

A) Each detached single-dwelling unit (site built, manufactured, and prefabricated dwellings on individual lots) and middle housing type must incorporate a minimum of three of the following design features: […]

Response: The standards of Section 18.100.070 only apply to detached single-dwelling units and middle housing. The proposed development includes multi-family dwelling units and, therefore, the above standards do not apply to this project.

CHAPTER 18.143: TRANSPORTATION FACILITIES

SECTION 18.143.020: GENERAL PROVISIONS

A) All transportation facilities shall be designed and improved in accordance with the standards of this code and the adopted Cornelius public works standards. In addition, when development abuts or impacts a transportation facility under the jurisdiction of one or more other governmental agencies, the city shall condition the development to obtain permits required by the other agencies.

B) In order to protect the public from potentially adverse impacts of the proposal, to fulfill an identified need for public services related to the development, or both, development shall provide traffic capacity, traffic safety, and transportation improvements in proportion to the identified impacts of the development.

Response: Both Davis Street and 26th Avenue have transportation improvements proposed with this application in accordance with all applicable public works standards and in proportion to the private development. Please see the attached Typical Sections (Sheet C802) and Roadway Plan & Profiles (Sheets C810 to C818) for details on transportation facility design and improvements.

C) For applications that meet the threshold criteria of CMC 18.143.030(B), Analysis Threshold, this analysis or limited elements thereof may be required.

Response: The proposed development meets the threshold criteria of Standard 18.143.030(B) and is therefore required to provide a traffic impact analysis.

D) The decision-making authority may impose development conditions of approval per this title. Conditions of approval may be based on the traffic impact analysis.

Response: The applicant understands that the decision making authority may impose development conditions of approval.

E) Dedication of rights-of-way shall be determined by the decision-making authority.

Response: The property owner understands right-of-way dedication is determined by the decision making authority. With this application, the property owner is dedicating 42 feet of right-of-way on the northern property line to construct Davis Street, and an additional 10 feet of right-of-way on the eastern property line to expand public facilities on 26th Avenue. Please see the attached Site Plan (Sheet C200) for details on proposed dedication.

F) Traffic calming may be approved or required by the decision-making authority in a design of the proposed and/or existing streets within the area of influence or any additional locations identified by the city engineer. Traffic calming measures shall be designed to city standards.

Response: There are no additional traffic calming measures proposed with the street design.

G) Intersection performance shall be determined using the Highway Capacity Manual, Sixth Edition, published by the Transportation Research Board. The city engineer may approve a different intersection analysis method prior to use when the different method can be justified. Terms used in this subsection are defined in the Highway Capacity Manual, Sixth Edition.

H) City street intersections shall maintain a level of service (LOS) of "D" during the p.m. peak hour of the day. An LOS of "E" may be accepted for local street approaches or driveway access points that intersect with collector or arterial streets, if these intersections are found to operate safely.

Response: The TIA provided by Lancaster Mobley addresses both intersection performance and levels of service using current and appropriate manuals and sources. Please see the attached analysis for details.

SECTION 18.143.030: TRAFFIC IMPACT ANALYSIS

For each development proposal that exceeds the analysis threshold of subsection (B) of this section, the application for land use or design review approval shall include a traffic impact analysis as required by this code. The traffic impact analysis shall be based on the type and intensity of the proposed land use change or development and its estimated level of impact to the existing and future local and regional transportation systems.

A) Engineer Certification. The traffic impact analysis shall be prepared and certified by a traffic engineer or civil engineer licensed in the state of Oregon.

B) Analysis Threshold. A traffic impact analysis is required when the proposed land use change or development will generate 200 vehicles or more per day (vpd) in average weekday trips as determined by the city engineer.

C) A traffic impact analysis or some elements of a traffic impact analysis may be required when projects that generate less than 200 average daily vehicle trips and the volume threshold under subsection (B) of this section is not met, but the city engineer finds that the traffic impacts attributable to the development have the potential to significantly impact the safe and efficient operation of the existing public transportation system.

Response: The proposed project will generate more than 200 vehicle trips a day and is therefore required to provide a traffic impact analysis with the submittal package. A TIA has been provided by a certified engineer at Lancaster Mobley that complies with all analysis elements outlined in this section.

D) Study Area. The traffic impact analysis shall evaluate the area of influence of the proposed development and all segments of the surrounding transportation system where users are likely to experience a change in the quality of traffic flow. At a minimum, the analysis will consider all road segments, access points, and intersections within the influence area. The city engineer may identify additional locations for study if existing traffic operation, safety, or performance is marginal or substandard. Prior to report preparation, the applicant shall submit the proposed scope and analysis assumptions of the traffic impact analysis. The city engineer shall determine whether the scope and analysis assumptions are adequate.

E) Traffic impact analysis shall be based on the type and intensity of proposed land use change or development and its estimated level of impact to the existing and future local and regional transportation systems. […]

Response: The traffic impact analysis has been provided by Lancaster Mobley and a professional civil engineer to include a relevant study area and all of the information outlined in Standard (E) above, including traffic forecasting, trip generation, trip distribution, performance analysis and other relevant information. The City Engineer found the scope, assumptions, and findings to be adequate. Please see the attached TIA for details.

SECTION 18.143.040: STREET DESIGN CROSS-SECTIONS PER TRANSPORTATION SYSTEM PLAN

Street cross-sections include the right-of-way, paved section, sidewalk and planter strip widths. The functional classification of a street as designated in the transportation system plan shall determine its design and width. Identification of functional classifications for streets in the city limits is found in the adopted Cornelius transportation system plan. Street design standards, which are based on functional classification and use, are found in the adopted Cornelius public works standards. Full street connections shall be provided at intervals consistent with the adopted Cornelius public works standards for the identified street classification, except as modified by Chapter 18.115 CMC, or where prevented by topography, barriers such as railroads or freeways, or environmental constraints such as major streams and rivers.

A) Deviations to Adopted Street Cross-Sections. A deviation from the adopted street cross-sections and/or widths or both shall require demonstration of a hardship or other exceptional circumstances resulting from conditions of the property. Hardship or exceptional circumstances may include, but are not limited to, unique topographic conditions, environmental protection requirements, and existing development and buildings. A request for a deviation shall comply with this title and, where applicable, the transportation planning rule (TPR).

Response: Both of the adjacent streets – Davis Street and 26th Avenue – are classified as collectors on the Cornelius Transportation System Plan. With the proposed development, both streets are proposed to be improved to the standards of their functional classification as shown in the Cornelius Public Works Standards manual. This includes minimum 10 foot wide travel lanes and a six foot wide sidewalk (or 12 foot multi-use path). Please see the attached Typical Sections (Sheet C802) for details on street design and cross sections.

SECTION 18.143.050: ACCESS STANDARDS

Access standards establish requirements and regulations for safe and efficient vehicle access to and from a site and enhance general circulation within a site.

A) Access Spacing. Access spacing shall be designed in conformance with the adopted Cornelius public works standards.

1) Access spacing for all state facilities shall be coordinated with the Oregon Department of Transportation (ODOT).

Response: All access spacing standards are met with the new public street and the private driveways for access to the development. These driveways are located over 100 feet from public street intersections, complying with the Cornelius Public Works Standards. Please see the attached Site Plan (Sheet C200) for details on access spacing.

B) An access report shall be submitted with all new development and/or redevelopment proposals that demonstrates the street/driveway is safe as designed and meets adequate stacking, site distance, deceleration distance, on-site circulation and deceleration requirements as set by the city, American Association of State Highway and Transportation Officials (AASHTO), and relevant agencies.

Response: The site plan has been designed by a licensed and professional engineer to comply with all applicable City design standards for streets and driveways. Between the City Engineer and the TIA provided by Lancaster Mobley, no additional information on transportation or access is required. Please see the responses within this narrative on Transportation Facility (Chapter 18.143) standards, as well as the attached TIA.

C) Driveway/Access Points. The location and number of driveways or access points have a direct effect on safe and efficient traffic flow. The following access management standards shall apply toward new driveways:

1) Driveway spacing shall be designed in accordance with adopted public works standards. In some cases, driveway setbacks may be greater than the standard depending upon the influence area, as determined by city engineer review of a traffic impact report submitted by the applicant's traffic engineer. If the subject property has less than 150 feet of street frontage, the applicant shall first investigate a shared access as an option. If a shared access is not possible, the driveway shall be placed as far from the intersection as possible.

Response: The project site has been designed by a professional and licensed engineer to comply with all applicable public works standards. This includes driveway spacing along Davis Street and 26th Avenue, where the driveways are located over 100 feet from another driveway or intersection. Please see the attached Site Plan (Sheet C200) for details on the development site layout.

2) Based on the applicants' proposal and its compliance with the comprehensive plan, transportation system plan and the development and zoning code, the city shall require the closing or consolidation of existing driveways or other vehicle access points, the recording of reciprocal access easements (i.e., for shared driveways), and installation of traffic control devices or other measures as a condition of approval to mitigate the impacts of the development.

Response: There are two existing driveways on 26th Avenue that access the industrial use currently occupying the project site. With the proposed development, these two driveways will be closed and the residential development will construction two new driveways – one on Davis Street and one on 26th Avenue. Please see the attached Site Plan (Sheet C200) for details on the development site layout.

3) *New developments shall provide cross-over easements to ensure potential shared driveway access points where existing conditions (i.e., surrounding land uses, lot configurations, physical characteristics, etc.) warrant consideration.*

Response: The proposed development includes providing a shared access easement to be utilized by the southern parcel for potential future access from 26th Avenue. Please see the attached Site Plan for details on exact location of this easement.

4) *Access to arterials shall only be from public streets. When a site that has private access onto a principal arterial is redeveloped, the private access shall be eliminated if alternate access exists or can be developed to the site.*

Response: The project site abuts Davis Street and 26th Avenue, both classified as collectors in the Cornelius Transportation Systems Plan. Therefore, the above standard does not apply to this project.

5) *Direct access to a collector street shall only be considered if there is no alternative way to access the site. If direct access is permitted by the city, the applicant shall be required to mitigate for any safety or neighborhood traffic management impacts deemed applicable by the city engineer. In no case shall the design of driveways, drive aisles or service drives require or encourage the backward movement or other maneuvering of a vehicle within a street, except for single-family and duplex residences.*

Response: The only two streets adjacent to the project site and available for access are classified as collectors, and there is no alternative way to access the site from the public right-of-way. These two driveways have been designed to ensure safety of pedestrian and vehicular traffic by meeting driveway aisle width requirements, sight distance and clear vision clearance, and other public works standards.

6) *Proposed shared-use paths shall be located to provide access to existing or planned commercial services and other neighborhood facilities, such as schools, shopping areas and park and transit facilities. To the greatest extent possible, access shall be reasonably direct, providing a route or routes that do not deviate unnecessarily from a straight line or that do not involve a significant amount of out-of-direction travel.*

Response: There are no shared use paths outside of the public right-of-way proposed with this application.

SECTION 18.143.060: TRANSIT SUPPORTIVE AMENITIES

Response: Section 18.143.060 only applies to new commercial, industrial, and institutional buildings. Therefore, as a residential development the standards of this section do not apply and the code language has been omitted from this narrative.

CHAPTER 18.145: OFF-STREET PARKING AND LOADING

SECTION 18.1435.010: GENERAL PROVISIONS

A) *The provision and maintenance of off-street parking and loading spaces are continuing obligations of the property owner. No building or other permit shall be issued until plans are presented that show property that is and will remain available for exclusive use as off-street parking and loading space as required by*

this title. The subsequent use of property for which the building permit is issued shall be conditional upon the unqualified continuance and availability of the amount of parking and loading space required for the specific use. Use of property in violation of the off-street parking and loading requirements located herein shall be a violation of this code. Should the owner or occupant of a lot or building change the use to which the lot or building is put, thereby increasing off-street parking or loading requirements, it shall be a violation of this code to begin or maintain the altered use until the required increase in off-street parking or loading is provided, except as provided in the central mixed use (CMU) and corridor commercial (CC) zoning districts (see CMC 18.145.020(C)).

Response: An off-street parking lot is provided with the proposed multi-family development, and will be maintained by the property owner to ensure safe and efficient operation and use of the facility. This parking lot has been designed to comply with all applicable provisions of Chapter 18.145 and specifically for use of the residential apartments proposed.

B) Unless otherwise provided, required parking and loading spaces shall not be located in a required yard.

Response: All off-street parking is proposed outside of all required setbacks. Please see the attached Site Plan (Sheet C200) for details on the development site layout.

C) Owners of two or more uses, structures, or parcels of land may agree to utilize jointly the same parking and loading spaces when the hours of operation do not overlap; provided, that satisfactory legal evidence is presented to the community development director in the form of deeds, leases, or contracts to establish the joint use.

Response: All off-street parking is for the proposed residential use, and no shared parking is proposed at this time.

D) A plan drawn to scale, indicating how the off-street parking and loading requirement is to be fulfilled, shall accompany the request for a building permit, site plan review, or certificate of occupancy. The plan shall show all those elements necessary to indicate that these requirements are being fulfilled and shall include but not be limited to:

1) Delineation of individual parking and loading spaces and their dimensions;
2) Circulation area necessary to serve spaces;
3) Access to streets, alleys and properties to be served;
4) Curb cuts;
5) Location and dimensions of all landscaping, including the type and size of plant material to be used, as well as any other nonliving landscape material incorporated into the overall plan, excluding single- and two-family residences and multi-family uses with not more than four units in the core residential zone; and
6) Specifications as to signs and bumper guards, excluding single- and two-family residences and multi-family uses with not more than four units in the core residential zone.

Response: The attached Site Plan (Sheet C200) shows all off-street parking, including striping, circulation, driveway location and access, curbs, landscaping, and number and types of parking spaces provided. Please refer to the Civil Plan Set for details on the above information.

E) Requirements for types of buildings and uses not specifically listed herein shall be determined by the community development director, based upon the requirements of comparable uses listed.

Response: Multi-family residential is a use listed within the code in Table 18.145.030-1. Please see that section of this narrative for details on compliance.

SECTION 18.145.020: OFF-STREET PARKING

A) At the time of erection of a new structure or at the time of enlargement or change in use of an existing structure within any zone in the city, off-street parking spaces shall be provided in accordance with CMC 18.145.030. If parking space has been provided in connection with an existing use or is added to an existing use, the parking space shall not be eliminated if elimination would result in less space than is specified in the standards of this section when applied to the entire use. In cases of enlargement of a building or use of land existing on the effective date of the ordinance codified in this title, the number of parking spaces required shall be based only on floor area or capacity of such enlargement.

Response: The off-street parking is proposed to be permitted and constructed at the same time as the residential buildings and other site improvements in accordance with Section 18.145.030 of the Cornelius Municipal Code. No existing parking or uses currently occupying the site are proposed to be kept with the new development.

B) Where square feet are specified, the area measured shall be the gross floor area primary to the functioning of the particular use of the property but shall exclude space devoted to off-street parking or loading. Where employees are specified, persons counted shall be those working on the premises during the largest shift at the peak season, including proprietors.

Response: Required off-street parking for multi-family residential uses is based on the number of units, not the gross floor area or number of employees. Therefore, the above standard does not apply to this project.

C) In the central mixed use and corridor commercial zoning districts, change of use of an existing commercial structure will not require additional parking to be constructed. However, construction of a new building or addition to an existing building will require the provision of off-street parking as required in CMC 18.145.030.

Response: The project site is zoned Gateway Mixed use, not central mixed use or corridor commercial. Therefore, the above standard does not apply to this project.

D) If several uses occupy a single structure or parcel of land, the total requirements for off-street parking shall be the sum of the requirements of the several uses computed separately with a reduction of 10 percent to account for cross-patronage and shared parking benefits. Where the peak hours of operation of two or more uses do not substantially overlap, such uses may share off-street parking spaces as required by this title.

Response: The only use proposed on the project site is multi-family residential. Therefore, the above standard does not apply to this project.

E) Parking spaces in public streets or alleys shall not be eligible as fulfilling any part of the parking requirements, except as allowed in the central mixed use and core commercial zoning districts.

Response: There are no proposed parking spaces on the public streets or alleys adjacent to the project site. All parking is provided in an off-street parking lot.

F) Required parking spaces shall be available for the parking of operable motor vehicles for residents, customers, patrons, and employees only, and shall not be used for the storage or sale of vehicles or other materials and shall not be rented, leased or assigned to any other person or organization not using or being directly served by the use.

Response: All off-street parking provided is for the use of residents, employees, and visitors to the site. No storage or sale of vehicles will be allowed on site nor will any of the paces be rented or leased.

G) Off-street parking spaces for dwellings shall be located on the same lot with the dwelling, unless specified elsewhere in the code.

Response: All of the proposed off-street parking is located on the same lot as the proposed residential units. No off-site parking is included with this application.

SECTION 18.145.030: REQUIRED OFF-STREET PARKING SPACES

A) Off-street parking shall be provided based on the primary use of the site according to the following standards and regardless of the parking zone in which the use is located (see Map 1 following this chapter).

Table 1
Minimum and Maximum Required Off-Street Vehicle and Bicycle Parking Requirements
(unless otherwise noted, standard is per 1,000 sf of gross floor area)

Land Use	Minimum Parking Standards	Maximum Parking Standards		Minimum Bicycle Parking Standards
		Zone A	Zone B	
RESIDENTIAL				
Detached Single Dwelling Units	1.0/DU	none	none	none
Middle Housing	1.0/DU	none	none	none
Multi-Unit Dwellings	1.0/DU	none	none	1.0/2 DUs except elderly, which is 1.0/20 DUs
Manufactured Units	1.0/DU	none	none	none
Mobile Home Parks	1.0/DU	none	none	none

Response: Based on Table 1, the proposed multi-unit apartment building is required to have a minimum of 1 space per dwelling unit. The development has 240 residential units and is proposing a total of 426 parking spaces in the off-street parking lot. Of these 426, 24 spaces will be compact and 10 will be accessible parking spaces. Please see the attached Site Plan (Sheet C200) for details on off-street parking provided.

SECTION 18.145.040: OFF-STREET LOADING

A) Buildings and structures to be built or substantially altered which received and distribute material or merchandise by truck shall provide and maintain off-street loading spaces as follows: […]

Response: The proposed development is a residential use, and there is no need to provide loading spaces since the use will not regularly receive materials or merchandise by truck. No off-street loading space is provided on site.

B) Passengers. A driveway designed for continuous forward flow of passenger vehicles for the purpose of loading and unloading children shall be located on the site of any school having a capacity greater than 25 students.

Response: The proposed development is not a school. Therefore, passenger loading is not required to be provided.

C) Merchandise, Materials or Supplies. Buildings or structures to be built or substantially altered which receive and distribute material or merchandise by truck shall provide and maintain off-street loading berths in sufficient numbers and size to adequately handle the needs of the particular use. If loading space has been provided in connection with an existing use or is added to an existing use, the loading space shall not be eliminated if elimination would result in less space than is required to adequately handle the needs of the particular use.

Response: The proposed development is a residential use, and there is no need to provide loading spaces since the use will not regularly receive materials or merchandise by truck. No off-street loading space is provided on site.

D) Any area to be used for the maneuvering of delivery vehicles and the unloading or loading of materials shall be separated from designated off-street parking areas and appropriately designed to prevent the encroachment of delivery vehicles into off-street parking areas or into a public street.

Response: No off-street loading space is provided with the proposed development. Therefore, the above standard does not apply to this project.

E) The facilities review committee may modify the off-street loading requirements as they apply to any individual case only for good cause shown, and it shall set reasonable safeguards and conditions to ensure that any such modification conforms to the intent of this title. Modification may be granted if it is demonstrated to the satisfaction of the committee that loading operations of the use or structure in question will not interfere with pedestrian or vehicular traffic on a public street.

Response: The applicant is not proposing any off-street loading since it is not anticipated to be needed for a residential use. Truck loading zones is not a normal amenity provided on residential sites since the use does not regularly receive large deliveries of materials or merchandise.

F) Exceptions and Adjustments. Loading areas within a street right-of-way within the Cornelius Town Center may be approved when all of the following conditions are met: […]

Response: No loading is proposed within the street right-of-way. Therefore, the above standard does not apply to this application and the remaining code language has been omitted.

SECTION 18.145.050: DESIGN AND MAINTENANCE STANDARDS FOR OFF-STREET PARKING AND LOADING FACILITIES

A) Except as otherwise defined in this code, "one standard parking space" means a minimum of a parking stall of nine feet in width and 20 feet in length. To accommodate compact cars more efficiently, up to 25 percent of the available parking spaces may have a minimum dimension of eight feet in width and 16 feet in length, so long as they are identified as compact car stalls and are not readily accessible to large cars.

Response: Of the 426 parking spaces proposed on the project site, 392 of them are standard nine foot by 20 foot parking spaces. Only 6% (or 24) of the parking spaces are proposed to be compact with a dimension of eight feet by 20 feet. Please see the attached Site Plan (Sheet C200) for details on parking stall dimensions.

B) Excluding detached single-unit dwellings and middle housing residences, groups of two or more parking spaces shall be served by a service drive so that no backing movements or other maneuvering within a street or other public right-of-way would be required.

Response: All off-street parking spaces proposed on the development site will be accessed via the on-site circulation system. Backing up from the spaces will occur on vehicle drive aisles, not a public street or public right-of-way. Please see the attached Site Plan (Sheet C200) for details on parking lot layout.

C) Service drives shall be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress consistent with CMC 18.150.070, and maximum safety of pedestrians and vehicular traffic on the site.

Response: The parking lot drive aisles have been designed to facilitate traffic in and around the site, meeting required aisle widths and turn radius for fire trucks. All applicable standards of Section 18.150.070 (Clear Vision Zones) are met with the proposed parking lot design, as well as the standards of Chapter 18.145. Please see the responses within this narrative for details, as well as the attached Civil Plan Set.

D) Each parking and/or loading space shall be accessible from a street and the access shall be of a width and location as described in this section.

E) Parking space configuration, stall and access aisles shall be of sufficient width for all vehicles turning and maneuvering.

Response: All of the parking spaces on the project site are accessible from drive aisles that then access the public street via a driveway. The width of the driveways and internal drive aisles are 24 feet to 26 feet, meeting the width requirements of this section. Individual Parking spaces meet either the standard dimensional requirements or the compact dimensional requirements outlined above. Please see the attached Site Plan (Sheets C200 to C213) for details.

F) Except for detached, single-unit dwellings and middle housing residences, any area intended to be used to meet the off-street parking requirements as contained in this title shall have all parking spaces clearly marked using a permanent paint. All interior drives and access aisles shall be clearly marked and signed to show direction of flow and maintain vehicular and pedestrian safety.

Response: All of the parking spaces proposed with the off-street parking lot will be clearly marked with permanent paint and the drive aisles will be marked to show direction of traffic flow. Please see the attached Site Plan (Sheets C200 to C213) for details.

G) Except for detached, single-unit dwellings and middle housing residences, all areas used for the parking and/or storage and/or maneuvering of any vehicle, boat and/or trailer shall be improved with asphalt or concrete surfaces according to the same standards required for the construction and acceptance of city streets. Off-street parking spaces for residential development with not more than four units in the core residential zone shall be improved with an asphalt or concrete surface to specification as approved by the building official.

Response: The entire off-street parking lot and vehicle maneuvering areas are proposed to be improved with asphalt and have been designed by a processional and licensed civil engineer to meet all applicable design and construction standards of the City of Cornelius. Please see the attached Site Plan (Sheets C200 to C213) for details.

H) Parking spaces along the outer boundaries of a parking lot or adjacent to interior landscaped areas or sidewalks shall be provided with a wheel stop at least four inches high located three feet back from the front of the parking stall. The facilities and design review committee or the planning commission may approve parking spaces without wheel stops, provided the abutting sidewalk is increased by three feet in width and/or the appropriate landscaping is planted where the bumper would overhang.

Response: The exterior spaces of the off-street parking lot have been designed to either have a wheel stop or a six inch curb to prevent any overhanging into landscaping or pedestrian pathways. Please see the attached Site Plan (Sheets C200 to C213) for details.

I) Off-street parking and loading areas shall be drained in accordance with specifications approved by the city engineer.

Response: The entire site, including the off-street parking lot, has been designed with stormwater detention facilities to meet City standards and specifications. Please see the attached Drainage Plan (Sheets C300 to C321) for details on drainage.

J) Artificial lighting on all off-street parking facilities shall be designed to deflect all light away from surrounding residences and so as not to create a hazard to the public use of any road or street.

Response: The lighting provided on site has been chosen and placed to ensure there is no light trespassing or glare on adjacent properties or the public right-of-way. Please see the attached Photometrics Plan and associated Lighting Cut Sheets for details on proposed lighting.

K) Signs which are provided on parking lots for the purpose of meeting this section shall be as prescribed by the building official.

Response: The applicant understands parking lot signage will be prescribed by the building official.

L) All parking lots shall be kept clean and in good repair at all times. Breaks in paved surfaces shall be repaired promptly, and broken or splintered wheel stops shall be replaced so that their function will not be impaired.

Response: The entire site, including the off-street parking lot, will be kept in good repair by the property owner. The site will have maintenance staff to ensure safe and efficient conditions of the parking lot, including any needed surface replacement and repair.

M) Bicycle parking spaces shall be conveniently located with respect to the street, bicycle path/lane and building entrance. Bicycle parking spaces shall not conflict with off-street vehicle parking spaces and drive aisles. There shall be at least 36 inches of clearance between parked bicycles and other obstructions or buildings.

Response: Bicycle parking is required to be provided at the rate of one parking space for every two dwelling units for multi-family housing, resulting in a minimum of 120 bike parking spaces required for this project. A total of 240 bicycle parking spaces are provided within the buildings – one bike parking space is provided within each of the proposed residential units. Please see the attached Architectural Plans for details on exact bike parking location within the units.

1) Short-Term Bicycle Parking. Short-term bicycle parking shall be provided to encourage shoppers, customers, and other visitors to use bicycles by providing a convenient and readily accessible place to park bicycles. […]

Response: All of the proposed bike parking on site is long-term bicycle parking. Please see the response to Standard (M)(2) below for details.

2) Long-Term Bicycle Parking. Long-term bicycle parking provides employees, students, residents, commuters, and others who generally stay at a site for several hours a weather-protected place to park bicycles.

a) A minimum of 50 percent of the bicycle parking spaces shall be provided as long-term bicycle parking in any of the following situations:

i. When 10 percent or more of automobile vehicle parking is covered.

ii. If more than four bicycle parking spaces are required.

iii. Multi-family residential development with nine or more units.

b) Secured bicycle parking facilities shall be provided on site; facilities can include a bicycle storage room, bicycle lockers, covered racks, or other secure storage space inside or outside of the building. Long-term bicycle parking facilities shall be located not more than 75 feet from a building entrance.

Response: Each of the units has a secure, long term bike parking space within the individual units. Please see the attached Architectural Plans for details on exact bike parking location within the units.

SECTION 18.145.060: LANDSCAPING REQUIRED

A) Purpose. The purpose of this section is to improve the appearance of off-street parking and open lot sales and services areas in Cornelius and to protect and preserve the appearance, character, and value of the surrounding neighborhoods and thereby promote the general welfare by providing for installation and maintenance of landscaping for screening, buffering and aesthetic qualities, finding that the particular

characteristics and qualities of Cornelius justify regulations to perpetuate its aesthetic appeal on a city-wide basis. It is also the purpose of this section to allow for increased seepage by providing openings in the impervious surface, increased safety by breaking up large expanses of pavement, and increased shading to reduce overheating of car interiors, and reduce glare and radiation from large numbers of vehicles.

Response: Landscaping is proposed throughout the site, including within and around the off-street parking area. Please see the attached Landscape Plans (Sheets L100 to L105) and the responses within this narrative for details.

B) Minimum Requirements. All areas used for the display and/or parking of any and all types of vehicles, trailers, boats or heavy construction equipment, whether such vehicles traverse the property as a function of the primary use, hereinafter referred to as "other vehicular uses," shall conform to the minimum landscaping requirements provided in this section. Activities that are of a drive-in nature such as, but not limited to, filling stations, grocery and dairy stores, banks, restaurants, and the like shall conform to the minimum landscaping requirements also. The following areas are not required to meet the landscaping standards:

1) Where all of the parking or other vehicular uses are located under, on or within buildings; and

2) Parking areas serving single- and two-family uses and multi-family uses with not more than four units in the core residential zone as normally such residential areas shall not be required to meet.

Response: Landscaping is provided to meet the minimum landscaping requirements of Section 18.145.060. Please see the attached Landscape Plans (Sheets L100 to L105) and the responses within this narrative for details.

C) Installation. All landscaping shall be installed in a sound workmanship-like manner and according to accepted good planting procedures with the quality of plant materials as hereinafter described. All elements of landscaping exclusive of plant material except hedges shall be installed so as to meet all other applicable ordinances and code requirements. Landscaped areas shall require protection from vehicular encroachment as herein provided in CMC 18.145.050(H). The community development director or the building official shall inspect all landscaping and no certificates of occupancy or similar authorization will be issued unless the landscaping meets the requirements herein provided.

D) Maintenance. The owner, tenant and their agent, if any, shall be jointly and severally responsible for the maintenance of all landscaping which shall be maintained in good condition so as to present a healthy, neat and orderly appearance and shall be kept free from refuse and debris. All plant growth in interior landscaped areas shall be controlled by pruning, trimming or otherwise so that:

1) It will not interfere with the maintenance or repair of any public utility;

2) It will not restrict pedestrian or vehicular access; and

3) It will not constitute a traffic hazard because of reduced visibility.

Response: The proposed landscaping will be installed and maintained according to accepted good planting methods and procedures. Please see the attached Landscape Plans (Sheets L100 to L105) for details on installation of plants, trees, ground covering, and other landscape material.

SECTION 18.145.070: PARKING LOT DESIGN STANDARDS

A) Required Landscaping Adjacent to Public Right-of-Way. A strip of land at least five feet in width located between the abutting right-of-way and the off-street parking area or vehicle use area which is exposed to an abutting right-of-way, except in required vision clearance areas as provided in CMC 18.150.070.

B) Perimeter Landscaping Relating to Abutting Properties. On the site of a building or structure or open lot use providing an off-street parking area or other vehicular use area, where such areas will not be entirely screened visually by an intervening building or structure from abutting property, a five-foot landscaped strip shall be between the common lot line and the off-street parking area or other vehicular use area exposed to abutting property.

Response: The parking lot is located interior to the project site, and no portion of the parking lot is adjacent to the public right of way and the parking lot is primarily screened and located behind the residential buildings. However, a five foot landscape strip is proposed to be installed around the perimeter of the development site and can be seen on the attached Landscape Plans (Sheets L100 to L105).

C) Where the boundary of a parking lot in a nonresidential zone adjoins a residential district, a 10-foot landscaped strip shall be provided along the entire length abutting the residential zone, and shall be landscaped with evergreen plant material and maintained at a minimum height of 36 inches.

Response: None of the adjacent properties are zoned residential. Therefore, the above standard does not apply to this project.

D) Parking Area Interior Landscaping. Landscaped islands shall be provided a minimum of every 10 parking spaces with a depth equivalent to the depth of the adjacent parking spaces and a minimum width of six feet to break up large expanses of pavement, improve the appearance and climate of the site, improve safety, and delineate pedestrian walkways and traffic lanes. Except for industrial development within industrial zones, the following interior landscaping shall be met:

1) Sight Distance for Landscaping at Points of Access. When an accessway intersects a public right-of-way or when the subject property abuts the intersection of two or more public rights-of-way, all landscaping within vision clearance areas pursuant to CMC 18.150.070 shall provide unobstructed cross-visibility at a level between three feet and 10 feet above the curb line; provided however, visibility areas shall be allowed, provided they are so located so as not to create a traffic hazard. Landscaping except required grass or ground cover shall not be located closer than three feet from the edge of any accessway pavement.

Response: All landscaping has been designed to avoid impacts to the vision clearance area or obstruction to cross-visibility. The site has been designed by a licensed and professional landscape architect to meet all standards of the Cornelius Municipal Code. Please see the attached Landscape Plan (Sheets L100 to L105) for details.

2) Parking lots that are more than three acres in size shall provide street features along major drive aisles. These features shall include at a minimum curbs, sidewalks and street trees and/or planter strips or both.

Response: The off-street parking lot has been designed to provide curbed pedestrian pathways along the main parking lot drive aisles, as well as five foot wide landscaping planters and parking lot trees. Please see the attached Landscape Plan (Sheets L100 to L105) for details.

3) Access to and from parking spaces/areas shall not permit backing onto a public street and/or a public vehicle travel lane or both, except for single-family or duplex dwellings and multi-family uses with not more than four units in the core residential zone.

Response: All of the off-street parking spaces are accessed from on-site drive aisles and do not require backing up onto a public street. Please see the attached Site Plan (Sheet C200) for details on parking lot layout and design.

SECTION 18.145.080: DRAINAGE OF OFF-STREET PARKING AND LOADING FACILITIES

Off-street parking and loading facilities shall be drained to avoid flow of water across public sidewalks.

Response: The entire site, including the off-street parking lot, has been designed to provide adequate drainage. Please see the attached Grading & Drainage Plans (Sheets C300 to C321) for details.

CHAPTER 18.150: SPECIAL USE STANDARDS

SECTION 18.150.070: CLEAR VISION ZONES

Except in the central mixed use (CMU) zoning district, a clear vision zone shall be maintained on the corners of all property adjacent to the intersection of two streets, a street and a railroad, or a driveway providing vehicular access to a public street.

A) The clear vision zone is defined as the triangular area beginning at the intersection of the projected curb lines, and extending 15 feet along the leg of each intersection. No fence, berm, wall, hedge or other planting or structure shall be placed within the clear vision zone that would impede visibility between a height of 30 inches and 10 feet as measured from the top of curb, or in the absence of a curb, from the established street center line grades. If the relation of the surface of the lot to the streets is such that visibility is already obscured, nothing shall be done to increase the impediment to visibility within the vertical and horizontal limits set forth above. Poles, tree trunks, and similar objects less than 12 inches in width may be allowed in the clear vision zone if they meet the vertical requirements noted above.

B) A private access shall be treated as a public street for the purpose of this section. The edge of the paved surface area of the private access, be it roadway, curb or sidewalk, shall be treated as the curb line in determining the vision clearance zone.

C) The requirements of visibility at intersections in the CMU zoning district shall be determined on a case-by-case basis by the facilities and design review committee in accordance with traffic and transportation engineering standards.

Response: All corners of the project site adjacent to the intersection of streets and/or driveways have been designed by a licensed and professional engineer to comply with all applicable clear vision areas. This includes private and public streets, as well as driveways accessing the site. Please see the attached civil plan set for details.

CHAPTER 18.155: SOLAR ACCESS FOR NEW DEVELOPMENT

SECTION 18.155.020: APPLICABILITY

All development shall be designed throughout to accommodate active and/or passive solar installations to the extent reasonably feasible.

Response: At this time, there are no active or passive solar installations proposed with the multi-family residential development as it is not feasible with the current project. However, the proposed development does not preclude the site from providing solar installations in the future, and the site has the ability to be retrofitted with active and/or passive solar installations. To demonstrate the potential accommodation for solar installation, the

applicant has provided a Shading Plan (Sheet A1.1) that demonstrates shading cast by physical elements on the project site.

SECTION 18.155.030: SOLAR ORIENTED RESIDENTIAL LOTS

At least 65 percent of the lots less than 10,000 square feet in area in single- and two-family residential developments must conform to the definition of a "solar-oriented lot" (see CMC 18.195.190) in order to preserve the potential for solar energy usage.

Response: The project site is over 10,000 square feet (approximately 12.4 acres). Therefore, the above standard does not apply to this development.

SECTION 18.155.040: ACCESS TO SUNSHINE

The elements of the development plan (e.g., buildings, circulation, open space and landscaping) shall be located and designed, to the maximum extent feasible, to protect access to sunshine for planned solar energy systems or for solar-oriented rooftop surfaces that can support a solar collector or collectors capable of providing for the anticipated hot water needs of the buildings in the project between the hours of 9:00 a.m. and 3:00 p.m. PST, on December 21st.

Response: The project site, including building design, circulation, and landscaping) has been designed by a team of professional and licensed engineers, architects, and landscape architects to protect access to sunshine for both on-site open space amenities and potential future solar energy systems. If it is determined in the future that solar energy systems are feasible, the proposed building roofs can be retrofitted. To demonstrate the potential accommodation for solar installation, the applicant has provided a Shading Plan (Sheet A1.1) that demonstrates shading cast by physical elements on the project site.

SECTION 18.155.050: SHADING

A) *The physical elements of the development plan shall be, to the maximum extent feasible, located and designed so as not to cast a shadow onto structures on adjacent property greater than the shadow which would be cast by a 25-foot hypothetical wall located along the property lines of the project between the hours of 9:00 a.m. and 3:00 p.m., PST, on December 21st. This provision shall not apply to structures within the central mixed use (CMU) and corridor commercial (CC) zoning districts.*

Response: The proposed site elements, including the proposed residential buildings, are located on the project site in a way that does not cast shadow on adjacent properties or structures. The property to the west is undeveloped and has no buildings or structures located on site. The property to the north is a self-storage business, and all proposed improvements on the subject property will be located south of the 42 foot proposed right-of-way dedication and an additional 15 feet from the proposed property line, avoiding any excessive shadows on the adjacent property. The property to the west is a movie theater, and is located on the other side of 26th Avenue, also avoiding any excessive shadows. Please see the attached Shading Plan (Sheet A1.1) for details on building location and shading.

B) *The impact of trees shall be evaluated on an individual basis considering the potential impacts of the shading and the potential adverse impacts that the shading could create for the adjacent properties in terms of blocking sunlight in indoor living areas, outdoor activity areas, gardens, and similar spaces benefiting from access to sunlight.*

Response: All of the proposed trees on site are planted to comply with street tree standards, parking lot tree and landscaping standards, or general landscaping coverage standards. There is no anticipated negative impact to the proposed trees on adjacent properties in terms of blocking sunlight. Please see the attached Landscape Plans (Sheets L100 to L301) for details.

I. CONCLUSION

This written statement and the accompanying supporting documents demonstrate compliance with the applicable approval criteria for a Type III Design Review and Property Line Adjustment in the City of Cornelius. Therefore, the applicant respectfully requests that the City approve the application.

Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:

Issuing Agent: First American Title Insurance Company
National Commercial Services
Issuing Office: 200 SW Market Street, Suite 250, Portland, OR 97201
Issuing Office's ALTA® Registry ID: 1153372
Commitment Number: NCS-1229131-OR1
Issuing Office File Number: NCS-1229131-OR1
Property Address: 139 & 273 North 26th Avenue, Cornelius, OR 97113
Revision Number:

Escrow Officer Name: Rene Moody
Escrow Officer Number: (503)795-7600
Escrow Officer Email: rmoody@firstam.com
Escrow Assistant Name: Lisa Smith
Escrow Assistant Number: (503)795-7606
Escrow Assistant Email: lisasmith@firstam.com
Title Officer Name: Emily Collins
Title Officer Number: (503)795-7604
Title Officer Email: ECollins@firstam.com

SCHEDULE A

1. Commitment Date: August 02, 2024 at 8:00 a.m.

2. Policy to be issued:
   a. ALTA® Standard Owner's Policy
      Proposed Insured: Fore Green Development LLC, a Nevada limited liability company
      Proposed Amount of Insurance: $5,000,000.00
      The estate or interest to be insured: See Item 3 below
   b. 2021 ALTA Policy - form(s) To Be Determined
      Proposed Insured: To Be Determined
      Proposed Amount of Insurance: $0.00
      The estate or interest to be insured: See Item 3 below
   c. 2021 ALTA Policy - form(s) To Be Determined
      Proposed Insured: To Be Determined
      Proposed Amount of Insurance: $0.00
      The estate or interest to be insured: See Item 3 below

3. The estate or interest in the Land at the Commitment Date is:

   Fee Simple

4. The Title is, at the Commitment Date, vested in:

   Haney Industrial Properties, Inc., an Oregon corporation

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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5. The Land is described as follows:

See Exhibit A attached hereto and made a part hereof

First American Title Insurance Company

By:

Authorized Signatory

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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Commitment No. NCS-1229131-OR1

SCHEDULE B, PART I—Requirements

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

2. Pay the agreed amount for the estate or interest to be insured.

3. Pay the premiums, fees, and charges for the Policy to the Company.

4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

5. If a proposed mortgage or deed of trust will secure, in whole or in part, construction advances, in order to consider providing coverage against statutory liens for services, labor, or materials arising from construction of improvements or work related to the Land, the Company will require:

    1. Project budget, including hard costs, soft costs, equity contributions, and sources and uses.
    2. An indemnity agreement on a form to be provided, and executed by indemnitor(s) approved, by the Company.
    3. Direct contract(s) with any general contractor(s), including projected schedule for completion of construction.
    4. Draft loan agreement detailing construction advance disbursement controls (or separate disbursement agreement, if applicable) and guaranty/ees.
    5. An appraisal, if lender has required one.

    Upon receipt and review of the foregoing, the Company reserves the right to require additional documentation. The cost for construction lien coverage will vary depending on if we issue up front coverage or incremental coverage:

    1. Full upfront coverage - the cost is $2.50 per thousand of the loan amount in addition to the title insurance policy fee.
    2. Incremental coverage - the cost is $1 per thousand of the loan amount in addition to the title insurance policy fee.

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Commitment No. NCS-1229131-OR1

SCHEDULE B, PART II—Exceptions

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage.

The Policy will not insure against loss or damage resulting from the terms and conditions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

1. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I—Requirements are met.

2. 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.

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

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

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

6. Any lien or right to a lien for services, labor, material or equipment, unless such lien is shown by the Public Records at Date of Policy and not otherwise excepted from coverage herein.

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The exceptions to coverage 2-6 inclusive as set forth above will remain on any subsequently issued Standard Coverage Title Insurance Policy.

In order to remove these exceptions to coverage in the issuance of an Extended Coverage Policy the following items are required to be furnished to the Company; additional exceptions to coverage may be added upon review of such information:

A. Survey or alternative acceptable to the Company
B. Affidavit regarding possession
C. Proof that there is no new construction or remodeling of any improvement located on the Land. In the event of new construction or remodeling the following is required:
   i. Satisfactory evidence that no construction liens will be filed; or
   ii. Adequate security to protect against actual or potential construction liens;
   iii. Payment of additional premiums as required by the Industry Rate Filing approved by the Insurance Division of the State of Oregon

7. General and special taxes and assessments for the fiscal year 2024-2025, a lien not yet due or payable.

8. City liens, if any, for the city of Cornelius.

   Note: An inquiry has NOT been made concerning the actual status of such liens. A fee of $25.00 will be charged per tax account each time an inquiry request is made.

9. These premises are within the boundaries of the Clean Water Services District and are subject to the levies and assessments thereof.

10. Easement, including terms and provisions contained therein:

Recording Date:	February 8, 1985
Recording Information:	85004781
In Favor of:	Portland General Electric Company, an Oregon corporation
For:	Underground distribution line
Affects:	Parcel II

11. Easement, including terms and provisions contained therein:

Recording Information:	September 14, 1995 as Recording No. 95065296
In Favor of:	The City of Cornelius
For:	Storm drainage

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12. Easement, including terms and provisions contained therein:
Recording Information: July 26, 2002 as Recording No. 2002-084971
In Favor of: The City of Cornelius
For: Public utilities

13. Easement, including terms and provisions contained therein:
Recording Information: July 26, 2002 as Recording No. 2002-084972
In Favor of: The City of Cornelius
For: Pedestrian, bicycle and vehicle passage and access

14. Easement, including terms and provisions contained therein:
Recording Date: August 21, 2014
Recording Information: 2014-052827
In Favor of: Portland General Electric Company, an Oregon corporation
For: Electrical power lines and signal or communication lines and appurtenances
Affects: Parcel II

15. Easement, including terms and provisions contained therein:
Recording Date: August 14, 2015
Recording Information: 2015-069158
In Favor of: Cornelius Cinemas 2, LLC, an Oregon limited liability company
For: Sign
Affects: Parcel II

16. Evidence of the authority of the individual(s) to execute the forthcoming document for Fore Green Development LLC, a Nevada limited liability company, copies of the current operating agreement should be submitted prior to closing.

NOTE: The Oregon Corporation Division has no active record of Fore Green Development LLC, a Nevada limited liability company.

17. Unrecorded leases or periodic tenancies, if any.

-END OF EXCEPTIONS-

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INFORMATIONAL NOTES

NOTE: This report does not include a search for Financing Statements filed in the office of the Secretary of State, or in a county other than the county wherein the premises are situated, and no liability is assumed if a Financing Statement is filed in the office of the County Clerk (Recorder) covering fixtures on the premises wherein the lands are described other than by metes and bounds or under the rectangular survey system or by recorded lot and book.

NOTE: Washington County Ordinance No. 267, filed August 5, 1982 in Washington County, Oregon, imposes a tax of $1.00 per thousand or fraction thereof on the transfer of real property located within Washington County.

NOTE: Taxes for the year 2023-2024, paid in full.

Tax Amount:	$13,889.10
Code No.:	007.56
Map & Tax Lot No.	1N334DC04500
Property ID/Key No.	R755533

(Affects Parcel I)

NOTE: Taxes for the year 2023-2024, paid in full.

Tax Amount:	$28,294.53
Code No.:	007.56
Map & Tax Lot No.	1N334DC04600
Property ID/Key No.	R755551

(Affects Parcel II)

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Commitment No. NCS-1229131-OR1

EXHIBIT A

The Land referred to herein below in situated in the County of Washington, State of Oregon, and is described as follows:

PARCEL I:

The West 210 feet of the following described tract:

Beginning at a point on the Baseline where the same is intersected by the division line of the Donation Land Claim of William McLinn and wife being Claim No. 67, in Township 1 North, Range 3 West, and Claim No. 40, Township 1 South, Range 3 West, this beginning point being 29.79 chains (1966.1 feet) West of the corner of Sections 2, 3, 34 and 35 of said townships and running thence on said division line North 0°8′ West, 21.942 chains (1448.2 feet) to the South boundary of the right of way of the Oregon Electric Railway; thence with said South boundary of right of way South 89°18′ West, 9.138 chains (603.1 feet) to an iron pipe 2 inches in diameter; thence South 0°8′ East, 21.37 chains (1410.7 feet) to an iron pipe 2 inches in diameter on North boundary of Baseline Road; thence continuing South 0°08′ East, 30 feet to the Baseline; thence East 9.138 chains (603.1 feet) to the place of beginning.

EXCEPTING THEREFROM that portion included in that tract of land conveyed to Robert L. Berner Co., by Warranty Deed recorded march 14, 1977 in Book 1150, page 668, being more particularly described as follows:

Beginning at the most Northwesterly corner of the Haney Truck Line tract as described in Book 418, page 484, and running thence along the Westerly line thereof, South 00°12'30" West 476.12 feet to an iron rod; thence South 89°15'15" East 604.76 feet to an iron rod on the East line of said Haney Truck Line tract described in Book 400, page 343; thence, along said Easterly line North 00°12'30" East 487.56 feet to the Northeast corner thereof, a point on the Southerly right-of-way of the Oregon Electric Railroad; thence along said right-of-way South 89°39'35" West 604.76 feet to the point of beginning.

ALSO EXCEPTING THEREFROM that portion lying within the boundaries of Tualatin Valley Highway.

PARCEL II:

Beginning at a point on the Baseline where the same is intersected by the division line of the Donation Land Claim of William McLinn and wife being Claim No. 67, in Township 1 North, Range 3 West, and Claim No. 40, Township 1 South, Range 3 West, this beginning point being 29.79 chains (1966.1 feet) West of the corner of Sections 2, 3, 34 and 35 of said townships and running thence on said division line North 0°8′ West, 21.942 chains (1448.2 feet) to the South boundary of the right of way of the Oregon Electric Railway; thence with said South boundary of right of way South 89°18′ West, 9.138 chains (603.1 feet) to an iron pipe 2 inches in diameter; thence South 0°8′ East, 21.37 chains (1410.7 feet) to an iron pipe 2 inches in diameter on North boundary of Baseline Road; thence continuing South 0°08′ East, 30

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feet to the Baseline; thence East 9.138 chains (603.1 feet) to the place of beginning.

EXCEPTING THEREFROM the West 210 feet.

ALSO EXCEPTING THEREFROM that portion included in that tract of land conveyed to Robert L. Berner Co., by Warranty Deed recorded march 14, 1977 in Book 1150, page 668, being more particularly described as follows:

Beginning at the most Northwesterly corner of the Haney Truck Line tract as described in Book 418, page 484, and running thence along the Westerly line thereof, South 00°12'30" West 476.12 feet to an iron rod; thence South 89°15'15" East 604.76 feet to an iron rod on the East line of said Haney Truck Line tract described in Book 400, page 343; thence, along said Easterly line North 00°12'30" East 487.56 feet to the Northeast corner thereof, a point on the Southerly right-of-way of the Oregon Electric Railroad; thence along said right-of-way South 89°39'35" West 604.76 feet to the point of beginning.

ALSO EXCEPTING THEREFROM that portion conveyed to the City of Cornelius by that certain Deed recorded June 4, 1980 as Recording No. 80019941.

EXCEPTING FROM THE ABOVE DESCRIBED TRACTS that portion granted to The City of Cornelius, an Oregon municipal corporation, in that certain Stipulated Judgment filed November 5, 2001 in Case No. C002466CV by the Circuit Court of the State of Oregon for the County of Washington.

ALSO EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, by that certain Warranty Deed recorded August 1, 2002 as Fee No. 2002-088310.

ALSO EXCEPTING THEREFROM that portion lying within the boundaries of Tualatin Valley Highway.

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ALTA COMMITMENT FOR TITLE INSURANCE
issued by
FIRST AMERICAN TITLE INSURANCE COMPANY

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, First American Title Insurance Company, a Nebraska Corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

FIRST AMERICAN TITLE INSURANCE COMPANY

By: _____
Kenneth D. DeGiorgio, President

By: _____
Lisa W. Cornehl, Secretary

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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COMMITMENT CONDITIONS

1. DEFINITIONS
   a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.
   b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.
   c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.
   d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.
   e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.
   f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.
   g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.
   h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.
   i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.
   j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:
   a. the Notice;
   b. the Commitment to Issue Policy;
   c. the Commitment Conditions;
   d. Schedule A;

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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e. Schedule B, Part I—Requirements; and
f. Schedule B, Part II—Exceptions; and
g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
   i. comply with the Schedule B, Part I—Requirements;
   ii. eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
   iii. acquire the Title or create the Mortgage covered by this Commitment.
b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.
e. The Company is not liable for the content of the Transaction Identification Data, if any.
f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.
c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or

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oral, express or implied, relating to the subject matter of this Commitment.

d. The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT
The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

8. PRO-FORMA POLICY
The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. CLAIMS PROCEDURES
This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.

10. CLASS ACTION
ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.

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'78 19651

BARGAIN AND SALE DEED

KNOW ALL MEN BY THESE PRESENTS that HANEY TRUCK LINE, INC., an Oregon corporation, hereinafter called Grantor, for the consideration hereinafter stated, does hereby grant, bargain, sell and convey unto HANEY INDUSTRIAL PROPERTIES, INC., an Oregon corporation, hereinafter called Grantee, and unto Grantee's successors and assigns all of that certain real property with the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining, situated in the County of Washington, State of Oregon, described as follows:

PARCEL I: Beginning at a point on the Baseline where the same is intersected by the division line of the Donation Land Claim of William McLinn and wife being Claim No. 67 in Township 1 North, Range 3 West, and Claim No. 40, Township 1 South, Range 3 West, this beginning point being 29.79 chains (1966.1 feet) West of the corner of Sections 2, 3, 34 and 35 of said townships and running thence on said division line North 0° 8' West, 21.942 chains (1448.2 feet) to the South boundary of the right of way of the Oregon Electric Railway; thence with said South boundary of right of way South 89° 18' West, 9.138 chains (603.1 feet) to an iron pipe 2 inches in diameter; thence South 0° 8' East, 21.37 chains (1410.7 feet) to an iron pipe 2 inches in diameter on North boundary of Baseline Road; thence continuing South 0° 08' East, 30 feet to the Baseline; thence East 9.138 chains (603.1 feet) to the place of beginning. EXCEPTING the West 210 feet of the above described premises.

PARCEL II: The West 210 feet of the following described tract: Beginning at a point on the Baseline where the same in intersected by the division line of the Donation Land Claim of William McLinn and wife being Claim No. 67 in Township 1 North, Range 3 West and Claim No. 40, Township 1 South, Range 3 West, this beginning point being 29.79 chains (1966.1 feet) West of the corner of Sections 2, 3, 34 and 35 of said Townships and running thence on said division line, North 0° 8' West, 21.942 chains (1448.2 feet) to the South boundary of the right of way of the Oregon Electric Railway; thence with said South boundary of right of way South 89° 18' West, 9.138 chains (603.1 feet) to an iron pipe 2 inches in diameter; thence South 0° 8' East 21.37 chains (1410.7 feet) to an iron pipe 2 inches in diameter on North boundary of Baseline Road; thence continuing South 0° 08' East, 30 feet to the Baseline; thence East, 9.138 chains (603.1 feet) to the place of beginning.

PARCEL III: Beginning at a point 12 feet East of the intersection of the line between the East and West halves of the William McLinn Donation Land Claim No. 67, Township 1 North, Range 3 West, with said Baseline; thence North parallel with said division line between the East and West halves of said Donation Land Claim for a distance of 1.447 feet to the South line of the Oregon Electric Railroad right of way; thence along said right of way North 89° 25' East, 261 feet; thence South 0° 8' East, 1.449 feet to said baseline; thence West 264.5 feet to the point of beginning.

1-3

PARCEL IV: Being a part of the William McLinn Donation Land Claim No. 67 in Section 34, Township 1 North, Range 3 West, Willamette Meridian, Washington County, Oregon, and more particularly described as follows:
Beginning at a point on the Baseline, West 1450.0 feet from the Southeast corner of said Section 34; thence North 1454.3 feet to the South boundary of the Oregon Electric Railroad right of way; thence along said right of way boundary South 89° 28' West, 239.8 feet; thence South 1452.1 feet to a point on the Baseline; thence East 239.8 feet to the place of beginning.

To Have and To Hold the same unto the said Grantee and Grantee's successors and assigns forever.

The true and actual consideration paid for this transfer, stated in the terms of dollars is None. However, the actual consideration consists of or includes other property or value given or promised which is the whole consideration. Corporate Reorganization - Split-Off.

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

IN WITNESS WHEREOF, the Grantor has executed this instrument this 27th day of April, 1978 and has caused its name to be signed and seal affixed by its officers, duly authorized thereto by order of its board of directors.

HANEY TRUCK LINE, INC.

By _____
President

By _____
Secretary

STATE OF OREGON)
) ss.
County of Washington)

April 27, 1978.

Personally appeared Everett Haney and Mildred L. Haney who, being duly sworn, each for himself and not one for the other, did say that the former is the President and that the latter is the Secretary of Haney Truck Line, Inc. and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors; and each of them acknowledged said instrument to be its voluntary act and deed.

Before me: _____
Notary Public for Oregon
My commission expires: 1-23-80

E 0 3 0

Cable Mountain
Estates #3
Mr. W. Bank
P.O. Box 739
Dillsboro, Or 97123

STATE OF OREGON } Deed
County of Washington } SS

I, Roger Thomssen, Director of Records and Elections and Ex-Officio Recorder of Conveyances for said county, do hereby certify that the within instrument of writing was received and recorded in book of records

No. _____
of said County

Witness my hand and seal affixed.
ROGER THOMSSEN, Director of Records & Elections

By _____ Deputy

'78 19651 INDEXED
MAY 1 1 45 PM '78

3

FORM No. 751—WARRANTY DEED—CORPORATION. 3334 STEVENS-NESS LAW PUB. CO., PORTLAND, ORE.

SCI

KNOW ALL MEN BY THESE PRESENTS, that HANEY TRUCK LINES, INC. *a corporation duly organized and existing under the laws of the State of* Oregon *, hereinafter called grantor, in consideration of* SIXTY-SIX THOUSAND EIGHT HUNDRED NINETY & NO/100 *Dollars* ($66,890.00) *to grantor paid, does hereby grant, bargain, sell and convey unto* ROBERT L. BERNER CO. *, hereinafter called grantee and grantee's heirs, successors and assigns, that certain real property, with the tenements, hereditaments and appurtenances thereunto belonging or appertaining, situated in the County of* Washington *, and State of Oregon, described as follows, to-wit:*

A portion of that certain tract of land in the Southeast Quarter, Section 34, Township 1 North, Range 3 West of the Willamette Meridian, Washington County, Oregon, described in deed to Haney Truck Line in Book 418, Page 484, and Book 400, Page 343, Deed Records, Washington County, Oregon, being more particularly described as follows:

BEGINNING at the most Northwesterly corner of said Haney Truck Line tract as described in Book 418, Page 484, and running thence along the Westerly line thereof, South 00° 12' 30" West 476.12 feet to an iron rod; thence South 89° 15' 15" East 604.76 feet to an iron rod on the East line of said Haney Truck Line tract described in Book 400, Page 343; thence, along said Easterly line North 00° 12' 30" East 487.56 feet to the Northeast corner thereof, a point on the Southerly right-of-way of the Oregon Electric Railroad; thence along said right-of-way South 89° 39' 35" West 604.76 feet to the point of beginning. --------

To Have and to Hold the above described and granted premises unto the said grantee and grantee's heirs, successors and assigns forever.

And said grantor hereby covenants to and with said grantee and grantee's heirs, successors and assigns, that grantor is lawfully seized in fee simple of the above granted premises, free from all encumbrances ..... *and that grantor will warrant and forever defend the above granted premises and every part and parcel thereof against the lawful claims and demands of all persons whomsoever.*

In construing this deed and where the context so requires, the singular includes the plural.

Done by order of the grantor's board of directors, with its corporate seal attached, this ..... *day of* March *, 19*77

(CORPORATE SEAL)

HANEY TRUCK LINES, INC.

By ..... *President*

By Mildred Haney *Secretary*

(ORS 93.490)

STATE OF OREGON, County of Washington) ss. March 9 *, 19*77

Personally appeared Everett Haney *and* .....

who, being sworn, each for himself and not one for the other, stated that the former is the President (president or other officer) *and that the latter is the* Secretary (secretary or other officer) *of grantor corporation and that the seal affixed hereto is its seal and that this deed was voluntarily signed and sealed in behalf of the corporation by authority of its board of directors.*

(OFFICIAL SEAL)

Before me: Walter L. Wright

Notary Public for Oregon.

My commission expires Dec 5-1977

WARRANTY DEED

CORPORATION

HANEY TRUCK LINES, INC.

1 Haney Lane, Cornelius

TO Oregon

ROBERT L. BERNER CO.

1204 S. Alpine, Cornelius

~~Oregon~~

AFTER RECORDING RETURN TO

J. D. Bailey
P. O. Box 89
Hillsboro, Oregon 97123

(DON'T USE THIS SPACE; RESERVED FOR RECORDING LABEL IN COUNTIES WHERE USED.)

STATE OF OREGON, } ss.

County of .....

I certify that the within instrument was received for record on the ..... *day of* ....., *19*..., *at* ..... *o'clock* ..... *M., and recorded in book* ..... *on page* ..... *Record of Deeds of said County.*

Witness my hand and seal of County affixed.

..... *Title.*

By ..... *Deputy*

No. .....

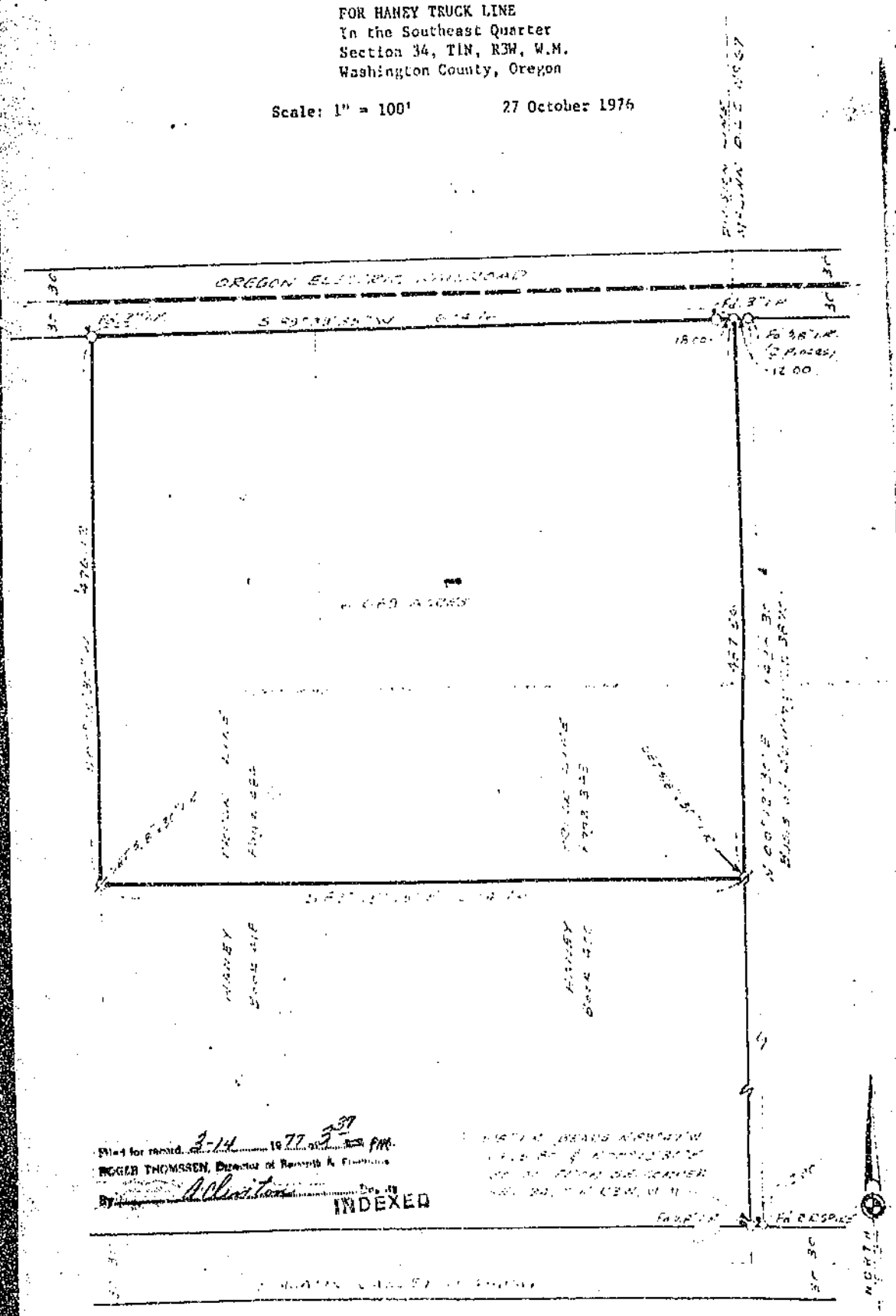
BOOK 1150 PAGE 668

761

3334

RECORD OF SURVEY
FOR HANEY TRUCK LINE
In the Southeast Quarter
Section 34, T1N, R3W, W.M.
Washington County, Oregon

Scale: 1" = 100' 27 October 1976



Filed for record 3-14 1977 at 3:37 PM.
ROGER THOMSSEN, Director of Records & Elections
By A Christian Deputy
INDEXED

BOOK 1150 PAGE 669

DOWD, BANCROFT & ASSOCIATES, INC.
CIVIL ENGINEERS

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHWEST ONE-QUARTER OF THE
SOUTHEAST ONE-QUARTER OF SECTION 34,
TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN
CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

SHEET INDEX:

SHEET 1 – SHEET INDEX, ZONING REPORT, NOTES, DATUMS, ABBREVIAITIONS, TOPOGRAPHIC LEGEND, UTILITY STATEMENT, VICINITY MAP, SURVEYOR'S CERTIFICQATE, LEGAL DESCRIPTION

SHEET 2 – BOUNDARY, EASEMENTS, DETAILS, NARRATIVE, MONUMENT TABLE, MONUMENT LEGEND, EXCEPTIONS

SHEET 3 – SURVEY FEATURE NOTES, TOPOGRAPHY

SHEET 4 – SURVEY FEATURE NOTES, TOPOGRAPHY

ZONING REPORT:

Cornelius Project Zoning Summary

- **Gateway Mixed Use** - allows multi-family use on the ground floor of a mixed use project subject to some restrictions that are currently being reviewed. The revised zoning would allow multi-family outright over the entire property.
- **Minimum density is 18 DU/AC**. No Maximum - 24 units would be achievable.
- **150 SF of usable recreation space per unit. Recreation space can be counted toward landscape minimums.**
- **Minimum landscape 15% + CFEC landscape requirements for parking.**
- **The maximum height shall be three stories or 45 feet in height, whichever is less. Building height may be increased to a maximum of four stories or 60 feet in height with a CUP and special setbacks.**
- **Setbacks:**
- **o Front (5 feet) or 20 to the face of the garage.**
- **o Rear (10 feet)**
- **o Side Yard. (5 feet)**
- **Building Separation. Buildings within a complex shall** be separated by at least (6 feet,) subject to Oregon Residential Specialty Code and/or Oregon Structural Specialty Code requirements.
- The application as currently shown would require a Minor Land Partition and a Type III Design Review
  - o Requires neighborhood meeting with all property owners within 250 feet. The meeting needs to be held in an ADA accessible location and require 20 days of notice. When asked, the planner suggested that we contact the School District or public library.
- o The neighborhood meeting is good for 180 days, so the application needs to be submitted before the meeting expires.
- o Will require minutes and an affidavit of posting
- The Type III is subject to PC review. The Planning Commission meets the 4th Tuesday of the month:
  - o The application needs to be deemed complete by the 10th of the month prior to the PC hearing.
- The appeal period is 10 days
- The partition approval is good for 1 year after the preliminary decision has been issued.

The Council Creek Regional Trail is located one property north.

- Existing signage on the corner for the theater may require an easement.





- Overhead utilities may need to be undergrounded with street improvements along N 26th Ave.
- Utility relocations and improvements along Baseline (TV-B)
- Parking - 1 space for every two units *(maybe required to be covered)*
- 30" storm line along north PL can be relocated as needed.
- Davis Ave storm treatment to be separate from private.
- 1200-C to be reviewed by City, WES, and DEQ.
- Existing public sanitary sewer is adequate. They are wrapping up a regional analysis.
- Send all stormwater to north of site, if possible.
- 8' PUE around property perimeter.
- Crossover access easements needed for access between north and south parcels.

NOTES:

THE LEGAL DESCRIPTION AND EXCEPTIONS SHOWN HEREON ARE BASED ON FIRST AMERICAN TITLE INSURANCE COMPANY, COMMITMENT NO. NCS-1229131-OR1 – DATED AUGUST 02, 2024

THE WORD "CERTIFY" AND/OR "CERTIFICATE" IS AN EXPRESSION OF PROFESSIONAL OPINION REGARDING THE FACTS OF THE SURVEY AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED.

IN REGARDS TO TABLE "A" ITEM 2, VARIOUS ADDRESSES AS SHOWN ON SHEET 3 AND 4 WERE OBTAINED FROM THE WASHINGTON COUNTY SURVEYORS HOME PAGE AT WASHINGTONCOUNTYOR.GOV/SURVEYEXPLORER

IN REGARDS TO TABLE "A" ITEM 3, PER FLOOD INSURANCE RATE MAP NUMBER 410261-0318-E MAP, THE SUBJECT PROPERTY LIES IN ZONE "X", DETERMINED TO BE OUTSIDE THE 0.2%ANNUAL CHANCE FLOODPLAIN.

IN REGARDS TO TABLE "A" ITEM 4, THE GROSS LAND AREA OF THE SUBJECT PROPERTY IS 539,744 SQUARE FEET OR 12.39 ACRES MORE OR LESS.

IN REGARDS TO TABLE "A" ITEM 6(a), SEE ZONING SUMMARY ON SHEET 1 AS PROVIDED BY THE CLIENT,

IN REGARDS TO TABLE "A" ITEM 6(b), ZONING CLASSIFICATION, SETBACK REQUIREMENTS, HEIGHT AND FLOOR SPACE RESTRICTIONS, AND PARKING REQUIREMENTS SPECIFIC TO THE SURVEYED PROPERTY WERE PROVIDED TO THE SURVEYOR BY THE CLIENT OR THE CLIENTS DESIGNATED REPRESENTATIVE AND SHOWN ON THIS SURVEY. IT IS OUTSIDE THE EXPERTISE OF THIS SURVEYOR TO ADDRESS/DETERMINE IF ADJUSTMENTS & EXCEPTIONS MAY BE APPLICABLE TO THE INDICATED SETBACKS.

IN REGARDS TO TABLE "A" ITEM 7(a) EXTERIOR DIMENSIONS OF BUILDINGS AT GROUND LEVEL ARE DEPICTED HEREON,

IN REGARDS TO TABLE "A" ITEM 8, ALL SUBSTANTIAL FEATURES OBSERVED IN THE PROCESS OF CONDUCTING FIELDWORK HAVE BEEN SHOWN IN THIS SURVEY.

IN REGARDS TO TABLE "A" ITEM 9, THERE ARE NO DESIGNATED PARKING SPACES.

IN REGARDS TO TABLE "A" ITEM 10, NO PARTY WALLS WERE DESIGNATED BY THE CLIENT FOR SURVEY ANALYSIS

IN REGARDS TO TABLE "A" ITEM 11(a), NO PLANS AND/OR REPORTS WERE PROVIDED BY THE CLIENT.

IN REGARDS TO TABLE "A" ITEM 11(b), PUBLIC AND PRIVATE UNDERGROUND UTILITY LOCATES WERE PERFORMED AS OUTLINED IN THE UTILITY STATEMENT SOWN ON SHEET 1

IN REGARDS TO TABLE "A" ITEM 13, THE NAMES AND ADDRESSES OF ADJOINING OWNERS WERE OBTAINED FROM THE WASHINGTON COUNTY SURVEYORS HOME PAGE AT WASHINGTONCOUNTYOR.GOV/SURVEYEXPLORER

IN REGARDS TO TABLE "A" ITEM 14, THE NEAREST INTERSECTING STREET TO SUBJECT PARCEL IS N 26TH AVENUE

IN REGARDS TO TABLE "A" ITEM 17, THERE IS NO KNOWN PROPOSED CHANGES IN STREET RIGHT-OF-WAY LINES, THERE IS ALSO NO APPARENT EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS OBSERVED IN THE PROCESS OF CONDUCTING FIELDWORK.

IN REGARDS TO TABLE "A" ITEM 18, THERE WERE NO PLOTTABLE OFF SITE EASEMENTS DISCLOSED IN DOCUMENTS OBTAINED BY THE SURVEYOR

THE PROPERTY DESCRIBED AND DEPICTED ON THIS SURVEY IS THE SAME PROPERTY DESCRIBED IN THE PROVIDED TITLE COMMITMENT.

EVIDENCE OF CEMETERIES WAS NOT DISCLOSED IN THE DOCUMENTS PROVIDED TO THE SURVEYOR OR OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK.

THE PROPERTY DESCRIBED BY THE PROVIDED PRELIMINARY TITLE REPORT FORMS A MATHEMATICALLY CLOSED FIGURE.

AT THE TIME OF THE SURVEYOR'S FIELD WORK AT THE SUBJECT PROPERTY, THE SURVEYOR OBSERVED NO APPARENT EVIDENCE OF THE USE OF THE SUBJECT PROPERTY AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

VERTICAL DATUM:

NAVD88 BASED ON GPS OBSERVATIONS.

HORIZONTAL DATUM

OREGON COORDINATE REFERENCE SYSTEM (OCRS), PORTLAND ZONE, NAD83(2011). EPOCH(2010.0000) INTERNATIONAL FEET.

ABBREVIATIONS:

CSP = CORRUGATED STEEL PIPE

TOPOGRAPHIC LEGEND:

STM — STORM SEWER LINE
SAN — SANITARY SEWER LINE
W — WATER LINE
G — GAS LINE
OW — OVERHEAD WIRE
X — X — X — FENCE LINE, TYPE AS NOTED
FO — FIBER OPTIC LINE
T — TELEPHONE LINE
E — ELECTRIC LINE
TV — CABLE TELEVISION LINE
FLOWLINE
BUILDING LINE
UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
MAJOR CONTOUR – 5' INTERVALS
MINOR CONTOUR – 1' INTERVALS

SANITARY SEWER MANHOLE
STORM SEWER MANHOLE
CATCH BASIN SQUARE
ROOF DRAIN DOWN SPOUT
FIRE HYDRANT
WATER VALVE
WATER METER
WATER STAND PIPE
WATER VAULT
IRRIGATION BOX
GAS METER
GAS VALVE
POWER RISER
POWER METER
ELECTRIC BOX
POWER TRANSFORMER
CABLE TELEVISION BOX
CABLE TELEVISION RISER
TELEPHONE RISER
SIGNAL POLE
SEE TOPO/SURVEY NOTES TABLE
EXCEPTION NUMBER PER TITLE REPORT
FOUND MONUMENT AS NOTED IN TABLE. PROTECT.

UNKNOWN UTILITY VAULT
UNKNOWN RISER/CABINET
GUY WIRE
LIGHT POLE
UTILITY POLE
UTILITY POLE W/ UNDERGROUND UTILITIES
UTILITY POLE W/ STREET LIGHT
UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
SINGLE POST SIGN
FLAG POLE
GATE POST
BOLLARD
MAIL-BOX
HANDI-CAP PARKING SPACE
CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
TRAFFIC SIGNAL BOX
TRAFFIC SIGNAL CABINET
POLE WITH PEDESTRIAN PUSH BUTTON
FIRE DEPT. CONNECTION

NOTE: SYMBOLS SHOWN HEREON ARE FOR GRAPHICAL REPRESENTATION PURPOSES AND DO NOT NECESSARILY SHOW SHAPE, SIZE, ROTATION, CONDITION, TYPE, ETC. OF THE ACTUAL PHYSICAL IMPROVEMENTS THAT THEY REPRESENT. CONDITION, TYPE, ROTATION, ETC. MAY VARY AMONGST ITEMS SHOWN BY THE SAME SYMBOL.

UTILITY STATEMENT:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM LOCATE PAINT MARKINGS TIED IN THE FIELD SURVEY AND AS-BUILT DRAWINGS PROVIDED BY UTILITY COMPANIES. THIS SURVEY DOES NOT SHOW ANY PAINT MARKINGS PROVIDED AFTER THE FIELD SURVEY WAS COMPLETED. AS-BUILT DRAWING INFORMATION THAT WAS NOT PROVIDED IS NOT REFLECTED ON THIS SURVEY. AS-BUILT INFORMATION, IF PROVIDED, WAS USED TO IDENTIFY UNDERGROUND PIPE SIZE AND TYPE (IF SHOWN, AND NOT MEASURED). PAINTED SIZE INFORMATION, IF PROVIDED, WAS USED TO IDENTIFY UNDERGROUND PIPE SIZE AND TYPE (IF SHOWN, AND NOT MEASURED). IF NO LOCATE PAINT MARKINGS WERE PROVIDED, AS-BUILT INFORMATION WAS USED TO HORIZONTALLY LOCATE THE UNDERGROUND UTILITIES.

THIS SURVEY MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE OF ALL SUCH UTILITIES IN THE AREA. THE UNDERGROUND UTILITIES SHOWN MAY NOT BE IN THE EXACT LOCATION AS NOTED ON THIS SURVEY, BUT ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION PROVIDED. MANHOLES OTHER THAN SANITARY AND STORM SEWER WERE IDENTIFIED BY MANHOLE LIDS AND MAY NOT BE LABELED CORRECTLY.

PRIVATE UTILITY LOCATES WERE PERFORMED BY MARK IT OUT, LLC.

UTILITY LOCATIONS MUST BE VERIFIED BY THE STATE UTILITY NOTIFICATION CENTER IMMEDIATELY PRIOR TO ANY EXCAVATION.

UTILITY LOCATES WERE REQUESTED 08/08/2024 UNDER TICKET NUMBERS 24225788, 24225796, 24225837 & 24225846

FOLLOWING IS A LIST OF UTILITY PROVIDERS NOTIFIED:

CCOR01	COMCAST CABLE	(800)778-9140
CORN01	CORNELIUS PUB. WORKS	(503)357-3011
HILLS01	CITY OF HILLSBORO – WATER	(503)615-6700
HILLS03	CITY OF HILLSBORO	(503)803-2106
NWN01	NW NATURAL	(971)277-4474
ODOTRE01	OREGON DOT ELECTRICAL	(971)283-0909
PGE03	PORTLAND GENERAL ELECTRIC	(503)255-4634
ZIPOR01	ZIPLY FIBER	(800)778-9140

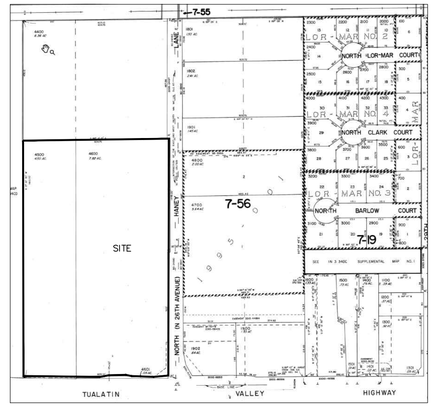
* – DENOTES AS-BUILT MAPS RECEIVED

MANHOLE LOCATION INFORMATION:

DUE TO THE HAZARDOUS NATURE AND APPLICABLE OSHA REQUIREMENTS REGARDING CONFINED SPACES, IT IS COMPANY POLICY TO NOT SEND OUR FIELD STAFF INTO UTILITY MANHOLES TO RETRIEVE DEPTH AND SIZE INFORMATION (PIPE SIZES AND DEPTHS ARE OBTAINED THROUGH ABOVE GROUND METHODS). THEREFORE, ANY MANHOLE ELEVATION INFORMATION SHOWN HEREON IS SUBJECT TO AN UNCERTAINTY IN ACCURACY OF PLUS OR MINUS 0.1' OR GREATER (DEPENDING ON DEPTH, SIZE, FLOW, AND CONSTRUCTION OF MANHOLE). MANHOLE PIPE SIZES ARE ALSO SUBJECT TO AN UNCERTAINTY OF TWO INCHES OR MORE (DEPENDING ON DEPTH, SIZE, FLOW, AND CONSTRUCTION OF MANHOLE). IF A HIGHER ACCURACY IS NEEDED, ADDITIONAL TIME, EQUIPMENT, AND PERSONNEL WILL BE REQUIRED TO ENTER THE MANHOLE AND RETRIEVE SAID INFORMATION.

MANHOLE LOCATIONS SHOWN ARE TO CENTER OF LID, NOT CENTER OF STRUCTURE.

VICINITY MAP



SURVEYOR'S CERTIFICATE:

TO: FORE GREEN DEVELOPMENT, LLC, A NEVADA LIMITED LIABILITY COMPANY, AS AGENT FOR ITSELF AND THE LENDERS.

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 6(a), 6(b), 7(a), 8, 9, 10, 11(a), 11(b), 13, 14, 17, 18, AND 19 OF TABLE "A" THEREOF. THE FIELD WORK WAS COMPLETED ON OCTOBER 18, 2024

DATE OF PLAT OR MAP: OCTOBER 24, 2024,

JOSEPH W. HURLIMAN, PLS — DATE: OCTOBER 24, 2024
OREGON PLS NUMBER 58960 LS
RENEWS: JUNE 30, 2025
JOSEPHH@HHPR.COM

LEGAL DESCRIPTION:

PER FIRST AMERICAN TITLE INSURANCE COMPANY, COMMITMENT NO. NCS-1229131-OR1 – DATED AUGUST 02, 2024

Exhibit "A"

The Land referred to herein below in situated in the County of Washington, State of Oregon, and is described as follows:

PARCEL I:

The West 210 feet of the following described tract:

Beginning at a point on the Baseline where the same is intersected by the division line of the Donation Land Claim of William McLinn and wife being Claim No. 67, in Township 1 North, Range 3 West, and Claim No. 40, Township 1 South, Range 3 West, this beginning point being 29.79 chains (1966.1 feet) West of the corner of Sections 2, 3, 34 and 35 of said townships and running thence on said division line North 0°8' West, 21.942 chains (1448.2 feet) to the South boundary of the right of way of the Oregon Electric Railway; thence with said South boundary of right of way South 89°18' West, 9.138 chains (603.1 feet) to an iron pipe 2 inches in diameter; thence South 0°8' East, 21.37 chains (1410.7 feet) to an iron pipe 2 inches in diameter on North boundary of Baseline Road; thence continuing South 0°08' East, 30 feet to the Baseline; thence East 9.138 chains (603.1 feet) to the place of beginning.

EXCEPTING THEREFROM that portion included in that tract of land conveyed to Robert L. Berner Co., by Warranty Deed recorded march 14, 1977 in Book 1150, page 668, being more particularly described as follows:

Beginning at the most Northwesterly corner of the Haney Truck Line tract as described in Book 418, page 484, and running thence along the Westerly line thereof, South 00°12'30" West 476.12 feet to an iron rod; thence South 89°15'15" East 604.76 feet to an iron rod on the East line of said Haney Truck Line tract described in Book 400, page 343; thence, along said Easterly line North 00°12'30" East 487.56 feet to the Northeast corner thereof, a point on the Southerly right-of-way of the Oregon Electric Railroad; thence along said right-of-way South 89°39'35" West 604.76 feet to the point of beginning.

ALSO EXCEPTING THEREFROM that portion lying within the boundaries of Tualatin Valley Highway.

PARCEL II:

Beginning at a point on the Baseline where the same is intersected by the division line of the Donation Land Claim of William McLinn and wife being Claim No. 67, in Township 1 North, Range 3 West, and Claim No. 40, Township 1 South, Range 3 West, this beginning point being 29.79 chains (1966.1 feet) West of the corner of Sections 2, 3, 34 and 35 of said townships and running thence on said division line North 0°8' West, 21.942 chains (1448.2 feet) to the South boundary of the right of way of the Oregon Electric Railway; thence with said South boundary of right of way South 89°18' West, 9.138 chains (603.1 feet) to an iron pipe 2 inches in diameter; thence South 0°8' East, 21.37 chains (1410.7 feet) to an iron pipe 2 inches in diameter on North boundary of Baseline Road; thence continuing South 0°08' East, 30 feet to the Baseline; thence East 9.138 chains (603.1 feet) to the place of beginning. EXCEPTING THEREFROM the West 210 feet.

ALSO EXCEPTING THEREFROM that portion included in that tract of land conveyed to Robert L. Berner Co., by Warranty Deed recorded march 14, 1977 in Book 1150, page 668, being more particularly described as follows:

Beginning at the most Northwesterly corner of the Haney Truck Line tract as described in Book 418, page 484, and running thence along the Westerly line thereof, South 00°12'30" West 476.12 feet to an iron rod; thence South 89°15'15" East 604.76 feet to an iron rod on the East line of said Haney Truck Line tract described in Book 400, page 343; thence, along said Easterly line North 00°12'30" East 487.56 feet to the Northeast corner thereof, a point on the Southerly right-of-way of the Oregon Electric Railroad; thence along said right-of-way South 89°39'35" West 604.76 feet to the point of beginning.

ALSO EXCEPTING THEREFROM that portion conveyed to the City of Cornelius by that certain Deed recorded June 4, 1980 as Recording No. 80019941.

EXCEPTING FROM THE ABOVE DESCRIBED TRACTS that portion granted to The City of Cornelius, an Oregon municipal corporation, in that certain Stipulated Judgment filed November 5, 2001 in Case No. C002466CV by the Circuit Court of the State of Oregon for the County of Washington.

ALSO EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, by that certain Warranty Deed recorded August 1, 2002 as Fee No. 2002- 088310.

ALSO EXCEPTING THEREFROM that portion lying within the boundaries of Tualatin Valley Highway.

ALTA/NSPS LAND TITLE SURVEY
85 N 26TH AVE
CORNELIUS, OREGON

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS • LANDSCAPE ARCHITECTS • SURVEYORS
205 SE Spokane Street, Suite 200, Portland, OR 97202
phone: 503.221.1131 www.hhpr.com fax: 503.221.1171

REGISTERED PROFESSIONAL LAND SURVEYOR

PRELIMINARY

OREGON
JANUARY 14, 2003
JOSEPH W. HURLIMAN
58960

RENEWS: 6-30-2025

DESIGNED:	DRAWN:	CHECKED:	DATE:
	TMW	JWH	10/30/2024

REVISIONS

NO.	DESCRIPTION	DATE

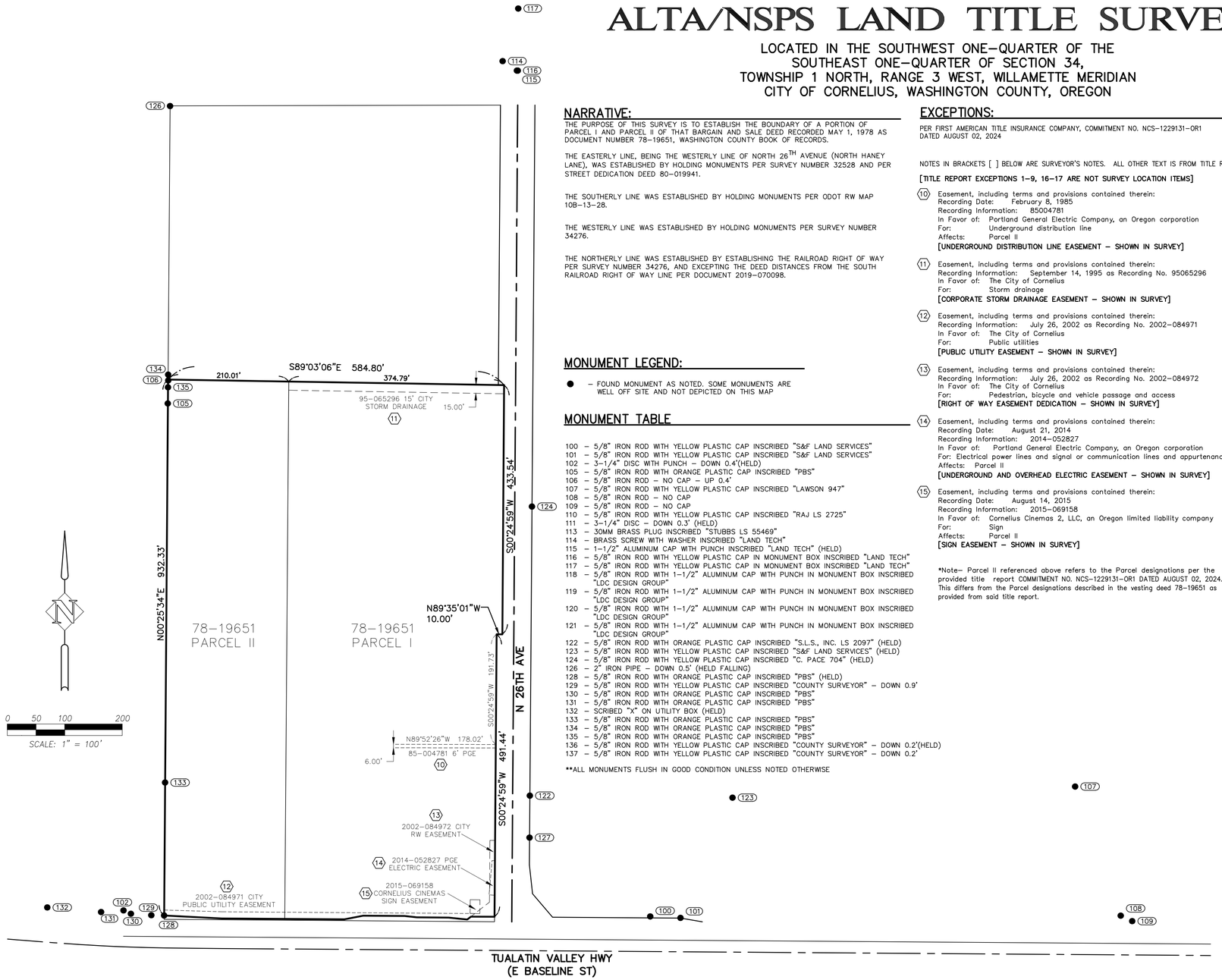
SHEET NO. 1 OF 4

JOB NO. FPC-02

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ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHWEST ONE-QUARTER OF THE
SOUTHEAST ONE-QUARTER OF SECTION 34,
TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN
CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON



NARRATIVE:

THE PURPOSE OF THIS SURVEY IS TO ESTABLISH THE BOUNDARY OF A PORTION OF PARCEL I AND PARCEL II OF THAT BARGAIN AND SALE DEED RECORDED MAY 1, 1978 AS DOCUMENT NUMBER 78-19651, WASHINGTON COUNTY BOOK OF RECORDS.

THE EASTERLY LINE, BEING THE WESTERLY LINE OF NORTH 26TH AVENUE (NORTH HANEY LANE), WAS ESTABLISHED BY HOLDING MONUMENTS PER SURVEY NUMBER 32528 AND PER STREET DEDICATION DEED 80-019941.

THE SOUTHERLY LINE WAS ESTABLISHED BY HOLDING MONUMENTS PER ODOT RW MAP 108-13-28.

THE WESTERLY LINE WAS ESTABLISHED BY HOLDING MONUMENTS PER SURVEY NUMBER 34276.

THE NORTHERLY LINE WAS ESTABLISHED BY ESTABLISHING THE RAILROAD RIGHT OF WAY PER SURVEY NUMBER 34276, AND EXCEPTING THE DEED DISTANCES FROM THE SOUTH RAILROAD RIGHT OF WAY LINE PER DOCUMENT 2019-070098.

MONUMENT LEGEND:

● – FOUND MONUMENT AS NOTED. SOME MONUMENTS ARE WELL OFF SITE AND NOT DEPICTED ON THIS MAP

MONUMENT TABLE

100 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "S&F LAND SERVICES"
101 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "S&F LAND SERVICES"
102 – 3-1/4" DISC WITH PUNCH – DOWN 0.4'(HELD)
105 – 5/8" IRON ROD WITH ORANGE PLASTIC CAP INSCRIBED "PBS"
106 – 5/8" IRON ROD – NO CAP – UP 0.4'
107 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "LAWSON 947"
108 – 5/8" IRON ROD – NO CAP
109 – 5/8" IRON ROD – NO CAP
110 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "RAJ LS 2725"
111 – 3-1/4" DISC – DOWN 0.3' (HELD)
113 – 30MM BRASS PLUG INSCRIBED "STUBBS LS 55469"
114 – BRASS SCREW WITH WASHER INSCRIBED "LAND TECH"
115 – 1-1/2" ALUMINUM CAP WITH PUNCH INSCRIBED "LAND TECH" (HELD)
116 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP IN MONUMENT BOX INSCRIBED "LAND TECH"
117 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP IN MONUMENT BOX INSCRIBED "LAND TECH"
118 – 5/8" IRON ROD WITH 1-1/2" ALUMINUM CAP WITH PUNCH IN MONUMENT BOX INSCRIBED "LDC DESIGN GROUP"
119 – 5/8" IRON ROD WITH 1-1/2" ALUMINUM CAP WITH PUNCH IN MONUMENT BOX INSCRIBED "LDC DESIGN GROUP"
120 – 5/8" IRON ROD WITH 1-1/2" ALUMINUM CAP WITH PUNCH IN MONUMENT BOX INSCRIBED "LDC DESIGN GROUP"
121 – 5/8" IRON ROD WITH 1-1/2" ALUMINUM CAP WITH PUNCH IN MONUMENT BOX INSCRIBED "LDC DESIGN GROUP"
122 – 5/8" IRON ROD WITH ORANGE PLASTIC CAP INSCRIBED "S.L.S., INC. LS 2097" (HELD)
123 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "S&F LAND SERVICES" (HELD)
124 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "C. PACE 704" (HELD)
126 – 2" IRON PIPE – DOWN 0.5' (HELD FALLING)
128 – 5/8" IRON ROD WITH ORANGE PLASTIC CAP INSCRIBED "PBS" (HELD)
129 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "COUNTY SURVEYOR" – DOWN 0.9'
130 – 5/8" IRON ROD WITH ORANGE PLASTIC CAP INSCRIBED "PBS"
131 – 5/8" IRON ROD WITH ORANGE PLASTIC CAP INSCRIBED "PBS"
132 – SCRIBED "X" ON UTILITY BOX (HELD)
133 – 5/8" IRON ROD WITH ORANGE PLASTIC CAP INSCRIBED "PBS"
134 – 5/8" IRON ROD WITH ORANGE PLASTIC CAP INSCRIBED "PBS"
135 – 5/8" IRON ROD WITH ORANGE PLASTIC CAP INSCRIBED "PBS"
136 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "COUNTY SURVEYOR" – DOWN 0.2'(HELD)
137 – 5/8" IRON ROD WITH YELLOW PLASTIC CAP INSCRIBED "COUNTY SURVEYOR" – DOWN 0.2'

**ALL MONUMENTS FLUSH IN GOOD CONDITION UNLESS NOTED OTHERWISE

EXCEPTIONS:

PER FIRST AMERICAN TITLE INSURANCE COMPANY, COMMITMENT NO. NCS-1229131-OR1 DATED AUGUST 02, 2024

NOTES IN BRACKETS [ ] BELOW ARE SURVEYOR'S NOTES. ALL OTHER TEXT IS FROM TITLE REPORT.

[TITLE REPORT EXCEPTIONS 1-9, 16-17 ARE NOT SURVEY LOCATION ITEMS]

(10) Easement, including terms and provisions contained therein:
Recording Date: February 8, 1985
Recording Information: 85004781
In Favor of: Portland General Electric Company, an Oregon corporation
For: Underground distribution line
Affects: Parcel II
[UNDERGROUND DISTRIBUTION LINE EASEMENT – SHOWN IN SURVEY]

(11) Easement, including terms and provisions contained therein:
Recording Information: September 14, 1995 as Recording No. 95065296
In Favor of: The City of Cornelius
For: Storm drainage
[CORPORATE STORM DRAINAGE EASEMENT – SHOWN IN SURVEY]

(12) Easement, including terms and provisions contained therein:
Recording Information: July 26, 2002 as Recording No. 2002-084971
In Favor of: The City of Cornelius
For: Public utilities
[PUBLIC UTILITY EASEMENT – SHOWN IN SURVEY]

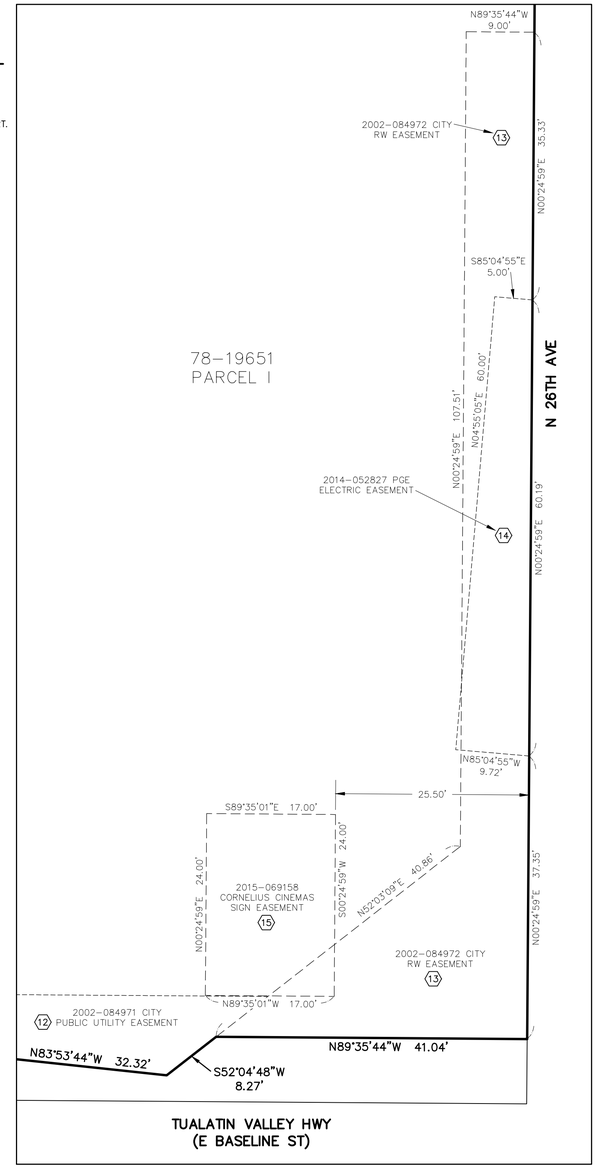
(13) Easement, including terms and provisions contained therein:
Recording Information: July 26, 2002 as Recording No. 2002-084972
In Favor of: The City of Cornelius
For: Pedestrian, bicycle and vehicle passage and access
[RIGHT OF WAY EASEMENT DEDICATION – SHOWN IN SURVEY]

(14) Easement, including terms and provisions contained therein:
Recording Date: August 21, 2014
Recording Information: 2014-052827
In Favor of: Portland General Electric Company, an Oregon corporation
For: Electrical power lines and signal or communication lines and appurtenances
Affects: Parcel II
[UNDERGROUND AND OVERHEAD ELECTRIC EASEMENT – SHOWN IN SURVEY]

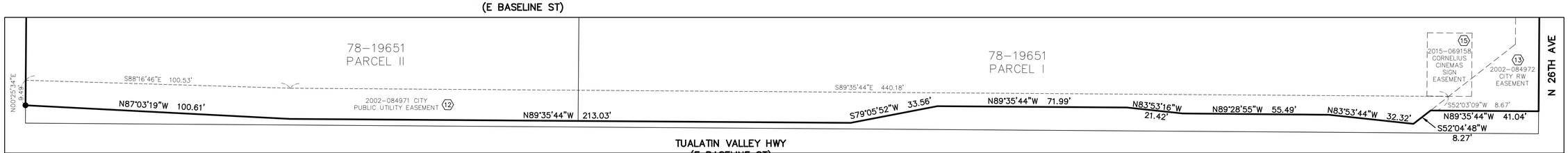
(15) Easement, including terms and provisions contained therein:
Recording Date: August 14, 2015
Recording Information: 2015-069158
In Favor of: Cornelius Cinemas 2, LLC, an Oregon limited liability company
For: Sign
Affects: Parcel II
[SIGN EASEMENT – SHOWN IN SURVEY]

*Note- Parcel II referenced above refers to the Parcel designations per the provided title report COMMITMENT NO. NCS-1229131-OR1 DATED AUGUST 02, 2024. This differs from the Parcel designations described in the vesting deed 78-19651 as provided from said title report.

EASEMENT DETAIL 1"=10'



DETAIL OF SOUTH PROPERTY LINE 1"=20'



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ALTA/NSPS LAND TITLE SURVEY
85 N 26TH AVE
CORNELIUS, OREGON

REGISTERED
PROFESSIONAL
LAND SURVEYOR

PRELIMINARY

OREGON
JANUARY 14, 2003
JOSEPH W. HURLIMAN
58960

RENEWS: 6-30-2025

DESIGNED:	DRAWN:	CHECKED:	DATE:
	TMW	JWH	10/30/2024

REVISIONS

NO.	DESCRIPTION	DATE

SHEET NO. 2 OF 4

JOB NO. FPC-02

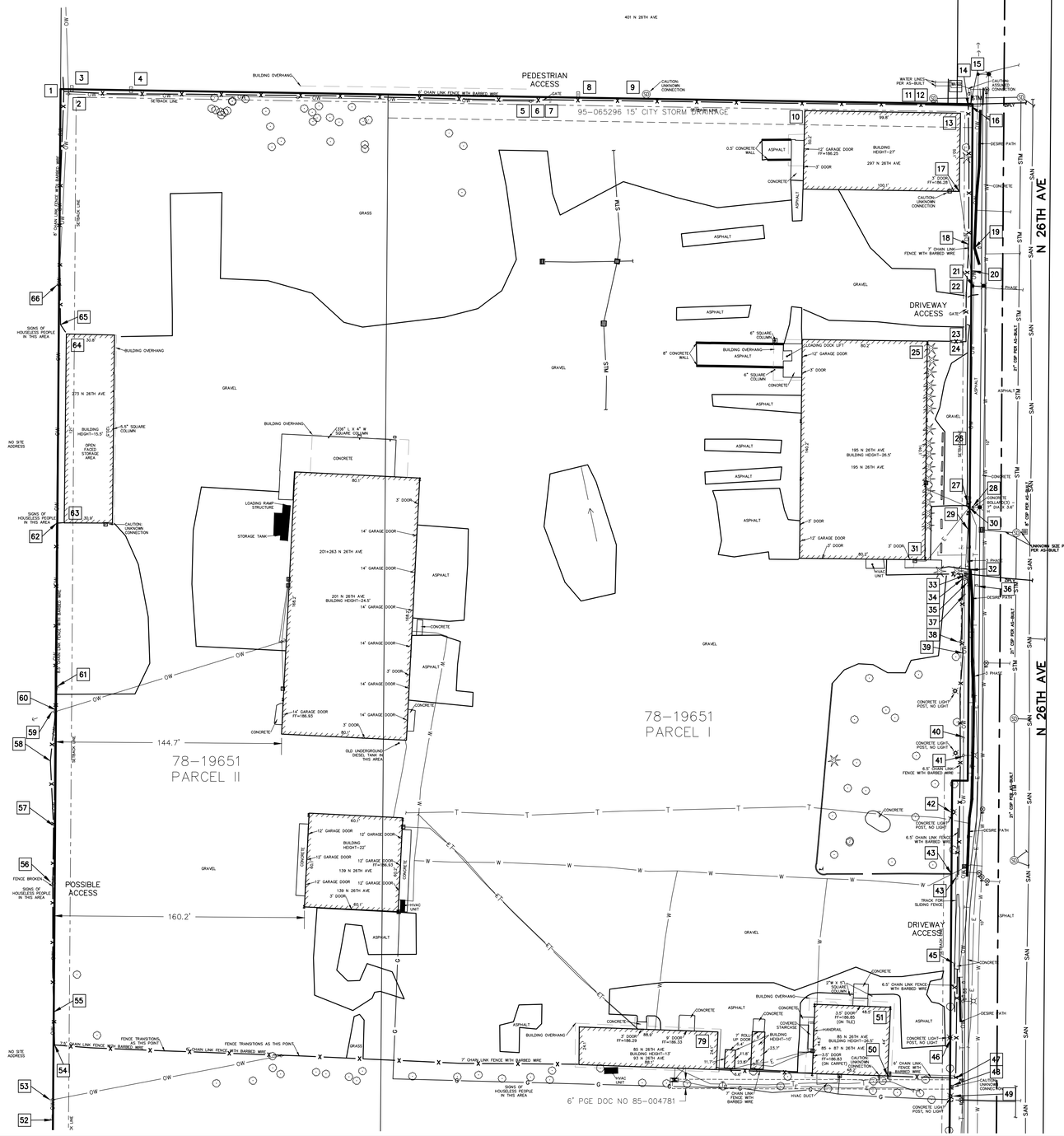
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ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHWEST ONE-QUARTER OF THE
SOUTHEAST ONE-QUARTER OF SECTION 34,
TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN
CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

SURVEY FEATURE NOTES

1. FENCE CORNER IS 2.0' EAST AND 1.5' SOUTH OF PROPERTY LINE
2. UTILITY POLE IS 5.1' EAST AND 3.1' SOUTH OF PROPERTY LINE
3. CENTER OF IRRIGATION BOX IS 0.5' NORTH OF PROPERTY LINE
4. CENTER OF IRRIGATION BOX IS 0.4' NORTH OF PROPERTY LINE
5. UTILITY POLE IS 2.9' SOUTH OF PROPERTY LINE.
6. GATE POST IS 2.1' SOUTH OF PROPERTY LINE.
7. GATE POST IS 1.7' SOUTH OF PROPERTY LINE.
8. CENTER OF IRRIGATION BOX IS 1.9' NORTH OF PROPERTY LINE.
9. CENTER OF MANHOLE IS 2.9' NORTH OF PROPERTY LINE.
10. BUILDING CORNER IS 5.9' SOUTH OF PROPERTY LINE.
11. CENTER OF MANHOLE IS 3.2' NORTH OF PROPERTY LINE.
12. CENTER OF IRRIGATION BOX IS 0.9' NORTH OF PROPERTY LINE.
13. BUILDING CORNER IS 5.9' SOUTH AND 7.8' WEST OF PROPERTY LINE.
14. FENCE CORNER IS 1.1' SOUTH AND 2.9' WEST OF PROPERTY LINE.
15. CABLE TV RISER IS ON THE NORTH PROPERTY LINE 2' WEST OF THE NORTHWEST PROPERTY CORNER.
16. CORNER OF SIDEWALK IS 1.4' SOUTH AND 0.8' WEST OF PROPERTY CORNER.
17. BUILDING CORNER IS 8.2' WEST OF PROPERTY LINE.
18. FENCE ANGLE POINT IS 1.9' WEST OF PROPERTY LINE.
19. DESIRE PATH IS 1.8' to 5.0' EAST OF PROPERTY LINE.
20. GUY ANCHOR IS 1.2' EAST OF PROPERTY LINE.
21. STREET LIGHT IS 1.1' EAST OF PROPERTY LINE.
22. GATE POST IS 2.3' WEST OF PROPERTY LINE.
23. GATE POST IS 2.2' WEST OF PROPERTY LINE.
24. FENCE CORNER IS 3.2' SOUTHEASTERLY OF PROPERTY LINE.
25. BUILDING CORNER IS 28.0' WEST OF PROPERTY LINE.
26. EDGE OF ASPHALT IS 1.0' to 2.2' WEST OF PROPERTY LINE.
27. BOLLARD IS 1.0' WEST OF PROPERTY LINE.
28. BOLLARD IS 2.0' EAST OF PROPERTY LINE.
29. BOLLARD IS 1.1' WEST OF PROPERTY LINE.
30. CENTER OF STREET LIGHT IS 0.4' WEST OF PROPERTY LINE.
31. BUILDING CORNER IS 28.6' WEST OF PROPERTY LINE.
32. CENTER OF DESIRE PATH IS 0.7' TO 12.8' EAST OF PROPERTY LINE
33. CENTER OF TELECOMMUNICATIONS RISER IS 2.2' WEST OF PROPERTY LINE.
34. CENTER OF UTILITY POLE IS 2.9' WEST OF PROPERTY LINE.
35. CENTER OF TELECOMMUNICATIONS BOX IS 1.5' WEST OF PROPERTY LINE.
36. CENTER OF MAILBOX POST IS 4.0' EAST OF PROPERTY LINE.
37. GUY ANCHOR IS 3.3' WEST OF PROPERTY LINE.
38. CENTER OF UTILITY POLE IS 5.3' WEST OF PROPERTY LINE
39. FENCE IS 3.7' WEST OF PROPERTY LINE.
40. GUY ANCHOR IS 3.1' WEST OF PROPERTY LINE.
41. CENTER OF STREET LIGHT IS 2.9' WEST OF PROPERTY LINE.
42. CONCRETE POST IS 1.0' EAST OF PROPERTY LINE.
43. EXTRUDED CURB IS 0.1' WEST OF PROPERTY LINE.
44. CENTER OF GATE POST IS 3.7' EAST OF PROPERTY LINE.
45. CENTER OF GATE POST IS 2.2' EAST OF PROPERTY LINE.
46. CENTER OF CONCRETE POST IS 0.2' WEST OF PROPERTY LINE.
47. FENCE CORNER IS 3.6' EAST OF PROPERTY LINE.
48. CENTER OF TELECOMMUNICATIONS RISER IS 1.5' EAST OF PROPERTY LINE.
49. CENTER OF CONCRETE POST IS 0.4' EAST OF PROPERTY LINE.
50. BUILDING CORNER IS 40.0' WEST OF PROPERTY LINE.
51. BUILDING CORNER IS 38.5' WEST OF PROPERTY LINE.
52. GUY ANCHOR IS 0.7' WEST OF PROPERTY LINE.
53. CENTER OF UTILITY POLE IS 0.4' WEST OF PROPERTY LINE.
54. FENCE CORNER IS 0.7' EAST OF PROPERTY LINE.
55. FENCE CROSSES PROPERTY LINE.
56. FENCE IS 1.2' WEST OF PROPERTY LINE. HOLE IN FENCE MAY ALLOW ACCESS TO PROPERTY.
57. FENCE IS 1.1' WEST OF PROPERTY LINE.
58. FENCE IS 3.4' WEST OF PROPERTY LINE.
59. CENTER OF UTILITY POLE IS 0.9' WEST OF PROPERTY LINE.
60. FENCE IS 0.1' WEST OF PROPERTY LINE.
61. GUY ANCHOR IS 0.9' WEST OF PROPERTY LINE.
62. FENCE IS 0.6' WEST OF PROPERTY LINE.
63. BUILDING CORNER IS 4.3' EAST OF PROPERTY LINE.
64. BUILDING CORNER IS 4.9' EAST OF PROPERTY LINE.
65. FENCE IS 1.1' EAST OF PROPERTY LINE.
66. CENTER OF UTILITY POLE IS 0.1' WEST OF PROPERTY LINE.



0 20 40 80
SCALE: 1" = 40'

S:\FPC (Fore Property Company\FPC-02 (Cornelius ALTA)\FPC-02-DWG\SIC3D\ FPC-02-TOPO-SUR.dwg

ALTA/NSPS LAND TITLE SURVEY
85 N 26TH AVE
CORNELIUS, OREGON

Harper Houf Peterson Righellis Inc.
ENGINEERS, PLANNERS, LANDSCAPE ARCHITECTS, SURVEYORS
205 SE Spokane Street, Suite 200, Portland, OR 97202
phone: 503.221.1131 www.hhpr.com fax: 503.221.1171

REGISTERED PROFESSIONAL LAND SURVEYOR

PRELIMINARY

OREGON
JANUARY 14, 2003
JOSEPH W. HURLIMAN
58960

RENEWS: 6-30-2025

DESIGNED:	TMW	JWH	10/30/2024
DRAWN:		CHECKED:	DATE:

DATE	NO.	DESCRIPTION
		REVISIONS

SHEET NO. 3 OF 4

JOB NO. FPC-02

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHWEST ONE-QUARTER OF THE
SOUTHEAST ONE-QUARTER OF SECTION 34,
TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN
CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

SURVEY FEATURE NOTES

67 CENTER OF CONCRETE POST IS 1.1' WEST OF CONCRETE POST
68 SOUTH END OF DESIRE PATH IS 2.5' WEST OF PROPERTY LINE
69 CONCRETE PAD WITH SIGNAL BOX IS 1.4' TO 5.2' WEST OF PROPERTY LINE
70 BACK OF CURB IS 2.2' WEST OF PROPERTY LINE
71 CENTER OF STREET LIGHT IS 4.8' WEST OF PROPERTY LINE.
72 WEST EDGE OF DESIRE PATH IS 10.5' WEST OF PROPERTY LINE.
73 CURB, SIDEWALK AND VARIOUS UTILITIES ON PROPERTY FALL IN RW EASEMENT (2002-084972)
74 VARIOUS UTILITIES ON PROPERTY FALL IN PUBLIC UTILITY EASEMENT (2002-084971)
75 DESIRE PATH IS 7.4' NORTH OF PROPERTY LINE.
76 CENTER OF CATCH BASIN IS 22.0' NORTH OF PROPERTY LINE.
77 SIGN AND ASSOCIATED POWER FALL IN SIGN EASEMENT (2015-069158)
78 SIDEWALK IS 4.4' NORTH OF PROPERTY LINE.
79 BUILDING CORNER IS 149.9' WEST OF PROPERTY LINE.


78-19651
PARCEL II
78-19651
PARCEL I
144.7'
160.2'
N 26TH AVE
TUALATIN VALLEY HWY
(E BASELINE ST)
2002-084971 CITY
PUBLIC UTILITY EASEMENT
2002-084972 CITY
RW EASEMENT
2014-052827
PGE ELECTRIC
EASEMENT
2015-069158
CORNELIUS CINEMAS
SIGN EASEMENT
DRIVEWAY
ACCESS
6' PGE DOC NO 85-004781
201 N 26TH AVE
BUILDING HEIGHT=24.5'
139 N 26TH AVE
85 N 26TH AVE
BUILDING HEIGHT=28.5'
83 N 26TH AVE
BUILDING HEIGHT=17'
85 + 87 N 26TH AVE
BUILDING HEIGHT=10'
SIGNS OF HOUSELESS PEOPLE IN THIS AREA
FENCE BROKEN
NO SITE ADDRESS
GRAVEL
ASPHALT
CONCRETE
GRASS
DESIRE PATH
SETBACK LINE
HVAC UNIT
STORAGE TANK
OLD UNDERGROUND DIESEL TANK IN THIS AREA
FENCE TRANSITIONS AS THIS POINT
6' CHAIN LINK FENCE WITH BARBED WIRE
3' CHAIN LINK FENCE WITH BARBED WIRE
6.5' CHAIN LINK FENCE WITH BARBED WIRE
CONCRETE LIGHT POST, NO LIGHT
TRACK FOR SLIDING FENCE
FOR SALE SIGN
CORNELIUS CINEMAS SIGN
TACTILE STRIP
CAUTION: UNKNOWN CONNECTION
FLEXIBLE PLASTIC DELINEATOR(3) - 4' H
18" CSP PER AS-BUILT
12" CSP PER AS-BUILT
8" CSP PER AS-BUILT
HANDRAIL
BUILDING OVERHANG
COVERED STAIRCASE
3.5' DOOR FF=186.85 (ON TILE)
3' DOOR FF=186.29
3' DOOR FF=186.33
14' GARAGE DOOR FF=186.93
12' GARAGE DOOR FF=186.83
3' ROLL UP DOOR FF=186.6
3' DOOR FF=186.5
3' DOOR FF=186.7
3' DOOR FF=186.8
3' DOOR FF=186.9
3' DOOR FF=187.0
3' DOOR FF=187.1
3' DOOR FF=187.2
3' DOOR FF=187.3
3' DOOR FF=187.4
3' DOOR FF=187.5
3' DOOR FF=187.6
3' DOOR FF=187.7
3' DOOR FF=187.8
3' DOOR FF=187.9
3' DOOR

LEGAL DESCRIPTION
Resultant Tract 1 – Property Line Adjustment
May 23, 2025

A tract of land located in the Southwest One-Quarter of the Southeast One-Quarter of Section 34, Township 1 North, Range 3 West of the Willamette Meridian, City of Cornelius, Washington County, Oregon. Said tract being a portion of Parcel I and Parcel II of Document No. 78-19651, Washington County Deed Records and being more particularly described as follows:

Beginning at the Southwest corner of that tract of land described in Book 1150, Page 668, Washington County Deed records; Thence S89°03'06"E along the South line thereof, 584.80 feet to a point on the West right-of-way line of N 26th avenue; Thence S00°24'59"W along said West right-of-way line 433.54 feet to an angle point in Street Dedication Document 80-019941; Thence continuing along said West right-of-way line per said Document No. 80-019941 the following two courses: N89°35'01"W 10.00 feet, Thence S00°24'59"W, 287.24 feet; Thence leaving said right-of-way line, N89°35'01", 574.89 feet to a point on the West line of Parcel II of said Document No. 78-19651; Thence N00°25'34"E, along said West line, 726.20 feet to the Point of Beginning.

The parcel herein described contains 420,246 square feet or 9.65 acres more or less.

LEGAL DESCRIPTION
Resultant Tract 2 – Property Line Adjustment
May 23, 2025

A tract of land located in the Southwest One-Quarter of the Southeast One-Quarter of Section 34, Township 1 North, Range 3 West of the Willamette Meridian, City of Cornelius, Washington County, Oregon. Said tract being a portion of Parcel I and Parcel II of Document No. 78-19651, Washington County Deed Records and being more particularly described as follows:

Commencing at the Southwest corner of that tract of land described in Book 1150, Page 668, Washington County Deed records; Thence S00°25'34"W, along the West line of Parcel II of said Document No. 78-19651, 726.20 feet to the **Point of Beginning**; Thence N89°35'01"E, 574.89 feet to a point on the West right-of way line of N. 26th Avenue per Street Dedication Document No. 80-019941, Washington County Deed Records; Thence S00°24'59"W, along the West line of said Document No. 80-019941, 204.20 feet to a point on the North right-of-way line of Tualatin Valley Highway (E Baseline Street) per Document No. 2002-88310, Washington County Deed Records; Thence westerly along the North line of said Document No. 2022-88310 the following courses: N89°35'44"W, 41.04 feet; Thence S52°04'48"W, 8.27 feet; Thence N83°53'44"W, 32.32 feet; Thence N89°28'55"W, 55.49 feet; Thence N83°53'16"W, 21.42 feet; Thence N89°35'44"W, 71.99 feet; Thence S79°05'52"W, 33.56 feet; Thence N89°35'44"W, 213.03 feet; Thence N87°03'19"W, 100.61 feet to a point on the West line of Parcel II of said Document No. 78-19651; Thence leaving said North line, N00°25'38"W along the West line of said Parcel II, 206.13 feet to the Point of Beginning

The parcel herein described contains 119,496 square feet or 2.74 acres more or less.

Outlook

FW: Haney Multifamily (PAC 12-24)

From Jason Wald <jwald@ForeProperty.com>
Date Thu 5/29/2025 4:11 PM
To Hillary Harris <hillaryh@hhpr.com>

1 attachment (3 MB)
Haney Multifamily TG Memo_250523.pdf;

[Email from external source]

Hilary,

Please see attached memo and response below from Terry Keyes. For purposes of the design review app, I think we attach the Memo and email from Terry and call it our TIA that meets the requirements of the code.

Jason Wald
PARTNER – PNW
FORE PROPERTY COMPANY
1332 NW Kearney St
Portland, OR 97209
O: 503.964.5658
C: 972.415.4214
jwald@foreproperty.com | ForeProperty.com

From: Terry Keyes <terry.keyes@corneliusor.gov>
Sent: Thursday, May 29, 2025 1:17 PM
To: Jennifer Danziger <jennifer@lancastermobley.com>
Cc: Jason Wald <jwald@ForeProperty.com>; Barbara Fryer <Barbara.Fryer@corneliusor.gov>; Tim Franz <Tim.Franz@corneliusor.gov>
Subject: Re: Haney Multifamily (PAC 12-24)

You don't often get email from terry.keyes@corneliusor.gov. Learn why this is important

Jennifer,

Your memo verifies what I indicated in the pre-application conference, i.e., a traffic study is **not** required by the city for development of the Haney parcel. The street system, especially with completion of the Davis St. east-west collector to N. 26th, provides excellent connectivity.

Again, a the city is not requiring a traffic study for this development.

Terry W. Keyes, PE
City Engineer
City of Cornelius
1355 N. Barlow Street

Cornelius, OR 97113
503-357-3011 office phone
503-449-3631 cell phone
terry.keyes@corneliusor.gov

On May 23, 2025, at 4:45 PM, Jennifer Danziger <jennifer@lancastermobley.com> wrote:

Good Afternoon Terry,

I've attached a memo that reviews trip generation for the Haney multifamily project west of N 26th Avenue. The pre-app notes indicate that you didn't think the city would require a TIA. This memo notes that while the project is over the threshold for a TIA, the trip impacts on City intersections will be minimal. It also reviews the ODOT thresholds and finds that the net increase in trips at ODOT intersections will also fall below the state thresholds. The memo seeks your concurrence that a TIA will not be required.

I look forward to hearing from you. Enjoy your weekend!

Jennifer

Jennifer Danziger, PE
Senior Transportation Engineer

1130 SW Morrison St, Suite 318 | Portland, OR 97205
Office: 503-248-0313 x327
Website: lancastermobley.com
Offices: Portland, OR | Bend, OR | Vancouver, WA

1130 SW Morrison St., Suite 318
Portland, OR 97205
503.248.0313
lancastermobley.com

Memorandum

To: **Terry Keyes, City of Cornelius**

CC: **Jason Wald, Fore Property Company**

From: **Jennifer Danziger, PE**

Date: **May 23, 2025**

Subject: **Proposed Haney Multifamily (PAC 12-24)**
Trip Generation Analysis



Introduction

This memorandum presents a trip generation analysis and review the transportation impact analysis (TIA) requirements for the proposed multifamily residential development located at Washington County assessor's map 1N334CD, tax lots 04500 and 04600, in Cornelius, Oregon. The proposal includes development of a 240-unit apartment complex.

Location Description

The project site is located northwest of the intersection of Tualatin-Valley (TV) Highway at N 26th Avenue in Cornelius, Oregon. The site consists of two properties (Tax Lot: 1N334DC04500 and 1N334DC04600) which encompass approximately 12.32 acres. The site will be partitioned to create a northern lot, which is proposed for residential development and a southern lot, fronting TV Highway, which will be developed separately with commercial uses. Figure 1 presents an aerial image of the nearby vicinity with the residential project site is outlined in yellow. A site plan is included as an attachment to this memorandum.

The site is currently developed with three industrial buildings and two office buildings. It is surrounded by industrial uses to the north and northeast and commercial uses to the east and south. The property immediately west of the site, outlined in red and labeled Calida Site, has received land use approval for 346 units of residential development.

The Calida Multifamily development will construct a new east-west roadway public street extending eastward from N Davis Street to the northwest corner of the subject site. This roadway will be constructed through the subject site to connect to N 26th Avenue. With completion of this public roadway, indicated by the dark blue line in Figure 1, the site will have access to N 19th Avenue, N Davis Avenue, and N 26th Avue.

A private drive aisle along the southern edge of the Calida site and the subject site (light blue line) will provide direct connectivity between the residential development and the Fred Meyer Shopping Center as well as another connection to both N Davis Avenue and N 26th Avenue.



Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

Site Trips

Trip Generation

There are three industrial buildings and two office buildings on the project site. The gross floor areas of these existing buildings are:

- Total of 28,040 square feet industrial building floor area
    - 13,440 square feet, 3,600 square feet, and 11,000 square feet industrial buildings
- Total of 4,267 square feet office building floor area
    - 2,133 square feet and 2,134 square feet

The proposed development will include the proposed 240-unit apartment complex while removing all existing industrial and office buildings. To estimate trips that will be generated by the existing land uses and the future

development, trip rates from the *Trip Generation Manual*[1] were used. Data from the following land use codes (LUC) were utilized to estimate site trip generation:

- 110, *General Light Industrial*, based on the square footage of the gross building floor area - existing
- 712, *Small Office Building*, based on the square footage of the gross building floor area - existing
- 220, *Multifamily Housing (Low-Rise)*, based on the dwelling units (DU) - proposed

Table 1 summarizes the estimated trip generation of the site for the morning and evening peak hours and on an average weekday. Detailed trip generation calculations are included as an attachment to this memorandum.

Table 1: Trip Generation Summary

Land Use (ITE Code)	Intensity	Morning Peak Hour			Evening Peak Hour			Weekday Trips
		In	Out	Total	In	Out	Total	
Existing Land Use								
General Light Industrial (LUC 110)	28,040 SF	18	3	21	3	15	18	136
Small Office Building (LUC 712)	4,267 SF	6	1	7	3	6	9	62
Total Trips		24	4	28	6	21	27	198
Proposed Development								
Multifamily Housing (Low-Rise) (LUC 220)	240 DU	23	73	96	77	45	122	1,618
Net New Trips		-1	69	68	71	24	95	1,420

The trip generation calculations show that the proposed development is projected to generate a net increase of 68 morning peak hour, 95 evening peak hour, and 1,420 weekday trips.

Trip Distribution

The following trip distribution for the site was estimated based on the trip distribution used for the April 2022 TIA[2] prepared for the adjacent site:

- Approximately 55 percent will travel to/from the east along TV Highway
- Approximately 15 percent will travel to/from the west along TV Highway
- Approximately 15 percent will travel to/from the north along N 19th Avenue
- Approximately 10 percent will travel to/from the west along N Davis Street
- Approximately 5 percent will travel to/from the south along S 20th Avenue

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.
[2] PBS, *Cornelius Multi-Family Development Traffic Impact Analysis,* Cornelius, Oregon, April 27, 2022.

Trip Assignment

The trip distribution was applied to the existing site uses with the current network and the proposed site uses with the anticipated network. The resulting trip assignment by intersection is summarized in Table 2.

Table 2: Trip Assignment by Intersection

Intersection	Distribution	Site Trips		
		AM Peak Hour	PM Peak Hour	Weekday
Existing Land Use				
N 26th Ave & TV Hwy	85%	-24	-23	-168
N Davis St & TV Hwy	30%	-8	-8	-59
N Davis St & N 19th Ave	10%	-3	-3	-20
N Holladay St & N 19th Ave	15%	-4	-4	-30
Proposed Land Use				
N 26th Ave & TV Hwy	55%	53	67	890
N Davis St & TV Hwy	20%	19	24	324
N Davis St & N 19th Ave	15%	14	18	243
N Holladay St & N 19th Ave	10%	10	12	162
Net Increase in Trips				
N 26th Ave & TV Hwy	-	29	44	722
N Davis St & TV Hwy	-	11	16	264
N Davis St & N 19th Ave	-	12	16	223
N Holladay St & N 19th Ave	-	5	8	132

Note, these trip increases do not account for any internal trips between the project site and the existing commercial development that can be accessed by the local and private street connections. Accounting for internal trips would further reduce the net trip increase on the nearby transportation network.

TIA Requirement

A pre-application meeting for this project was held on October 22, 2024. Staff from the City of Cornelius and ODOT were in attendance

City

City comments at the pre-application meeting indicate that "as currently proposed, this project does not merit a traffic study from the City's standpoint. However, ODOT may require a traffic study."

For reference, the criteria in Cornelius Municipal Code (CMC) Section 18.143.030 were reviewed to determine if a study is necessary. CMC Section 18.143.030 (B) indicates that a "traffic impact analysis is required when the proposed land use change or development will generate 200 vehicles or more per day (vpd) in average weekday trips as determined by the city engineer."

The proposed development will generate a net daily trip increase greater than 200 trips, which meets the criteria for a study. However, the study area shall include "all segments of the surrounding transportation system where users are likely to experience a change in the quality of traffic flow." As shown in Table 2, the two city intersections along N 19th Avenue are anticipated to carry fewer than 20 peak hour trips with the proposed development, which is low enough that they unlikely to experience a significant change in the quality of traffic flow. The other intersections in the table are under ODOT jurisdiction; the state thresholds for a traffic study are discussed below.

ODOT

ODOT Traffic Engineer John Russell's comment indicate that he "does not expect a traffic impact analysis to be requested for the site regarding the residential plans" and noted that "the extension of Davis Street will spread hour traffic and should help avoid meeting the thresholds that would require a traffic impact analysis."

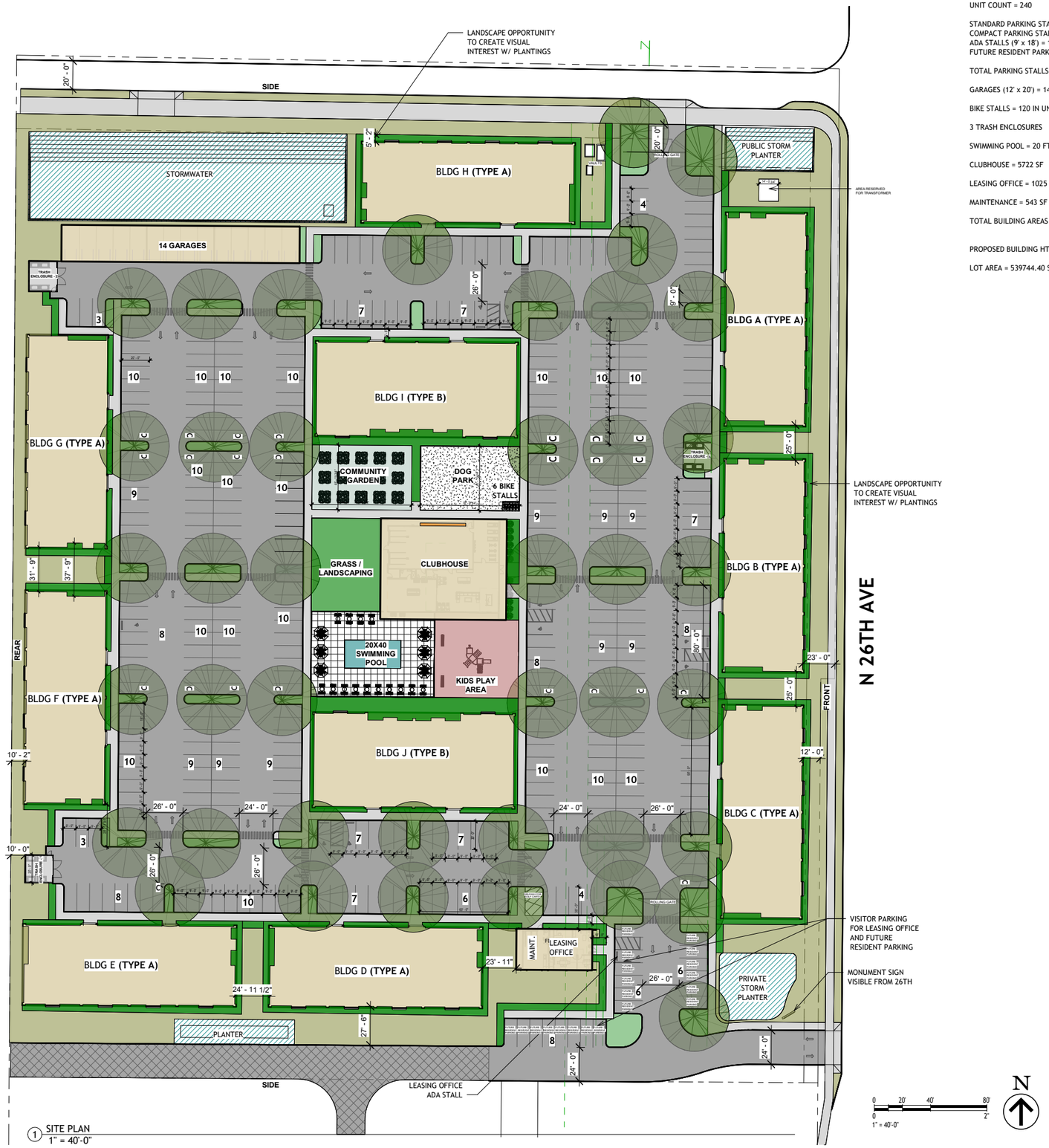
To confirm this conclusion, ODOT's *Development Review Guidelines* were reviewed. Based on best practices, *Table 3.2: TIA Threshold and Analysis Areas* suggests analysis at intersections where traffic is increased by 50 peak hour trips, 300 average daily trips, or by 10 percent of the intersections total entering volumes.

As shown in Table 2, none of the nearby intersections are expected to experience a net increase of more than 50 peak hour trips. While the daily trip numbers may be higher, the TIA only evaluates peak hours; thus, using the daily number as the basis for requiring analysis contradicts the peak hour criteria. Additionally, daily volumes on TV Highway are above 30,000 vehicles per day. The added traffic from the site falls well below the 10 percent threshold.

Summary

The trip generation presented in this memorandum demonstrates that the proposed residential development is not likely to significantly impact operations at any City intersections and it will not meet the ODOT thresholds for a TIA. Therefore, we are seeking to confirm that a TIA will not be required for the 240-unit multifamily development proposal.

Attachments:
Site Plan
Trip Generation Estimates



1 SITE PLAN
1" = 40'-0"

SITE DATA:

UNIT COUNT = 240

STANDARD PARKING STALLS (9' x 20') = 372
COMPACT PARKING STALLS (8' x 16') = 24
ADA STALLS (9' x 18') = 10 (VAN-ACCESSIBLE)
FUTURE RESIDENT PARKING STALLS (9' x 20') = 20

TOTAL PARKING STALLS = 426

GARAGES (12' x 20') = 14

BIKE STALLS = 120 IN UNITS, 6 NEAR CLUBHOUSE

3 TRASH ENCLOSURES

SWIMMING POOL = 20 FT X 40 FT

CLUBHOUSE = 5722 SF

LEASING OFFICE = 1025 SF

MAINTENANCE = 543 SF

TOTAL BUILDING AREAS = (21,972 SF X 8) + (25,092 SF X 2)
= 225,960 SF

PROPOSED BUILDING HT = 40' 8"

LOT AREA = 539744.40 SF (12.39 ACRES)

LEGEND

- CONCRETE SIDEWALK AND TRASH ENCLOSURE FLOOR
- LAWN
- PLANTINGS
- HEAVY DUTY ASPHALT PAVEMENT
- OUTDOOR USPS MAIL UNDER CLUBHOUSE ROOF
- STORMWATER
- BUILDING ROOF LINE

abbasi design works LLC
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

REGISTERED PROFESSIONAL ENGINEER
82291
OREGON
Jan. 13, 2009
RAHIM A. ABBASI
EXPIRES:

No.	Date

HANEY MULTIFAMILY
Enter address here
Address Line 2

ADW # Project Number

Project Status
SITE PLAN

Date 5/21/2025 1:40:27 PM
Drawn Author
Checked Checker

A1.0

As indicated

5/21/2025 1:40:27 PM

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	General Light Industrial
Land Use Code:	110
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	1000 SF GFA
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	28.04

AM PEAK HOUR

Trip Rate: 0.74

	Enter	Exit	Total
Directional Split	88%	12%	
Trip Ends	18	3	21

PM PEAK HOUR

Trip Rate: 0.65

	Enter	Exit	Total
Directional Split	14%	86%	
Trip Ends	3	15	18

WEEKDAY

Trip Rate: 4.87

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	68	68	136

SATURDAY

Trip Rate: 0.69

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	10	10	20

Caution: Small Sample Size

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	Multifamily Housing (Low-Rise)
Land Use Code:	220
Land Use Subcategory:	Not Close to Rail Transit
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	240

AM PEAK HOUR

Trip Rate: 0.4

	Enter	Exit	Total
Directional Split	24%	76%	
Trip Ends	23	73	96

PM PEAK HOUR

Trip Rate: 0.51

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	77	45	122

WEEKDAY

Trip Rate: 6.74

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	809	809	1,618

SATURDAY

Trip Rate: 4.55

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	546	546	1,092

Caution: Small Sample Size

Source: Trip Generation Manual, 11th Edition

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	Small Office Building
Land Use Code:	712
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	1000 SF GFA
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	4.267

AM PEAK HOUR

Trip Rate: 1.67

	Enter	Exit	Total
Directional Split	82%	18%	
Trip Ends	6	1	7

PM PEAK HOUR

Trip Rate: 2.16

	Enter	Exit	Total
Directional Split	34%	66%	
Trip Ends	3	6	9

WEEKDAY

Trip Rate: 14.39

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	31	31	62

SATURDAY

Trip Rate: 0

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	NA	NA	NA

HANEY MULTIFAMILY
CORNELIUS, OR

Stormwater Management Report

May 2025

PREPARED FOR:
Fore Property Company
1332 NW Kearney Street
Portland, Oregon 97209

PREPARED BY:
Harper Houf Peterson Righellis Inc.
530 Center Street NE, Suite 240
Salem, OR 97301
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Ryan Mosher, PE
Spencer Martin, PE



EXPIRES: 12/31/26

Harper Houf Peterson Righellis Inc.
ENGINEERS◆PLANNERS
LANDSCAPE ARCHITECTS◆SURVEYORS

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Pipe Conveyance Calculations

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PROJECT OVERVIEW

The proposed project is located on two tax lots (1N334DC04500 & 4600) in Cornelius, Oregon. The site is bordered to the south by Oregon Route 8, bordered to the west and east by commercial development, and bordered to the north by industrial development. The project is within the City of Cornelius (COC) and Clean Water Services (CWS).

The existing 12.3-acre site consists of an industrial park with several buildings, gravel surface parking, and utilities. The project will disturb approximately 10 acres of land.

The project improvements include ten new apartment buildings, clubhouse, leasing office, garages, asphalt surface parking, drive aisles, sidewalks, landscaping and stormwater management facilities. Overall, the project is adding roughly 18,081 square feet of additional impervious area to the site and modifying 279,595 square feet of existing impervious surfaces.

The purpose of this stormwater management report is to present stormwater best management practices (BMP) for conveyance, hydromodification, and water quality treatment to be installed as part of the apartment project. This study demonstrates that the proposed design meets or exceeds requirements and guidelines for CWS standards per CWS R&O 19-5 as amended by R&O 19-22 and COC Design and Construction standards. **Table 1** below summarizes these requirements.

Table 1. CWS R&O 19-5 (As Amended by R&O 19-22) & COC

Design Requirement	CWS & COC
Risk Level	Moderate
Development Class	Developed Area
Project Size	Large (>80,000 sf)
Project Category	Category 2
Hydromodification	Peak-Flow Matching Detention, using design criteria described in CWS Section 4.08.6
Treatment Area	New Impervious Area + 3 x (Modified Impervious – Permanently Removed Impervious, up to total existing)
Treatment Storm	0.36 inches of precipitation falling in 4 hours with an average storm return period of 96 hours
Detention	Match post-development peak runoff rate to the pre-development peak runoff rate target for the 2-year, 24-hour storm to 50% of the 2-year, 24-hour storm; 5-year, 24-hour storm to the 5-year, 24-hour storm; 10-year, 24-hour storm to the 10-year, 24-hour storm; 1 foot of freeboard from 25-year, 24-hour storm maximum water surface elevation.
Conveyance	25-year, 24-hour SBUH Method

Table 2 below summarizes the design storm events and associated precipitation rates.

Table 2. Precipitation Frequency Estimates

Event	Precip (in/hr)
2-yr:	2.50
5-yr:	3.10
10-yr:	3.45
25-yr:	3.90
100-yr:	4.50

BASIN CHARACTERISTICS

Existing Conditions

The existing conditions within the project footprint consist of an industrial park with several buildings, gravel surface parking, and utilities. The southern portion of the site is generally unused open space with remnant asphalt and sparse tree growth around the perimeter. Runoff from the existing site drains to catch basins which are piped north of the property to Council Creek. Based on the geotechnical investigation report provided NV5 dated November 27, 2024, the site moisture sensitive soils with high fines content and zero infiltration; therefore, infiltration is not a viable method of disposal. Due to the existing conditions, all stormwater facilities will be lined with an impermeable liner.

The Natural Resource Conservation Service (NRCS) Soil Survey identifies the existing soils onsite to be Aloha Silt Loam classified as Hydrologic Soil Group C/D. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. See Appendix B for Soil Survey information and Appendix F for pertinent Geotechnical report information.

The assumed curve numbers for this report are shown in **Table 3** below (see Appendix B for curve number information).

Table 3. Assumed Curve Numbers

Condition	Curve Number
Proposed Impervious Areas	98
Proposed Landscape Areas (Good Condition, Soil C/D)	76
Existing Impervious Areas per CWS 4.08.6.d	75
Existing Pervious Areas (Fair Condition, Soil C/D)	81

Proposed Conditions

The proposed improvements include ten apartment buildings, leasing office, clubhouse, drive aisles, sidewalks, landscaping and stormwater management facilities. The existing and proposed impervious and pervious areas are outlined in Table 4 below. See Appendix A for pre-developed and post-developed basin maps.

Table 4. Impervious & Pervious Basin Areas

Basin	Pre-Development			Post-Development		
	Impervious (ac)	Pervious (ac)	Total (ac)	Impervious (ac)	Pervious (ac)	Total (ac)
A	6.211	1.877	8.088	5.905	2.183	8.088
B (Public)	0.191	0.553	0.744	0.496	0.248	0.744
C	0.016	0.330	0.346	0.205	0.141	0.346
D	0.000	0.447	0.447	0.227	0.220	0.447

STORMWATER MANAGEMENT

Water Quality

The COC and CWS treatment requirements and standards will be met by treatment of onsite runoff utilizing a LIDA treatment facility.

The modified impervious areas for water quality are outlined in **Table 5** below and based on the following CWS equation:

$$CWS\ Water\ Quality\ Area\ (sf) = New\ Impervious + (3 \times Modified\ Impervious)^*$$

*Modified impervious surface area up to the total existing impervious area on the site.

This water quality area was determined for CWS water quality flow calculations only. The CWS water quality design flow anticipated from the water quality design storm is based on the storm event totaling 0.36 inches of precipitation falling in four hours. See water quality flow formula below. Proposed water quality flow and volume is outlined in **Table 5.**

$$Water\ Quality\ Flow\ (cfs) = \frac{0.36\ (in) \times Area\ (sf)}{12\ (in/ft)\ \times 4\ (hr) \times 60\ (min/hr)\ \times 60\ (sec/min)}$$

Table 5. Water Quality Impervious Area

Basin	New Impervious Area (ac)	Modified Impervious Area (ac)	CWS Water Quality Area (ac)	CWS Water Quality Flow (cfs)	CWS Water Quality Volume (cf)	Proposed Treatment Method
A	0.000 ac	5.905 ac	5.905 ac	0.536 cfs	7,717 cf	LIDA Detention Pond
B (Public)	0.305 ac	0.191 ac	0.496 ac	0.045 cfs	649 cf	LIDA Detention Pond
C	0.189 ac	0.016 ac	0.205 ac	0.019 cfs	268 cf	LIDA Detention Pond
D	0.227 ac	0.000 ac	0.227 ac	0.021 cfs	296 cf	LIDA Detention Pond

A water quality design storm producing an equivalent volume of runoff was routed through the HydroCAD model. The beehive overflow is set above the peak water quality design elevation, ensuring the required water quality design storm volume does not overflow and is infiltrated through the vegetated facility growing medium and into the perforated underdrain system. See Appendix C for calculations.

Pollutants of concern related to commercial development and roadway construction include sediment, nutrients, pesticides, herbicides, fungicides, metals (zinc, copper, lead, etc.), oil, grease and other petroleum. CWS pollutant removal requirements identifies the required phosphorous removal efficiency of proposed improvements to be a minimum of 65%. Section 4.09.2.c(1) of the current CWS design standards specify detention ponds as approved LIDA water quality facilities provided they meet all relevant criteria. These selected stormwater management best management practices (BMP) specifically target all pollutants of concern.

Basin A will be managed by a 9,122 sf (bottom area) and 7.0 ft deep (max ponding of 5.0 ft deep including 2.0 ft freeboard) detention pond. Pre-treatment will be provided by water quality manhole prior to reaching the detention pond.

Basin B will be managed by a 1,270 sf (bottom area) and 3.0 ft deep (including freeboard) detention pond. Pre-treatment will be provided by water quality manhole prior to reaching the detention pond.

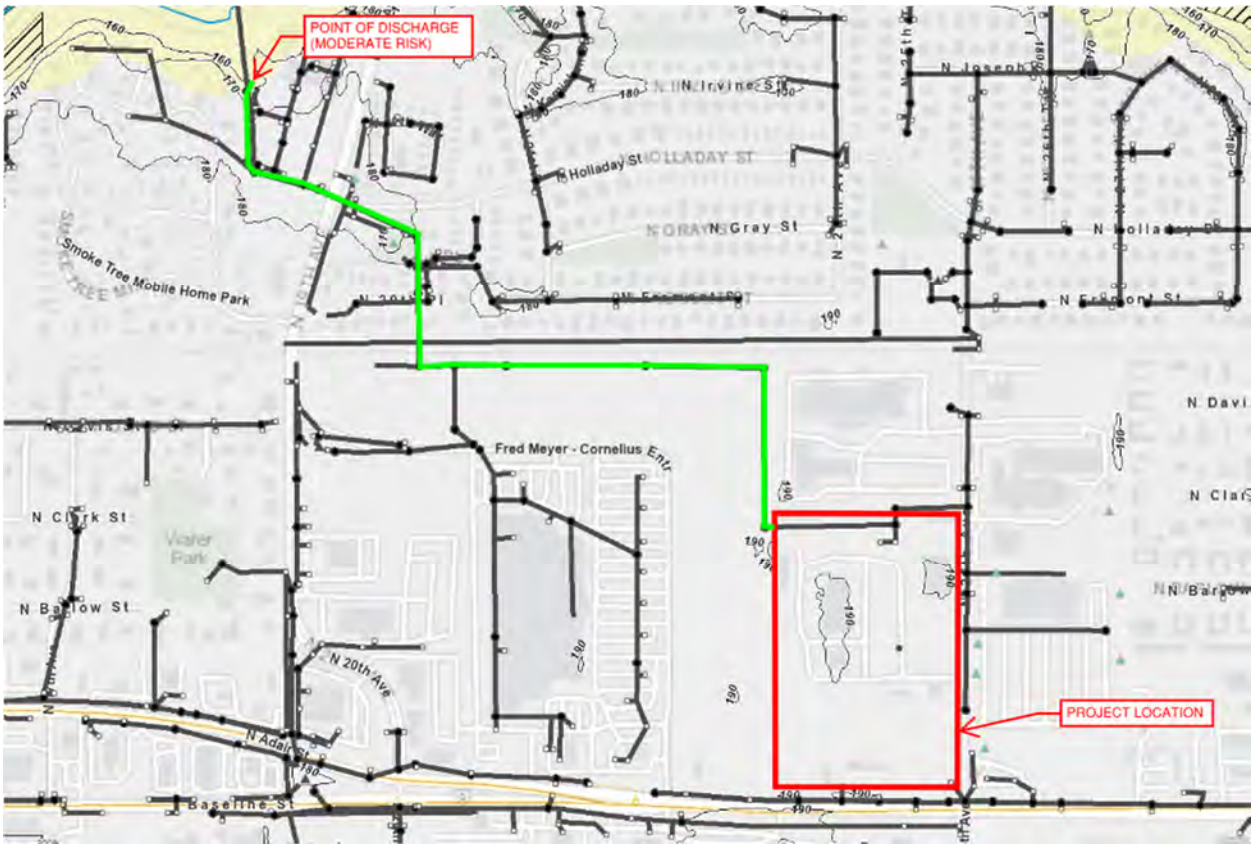
Basin C will be managed by a 1,597 sf (bottom area) and 1.5 ft deep (including freeboard) detention pond. Pre-treatment will be provided by a modified nyloplast inlet structure with sump per CWS Dwg. No 760 prior to reaching the raingarden.

Basin D will be managed by a 650 sf (bottom area) and 1.5 ft deep (including freeboard) detention pond. Pre-treatment will be provided by a modified nyloplast inlet structure with sump per CWS Dwg. No 760 prior to reaching the raingarden.

26th Street is very flat and does not have adequate grades for stormwater facilities. Due to this existing topography the new sidewalk and driveway along 26th Street will not be able to be captured and treated. A fee-in-lieu will be paid to CWS for this 5,300 SF area.

Hydromodification Assessment & Detention

A CWS hydromodification assessment has been conducted per CWS DCS section 4.03.3. Following the point of discharge to the receiving reach determines the site is located within the “Council Creek” reach. This basin is considered “moderate risk”.



The development class lists the site within a “Developed” area. The total project re-developed impervious area is more than 80,000 sf, which per CWS DCS 4.03.3.c.2 is a “large” project. Finally, using the above information, CWS DCS 4.03.5 and CWS Table 4-2, the project is listed as hydromodification Category 2.

Projects in Category 2 represent those with a moderate anticipated hydromodification risk. Per CWS DCS section 4.03.5.b, any of the following approaches may be used to address hydromodification:

1. Infiltration facility, using the Standard Sizing, described in Section 4.08.5; or
2. Peak-Flow Matching Detention, using design criteria described in Section 4.08.6; or
3. Combination of Infiltration facility and Peak-Flow Matching Detention, using criteria described in Section 4.08.5 and 4.08.6; or
4. Flow Duration Curve Matching Detention, using the sizing methodology described in Section 4.08.7.

Considering the site’s space constraints, the Santa-Barbara Hydrograph Peak-Flow Matching Detention approach was used to size the proposed stormwater facilities. Detention shall comply with COC and CWS requirements. COC and CWS require the proposed discharge for the 2-year, 24-hour storm to be detained and reduced to half that of the pre-development peak discharging rate, resulting in an orifice less than the required 0.5” minimum for Basins B, C, and D. Therefore, this orifice is sized to meet the minimum diameter standard. COC and CWS also require that the post-development runoff rates from the site do not exceed the pre-development runoff rates for the 5 and 10-year events for peak flow matching. See Appendix D for hydrographs.

Basin A runoff will be detained by a new 9,122 sf (bottom area) and 6.0 ft deep (including freeboard) detention pond. The pond's total volume is 61,520 cf (from bottom to 25-yr, 24-hr storm event depth). The flow will be controlled via one orifice and a weir within a flow control structure.

Basin B runoff will be detained by a new 1,270 sf (bottom area) and 2.5 ft deep (including freeboard) detention pond. The pond's total volume is 3,711 cf (from bottom to 25-yr, 24-hr storm event depth). The flow will be controlled via one orifice and a weir within a flow control structure.

Basin C runoff will be detained by a new 1,158 sf (bottom area) and 2.0 ft deep (including freeboard) detention pond. The pond's total volume is 2,662 cf (from bottom to 25-yr, 24-hr storm event depth). The flow will be controlled via one orifice and a weir within a flow control structure.

Basin D runoff will be detained by a new 531 sf (bottom area) and 2.3 ft deep (including freeboard) detention pond. The pond's total volume is 1,491 cf (from bottom to 25-yr, 24-hr storm event depth). The flow will be controlled via one orifice and a weir within a flow control structure.

26th Street is very flat and does not have adequate grades for stormwater facilities. Due to this existing topography the new sidewalk and driveway along 26th Street will not be able to be captured and treated. A fee-in-lieu will be paid to CWS for this 5,300 SF area.

The proposed detention ponds will be lined with impervious liner to account for groundwater conditions and feature an underdrain to help facilitate pond drainage for maintenance purposes. See Table 6 for pre-development and post-development runoff rates and see Appendix D for hydrographs.

Table 6. Flow Analysis Pre-Development & Post-Development Runoff Rates

Design Storm Events	Pre-Developed Flow (cfs)	Post-Developed Targets (cfs)	Post-Developed Flow (cfs)	Detained Release Rate (cfs)
2-yr, 24-hr	0.780	0.071	4.026	0.104
5-yr, 24-hr	1.584	1.584	5.235	0.608
10-yr, 24-hr	2.112	2.112	5.955	0.846

Pond access is provided along the northern side of Ponds A and B via N Davis St which is a 20' wide public road. Pond access is provided along the southern side of Ponds C and D via the 24' wide private drive aisle and fire access road turnaround. The private detention ponds and structures will be privately maintained per section 4.07.7 of the CWS standards and will have a Private Stormwater Facility Agreement per Section 2.0.2. See the utility plans in Appendix A for pond structures and details.

The 25-year maximum water surface elevation is 5.0 feet above the bottom of Detention Pond A, 1.5 feet above the bottom of Detention Pond B, 1.0 feet above the bottom of Detention Pond C, and 1.3 feet above the bottom of Detention Pond D. See Appendix D for hydrographs. The proposed emergency spillway for the ponds will be a ditch inlet set at the 100-year water surface elevation. The 100-year event was routed through the facility to determine peak elevation and it does not overtop the facility in the model.

Conveyance

The piped conveyance system was sized and/or analyzed using the 25-year, 24-hour storm. See Appendix E for conveyance basin map, hydrographs, and pipe capacity calculations.

Downstream Analysis

A downstream analysis of the site has been performed per section 2.04.2.m.3 of the CWS standards. CWS standards state that the analysis shall extend downstream to a point in the drainage system where additional flow from the proposed development drops to 10 percent or less of the total tributary drainage flow. Then, the analysis will continue for the lesser of one-quarter of a mile or until the additional flow constitutes less than 5 percent of the total tributary drainage flow.

The project drains to an existing 36-inch pipe at the northwestern corner of the site. At a location roughly 2,300 feet downstream of the public connection point, the public main increases to a 48-inch pipe. The storm main flows roughly 640 additional feet before ultimately outfalling to Council Creek. The proposed development does not constitute less than 10 percent of total tributary drainage flow before the outfall, and will constitute less than 5 percent after, so the outfall will serve as our analysis point.

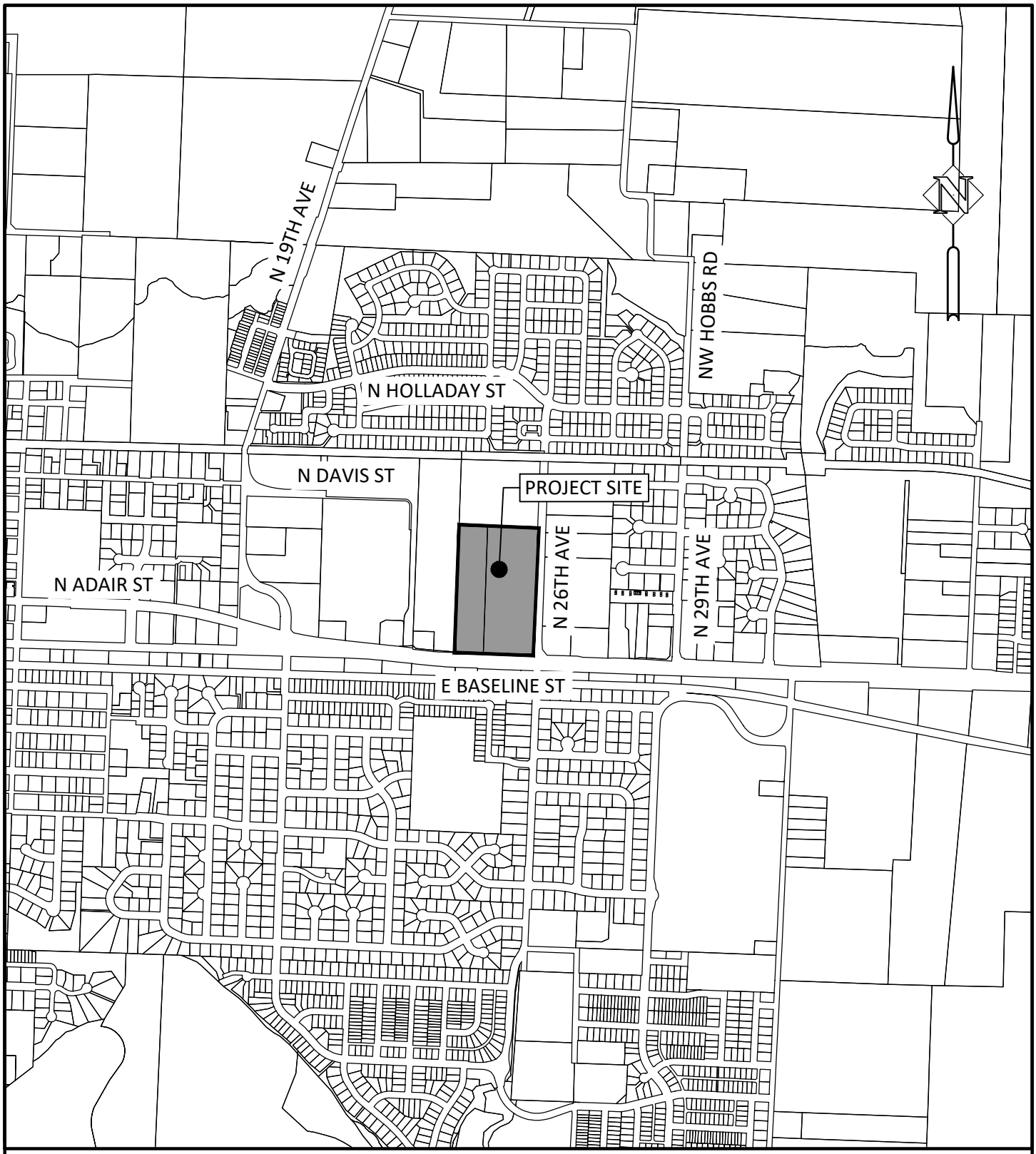
Existing pipe capacities were checked at critical locations (ends of basins) using minimum pipe diameters and slopes established from CWS GIS maps. The addition of the proposed project impervious area does not increase flow above pipe capacities and the project is not anticipated to affect the operation of the downstream storm system negatively. See Appendix F for full downstream analysis documentation.

ENGINEERING CONCLUSION

The proposed stormwater management plan will achieve stormwater management to Clean Water Services R&O 19-22 and City of Cornelius design standards.

APPENDIX A

MAPS AND PLANS



VICINITY MAP

SCALE: 1" = 1000'

SHEET NO. FIG.1	REVISIONS	DESIGNED: HHPR DRAWN: HHPR CHECKED: HHPR DATE: MAY 2025
JOB NO. FPC-02		

HHPR Harper Houf Peterson Righellis Inc.

ENGINEERS♦PLANNERS
LANDSCAPE ARCHITECTS♦SURVEYORS

530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

VICINITY MAP

HANEY MULTIFAMILY

CORNELIUS, OREGON

P:\04-Salem\FPC (Fore Property Company)\FPC-02 (Cornelius Multifamily)\FPC02-DOCS\Reports\Stormwater\CAD\ FPC02 - Pre-Development Basin Map.dwg

LEGEND:

- PERVIOUS AREA
- BASIN LIMITS
- TIME OF CONCENTRATION FLOW PATH



BASIN	IMPERVIOUS AREA (SQFT/ACRES)	PERVIOUS AREA (SQFT/ACRES)
PRE-DEV	279,595 (6.419)	139,677 (3.207)

0 50 100 200

SCALE: 1" = 100'

PRE-DEVELOPMENT BASIN MAP

HANEY MULTIFAMILY

CORNELIUS, OR

Harper Houf Peterson Righellis Inc.

ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS

530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 fax: 503.221.1171
www.hhpr.com

DESIGNED:	HHPR
DRAWN:	HHPR
CHECKED:	RMM
DATE:	JUNE 2025

REVISIONS

NO.	DESCRIPTION	DATE

SHEET NO.

FIG. 2

JOB NO. FPC-02

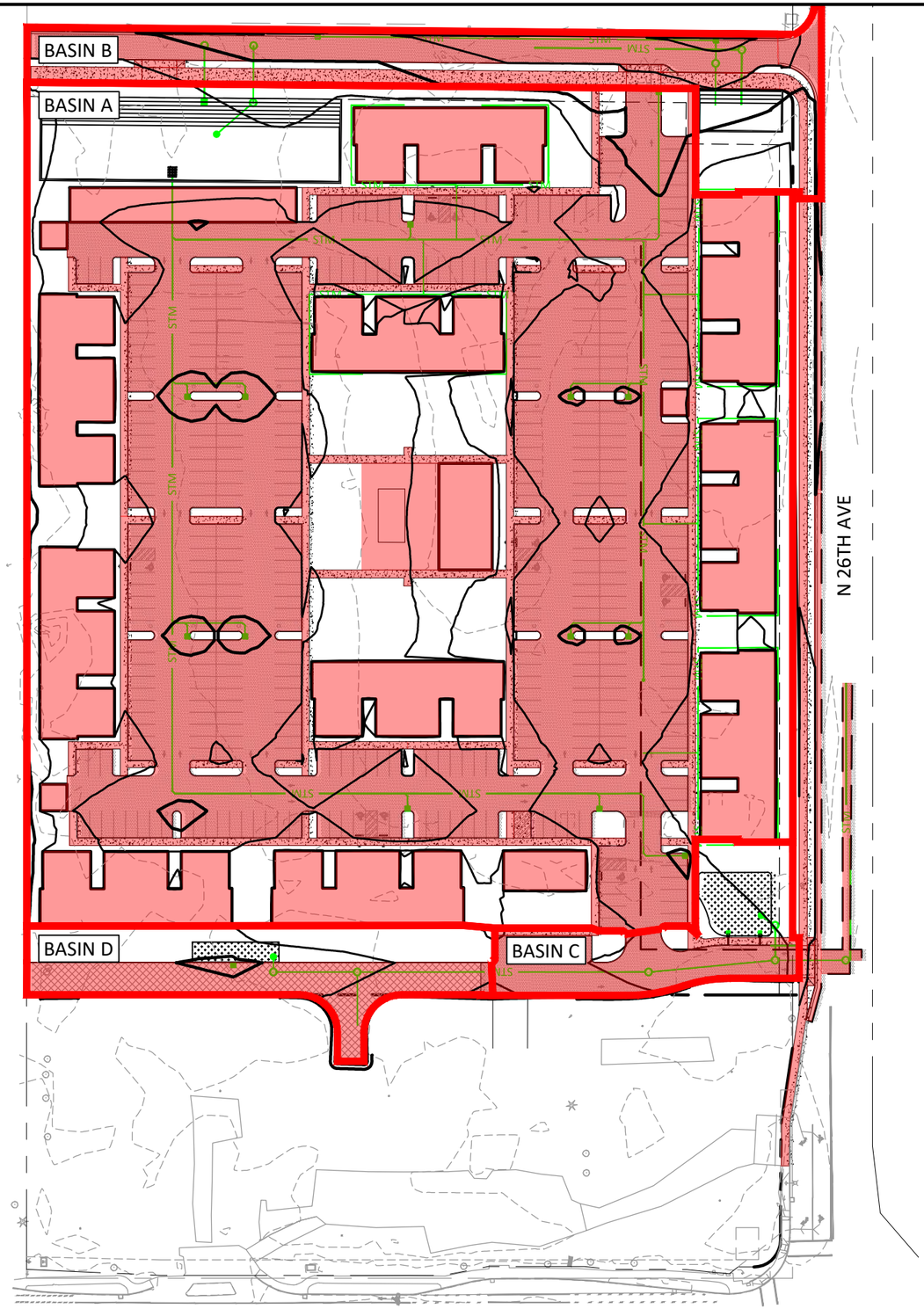
P:\04-Salem\FPC (Fore Property Company)\FPC-02 (Cornelius Multifamily)\FPC02-DOCS\Reports\Stormwater\CAD\ FPC02 - Post-Development Basin Map.dwg

LEGEND:

NEW/REPLACED IMPERVIOUS AREA

BASIN LIMITS

TIME OF CONCENTRATION FLOW PATH



BASIN	IMPERVIOUS AREA (SQFT/ACRES)	PERVIOUS AREA (SQFT/ACRES)
A	257,243 (5.905)	95,105 (2.183)
B	21,622 (0.496)	10,786 (0.248)
C	8,934 (0.205)	6,135 (0.141)
D	9,877 (0.227)	9,572 (0.220)

0 50 100 200

SCALE: 1" = 100'

POST-DEVELOPMENT BASIN MAP

HANEY MULTIFAMILY

CORNELIUS, OR

Harper Houf Peterson Righellis Inc.
ENGINEERS ♦ PLANNERS
LANDSCAPE ARCHITECTS ♦ SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

DESIGNED:	HHPR
DRAWN:	HHPR
CHECKED:	RMM
DATE:	JUNE 2025

NO.	DATE	DESCRIPTION

REVISIONS

SHEET NO.

FIG. 3

JOB NO. FPC-02

LOCATED IN THE SOUTHWEST ONE-QUARTER OF THE
SOUTHEAST ONE-QUARTER OF SECTION 34,
TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN
CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

FIELD WORK DATES: 08/08/2024 – 09/23/2024

TOPOGRAPHIC LEGEND:

- STM — STORM SEWER LINE
- SAN — SANITARY SEWER LINE
- W — WATER LINE
- G — GAS LINE
- OW — OVERHEAD WIRE
- X — X — X — FENCE LINE, TYPE AS NOTED
- FO — FIBER OPTIC LINE
- T — TELEPHONE LINE
- E — ELECTRIC LINE
- TV — CABLE TELEVISION LINE
- FLOWLINE
- BUILDING LINE
- UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
- MAJOR CONTOUR – 5' INTERVALS
- MINOR CONTOUR – 1' INTERVALS
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- CATCH BASIN SQUARE
- ROOF DRAIN DOWN SPOUT
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER STAND PIPE
- WATER VAULT
- IRRIGATION BOX
- GAS METER
- GAS VALVE
- POWER RISER
- POWER METER
- ELECTRIC BOX
- POWER TRANSFORMER
- CABLE TELEVISION BOX
- CABLE TELEVISION RISER
- TELEPHONE RISER
- SIGNAL POLE
- SEE TOPO/SURVEY NOTES TABLE
- EXCEPTION NUMBER PER TITLE REPORT
- FOUND MONUMENT AS NOTED IN TABLE. PROTECT.
- ?? — UNKNOWN UTILITY VAULT
- UNKNOWN RISER/CABINET
- GUY WIRE
- LIGHT POLE
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
- UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
- SINGLE POST SIGN
- FLAG POLE
- GATE POST
- BOLLARD
- MAIL-BOX
- HANDI-CAP PARKING SPACE
- CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- TRAFFIC SIGNAL BOX
- TRAFFIC SIGNAL CABINET
- POLE WITH PEDESTRIAN PUSH BUTTON
- FIRE DEPT. CONNECTION

NOTE: SYMBOLS SHOWN HEREON ARE FOR GRAPHICAL REPRESENTATION PURPOSES AND DO NOT NECESSARILY SHOW SHAPE, SIZE, ROTATION, CONDITION, TYPE, ETC. OF THE ACTUAL PHYSICAL IMPROVEMENTS THAT THEY REPRESENT. CONDITION, TYPE, ROTATION, ETC. MAY VARY AMONGST ITEMS SHOWN BY THE SAME SYMBOL.

UTILITY STATEMENT:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM LOCATE PAINT MARKINGS TIED IN THE FIELD SURVEY AND AS-BUILT DRAWINGS PROVIDED BY UTILITY COMPANIES. THIS SURVEY DOES NOT SHOW ANY PAINT MARKINGS PROVIDED AFTER THE FIELD SURVEY WAS COMPLETED. AS-BUILT DRAWING INFORMATION THAT WAS NOT PROVIDED IS NOT REFLECTED ON THIS SURVEY. AS-BUILT INFORMATION, IF PROVIDED, WAS USED TO IDENTIFY UNDERGROUND PIPE SIZE AND TYPE (IF SHOWN, AND NOT MEASURED). PAINTED SIZE INFORMATION, IF PROVIDED, WAS USED TO IDENTIFY UNDERGROUND PIPE SIZE AND TYPE (IF SHOWN, AND NOT MEASURED). IF NO LOCATE PAINT MARKINGS WERE PROVIDED, AS-BUILT INFORMATION WAS USED TO HORIZONTALLY LOCATE THE UNDERGROUND UTILITIES.

THIS SURVEY MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE OF ALL SUCH UTILITIES IN THE AREA. THE UNDERGROUND UTILITIES SHOWN MAY NOT BE IN THE EXACT LOCATION AS NOTED ON THIS SURVEY, BUT ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION PROVIDED. MANHOLES OTHER THAN SANITARY AND STORM SEWER WERE IDENTIFIED BY MANHOLE LIDS AND MAY NOT BE LABELED CORRECTLY.

PRIVATE UTILITY LOCATES WERE PERFORMED BY MARK IT OUT, LLC.

UTILITY LOCATIONS MUST BE VERIFIED BY THE STATE UTILITY NOTIFICATION CENTER IMMEDIATELY PRIOR TO ANY EXCAVATION.

UTILITY LOCATES WERE REQUESTED 08/08/2024 UNDER TICKET NUMBERS 24225788, 24225796, 24225837 & 24225846

FOLLOWING IS A LIST OF UTILITY PROVIDERS NOTIFIED:

CCOR01	COMCAST CABLE	(800)778-9140
CORN01	CORNELIUS PUB. WORKS	(503)357-3011
HILLS01	CITY OF HILLSBORO – WATER	(503)615-6700
HILLS03	CITY OF HILLSBORO	(503)803-1106
NWN01	NW NATURAL	(971)277-4474
ODOTRE01	OREGON DOT ELECTRICAL	(971)283-0909
PGE03	PORTLAND GENERAL ELECTRIC	(503)255-4634
ZIPOR01	ZIPLY FIBER	(800)778-9140

* – DENOTES AS-BUILT MAPS RECEIVED

MANHOLE LOCATION INFORMATION:

DUE TO THE HAZARDOUS NATURE AND APPLICABLE OSHA REQUIREMENTS REGARDING CONFINED SPACES, IT IS COMPANY POLICY TO NOT SEND OUR FIELD STAFF INTO UTILITY MANHOLES TO RETRIEVE DEPTH AND SIZE INFORMATION (PIPE SIZES AND DEPTHS ARE OBTAINED THROUGH ABOVE GROUND METHODS). THEREFORE, ANY MANHOLE ELEVATION INFORMATION SHOWN HEREON IS SUBJECT TO AN UNCERTAINTY IN ACCURACY OF PLUS OR MINUS 0.1' OR GREATER (DEPENDING ON DEPTH, SIZE, FLOW, AND CONSTRUCTION OF MANHOLE). MANHOLE PIPE SIZES ARE ALSO SUBJECT TO AN UNCERTAINTY OF TWO INCHES OR MORE (DEPENDING ON DEPTH, SIZE, FLOW, AND CONSTRUCTION OF MANHOLE). IF A HIGHER ACCURACY IS NEEDED, ADDITIONAL TIME, EQUIPMENT, AND PERSONNEL WILL BE REQUIRED TO ENTER THE MANHOLE AND RETRIEVE SAID INFORMATION.

MANHOLE LOCATIONS SHOWN ARE TO CENTER OF LID, NOT CENTER OF STRUCTURE.

VERTICAL DATUM:

NAVD88 BASED ON GPS OBSERVATIONS.

HORIZONTAL DATUM

OREGON COORDINATE REFERENCE SYSTEM (OCRS), PORTLAND ZONE, NAD83(2011). EPOCH(2010.0000) INTERNATIONAL FEET.

ABBREVIATIONS:

CSP = CORRUGATED STEEL PIPE

STORM SEWER NOTES

1109 CATCH BASIN SQUARE
RIM=184.27'
IE 12" CONC(SE)=181.57'
BOTTOM=180.27'

1169 STORM MANHOLE
RIM=185.31'
IE 18" CONC(W)=176.76'
IE 18" CONC(E)=176.76'

1280 CATCH BASIN SQUARE
RIM=185.35'
IE 15" ???(N)=177.85'
IE 18" CONC(W)=177.20'
IE 18" CONC(E)=177.15'

1724 CATCH BASIN SQUARE
RIM=185.56'
IE 12" CONC(N)=179.66'
IE 12" CONC(S)=179.71'
STANDING WATER NOTED IN NORTH PIPE

1725 STORM MANHOLE
RIM=185.74'
IE 12" CONC(N)=178.94'
IE 18" CONC(W)=177.64'
IE 18" CONC(E)=177.44'

1813 CATCH BASIN SQUARE
RIM=185.82'
IE 10" CONC(N)=179.02'
IE 15" CONC(W)=178.37'
IE 15" CONC(E)=178.27'

1928 CATCH BASIN SQUARE
RIM=185.62'
IE 12" CONC(N)=179.22'
IE 15" CONC(W)=179.07'
IE 15" CONC(E)=178.97'

2200 STORM MANHOLE
RIM=185.36'
IE 21" CONC(S)=176.21'
IE 15" CPP(W)=175.86'
IE 21" CONC(N)=175.81'

2387 CATCH BASIN SQUARE
RIM=184.63'
IE 12" CONC(E)=182.53'
BOTTOM=181.43'

2389 STORM MANHOLE
RIM=184.83'
IE 12" PVC(W)=181.08'
IE 12" PVC(E)=177.13'
IE 21" CONC(S)=175.63'
IE 21" CONC(N)=175.43'

2390 CATCH BASIN SQUARE
RIM=184.30'
IE 12" PVC(W)=181.90'

2430 STORM MANHOLE
RIM=184.41'
IE 10" CONC(SE)=175.01'
IE 18" CONC(N)=174.76'
IE 21" CONC(S)=174.26'
IE 30" CONC(W)=173.91'

3363 CATCH BASIN SQUARE
RIM=182.61'
IE 12" CMP(S)=180.91'
IE 12" CMP(W)=180.61'
IE 18" CMP(N)=180.41'

3364 CATCH BASIN SQUARE
RIM=182.40'
IE 12" CMP(E)=180.80'

3368 CATCH BASIN SQUARE
RIM=182.60'
UNABLE TO OPEN OR MEASURE DUE TO GRAVEL EMBEDDED IN GRATE

3848 STORM MANHOLE
RIM=185.55'
IE 12" PVC(SE)=178.90'
IE 12" PVC(NE)=178.55'
IE 21" CONC(N)=176.05'

3940 STORM MANHOLE
RIM=184.86'
IE 30" CONC(E)=173.86'
IE 18" PVC(N)=173.86'
IE 30" CONC(W)=173.81'

3949 STORM MANHOLE
RIM=185.53'
IE 30" CONC(E)=173.33'
IE 30" CONC(S)=173.28'

4109 CATCH BASIN SQUARE W/OIL TRAP
RIM=183.45'
IE 12" CONC(S)=181.35'
BOTTOM=180.05'

6026 STORM MANHOLE
RIM=185.28'
NOT MEASURED DUE TO TRAFFIC

6029 CATCH BASIN ROUND
RIM=184.40'
IE 6" CONC(SE)=183.60'

6030 CATCH BASIN SQUARE
RIM=185.17'
IE 12" CONC(N)=179.87'
IE 12" CONC(W)=179.82'
IE 15" CONC(E)=179.62'

6033 STORM MANHOLE
RIM=184.24'
IE(S) CANNOT SEE OR MEASURE
IE 30" CONC(N)=173.19'
IE 36" CONC(W)=172.74'

6035 STORM MANHOLE
RIM=185.74'
IE 36" CONC(E)=171.64'
IE 36" CONC(N)=171.49'

SANITARY SEWER NOTES

1801 SANITARY MANHOLE
RIM=186.84'
IE 8" CONC(W)=173.99'
IE 8" CONC(E)=173.99'

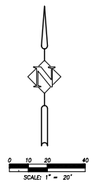
3842 SANITARY MANHOLE
RIM=184.98'
IE 8" CONC(E)=173.18'
IE 8" CONC(W)=173.13'
IE 8" CSP(S)=173.03'
IE 8" CSP(N)=173.03'

6018 SANITARY MANHOLE
RIM=184.45'
IE 8" ??(W)=176.55'
IE 8" ??(E)=176.45'
IE 8" CSP(N)=176.40'
IE 8" CSP(S)=176.35'

6023 SANITARY MANHOLE
RIM=185.16'
IE 8" PVC(E)=174.87'
IE 8" CSP(N)=174.81'
IE 8" CSP(S)=174.76'

6027 SANITARY MANHOLE
RIM=185.25'
NOT MEASURED DUE TO TRAFFIC

6031 SANITARY MANHOLE
RIM=185.49'
NOT MEASURED DUE TO TRAFFIC



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REGISTERED PROFESSIONAL LAND SURVEYOR

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OREGON
JANUARY 14, 2003
JOSEPH W. HURLIMAN
58960

RENEWS: 6-30-2025

DESIGNED:	DRAWN:	CHECKED:	DATE:
!	ACY	JWH	10/03/2024

REVISIONS

NO.	DESCRIPTION	DATE
1.	ADDED MANHOLE LOCATIONS	4/10/2025

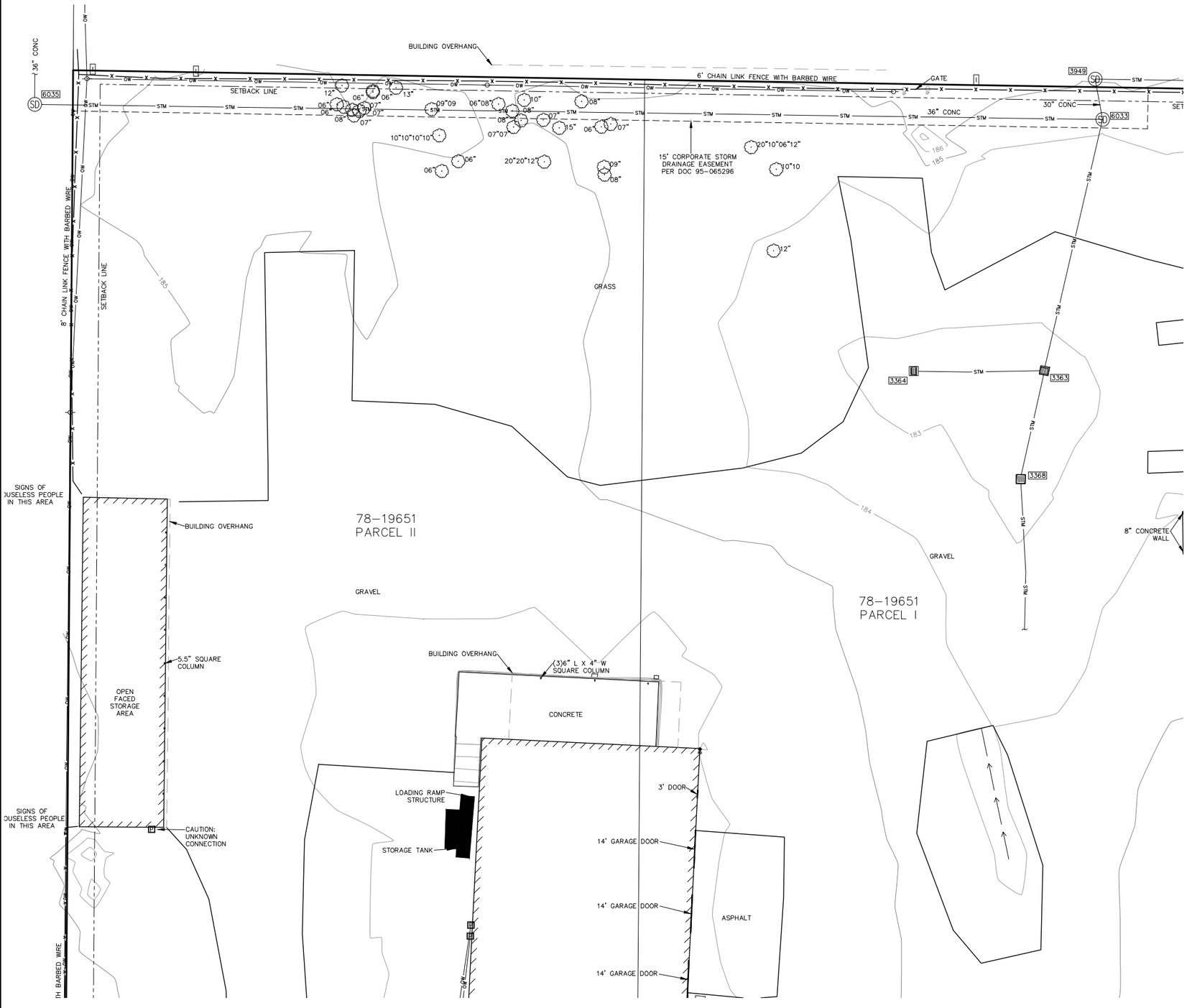
SHEET NO. 1 OF 7

JOB NO. FPC-02

S:\FPC (Fore Property Company)\FPC-02 (Cornelius ALTA)\FPC-02-DWGS\Sent\20250410 FINAL TOPO AND ALTA\FPC02-TOPO.dwg

LOCATED IN THE SOUTHWEST ONE-QUARTER OF THE
SOUTHEAST ONE-QUARTER OF SECTION 34,
TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN
CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

FIELD WORK DATES: 08/08/2024 – 09/23/2024



TOPOGRAPHIC LEGEND:

- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE
- GAS LINE
- OVERHEAD WIRE
- FENCE LINE, TYPE AS NOTED
- FIBER OPTIC LINE
- TELEPHONE LINE
- ELECTRIC LINE
- CABLE TELEVISION LINE
- FLOWLINE
- BUILDING LINE
- UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
- MAJOR CONTOUR – 5' INTERVALS
- MINOR CONTOUR – 1' INTERVALS
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- CATCH BASIN SQUARE
- ROOF DRAIN DOWN SPOUT
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER STAND PIPE
- WATER VAULT
- IRRIGATION BOX
- GAS METER
- GAS VALVE
- POWER RISER
- POWER METER
- ELECTRIC BOX
- POWER TRANSFORMER
- CABLE TELEVISION BOX
- CABLE TELEVISION RISER
- TELEPHONE RISER
- SIGNAL POLE
- SEE TOPO/SURVEY NOTES TABLE
- EXCEPTION NUMBER PER TITLE REPORT
- FOUND MONUMENT AS NOTED IN TABLE. PROTECT.
- UNKNOWN UTILITY VAULT
- UNKNOWN RISER/CABINET
- GUY WIRE
- LIGHT POLE
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
- UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
- SINGLE POST SIGN
- FLAG POST
- GATE POST
- BOLLARD
- MAIL-BOX
- HANDI-CAP PARKING SPACE
- CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- TRAFFIC SIGNAL BOX
- TRAFFIC SIGNAL CABINET
- POLE WITH PEDESTRIAN PUSH BUTTON
- FIRE DEPT. CONNECTION

NOTE: SYMBOLS SHOWN HEREON ARE FOR GRAPHICAL REPRESENTATION PURPOSES AND DO NOT NECESSARILY SHOW SHAPE, SIZE, ROTATION, CONDITION, TYPE, ETC. OF THE ACTUAL PHYSICAL IMPROVEMENTS THAT THEY REPRESENT. CONDITION, TYPE, ROTATION, ETC. MAY VARY AMONGST ITEMS SHOWN BY THE SAME SYMBOL.

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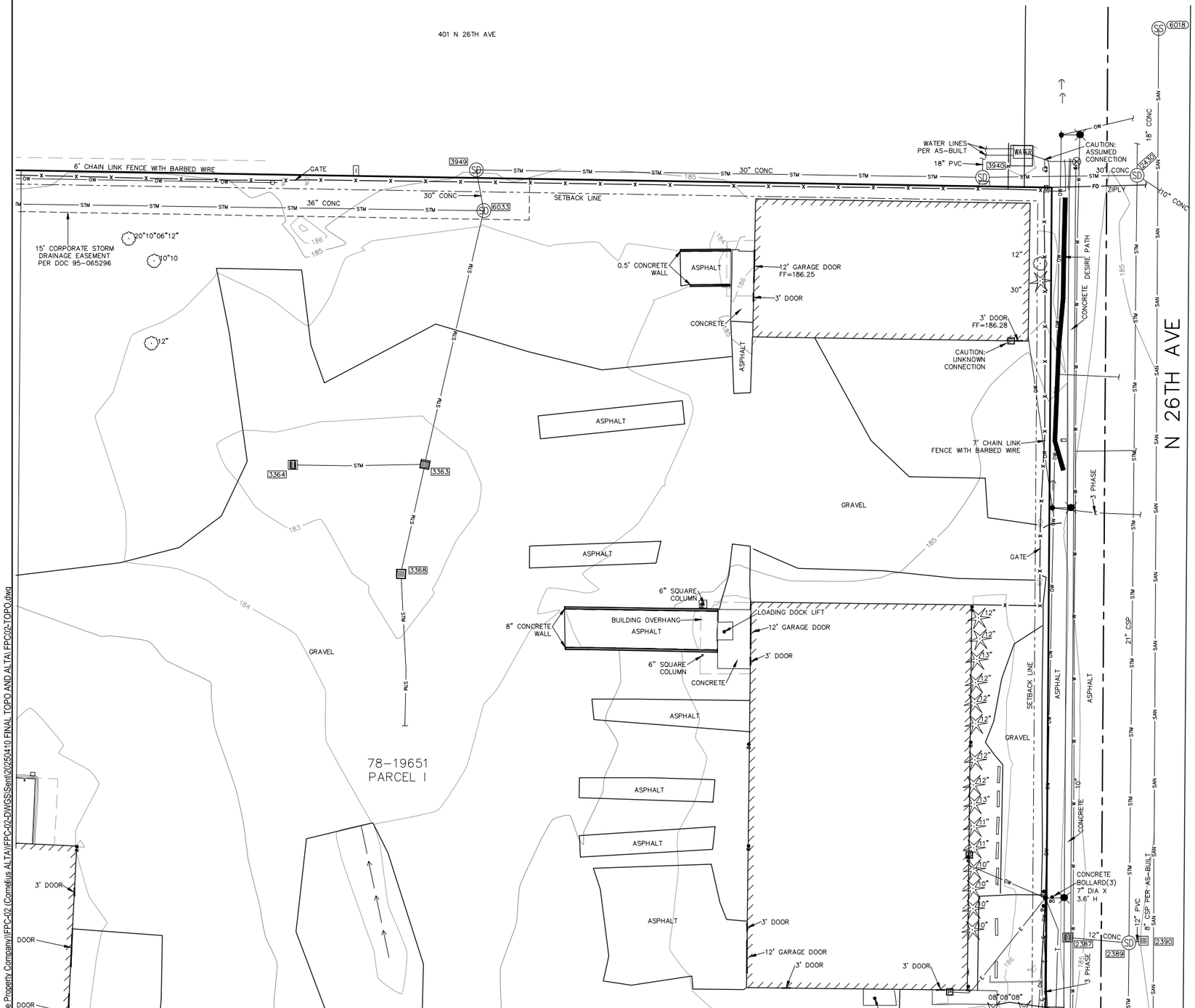
SHEET NO. 2 OF 7

JOB NO. FPC-02

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CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

FIELD WORK DATES: 08/08/2024 – 09/23/2024



TOPOGRAPHIC LEGEND:

- STM — STORM SEWER LINE
- SAN — SANITARY SEWER LINE
- W — WATER LINE
- G — GAS LINE
- OW — OVERHEAD WIRE
- X — X — X — FENCE LINE, TYPE AS NOTED
- FO — FIBER OPTIC LINE
- T — TELEPHONE LINE
- E — ELECTRIC LINE
- TV — CABLE TELEVISION LINE
- FLOWLINE
- BUILDING LINE
- UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
- MAJOR CONTOUR – 5' INTERVALS
- MINOR CONTOUR – 1' INTERVALS
- SS — SANITARY SEWER MANHOLE
- SD — STORM SEWER MANHOLE
- CATCH BASIN SQUARE
- ROOF DRAIN DOWN SPOUT
- FIRE HYDRANT
- WATER VALVE
- W — WATER METER
- WATER STAND PIPE
- WATER — WATER VAULT
- IRRIGATION BOX
- GAS METER
- GAS VALVE
- POWER RISER
- POWER METER
- ELECTRIC BOX
- POWER TRANSFORMER
- CABLE TELEVISION BOX
- CABLE TELEVISION RISER
- TELEPHONE RISER
- SIGNAL POLE
- # — SEE TOPO/SURVEY NOTES TABLE
- EXCEPTION NUMBER PER TITLE REPORT
- FOUND MONUMENT AS NOTED IN TABLE. PROTECT.
- ?? — UNKNOWN UTILITY VAULT
- UNKNOWN RISER/CABINET
- GUY WIRE
- LIGHT POLE
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
- UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
- SINGLE POST SIGN
- FLAG POLE
- GATE POST
- BOLLARD
- MAIL-BOX
- HANDI-CAP PARKING SPACE
- CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- TRAFFIC SIGNAL BOX
- TRAFFIC SIGNAL CABINET
- POLE WITH PEDESTRIAN PUSH BUTTON
- FIRE DEPT. CONNECTION

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OREGON
JANUARY 14, 2003
JOSEPH W. HURLIMAN
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RENEWS: 6-30-2025

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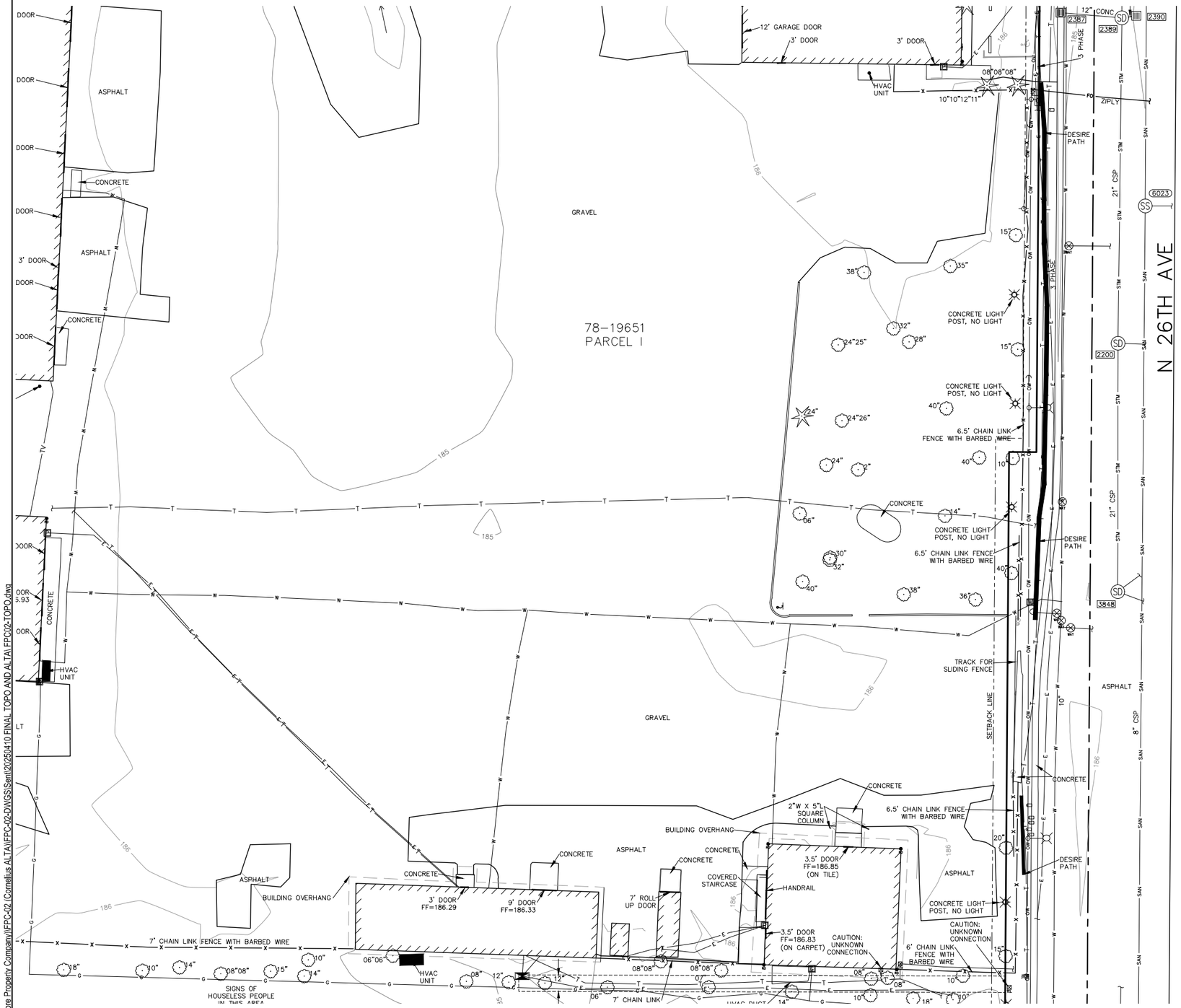
SHEET NO. 3 OF 7

JOB NO. FPC-02

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FIELD WORK DATES: 08/08/2024 – 09/23/2024



TOPOGRAPHIC LEGEND:

STM	STORM SEWER LINE
SAN	SANITARY SEWER LINE
W	WATER LINE
G	GAS LINE
OW	OVERHEAD WIRE
X X X	FENCE LINE, TYPE AS NOTED
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T	TELEPHONE LINE
E	ELECTRIC LINE
TV	CABLE TELEVISION LINE
	FLOWLINE
	BUILDING LINE
	UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
	MAJOR CONTOUR – 5' INTERVALS
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SANITARY SEWER MANHOLE	UNKNOWN UTILITY VAULT
STORM SEWER MANHOLE	UNKNOWN RISER/CABINET
CATCH BASIN SQUARE	GUY WIRE
ROOF DRAIN DOWN SPOUT	LIGHT POLE
FIRE HYDRANT	UTILITY POLE
WATER VALVE	UTILITY POLE W/ UNDERGROUND UTILITIES
WATER METER	UTILITY POLE W/ STREET LIGHT
WATER STAND PIPE	UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
WATER VAULT	SINGLE POST SIGN
IRRIGATION BOX	FLAG POST
GAS METER	GATE POST
GAS VALVE	BOLLARD
POWER RISER	MAIL-BOX
POWER METER	HANDI-CAP PARKING SPACE
ELECTRIC BOX	CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
POWER TRANSFORMER	DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
CABLE TELEVISION BOX	TRAFFIC SIGNAL BOX
CABLE TELEVISION RISER	TRAFFIC SIGNAL CABINET
TELEPHONE RISER	POLE WITH PEDESTRIAN PUSH BUTTON
SIGNAL POLE	FIRE DEPT. CONNECTION
SEE TOPO/SURVEY NOTES TABLE	
EXCEPTION NUMBER PER TITLE REPORT	
FOUND MONUMENT AS NOTED IN TABLE. PROTECT.	

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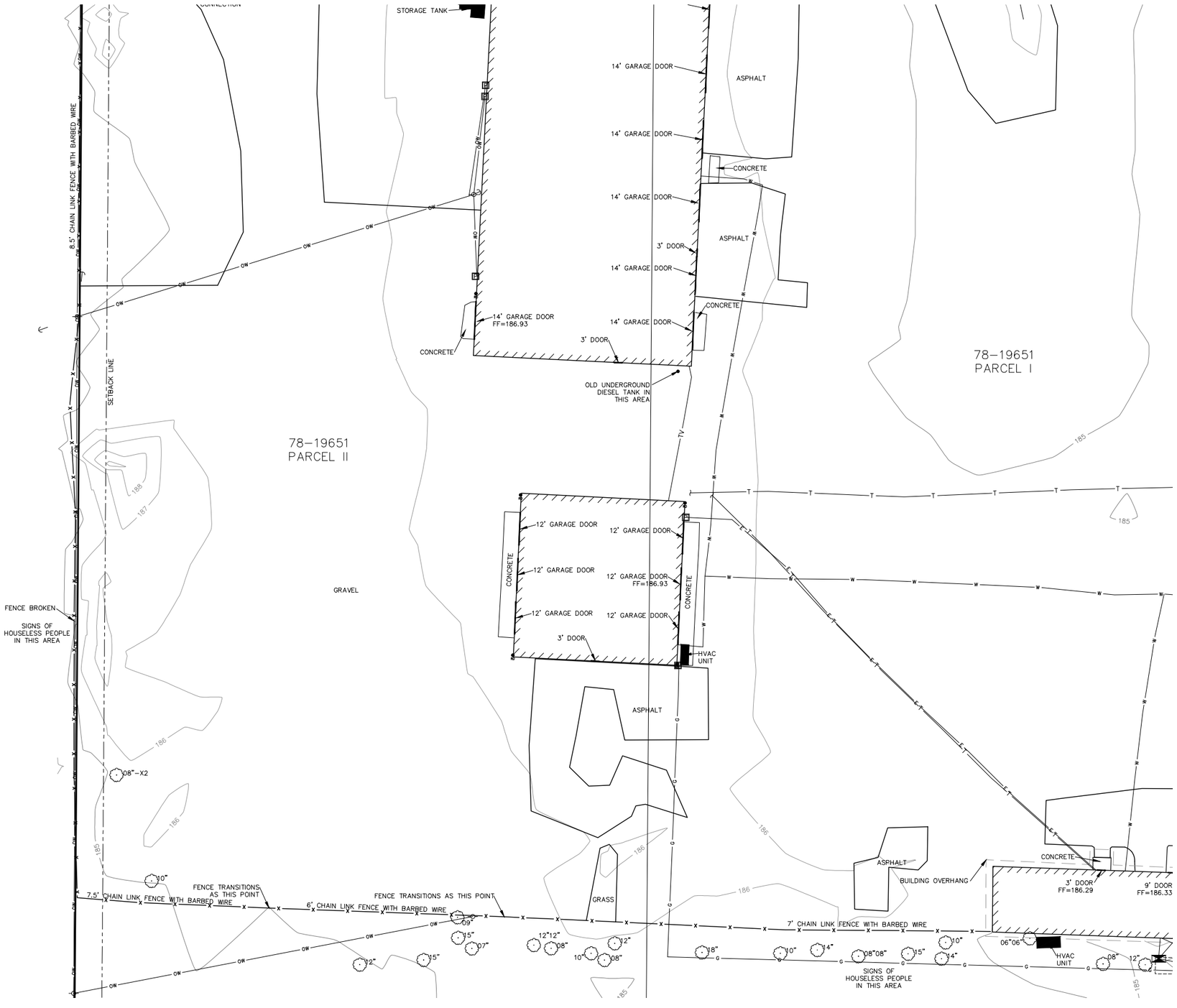
SHEET NO. 4 OF 7

JOB NO. FPC-02

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TV	CABLE TELEVISION LINE
	FLOWLINE
	BUILDING LINE
	UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
	MAJOR CONTOUR – 5' INTERVALS
	MINOR CONTOUR – 1' INTERVALS
SANITARY SEWER MANHOLE	UNKNOWN UTILITY VAULT
STORM SEWER MANHOLE	UNKNOWN RISER/CABINET
CATCH BASIN SQUARE	GUY WIRE
ROOF DRAIN DOWN SPOUT	LIGHT POLE
FIRE HYDRANT	UTILITY POLE
WATER VALVE	UTILITY POLE
WATER METER	W/ UNDERGROUND UTILITIES
WATER STAND PIPE	UTILITY POLE
WATER VAULT	W/ STREET LIGHT
IRRIGATION BOX	UTILITY POLE
GAS METER	W/ UNDERGROUND UTILITIES AND STREET LIGHT
GAS VALVE	SINGLE POST SIGN
POWER RISER	FLAG POST
POWER METER	GATE POST
ELECTRIC BOX	BOLLARD
POWER TRANSFORMER	MAIL-BOX
CABLE TELEVISION BOX	HANDI-CAP PARKING SPACE
CABLE TELEVISION RISER	CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
TELEPHONE RISER	DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
SIGNAL POLE	TRAFFIC SIGNAL BOX
SEE TOPO/SURVEY NOTES TABLE	TRAFFIC SIGNAL CABINET
EXCEPTION NUMBER PER TITLE REPORT	POLE WITH PEDESTRIAN PUSH BUTTON
FOUND MONUMENT AS NOTED IN TABLE. PROTECT.	FIRE DEPT. CONNECTION

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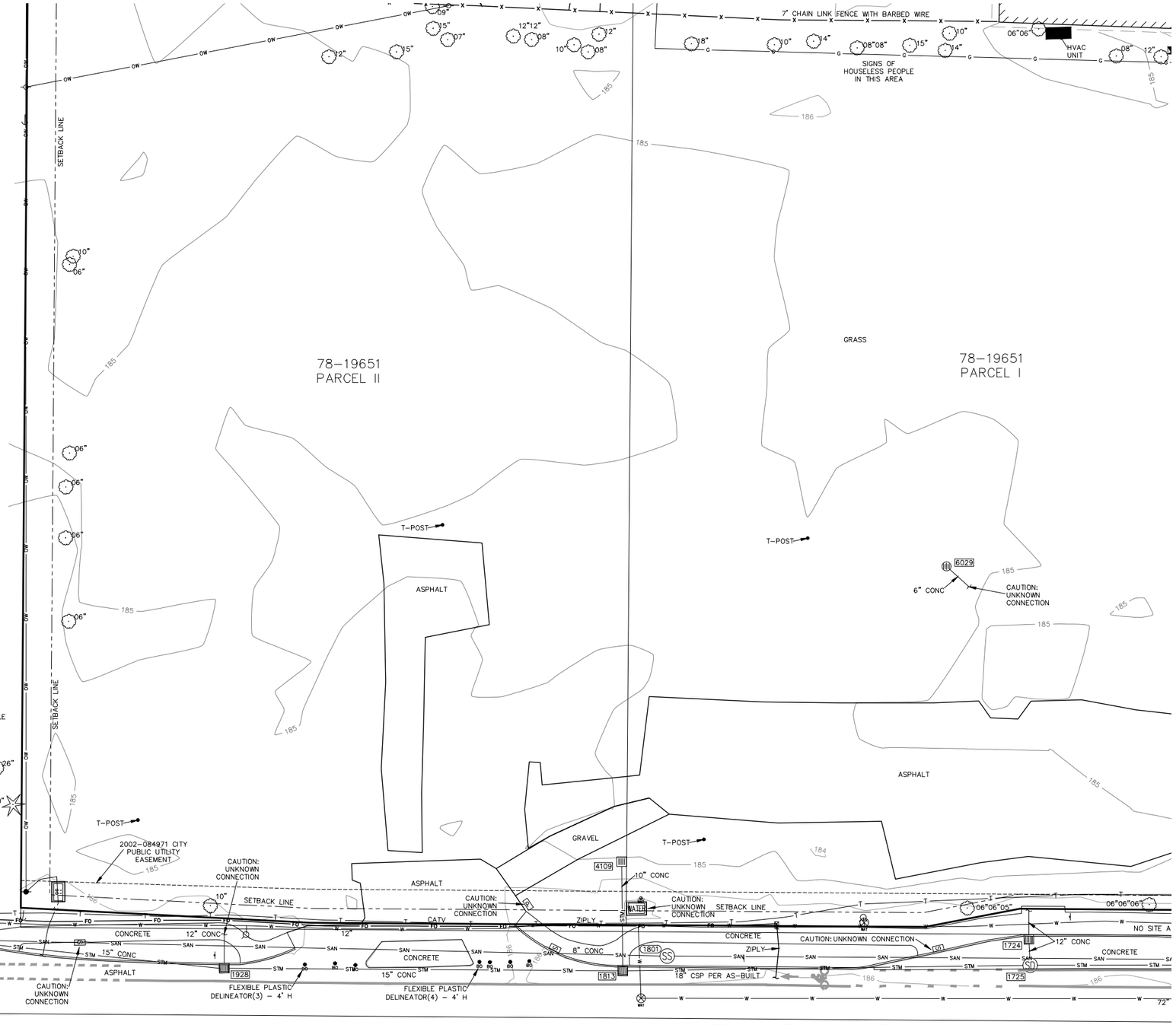
SHEET NO. 5 OF 7

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- ELECTRIC BOX
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- CABLE TELEVISION RISER
- TELEPHONE RISER
- SIGNAL POLE
- SEE TOPO/SURVEY NOTES TABLE
- EXCEPTION NUMBER PER TITLE REPORT
- FOUND MONUMENT AS NOTED IN TABLE. PROTECT.
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- UNKNOWN RISER/CABINET
- GUY WIRE
- LIGHT POLE
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
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- SINGLE POST SIGN
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- GATE POST
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- MAIL-BOX
- HANDI-CAP PARKING SPACE
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RENEWS: 6-30-2025

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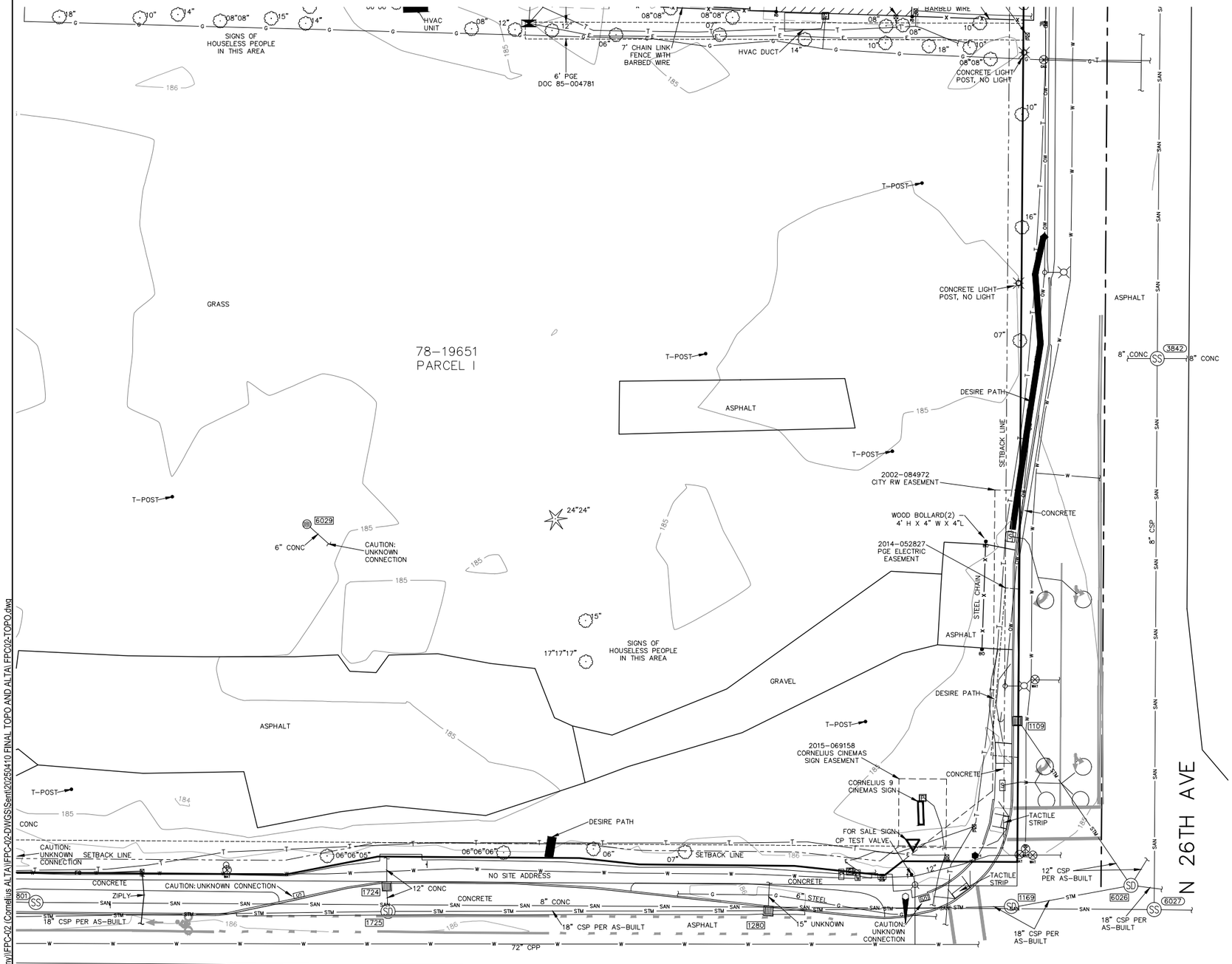
SHEET NO. 6 OF 7

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SOUTHEAST ONE-QUARTER OF SECTION 34,
TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN
CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

FIELD WORK DATES: 08/08/2024 – 09/23/2024



TOPOGRAPHIC LEGEND:

- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE
- GAS LINE
- OVERHEAD WIRE
- FENCE LINE, TYPE AS NOTED
- FIBER OPTIC LINE
- TELEPHONE LINE
- ELECTRIC LINE
- CABLE TELEVISION LINE
- FLOWLINE
- BUILDING LINE
- UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
- MAJOR CONTOUR – 5' INTERVALS
- MINOR CONTOUR – 1' INTERVALS
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- CATCH BASIN SQUARE
- ROOF DRAIN DOWN SPOUT
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER STAND PIPE
- WATER VAULT
- IRRIGATION BOX
- GAS METER
- GAS VALVE
- POWER RISER
- POWER METER
- ELECTRIC BOX
- POWER TRANSFORMER
- CABLE TELEVISION BOX
- CABLE TELEVISION RISER
- TELEPHONE RISER
- SIGNAL POLE
- SEE TOPO/SURVEY NOTES TABLE
- EXCEPTION NUMBER PER TITLE REPORT
- FOUND MONUMENT AS NOTED IN TABLE. PROTECT.
- UNKNOWN UTILITY VAULT
- UNKNOWN RISER/CABINET
- GUY WIRE
- LIGHT POLE
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
- UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
- SINGLE POST SIGN
- FLAG POST
- GATE POST
- BOLLARD
- MAIL-BOX
- HANDI-CAP PARKING SPACE
- CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- TRAFFIC SIGNAL BOX
- TRAFFIC SIGNAL CABINET
- POLE WITH PEDESTRIAN PUSH BUTTON
- FIRE DEPT. CONNECTION

NOTE: SYMBOLS SHOWN HEREON ARE FOR GRAPHICAL REPRESENTATION PURPOSES AND DO NOT NECESSARILY SHOW SHAPE, SIZE, ROTATION, CONDITION, TYPE, ETC. OF THE ACTUAL PHYSICAL IMPROVEMENTS THAT THEY REPRESENT. CONDITION, TYPE, ROTATION, ETC. MAY VARY AMONGST ITEMS SHOWN BY THE SAME SYMBOL.

SCALE: 1" = 20'

TOPOGRAPHIC SURVEY
85 N 26TH AVE
CORNELIUS, OREGON

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS
205 SE Spokane Street, Suite 200, Portland, OR 97202
phone: 503.221.1131 www.hhpr.com fax: 503.221.1171

REGISTERED PROFESSIONAL LAND SURVEYOR

Digitally Signed 2025.04.11 09:43:46-07'00'

OREGON
JANUARY 14, 2003
JOSEPH W. HURLIMAN
58960

RENEWS: 6-30-2025

DESIGNED:	DRAWN:	CHECKED:	DATE:
!	ACY	JWH	10/03/2024

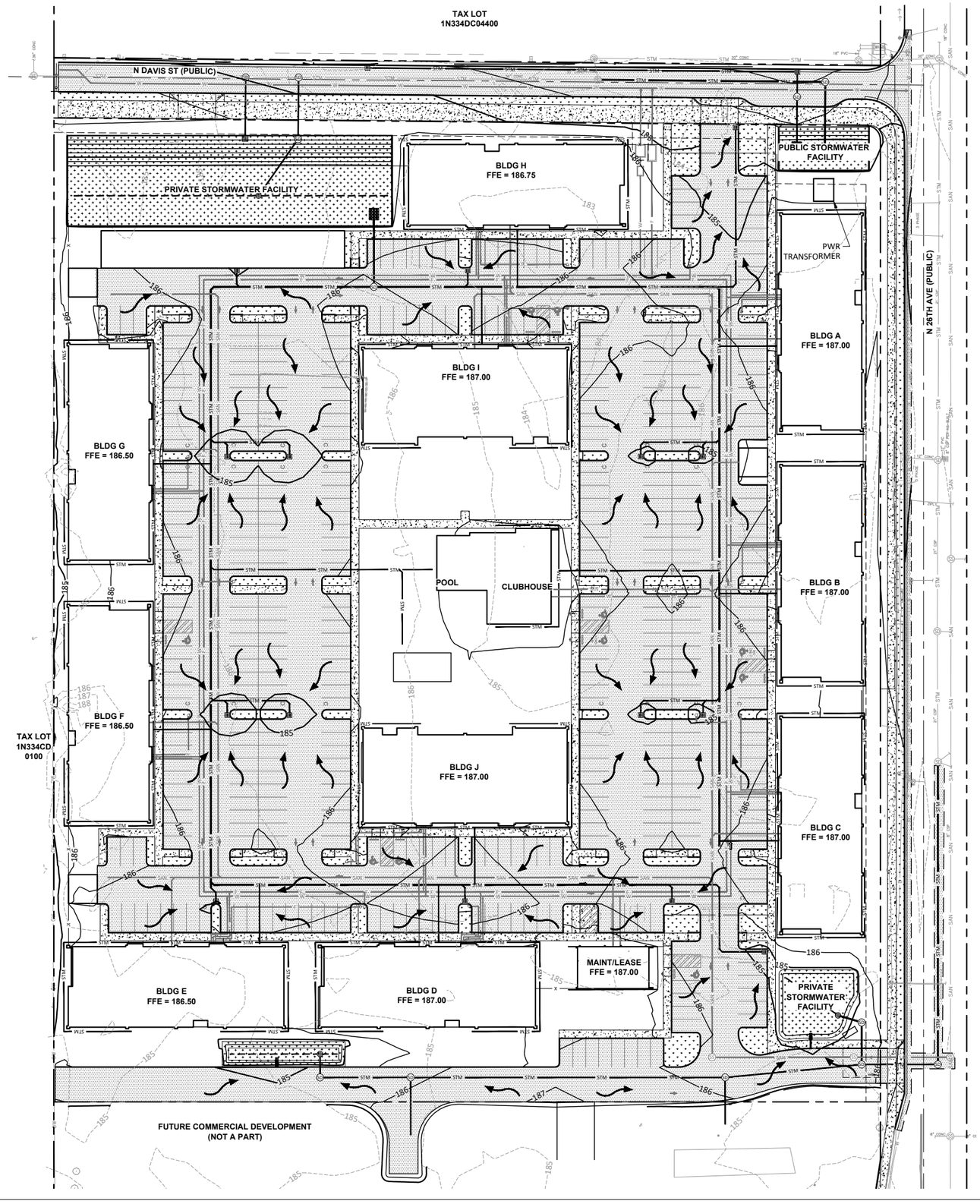
REVISIONS

NO.	DESCRIPTION	DATE
1.	ADDED MANHOLE LOCATIONS	4/10/2025

SHEET NO. 7 OF 7

JOB NO. FPC-02

S:\FPC (Fore Property Company)\FPC-02 (Cornelius ALTA)\FPC-02-DWGS\Sent\20250410 FINAL TOPO AND ALTA FPC02-TOPO.dwg



PROPOSED LEGEND:

- XXX — PROPOSED MAJOR CONTOUR (5')
- XXX — PROPOSED MINOR CONTOUR (1')
- XXX — EXISTING CONTOUR (1')
- FLOW PATH
- GRADING LIMITS
- FLOW DIRECTION
- XXX.XX TC / XXX.XX G

TC = TOP OF CURB
EG = EXISTING GRADE
FG = FINISH GRADE
FFE = FINISH FLOOR ELEVATION
G = GUTTER LINE
RIM = RIM
SW = SIDEWALK

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.

0 20 40 80
SCALE: 1" = 40'

Harper Houf Peterson Righellis Inc.
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530 Center Street NE, Suite 240, Salem, OR 97301
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abbasi design works LLC
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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

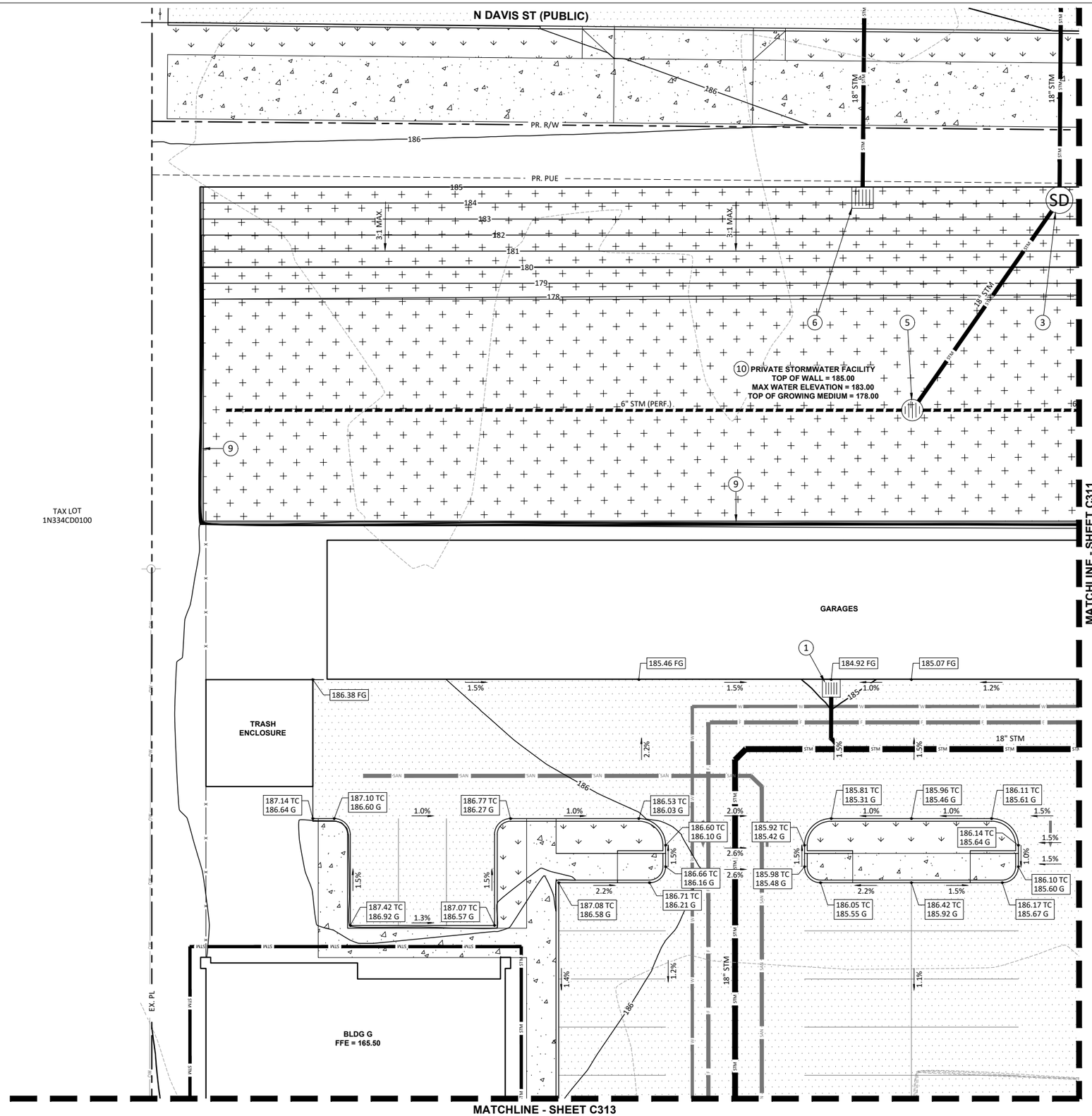
Project Status

OVERALL GRADING PLAN

Date	4/23/2025 8:13:40 PM
Drawn	HHPR
Checked	HHPR

C300

4/23/2025 8:13:40 PM



CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.
3. PROPOSED FLOW CONTROL MANHOLE PER CWS.
5. PROPOSED BEEHIVE OVERFLOW INLET.
6. PROPOSED SECONDARY OVERFLOW INLET FOR EMERGENCY OVERFLOW.
9. PROPOSED ECOBLOCK RETAINING WALL. DESIGN BY OTHERS.
10. PROPOSED LINED DETENTION POND WITH PERFORATED UNDERDRAIN PER CWS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

ENLARGED GRADING & DRAINAGE PLAN

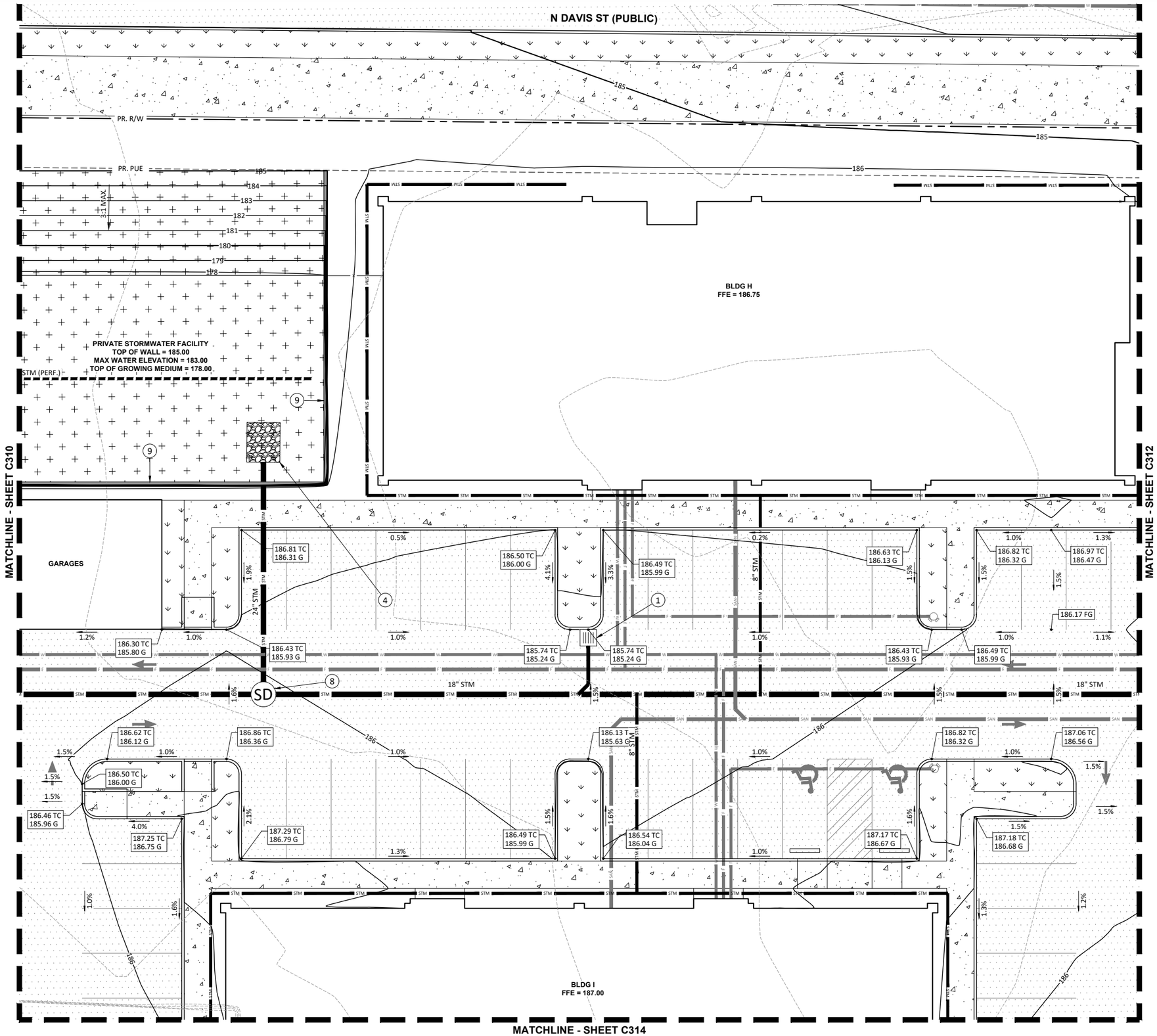
Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C310

SCALE: 1" = 10'

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CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.
4. PROPOSED RIP RAP STORM OUTFALL.
8. PROPOSED WATER QUALITY MANHOLE WITH SNOUT PER CWS.
9. PROPOSED ECOBLOCK RETAINING WALL. DESIGN BY OTHERS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
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3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

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+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

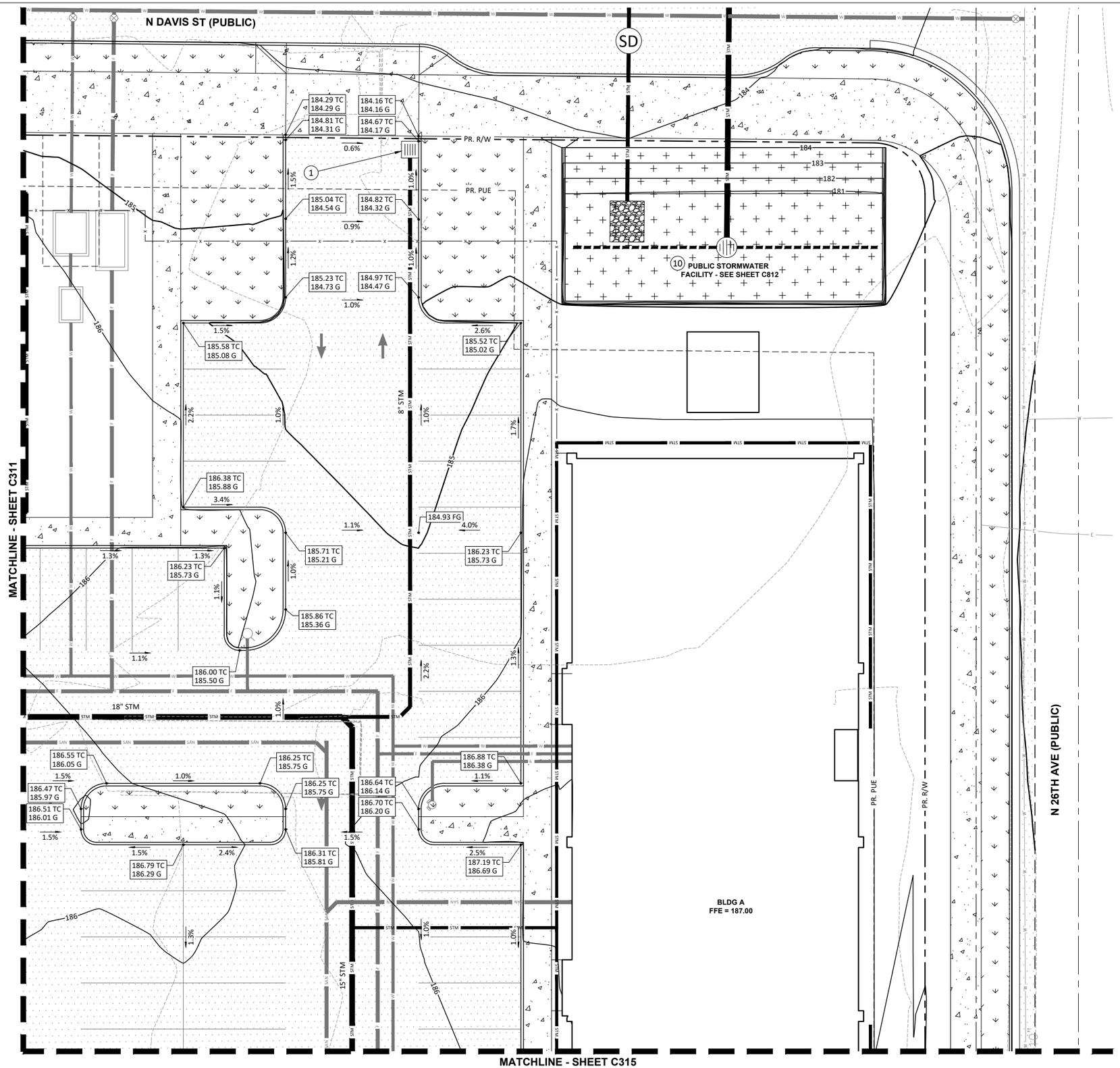
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C311

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CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.
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SCALE: 1" = 10'

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Project Status

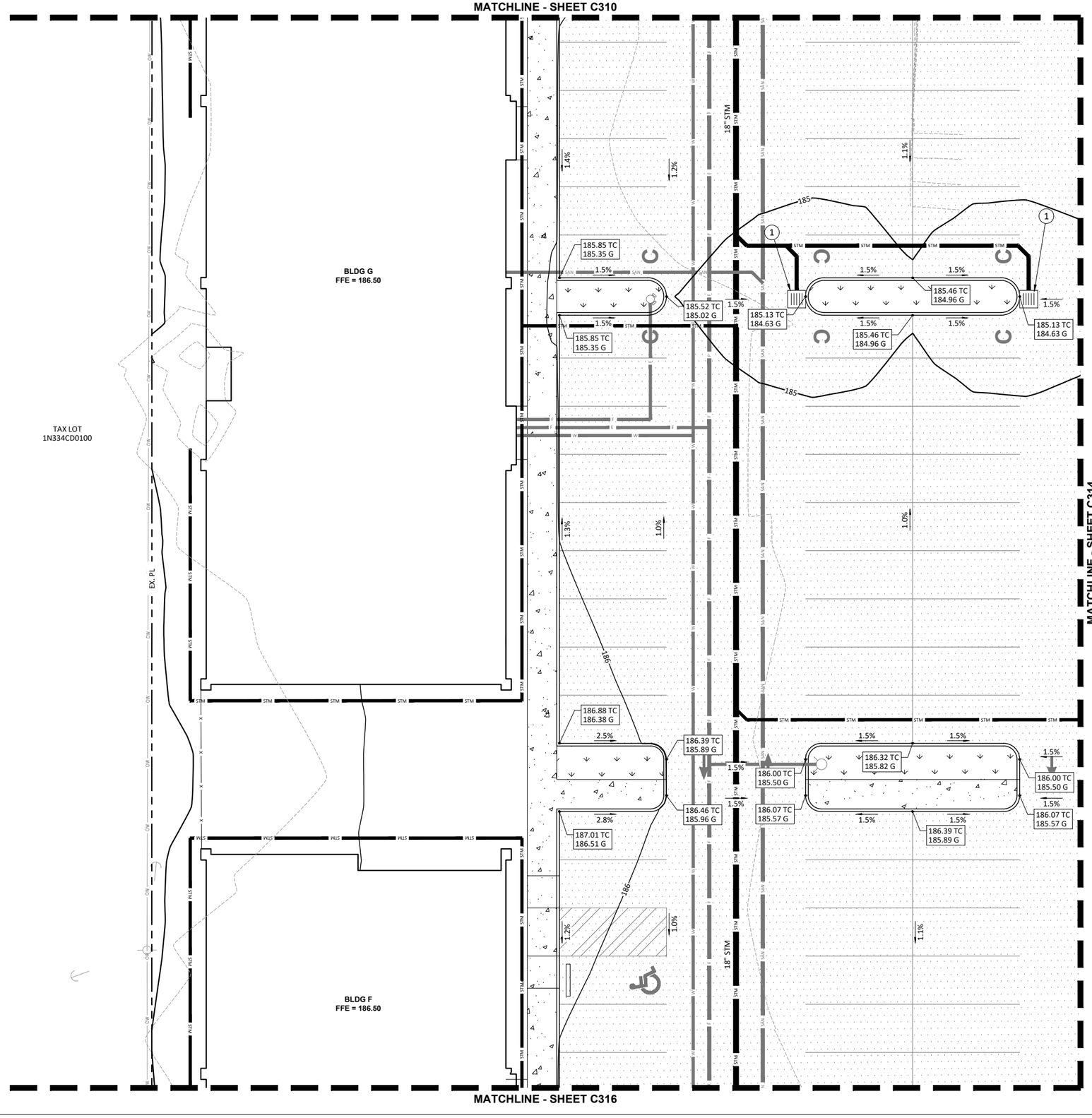
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C312

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CONSTRUCTION NOTES:

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SCALE: 1" = 10'

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PRELIMINARY

No.	Date

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HHPR #
FPC-02

Project Status

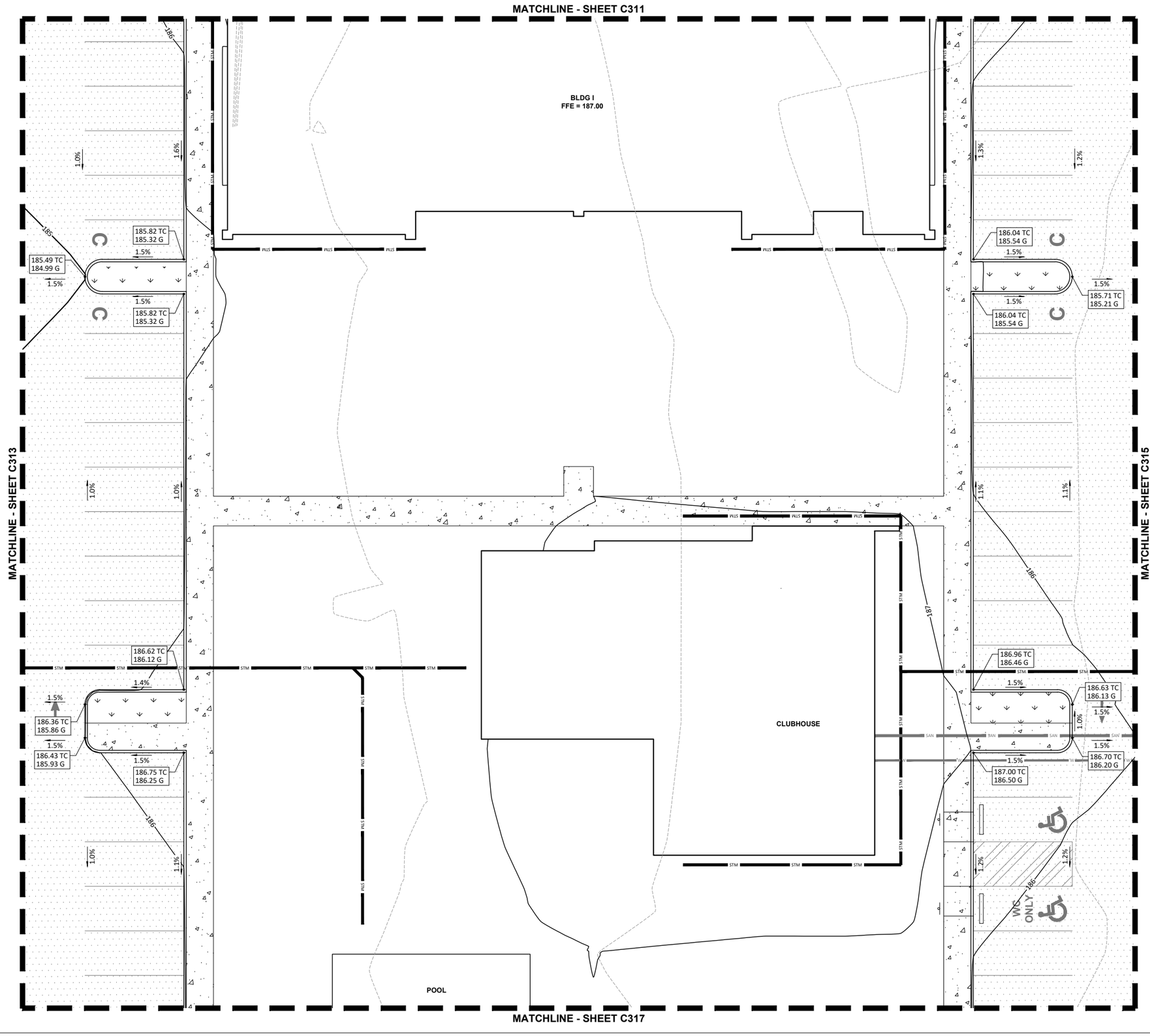
ENLARGED GRADING & DRAINAGE PLAN

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Drawn	HHPR
Checked	HHPR

C313

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SCALE: 1" = 10'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR # FPC-02

Project Status

ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C314

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phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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MATCHLINE - SHEET C312

MATCHLINE - SHEET C314

MATCHLINE - SHEET C318

BLDG A
FFE = 187.00

BLDG B
FFE = 187.00

N 26TH AVE (PUBLIC)

PR. R/W

PR. PUE

15" STM

12" STM

12" STM

185.68 TC
185.18 G

185.35 TC
184.85 G

185.68 TC
185.18 G

185.35 TC
184.85 G

186.22 TC
185.72 G

185.83 TC
185.33 G

185.74 TC
185.24 G

185.97 TC
185.47 G

186.36 TC
185.86 G

186.60 TC
186.10 G

186.27 TC
185.77 G

186.27 TC
185.77 G

186.66 TC
186.16 G

186.34 TC
185.84 G

186.34 TC
185.84 G

186.66 TC
186.16 G

186.73 TC
186.23 G

187.02 TC
186.52 G

187.11 TC
186.61 G

WC ONLY

CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.

GRADING NOTES:

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3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

0 5 10 20

SCALE: 1" = 10'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

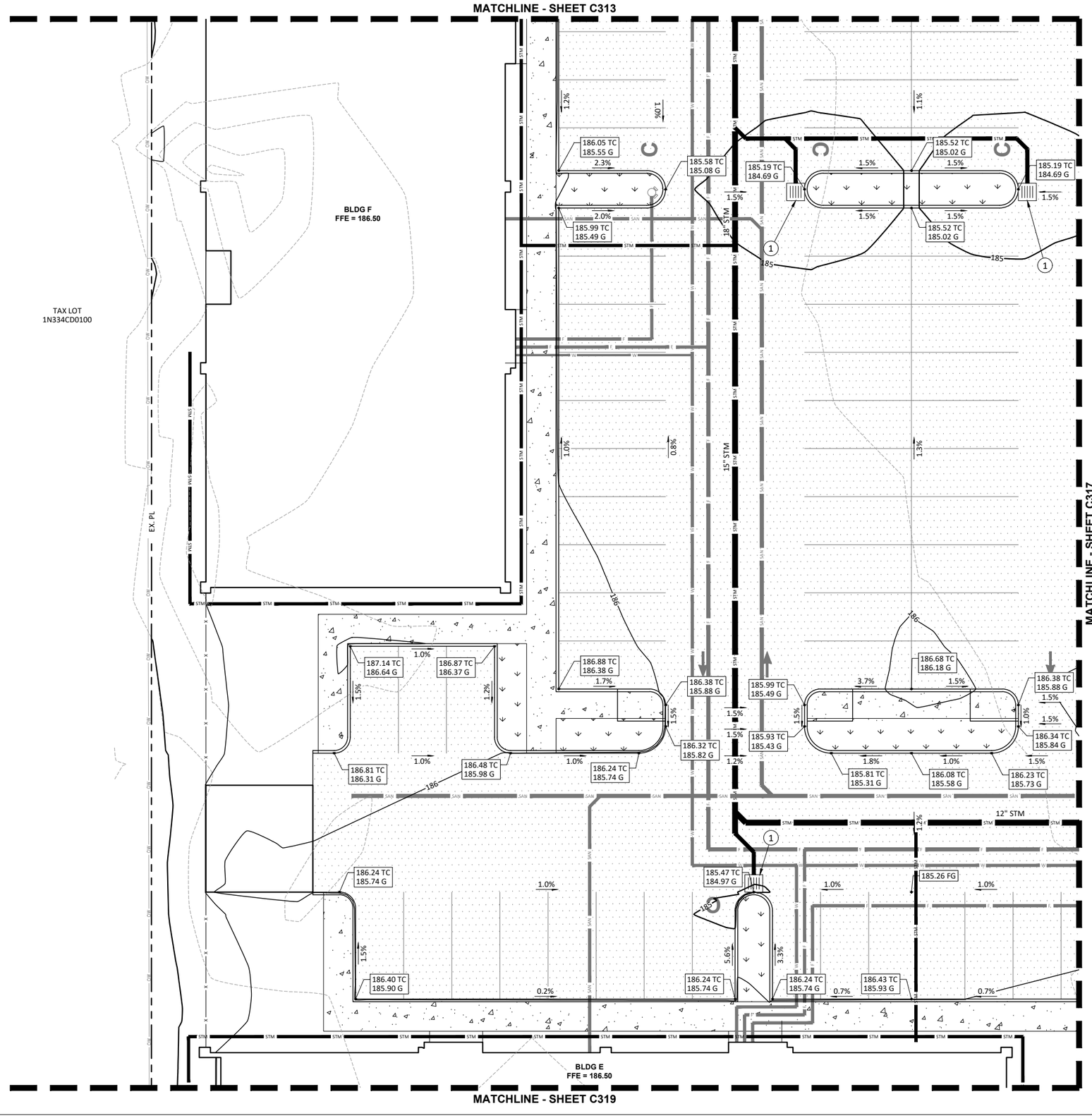
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C315

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CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.

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PRELIMINARY

No.	Date

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85 N 26th Ave
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HHPR #
FPC-02

Project Status

ENLARGED GRADING & DRAINAGE PLAN

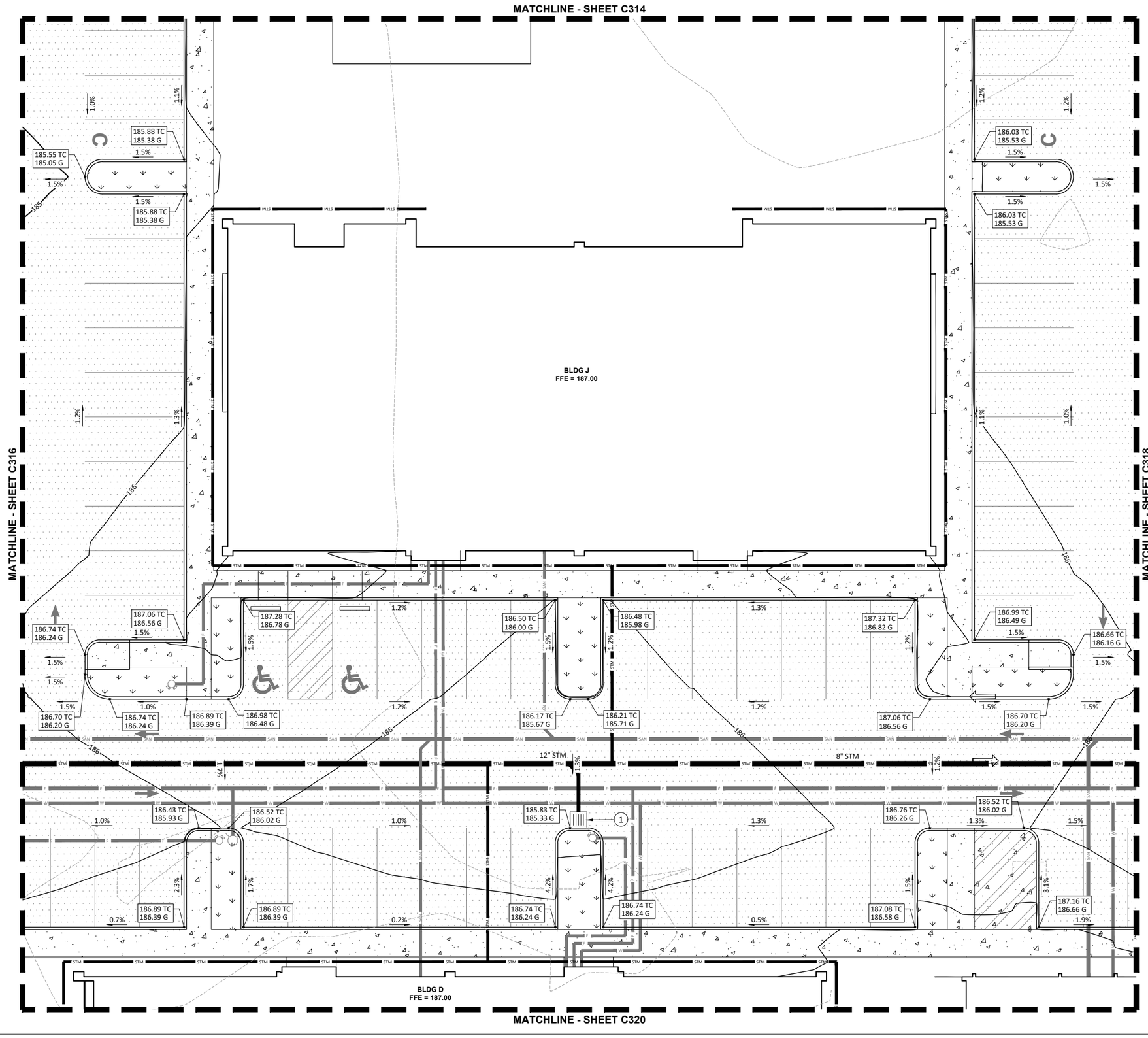
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Drawn HHPR
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C316

SCALE: 1" = 10'

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CONSTRUCTION NOTES:

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SCALE: 1" = 10'

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vancouver wa 98663
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+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
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Cornelius, OR 97113

HHPR #
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Project Status

ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
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C317

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MATCHLINE - SHEET C315

MATCHLINE - SHEET C317

MATCHLINE - SHEET C321

BLDG B
FFE = 187.00

BLDG C
FFE = 187.00

N 26TH AVE (PUBLIC)

PR. PUE

PR. R/W

CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.

GRADING NOTES:

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SCALE: 1" = 10'

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No.	Date

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Cornelius, OR 97113

HHPR #
FPC-02

Project Status

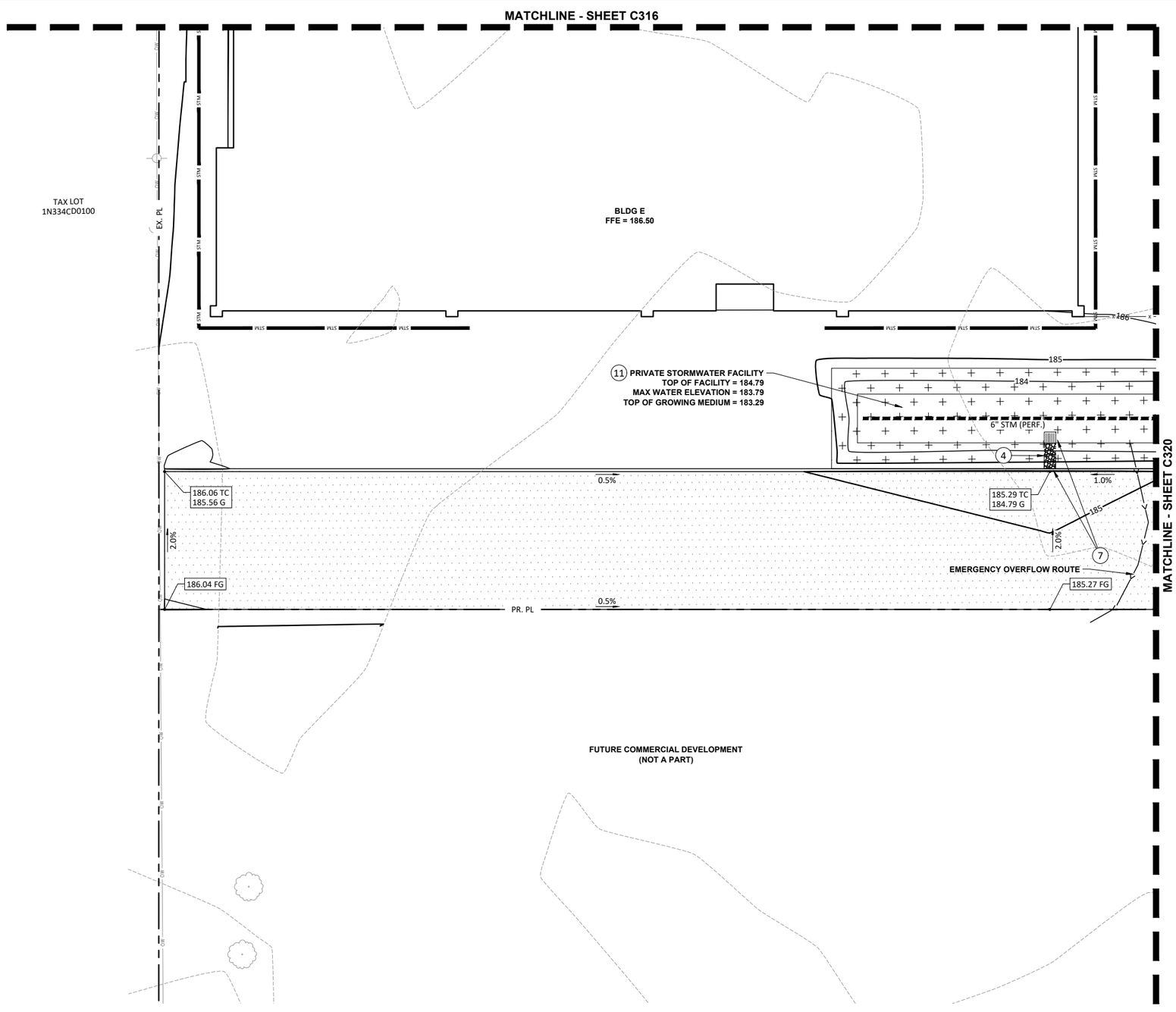
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C318

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CONSTRUCTION NOTES:

4 PROPOSED RIP RAP STORM OUTFALL.

7 PROPOSED CURB CUT PER CWS AND INLET STRUCTURE WITH SUMP PER CWS.

11 PROPOSED LINED RAINGARDEN WITH PERFORATED UNDERDRAIN PER CWS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
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3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

0 5 10 20

SCALE: 1" = 10'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
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HHPR #
FPC-02

Project Status

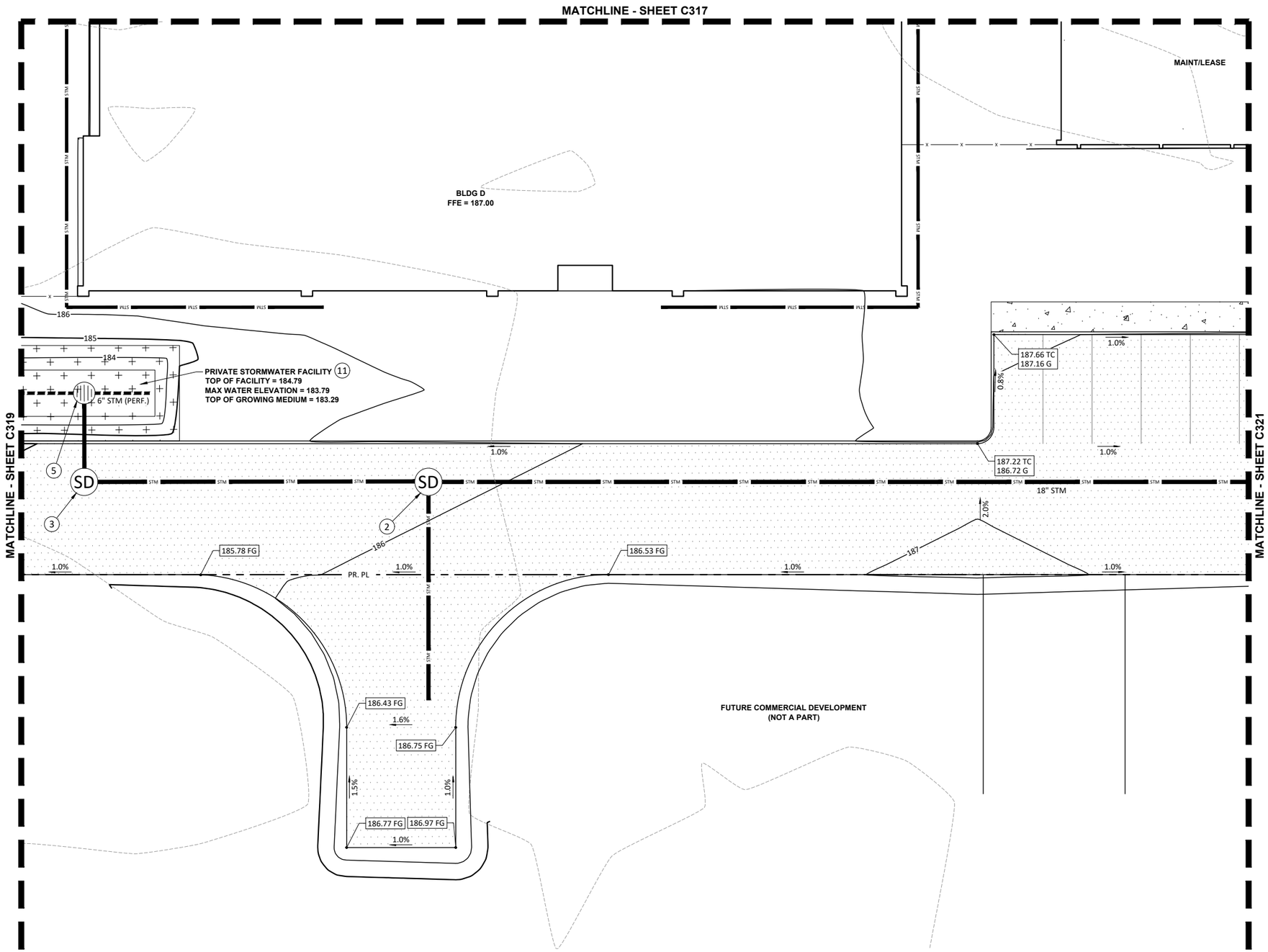
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
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C319

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CONSTRUCTION NOTES:

(2) PROPOSED 48" MANHOLE.

(3) PROPOSED FLOW CONTROL MANHOLE PER CWS.

(5) PROPOSED BEEHIVE OVERFLOW INLET.

(11) PROPOSED LINED RAINGARDEN WITH PERFORATED UNDERDRAIN PER CWS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
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0 5 10 20

SCALE: 1" = 10'

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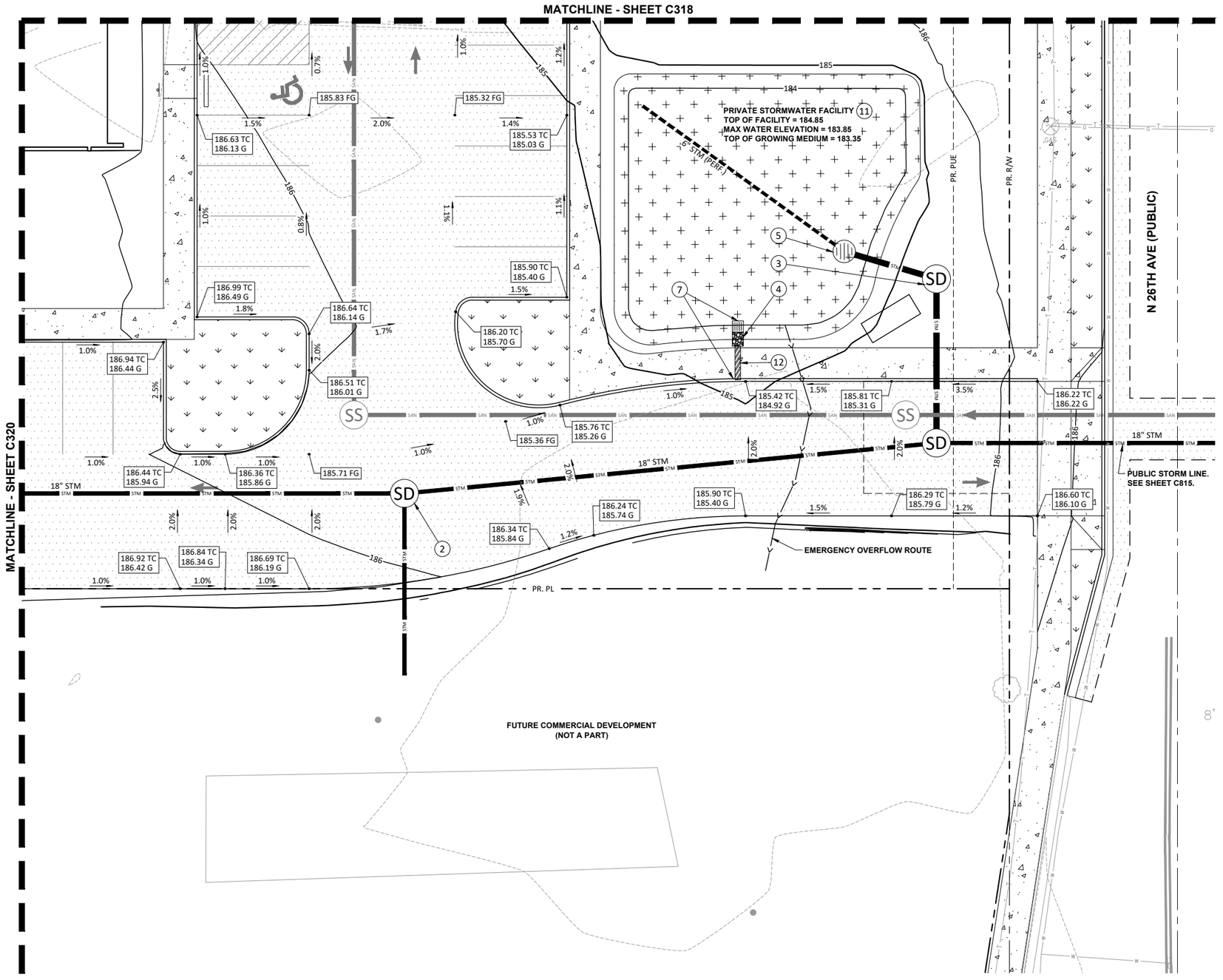
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
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C320

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CONSTRUCTION NOTES:

(2) PROPOSED 48" MANHOLE.

(3) PROPOSED FLOW CONTROL MANHOLE PER CWS.

(4) PROPOSED RIP RAP STORM OUTFALL.

(5) PROPOSED BEEHIVE OVERFLOW INLET.

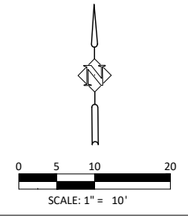
(7) PROPOSED CURB CUT PER CWS AND INLET STRUCTURE WITH SUMP PER CWS.

(11) PROPOSED LINED RAINGARDEN WITH PERFORATED UNDERDRAIN PER CWS.

(12) PROPOSED SIDEWALK DRAINAGE GRATE.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.



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+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

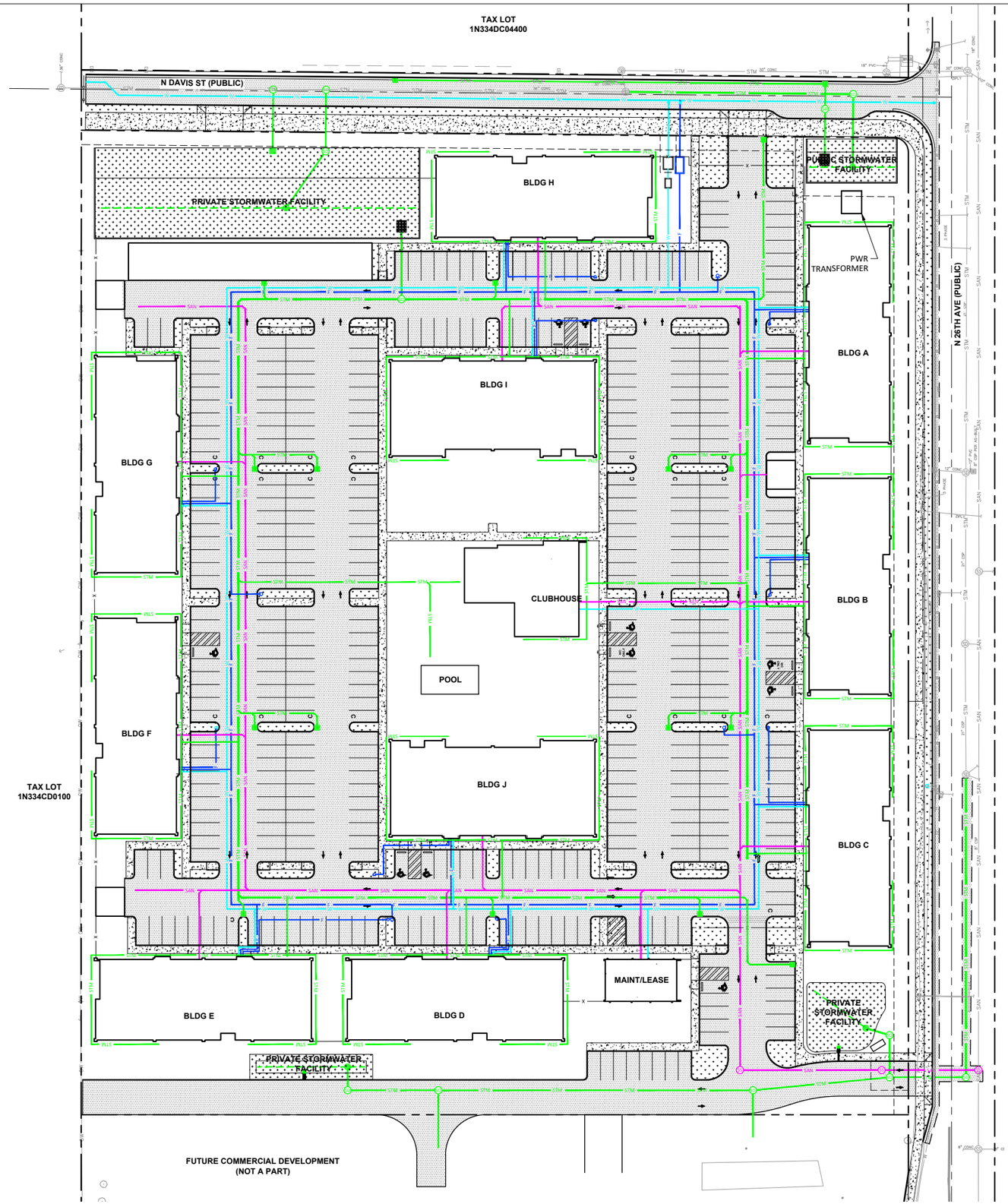
ENLARGED GRADING & DRAINAGE PLAN

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C321

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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LEGEND:

- STM — STORM SEWER LINE
- SAN — SANITARY SEWER LINE
- W — DOMESTIC WATER LINE
- F — FIRE WATER LINE

0 20 40 80

SCALE: 1" = 40'

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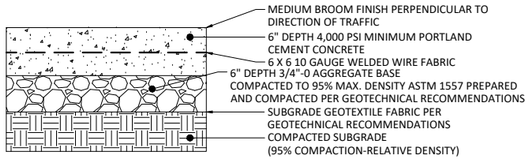
COMPOSITE UTILITY PLAN

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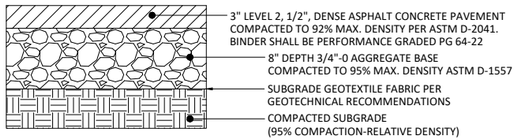
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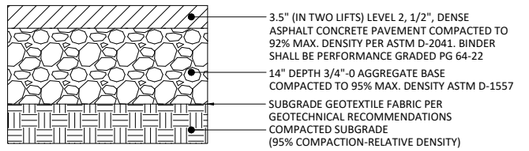
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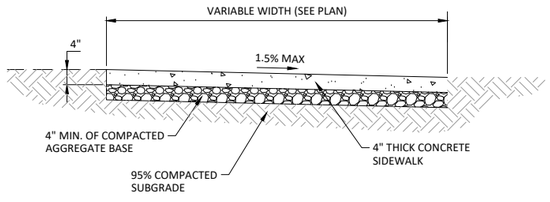
CONCRETE PAVING SECTION (PRIVATE)
(VEHICLE AREAS)
NTS



ASPHALT PAVING SECTION (PRIVATE)
(CAR PARKING AREAS)
NTS

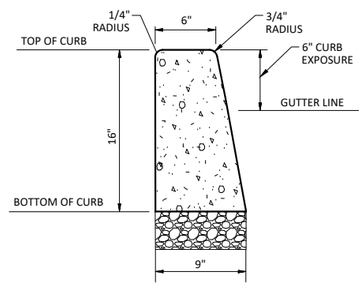


ASPHALT PAVING SECTION (PRIVATE)
(DRIVE AISLE AREAS)
NTS



SIDEWALK SECTION NOTES:
1. PROVIDE EXPANSION JOINT WHERE NEW WORK ABUTS EXISTING CONSTRUCTION. PROVIDE EXPANSION JOINTS AROUND CURB RAMP.
2. PROVIDE WEAKENED PLANE CONTRACTION JOINTS IN SIDEWALK AT A MAXIMUM SPACING OF 15 FT.
3. SIDEWALKS SHALL BE LIGHTLY BROOM-FINISHED WITH DIRECTION OF BROOMING PERPENDICULAR TO DIRECTION OF TRAFFIC UNLESS OTHERWISE INDICATED.
4. CONCRETE STRENGTH SHALL BE 3,500 PSI.
5. VEHICULAR CONCRETE TO BE 6" CONCRETE OVER 8" BASE.
6. PEDESTRIAN RATED CONCRETE TO BE 4" CONCRETE OVER 4" BASE.

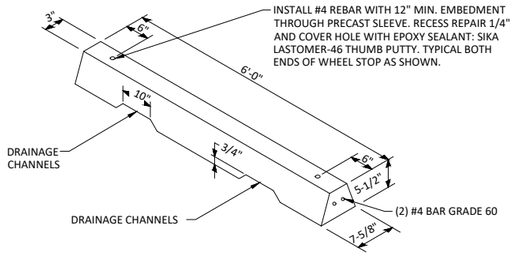
CONCRETE SIDEWALK SECTION
NTS



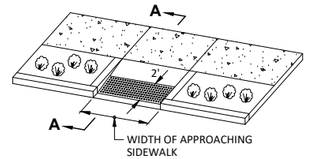
1. SEE CURB NOTES, THIS SHEET

STANDARD CURB DETAIL
NTS

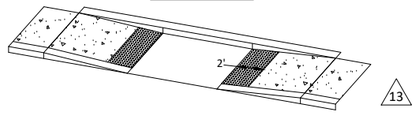
CURB NOTES:
1. CONCRETE SHALL BE 4000 PSI MIN. 3-1/2: SLUMP (MAX).
2. CURBS ADJACENT TO PAVEMENT OR SIDEWALK TO HAVE EXPANSION AND/OR CONTRACTION JOINTS TO MATCH EXISTING PATTERNS.
3. EXPANSION JOINTS TO BE PROVIDED AT EACH; POINT OF TANGENCY, COLD JOINT, SIDE OF INLET STRUCTURE, SIDE OF DRIVEWAYS.
4. EXPANSION JOINT MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF ½ INCH.
5. CONTRACTION JOINTS SHALL HAVE; SPACING OF NOT MORE THAN 15FEET, DEPTH OF JOINT OF AT LEAST 1 ¼ INCHES.
6. BASE ROCK SHALL BE ¾"-0, COMPACTED TO 95% ASTM D 1557. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4 INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 12" BEHIND THE CURB.



PRECAST CONCRETE WHEEL STOP
NTS

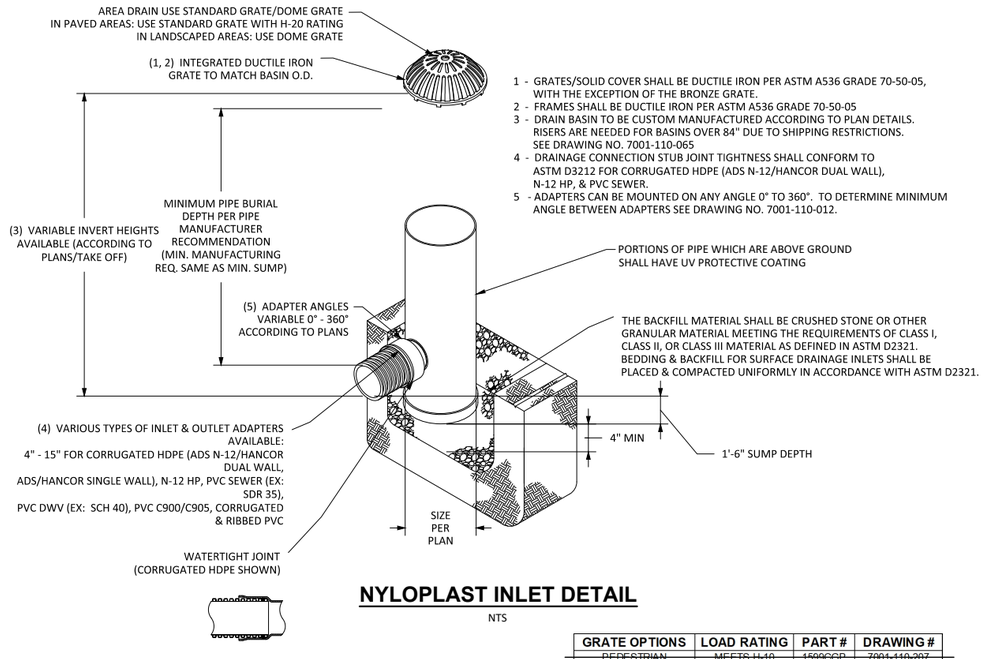


SECTION A-A



GENERAL NOTES:
1. PLACE TRUNCATED DOME DETECTABLE WARNING TEXTURE IN THE LOWER 2' OF THROAT OF RAMP ONLY. ARRANGE DOMES USING IN-LINE PATTERN AS SHOWN IN DETAIL BELOW. COLOR OF TEXTURE TO BE SAFETY YELLOW. FOR CONSTRUCTION OF SIDEWALK RAMPS OUTSIDE OF PUBLIC RIGHT-OF-WAY, CHECK OSSC AND FEDERAL ADA GUIDELINES AS WELL AS STATE BUILDING CODE REQUIREMENTS.
2. SIDEWALK CURB RAMP SLOPES SHOWN ARE RELATIVE TO THE TRUE LEVEL HORIZON (ZERO BUBBLE).
3. SIDE FLARES THAT ARE NOT PART OF THE PATH OF TRAVEL MAY BE ANY SLOPE.
4. RAMPS FOR PATHS INTERSECTING A ROADWAY SHOULD BE FULL WIDTH OF PATH. WHEN A RAMP IS USED TO PROVIDE BICYCLE ACCESS FROM A ROADWAY TO A SIDEWALK, THE RAMP SHOULD BE 8' WIDE WITH NO TEXTURING.
5. FOR THE PURPOSE OF THIS DRAWING, A CURB RAMP IS CONSIDERED "PERPENDICULAR" IF THE ANGLE BETWEEN THE LONGITUDINAL AXIS OF THE RAMP AND A TANGENT TO THE CURB AT THE RAMP CENTER IS 75° OR GREATER.
6. TOOLED JOINTS ARE REQUIRED AT ALL SIDEWALK RAMP SLOPE BREAK LINES.
7. SIDEWALK FLARE IS NOT NECESSARY WHERE THE RAMP IS PROTECTED FROM PEDESTRIAN CROSS-TRAVEL.

CURB RAMP DETAIL
NTS



NYLOPLAST INLET DETAIL
NTS

GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
~~PEDESTRIAN~~	~~MEETS H-10~~	~~1599CGP~~	~~7001-110-207~~
STANDARD	MEETS H-20	1599CGS	7001-110-208
~~SOLID COVER~~	~~MEETS H-20~~	~~1599CGC~~	~~7001-110-209~~
~~PEDESTRIAN BRONZE~~	~~N/A~~	~~1599CGPB~~	~~7001-110-210~~
DOME	N/A	1599CGD	7001-110-211
~~DROP IN GRATE~~	~~LIGHT DUTY~~	~~150 DI~~	~~7001-110-073~~

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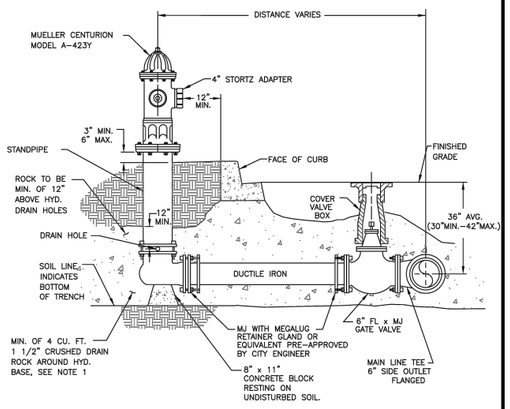
Project Status

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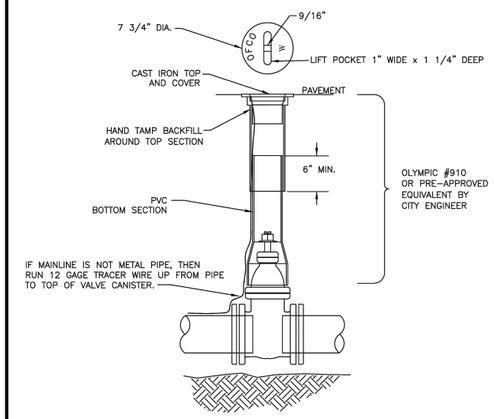
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NOTES:

1. IF DISTANCE IS GREATER THAN 10' FROM CENTER OF MAINLINE TO CENTER OF HYDRANT ELBOW THRUST BLOCK OR RODDING IS REQUIRED.
2. ALL FITTINGS TO BE MUELLER UNLESS EQUIVALENT PRE-APPROVED BY CITY ENGINEER.
3. GATE VALVE TO BE DUCTILE IRON BODY, RESILIENT WEDGE ONLY PER AWWA C515.

Cornelius Oregon's Family Town	FIRE HYDRANT ASSEMBLY	WATER W - 1 7/18/16



NOTES:

1. VALVE BOX NOT TO REST ON OPERATING ASSEMBLY.
2. CENTER VALVE BOX ON AXIS OF OPERATING NUT.
3. GATE VALVE TO BE DUCTILE IRON BODY, RESILIENT WEDGE ONLY PER AWWA #C515.

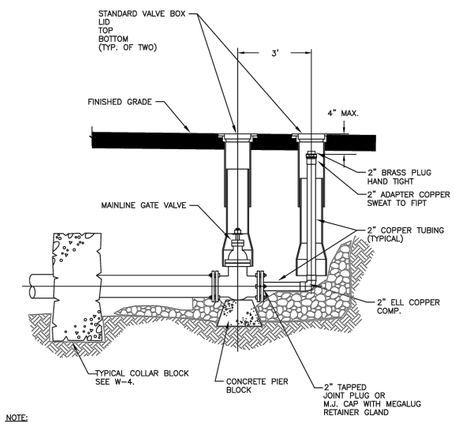
Cornelius Oregon's Family Town	GATE VALVE SETTING DETAIL	WATER W - 2 7/18/16

(HORIZONTAL) BEARING AREA OF THRUST BLOCKS IN SQUARE FEET									(VERTICAL) VOLUME OF THRUST BLOCK IN CUBIC YARDS			
FITTING SIZE	TEE, WYE, DEAD END AND HYDRANT	STRADDLE BLOCK	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN A-1	TEE PLUGGED ON RUN A-2	45° BEND	22-1/2° BEND	11-1/4° BEND	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4	1.0	1.6	1.4	1.9	1.4	1.0	---	---	---	---	---	---
6	2.1	3.7	3.0	4.3	3.0	1.6	1.0	---	1.3	---	---	---
8	3.8	6.5	5.3	7.6	5.4	2.9	1.5	1.0	2.3	1.1	---	---
10	5.9	10.2	8.4	11.8	8.4	4.6	2.4	1.2	3.7	1.8	---	---
12	8.5	14.7	12.0	17.0	12.0	8.6	3.4	1.7	5.5	2.8	1.2	---

NOTES:

1. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:
   BEARING AREA = (TEST PRESSURE/150) x (2000/SOIL BEARING STRESS) x (TABLE VALUE)
2. ABOVE VOLUMES BASED ON TEST PRESSURE OF 150 PSI AND THE WEIGHT OF CONCRETE = 4050 POUNDS PER CUBIC YARD. TO COMPUTE FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION:
   VOLUME = (TEST PRESSURE/150) x (TABLE VALUE)

Cornelius Oregon's Family Town	THRUST BLOCK TABLE	WATER W - 3 7/18/16

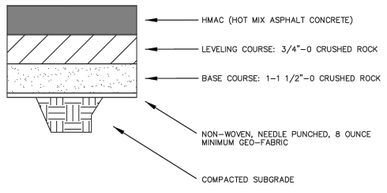


NOTE:

1. THREADED BRASS PIPING MAY BE USED IN PLACE OF COPPER TUBING
2. 8" MAXIMUM PIPE SIZE ALLOWED FOR 2" BLOW-OFF. 10" AND 12" PIPE SIZE SHALL HAVE 4" AND 6" BLOW-OFFS RESPECTIVELY.
3. BLOW-OFF SHALL BE LOCATED AS NEEDED, AS CLOSE AS POSSIBLE TO EDGE OF PAVEMENT TO MINIMIZE PAVEMENT PATCH WHEN LINE IS EXTENDED.

Cornelius Oregon's Family Town	STANDARD BLOWOFF (FUTURE EXTENSION)	WATER W - 5 7/18/16

CROSS-SECTION



THICKNESS

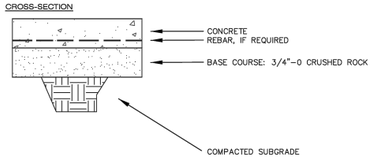
	ARTERIALS AND INDUSTRIAL STREETS	COLLECTORS	LOCAL STREETS	ALLEYS	MAINTENANCE ACCESS ROADS
HMAC	LEVEL 3 6"	LEVEL 2 6"	LEVEL 2 4"	LEVEL 2 3"	LEVEL 2 3"
LEVELING COURSE	2"	2"	2"	2"	2"
BASE COURSE	14"	14"	10"	10"	6"

NOTE:

1. THE MAXIMUM LIFT THICKNESS FOR HMAC SHALL BE 2 INCHES.
2. SUBGRADE COMPACTED TO 95% AASHTO T-99
3. ALLEYS ARE GENERALLY PAVED WITH CONCRETE. THE ALLEY COLUMN IN THE TABLE ABOVE IS FOR SITUATIONS WHERE ONLY A PORTION OF AN EXISTING ALLEY IS PAVED.

Cornelius Oregon's Family Town	ASPHALT PAVEMENT THICKNESS	STREETS S - 1 2/6/17

CROSS-SECTION



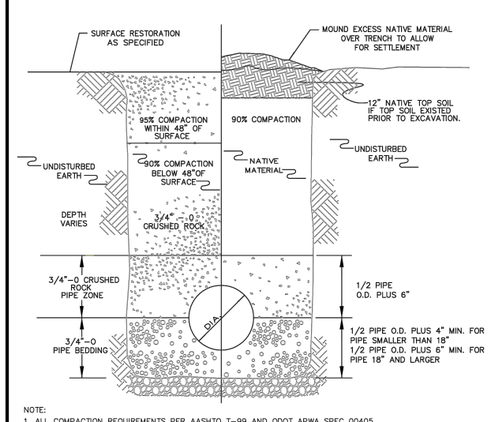
THICKNESS

	ON-STREET PARKING BAYS	ALLEYS AND WOONERFS	MAINTENANCE ACCESS ROADS	COMMERCIAL DRIVEWAYS	RESIDENTIAL DRIVEWAYS	SIDEWALK AND MULTI-USE PATHS
CONCRETE	6"	6"	6"	8"	6"	4"
REBAR	NO	NO	NO	YES	NO	NO
BASE COURSE	6"	8"	6"	4"	4"	4"

NOTE:

1. CONCRETE SHALL BE 4000 PSI, 28 DAY STRENGTH EXCEPT RESIDENTIAL DRIVEWAYS, SIDEWALKS AND MULTI-USE PATHS WHERE THE CONCRETE STRENGTH SHALL BE 3,300 PSI, 28-DAY.
2. SUBGRADE COMPACTED TO 95% AASHTO T-99
3. WHEREVER SIDEWALK CROSSES A ROADWAY, ALLEY, OR DRIVEWAY, THE ROADWAY CROSS-SECTION SHALL PREVAIL.

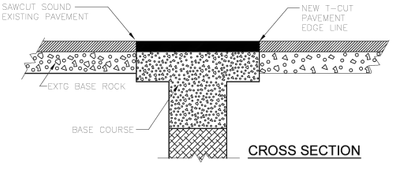
Cornelius Oregon's Family Town	CONCRETE PAVEMENT THICKNESS	STREETS S - 2 3/17/17



NOTE:

1. ALL COMPACTION REQUIREMENTS PER AASHTO T-99 AND ODOT APWA SPEC 00405.
2. TRENCH STABILIZATION: IF REQUIRED, TRENCH STABILIZATION SHALL BE SPECIFIED SEPARATELY AND PLACED PRIOR TO PLACEMENT OF BEDDING MATERIAL.
3. THE TRENCH WIDTH AT THE GROUND SURFACE SHALL BE KEPT TO THE MINIMUM NECESSARY TO INSTALL THE PIPE IN A SAFE MANNER.
4. THE MINIMUM WIDTH IN THE PIPE ZONE SHALL PROVIDE A CLEAR WORKING SPACE OF AT LEAST SIX INCHES OUTSIDE THE OUTSIDE DIAMETER OF THE PIPE BEING INSTALLED.
5. IN ALL CASES, TRENCHES SHALL BE OF SUFFICIENT WIDTH TO ALLOW FOR SHORING, PROPER JOINING OF PIPE, AND BACKFILLING OF MATERIAL ALONG THE SIDES OF THE PIPE.
6. TRACER WIRE SHALL BE PLACED ABOVE NON-METALLIC PIPE, EXCEPT WHERE SECTIONS BETWEEN STRUCTURES (MANHOLES AND CATCH BASINS) ARE STRAIGHT.

Cornelius Oregon's Family Town	TRENCH BACKFILL	STREETS S - 3 10/17/19



NOTES:

1. SAWCUT EXISTING PAVEMENT TO FULL DEPTH.
2. CITY STREETS SHALL BE RESTORED TO THE PAVEMENT AND BASE THICKNESS AND DESIGN IDENTIFIED FOR THAT TYPE OF STREET IN THESE STANDARDS.
3. HWY 8 PAVEMENT RESTORATION WILL BE DICTATED BY ODOT.
4. ALL CUT EDGES OF AC SHALL BE SAND SEALED WITH CRS-1 OR CRS-2 EMULSIFIED ASPHALT OR EQUAL.
5. IF NEW EDGE OF PAVEMENT IS LESS THAN THREE FEET FROM ANOTHER PATCH, CURB OR EDGE OF STREET, REPLACE THE PAVEMENT IN BETWEEN, IF REQUIRED BY CITY ENGINEER.
6. IF ANY PART OF MORE THAN ONE PRE-EXISTING PATCH EDGE IS WITHIN 3 FEET OF THE T-CUT, THE PAVEMENT TO THE FAR EDGE OF THE FURTHEST PRE-EXISTING PATCH SHALL BE REMOVED AND RESTORED.
7. ON LONGITUDINAL PAVEMENT CUTS, THE EDGE OF THE T-CUT SHALL NOT LIE IN A WHEEL PATH.
8. IF AN EDGE OF A T-CUT IS WITHIN 5 FEET OR LESS OF AN AREA OF DISTRESSED EXISTING PAVEMENT, THE LENGTH AND WIDTH OF THE PAVEMENT RESTORATION MAY BE MODIFIED BY THE CITY ENGINEER TO ENSURE THE INTEGRITY OF THE PAVEMENT RESTORATION.
9. THE WIDTH FROM EDGE OF TRENCH SHALL BE 6 INCHES MINIMUM FOR TRENCHES THAT ARE 12 INCHES WIDE OR LESS AND 12 INCHES MINIMUM FOR TRENCHES WIDER THAN 12 INCHES. THE CITY ENGINEER MAY INCREASE THE WIDTH UP TO 10 FEET ON BOTH SIDES OF THE PAVEMENT CUT IF NEEDED TO ENSURE LONG-TERM INTEGRITY OF THE PAVEMENT.

Cornelius Oregon's Family Town	ASPHALT PAVEMENT CUT RESTORATION	STREETS S - 4 7/18/16

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HHPR #
FPC-02

Project Status

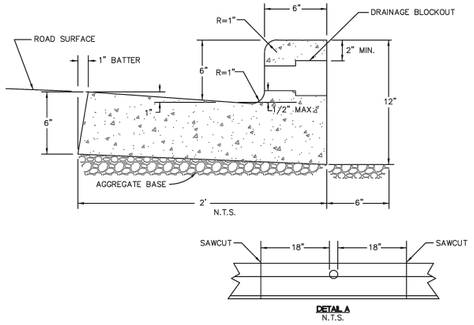
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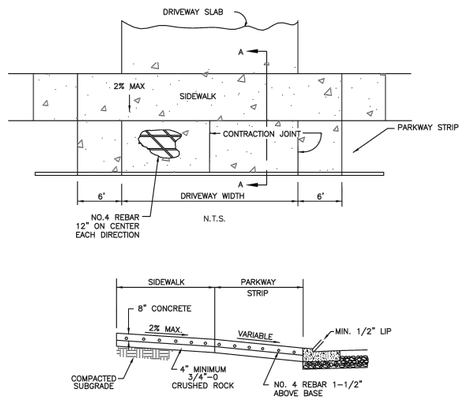
NOTES:

1. CONCRETE TO HAVE A COMPRESSIVE STRENGTH (fc) OF 3300 P.S.I. AFTER 28 DAYS.
2. CONTRACTION JOINTS.
   A. SPACE NOT MORE THAN 10 FEET
   B. DEPTH OF JOINT SHALL BE AT LEAST 1/3 DEPTH OF CONCRETE
   C. CENTER WEEPHOLES WITH CONTRACTION JOINTS
3. USE 1-1/2"-0" OR 3/4"-0" AGGREGATE BASE COMPACTED TO 100% OF AASHTO T-99. PLACE TO SUBGRADE, STREET STRUCTURE, OR 10" DEPTH, WHICHEVER IS GREATER. EXTEND AT LEAST 6" BEHIND CURB.
4. DRAINAGE BLOCKOUT (REQUIRE CITY ENGINEER APPROVAL)
   A. 3" DIAMETER ABS PLASTIC PIPE WITH COUPLING
   B. 2 PER LOT, 5' IN FROM PROPERTY LINES OR LOCATE TO EXISTING ROOF DOWNSPOUTS
   C. CORE DRILL DRAINAGE ACCESS THROUGH EXISTING CURBS OR VERTICALLY SAWCUT CURB AND GUTTER 18" ON EACH SIDE OF DRAIN AND REPOUR TO FULL DEPTH OF CURB AS SHOWN IN DETAIL A.

Cornelius Oregon's Family Town

CURB & GUTTER

STREETS
S - 11
7/18/16



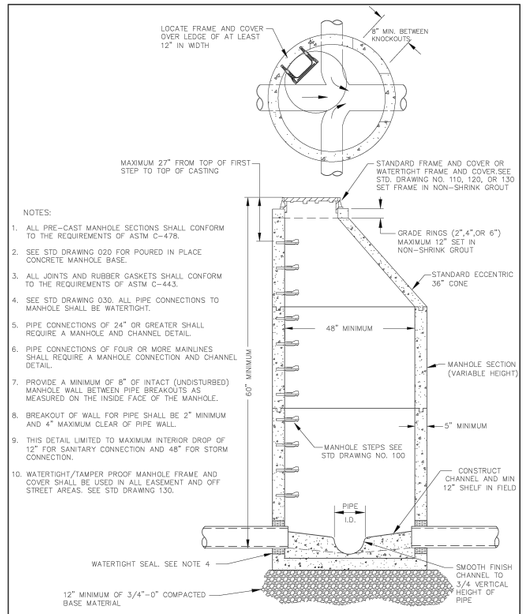
NOTES:

1. CALL PUBLIC WORKS (503) 357-3011 FOR FORM INSPECTION AT LEAST 24 HRS. PRIOR TO PLACEMENT.
2. DRIVEWAY APPROACH MUST EXTEND TO BACK OF RIGHT-OF-WAY (R/W).
3. CONCRETE SHALL HAVE A MINIMUM BEARING STRENGTH OF 4000 PSI AFTER 28 DAYS.
4. REBAR TO BE SUPPORTED ON 1-1/2" BLOCKS.

Cornelius Oregon's Family Town

COMMERCIAL DRIVEWAY WITH PARKWAY STRIP

STREETS
S - 22
7/18/16



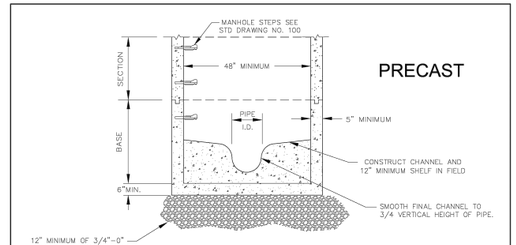
NOTES:

1. ALL PRE-CAST MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
2. SEE STD DRAWING 020 FOR POURED IN PLACE CONCRETE MANHOLE BASE.
3. ALL JOINTS AND RUBBER GASKETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-443.
4. SEE STD DRAWING 030. ALL PIPE CONNECTIONS TO MANHOLE SHALL BE WATERTIGHT.
5. PIPE CONNECTIONS OF 24" OR GREATER SHALL REQUIRE A MANHOLE AND CHANNEL DETAIL.
6. PIPE CONNECTIONS OF FOUR OR MORE MAINLINES SHALL REQUIRE A MANHOLE CONNECTION AND CHANNEL DETAIL.
7. PROVIDE A MINIMUM OF 8" OF INTACT (UNDISTURBED) MANHOLE WALL BETWEEN PIPE BREAKOUTS AS MEASURED ON THE INSIDE FACE OF THE MANHOLE.
8. BREAKOUT OF WALL FOR PIPE SHALL BE 2" MINIMUM AND 4" MAXIMUM CLEAR OF PIPE WALL.
9. THIS DETAIL LIMITED TO MAXIMUM INTERIOR DROP OF 12" FOR SANITARY CONNECTION AND 48" FOR STORM CONNECTION.
10. WATERTIGHT/TAMPER PROOF MANHOLE FRAME AND COVER SHALL BE USED IN ALL EASEMENT AND OFF STREET AREAS. SEE STD DRAWING 130.

STANDARD MANHOLE

DRAWING NO. 010 REVISED 10-31-19

CleanWater Services



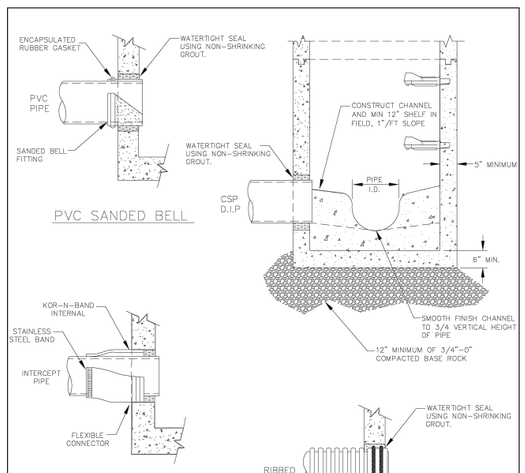
NOTES:

1. ALL MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STANDARD MANHOLE, DRAWING NO. 010.
2. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 PSI AND A SLUMP OF 2" TO 4".

PRE-CAST/POURED IN PLACE MANHOLE BASE

DRAWING NO. 020 REVISED 10-31-19

CleanWater Services



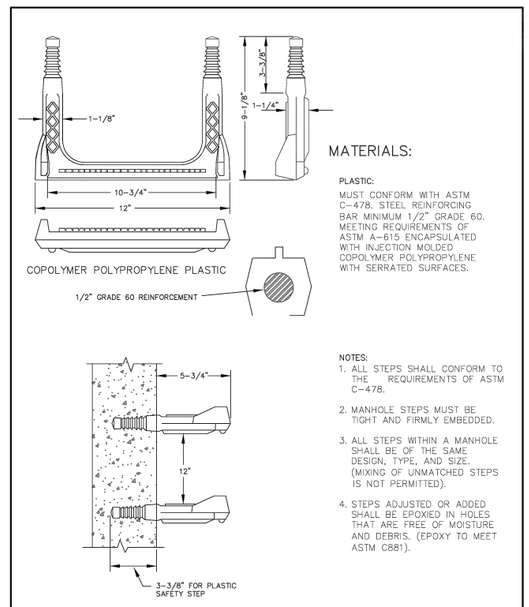
NOTES:

1. ALL PRE-CAST MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STANDARD DRAWING NO. 010.
2. ALTERNATE METHODS TO BE APPROVED BY CITY/DISTRICT.
3. BOOTS TO BE SIZED PER MANUFACTURER'S RECOMMENDATIONS/SPECIFICATIONS.

MANHOLE CONNECTIONS

DRAWING NO. 030 REVISED 10-31-19

CleanWater Services



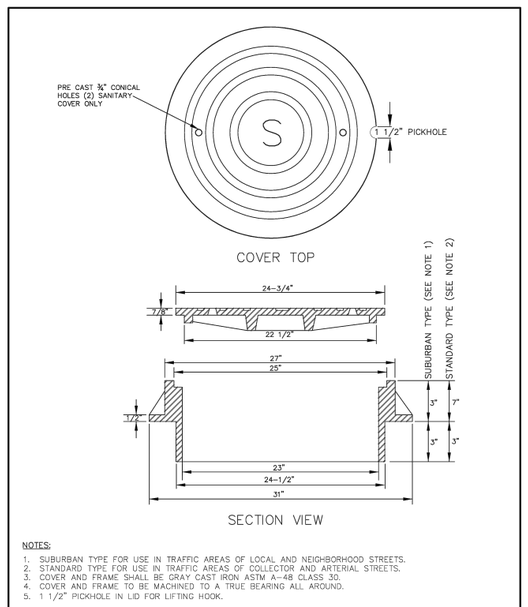
NOTES:

1. ALL STEPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
2. MANHOLE STEPS MUST BE TIGHT AND FIRMLY EMBEDDED.
3. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME DESIGN, TYPE, AND SIZE. (MIXING OF UNMATCHED STEPS IS NOT PERMITTED).
4. STEPS ADJUSTED OR ADDED SHALL BE EPOXIED IN HOLES THAT ARE FREE OF MOISTURE AND DEBRIS. (EPOXY TO MEET ASTM C881).

MANHOLE STEP

DRAWING NO. 100 REVISED 10-31-19

CleanWater Services



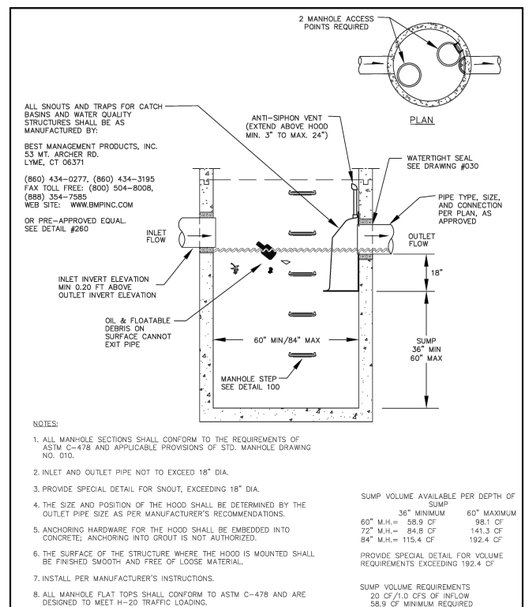
NOTES:

1. SUBURBAN TYPE FOR USE IN TRAFFIC AREAS OF LOCAL AND NEIGHBORHOOD STREETS.
2. STANDARD TYPE FOR USE IN TRAFFIC AREAS OF COLLECTOR AND ARTERIAL STREETS.
3. COVER AND FRAME SHALL BE GRAY CAST IRON ASTM A-48 CLASS 30.
4. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
5. 1 1/2" PICKHOLE IN LID FOR LIFTING HOOK.

SUBURBAN AND STANDARD MANHOLE FRAME AND COVER SANITARY

DRAWING NO. 110 REVISED 10-31-19

CleanWater Services



NOTES:

1. ALL MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STD. MANHOLE DRAWING NO. 010.
2. INLET AND OUTLET PIPE NOT TO EXCEED 18" DIA.
3. PROVIDE SPECIAL DETAIL FOR SNOUT, EXCEEDING 18" DIA.
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY THE OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATIONS.
5. ANCHORING HARDWARE FOR THE HOOD SHALL BE EMBEDDED INTO CONCRETE; ANCHORING INTO GROUT IS NOT AUTHORIZED.
6. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
7. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
8. ALL MANHOLE FLAT TOPS SHALL CONFORM TO ASTM C-478 AND ARE DESIGNED TO MEET H-20 TRAFFIC LOADING.

SUMP VOLUME AVAILABLE PER DEPTH OF SUMP

	36" MINIMUM	60" MAXIMUM
60" M.H.=	58.9 CF	98.1 CF
72" M.H.=	84.8 CF	141.3 CF
84" M.H.=	115.4 CF	192.4 CF

PROVIDE SPECIAL DETAIL FOR VOLUME REQUIREMENTS EXCEEDING 192.4 CF

SUMP VOLUME REQUIREMENTS
20 CF/1.0 CFS OF INFLOW
58.9 CF MINIMUM REQUIRED

WATER QUALITY MANHOLE (SNOUT) A

DRAWING NO. 250 REVISED 10-31-19

CleanWater Services

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rahim@abbasidesign.com
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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR # FPC-02

Project Status

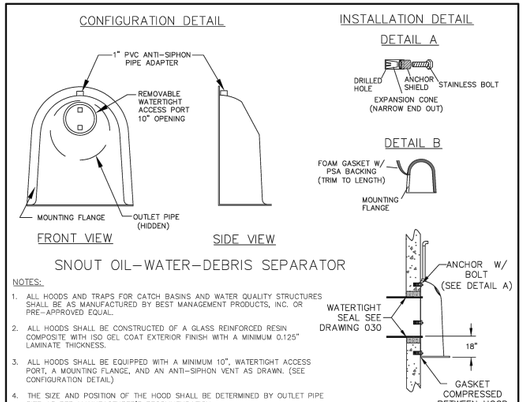
DETAILS

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Drawn HHPR
Checked HHPR

C903

Harper Houf Peterson Righellis Inc.
ENGINEERS★PLANNERS★LANDSCAPE ARCHITECTS★SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

4/23/2025 8:13:40 PM



NOTES:

1. ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY BEST MANAGEMENT PRODUCTS, INC. OR PRE-APPROVED EQUAL.
2. ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
3. ALL HOODS SHALL BE EQUIPPED WITH A MINIMUM 10", WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT AS DRAWN. (SEE CONFIGURATION DETAIL)
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION.
5. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE OF 18" FROM I.E. OUT.
6. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
7. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
8. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET.
9. ANCHOR BOLTS SHALL BE INSTALLED INTO THE CONCRETE OF THE STRUCTURE'S WALL (NOT WITHIN GROUT)
10. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT.
    KIT SHALL INCLUDE:
    A. INSTALLATION INSTRUCTIONS
    B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER
    C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
    D. 3/8" STAINLESS STEEL BOLTS
    E. ANCHOR SHIELDS

BEST MANAGEMENT PRODUCTS, INC.
53 MT. ARCHER RD.
LYME, CT 06371
TOLL FREE: (800) 504-8008 (888) 354-7585
WEB SITE: WWW.BMPINC.COM

WHEN ORDERING, SPECIFY IF THE STRUCTURE IN WHICH THE HOOD WILL BE ATTACHED IS FLAT OR ROUND.

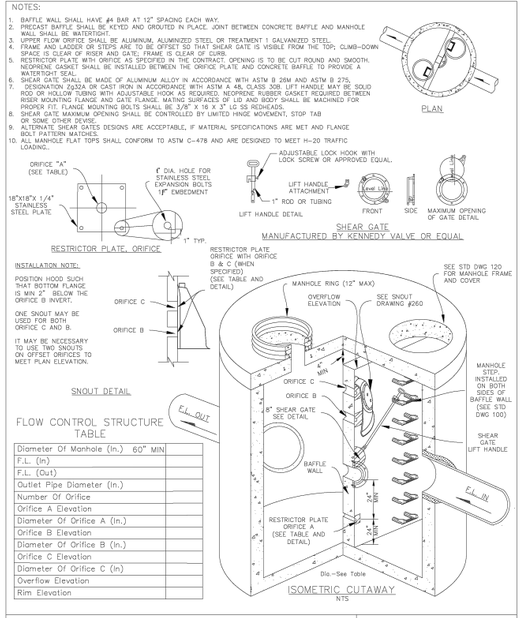
WATER QUALITY MANHOLE (SNOUT) B

DRAWING NO. 260 REVISED 10-31-19

CleanWater Services

NOTES:

1. BAFFLE WALL SHALL HAVE #4 BAR AT 12" SPACING EACH WAY.
2. PRECAST BAFFLE SHALL BE KEYED AND GROUTED IN PLACE. JOINT BETWEEN CONCRETE BAFFLE AND MANHOLE WALL SHALL BE WATERTIGHT.
3. UPPER FLOW ORIFICE SHALL BE ALUMINUM, ALUMINIZED STEEL OR TREATMENT I GALVANIZED STEEL.
4. FRAME AND LADDER OR STEPS ARE TO BE OFFSET SO THAT SHEAR GATE IS VISIBLE FROM THE TOP; CLIMB-DOWN SPACE IS CLEAR OF RISER AND GATE; FRAME IS CLEAR OF CURB.
5. RESTRICTOR PLATE WITH ORIFICE AS SPECIFIED IN THE CONTRACT. OPENING IS TO BE CUT ROUND AND SMOOTH. NEOPRENE GASKET SHALL BE INSTALLED BETWEEN THE ORIFICE PLATE AND CONCRETE BAFFLE TO PROVIDE A WATERTIGHT SEAL.
6. SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26M AND ASTM B 275, DESIGNATION 74332A OR CAST IRON IN ACCORDANCE WITH ASTM A 48, CLASS 30B. LIFT HANDLE MAY BE SOLID ROD OR HOLLOW TUBING WITH ADJUSTABLE HOOK AS REQUIRED. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE. MATING SURFACES OF LID AND BODY SHALL BE MACHINED FOR PROPER FIT. FLANGE MOUNTING BOLTS SHALL BE 3/8" X 16 X 3" LG SS REDHEADS.
7. SHEAR GATE MAXIMUM OPENING SHALL BE CONTROLLED BY LIMITED HINGE MOVEMENT, STOP TAB OR SOME OTHER DEVISE.
8. ALTERNATE SHEAR GATES DESIGNS ARE ACCEPTABLE, IF MATERIAL SPECIFICATIONS ARE MET AND FLANGE BOLT PATTERN MATCHES.
9. ALL MANHOLE FLAT TOPS SHALL CONFORM TO ASTM C-478 AND ARE DESIGNED TO MEET H-20 TRAFFIC LOADING.



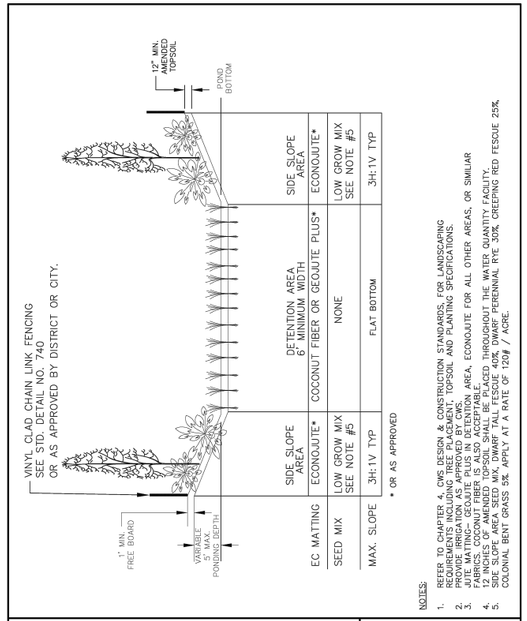
FLOW CONTROL STRUCTURE TABLE

Diameter Of Manhole (in.) 60" MIN		
F.L. (In)		
F.L. (Out)		
Outlet Pipe Diameter (In.)		
Number Of Orifice		
Orifice A Elevation		
Diameter Of Orifice A (In.)		
Orifice B Elevation		
Diameter Of Orifice B (In.)		
Orifice C Elevation		
Diameter Of Orifice C (In)		
Overflow Elevation		
Rim Elevation		

FLOW CONTROL STRUCTURE DETAIL

DRAWING NO. 270 REVISED 10-31-19

CleanWater Services



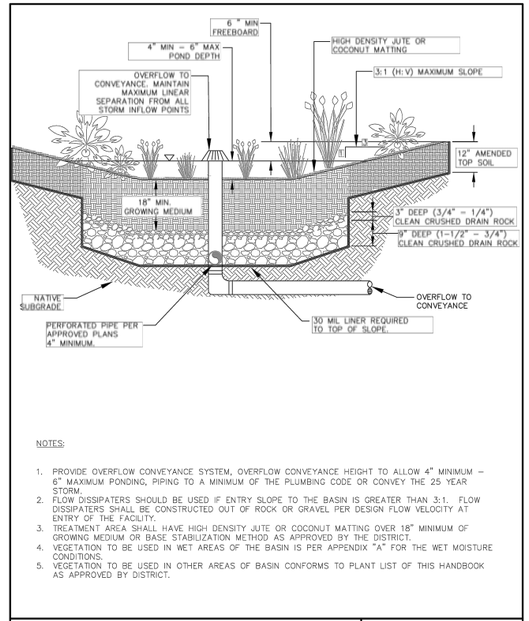
NOTES:

1. REFER TO CHAPTER 4, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS AND SPECIFICATIONS. PROVIDE IRRIGATION AS APPROVED BY CWS.
2. FLAT BOTTOM DETENTION AREA, ECONOJUTE FOR ALL OTHER AREAS; OR SIMILAR FABRIC/MATTING DESIGNED FOR A VELOCITY OF 10 FPS.
3. 12 INCHES OF AMENDED TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUANTITY FACILITY: SOIL AMENDMENTS SHALL BE INCORPORATED AT A RATE OF 10% DWF. PERENNIAL RYE 30% CREEPING RED FESCUE 25% COLONIAL BENT GRASS 5% APPLY AT A RATE OF 10#/ 1,000 SF / ACRE.
4. 5.

DETENTION POND

DRAWING NO. 700 REVISED 10-31-19

CleanWater Services



NOTES:

1. PROVIDE OVERFLOW CONVEYANCE SYSTEM, OVERFLOW CONVEYANCE HEIGHT TO ALLOW 4" MINIMUM – 6" MAXIMUM PONDING, PIPING TO A MINIMUM OF THE PLUMBING CODE OR CONVEY THE 25 YEAR STORM.
2. FLOW DISSIPATERS SHOULD BE USED IF ENTRY SLOPE TO THE BASIN IS GREATER THAN 3:1. FLOW DISSIPATERS SHALL BE CONSTRUCTED OUT OF ROCK OR GRAVEL PER DESIGN FLOW VELOCITY AT ENTRY OF THE FACILITY.
3. TREATMENT AREA SHALL HAVE HIGH DENSITY JUTE OR COCONUT MATTING OVER 18" MINIMUM OF GROWING MEDIUM OR BASE STABILIZATION METHOD AS APPROVED BY THE DISTRICT.
4. VEGETATION TO BE USED IN WET AREAS OF THE BASIN IS PER APPENDIX "A" FOR THE WET MOISTURE CONDITIONS.
5. VEGETATION TO BE USED IN OTHER AREAS OF BASIN CONFORMS TO PLANT LIST OF THIS HANDBOOK AS APPROVED BY DISTRICT.

NON-STRUCTURAL FLOW THROUGH PLANTER/SWALE

DRAWING NO. 735 REVISED 10-31-19

CleanWater Services

STORMWATER FACILITY GROWING MEDIUM

FURNISH IMPORTED BLENDED SOIL FOR ALL VEGETATED LIDA FACILITIES CONFORMING TO THE FOLLOWING:

- GENERAL COMPOSITION – SOIL MATERIAL THAT IS ANY BLEND OF LOAMY SOIL, SAND, AND COMPOST THAT IS 30–40% COMPOST (BY VOLUME) AND MEETS THE OTHER CRITERIA IN THIS SPECIFICATION.
- ANALYSIS REQUIREMENTS FOR THE BLENDED MATERIAL:
  PARTICLE GRADATION – A SIEVE ANALYSIS OF THE BLENDED MATERIAL, NOT INCLUDING COMPOST, SHALL BE CONDUCTED IN CONFORMANCE WITH ASTM C117/C136, AASHTO T11/T27, ASTM D422/D1140, OR ASTM D691.3. THE ANALYSIS SHALL INCLUDE THE FOLLOWING SIEVE SIZES: 1 INCH, 3/8 INCH, #4, #10, #20, #40, #60, #100, #200. THE GRADATION OF THE BLEND SHALL MEET THE FOLLOWING GRADATION CRITERIA.

SIEVE SIZE	PERCENT PASSING
1 INCH	100
# 4	85 –100
# 10	50–100
# 40	20–60
# 100	10–40
# 200	10–20

- THE MATERIAL SHALL BE LOOSE AND EASILY BROKEN INTO SMALL PIECES
- IT SHALL BE WELL MIXED AND HOMOGENOUS.
- IT SHALL BE FREE OF WOOD PIECES, PLASTIC, AND OTHER FOREIGN MATTER.
- IT SHALL HAVE NO VISIBLE FREE WATER.
- THE PH (POWER OF HYDROGEN) OF THE BLENDED MATERIAL SHALL BE TESTED AND BE BETWEEN 6 TO 8.

COMPOST

THE COMPOST SHALL BE DERIVED FROM PLANT MATERIAL AND PROVIDED BY A MEMBER OF THE US COMPOSTING COUNCIL SEAL OF TESTING ASSURANCE (STA) PROGRAM. SEE WWW.COMPOSTINGCOUNCIL.ORG FOR A LIST OF LOCAL PROVIDERS.

THE COMPOST SHALL BE THE RESULT OF THE BIOLOGICAL DEGRADATION AND TRANSFORMATION OF PLANT-DERIVED MATERIALS UNDER CONDITIONS DESIGNED TO PROMOTE AEROBIC DECOMPOSITION. THE MATERIAL SHALL BE WELL COMPOSTED, FREE OF VIABLE WEED SEEDS, AND STABLE WITH REGARD TO OXYGEN CONSUMPTION AND CARBON DIOXIDE GENERATION. THE COMPOST SHALL HAVE NO VISIBLE FREE WATER AND PRODUCE NO DUST WHEN HANDLED. IT SHALL MEET THE FOLLOWING CRITERIA, AS REPORTED BY THE US COMPOSTING COUNCIL STA COMPOST TECHNICAL DATA SHEET PROVIDED BY THE VENDOR.

- 100% OF THE MATERIAL MUST PASS THROUGH A 1/2-INCH SCREEN.
- THE PH OF THE MATERIAL SHALL BE BETWEEN 6 MIN. AND 8 MAX.
- MANUFACTURED INERT MATERIAL (PLASTIC, CONCRETE, CERAMICS, METAL, ETC.) SHALL BE LESS THAN 1.0% BY WEIGHT.
- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 30 AND 70% (DRY WEIGHT BASIS).
- SOLUBLE SALT CONTENT SHALL BE LESS THAN 6.0 MMHOS/CM.
- MATURITY INDICATOR SHALL BE GREATER THAN 80% FOR GERMINATION AND VIGOR.
- STABILITY SHALL BE "STABLE" TO "VERY STABLE".
- CARBON/NITROGEN (C/N) RATIO SHALL BE LESS THAN 25:1.
- TRACE METALS TEST RESULT = "PASS."

CONSTRUCTION

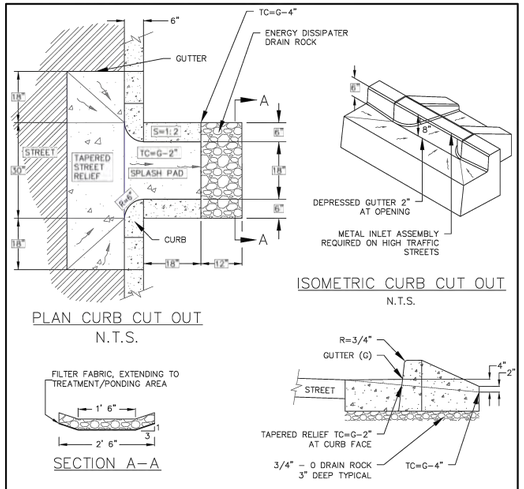
STORMWATER FACILITY GROWING MEDIUM:

- PROTECTION OF THE SOIL – THE MATERIAL SHALL BE PROTECTED FROM ALL SOURCES OF CONTAMINATION, INCLUDING WEED SEEDS, WHILE AT THE SUPPLIER, IN CONVEYANCE, AND AT THE PROJECT SITE.
- WET AND WINTER CONDITIONS – HAULING AND PLACEMENT OF THE MATERIAL WILL NOT BE ALLOWED WHEN THE WEATHER IS TOO WET OR THE GROUND IS FROZEN OR SATURATED AS DETERMINED BY THE OWNERS REPRESENTATIVE.
- PLACEMENT OF THE SOIL – PLACE THE MATERIAL IN LOOSE LIFTS, NOT TO EXCEED 8 INCHES EACH AND EACH LIFT SHALL BE COMPACTED WITH A WATER-FILLED LANDSCAPE ROLLER. DO NOT OTHERWISE MECHANICALLY COMPACT THE MATERIAL.
- TIMING OF PLANT INSTALLATION – WEATHER PERMITTING AND AS APPROVED, INSTALL PLANTS AS SOON AS POSSIBLE AFTER PLACING AND GRADING THE SOIL IN ORDER TO MINIMIZE EROSION AND FURTHER COMPACTION.
- EROSION CONTROL – TEMPORARY EROSION CONTROL MEASURES ARE REQUIRED UNTIL PERMANENT STABILIZATION MEASURES ARE FUNCTIONAL.
- PROTECTION OF THE INSTALLED SOIL – IN ALL CASES, THE PROTECT INSTALLED MATERIAL FROM FOOT OR EQUIPMENT TRAFFIC AND SURFACE WATER RUNOFF. INSTALL TEMPORARY FENCING OR WALKWAYS AS NEEDED TO KEEP WORKERS, PEDESTRIANS, AND EQUIPMENT OUT OF THE AREA. UNDER NO CIRCUMSTANCES SHOULD MATERIALS AND EQUIPMENT BE STORED ON TOP OF THE INSTALLATION AREA.

GROWING MEDIUM SPECIFICATION FOR VEGETATED FACILITIES

DRAWING NO. 742 REVISED 10-31-19

CleanWater Services



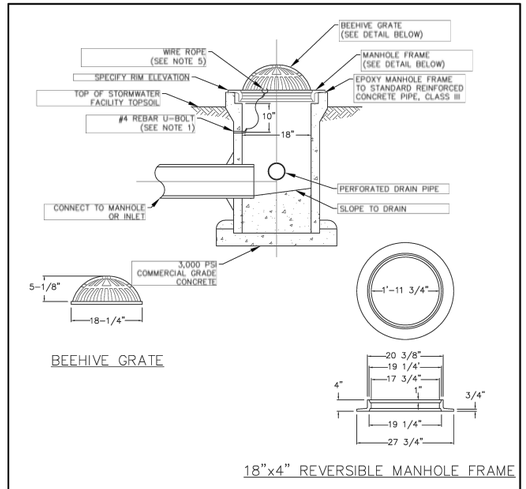
NOTES:

1. INFLOW STRUCTURE PER LOCAL JURISDICTION. CURB CUT OUTS NOT ALLOWED ON WASHINGTON COUNTY ROADS – USE MODIFIED CG-30 SEE DETAIL 755, FOR INLET STRUCTURE.
2. INFLOW STRUCTURE – CURB CUT OUT SHALL HAVE MINIMUM 2" DROP AT THE FLOW LINE LEADING TO THE SPLASH PAD, SEE DETAIL.
3. ENERGY DISSIPATER DRAIN ROCK: ROCK SIZE 4-1/2" – 2-1/2" OR SIZED BY DESIGN INFLOW. PLACE ROCK 6" DEEP BEHIND SPLASH PAD.
4. CURB PROFILE PER LOCAL JURISDICTION.
5. ENSURE THAT DOWNSTREAM CATCH BASINS ARE IN PLACE FOR HIGH FLOW CONVEYANCE.

CURB CUT OUT

DRAWING NO. 752 REVISED 10-31-19

CleanWater Services



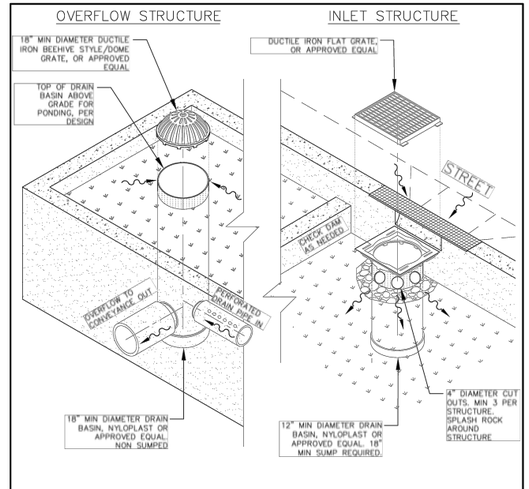
NOTES

1. SECURE GRATE IN PLACE WITH 54" OF WIRE ROPE. LOOP ENDS OF WIRE ROPE AROUND U-BOLT AND GRATE. CRIMP EACH END OF WIRE ROPE WITH 3" OVERLAP.
2. DRILL 2" DEEP HOLES INTO PIPE AND EPOXY #4 REBAR U-BOLT (2"X 4") IN HOLES.
3. GRATE TO BE CAST IRON, ASTM A48 CL30.
4. SIZE INLET BASED ON CALCULATED FLOWS AND MANUFACTURERS RECOMMENDATIONS.
5. WIRE ROPE BETWEEN 1/8"-3/16" DIAMETER, STAINLESS STEEL, 7 STRANDS OF 19 WIRES.

BEEHIVE INLET

DRAWING NO. 758 REVISED 10-31-19

CleanWater Services



NOTE:

1. PLACE STRUCTURE ON 3/4" TO 0" BASE ROCK PLACED OVER NATIVE SUBGRADE.

OVERFLOW/INLET STRUCTURE

DRAWING NO. 760 REVISED 10-31-19

CleanWater Services

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR

HHPR # FPC-02

Project Status

DETAILS

Date 4/23/2025 8:13:40 PM
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Checked HHPR

C904

Harper Houf Peterson Righellis Inc.
ENGINEERS★PLANNERS★LANDSCAPE ARCHITECTS★SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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APPENDIX B

SOILS DATA

United States Department of Agriculture

NRCS

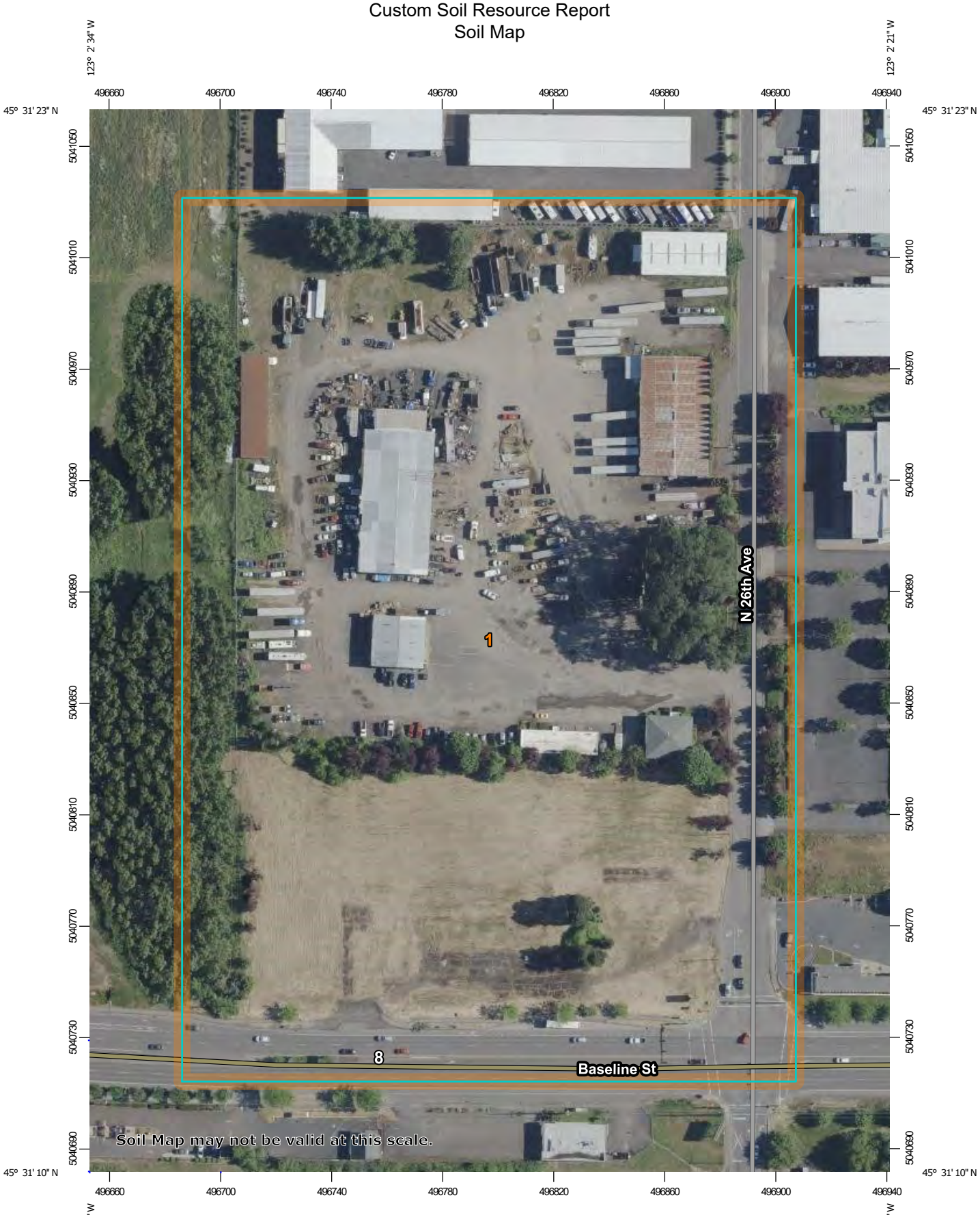
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Washington County, Oregon



April 17, 2025



Map Scale: 1:1,860 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Oregon
Survey Area Data: Version 24, Aug 28, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Aloha silt loam	17.4	100.0%
Totals for Area of Interest		**17.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Washington County, Oregon

1—Aloha silt loam

Map Unit Setting

National map unit symbol: 21x8
Elevation: 150 to 250 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 160 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Aloha and similar soils: 90 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aloha

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old loamy alluvium

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 46 inches: silt loam
H3 - 46 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R002XC007OR - Valley Swale Group
Forage suitability group: Somewhat Poorly Drained (G002XY005OR)
Other vegetative classification: Somewhat Poorly Drained (G002XY005OR)
Hydric soil rating: No

Minor Components

Huberly

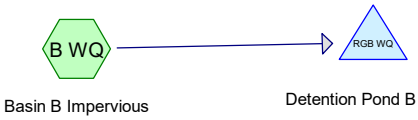
Percent of map unit: 1 percent
Landform: Terraces

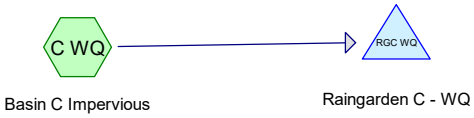
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

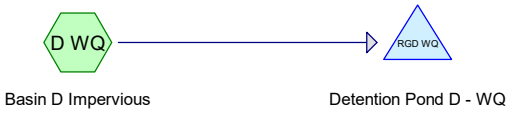
APPENDIX C

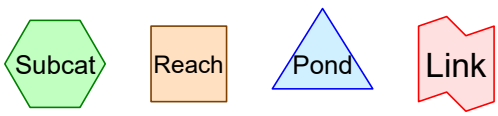
WATER QUALITY HYDROGRAPHS











Routing Diagram for FPC02 - HydroCAD
Prepared by HHPR, Printed 5/2/2025
HydroCAD® 10.10-6a s/n 12110 © 2020 HydroCAD Software Solutions LLC

Time span=0.00-100.00 hrs, dt=0.02 hrs, 5001 points x 3
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A WQ: Basin A Runoff Area=257,243 sf 100.00% Impervious Runoff Depth=0.36"
Tc=6.0 min CN=0/98 Runoff=0.671 cfs 0.179 af

Subcatchment B WQ: Basin B Impervious Runoff Area=21,622 sf 100.00% Impervious Runoff Depth=0.36"
Tc=6.0 min CN=0/98 Runoff=0.056 cfs 0.015 af

Subcatchment C WQ: Basin C Impervious Runoff Area=8,934 sf 100.00% Impervious Runoff Depth=0.36"
Tc=6.0 min CN=0/98 Runoff=0.023 cfs 0.006 af

Subcatchment D WQ: Basin D Impervious Runoff Area=9,877 sf 100.00% Impervious Runoff Depth=0.36"
Tc=6.0 min CN=0/98 Runoff=0.026 cfs 0.007 af

Pond RGA WQ: Detention Pond A - WQ Peak Elev=100.81' Storage=7,598 cf Inflow=0.671 cfs 0.179 af
Discarded=0.026 cfs 0.127 af Primary=0.000 cfs 0.000 af Outflow=0.026 cfs 0.127 af

Pond RGB WQ: Detention Pond B - WQ Peak Elev=100.47' Storage=624 cf Inflow=0.056 cfs 0.015 af
Discarded=0.004 cfs 0.014 af Primary=0.000 cfs 0.000 af Outflow=0.004 cfs 0.014 af

Pond RGC WQ: Raingarden C - WQ Peak Elev=100.00' Storage=0 cf Inflow=0.023 cfs 0.006 af
Discarded=0.023 cfs 0.006 af Primary=0.000 cfs 0.000 af Outflow=0.023 cfs 0.006 af

Pond RGD WQ: Detention Pond D - WQ Peak Elev=100.39' Storage=241 cf Inflow=0.026 cfs 0.007 af
Discarded=0.008 cfs 0.007 af Primary=0.000 cfs 0.000 af Outflow=0.008 cfs 0.007 af

Total Runoff Area = 6.834 ac Runoff Volume = 0.207 af Average Runoff Depth = 0.36"
0.00% Pervious = 0.000 ac 100.00% Impervious = 6.834 ac

Summary for Subcatchment A WQ: Basin A Impervious

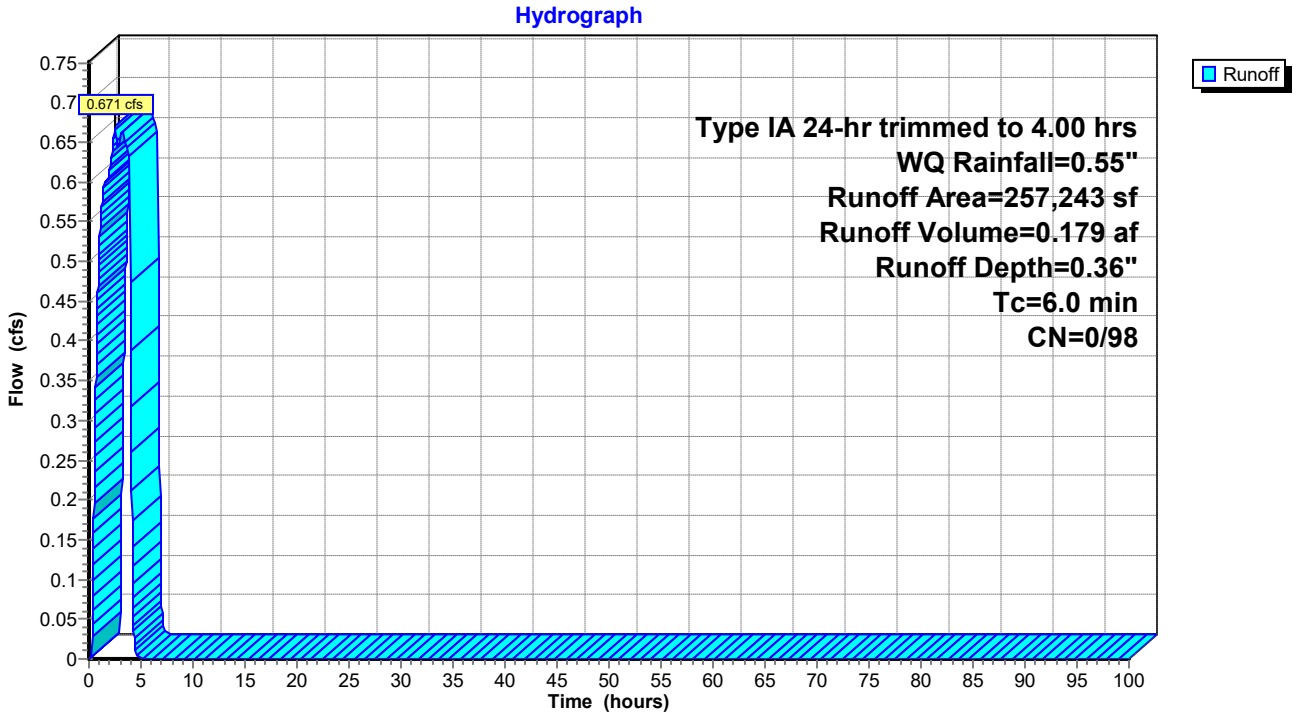
Runoff = 0.671 cfs @ 2.51 hrs, Volume= 0.179 af, Depth= 0.36"
Routed to Pond RGA WQ : Detention Pond A - WQ

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr trimmed to 4.00 hrs WQ Rainfall=0.55"

	Area (sf)	CN	Description
*	257,243	98	Pervious
	257,243	98	100.00% Impervious Area

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

Subcatchment A WQ: Basin A Impervious



Summary for Subcatchment B WQ: Basin B Impervious

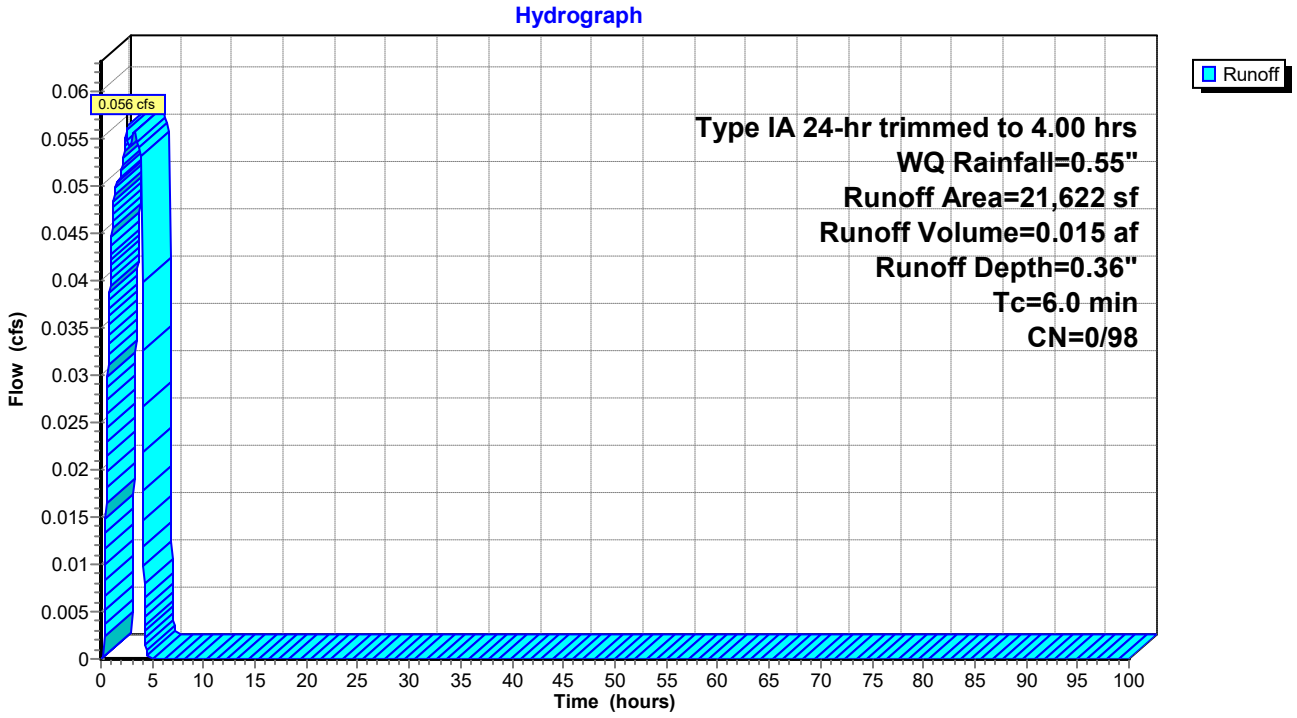
Runoff = 0.056 cfs @ 2.51 hrs, Volume= 0.015 af, Depth= 0.36"
Routed to Pond RGB WQ : Detention Pond B - WQ

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr trimmed to 4.00 hrs WQ Rainfall=0.55"

	Area (sf)	CN	Description
*	21,622	98	Pervious
	21,622	98	100.00% Impervious Area

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

Subcatchment B WQ: Basin B Impervious



Summary for Subcatchment C WQ: Basin C Impervious

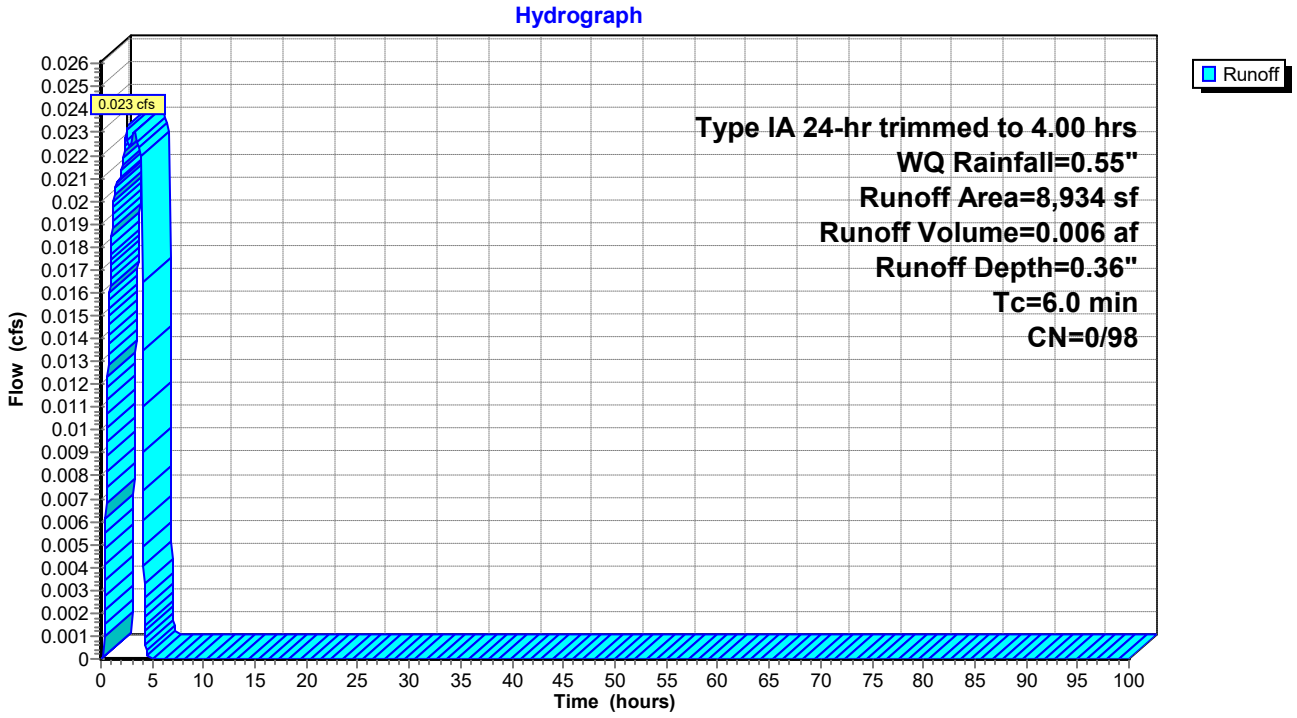
Runoff = 0.023 cfs @ 2.51 hrs, Volume= 0.006 af, Depth= 0.36"
Routed to Pond RGC WQ : Raingarden C - WQ

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr trimmed to 4.00 hrs WQ Rainfall=0.55"

	Area (sf)	CN	Description
*	8,934	98	Pervious
	8,934	98	100.00% Impervious Area

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

Subcatchment C WQ: Basin C Impervious



Summary for Subcatchment D WQ: Basin D Impervious

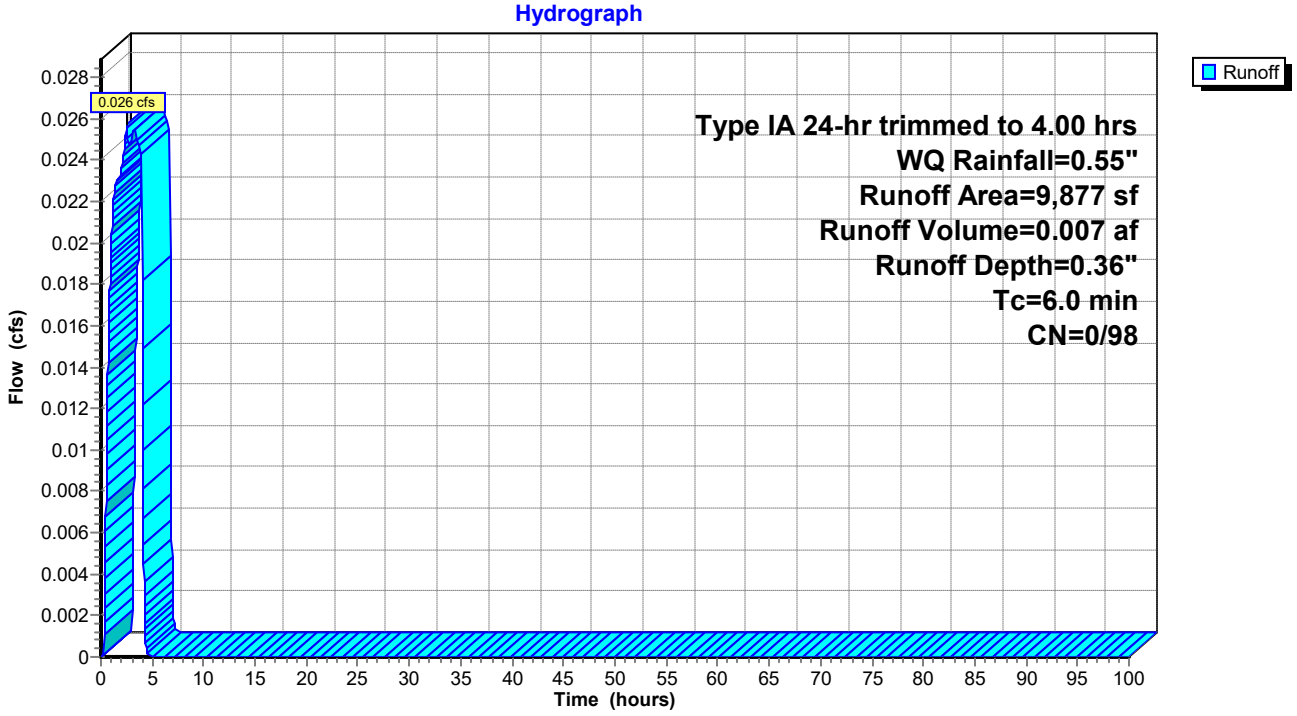
Runoff = 0.026 cfs @ 2.51 hrs, Volume= 0.007 af, Depth= 0.36"
Routed to Pond RGD WQ : Detention Pond D - WQ

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr trimmed to 4.00 hrs WQ Rainfall=0.55"

	Area (sf)	CN	Description
*	9,877	98	Impervious
	9,877	98	100.00% Impervious Area

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

Subcatchment D WQ: Basin D Impervious



Summary for Pond RGA WQ: Detention Pond A - WQ

Inflow Area = 5.905 ac,100.00% Impervious, Inflow Depth = 0.36" for WQ event
Inflow = 0.671 cfs @ 2.51 hrs, Volume= 0.179 af
Outflow = 0.026 cfs @ 4.33 hrs, Volume= 0.127 af, Atten= 96%, Lag= 109.3 min
Discarded = 0.026 cfs @ 4.33 hrs, Volume= 0.127 af
Primary = 0.000 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 100.81' @ 4.33 hrs Surf.Area= 9,689 sf Storage= 7,598 cf

Plug-Flow detention time= 2,382.3 min calculated for 0.127 af (71% of inflow)
Center-of-Mass det. time= 2,352.2 min (2,496.9 - 144.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	81,111 cf	**Detention Pond (Prismatic)** Listed below (Recalc)

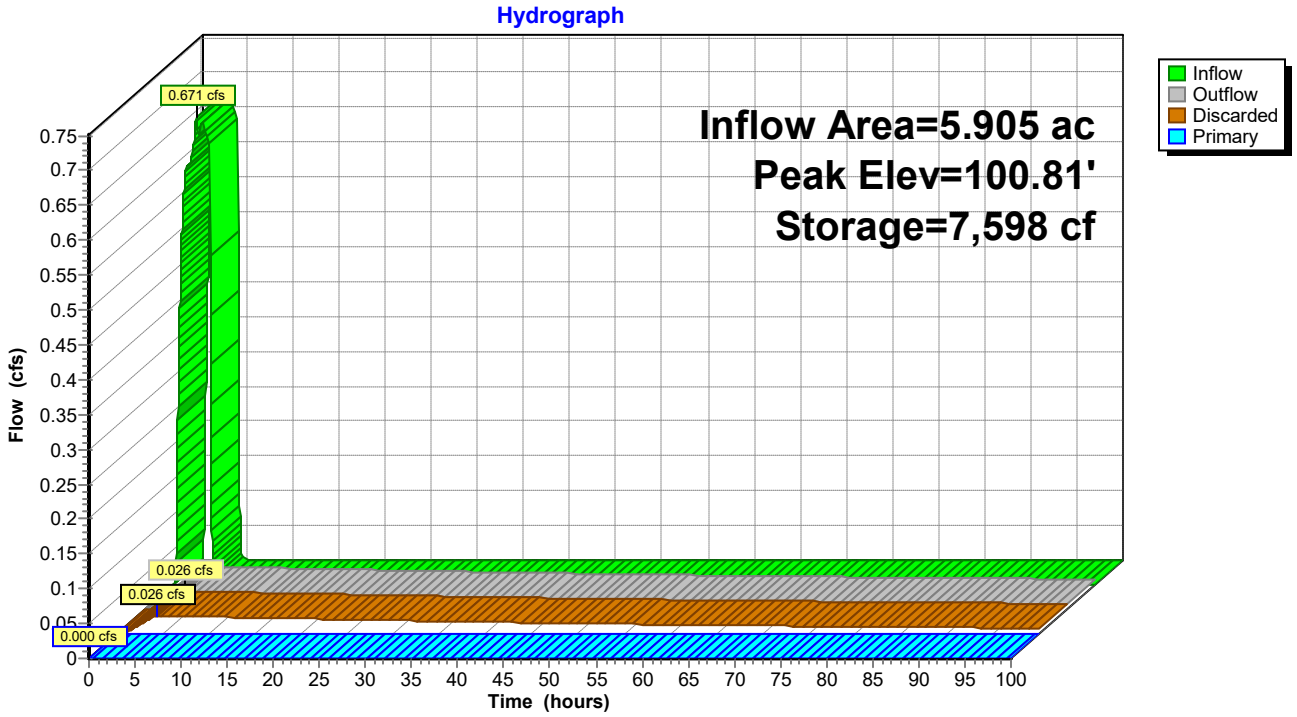
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,122	0	0
101.00	9,824	9,473	9,473
102.00	10,528	10,176	19,649
103.00	11,232	10,880	30,529
104.00	11,938	11,585	42,114
105.00	12,644	12,291	54,405
106.00	13,353	12,999	67,404
107.00	14,062	13,708	81,111

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.15' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	100.81'	**24.0" Horiz. Beehive OF** C= 0.600 Limited to weir flow at low heads
#3	Discarded	100.00'	**2.000 in/hr Exfiltration over Surface area above 100.00'** Excluded Surface area = 9,122 sf

Discarded OutFlow Max=0.026 cfs @ 4.33 hrs HW=100.81' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.026 cfs)

Primary OutFlow Max=0.000 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
└**1=Culvert** (Passes 0.000 cfs of 5.382 cfs potential flow)
└**2=Beehive OF** (Controls 0.000 cfs)

Pond RGA WQ: Detention Pond A - WQ



Summary for Pond RGB WQ: Detention Pond B - WQ

Inflow Area = 0.496 ac,100.00% Impervious, Inflow Depth = 0.36" for WQ event
Inflow = 0.056 cfs @ 2.51 hrs, Volume= 0.015 af
Outflow = 0.004 cfs @ 4.26 hrs, Volume= 0.014 af, Atten= 92%, Lag= 105.3 min
Discarded = 0.004 cfs @ 4.26 hrs, Volume= 0.014 af
Primary = 0.000 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 100.47' @ 4.26 hrs Surf.Area= 1,363 sf Storage= 624 cf

Plug-Flow detention time= 1,850.8 min calculated for 0.014 af (92% of inflow)
Center-of-Mass det. time= 1,842.1 min (1,986.8 - 144.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	4,693 cf	**Detention Pond (Prismatic)** Listed below (Recalc)

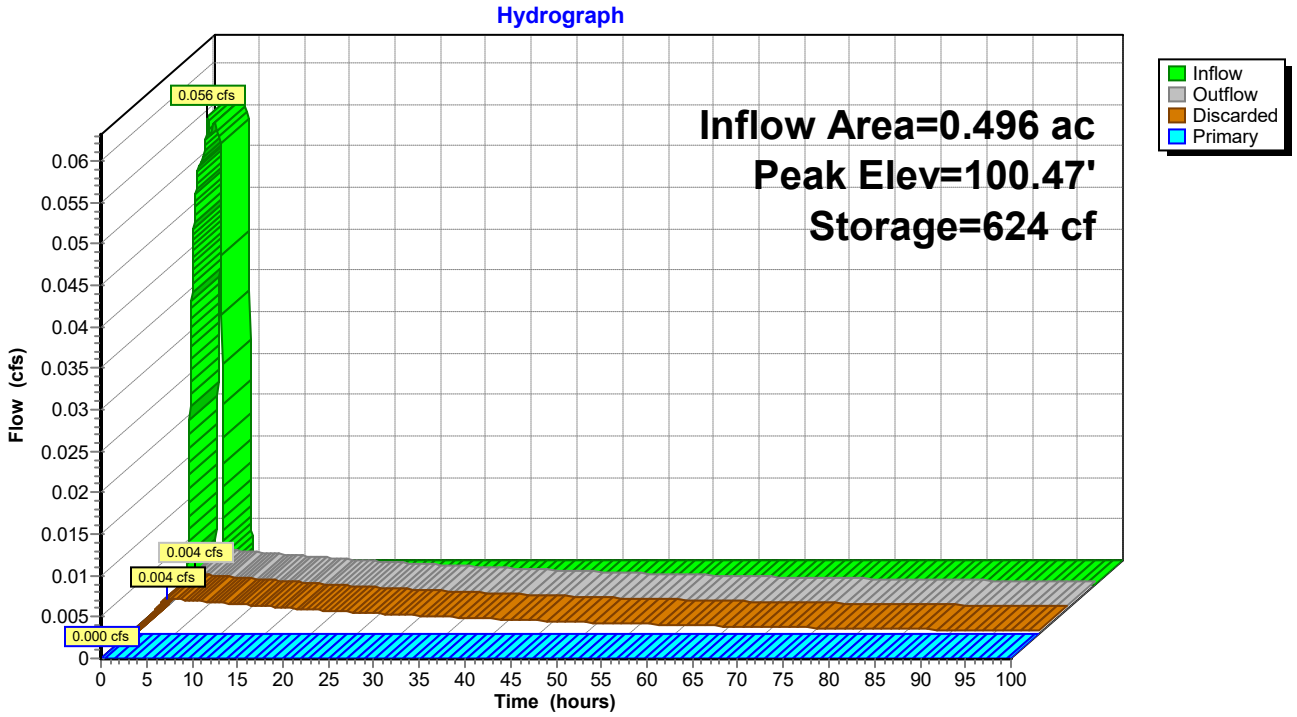
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,270	0	0
101.00	1,466	1,368	1,368
102.00	1,662	1,564	2,932
103.00	1,860	1,761	4,693

Device	Routing	Invert	Outlet Devices
#1	Primary	95.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.25' / 95.05' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Discarded	100.00'	**2.000 in/hr Exfiltration over Surface area above 100.00'** Excluded Surface area = 1,270 sf

Discarded OutFlow Max=0.004 cfs @ 4.26 hrs HW=100.47' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.004 cfs)

Primary OutFlow Max=0.000 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
↑—**1=Culvert** (Passes 0.000 cfs of 6.155 cfs potential flow)
↑—**2=Beehive** (Controls 0.000 cfs)

Pond RGB WQ: Detention Pond B - WQ



Summary for Pond RGC WQ: Raingarden C - WQ

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 0.36" for WQ event
Inflow = 0.023 cfs @ 2.51 hrs, Volume= 0.006 af
Outflow = 0.023 cfs @ 2.51 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.023 cfs @ 2.51 hrs, Volume= 0.006 af
Primary = 0.000 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 100.00' @ 0.00 hrs Surf.Area= 1,158 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (144.7 - 144.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	2,865 cf	**Detention Pond (Prismatic)** Listed below (Recalc)

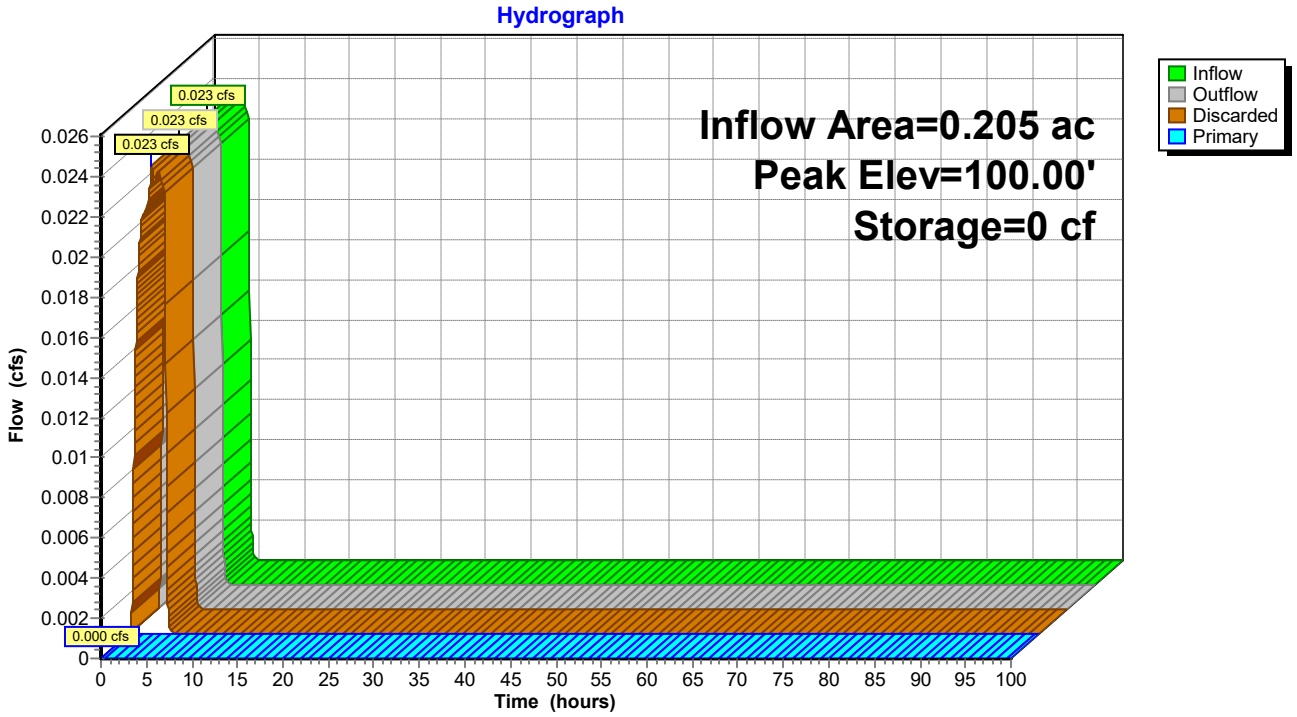
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,158	0	0
100.50	1,845	751	751
101.50	2,383	2,114	2,865

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	100.50'	**24.0" Horiz. Beehive OF** C= 0.600 Limited to weir flow at low heads
#3	Discarded	100.00'	**2.000 in/hr Exfiltration over Surface area above 96.00'** Excluded Surface area = 0 sf

Discarded OutFlow Max=0.000 cfs @ 2.51 hrs HW=100.00' (Free Discharge)
└**3=Exfiltration** (Passes 0.000 cfs of 0.054 cfs potential flow)

Primary OutFlow Max=0.000 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
└**1=Culvert** (Passes 0.000 cfs of 5.382 cfs potential flow)
└**2=Beehive OF** (Controls 0.000 cfs)

Pond RGC WQ: Raingarden C - WQ



Summary for Pond RGD WQ: Detention Pond D - WQ

Inflow Area = 0.227 ac,100.00% Impervious, Inflow Depth = 0.36" for WQ event
Inflow = 0.026 cfs @ 2.51 hrs, Volume= 0.007 af
Outflow = 0.008 cfs @ 4.12 hrs, Volume= 0.007 af, Atten= 69%, Lag= 96.9 min
Discarded = 0.008 cfs @ 4.12 hrs, Volume= 0.007 af
Primary = 0.000 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 100.39' @ 4.12 hrs Surf.Area= 704 sf Storage= 241 cf

Plug-Flow detention time= 469.2 min calculated for 0.007 af (100% of inflow)
Center-of-Mass det. time= 469.9 min (614.6 - 144.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1,986 cf	**Detention Pond (Prismatic)** Listed below (Recalc)

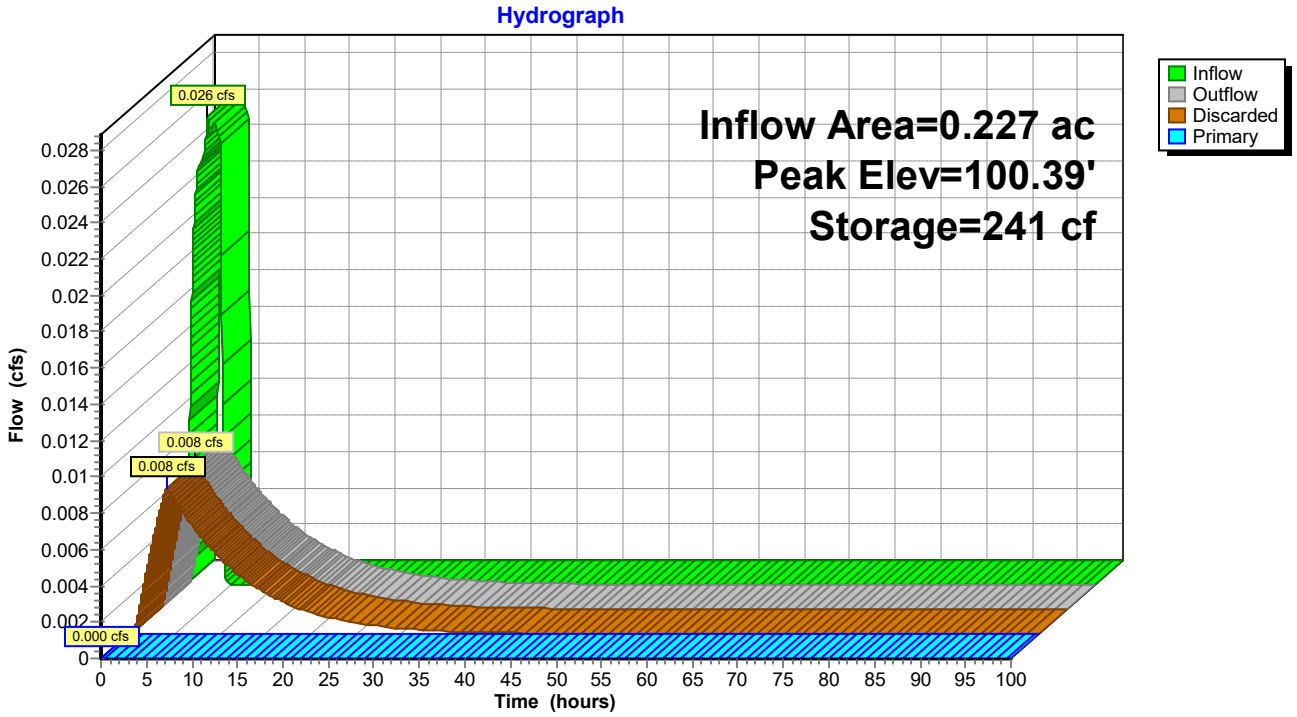
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	531	0	0
101.00	975	753	753
102.00	1,491	1,233	1,986

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Discarded	100.00'	**2.000 in/hr Exfiltration over Surface area above 100.00'** Excluded Surface area = 531 sf

Discarded OutFlow Max=0.008 cfs @ 4.12 hrs HW=100.39' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.008 cfs)

Primary OutFlow Max=0.000 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
└**1=Culvert** (Passes 0.000 cfs of 5.382 cfs potential flow)
└**2=Beehive** (Controls 0.000 cfs)

Pond RGD WQ: Detention Pond D - WQ



APPENDIX D

HYDROMODIFICATION ASSESSMENT & DETENTION HYDROGRAPHS



Routing Diagram for FPC02 - HydroCAD
Prepared by HHPR, Printed 5/2/2025
HydroCAD® 10.10-6a s/n 12110 © 2020 HydroCAD Software Solutions LLC

Time span=0.00-100.00 hrs, dt=0.02 hrs, 5001 points x 3
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Basin A Runoff Area=352,348 sf 73.01% Impervious Runoff Depth=0.78"
Tc=10.0 min CN=76/98 Runoff=1.499 cfs 0.528 af

Subcatchment A EX: Pre-Dev Basin A Runoff Area=352,348 sf 0.00% Impervious Runoff Depth=0.09"
Tc=15.0 min CN=75/0 Runoff=0.059 cfs 0.059 af

Subcatchment B: Basin B Runoff Area=32,408 sf 66.72% Impervious Runoff Depth=0.72"
Tc=10.0 min CN=76/98 Runoff=0.126 cfs 0.045 af

Subcatchment B EX: Pre-Dev Basin B Runoff Area=32,408 sf 0.00% Impervious Runoff Depth=0.09"
Tc=10.0 min CN=75/0 Runoff=0.005 cfs 0.005 af

Subcatchment C: Basin C Runoff Area=15,069 sf 59.29% Impervious Runoff Depth=0.65"
Tc=6.0 min CN=76/98 Runoff=0.054 cfs 0.019 af

Subcatchment C EX: Pre-Dev Basin C Runoff Area=15,069 sf 0.00% Impervious Runoff Depth=0.09"
Tc=10.0 min CN=75/0 Runoff=0.003 cfs 0.003 af

Subcatchment D: Basin D Runoff Area=19,449 sf 50.78% Impervious Runoff Depth=0.58"
Tc=6.0 min CN=76/98 Runoff=0.060 cfs 0.021 af

Subcatchment D EX: Pre-Dev Basin D (Fire Runoff Area=19,449 sf 0.00% Impervious Runoff Depth=0.09"
Tc=10.0 min CN=75/0 Runoff=0.003 cfs 0.003 af

Pond RG A: Detentionn Pond A - Flow Peak Elev=101.33' Storage=20,064 cf Inflow=1.499 cfs 0.528 af
Outflow=0.048 cfs 0.346 af

Pond RG B: Detention Pond B - Flow Control Peak Elev=97.89' Storage=1,340 cf Inflow=0.126 cfs 0.045 af
Outflow=0.011 cfs 0.045 af

Pond RG C: Raingarden C - Flow Control Peak Elev=97.21' Storage=443 cf Inflow=0.054 cfs 0.019 af
Outflow=0.006 cfs 0.019 af

Pond RG D: Detention Pond D - Flow Control Peak Elev=98.11' Storage=395 cf Inflow=0.060 cfs 0.021 af
Outflow=0.009 cfs 0.021 af

Total Runoff Area = 19.250 ac Runoff Volume = 0.682 af Average Runoff Depth = 0.43"
64.50% Pervious = 12.417 ac 35.50% Impervious = 6.834 ac

Summary for Subcatchment A: Basin A

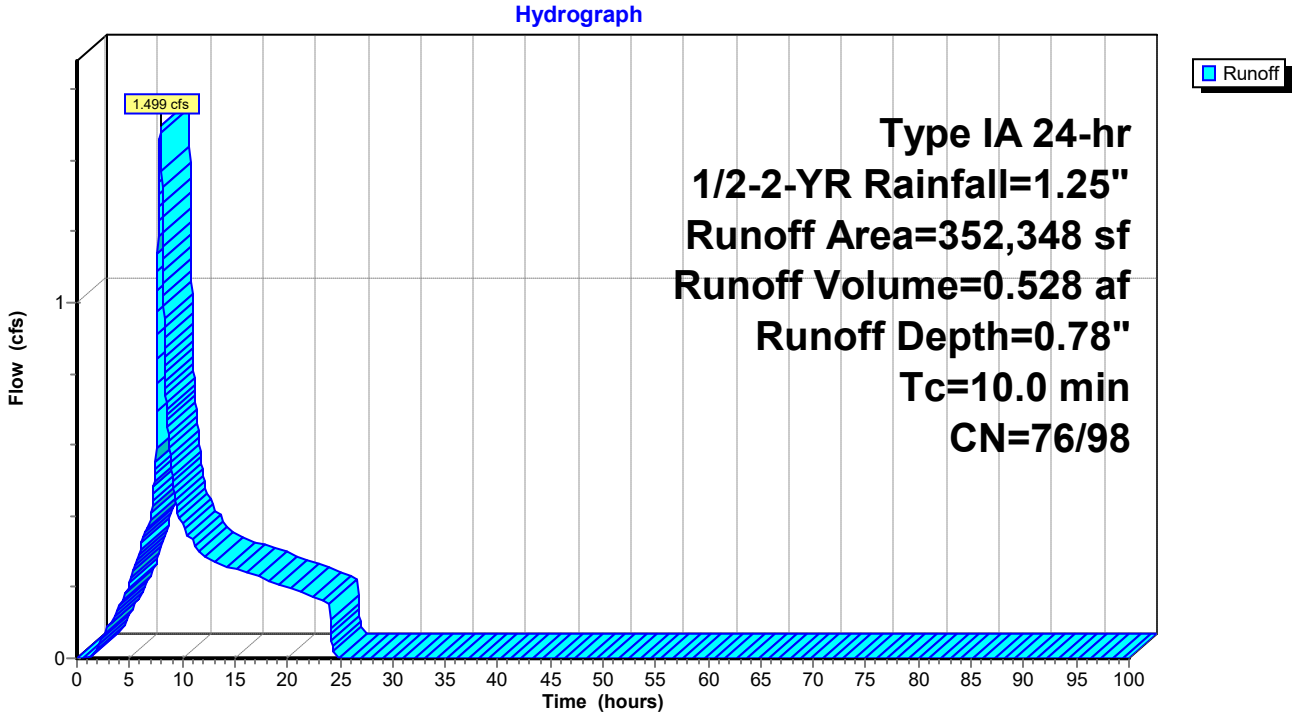
Runoff = 1.499 cfs @ 7.98 hrs, Volume= 0.528 af, Depth= 0.78"
Routed to Pond RG A : Detentionn Pond A - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2-2-YR Rainfall=1.25"

	Area (sf)	CN	Description
*	257,243	98	Impervious
*	95,105	76	Pervious
	352,348	92	Weighted Average
	95,105	76	26.99% Pervious Area
	257,243	98	73.01% Impervious Area

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

Subcatchment A: Basin A



Summary for Subcatchment A EX: Pre-Dev Basin A (On-Site)

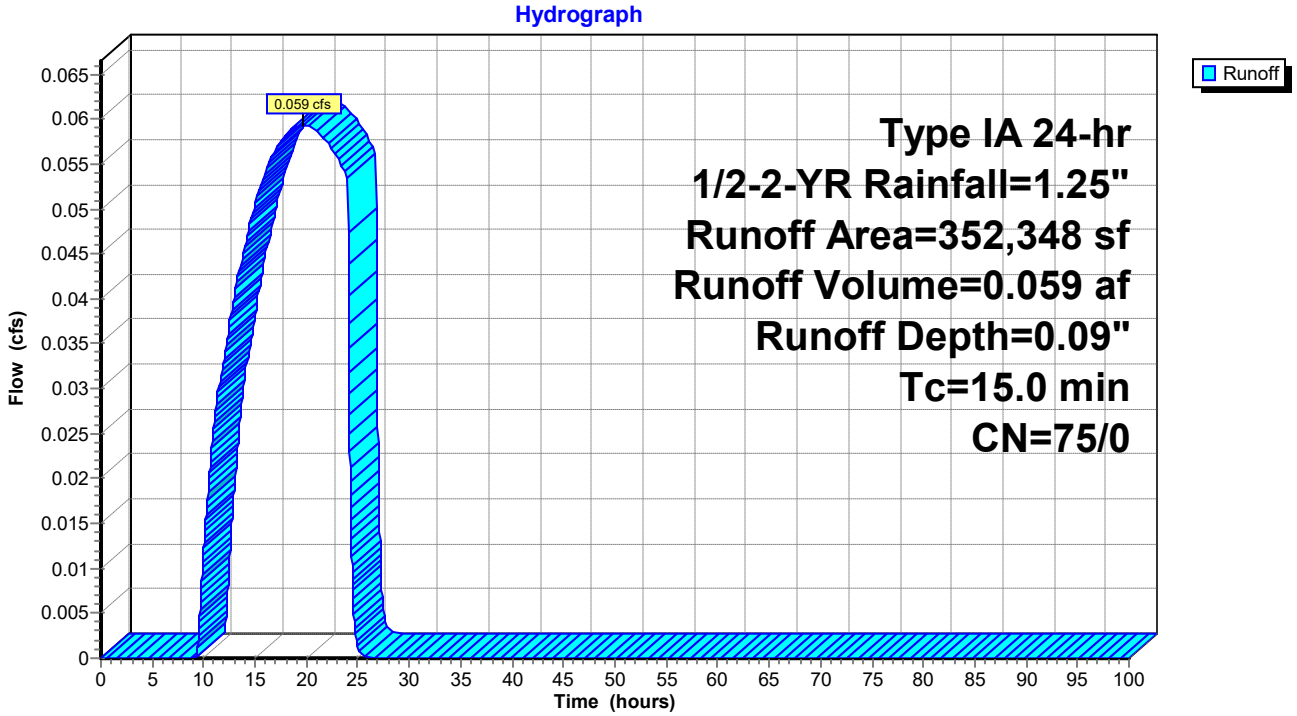
Runoff = 0.059 cfs @ 19.61 hrs, Volume= 0.059 af, Depth= 0.09"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2-2-YR Rainfall=1.25"

	Area (sf)	CN	Description
*	257,243	75	
*	95,105	75	
	352,348	75	Weighted Average
	352,348	75	100.00% Pervious Area

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

Subcatchment A EX: Pre-Dev Basin A (On-Site)



Summary for Subcatchment B: Basin B

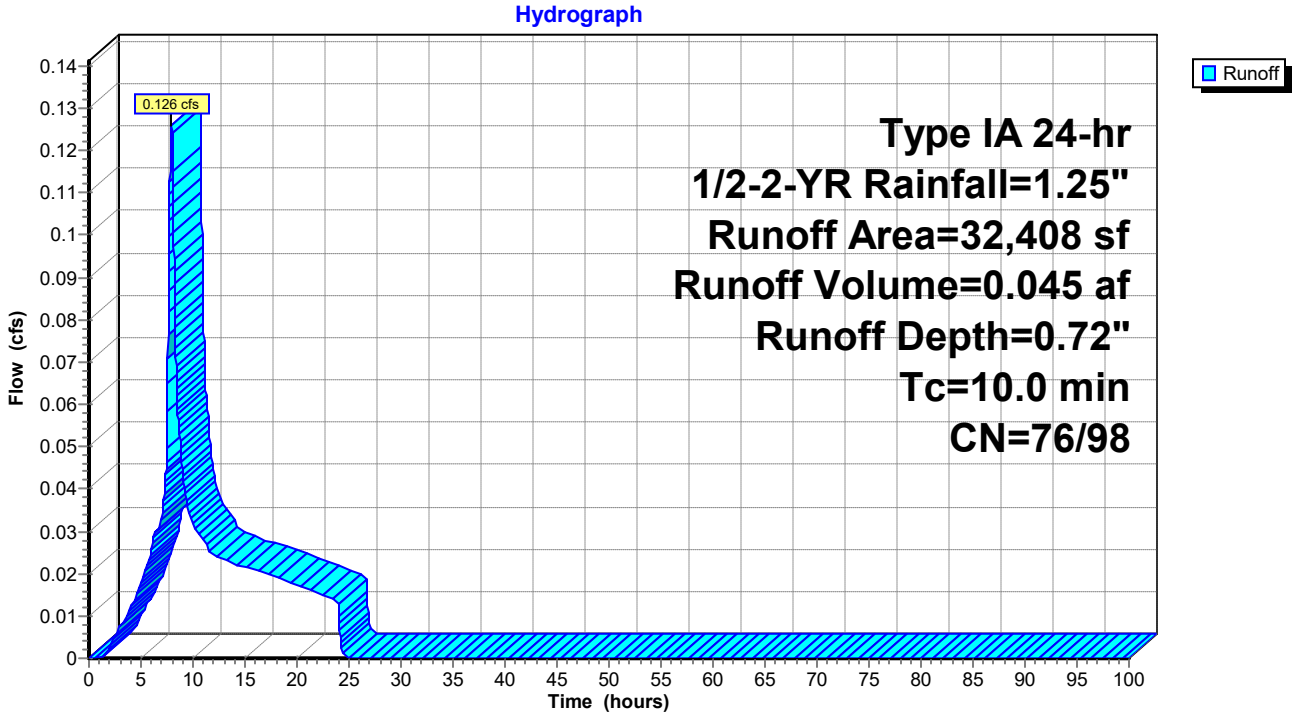
Runoff = 0.126 cfs @ 7.98 hrs, Volume= 0.045 af, Depth= 0.72"
Routed to Pond RG B : Detention Pond B - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2-2-YR Rainfall=1.25"

	Area (sf)	CN	Description
*	21,622	98	Impervious
*	10,786	76	Pervious
	32,408	91	Weighted Average
	10,786	76	33.28% Pervious Area
	21,622	98	66.72% Impervious Area

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

Subcatchment B: Basin B



Summary for Subcatchment B EX: Pre-Dev Basin B (Davis)

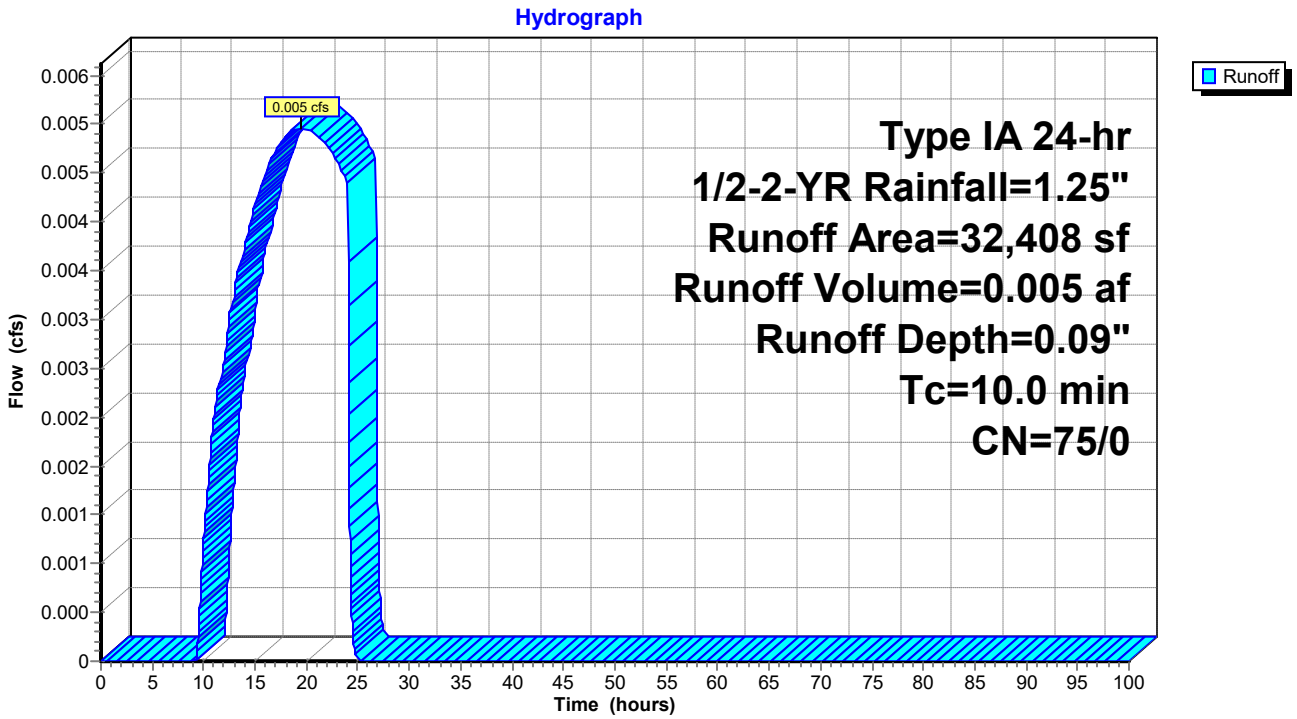
Runoff = 0.005 cfs @ 19.53 hrs, Volume= 0.005 af, Depth= 0.09"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2-2-YR Rainfall=1.25"

	Area (sf)	CN	Description
*	21,622	75	
*	10,786	75	
	32,408	75	Weighted Average
	32,408	75	100.00% Pervious Area

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

Subcatchment B EX: Pre-Dev Basin B (Davis)



Summary for Subcatchment C: Basin C

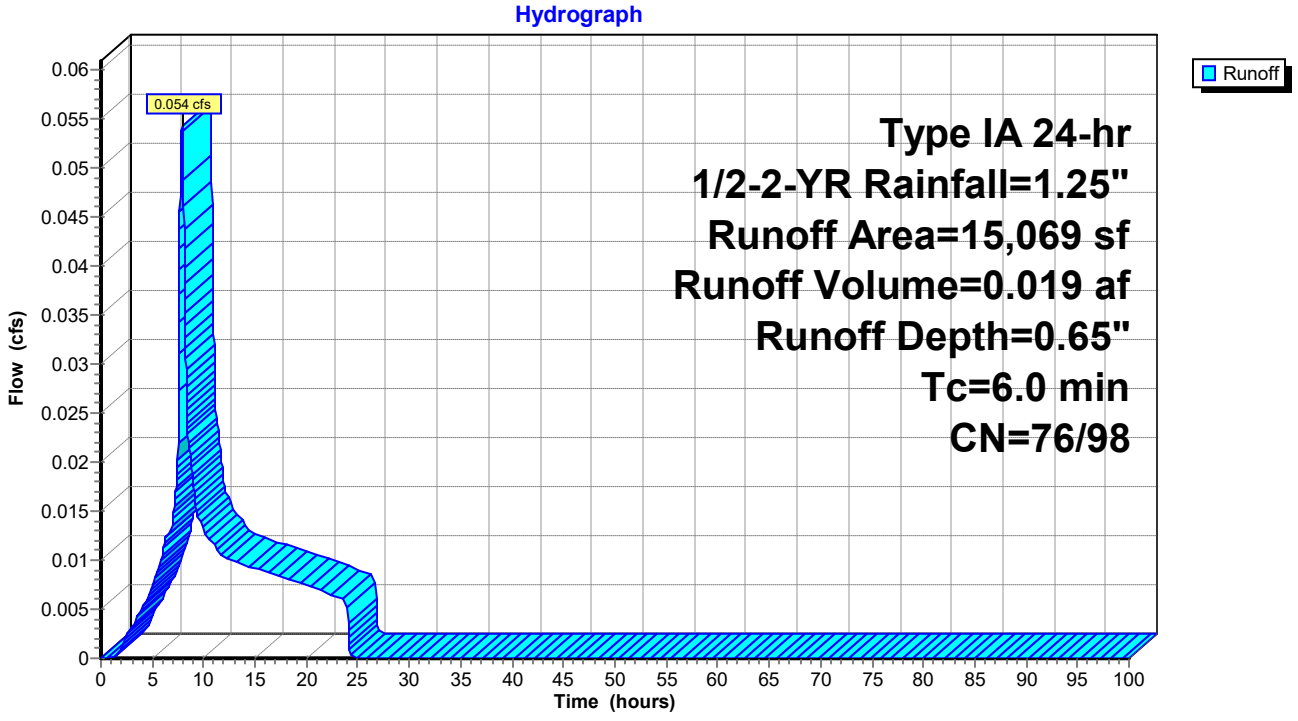
Runoff = 0.054 cfs @ 7.92 hrs, Volume= 0.019 af, Depth= 0.65"
Routed to Pond RG C : Raingarden C - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2-2-YR Rainfall=1.25"

	Area (sf)	CN	Description
*	8,934	98	Impervious
*	6,135	76	Pervious
	15,069	89	Weighted Average
	6,135	76	40.71% Pervious Area
	8,934	98	59.29% Impervious Area

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

Subcatchment C: Basin C



Summary for Subcatchment C EX: Pre-Dev Basin C (Access Lane)

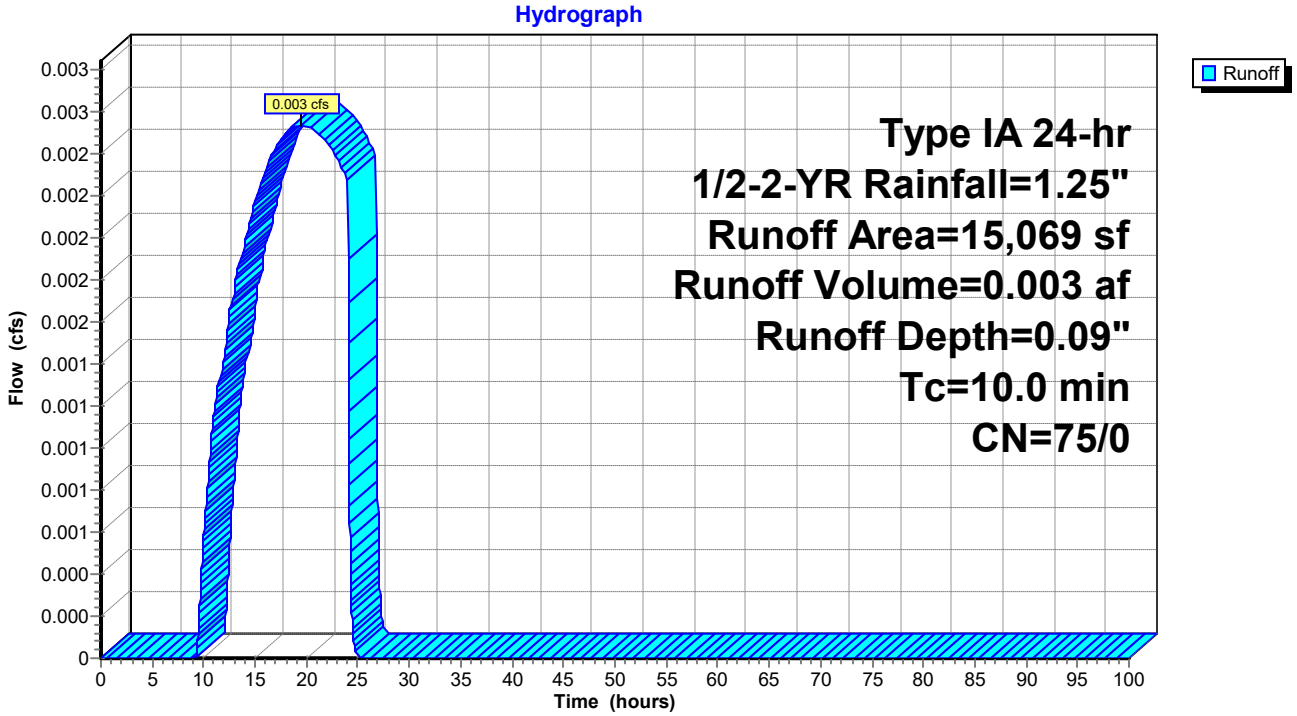
Runoff = 0.003 cfs @ 19.53 hrs, Volume= 0.003 af, Depth= 0.09"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2-2-YR Rainfall=1.25"

	Area (sf)	CN	Description
*	8,934	75	
*	6,135	75	
	15,069	75	Weighted Average
	15,069	75	100.00% Pervious Area

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

Subcatchment C EX: Pre-Dev Basin C (Access Lane)



Summary for Subcatchment D: Basin D

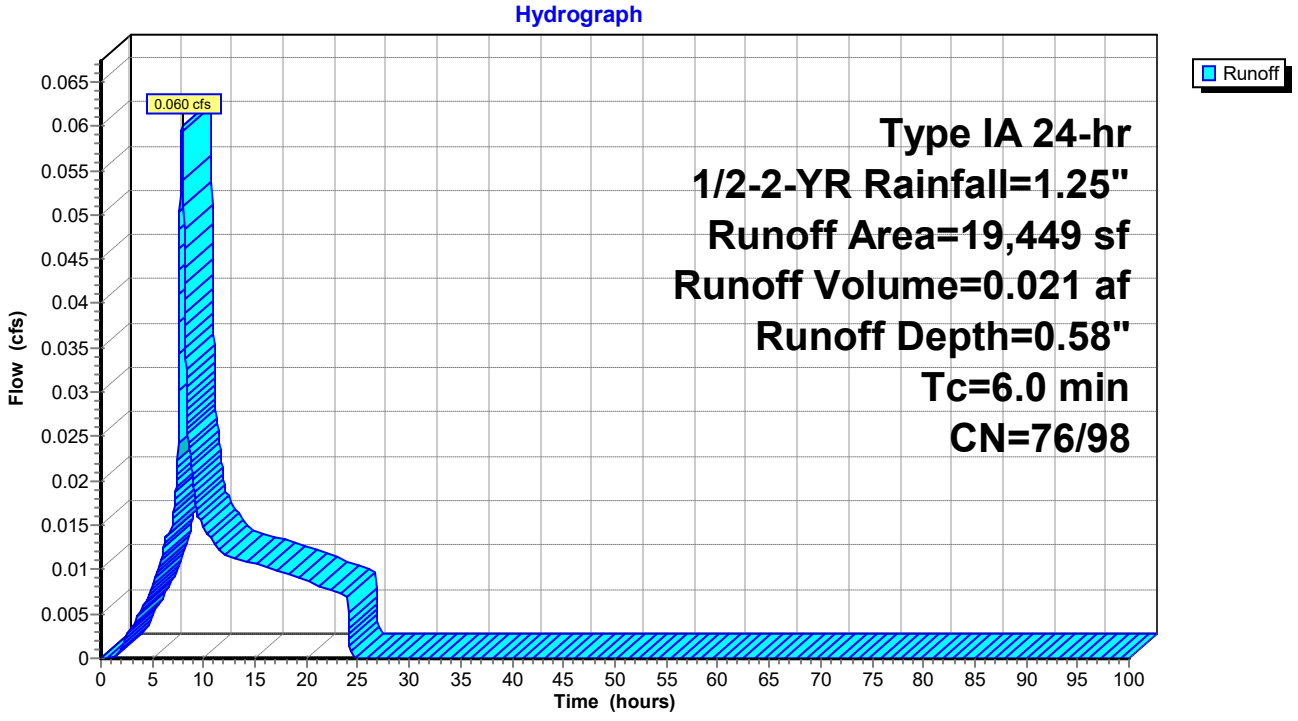
Runoff = 0.060 cfs @ 7.92 hrs, Volume= 0.021 af, Depth= 0.58"
Routed to Pond RG D : Detention Pond D - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2-2-YR Rainfall=1.25"

	Area (sf)	CN	Description
*	9,877	98	Impervious
*	9,572	76	Pervious
	19,449	87	Weighted Average
	9,572	76	49.22% Pervious Area
	9,877	98	50.78% Impervious Area

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

Subcatchment D: Basin D



Summary for Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)

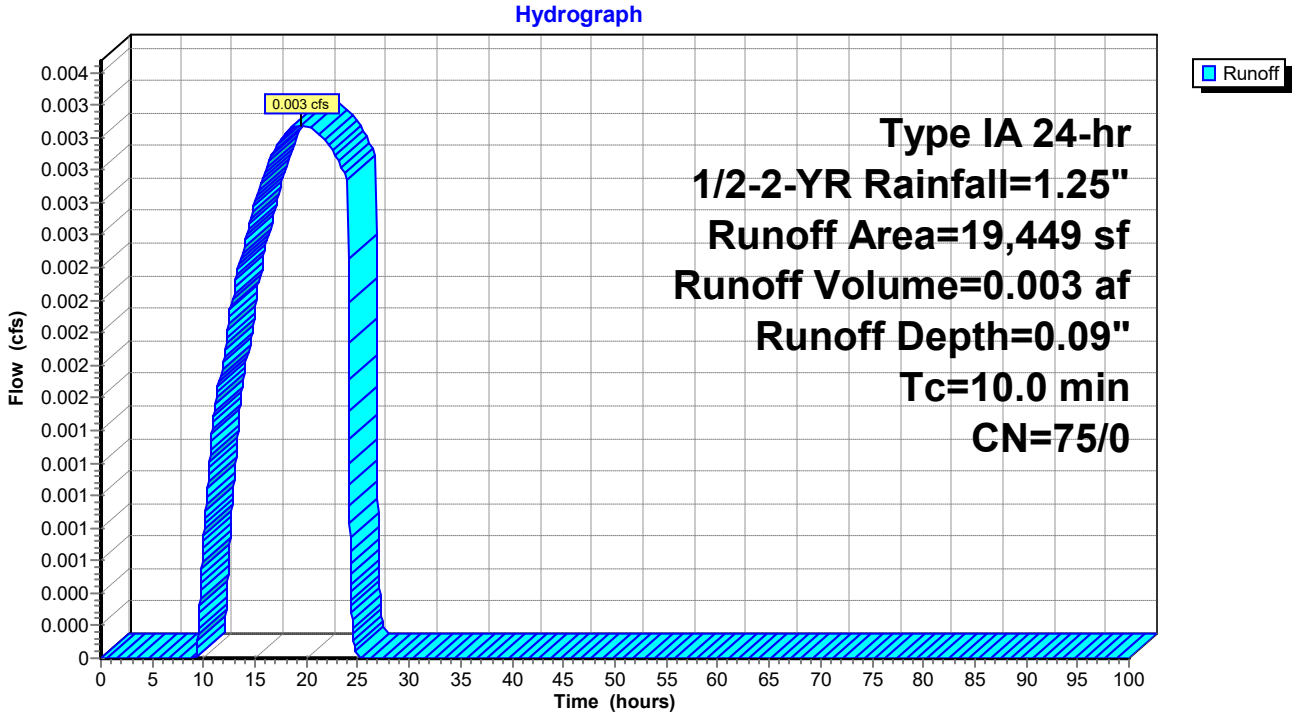
Runoff = 0.003 cfs @ 19.53 hrs, Volume= 0.003 af, Depth= 0.09"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2-2-YR Rainfall=1.25"

	Area (sf)	CN	Description
*	9,877	75	
*	9,572	75	
	19,449	75	Weighted Average
	19,449	75	100.00% Pervious Area

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

Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)



Summary for Pond RG A: Detentionn Pond A - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 8.089 ac, 73.01% Impervious, Inflow Depth = 0.78" for 1/2-2-YR event
Inflow = 1.499 cfs @ 7.98 hrs, Volume= 0.528 af
Outflow = 0.048 cfs @ 24.21 hrs, Volume= 0.346 af, Atten= 97%, Lag= 973.5 min
Primary = 0.048 cfs @ 24.21 hrs, Volume= 0.346 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.33' @ 24.21 hrs Surf.Area= 19,179 sf Storage= 20,064 cf

Plug-Flow detention time= 2,632.9 min calculated for 0.346 af (66% of inflow)
Center-of-Mass det. time= 2,427.2 min (3,145.3 - 718.1)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	81,111 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	7,298 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 18,244 cf Overall x 40.0% Voids
		88,409 cf	Total Available Storage

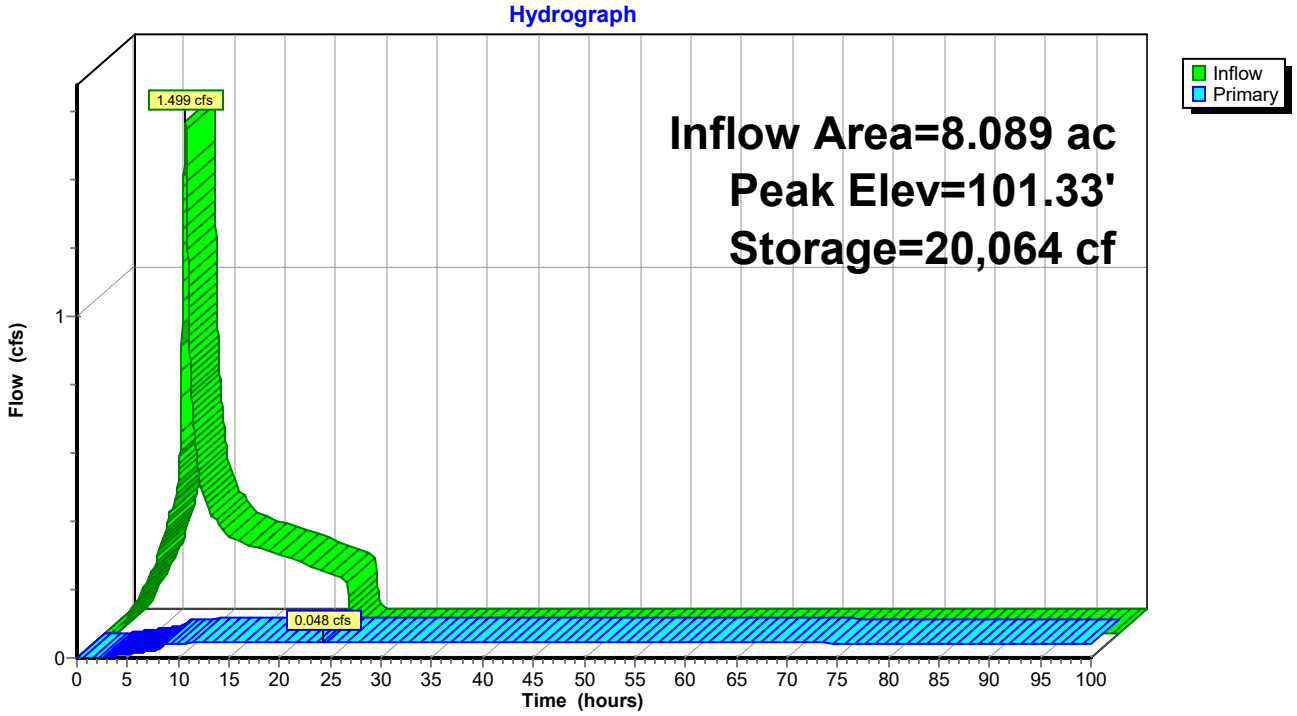
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,122	0	0
101.00	9,824	9,473	9,473
102.00	10,528	10,176	19,649
103.00	11,232	10,880	30,529
104.00	11,938	11,585	42,114
105.00	12,644	12,291	54,405
106.00	13,353	12,999	67,404
107.00	14,062	13,708	81,111

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	9,122	0	0
98.25	9,122	18,244	18,244

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.15' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	101.81'	**24.0" Horiz. Beehive OF** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.9" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	104.95'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.048 cfs @ 24.21 hrs HW=101.33' (Free Discharge)
└─**1=Culvert** (Passes 0.048 cfs of 6.390 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.048 cfs @ 10.814 fps)
    └─**2=Beehive OF** (Controls 0.000 cfs)
    └─**4=Underdrain** (Passes 0.048 cfs of 2.078 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Pond RG A: Detentionn Pond A - Flow Control



Summary for Pond RG B: Detention Pond B - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.744 ac, 66.72% Impervious, Inflow Depth = 0.72" for 1/2-2-YR event
Inflow = 0.126 cfs @ 7.98 hrs, Volume= 0.045 af
Outflow = 0.011 cfs @ 24.05 hrs, Volume= 0.045 af, Atten= 92%, Lag= 964.2 min
Primary = 0.011 cfs @ 24.05 hrs, Volume= 0.045 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 97.89' @ 24.05 hrs Surf.Area= 1,270 sf Storage= 1,340 cf

Plug-Flow detention time= 1,528.0 min calculated for 0.045 af (100% of inflow)
Center-of-Mass det. time= 1,526.5 min (2,248.7 - 722.1)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	4,693 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	95.25'	1,524 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 3,810 cf Overall x 40.0% Voids
		6,217 cf	Total Available Storage

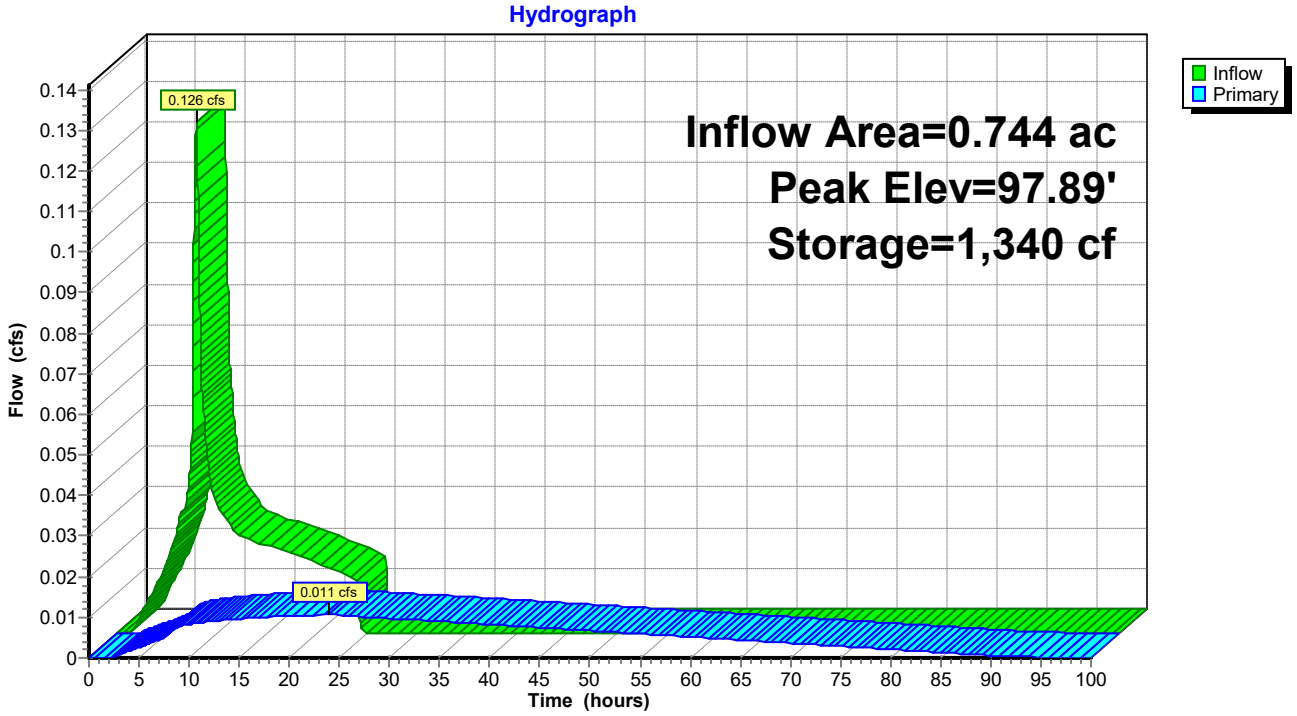
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,270	0	0
101.00	1,466	1,368	1,368
102.00	1,662	1,564	2,932
103.00	1,860	1,761	4,693

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.25	1,270	0	0
98.25	1,270	3,810	3,810

Device	Routing	Invert	Outlet Devices
#1	Primary	95.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.25' / 95.05' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	95.25'	**0.5" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	95.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.53'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.011 cfs @ 24.05 hrs HW=97.89' (Free Discharge)
└─**1=Culvert** (Passes 0.011 cfs of 4.365 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.011 cfs @ 7.789 fps)
    └─**2=Beehive** (Controls 0.000 cfs)
    └─**4=Underdrain** (Passes 0.011 cfs of 1.461 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Pond RG B: Detention Pond B - Flow Control



Summary for Pond RG C: Raingarden C - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.346 ac, 59.29% Impervious, Inflow Depth = 0.65" for 1/2-2-YR event
Inflow = 0.054 cfs @ 7.92 hrs, Volume= 0.019 af
Outflow = 0.006 cfs @ 22.73 hrs, Volume= 0.019 af, Atten= 88%, Lag= 888.6 min
Primary = 0.006 cfs @ 22.73 hrs, Volume= 0.019 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 97.21' @ 22.73 hrs Surf.Area= 1,158 sf Storage= 443 cf

Plug-Flow detention time= 908.1 min calculated for 0.019 af (100% of inflow)
Center-of-Mass det. time= 907.5 min (1,631.3 - 723.8)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	2,865 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	926 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 2,316 cf Overall x 40.0% Voids
		3,791 cf	Total Available Storage

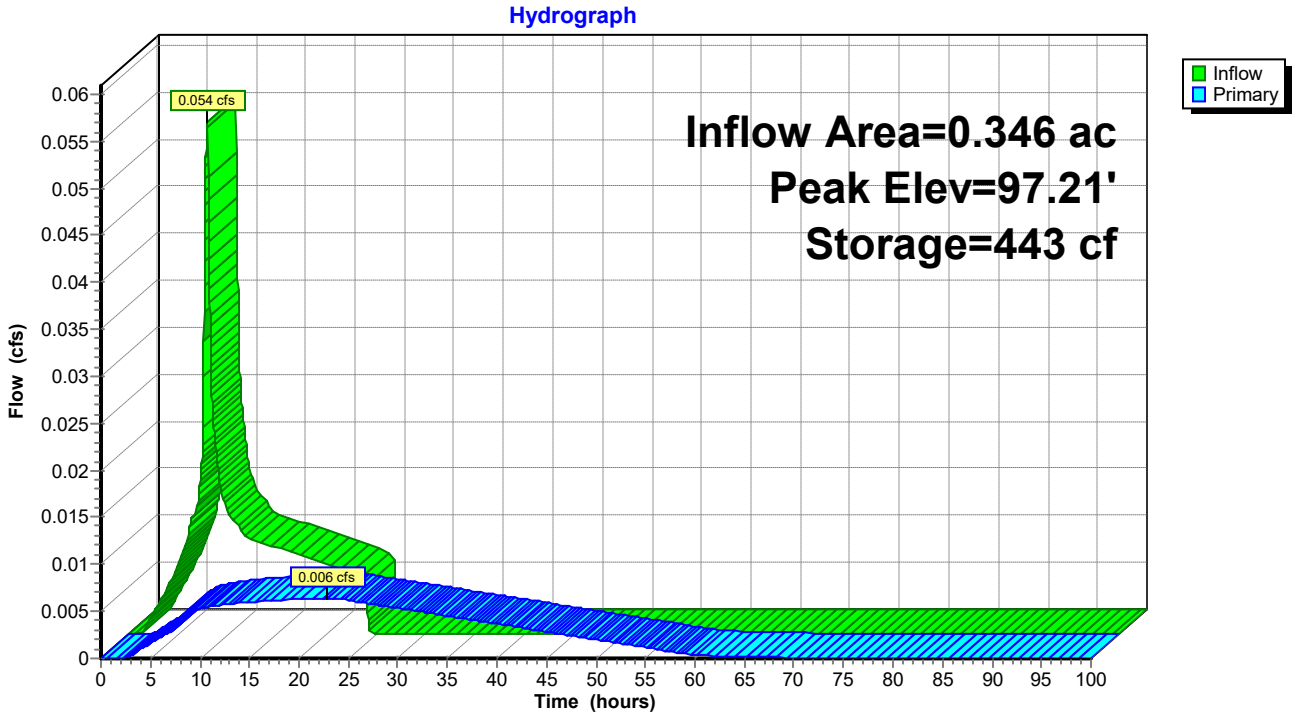
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,158	0	0
100.50	1,845	751	751
101.50	2,383	2,114	2,865

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	1,158	0	0
98.25	1,158	2,316	2,316

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.00'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.006 cfs @ 22.73 hrs HW=97.21' (Free Discharge)
└**1=Culvert** (Passes 0.006 cfs of 1.777 cfs potential flow)
  └**3=Orifice** (Orifice Controls 0.006 cfs @ 4.659 fps)
    └**2=Beehive** (Controls 0.000 cfs)
    └**4=Underdrain** (Passes 0.006 cfs of 0.795 cfs potential flow)
  └**5=Weir** (Controls 0.000 cfs)

Pond RG C: Raingarden C - Flow Control



Summary for Pond RG D: Detention Pond D - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.446 ac, 50.78% Impervious, Inflow Depth = 0.58" for 1/2-2-YR event
Inflow = 0.060 cfs @ 7.92 hrs, Volume= 0.021 af
Outflow = 0.009 cfs @ 19.68 hrs, Volume= 0.021 af, Atten= 85%, Lag= 705.9 min
Primary = 0.009 cfs @ 19.68 hrs, Volume= 0.021 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 98.11' @ 19.68 hrs Surf.Area= 531 sf Storage= 395 cf

Plug-Flow detention time= 598.1 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 598.5 min (1,330.4 - 731.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1,986 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	425 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 1,062 cf Overall x 40.0% Voids
		2,411 cf	Total Available Storage

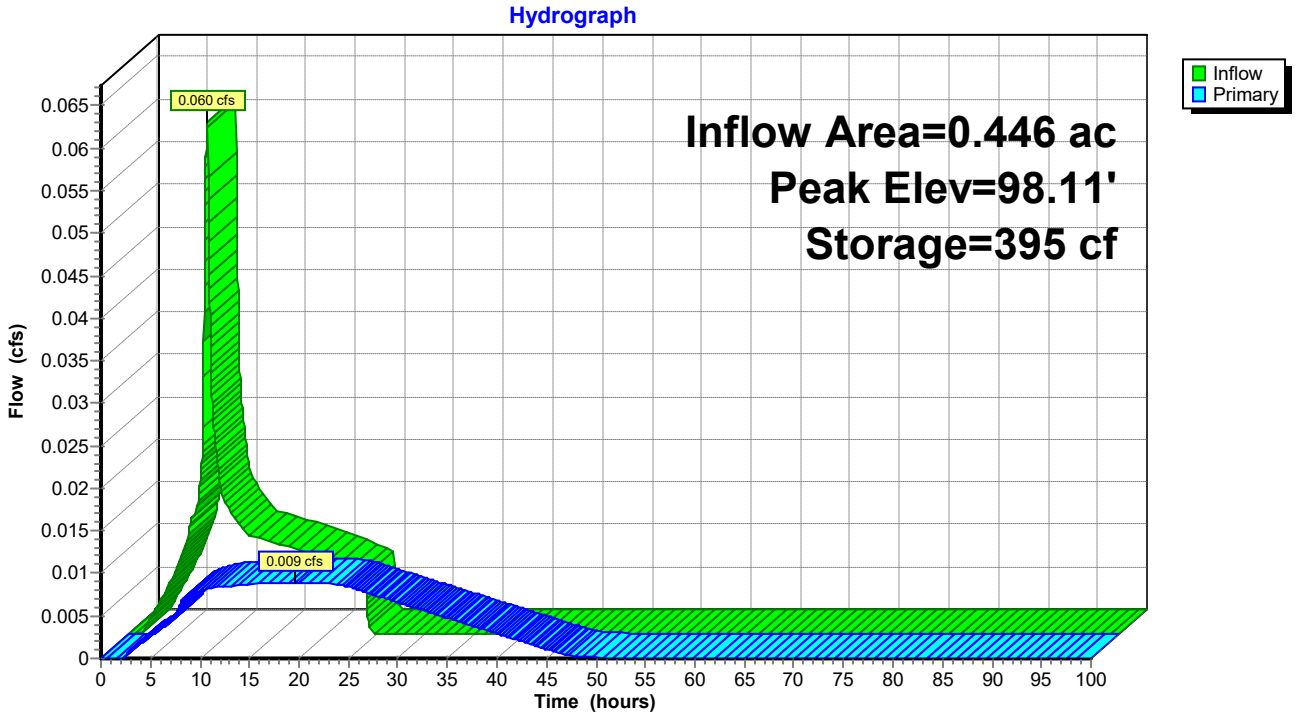
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	531	0	0
101.00	975	753	753
102.00	1,491	1,233	1,986

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	531	0	0
98.25	531	1,062	1,062

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.29'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.009 cfs @ 19.68 hrs HW=98.11' (Free Discharge)
- **1=Culvert** (Passes 0.009 cfs of 3.481 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.009 cfs @ 6.529 fps)
    - **2=Beehive** (Controls 0.000 cfs)
    - **4=Underdrain** (Passes 0.009 cfs of 1.199 cfs potential flow)
  - **5=Weir** (Controls 0.000 cfs)

Pond RG D: Detention Pond D - Flow Control



Time span=0.00-100.00 hrs, dt=0.02 hrs, 5001 points x 3
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Basin A Runoff Area=352,348 sf 73.01% Impervious Runoff Depth=1.85"
Tc=10.0 min CN=76/98 Runoff=3.447 cfs 1.244 af

Subcatchment A EX: Pre-Dev Basin A Runoff Area=352,348 sf 0.00% Impervious Runoff Depth=0.65"
Tc=15.0 min CN=75/0 Runoff=0.642 cfs 0.439 af

Subcatchment B: Basin B Runoff Area=32,408 sf 66.72% Impervious Runoff Depth=1.75"
Tc=10.0 min CN=76/98 Runoff=0.296 cfs 0.108 af

Subcatchment B EX: Pre-Dev Basin B Runoff Area=32,408 sf 0.00% Impervious Runoff Depth=0.65"
Tc=10.0 min CN=75/0 Runoff=0.067 cfs 0.040 af

Subcatchment C: Basin C Runoff Area=15,069 sf 59.29% Impervious Runoff Depth=1.63"
Tc=6.0 min CN=76/98 Runoff=0.132 cfs 0.047 af

Subcatchment C EX: Pre-Dev Basin C Runoff Area=15,069 sf 0.00% Impervious Runoff Depth=0.65"
Tc=10.0 min CN=75/0 Runoff=0.031 cfs 0.019 af

Subcatchment D: Basin D Runoff Area=19,449 sf 50.78% Impervious Runoff Depth=1.50"
Tc=6.0 min CN=76/98 Runoff=0.153 cfs 0.056 af

Subcatchment D EX: Pre-Dev Basin D (Fire Runoff Area=19,449 sf 0.00% Impervious Runoff Depth=0.65"
Tc=10.0 min CN=75/0 Runoff=0.040 cfs 0.024 af

Pond RG A: Detentionn Pond A - Flow Peak Elev=104.08' Storage=50,374 cf Inflow=3.447 cfs 1.244 af
Outflow=0.059 cfs 0.442 af

Pond RG B: Detention Pond B - Flow Peak Elev=101.52' Storage=3,683 cf Inflow=0.296 cfs 0.108 af
Outflow=0.016 cfs 0.099 af

Pond RG C: Raingarden C - Flow Control Peak Elev=100.26' Storage=1,267 cf Inflow=0.132 cfs 0.047 af
Outflow=0.013 cfs 0.047 af

Pond RG D: Detention Pond D - Flow Peak Elev=101.28' Storage=1,474 cf Inflow=0.153 cfs 0.056 af
Outflow=0.015 cfs 0.056 af

Total Runoff Area = 19.250 ac Runoff Volume = 1.976 af Average Runoff Depth = 1.23"
64.50% Pervious = 12.417 ac 35.50% Impervious = 6.834 ac

Summary for Subcatchment A: Basin A

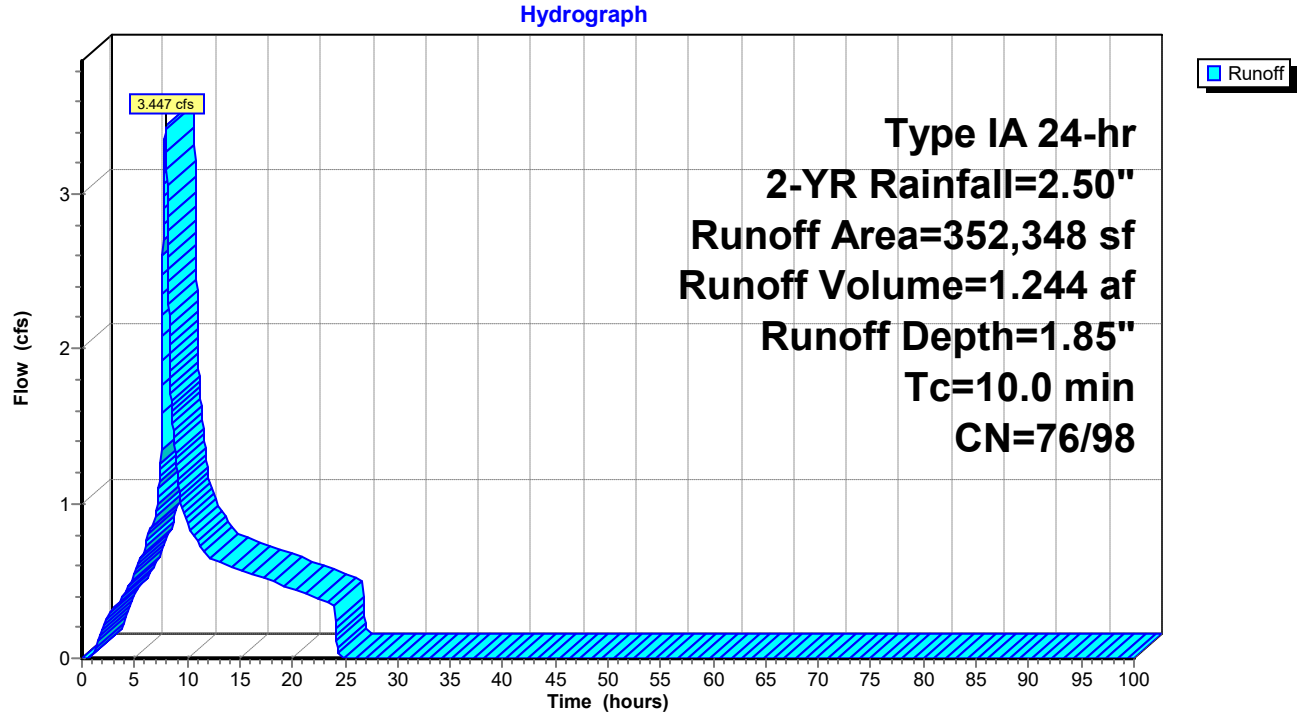
Runoff = 3.447 cfs @ 7.99 hrs, Volume= 1.244 af, Depth= 1.85"
Routed to Pond RG A : Detentionn Pond A - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.50"

	Area (sf)	CN	Description
*	257,243	98	Impervious
*	95,105	76	Pervious
	352,348	92	Weighted Average
	95,105	76	26.99% Pervious Area
	257,243	98	73.01% Impervious Area

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

Subcatchment A: Basin A



Summary for Subcatchment A EX: Pre-Dev Basin A (On-Site)

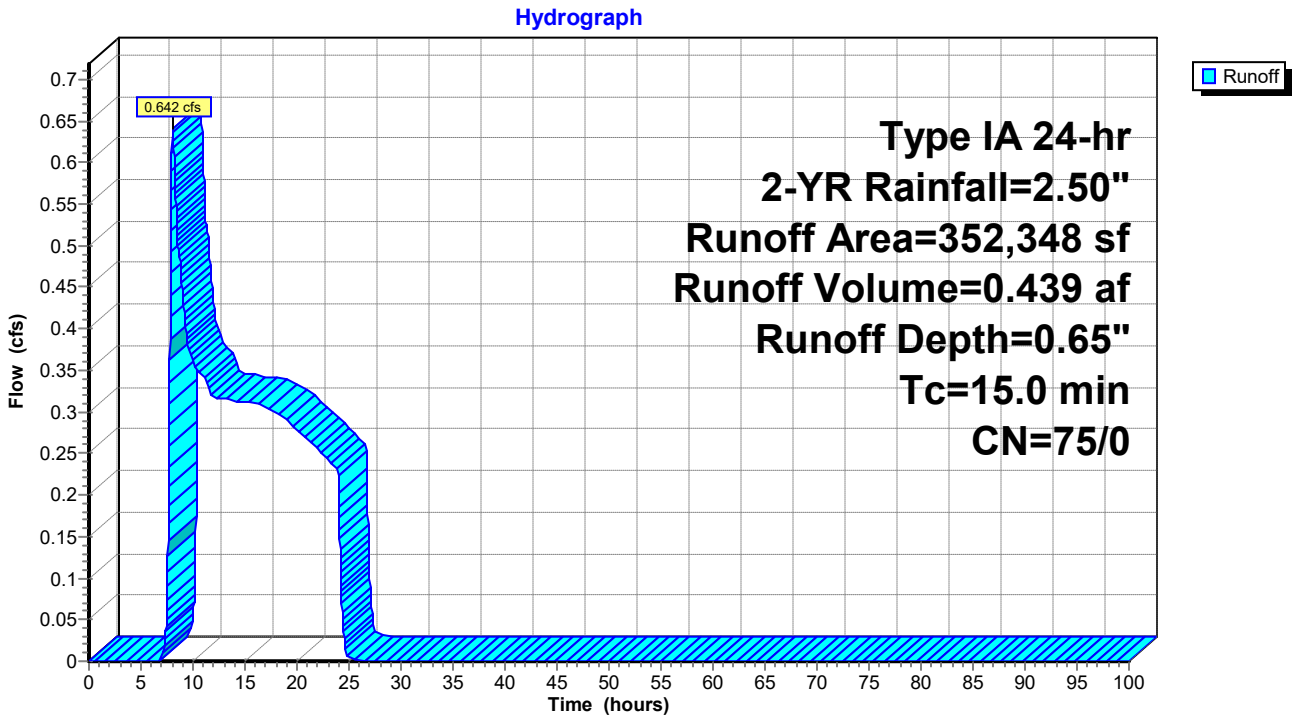
Runoff = 0.642 cfs @ 8.03 hrs, Volume= 0.439 af, Depth= 0.65"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.50"

	Area (sf)	CN	Description
*	257,243	75	
*	95,105	75	
	352,348	75	Weighted Average
	352,348	75	100.00% Pervious Area

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

Subcatchment A EX: Pre-Dev Basin A (On-Site)



Summary for Subcatchment B: Basin B

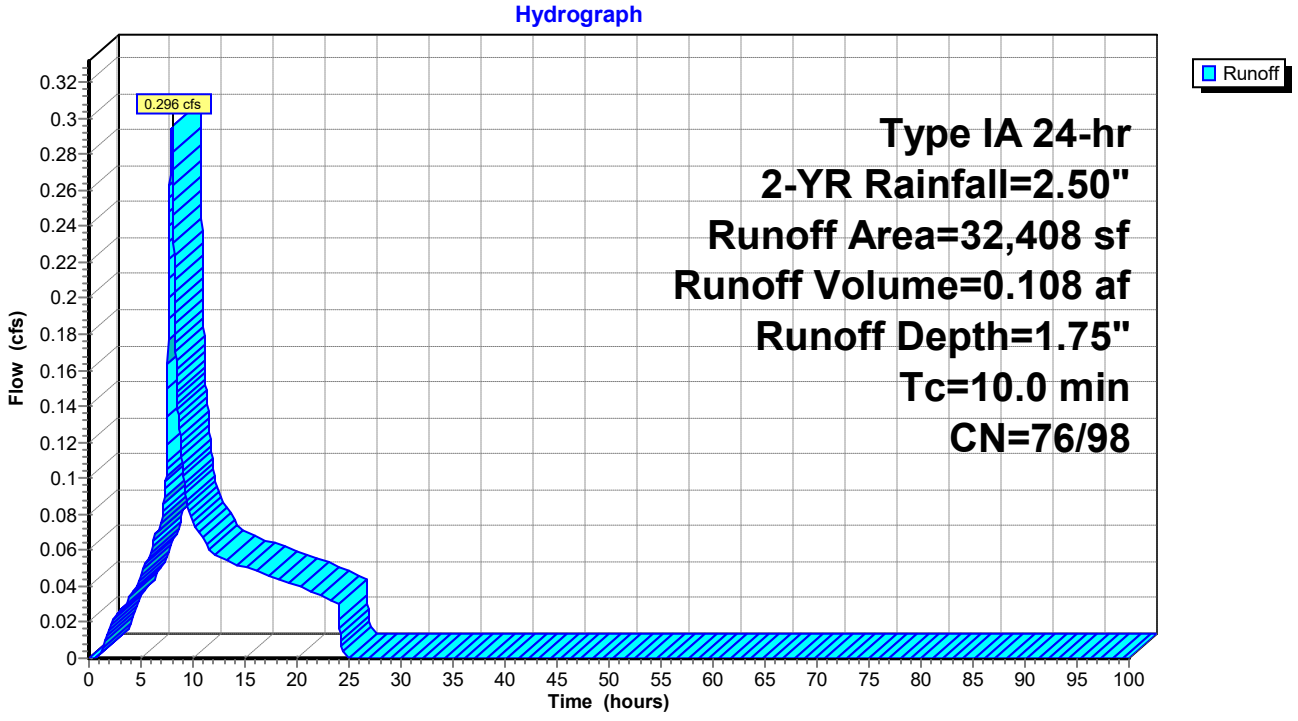
Runoff = 0.296 cfs @ 8.00 hrs, Volume= 0.108 af, Depth= 1.75"
Routed to Pond RG B : Detention Pond B - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.50"

	Area (sf)	CN	Description
*	21,622	98	Impervious
*	10,786	76	Pervious
	32,408	91	Weighted Average
	10,786	76	33.28% Pervious Area
	21,622	98	66.72% Impervious Area

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

Subcatchment B: Basin B



Summary for Subcatchment B EX: Pre-Dev Basin B (Davis)

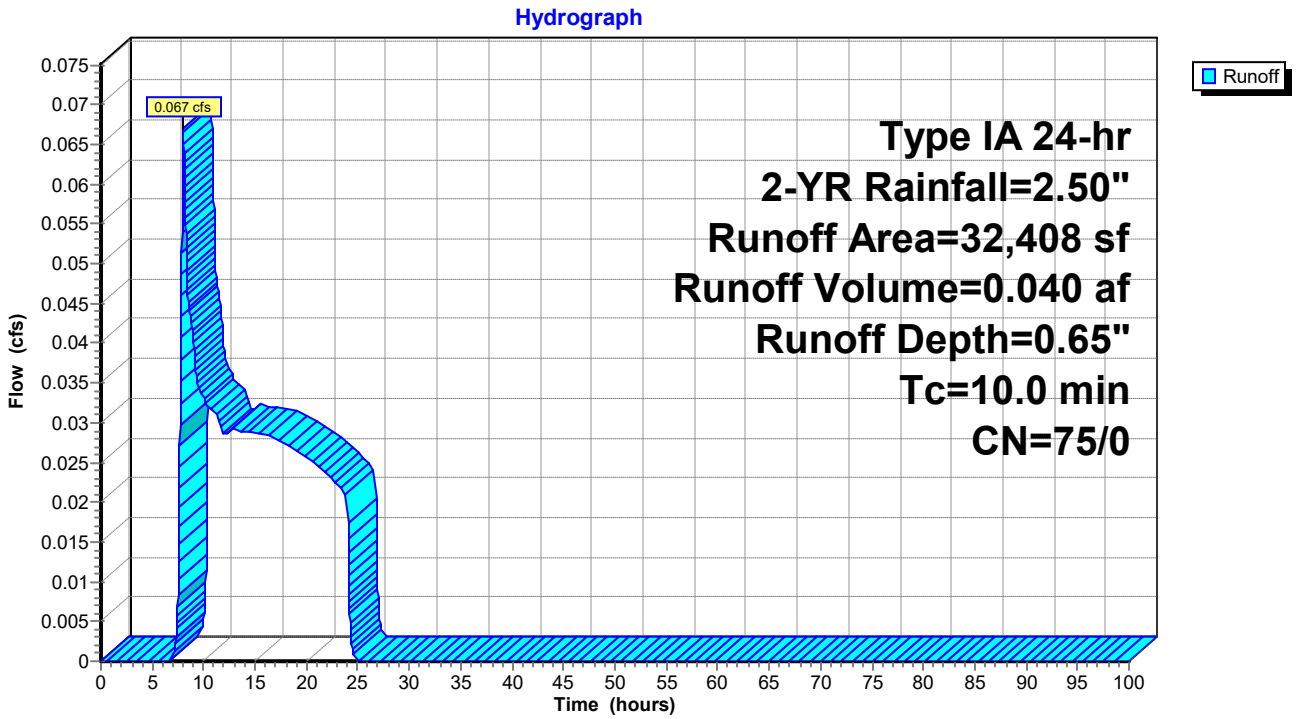
Runoff = 0.067 cfs @ 8.01 hrs, Volume= 0.040 af, Depth= 0.65"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.50"

	Area (sf)	CN	Description
*	21,622	75	
*	10,786	75	
	32,408	75	Weighted Average
	32,408	75	100.00% Pervious Area

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

Subcatchment B EX: Pre-Dev Basin B (Davis)



Summary for Subcatchment C: Basin C

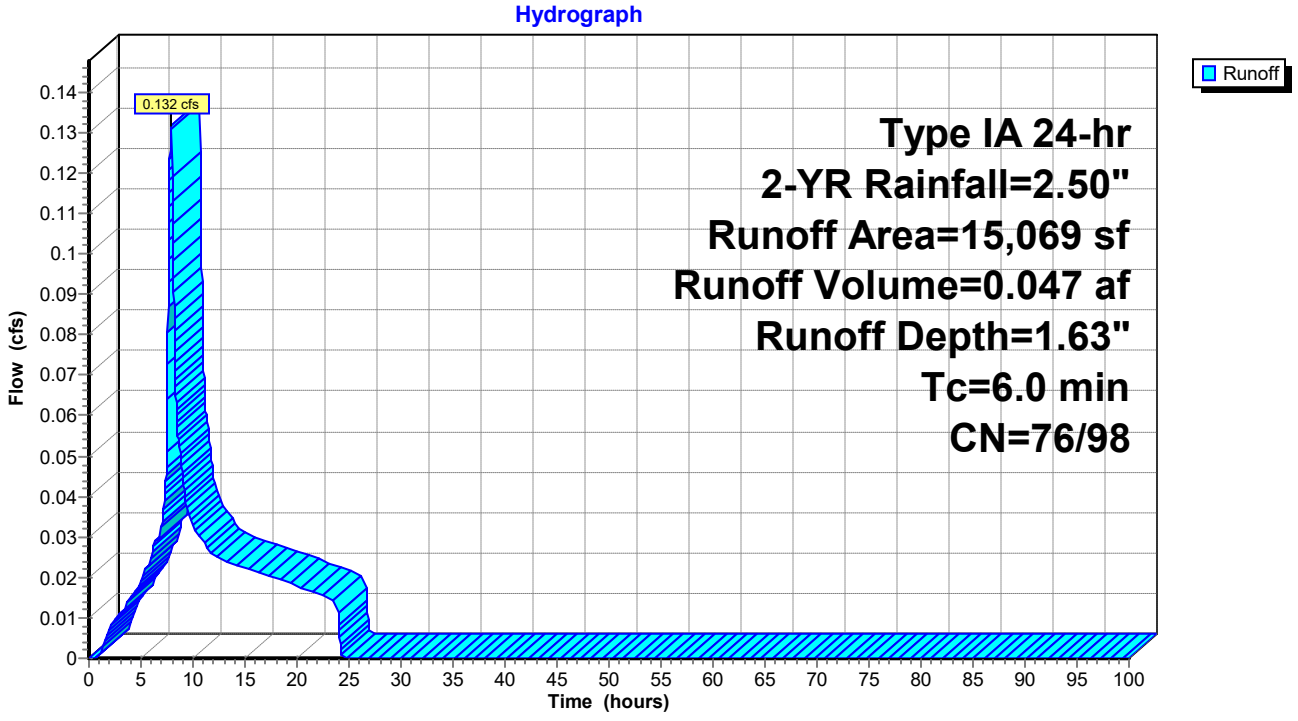
Runoff = 0.132 cfs @ 7.94 hrs, Volume= 0.047 af, Depth= 1.63"
Routed to Pond RG C : Raingarden C - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.50"

	Area (sf)	CN	Description
*	8,934	98	Impervious
*	6,135	76	Pervious
	15,069	89	Weighted Average
	6,135	76	40.71% Pervious Area
	8,934	98	59.29% Impervious Area

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

Subcatchment C: Basin C



Summary for Subcatchment C EX: Pre-Dev Basin C (Access Lane)

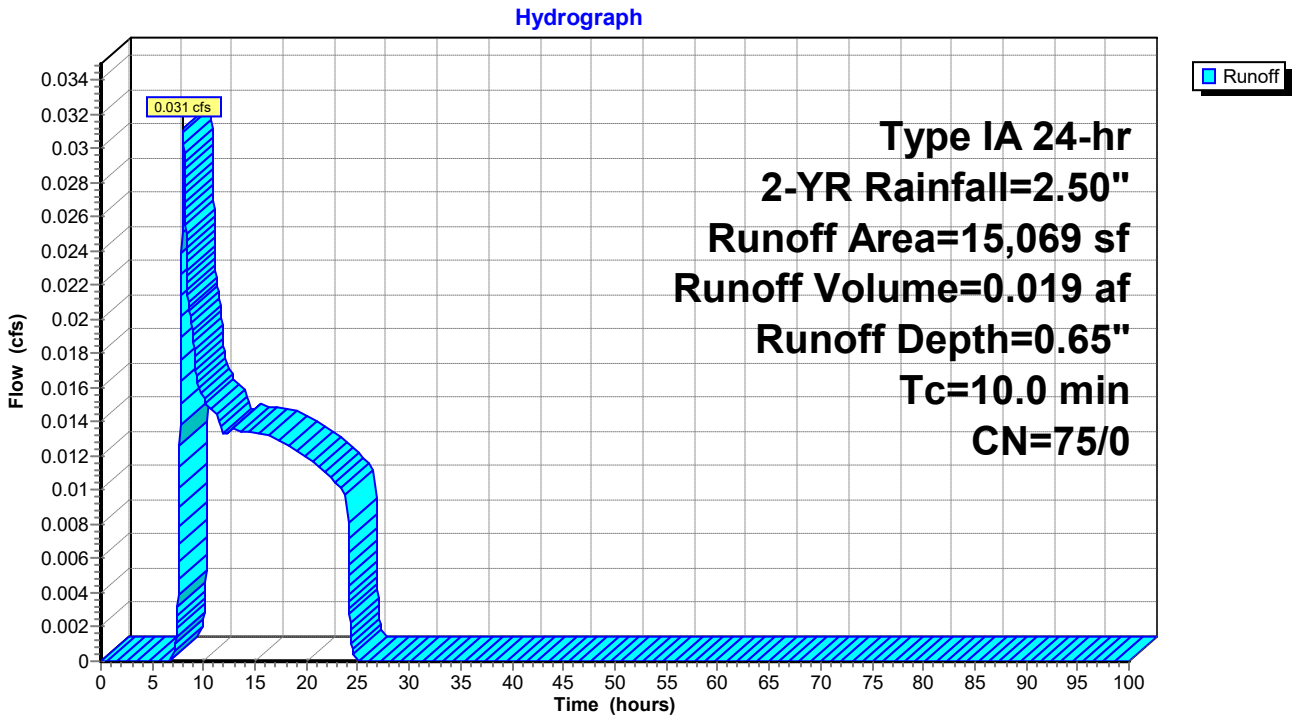
Runoff = 0.031 cfs @ 8.01 hrs, Volume= 0.019 af, Depth= 0.65"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.50"

	Area (sf)	CN	Description
*	8,934	75	
*	6,135	75	
	15,069	75	Weighted Average
	15,069	75	100.00% Pervious Area

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

Subcatchment C EX: Pre-Dev Basin C (Access Lane)



Summary for Subcatchment D: Basin D

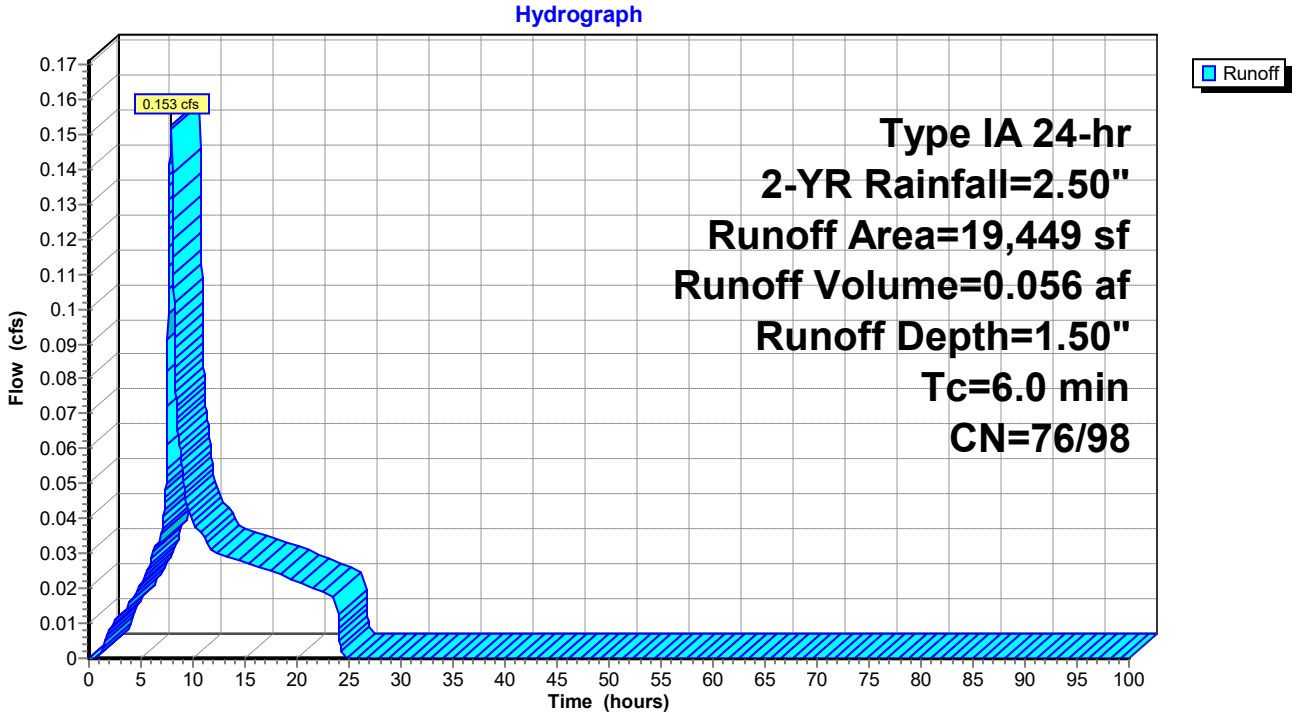
Runoff = 0.153 cfs @ 7.95 hrs, Volume= 0.056 af, Depth= 1.50"
Routed to Pond RG D : Detention Pond D - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.50"

	Area (sf)	CN	Description
*	9,877	98	Impervious
*	9,572	76	Pervious
	19,449	87	Weighted Average
	9,572	76	49.22% Pervious Area
	9,877	98	50.78% Impervious Area

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

Subcatchment D: Basin D



Summary for Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)

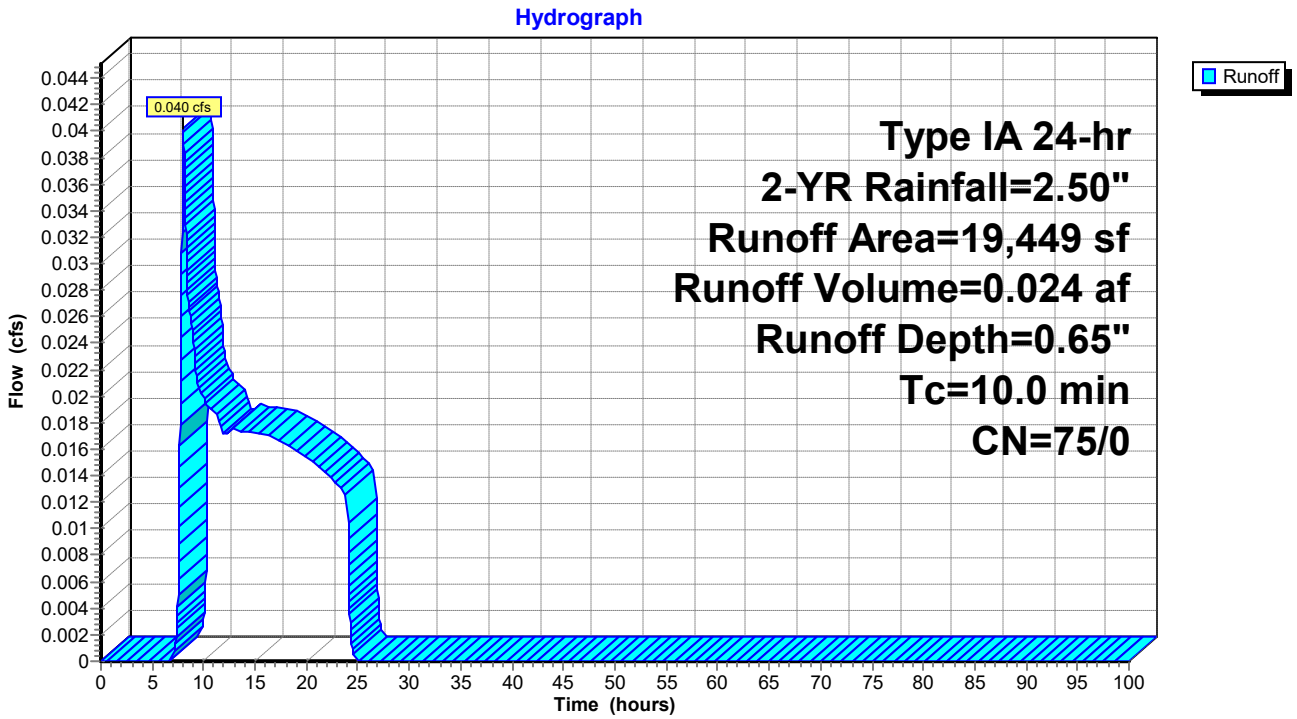
Runoff = 0.040 cfs @ 8.01 hrs, Volume= 0.024 af, Depth= 0.65"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.50"

	Area (sf)	CN	Description
*	9,877	75	
*	9,572	75	
	19,449	75	Weighted Average
	19,449	75	100.00% Pervious Area

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

Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)



Summary for Pond RG A: Detentionn Pond A - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 8.089 ac, 73.01% Impervious, Inflow Depth = 1.85" for 2-YR event
Inflow = 3.447 cfs @ 7.99 hrs, Volume= 1.244 af
Outflow = 0.059 cfs @ 24.30 hrs, Volume= 0.442 af, Atten= 98%, Lag= 979.1 min
Primary = 0.059 cfs @ 24.30 hrs, Volume= 0.442 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 104.08' @ 24.30 hrs Surf.Area= 21,117 sf Storage= 50,374 cf

Plug-Flow detention time= 2,763.2 min calculated for 0.442 af (36% of inflow)
Center-of-Mass det. time= 2,445.3 min (3,144.7 - 699.4)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	81,111 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	7,298 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 18,244 cf Overall x 40.0% Voids
		88,409 cf	Total Available Storage

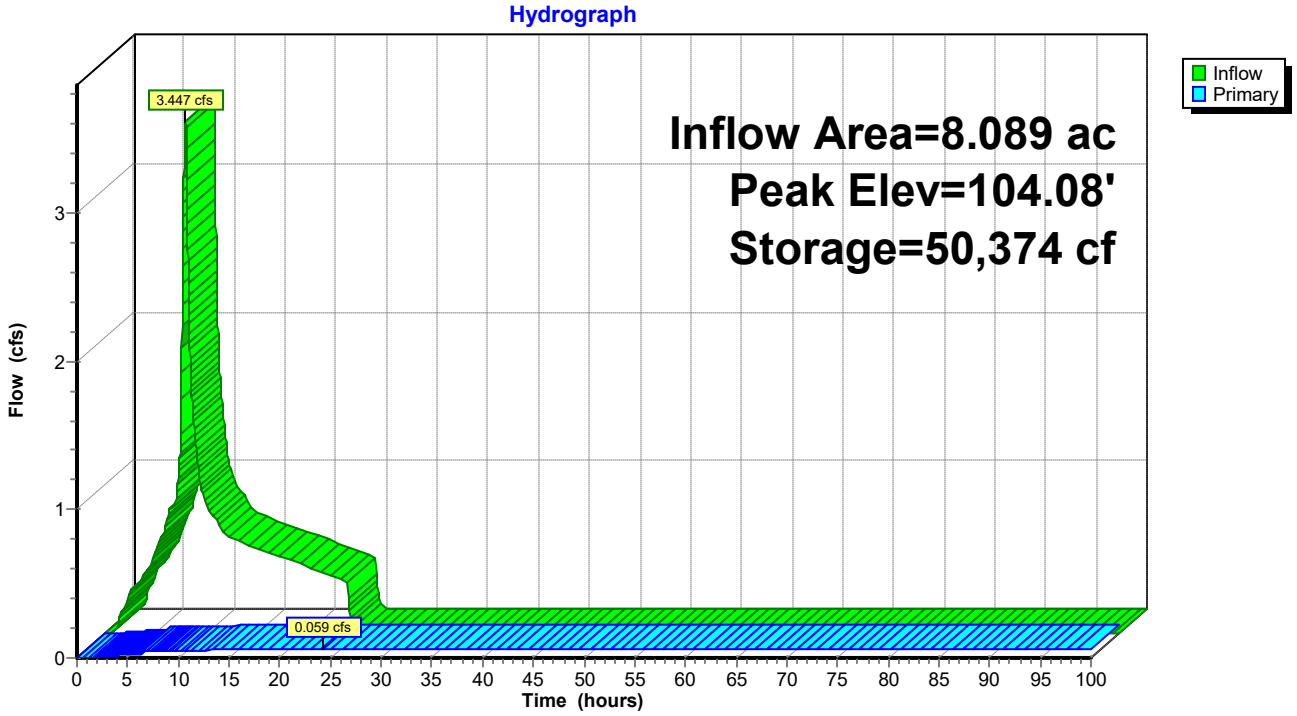
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,122	0	0
101.00	9,824	9,473	9,473
102.00	10,528	10,176	19,649
103.00	11,232	10,880	30,529
104.00	11,938	11,585	42,114
105.00	12,644	12,291	54,405
106.00	13,353	12,999	67,404
107.00	14,062	13,708	81,111

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	9,122	0	0
98.25	9,122	18,244	18,244

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.15' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	101.81'	**24.0" Horiz. Beehive OF** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.9" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	104.95'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.059 cfs @ 24.30 hrs HW=104.08' (Free Discharge)
└─**1=Culvert** (Passes 0.059 cfs of 8.083 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.059 cfs @ 13.441 fps)
    └─**2=Beehive OF** (Passes < 22.793 cfs potential flow)
    └─**4=Underdrain** (Passes < 2.603 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Pond RG A: Detentionn Pond A - Flow Control



Summary for Pond RG B: Detention Pond B - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.744 ac, 66.72% Impervious, Inflow Depth = 1.75" for 2-YR event
Inflow = 0.296 cfs @ 8.00 hrs, Volume= 0.108 af
Outflow = 0.016 cfs @ 24.12 hrs, Volume= 0.099 af, Atten= 94%, Lag= 967.0 min
Primary = 0.016 cfs @ 24.12 hrs, Volume= 0.099 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.52' @ 24.12 hrs Surf.Area= 2,838 sf Storage= 3,683 cf

Plug-Flow detention time= 2,117.2 min calculated for 0.099 af (92% of inflow)
Center-of-Mass det. time= 2,058.1 min (2,763.9 - 705.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	4,693 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	95.25'	1,524 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 3,810 cf Overall x 40.0% Voids
		6,217 cf	Total Available Storage

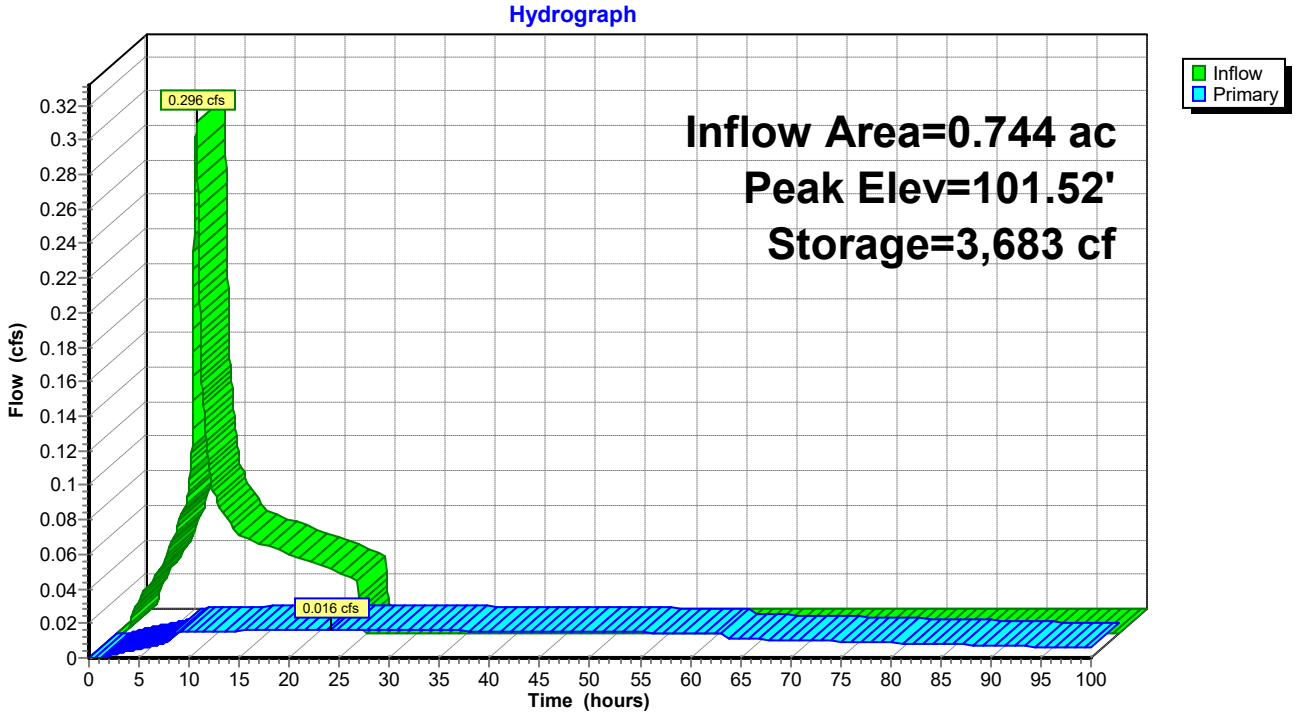
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,270	0	0
101.00	1,466	1,368	1,368
102.00	1,662	1,564	2,932
103.00	1,860	1,761	4,693

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.25	1,270	0	0
98.25	1,270	3,810	3,810

Device	Routing	Invert	Outlet Devices
#1	Primary	95.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.25' / 95.05' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	95.25'	**0.5" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	95.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.53'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.016 cfs @ 24.12 hrs HW=101.52' (Free Discharge)
└─**1=Culvert** (Passes 0.016 cfs of 7.172 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.016 cfs @ 12.038 fps)
    └─**2=Beehive** (Passes < 15.289 cfs potential flow)
    └─**4=Underdrain** (Passes < 2.320 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Pond RG B: Detention Pond B - Flow Control



Summary for Pond RG C: Raingarden C - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.346 ac, 59.29% Impervious, Inflow Depth = 1.63" for 2-YR event
Inflow = 0.132 cfs @ 7.94 hrs, Volume= 0.047 af
Outflow = 0.013 cfs @ 24.01 hrs, Volume= 0.047 af, Atten= 90%, Lag= 964.5 min
Primary = 0.013 cfs @ 24.01 hrs, Volume= 0.047 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 100.26' @ 24.01 hrs Surf.Area= 2,667 sf Storage= 1,267 cf

Plug-Flow detention time= 1,281.6 min calculated for 0.047 af (100% of inflow)
Center-of-Mass det. time= 1,280.5 min (1,991.0 - 710.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	2,865 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	926 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 2,316 cf Overall x 40.0% Voids
		3,791 cf	Total Available Storage

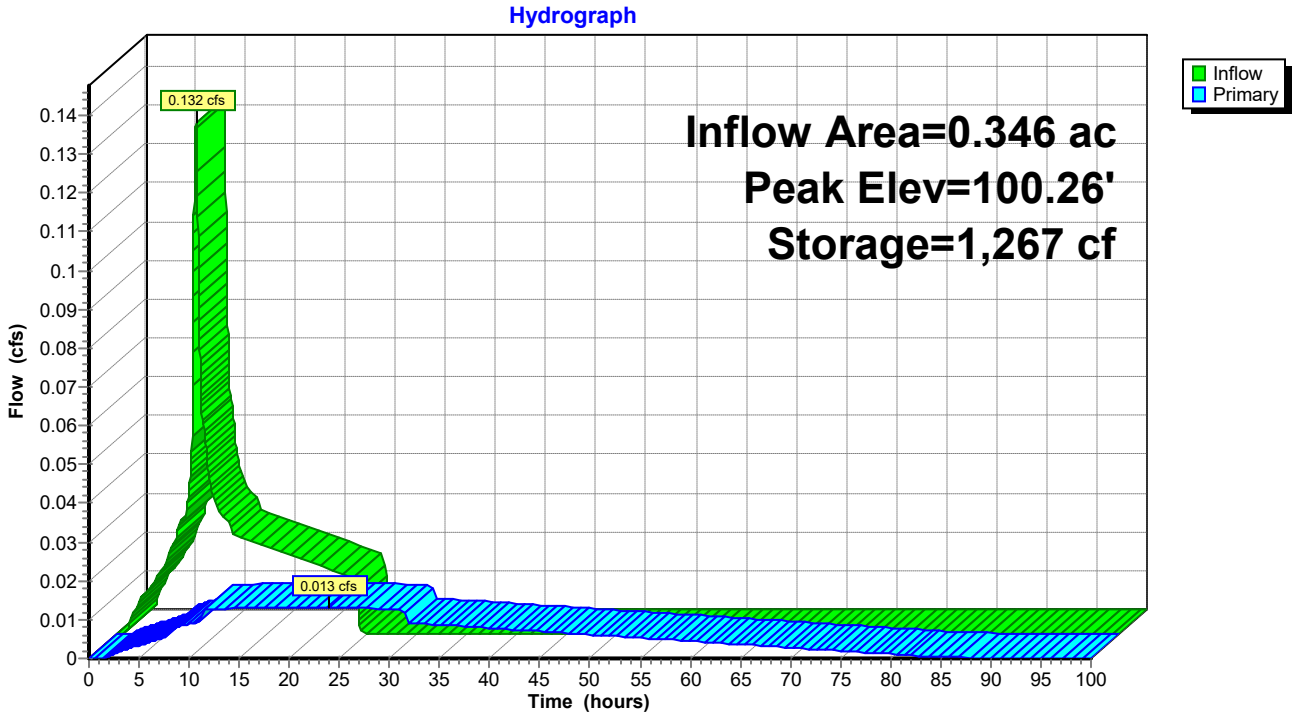
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,158	0	0
100.50	1,845	751	751
101.50	2,383	2,114	2,865

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	1,158	0	0
98.25	1,158	2,316	2,316

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.00'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.013 cfs @ 24.01 hrs HW=100.26' (Free Discharge)
- **1=Culvert** (Passes 0.013 cfs of 5.590 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.013 cfs @ 9.611 fps)
    - **2=Beehive** (Controls 0.000 cfs)
    - **4=Underdrain** (Passes 0.013 cfs of 1.832 cfs potential flow)
  - **5=Weir** (Controls 0.000 cfs)

Pond RG C: Raingarden C - Flow Control



Summary for Pond RG D: Detention Pond D - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.446 ac, 50.78% Impervious, Inflow Depth = 1.50" for 2-YR event
Inflow = 0.153 cfs @ 7.95 hrs, Volume= 0.056 af
Outflow = 0.015 cfs @ 24.02 hrs, Volume= 0.056 af, Atten= 90%, Lag= 964.7 min
Primary = 0.015 cfs @ 24.02 hrs, Volume= 0.056 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.28' @ 24.02 hrs Surf.Area= 1,652 sf Storage= 1,474 cf

Plug-Flow detention time= 1,087.1 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 1,087.6 min (1,809.8 - 722.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1,986 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	425 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 1,062 cf Overall x 40.0% Voids
		2,411 cf	Total Available Storage

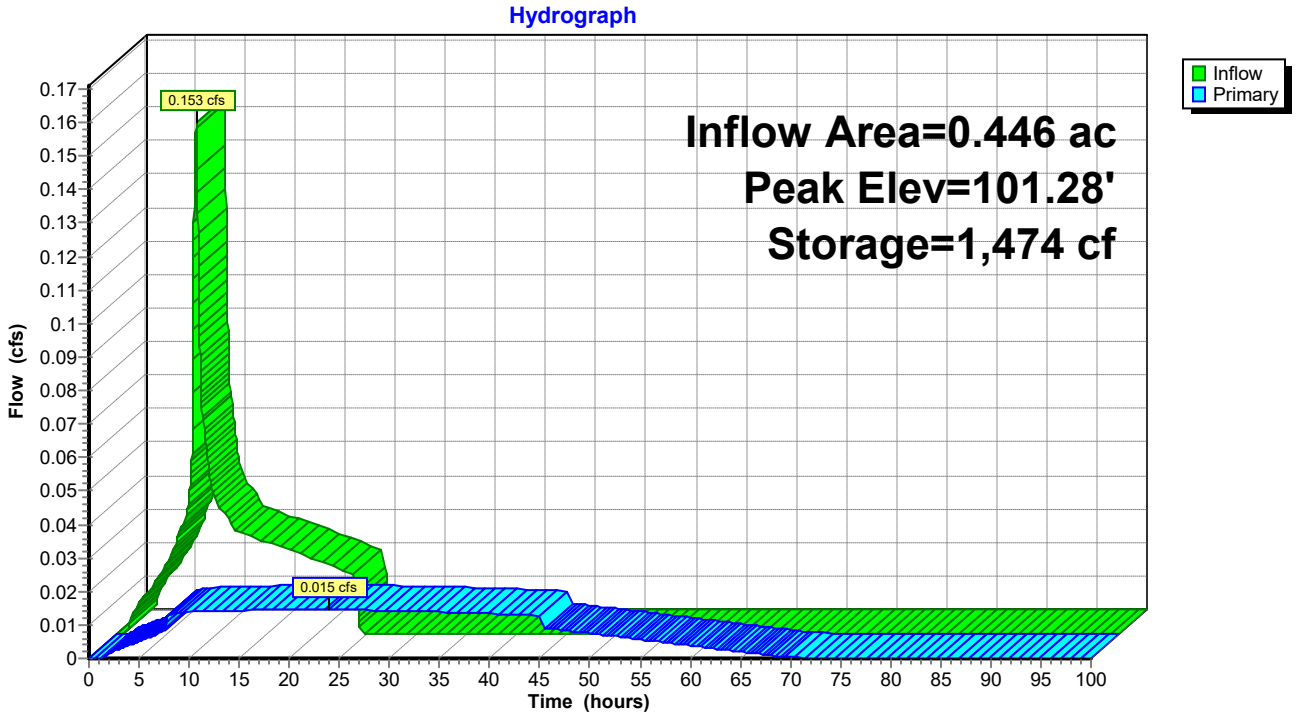
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	531	0	0
101.00	975	753	753
102.00	1,491	1,233	1,986

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	531	0	0
98.25	531	1,062	1,062

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.29'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.015 cfs @ 24.02 hrs HW=101.28' (Free Discharge)
- **1=Culvert** (Passes 0.015 cfs of 6.356 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.015 cfs @ 10.779 fps)
    - **2=Beehive** (Passes < 13.380 cfs potential flow)
    - **4=Underdrain** (Passes < 2.068 cfs potential flow)
  - **5=Weir** (Controls 0.000 cfs)

Pond RG D: Detention Pond D - Flow Control



Time span=0.00-100.00 hrs, dt=0.02 hrs, 5001 points x 3
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Basin A Runoff Area=352,348 sf 73.01% Impervious Runoff Depth=2.39"
Tc=10.0 min CN=76/98 Runoff=4.467 cfs 1.608 af

Subcatchment A EX: Pre-Dev Basin A Runoff Area=352,348 sf 0.00% Impervious Runoff Depth=1.03"
Tc=15.0 min CN=75/0 Runoff=1.309 cfs 0.692 af

Subcatchment B: Basin B Runoff Area=32,408 sf 66.72% Impervious Runoff Depth=2.27"
Tc=10.0 min CN=76/98 Runoff=0.388 cfs 0.141 af

Subcatchment B EX: Pre-Dev Basin B Runoff Area=32,408 sf 0.00% Impervious Runoff Depth=1.03"
Tc=10.0 min CN=75/0 Runoff=0.134 cfs 0.064 af

Subcatchment C: Basin C Runoff Area=15,069 sf 59.29% Impervious Runoff Depth=2.14"
Tc=6.0 min CN=76/98 Runoff=0.175 cfs 0.062 af

Subcatchment C EX: Pre-Dev Basin C Runoff Area=15,069 sf 0.00% Impervious Runoff Depth=1.03"
Tc=10.0 min CN=75/0 Runoff=0.062 cfs 0.030 af

Subcatchment D: Basin D Runoff Area=19,449 sf 50.78% Impervious Runoff Depth=1.99"
Tc=6.0 min CN=76/98 Runoff=0.207 cfs 0.074 af

Subcatchment D EX: Pre-Dev Basin D (Fire Runoff Area=19,449 sf 0.00% Impervious Runoff Depth=1.03"
Tc=10.0 min CN=75/0 Runoff=0.080 cfs 0.038 af

Pond RG A: Detentionn Pond A - Flow Peak Elev=104.97' Storage=61,357 cf Inflow=4.467 cfs 1.608 af
Outflow=0.521 cfs 0.580 af

Pond RG B: Detention Pond B - Flow Peak Elev=101.54' Storage=3,705 cf Inflow=0.388 cfs 0.141 af
Outflow=0.067 cfs 0.132 af

Pond RG C: Raingarden C - Flow Control Peak Elev=100.58' Storage=1,832 cf Inflow=0.175 cfs 0.062 af
Outflow=0.014 cfs 0.062 af

Pond RG D: Detention Pond D - Flow Peak Elev=101.29' Storage=1,486 cf Inflow=0.207 cfs 0.074 af
Outflow=0.041 cfs 0.074 af

Total Runoff Area = 19.250 ac Runoff Volume = 2.709 af Average Runoff Depth = 1.69"
64.50% Pervious = 12.417 ac 35.50% Impervious = 6.834 ac

Summary for Subcatchment A: Basin A

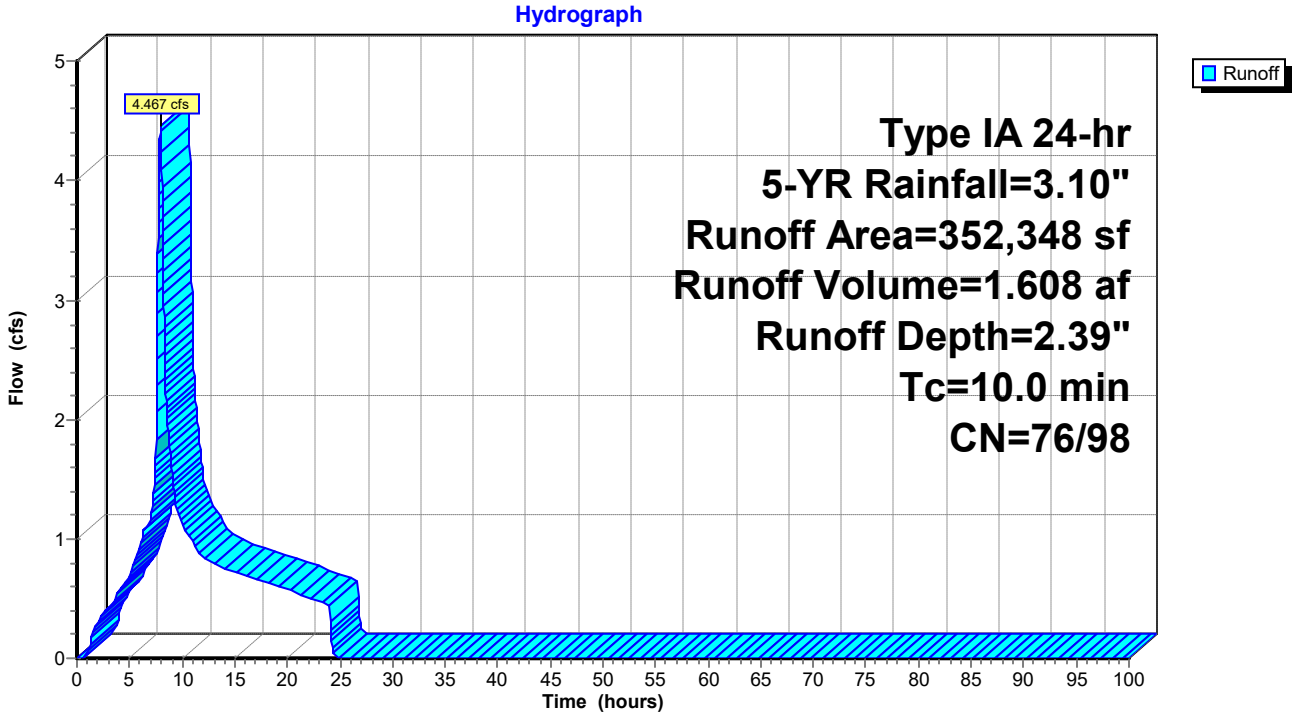
Runoff = 4.467 cfs @ 7.98 hrs, Volume= 1.608 af, Depth= 2.39"
Routed to Pond RG A : Detentionn Pond A - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	257,243	98	Impervious
*	95,105	76	Pervious
	352,348	92	Weighted Average
	95,105	76	26.99% Pervious Area
	257,243	98	73.01% Impervious Area

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

Subcatchment A: Basin A



Summary for Subcatchment A EX: Pre-Dev Basin A (On-Site)

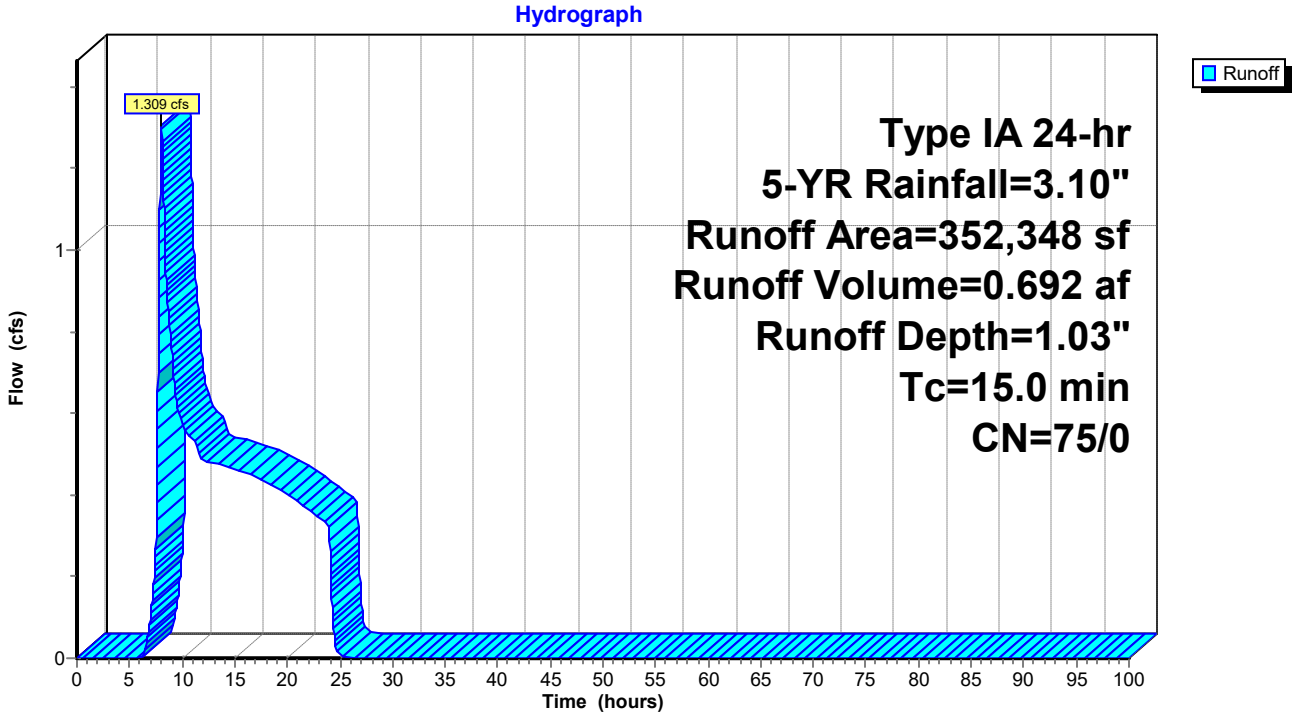
Runoff = 1.309 cfs @ 8.02 hrs, Volume= 0.692 af, Depth= 1.03"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	257,243	75	
*	95,105	75	
	352,348	75	Weighted Average
	352,348	75	100.00% Pervious Area

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

Subcatchment A EX: Pre-Dev Basin A (On-Site)



Summary for Subcatchment B: Basin B

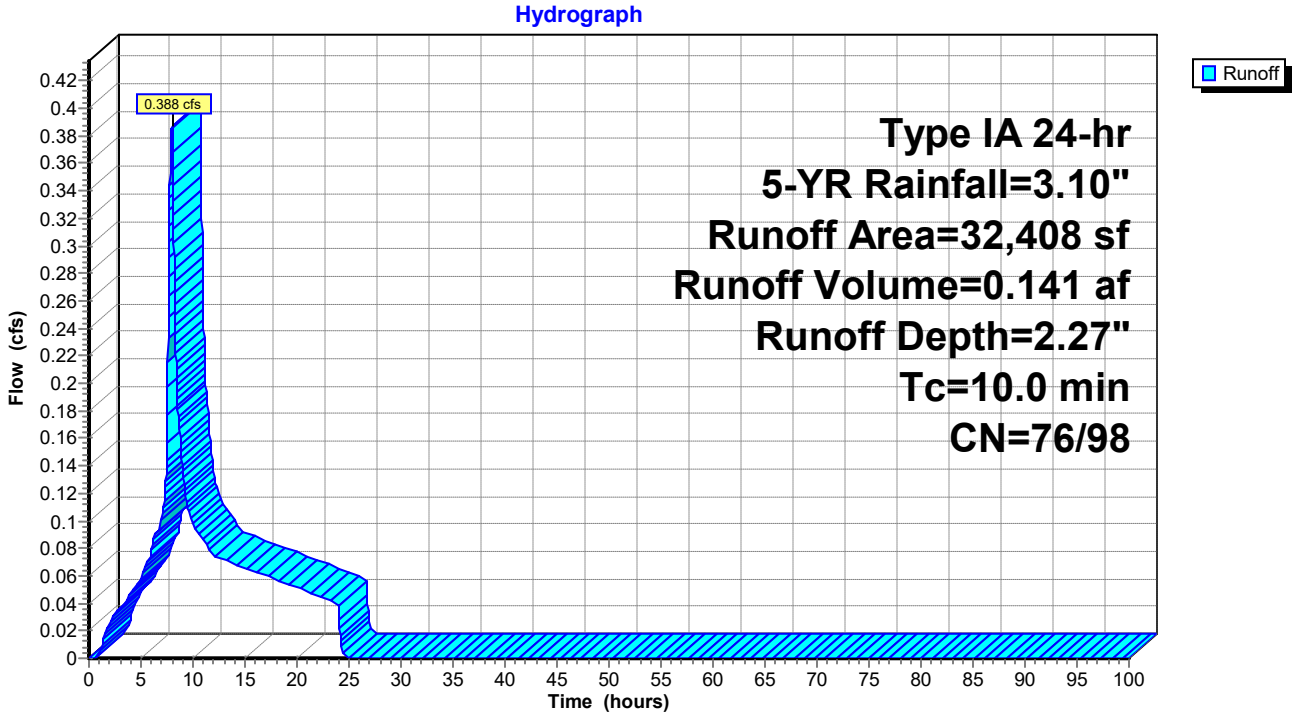
Runoff = 0.388 cfs @ 7.99 hrs, Volume= 0.141 af, Depth= 2.27"
Routed to Pond RG B : Detention Pond B - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	21,622	98	Impervious
*	10,786	76	Pervious
	32,408	91	Weighted Average
	10,786	76	33.28% Pervious Area
	21,622	98	66.72% Impervious Area

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

Subcatchment B: Basin B



Summary for Subcatchment B EX: Pre-Dev Basin B (Davis)

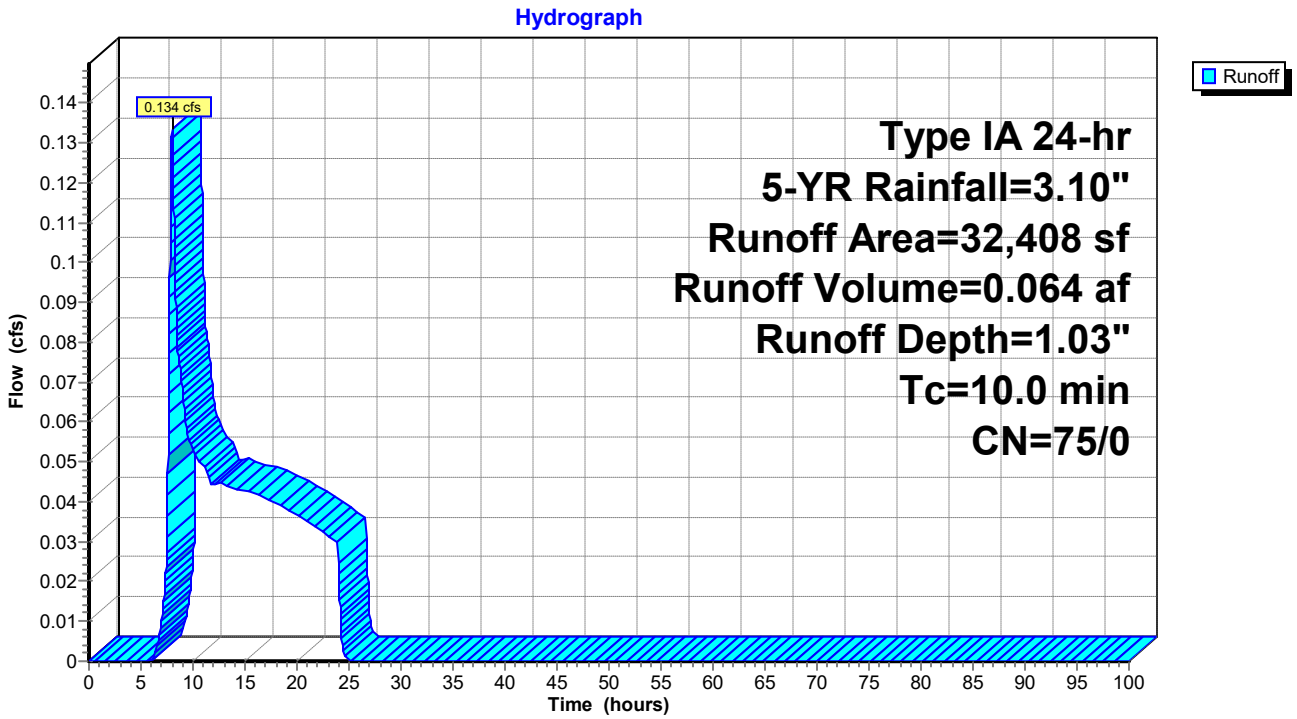
Runoff = 0.134 cfs @ 8.01 hrs, Volume= 0.064 af, Depth= 1.03"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	21,622	75	
*	10,786	75	
	32,408	75	Weighted Average
	32,408	75	100.00% Pervious Area

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

Subcatchment B EX: Pre-Dev Basin B (Davis)



Summary for Subcatchment C: Basin C

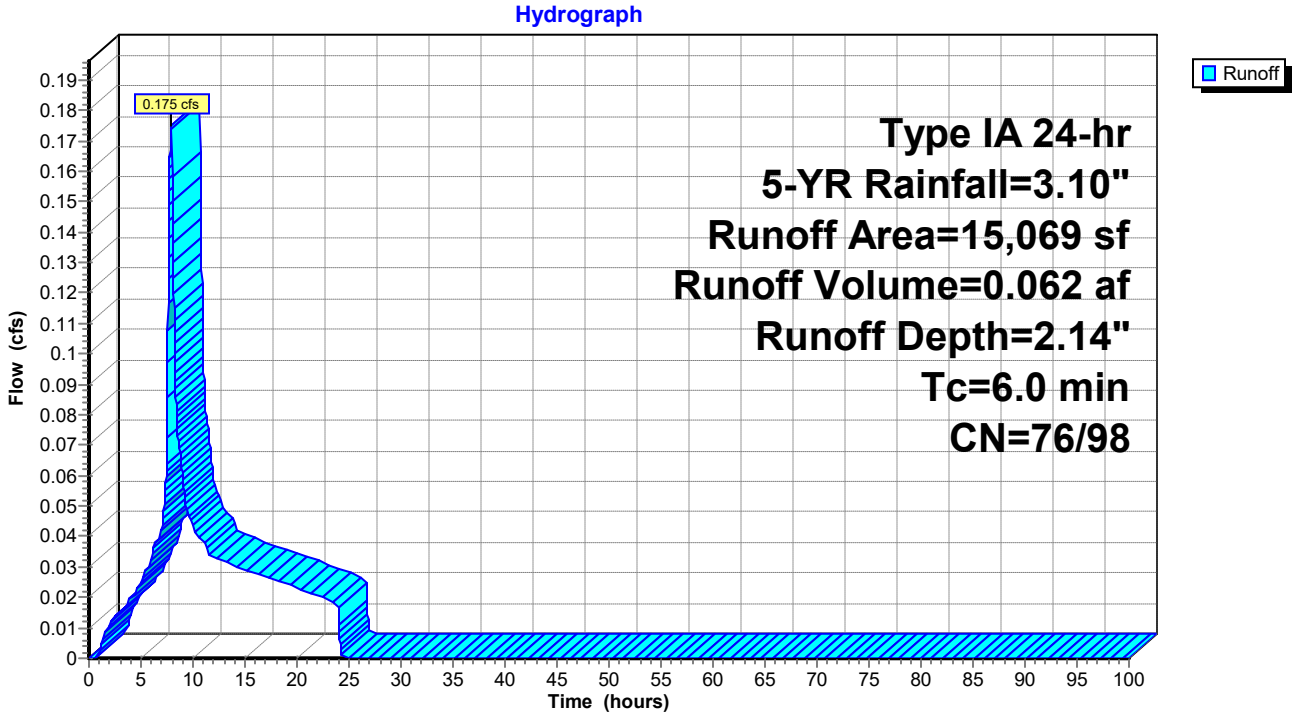
Runoff = 0.175 cfs @ 7.93 hrs, Volume= 0.062 af, Depth= 2.14"
Routed to Pond RG C : Raingarden C - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	8,934	98	Impervious
*	6,135	76	Pervious
	15,069	89	Weighted Average
	6,135	76	40.71% Pervious Area
	8,934	98	59.29% Impervious Area

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

Subcatchment C: Basin C



Summary for Subcatchment C EX: Pre-Dev Basin C (Access Lane)

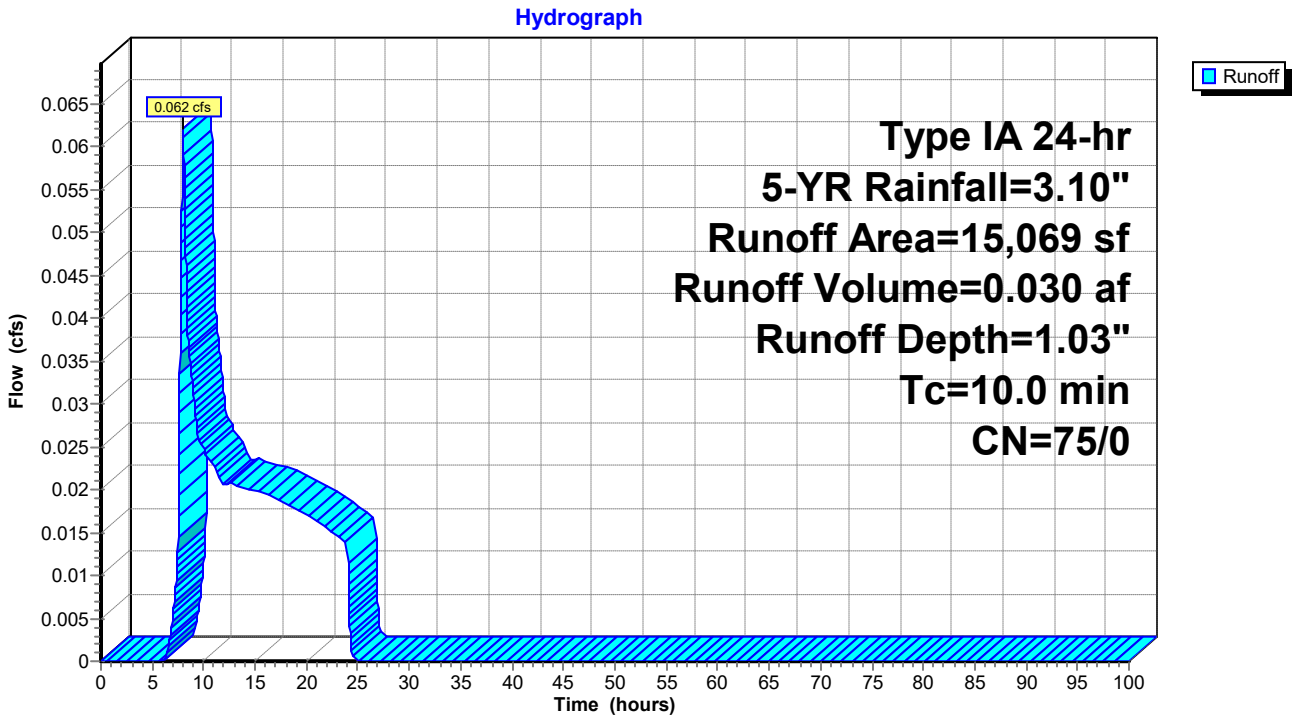
Runoff = 0.062 cfs @ 8.01 hrs, Volume= 0.030 af, Depth= 1.03"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	8,934	75	
*	6,135	75	
	15,069	75	Weighted Average
	15,069	75	100.00% Pervious Area

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

Subcatchment C EX: Pre-Dev Basin C (Access Lane)



Summary for Subcatchment D: Basin D

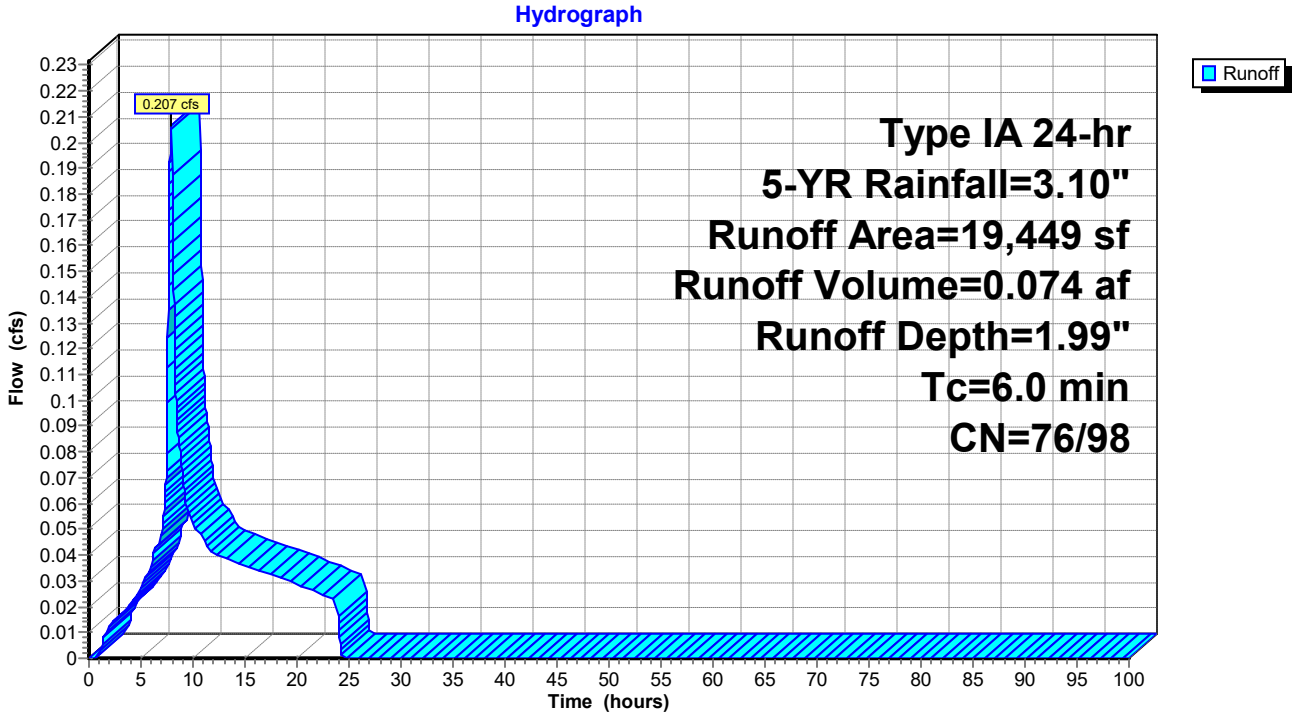
Runoff = 0.207 cfs @ 7.94 hrs, Volume= 0.074 af, Depth= 1.99"
Routed to Pond RG D : Detention Pond D - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	9,877	98	Impervious
*	9,572	76	Pervious
	19,449	87	Weighted Average
	9,572	76	49.22% Pervious Area
	9,877	98	50.78% Impervious Area

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

Subcatchment D: Basin D



Summary for Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)

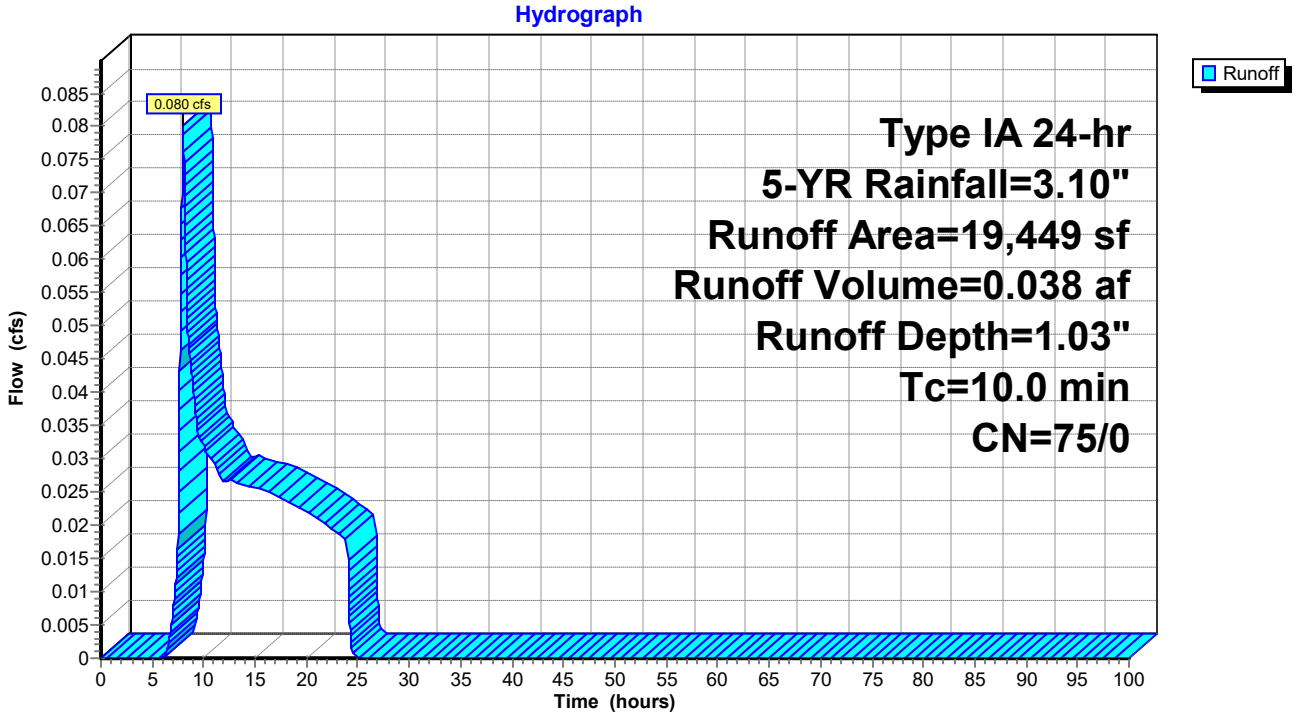
Runoff = 0.080 cfs @ 8.01 hrs, Volume= 0.038 af, Depth= 1.03"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	9,877	75	
*	9,572	75	
	19,449	75	Weighted Average
	19,449	75	100.00% Pervious Area

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

Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)



Summary for Pond RG A: Detentionn Pond A - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 8.089 ac, 73.01% Impervious, Inflow Depth = 2.39" for 5-YR event
Inflow = 4.467 cfs @ 7.98 hrs, Volume= 1.608 af
Outflow = 0.521 cfs @ 21.60 hrs, Volume= 0.580 af, Atten= 88%, Lag= 817.0 min
Primary = 0.521 cfs @ 21.60 hrs, Volume= 0.580 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 104.97' @ 21.60 hrs Surf.Area= 21,747 sf Storage= 61,357 cf

Plug-Flow detention time= 2,420.0 min calculated for 0.580 af (36% of inflow)
Center-of-Mass det. time= 2,103.7 min (2,798.0 - 694.3)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	81,111 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	7,298 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 18,244 cf Overall x 40.0% Voids
		88,409 cf	Total Available Storage

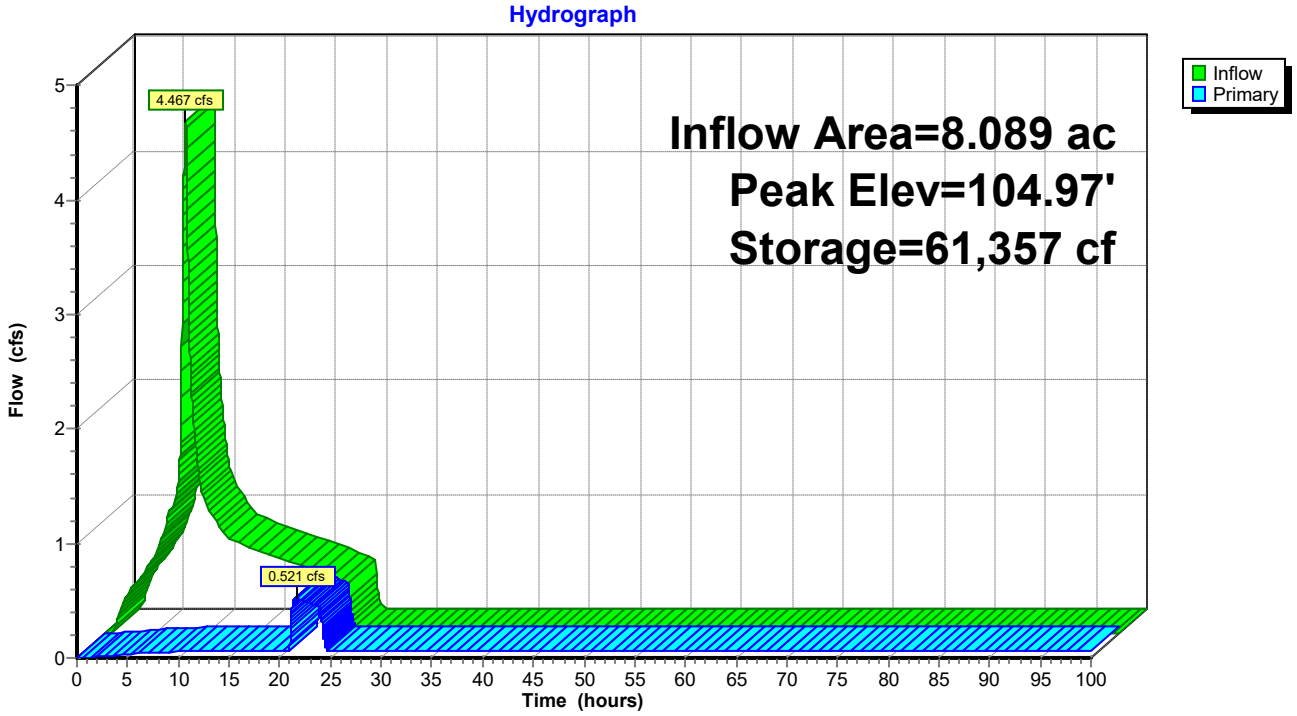
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,122	0	0
101.00	9,824	9,473	9,473
102.00	10,528	10,176	19,649
103.00	11,232	10,880	30,529
104.00	11,938	11,585	42,114
105.00	12,644	12,291	54,405
106.00	13,353	12,999	67,404
107.00	14,062	13,708	81,111

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	9,122	0	0
98.25	9,122	18,244	18,244

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.15' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	101.81'	**24.0" Horiz. Beehive OF** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.9" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	104.95'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.521 cfs @ 21.60 hrs HW=104.97' (Free Discharge)
└─**1=Culvert** (Passes 0.521 cfs of 8.561 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.063 cfs @ 14.190 fps)
    └─**2=Beehive OF** (Passes < 26.901 cfs potential flow)
    └─**4=Underdrain** (Passes < 2.752 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.458 cfs @ 0.421 fps)

Pond RG A: Detentionn Pond A - Flow Control



Summary for Pond RG B: Detention Pond B - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.744 ac, 66.72% Impervious, Inflow Depth = 2.27" for 5-YR event
Inflow = 0.388 cfs @ 7.99 hrs, Volume= 0.141 af
Outflow = 0.067 cfs @ 14.29 hrs, Volume= 0.132 af, Atten= 83%, Lag= 378.0 min
Primary = 0.067 cfs @ 14.29 hrs, Volume= 0.132 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.54' @ 14.29 hrs Surf.Area= 2,841 sf Storage= 3,705 cf

Plug-Flow detention time= 1,700.6 min calculated for 0.132 af (93% of inflow)
Center-of-Mass det. time= 1,654.3 min (2,355.3 - 701.0)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	4,693 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	95.25'	1,524 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 3,810 cf Overall x 40.0% Voids
		6,217 cf	Total Available Storage

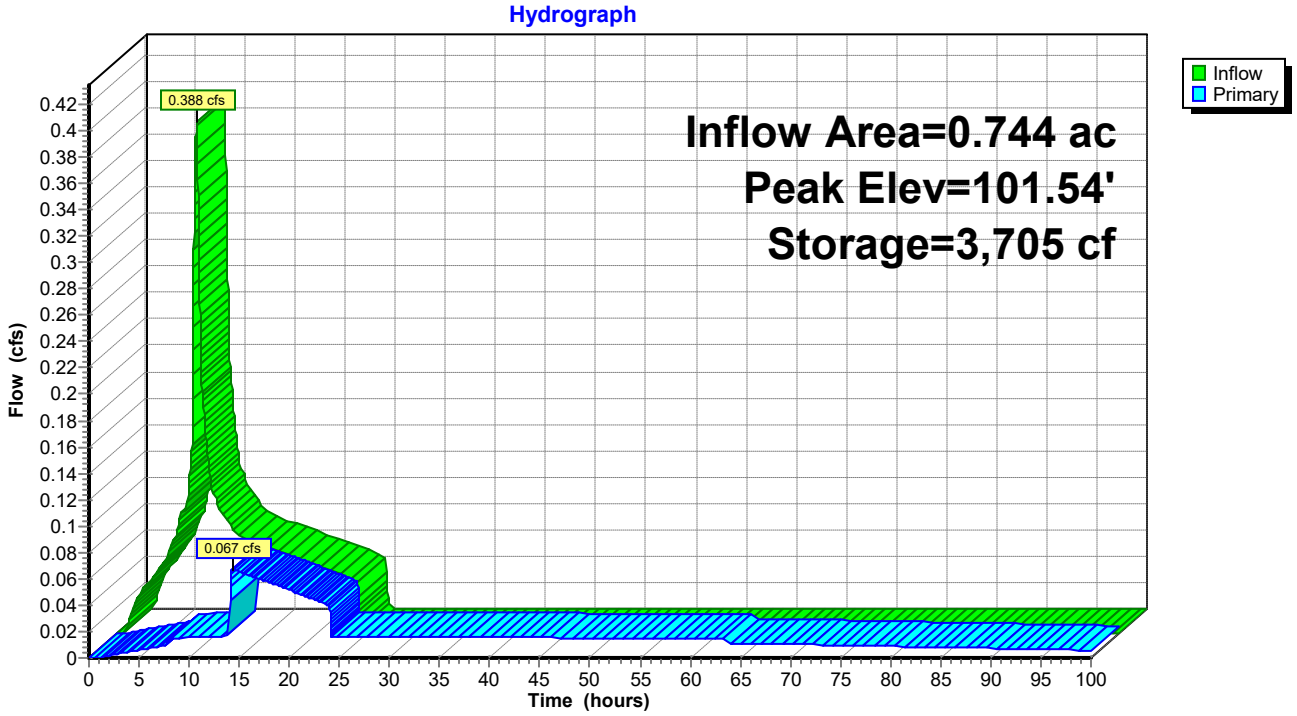
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,270	0	0
101.00	1,466	1,368	1,368
102.00	1,662	1,564	2,932
103.00	1,860	1,761	4,693

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.25	1,270	0	0
98.25	1,270	3,810	3,810

Device	Routing	Invert	Outlet Devices
#1	Primary	95.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.25' / 95.05' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	95.25'	**0.5" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	95.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.53'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.067 cfs @ 14.29 hrs HW=101.54' (Free Discharge)
└─**1=Culvert** (Passes 0.067 cfs of 7.181 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.016 cfs @ 12.051 fps)
    └─**2=Beehive** (Passes < 15.391 cfs potential flow)
    └─**4=Underdrain** (Passes < 2.323 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.050 cfs @ 0.202 fps)

Pond RG B: Detention Pond B - Flow Control



Summary for Pond RG C: Raingarden C - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.346 ac, 59.29% Impervious, Inflow Depth = 2.14" for 5-YR event
Inflow = 0.175 cfs @ 7.93 hrs, Volume= 0.062 af
Outflow = 0.014 cfs @ 24.04 hrs, Volume= 0.062 af, Atten= 92%, Lag= 966.3 min
Primary = 0.014 cfs @ 24.04 hrs, Volume= 0.062 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 100.58' @ 24.04 hrs Surf.Area= 3,048 sf Storage= 1,832 cf

Plug-Flow detention time= 1,534.9 min calculated for 0.062 af (100% of inflow)
Center-of-Mass det. time= 1,533.0 min (2,238.8 - 705.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	2,865 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	926 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 2,316 cf Overall x 40.0% Voids
		3,791 cf	Total Available Storage

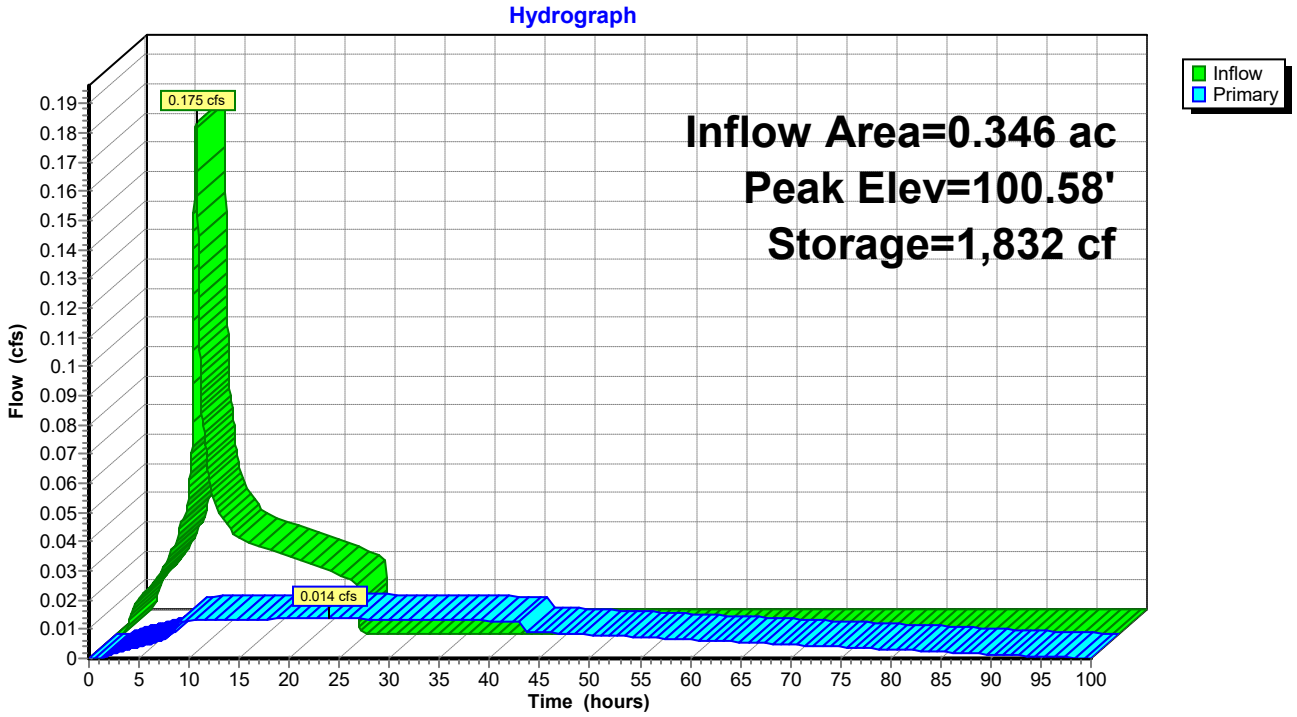
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,158	0	0
100.50	1,845	751	751
101.50	2,383	2,114	2,865

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	1,158	0	0
98.25	1,158	2,316	2,316

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.00'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.014 cfs @ 24.04 hrs HW=100.58' (Free Discharge)
- **1=Culvert** (Passes 0.014 cfs of 5.845 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.014 cfs @ 9.999 fps)
    - **2=Beehive** (Passes < 0.492 cfs potential flow)
    - **4=Underdrain** (Passes < 1.910 cfs potential flow)
  - **5=Weir** (Controls 0.000 cfs)

Pond RG C: Raingarden C - Flow Control



Summary for Pond RG D: Detention Pond D - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.446 ac, 50.78% Impervious, Inflow Depth = 1.99" for 5-YR event
Inflow = 0.207 cfs @ 7.94 hrs, Volume= 0.074 af
Outflow = 0.041 cfs @ 12.52 hrs, Volume= 0.074 af, Atten= 80%, Lag= 274.7 min
Primary = 0.041 cfs @ 12.52 hrs, Volume= 0.074 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.29' @ 12.52 hrs Surf.Area= 1,657 sf Storage= 1,486 cf

Plug-Flow detention time= 893.9 min calculated for 0.074 af (100% of inflow)
Center-of-Mass det. time= 894.4 min (1,611.9 - 717.5)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1,986 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	425 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 1,062 cf Overall x 40.0% Voids
		2,411 cf	Total Available Storage

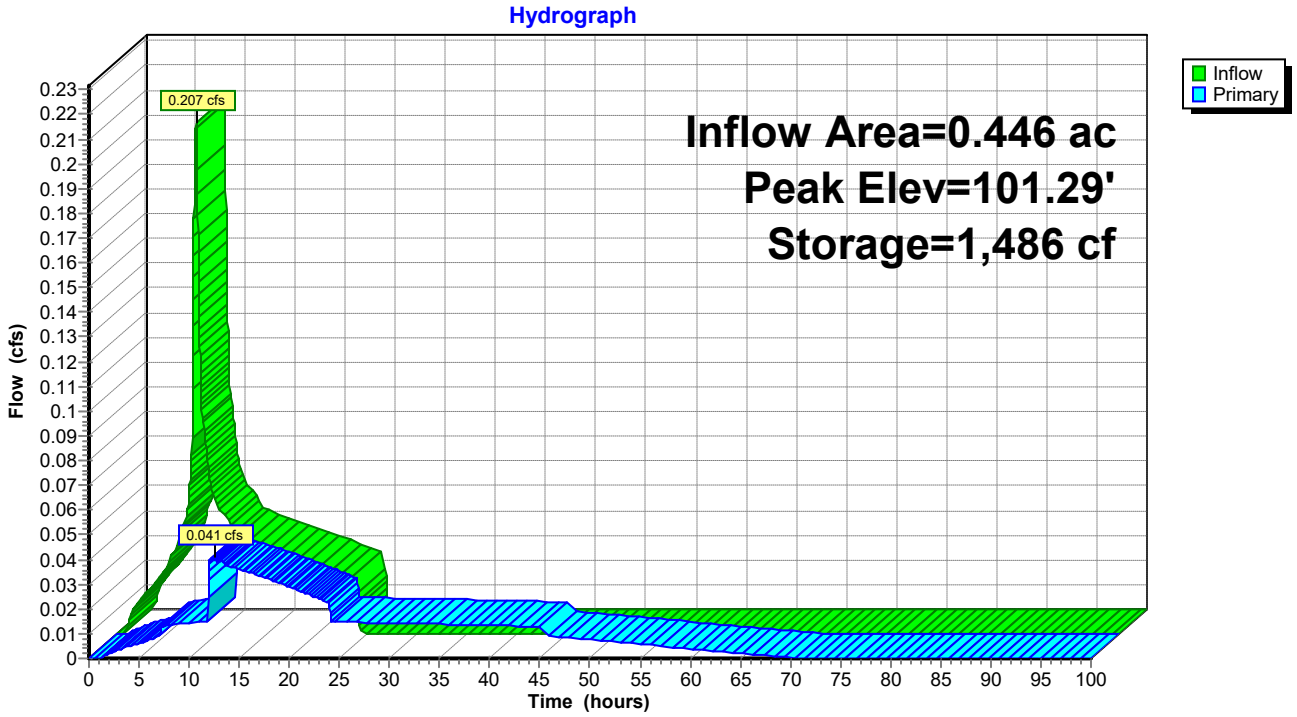
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	531	0	0
101.00	975	753	753
102.00	1,491	1,233	1,986

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	531	0	0
98.25	531	1,062	1,062

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.29'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.041 cfs @ 12.52 hrs HW=101.29' (Free Discharge)
- **1=Culvert** (Passes 0.041 cfs of 6.364 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.015 cfs @ 10.791 fps)
    - **2=Beehive** (Passes < 13.474 cfs potential flow)
    - **4=Underdrain** (Passes < 2.070 cfs potential flow)
  - **5=Weir** (Weir Controls 0.027 cfs @ 0.163 fps)

Pond RG D: Detention Pond D - Flow Control



Time span=0.00-100.00 hrs, dt=0.02 hrs, 5001 points x 3
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Basin A Runoff Area=352,348 sf 73.01% Impervious Runoff Depth=2.71"
Tc=10.0 min CN=76/98 Runoff=5.074 cfs 1.825 af

Subcatchment A EX: Pre-Dev Basin A Runoff Area=352,348 sf 0.00% Impervious Runoff Depth=1.27"
Tc=15.0 min CN=75/0 Runoff=1.747 cfs 0.854 af

Subcatchment B: Basin B Runoff Area=32,408 sf 66.72% Impervious Runoff Depth=2.59"
Tc=10.0 min CN=76/98 Runoff=0.443 cfs 0.160 af

Subcatchment B EX: Pre-Dev Basin B Runoff Area=32,408 sf 0.00% Impervious Runoff Depth=1.27"
Tc=10.0 min CN=75/0 Runoff=0.177 cfs 0.079 af

Subcatchment C: Basin C Runoff Area=15,069 sf 59.29% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=76/98 Runoff=0.201 cfs 0.071 af

Subcatchment C EX: Pre-Dev Basin C Runoff Area=15,069 sf 0.00% Impervious Runoff Depth=1.27"
Tc=10.0 min CN=75/0 Runoff=0.082 cfs 0.037 af

Subcatchment D: Basin D Runoff Area=19,449 sf 50.78% Impervious Runoff Depth=2.29"
Tc=6.0 min CN=76/98 Runoff=0.240 cfs 0.085 af

Subcatchment D EX: Pre-Dev Basin D (Fire Runoff Area=19,449 sf 0.00% Impervious Runoff Depth=1.27"
Tc=10.0 min CN=75/0 Runoff=0.106 cfs 0.047 af

Pond RG A: Detentionn Pond A - Flow Peak Elev=104.98' Storage=61,438 cf Inflow=5.074 cfs 1.825 af
Outflow=0.730 cfs 0.797 af

Pond RG B: Detention Pond B - Flow Peak Elev=101.54' Storage=3,707 cf Inflow=0.443 cfs 0.160 af
Outflow=0.086 cfs 0.151 af

Pond RG C: Raingarden C - Flow Control Peak Elev=100.77' Storage=2,188 cf Inflow=0.201 cfs 0.071 af
Outflow=0.014 cfs 0.070 af

Pond RG D: Detention Pond D - Flow Peak Elev=101.29' Storage=1,488 cf Inflow=0.240 cfs 0.085 af
Outflow=0.060 cfs 0.085 af

Total Runoff Area = 19.250 ac Runoff Volume = 3.157 af Average Runoff Depth = 1.97"
64.50% Pervious = 12.417 ac 35.50% Impervious = 6.834 ac

Summary for Subcatchment A: Basin A

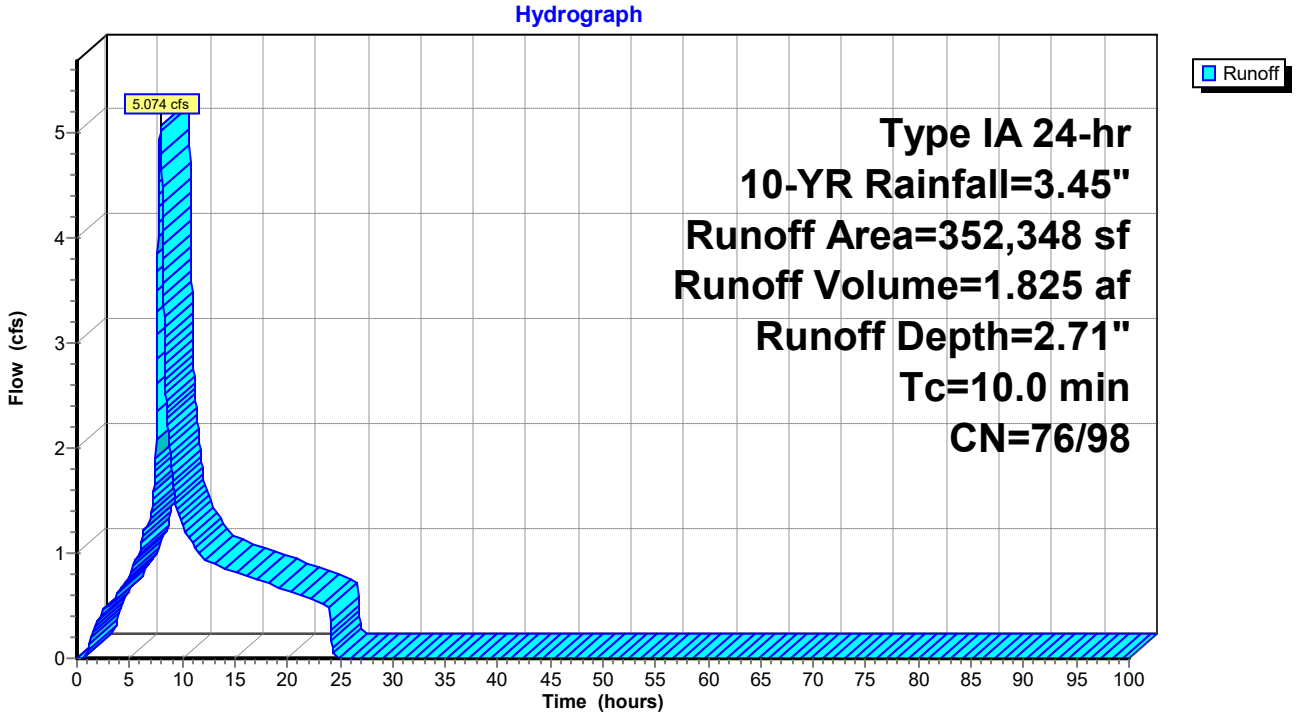
Runoff = 5.074 cfs @ 7.98 hrs, Volume= 1.825 af, Depth= 2.71"
Routed to Pond RG A : Detentionn Pond A - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10-YR Rainfall=3.45"

	Area (sf)	CN	Description
*	257,243	98	Impervious
*	95,105	76	Pervious
	352,348	92	Weighted Average
	95,105	76	26.99% Pervious Area
	257,243	98	73.01% Impervious Area

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

Subcatchment A: Basin A



Summary for Subcatchment A EX: Pre-Dev Basin A (On-Site)

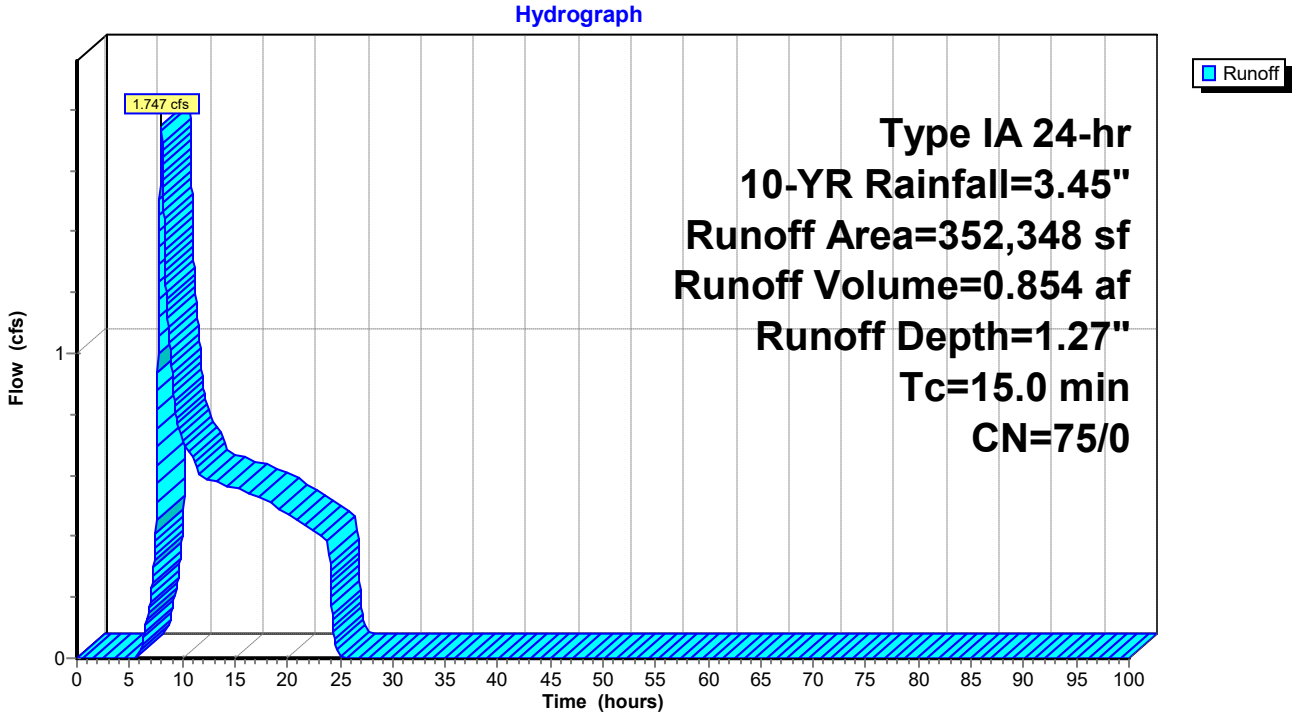
Runoff = 1.747 cfs @ 8.01 hrs, Volume= 0.854 af, Depth= 1.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10-YR Rainfall=3.45"

	Area (sf)	CN	Description
*	257,243	75	
*	95,105	75	
	352,348	75	Weighted Average
	352,348	75	100.00% Pervious Area

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

Subcatchment A EX: Pre-Dev Basin A (On-Site)



Summary for Subcatchment B: Basin B

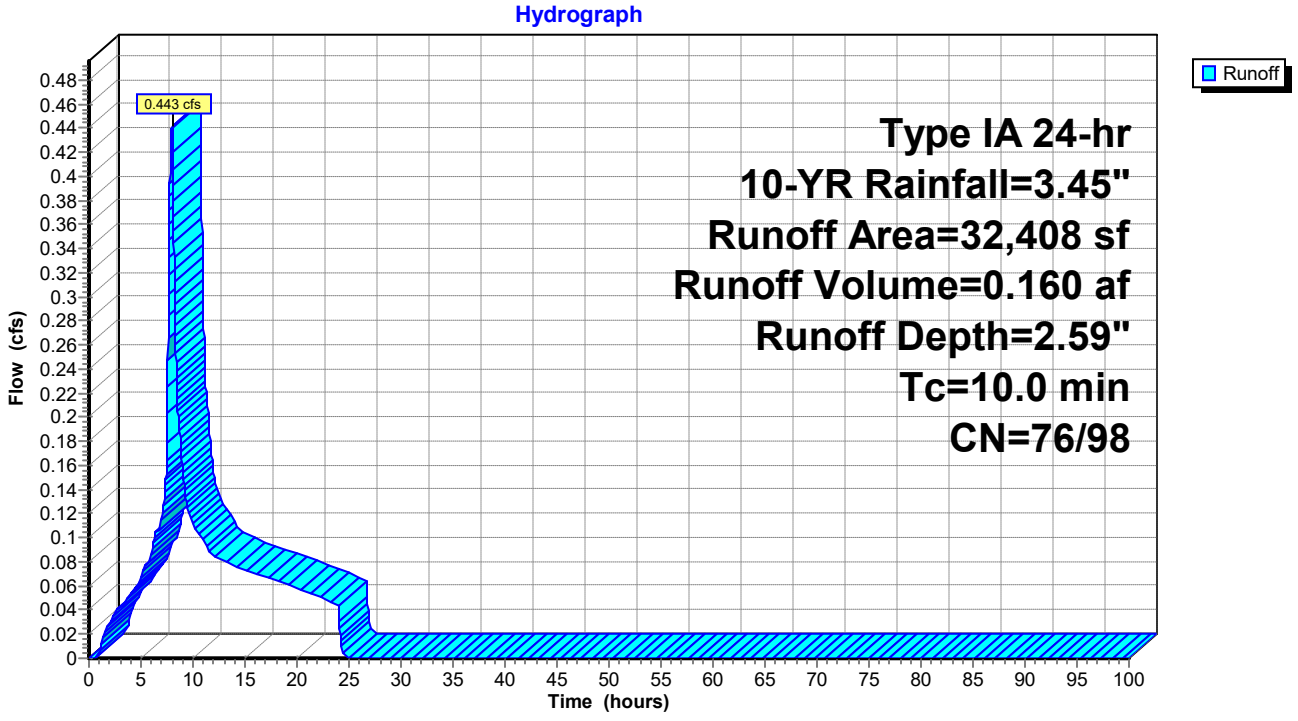
Runoff = 0.443 cfs @ 7.99 hrs, Volume= 0.160 af, Depth= 2.59"
Routed to Pond RG B : Detention Pond B - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10-YR Rainfall=3.45"

	Area (sf)	CN	Description
*	21,622	98	Impervious
*	10,786	76	Pervious
	32,408	91	Weighted Average
	10,786	76	33.28% Pervious Area
	21,622	98	66.72% Impervious Area

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

Subcatchment B: Basin B



Summary for Subcatchment B EX: Pre-Dev Basin B (Davis)

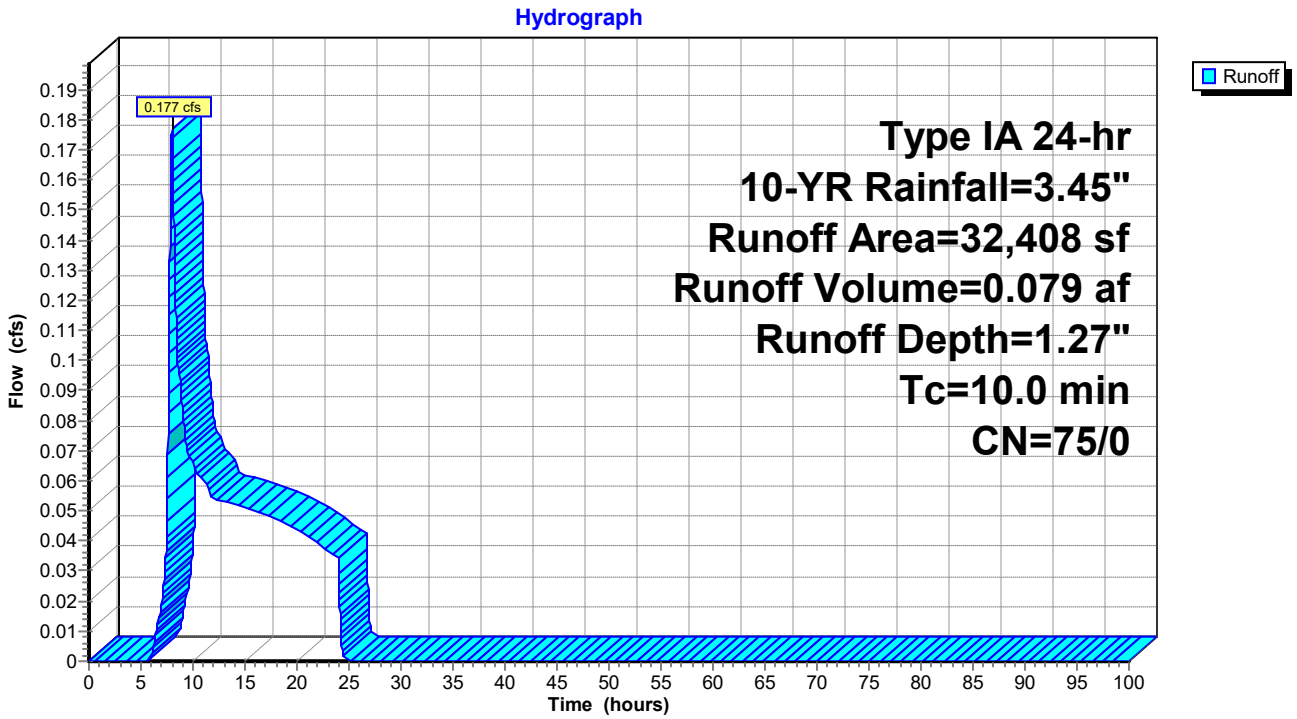
Runoff = 0.177 cfs @ 8.00 hrs, Volume= 0.079 af, Depth= 1.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10-YR Rainfall=3.45"

	Area (sf)	CN	Description
*	21,622	75	
*	10,786	75	
	32,408	75	Weighted Average
	32,408	75	100.00% Pervious Area

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

Subcatchment B EX: Pre-Dev Basin B (Davis)



Summary for Subcatchment C: Basin C

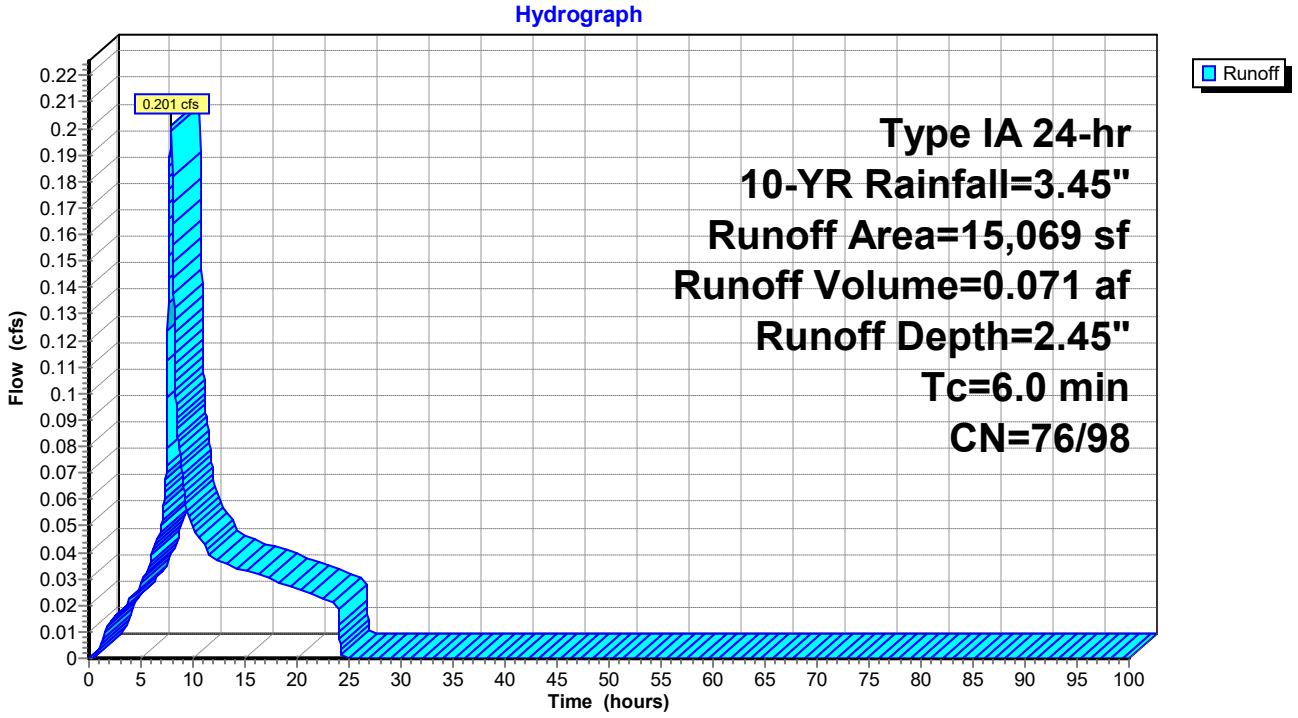
Runoff = 0.201 cfs @ 7.93 hrs, Volume= 0.071 af, Depth= 2.45"
Routed to Pond RG C : Raingarden C - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10-YR Rainfall=3.45"

	Area (sf)	CN	Description
*	8,934	98	Impervious
*	6,135	76	Pervious
	15,069	89	Weighted Average
	6,135	76	40.71% Pervious Area
	8,934	98	59.29% Impervious Area

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

Subcatchment C: Basin C



Summary for Subcatchment C EX: Pre-Dev Basin C (Access Lane)

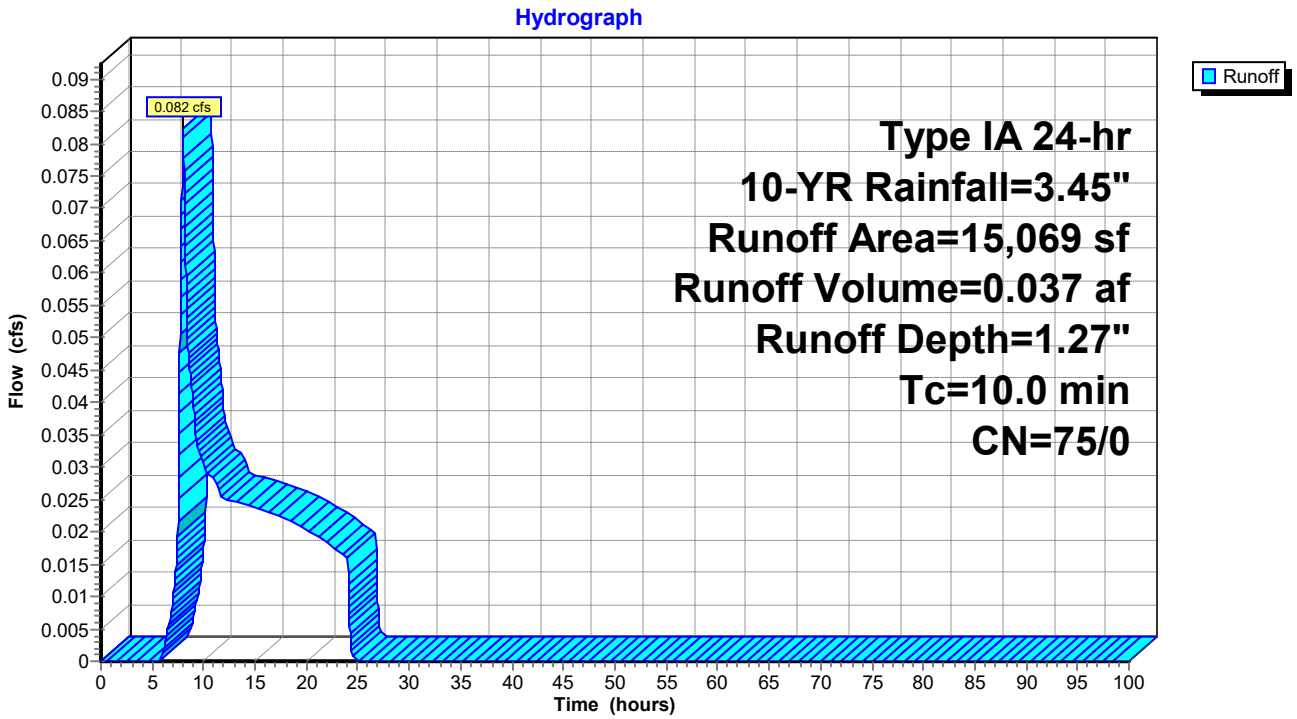
Runoff = 0.082 cfs @ 8.00 hrs, Volume= 0.037 af, Depth= 1.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10-YR Rainfall=3.45"

	Area (sf)	CN	Description
*	8,934	75	
*	6,135	75	
	15,069	75	Weighted Average
	15,069	75	100.00% Pervious Area

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

Subcatchment C EX: Pre-Dev Basin C (Access Lane)



Summary for Subcatchment D: Basin D

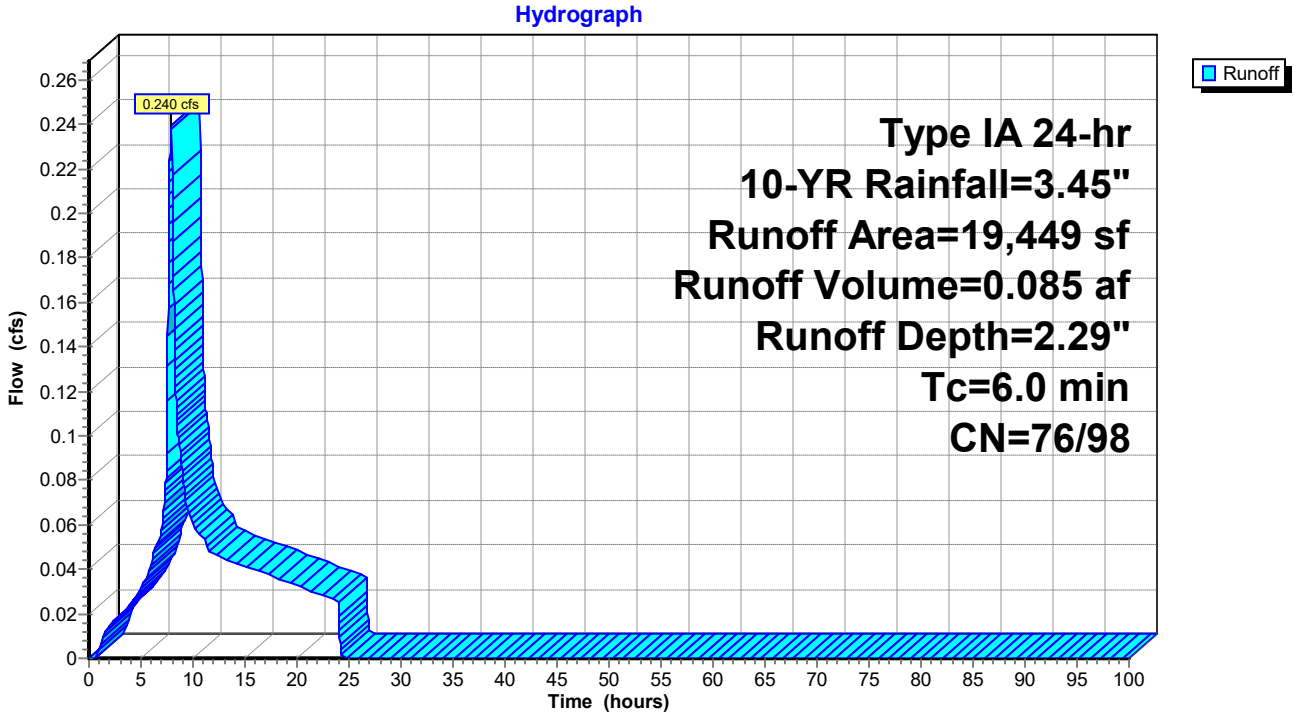
Runoff = 0.240 cfs @ 7.94 hrs, Volume= 0.085 af, Depth= 2.29"
Routed to Pond RG D : Detention Pond D - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10-YR Rainfall=3.45"

	Area (sf)	CN	Description
*	9,877	98	Impervious
*	9,572	76	Pervious
	19,449	87	Weighted Average
	9,572	76	49.22% Pervious Area
	9,877	98	50.78% Impervious Area

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

Subcatchment D: Basin D



Summary for Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)

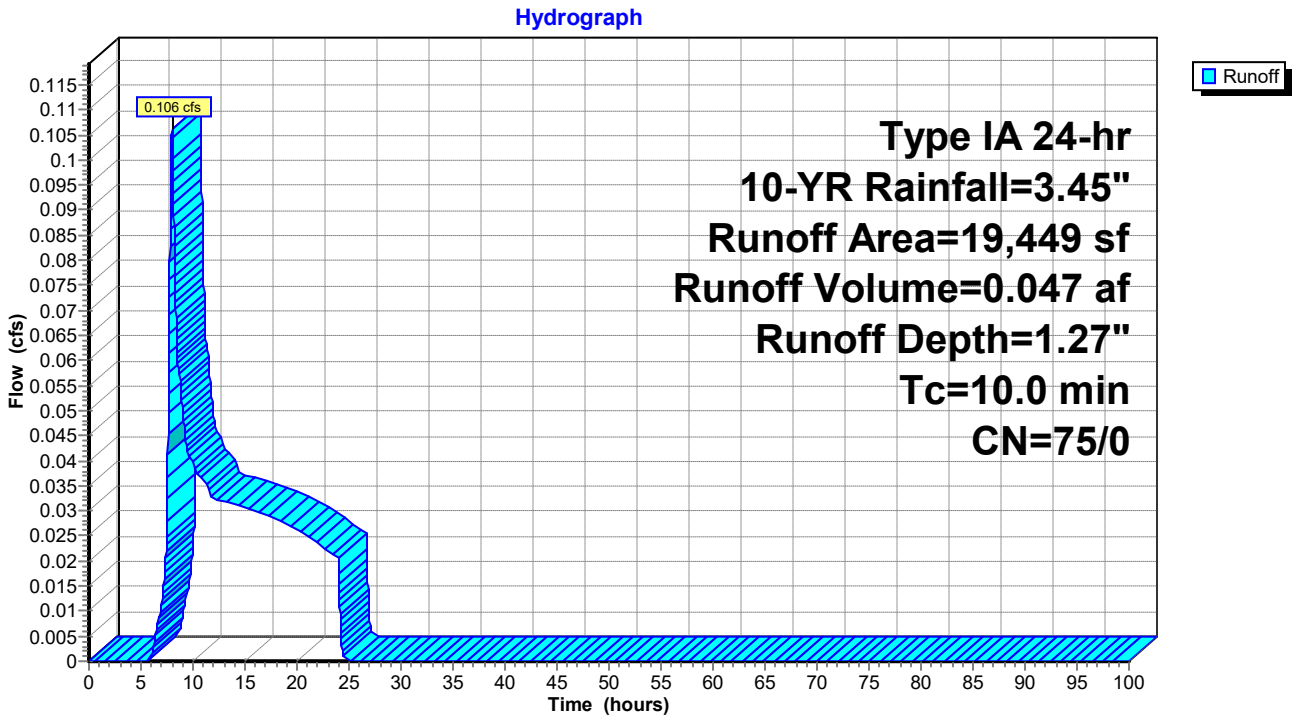
Runoff = 0.106 cfs @ 8.00 hrs, Volume= 0.047 af, Depth= 1.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10-YR Rainfall=3.45"

	Area (sf)	CN	Description
*	9,877	75	
*	9,572	75	
	19,449	75	Weighted Average
	19,449	75	100.00% Pervious Area

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

Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)



Summary for Pond RG A: Detentionn Pond A - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 8.089 ac, 73.01% Impervious, Inflow Depth = 2.71" for 10-YR event
Inflow = 5.074 cfs @ 7.98 hrs, Volume= 1.825 af
Outflow = 0.730 cfs @ 17.71 hrs, Volume= 0.797 af, Atten= 86%, Lag= 583.9 min
Primary = 0.730 cfs @ 17.71 hrs, Volume= 0.797 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 104.98' @ 17.71 hrs Surf.Area= 21,751 sf Storage= 61,438 cf

Plug-Flow detention time= 1,953.0 min calculated for 0.797 af (44% of inflow)
Center-of-Mass det. time= 1,660.1 min (2,352.0 - 691.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	81,111 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	7,298 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 18,244 cf Overall x 40.0% Voids
		88,409 cf	Total Available Storage

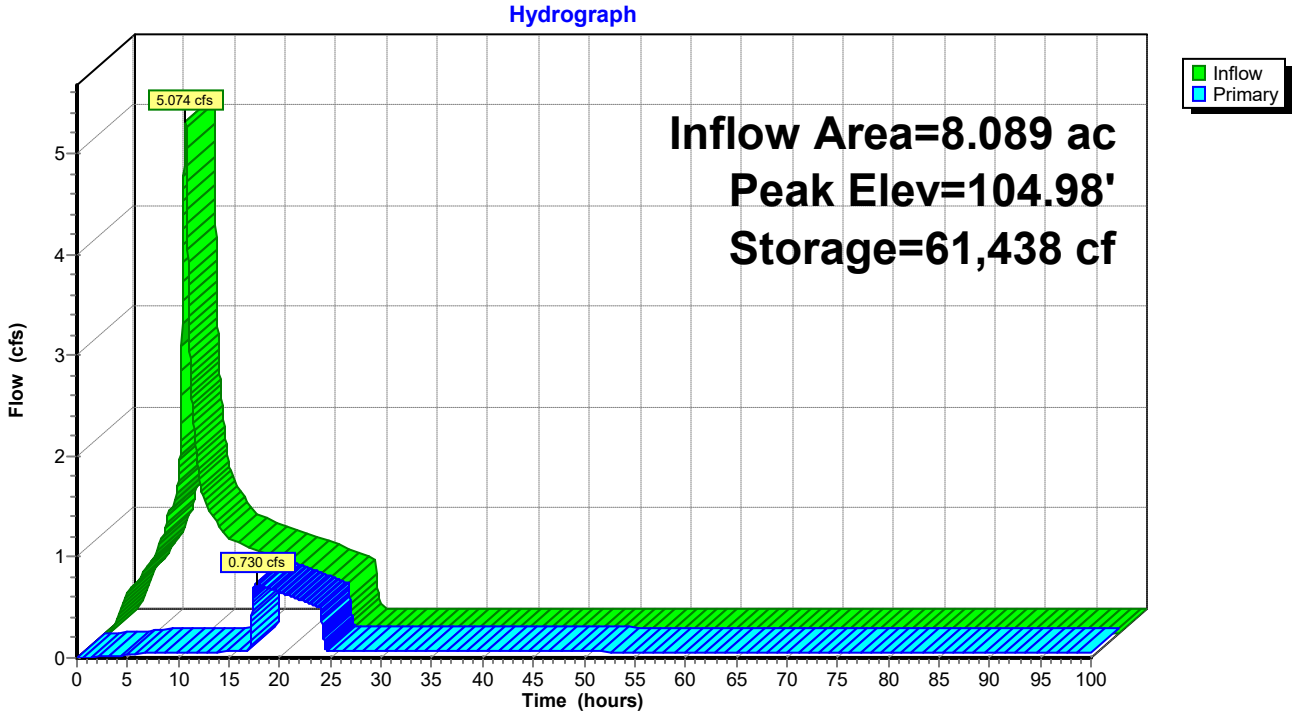
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,122	0	0
101.00	9,824	9,473	9,473
102.00	10,528	10,176	19,649
103.00	11,232	10,880	30,529
104.00	11,938	11,585	42,114
105.00	12,644	12,291	54,405
106.00	13,353	12,999	67,404
107.00	14,062	13,708	81,111

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	9,122	0	0
98.25	9,122	18,244	18,244

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.15' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	101.81'	**24.0" Horiz. Beehive OF** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.9" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	104.95'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.730 cfs @ 17.71 hrs HW=104.98' (Free Discharge)
└─**1=Culvert** (Passes 0.730 cfs of 8.564 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.063 cfs @ 14.195 fps)
    └─**2=Beehive OF** (Passes < 26.928 cfs potential flow)
    └─**4=Underdrain** (Passes < 2.753 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.667 cfs @ 0.478 fps)

Pond RG A: Detentionn Pond A - Flow Control



Summary for Pond RG B: Detention Pond B - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.744 ac, 66.72% Impervious, Inflow Depth = 2.59" for 10-YR event
Inflow = 0.443 cfs @ 7.99 hrs, Volume= 0.160 af
Outflow = 0.086 cfs @ 11.76 hrs, Volume= 0.151 af, Atten= 81%, Lag= 226.6 min
Primary = 0.086 cfs @ 11.76 hrs, Volume= 0.151 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.54' @ 11.76 hrs Surf.Area= 2,841 sf Storage= 3,707 cf

Plug-Flow detention time= 1,506.1 min calculated for 0.151 af (94% of inflow)
Center-of-Mass det. time= 1,465.2 min (2,163.8 - 698.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	4,693 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	95.25'	1,524 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 3,810 cf Overall x 40.0% Voids
		6,217 cf	Total Available Storage

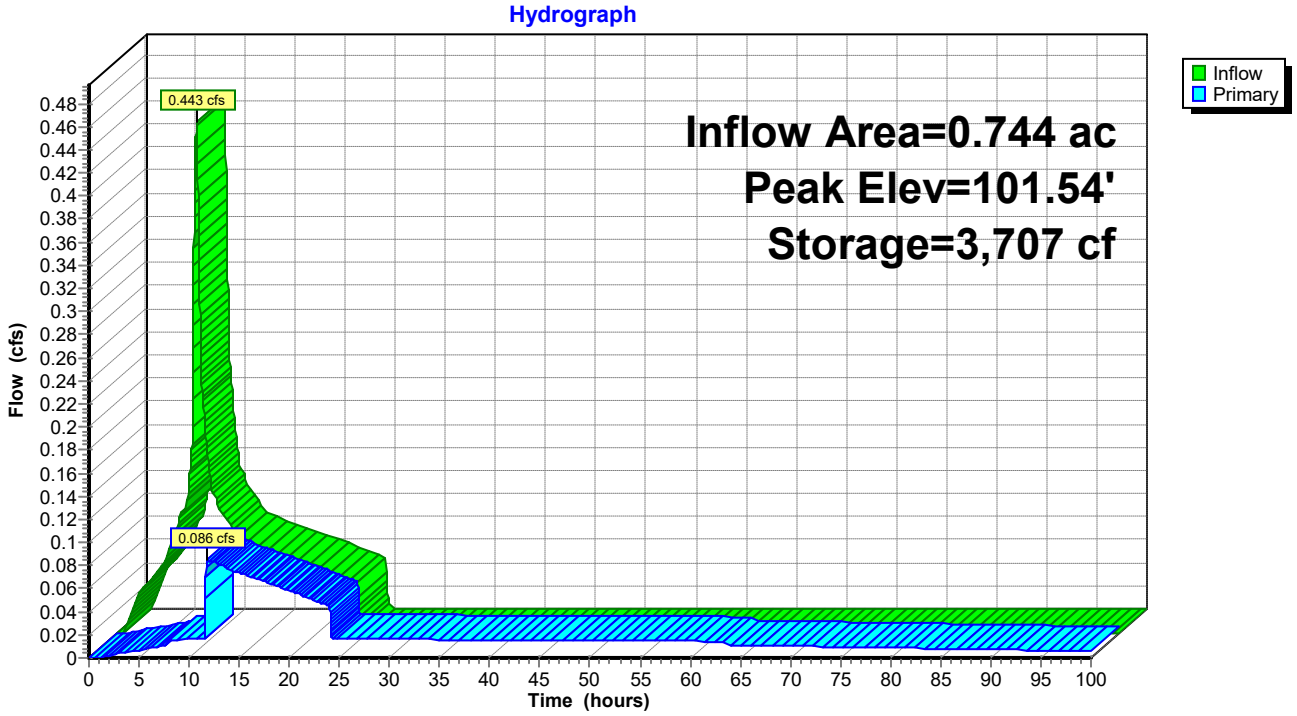
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,270	0	0
101.00	1,466	1,368	1,368
102.00	1,662	1,564	2,932
103.00	1,860	1,761	4,693

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.25	1,270	0	0
98.25	1,270	3,810	3,810

Device	Routing	Invert	Outlet Devices
#1	Primary	95.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.25' / 95.05' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	95.25'	**0.5" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	95.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.53'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.086 cfs @ 11.76 hrs HW=101.54' (Free Discharge)
└─**1=Culvert** (Passes 0.086 cfs of 7.182 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.016 cfs @ 12.052 fps)
    └─**2=Beehive** (Passes < 15.400 cfs potential flow)
    └─**4=Underdrain** (Passes < 2.323 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.069 cfs @ 0.224 fps)

Pond RG B: Detention Pond B - Flow Control



Summary for Pond RG C: Raingarden C - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.346 ac, 59.29% Impervious, Inflow Depth = 2.45" for 10-YR event
Inflow = 0.201 cfs @ 7.93 hrs, Volume= 0.071 af
Outflow = 0.014 cfs @ 24.05 hrs, Volume= 0.070 af, Atten= 93%, Lag= 967.0 min
Primary = 0.014 cfs @ 24.05 hrs, Volume= 0.070 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 100.77' @ 24.05 hrs Surf.Area= 3,147 sf Storage= 2,188 cf

Plug-Flow detention time= 1,700.7 min calculated for 0.070 af (99% of inflow)
Center-of-Mass det. time= 1,696.1 min (2,399.6 - 703.4)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	2,865 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	926 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 2,316 cf Overall x 40.0% Voids
		3,791 cf	Total Available Storage

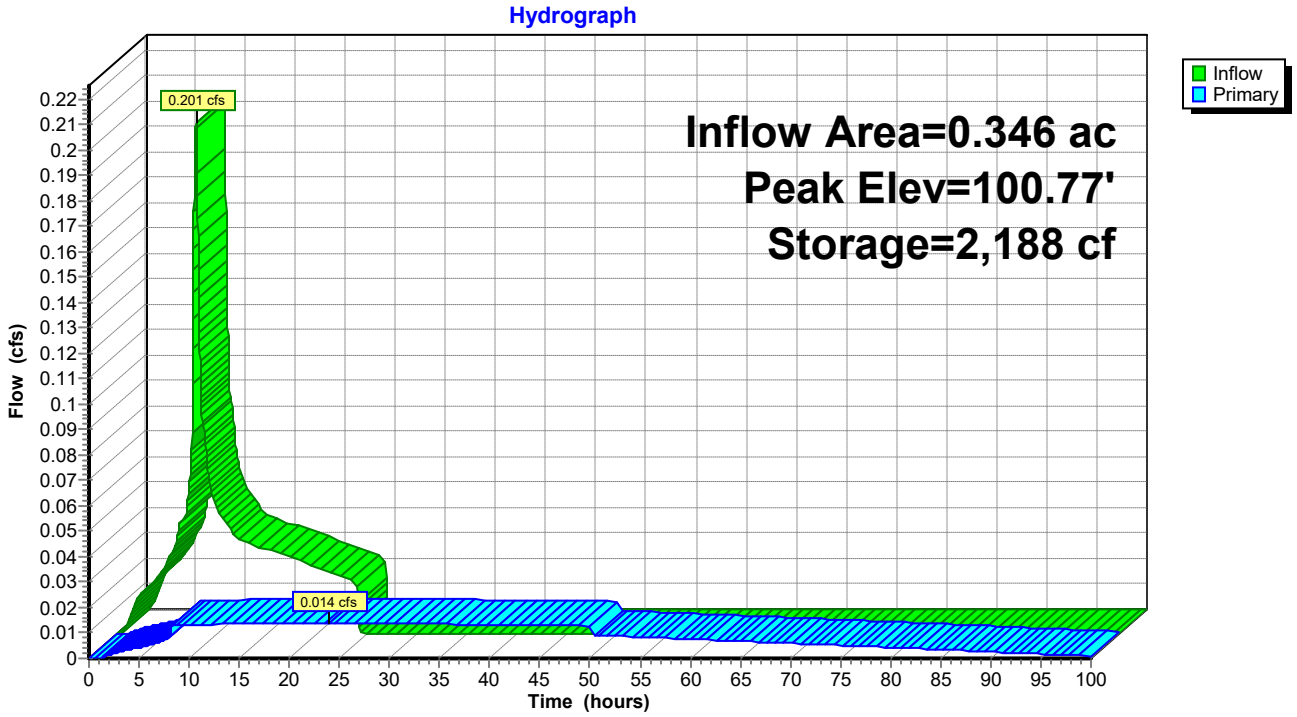
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,158	0	0
100.50	1,845	751	751
101.50	2,383	2,114	2,865

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	1,158	0	0
98.25	1,158	2,316	2,316

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.00'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.014 cfs @ 24.05 hrs HW=100.77' (Free Discharge)
- **1=Culvert** (Passes 0.014 cfs of 5.984 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.014 cfs @ 10.209 fps)
    - **2=Beehive** (Passes < 2.831 cfs potential flow)
    - **4=Underdrain** (Passes < 1.953 cfs potential flow)
  - **5=Weir** (Controls 0.000 cfs)

Pond RG C: Raingarden C - Flow Control



Summary for Pond RG D: Detention Pond D - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.446 ac, 50.78% Impervious, Inflow Depth = 2.29" for 10-YR event
Inflow = 0.240 cfs @ 7.94 hrs, Volume= 0.085 af
Outflow = 0.060 cfs @ 10.10 hrs, Volume= 0.085 af, Atten= 75%, Lag= 129.4 min
Primary = 0.060 cfs @ 10.10 hrs, Volume= 0.085 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.29' @ 10.10 hrs Surf.Area= 1,658 sf Storage= 1,488 cf

Plug-Flow detention time= 791.7 min calculated for 0.085 af (100% of inflow)
Center-of-Mass det. time= 791.6 min (1,506.4 - 714.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1,986 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	425 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 1,062 cf Overall x 40.0% Voids
		2,411 cf	Total Available Storage

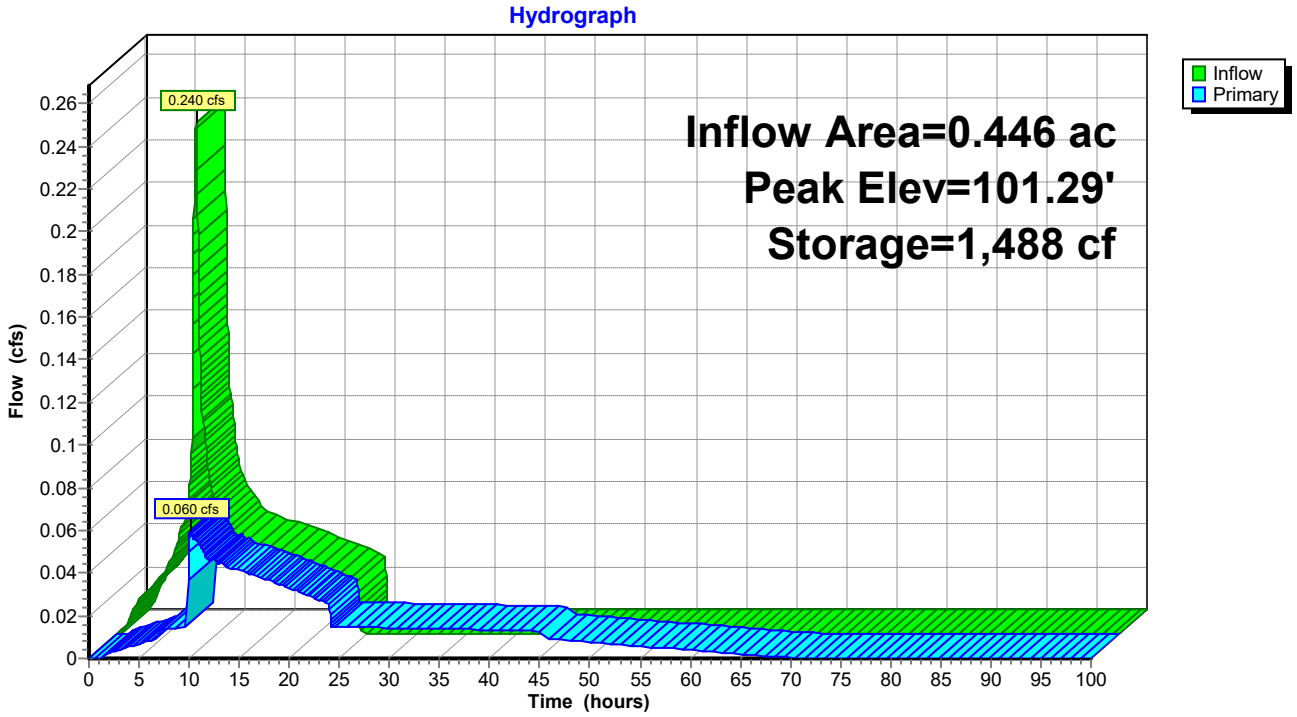
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	531	0	0
101.00	975	753	753
102.00	1,491	1,233	1,986

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	531	0	0
98.25	531	1,062	1,062

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.29'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.060 cfs @ 10.10 hrs HW=101.29' (Free Discharge)
- **1=Culvert** (Passes 0.060 cfs of 6.365 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.015 cfs @ 10.792 fps)
    - **2=Beehive** (Passes < 13.486 cfs potential flow)
    - **4=Underdrain** (Passes < 2.070 cfs potential flow)
  - **5=Weir** (Weir Controls 0.045 cfs @ 0.194 fps)

Pond RG D: Detention Pond D - Flow Control



Time span=0.00-100.00 hrs, dt=0.02 hrs, 5001 points x 3
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Basin A Runoff Area=352,348 sf 73.01% Impervious Runoff Depth=3.12"
Tc=10.0 min CN=76/98 Runoff=5.864 cfs 2.106 af

Subcatchment A EX: Pre-Dev Basin A Runoff Area=352,348 sf 0.00% Impervious Runoff Depth=1.59"
Tc=15.0 min CN=75/0 Runoff=2.352 cfs 1.073 af

Subcatchment B: Basin B Runoff Area=32,408 sf 66.72% Impervious Runoff Depth=3.00"
Tc=10.0 min CN=76/98 Runoff=0.515 cfs 0.186 af

Subcatchment B EX: Pre-Dev Basin B Runoff Area=32,408 sf 0.00% Impervious Runoff Depth=1.59"
Tc=10.0 min CN=75/0 Runoff=0.237 cfs 0.099 af

Subcatchment C: Basin C Runoff Area=15,069 sf 59.29% Impervious Runoff Depth=2.85"
Tc=6.0 min CN=76/98 Runoff=0.236 cfs 0.082 af

Subcatchment C EX: Pre-Dev Basin C Runoff Area=15,069 sf 0.00% Impervious Runoff Depth=1.59"
Tc=10.0 min CN=75/0 Runoff=0.110 cfs 0.046 af

Subcatchment D: Basin D Runoff Area=19,449 sf 50.78% Impervious Runoff Depth=2.68"
Tc=6.0 min CN=76/98 Runoff=0.283 cfs 0.100 af

Subcatchment D EX: Pre-Dev Basin D (Fire Runoff Area=19,449 sf 0.00% Impervious Runoff Depth=1.59"
Tc=10.0 min CN=75/0 Runoff=0.142 cfs 0.059 af

Pond RG A: Detentionn Pond A - Flow Peak Elev=104.99' Storage=61,520 cf Inflow=5.864 cfs 2.106 af
Outflow=0.964 cfs 1.078 af

Pond RG B: Detention Pond B - Flow Peak Elev=101.54' Storage=3,711 cf Inflow=0.515 cfs 0.186 af
Outflow=0.133 cfs 0.177 af

Pond RG C: Raingarden C - Flow Control Peak Elev=101.00' Storage=2,662 cf Inflow=0.236 cfs 0.082 af
Outflow=0.014 cfs 0.080 af

Pond RG D: Detention Pond D - Flow Peak Elev=101.30' Storage=1,491 cf Inflow=0.283 cfs 0.100 af
Outflow=0.104 cfs 0.100 af

Total Runoff Area = 19.250 ac Runoff Volume = 3.751 af Average Runoff Depth = 2.34"
64.50% Pervious = 12.417 ac 35.50% Impervious = 6.834 ac

Summary for Subcatchment A: Basin A

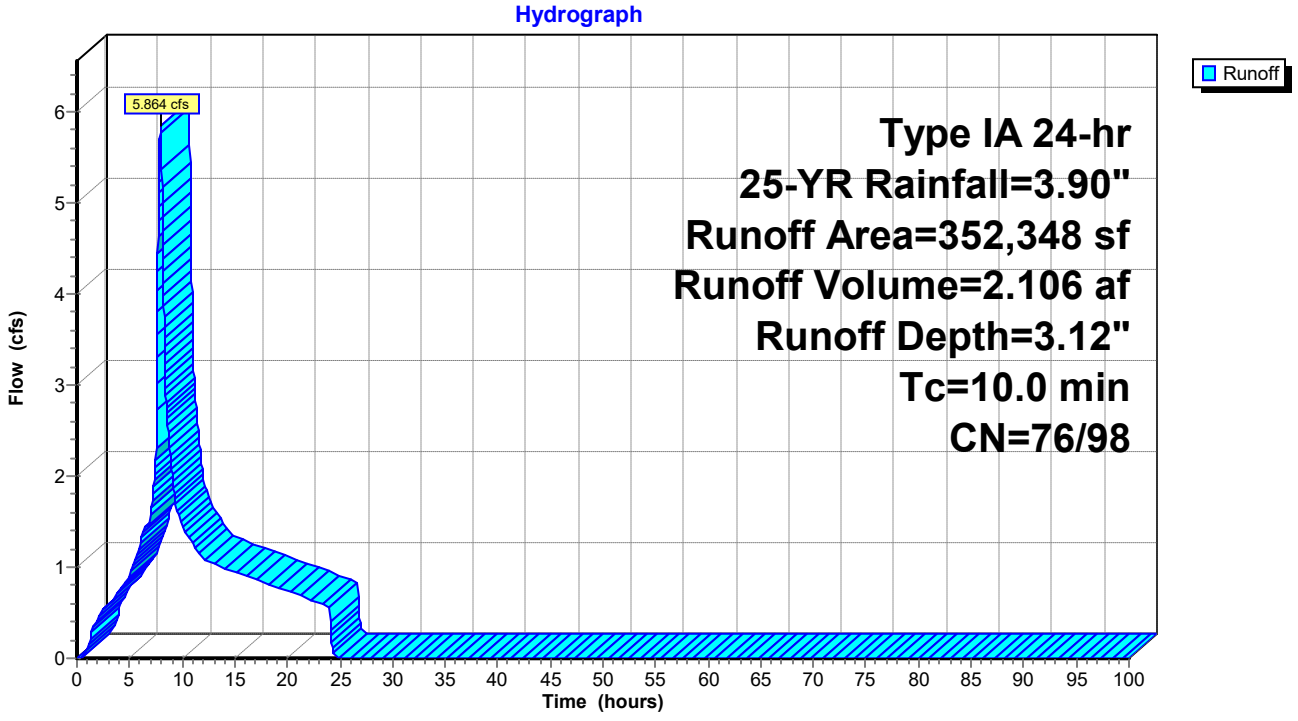
Runoff = 5.864 cfs @ 7.98 hrs, Volume= 2.106 af, Depth= 3.12"
Routed to Pond RG A : Detentionn Pond A - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	257,243	98	Impervious
*	95,105	76	Pervious
	352,348	92	Weighted Average
	95,105	76	26.99% Pervious Area
	257,243	98	73.01% Impervious Area

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

Subcatchment A: Basin A



Summary for Subcatchment A EX: Pre-Dev Basin A (On-Site)

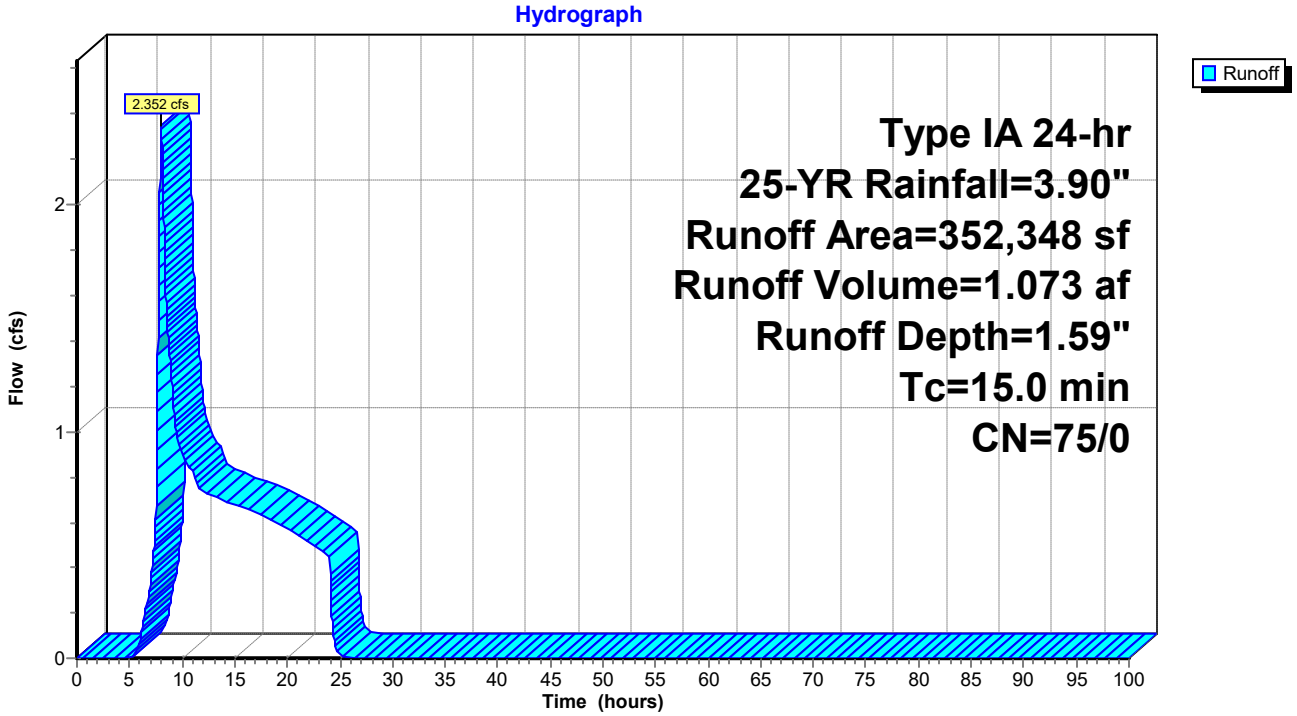
Runoff = 2.352 cfs @ 8.01 hrs, Volume= 1.073 af, Depth= 1.59"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	257,243	75	
*	95,105	75	
	352,348	75	Weighted Average
	352,348	75	100.00% Pervious Area

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

Subcatchment A EX: Pre-Dev Basin A (On-Site)



Summary for Subcatchment B: Basin B

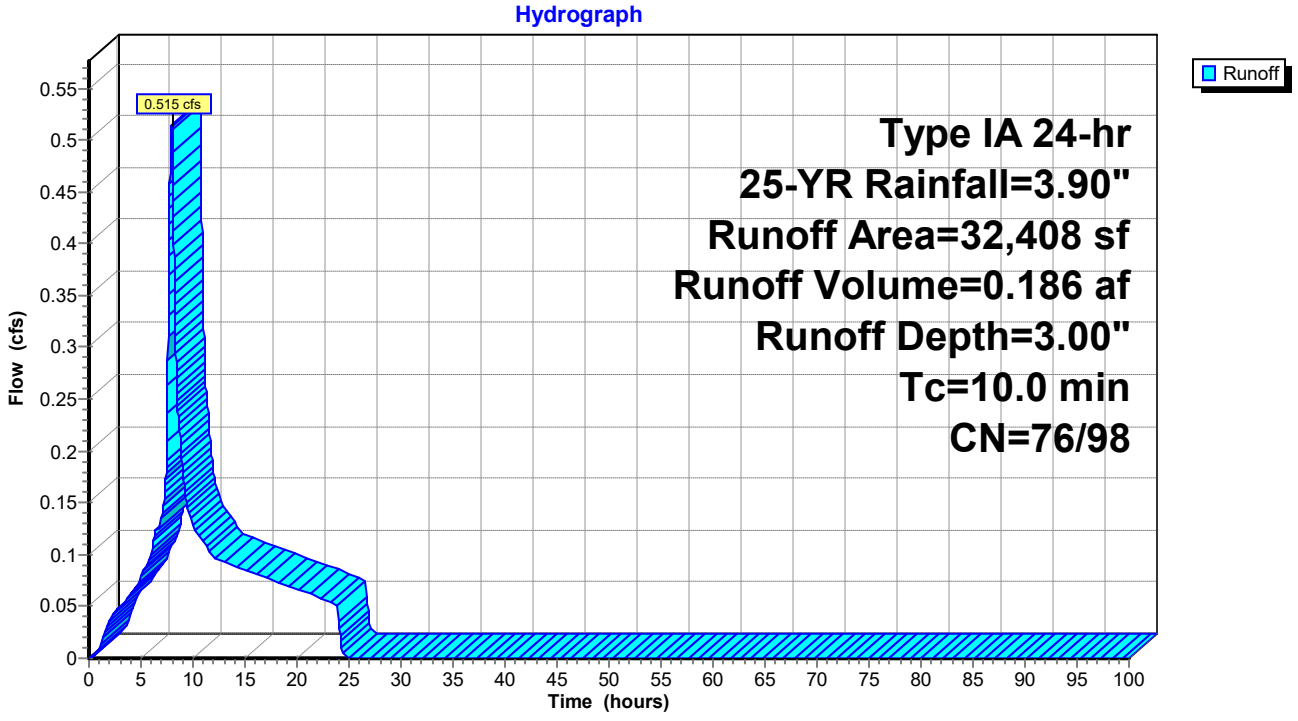
Runoff = 0.515 cfs @ 7.99 hrs, Volume= 0.186 af, Depth= 3.00"
Routed to Pond RG B : Detention Pond B - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	21,622	98	Impervious
*	10,786	76	Pervious
	32,408	91	Weighted Average
	10,786	76	33.28% Pervious Area
	21,622	98	66.72% Impervious Area

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

Subcatchment B: Basin B



Summary for Subcatchment B EX: Pre-Dev Basin B (Davis)

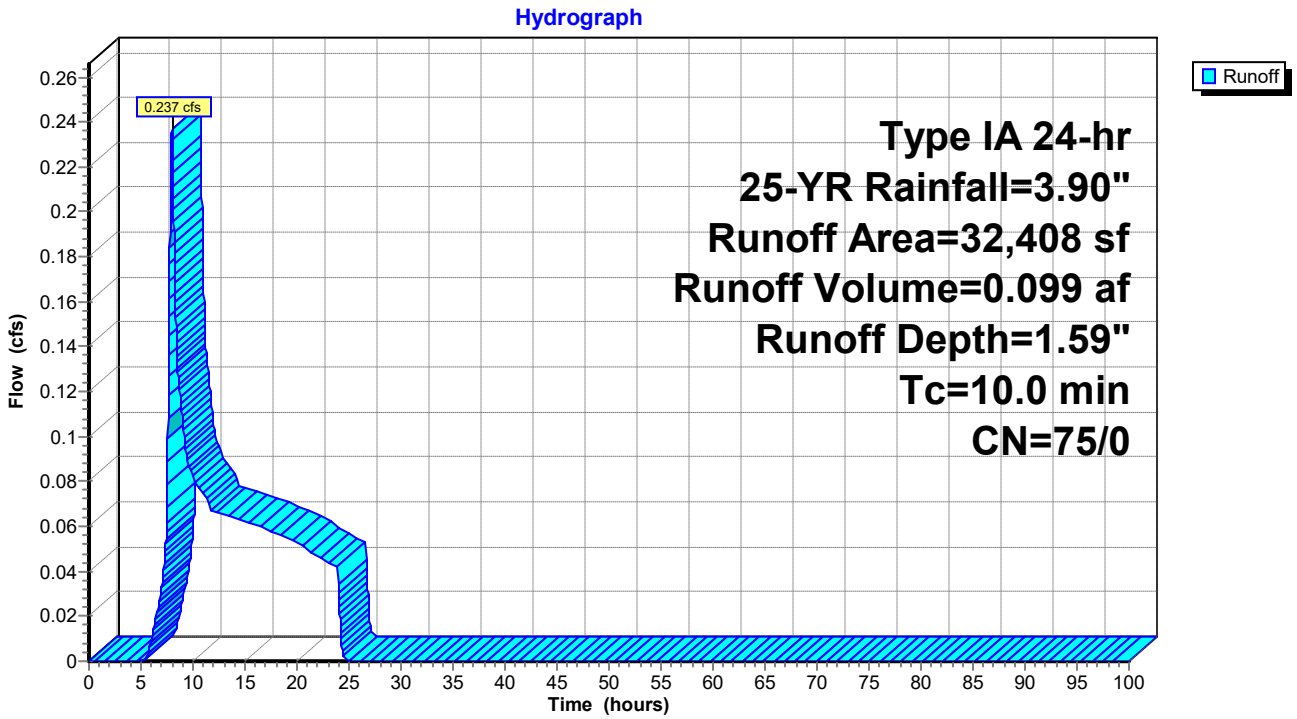
Runoff = 0.237 cfs @ 8.00 hrs, Volume= 0.099 af, Depth= 1.59"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	21,622	75	
*	10,786	75	
	32,408	75	Weighted Average
	32,408	75	100.00% Pervious Area

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

Subcatchment B EX: Pre-Dev Basin B (Davis)



Summary for Subcatchment C: Basin C

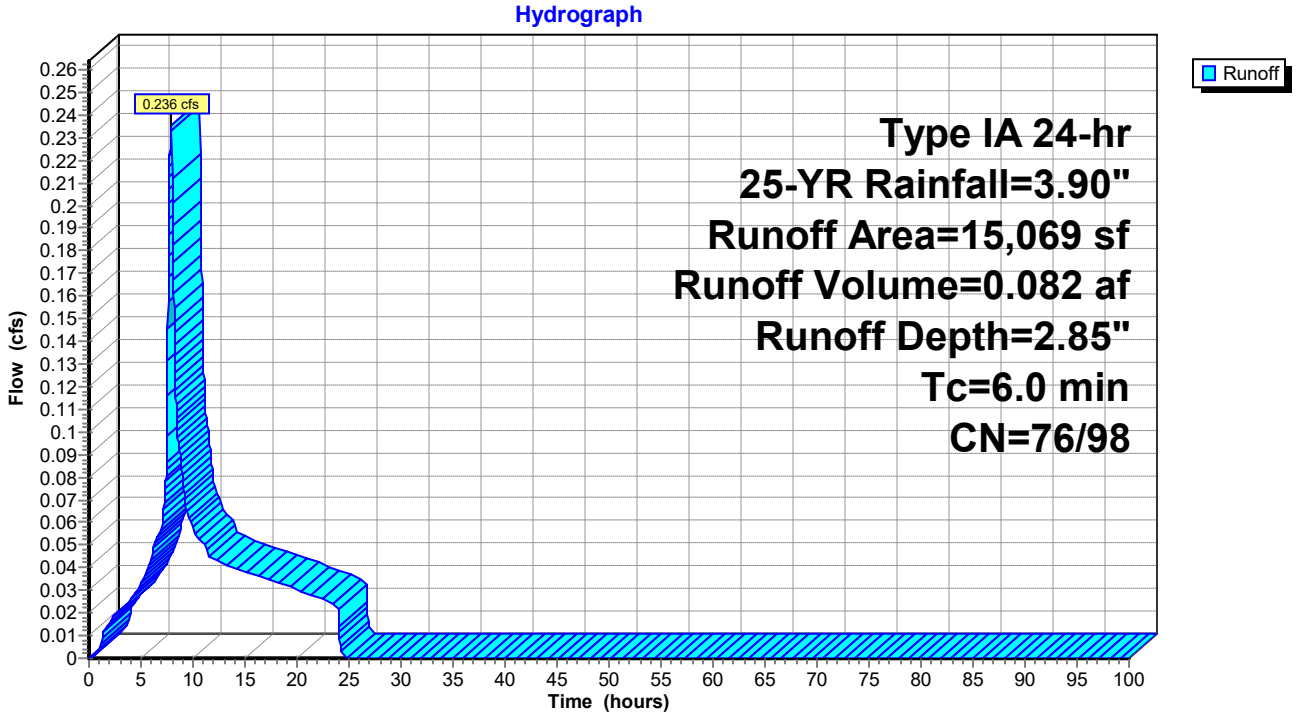
Runoff = 0.236 cfs @ 7.93 hrs, Volume= 0.082 af, Depth= 2.85"
Routed to Pond RG C : Raingarden C - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	8,934	98	Impervious
*	6,135	76	Pervious
	15,069	89	Weighted Average
	6,135	76	40.71% Pervious Area
	8,934	98	59.29% Impervious Area

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

Subcatchment C: Basin C



Summary for Subcatchment C EX: Pre-Dev Basin C (Access Lane)

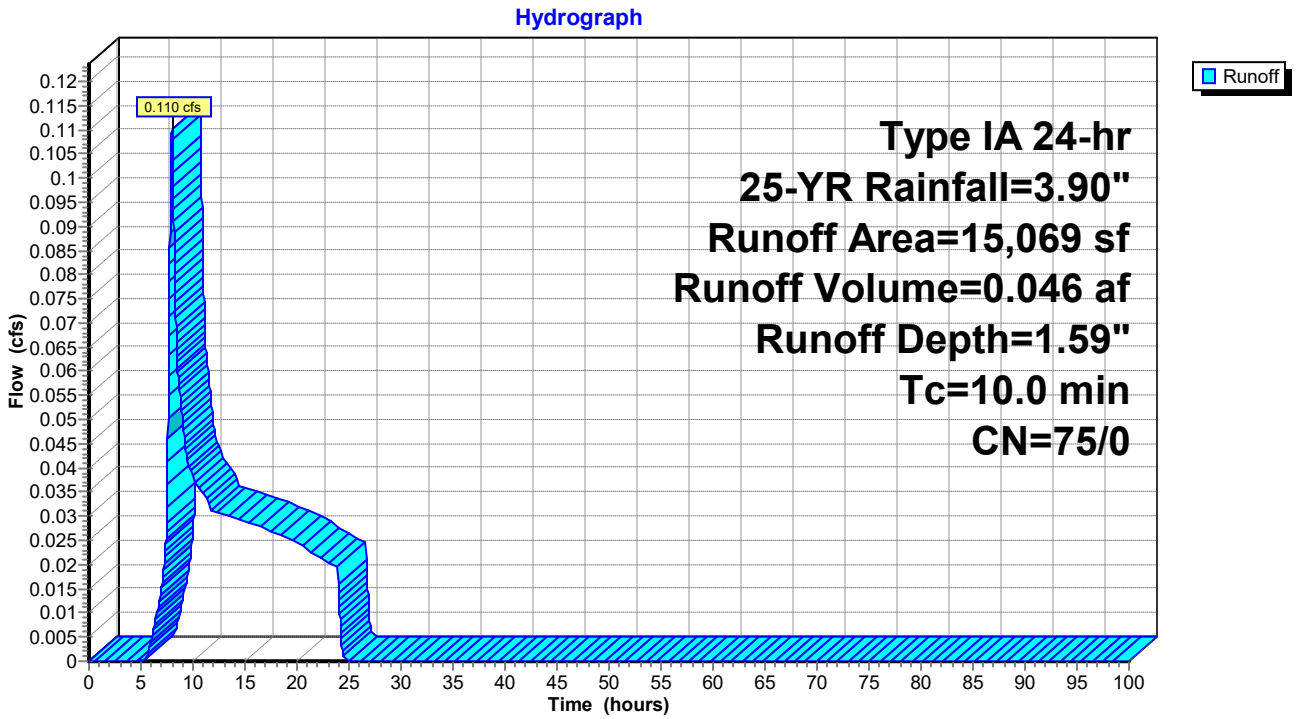
Runoff = 0.110 cfs @ 8.00 hrs, Volume= 0.046 af, Depth= 1.59"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	8,934	75	
*	6,135	75	
	15,069	75	Weighted Average
	15,069	75	100.00% Pervious Area

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

Subcatchment C EX: Pre-Dev Basin C (Access Lane)



Summary for Subcatchment D: Basin D

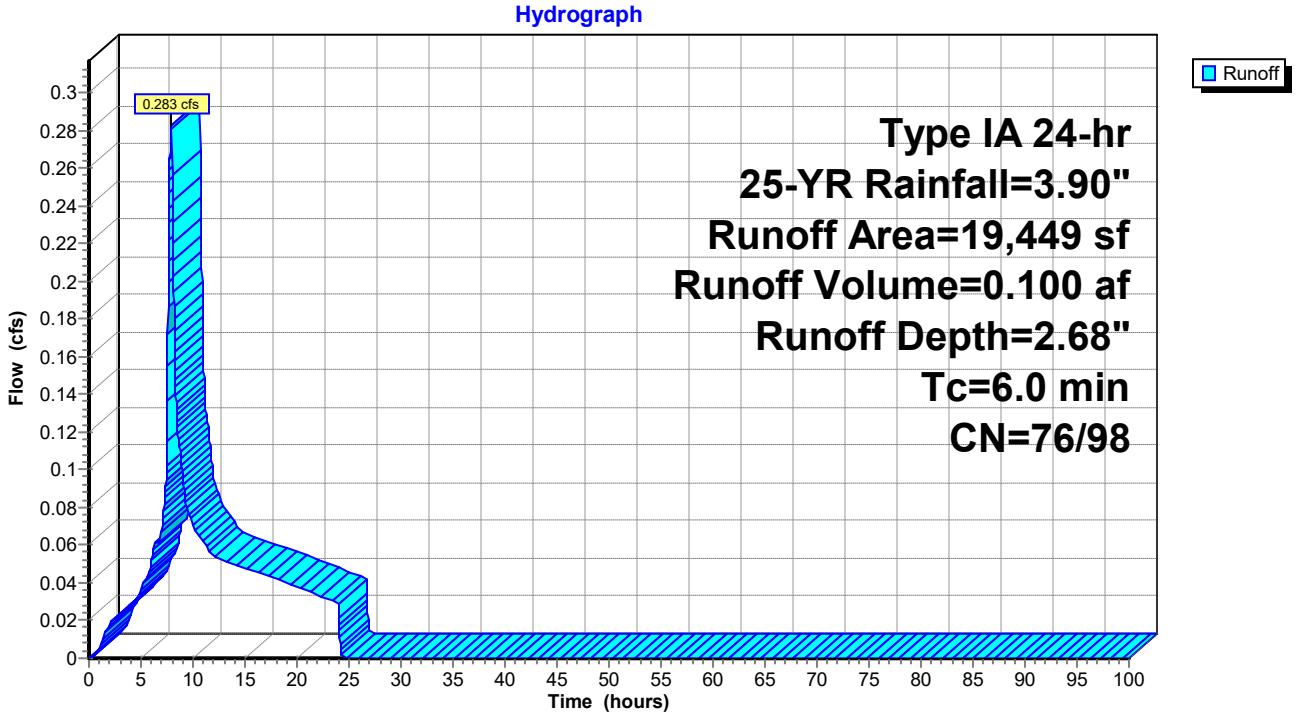
Runoff = 0.283 cfs @ 7.94 hrs, Volume= 0.100 af, Depth= 2.68"
Routed to Pond RG D : Detention Pond D - Flow Control

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	9,877	98	Impervious
*	9,572	76	Pervious
	19,449	87	Weighted Average
	9,572	76	49.22% Pervious Area
	9,877	98	50.78% Impervious Area

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

Subcatchment D: Basin D



Summary for Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)

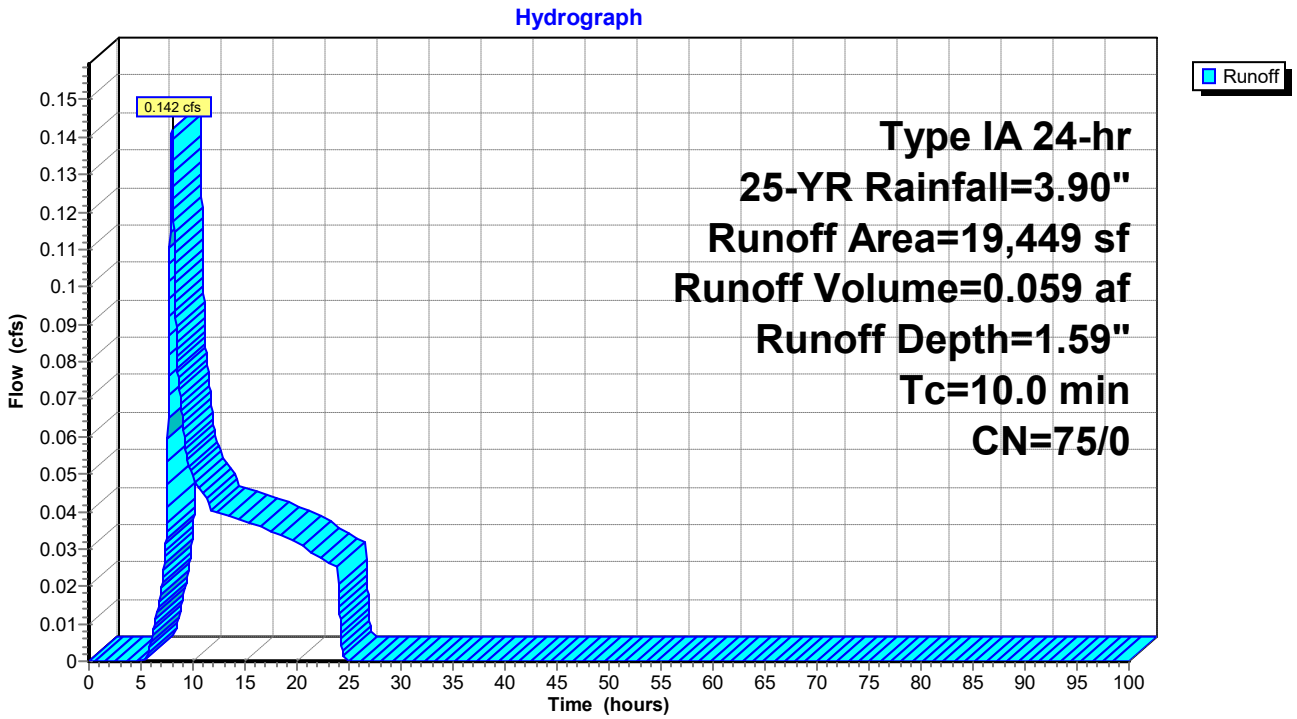
Runoff = 0.142 cfs @ 8.00 hrs, Volume= 0.059 af, Depth= 1.59"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	9,877	75	
*	9,572	75	
	19,449	75	Weighted Average
	19,449	75	100.00% Pervious Area

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

Subcatchment D EX: Pre-Dev Basin D (Fire Turnaround)



Summary for Pond RG A: Detentionn Pond A - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 8.089 ac, 73.01% Impervious, Inflow Depth = 3.12" for 25-YR event
Inflow = 5.864 cfs @ 7.98 hrs, Volume= 2.106 af
Outflow = 0.964 cfs @ 14.52 hrs, Volume= 1.078 af, Atten= 84%, Lag= 392.6 min
Primary = 0.964 cfs @ 14.52 hrs, Volume= 1.078 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 104.99' @ 14.52 hrs Surf.Area= 21,756 sf Storage= 61,520 cf

Plug-Flow detention time= 1,574.5 min calculated for 1.078 af (51% of inflow)
Center-of-Mass det. time= 1,306.8 min (1,995.9 - 689.1)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	81,111 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	7,298 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 18,244 cf Overall x 40.0% Voids
		88,409 cf	Total Available Storage

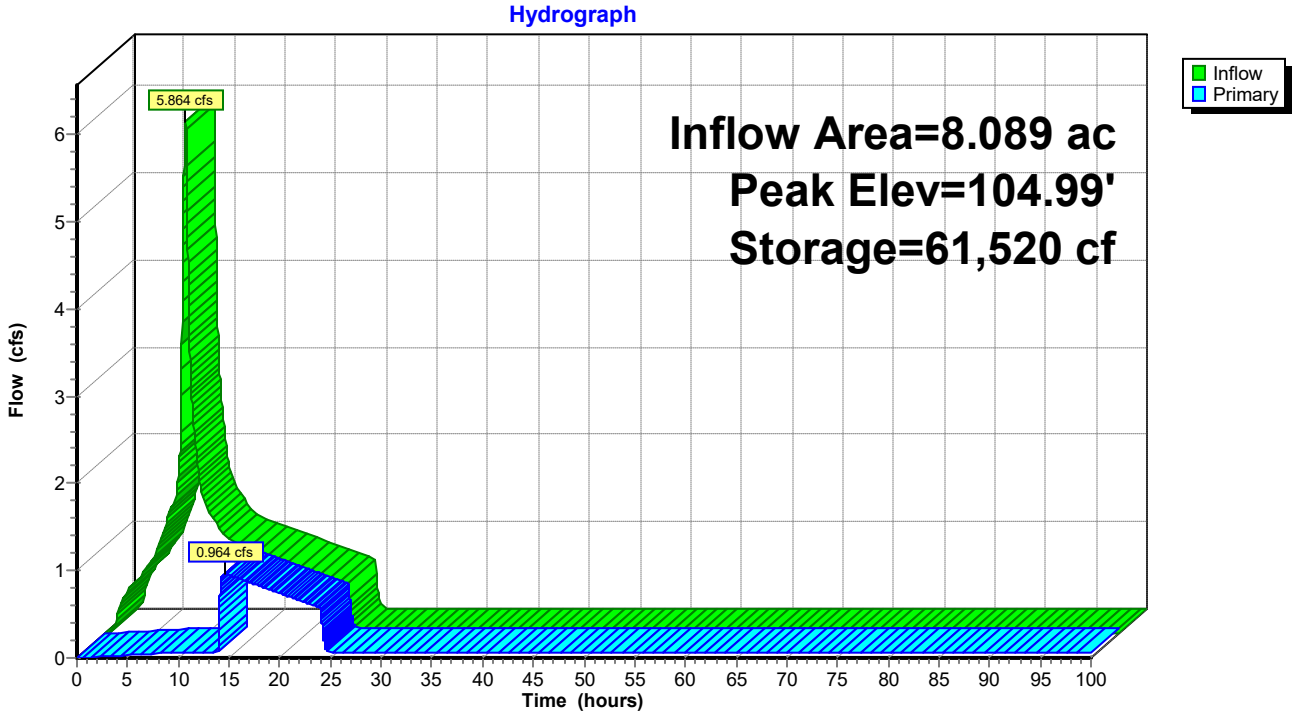
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,122	0	0
101.00	9,824	9,473	9,473
102.00	10,528	10,176	19,649
103.00	11,232	10,880	30,529
104.00	11,938	11,585	42,114
105.00	12,644	12,291	54,405
106.00	13,353	12,999	67,404
107.00	14,062	13,708	81,111

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	9,122	0	0
98.25	9,122	18,244	18,244

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.15' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	101.81'	**24.0" Horiz. Beehive OF** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.9" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	104.95'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.964 cfs @ 14.52 hrs HW=104.99' (Free Discharge)
└─**1=Culvert** (Passes 0.964 cfs of 8.568 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.063 cfs @ 14.201 fps)
    └─**2=Beehive OF** (Passes < 26.956 cfs potential flow)
    └─**4=Underdrain** (Passes < 2.754 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.901 cfs @ 0.528 fps)

Pond RG A: Detentionn Pond A - Flow Control



Summary for Pond RG B: Detention Pond B - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.744 ac, 66.72% Impervious, Inflow Depth = 3.00" for 25-YR event
Inflow = 0.515 cfs @ 7.99 hrs, Volume= 0.186 af
Outflow = 0.133 cfs @ 9.97 hrs, Volume= 0.177 af, Atten= 74%, Lag= 118.9 min
Primary = 0.133 cfs @ 9.97 hrs, Volume= 0.177 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.54' @ 9.97 hrs Surf.Area= 2,842 sf Storage= 3,711 cf

Plug-Flow detention time= 1,307.1 min calculated for 0.177 af (95% of inflow)
Center-of-Mass det. time= 1,270.8 min (1,966.7 - 695.8)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	4,693 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	95.25'	1,524 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 3,810 cf Overall x 40.0% Voids
		6,217 cf	Total Available Storage

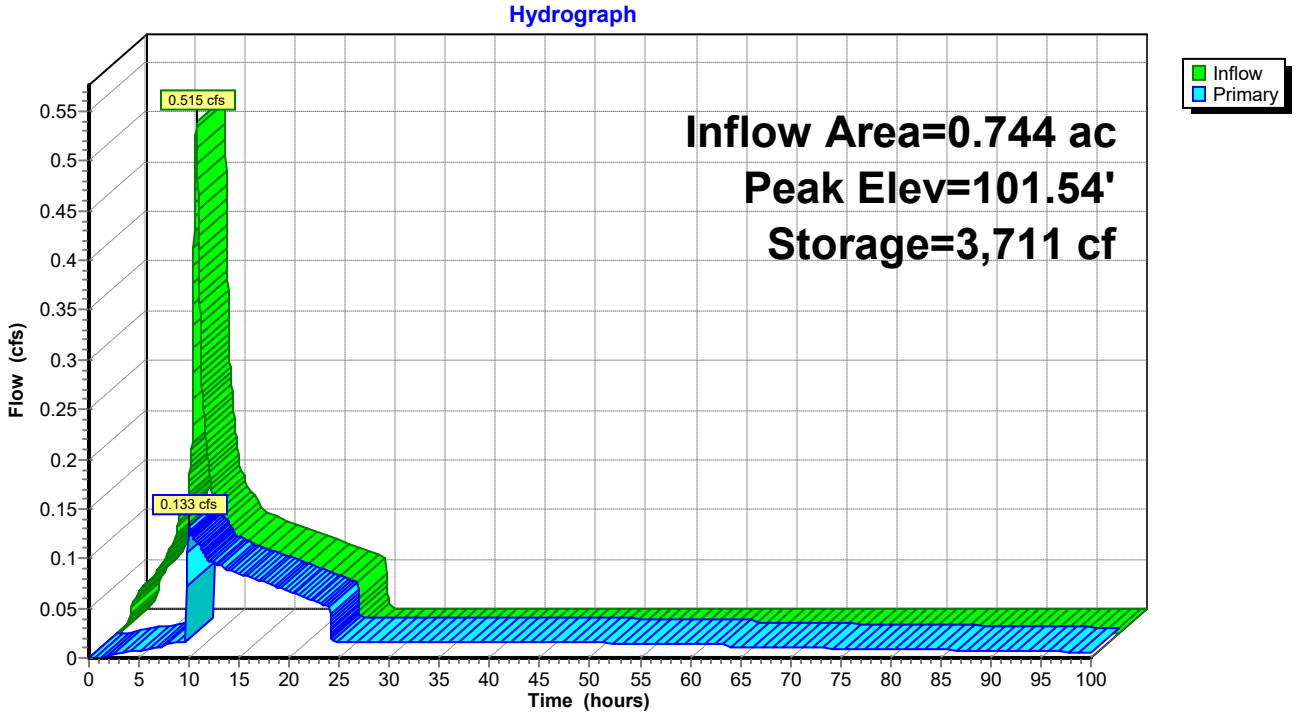
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,270	0	0
101.00	1,466	1,368	1,368
102.00	1,662	1,564	2,932
103.00	1,860	1,761	4,693

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.25	1,270	0	0
98.25	1,270	3,810	3,810

Device	Routing	Invert	Outlet Devices
#1	Primary	95.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.25' / 95.05' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	95.25'	**0.5" Vert. Orifice A** C= 0.600 Limited to weir flow at low heads
#4	Device 3	95.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.53'	**48.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.132 cfs @ 9.97 hrs HW=101.54' (Free Discharge)
└─**1=Culvert** (Passes 0.132 cfs of 7.183 cfs potential flow)
  └─**3=Orifice A** (Orifice Controls 0.016 cfs @ 12.055 fps)
    └─**2=Beehive** (Passes < 15.419 cfs potential flow)
    └─**4=Underdrain** (Passes < 2.323 cfs potential flow)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.116 cfs @ 0.267 fps)

Pond RG B: Detention Pond B - Flow Control



Summary for Pond RG C: Raingarden C - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.346 ac, 59.29% Impervious, Inflow Depth = 2.85" for 25-YR event
Inflow = 0.236 cfs @ 7.93 hrs, Volume= 0.082 af
Outflow = 0.014 cfs @ 24.06 hrs, Volume= 0.080 af, Atten= 94%, Lag= 967.9 min
Primary = 0.014 cfs @ 24.06 hrs, Volume= 0.080 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.00' @ 24.06 hrs Surf.Area= 3,271 sf Storage= 2,662 cf

Plug-Flow detention time= 1,893.0 min calculated for 0.080 af (98% of inflow)
Center-of-Mass det. time= 1,877.4 min (2,577.9 - 700.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	2,865 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	926 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 2,316 cf Overall x 40.0% Voids
		3,791 cf	Total Available Storage

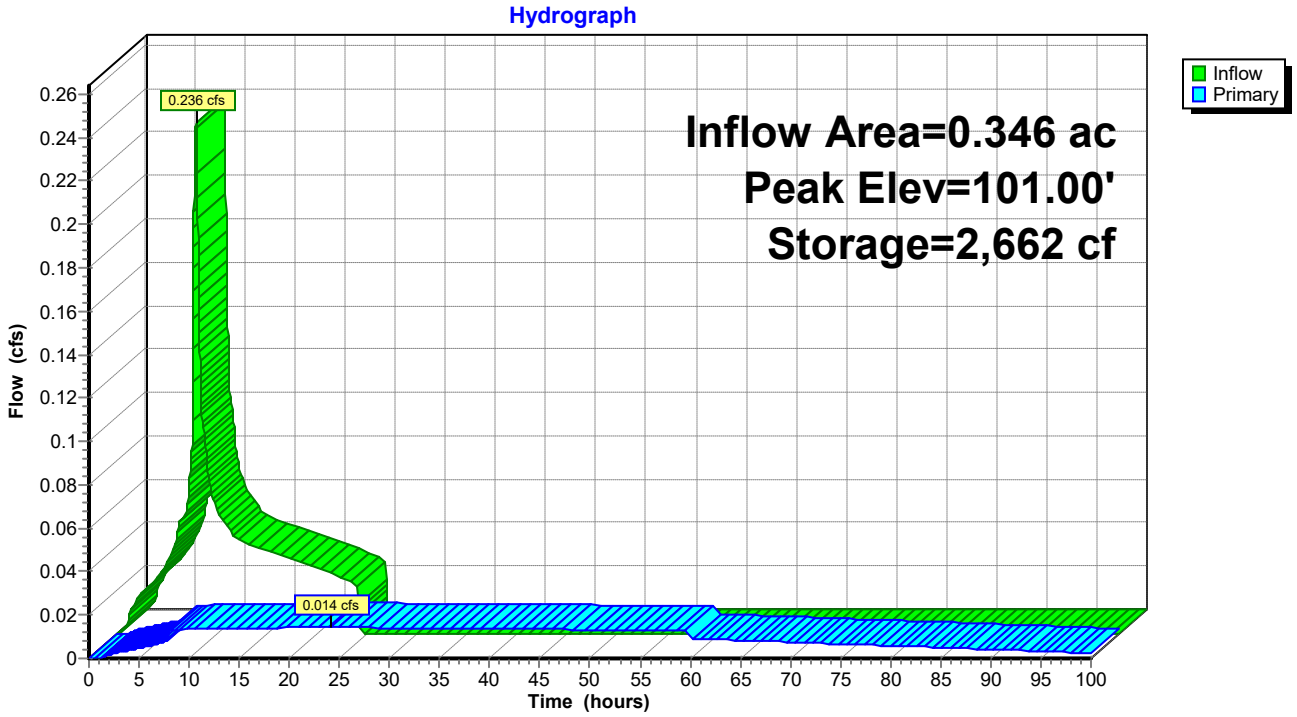
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	1,158	0	0
100.50	1,845	751	751
101.50	2,383	2,114	2,865

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	1,158	0	0
98.25	1,158	2,316	2,316

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.00'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.014 cfs @ 24.06 hrs HW=101.00' (Free Discharge)
- **1=Culvert** (Passes 0.014 cfs of 6.153 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.014 cfs @ 10.468 fps)
    - **2=Beehive** (Passes < 7.210 cfs potential flow)
    - **4=Underdrain** (Passes < 2.005 cfs potential flow)
  - **5=Weir** (Controls 0.000 cfs)

Pond RG C: Raingarden C - Flow Control



Summary for Pond RG D: Detention Pond D - Flow Control

[42] Hint: Gap in defined storage above volume #2 at 98.25'

Inflow Area = 0.446 ac, 50.78% Impervious, Inflow Depth = 2.68" for 25-YR event
Inflow = 0.283 cfs @ 7.94 hrs, Volume= 0.100 af
Outflow = 0.104 cfs @ 8.87 hrs, Volume= 0.100 af, Atten= 63%, Lag= 56.1 min
Primary = 0.104 cfs @ 8.87 hrs, Volume= 0.100 af
Routed to nonexistent node 1L

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 101.30' @ 8.87 hrs Surf.Area= 1,660 sf Storage= 1,491 cf

Plug-Flow detention time= 684.8 min calculated for 0.100 af (100% of inflow)
Center-of-Mass det. time= 685.3 min (1,397.0 - 711.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1,986 cf	**Detention Pond (Prismatic)** Listed below (Recalc)
#2	96.25'	425 cf	**Rock Storage (Prismatic)** Listed below (Recalc) 1,062 cf Overall x 40.0% Voids
		2,411 cf	Total Available Storage

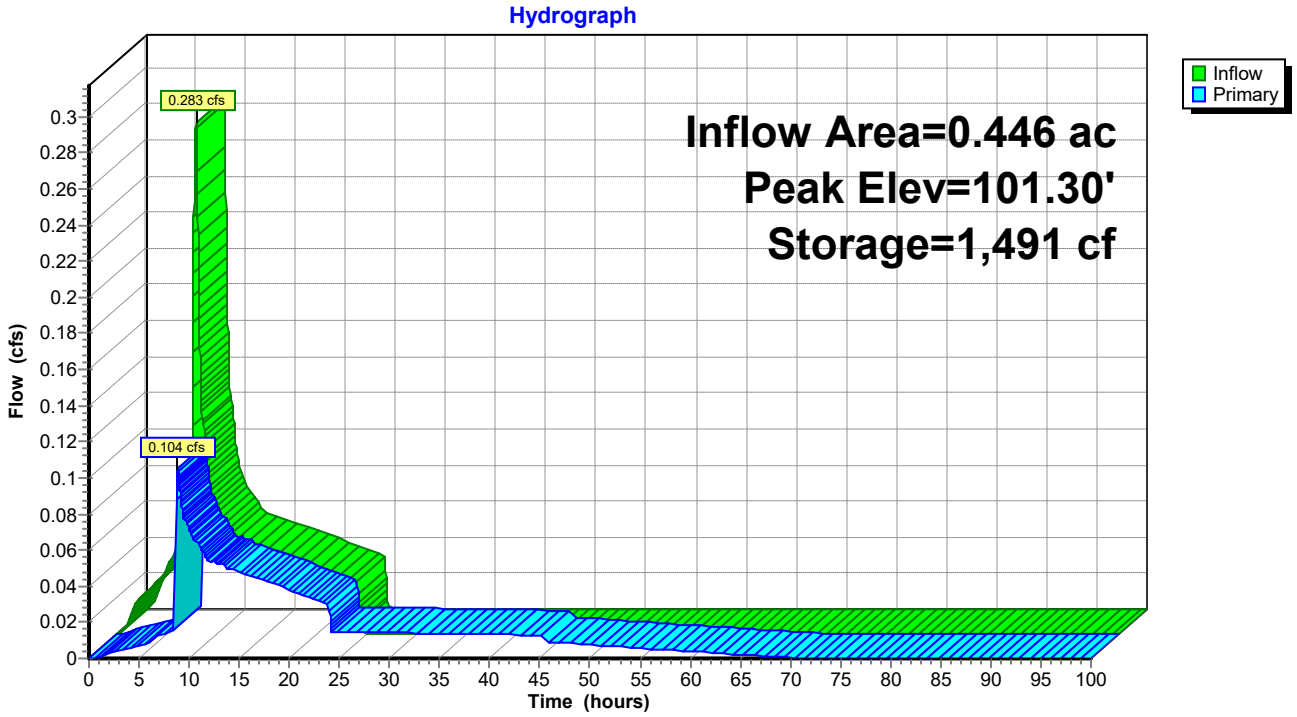
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	531	0	0
101.00	975	753	753
102.00	1,491	1,233	1,986

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.25	531	0	0
98.25	531	1,062	1,062

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.25' / 96.20' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 3	100.50'	**24.0" Horiz. Beehive** C= 0.600 Limited to weir flow at low heads
#3	Device 1	96.25'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 3	96.25'	**6.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#5	Device 1	101.29'	**48.0' long x 0.5' breadth Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.104 cfs @ 8.87 hrs HW=101.30' (Free Discharge)
- **1=Culvert** (Passes 0.104 cfs of 6.367 cfs potential flow)
  - **3=Orifice** (Orifice Controls 0.015 cfs @ 10.795 fps)
    - **2=Beehive** (Passes < 13.510 cfs potential flow)
    - **4=Underdrain** (Passes < 2.071 cfs potential flow)
  - **5=Weir** (Weir Controls 0.089 cfs @ 0.244 fps)

Pond RG D: Detention Pond D - Flow Control



APPENDIX E

CONVEYANCE CALCULATIONS

P:\04-Salem\FPC (Fore Property Company)\FPC-02 (Cornelius Multifamily)\FPC02-DOCS\Reports\Stormwater\CAD\FPC02 - Pipe Capacity.dwg

PIPE 11
PIPE 6
PIPE 10
PIPE 9
PIPE 8
PIPE 5
PIPE 7
PIPE 3
PIPE 4
PIPE 2
PIPE 1
PIPE 12
STM
N 26TH AVE
E BASELINE ST

0 50 100 200
SCALE: 1" = 100'

PIPE CONVEYANCE EXHIBIT

HANEY MULTIFAMILY

CORNELIUS, OR

Harper Houf Peterson Righellis Inc.
HHPR
ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

DESIGNED:	HHPR
DRAWN:	HHPR
CHECKED:	RMM
DATE:	JUNE 2025

DATE	NO.	DESCRIPTION

REVISIONS

SHEET NO.

FIG. 4

JOB NO. FPC-02

HANEY MULTIFAMILY

Pipe Conveyance Calculations

Prepared by Harper Houf Peterson Righellis, Inc.

HHPR Job No. FPC-02

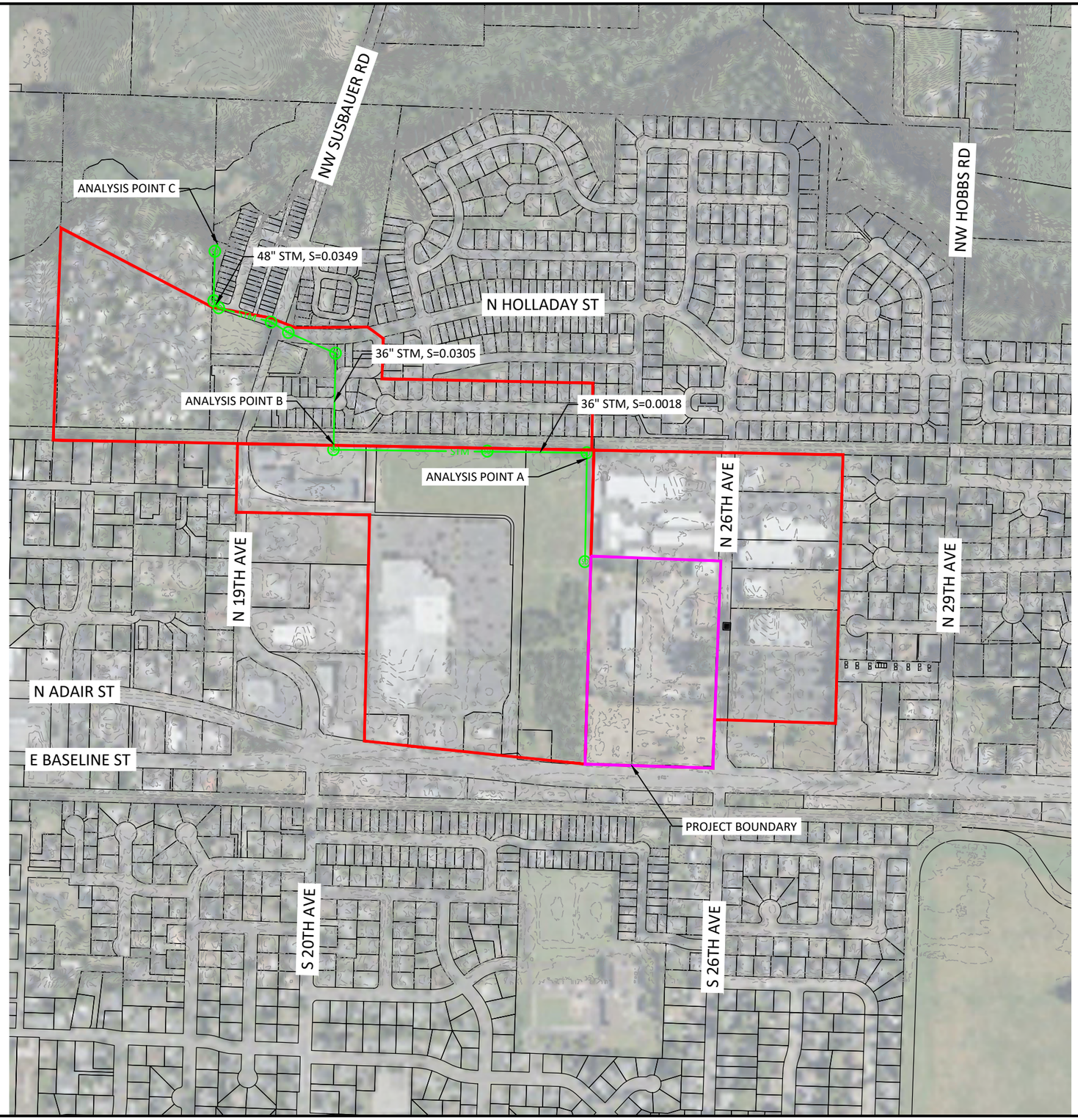
May 7, 2025

Rational Method Calculations

Pipe Segment	Impervious Area	Impervious Area	C	T_c	Rainfall	Pipe Size	Area	Per.	N	Q	Slope	$Q_{CAPACITY}$	Min. Slope	Velocity Full	Capacity Met?
	(sqft)	(ac)	(--)	(min)	(in/hr)	(in)	(sf)	(ft)	(--)	(cfs)	(%)	(cfs)	(%)	(fps)	
1	6,933	0.159	0.9	5.00	2.10	8	0.35	2.09	0.013	0.30	0.50%	0.85	0.06%	2.45	YES
2	16,400	0.376	0.9	5.00	2.10	8	0.35	2.09	0.013	0.71	0.50%	0.85	0.35%	2.45	YES
3	45,454	1.043	0.9	5.00	2.10	12	0.79	3.14	0.013	1.97	0.50%	2.52	0.31%	3.21	YES
4	71,355	1.638	0.9	5.00	2.10	15	1.23	3.93	0.013	3.10	0.50%	4.57	0.23%	3.72	YES
5	125,522	2.882	0.9	5.00	2.10	18	1.77	4.71	0.013	5.45	0.50%	7.43	0.27%	4.20	YES
6	162,187	3.723	0.9	5.00	2.10	18	1.77	4.71	0.013	7.04	0.50%	7.43	0.45%	4.20	YES
7	7,400	0.170	0.9	5.00	2.10	8	0.35	2.09	0.013	0.32	0.50%	0.85	0.07%	2.45	YES
8	38,000	0.872	0.9	5.00	2.10	12	0.79	3.14	0.013	1.65	0.50%	2.52	0.21%	3.21	YES
9	73,790	1.694	0.9	5.00	2.10	15	1.23	3.93	0.013	3.20	0.50%	4.57	0.25%	3.72	YES
10	125,000	2.870	0.9	5.00	2.10	18	1.77	4.71	0.013	5.42	0.50%	7.43	0.27%	4.20	YES
11	287,000	6.589	0.9	5.00	2.10	24	3.14	6.28	0.013	12.45	0.50%	16.00	0.30%	5.09	YES
12	130,000	2.984	0.9	5.00	2.10	18	1.77	4.71	0.013	5.64	0.50%	7.43	0.29%	4.20	YES

APPENDIX F

DOWNSTREAM ANALYSIS



0 250 500 1000

SCALE: 1" = 500'

DOWNSTREAM ANALYSIS MAP

HANEY MULTIFAMILY

CORNELIUS, OR

Harper Houf Peterson Righellis Inc.
ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

DESIGNED:	HHPR
DRAWN:	HHPR
CHECKED:	RMM
DATE:	JUNE 2025

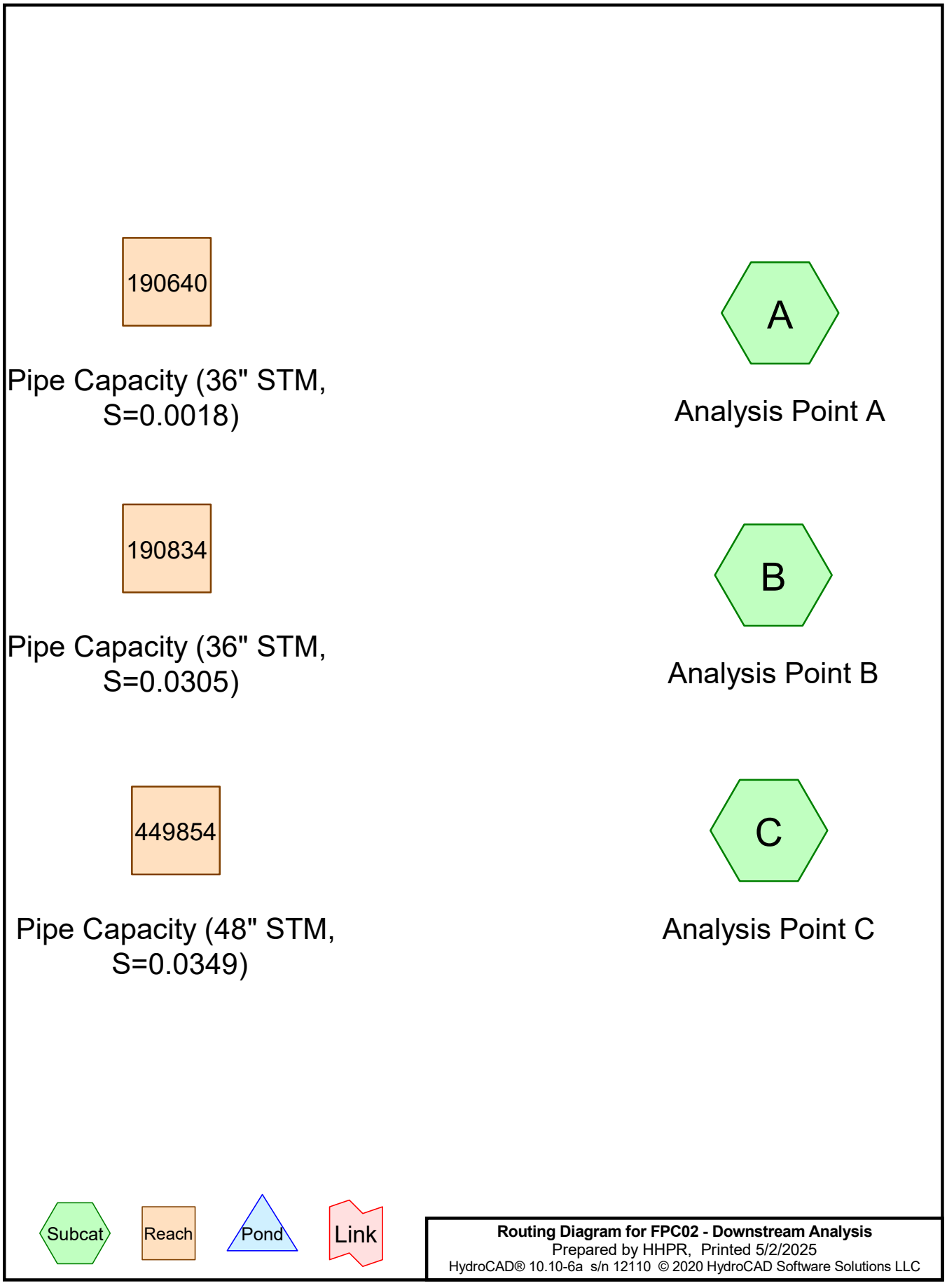
NO.	DESCRIPTION	DATE
	REVISIONS	

SHEET NO.

FIG. 5

JOB NO. FPC-02

P:\04-Salem\FPC (Fore Property Company)\FPC-02 (Cornelius Multifamily)\FPC02-DOCS\Reports\Stormwater\CAD\ FPC02 - Downstream Analysis.dwg


190640
Pipe Capacity (36" STM, S=0.0018)
A
Analysis Point A
190834
Pipe Capacity (36" STM, S=0.0305)
B
Analysis Point B
449854
Pipe Capacity (48" STM, S=0.0349)
C
Analysis Point C
Subcat
Reach
Pond
Link
Routing Diagram for FPC02 - Downstream Analysis
Prepared by HHPR, Printed 5/2/2025
HydroCAD® 10.10-6a s/n 12110 © 2020 HydroCAD Software Solutions LLC

Time span=0.00-100.00 hrs, dt=0.05 hrs, 2001 points x 2
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Analysis Point A Runoff Area=1,470,712 sf 0.00% Impervious Runoff Depth=3.33"
Tc=20.0 min CN=95/0 Runoff=23.918 cfs 9.376 af

Subcatchment B: Analysis Point B Runoff Area=3,022,937 sf 0.00% Impervious Runoff Depth=3.33"
Tc=25.0 min CN=95/0 Runoff=45.953 cfs 19.272 af

Subcatchment C: Analysis Point C Runoff Area=4,279,379 sf 0.00% Impervious Runoff Depth=3.23"
Tc=45.0 min CN=94/0 Runoff=50.563 cfs 26.414 af

Reach 190640: Pipe Capacity (36" STM, S=0.0018) Avg. Flow Depth=0.00' Max Vel=0.000 fps
36.0" Round Pipe n=0.013 L=452.0' S=0.0018 '/' Capacity=28.060 cfs Outflow=0.000 cfs 0.000 af

Reach 190834: Pipe Capacity (36" STM, S=0.0305) Avg. Flow Depth=0.00' Max Vel=0.000 fps
36.0" Round Pipe n=0.013 L=263.0' S=0.0305 '/' Capacity=116.400 cfs Outflow=0.000 cfs 0.000 af

Reach 449854: Pipe Capacity (48" STM, S=0.0349) Avg. Flow Depth=0.00' Max Vel=0.000 fps
36.0" Round Pipe n=0.013 L=35.0' S=0.0349 '/' Capacity=124.526 cfs Outflow=0.000 cfs 0.000 af

Total Runoff Area = 201.401 ac Runoff Volume = 55.062 af Average Runoff Depth = 3.28"
100.00% Pervious = 201.401 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment A: Analysis Point A

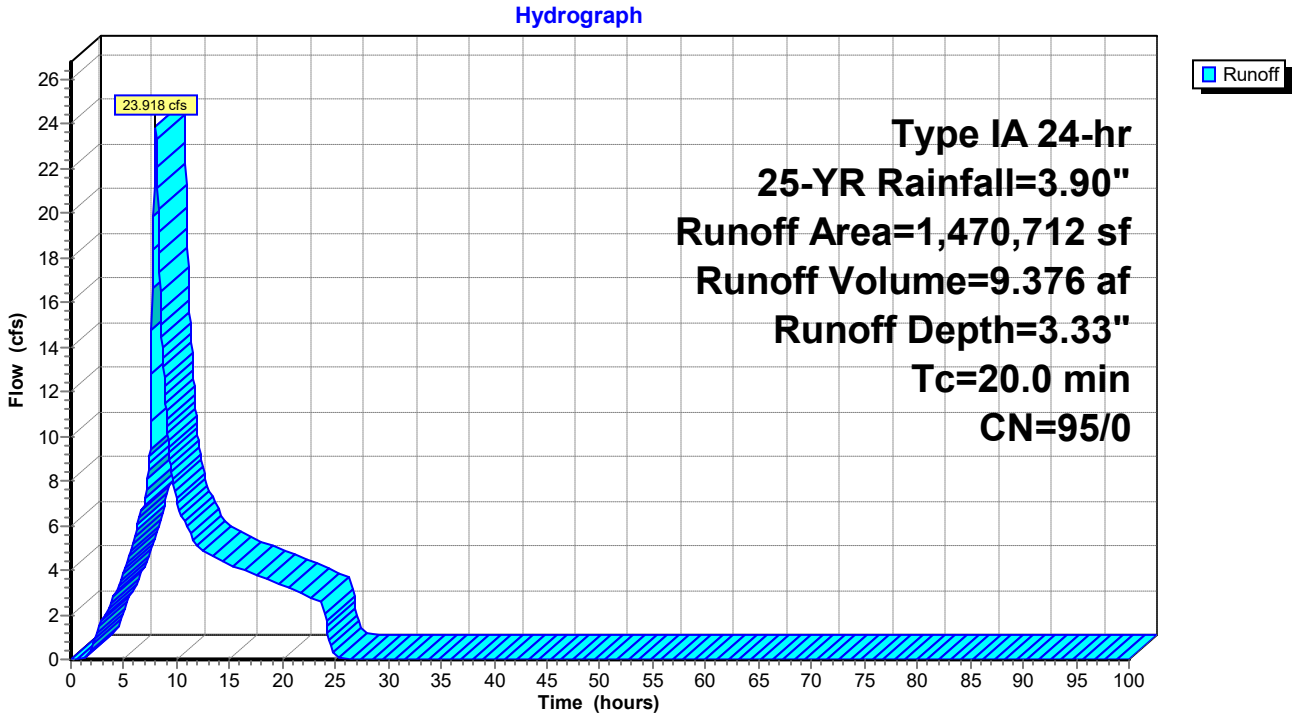
Runoff = 23.918 cfs @ 8.02 hrs, Volume= 9.376 af, Depth= 3.33"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	1,470,712	95	Commercial: HSG C/D
	1,470,712	95	100.00% Pervious Area

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

Subcatchment A: Analysis Point A



Summary for Subcatchment B: Analysis Point B

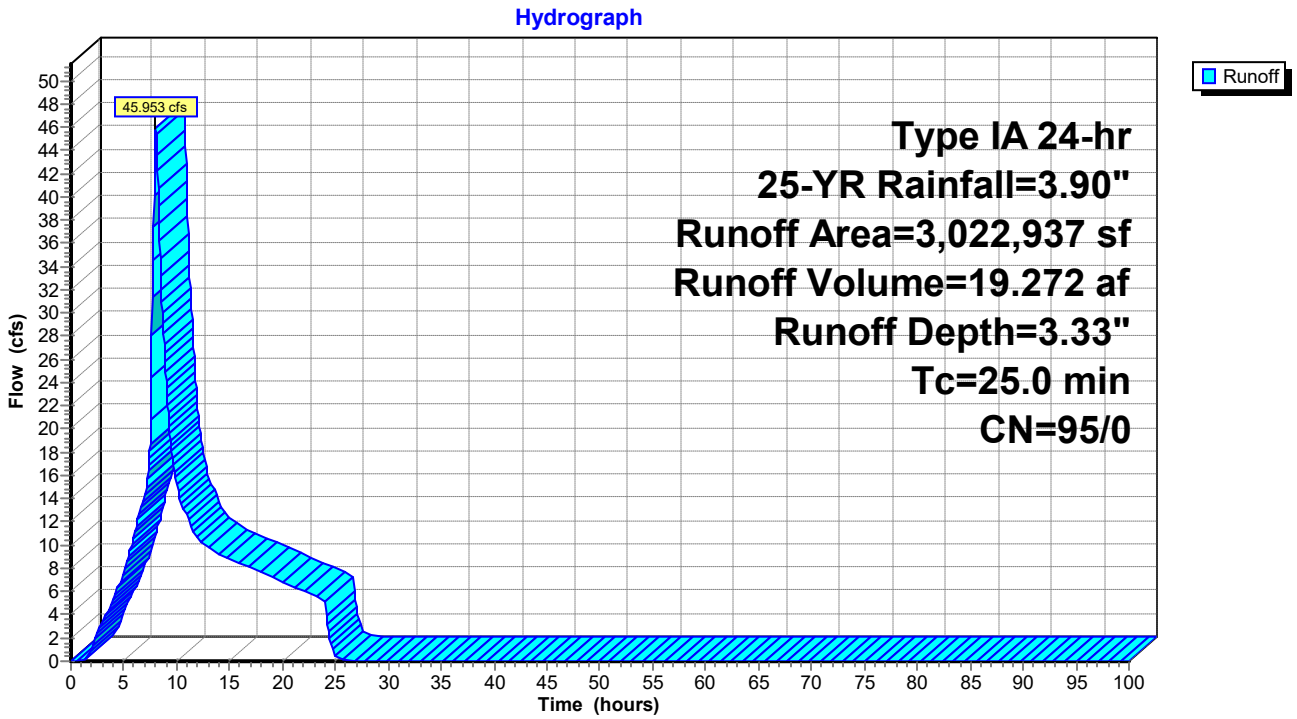
Runoff = 45.953 cfs @ 8.03 hrs, Volume= 19.272 af, Depth= 3.33"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	1,470,712	95	Commercial: HSG C/D
*	1,552,225	95	Commercial: HSG C/D
	3,022,937	95	Weighted Average
	3,022,937	95	100.00% Pervious Area

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

Subcatchment B: Analysis Point B



Summary for Subcatchment C: Analysis Point C

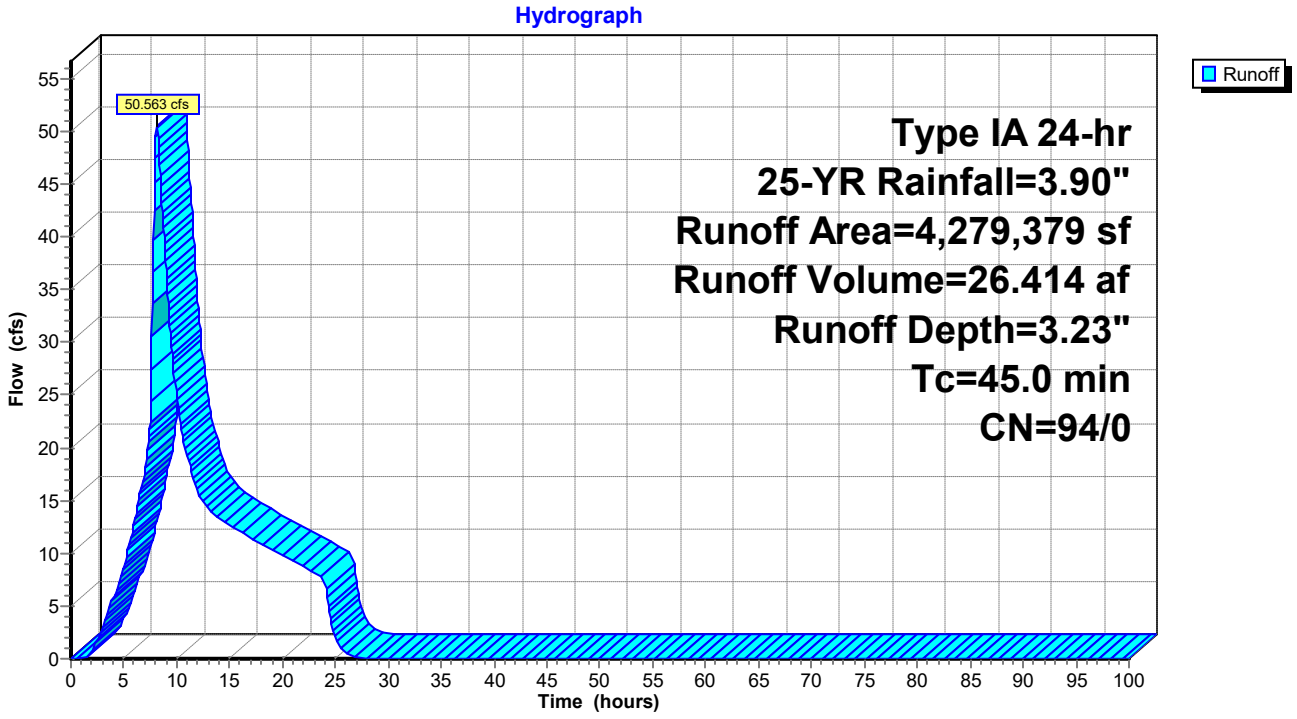
Runoff = 50.563 cfs @ 8.08 hrs, Volume= 26.414 af, Depth= 3.23"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
*	1,470,712	95	Commercial: HSG C/D
*	1,552,225	95	Commercial: HSG C/D
*	1,256,442	91	Residential: HSG C/D
	4,279,379	94	Weighted Average
	4,279,379	94	100.00% Pervious Area

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

Subcatchment C: Analysis Point C

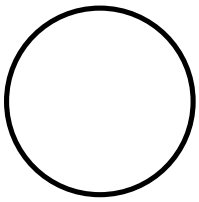


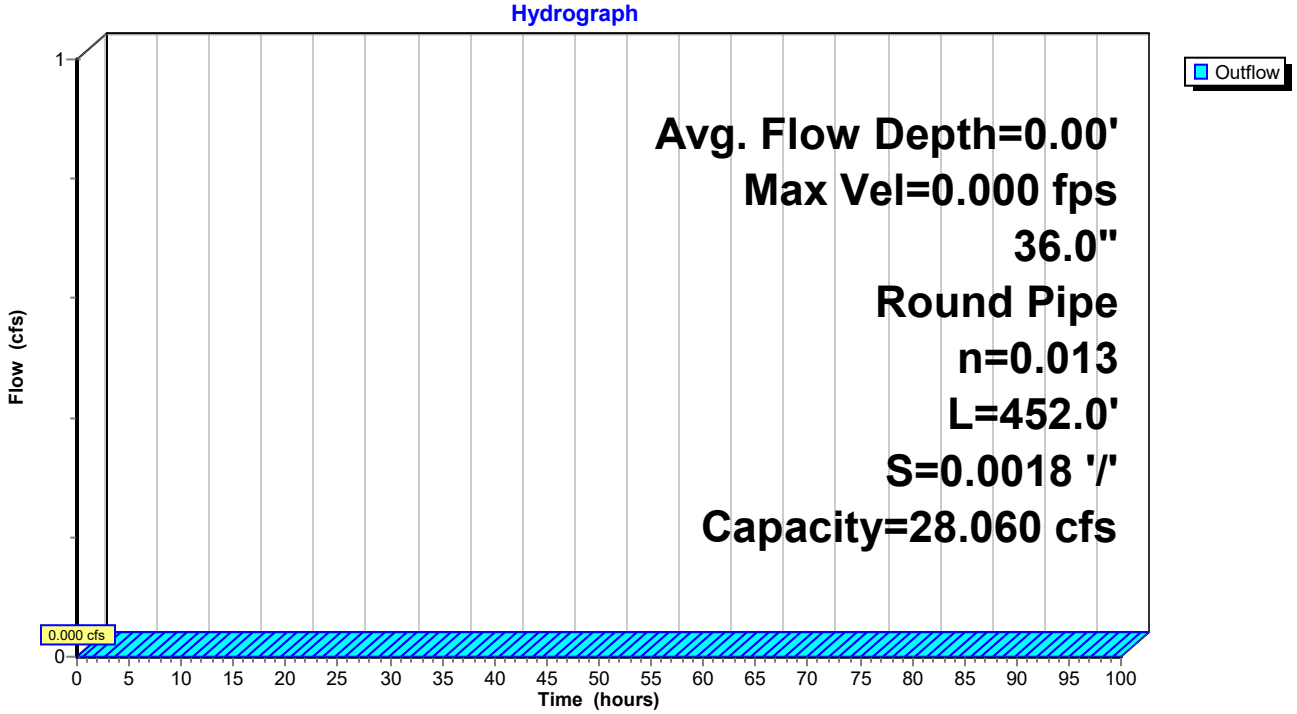
Summary for Reach 190640: Pipe Capacity (36" STM, S=0.0018)

[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 28.060 cfs

36.0" Round Pipe
n= 0.013
Length= 452.0' Slope= 0.0018 '/'
Inlet Invert= 170.10', Outlet Invert= 169.30'



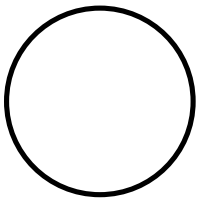


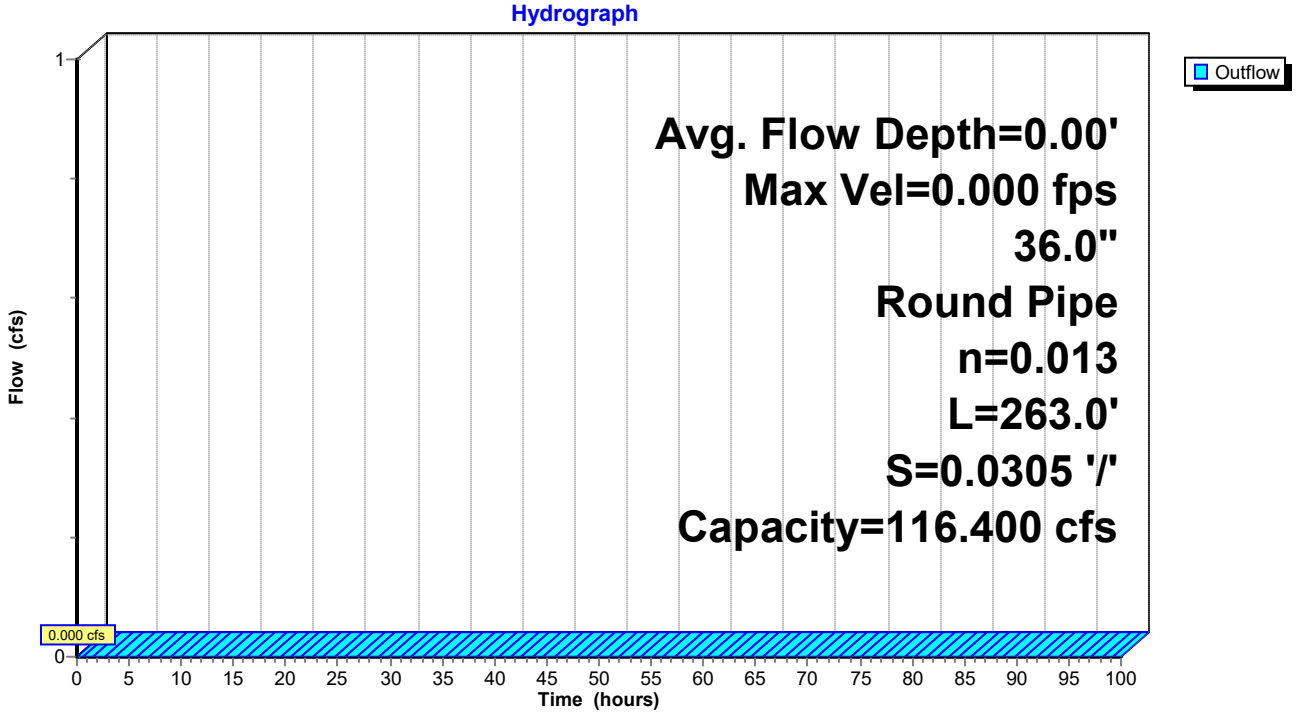
Summary for Reach 190834: Pipe Capacity (36" STM, S=0.0305)

[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 116.400 cfs

36.0" Round Pipe
n= 0.013
Length= 263.0' Slope= 0.0305 '/'
Inlet Invert= 166.81', Outlet Invert= 158.80'



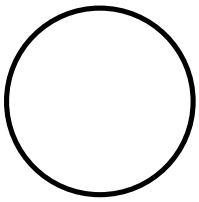


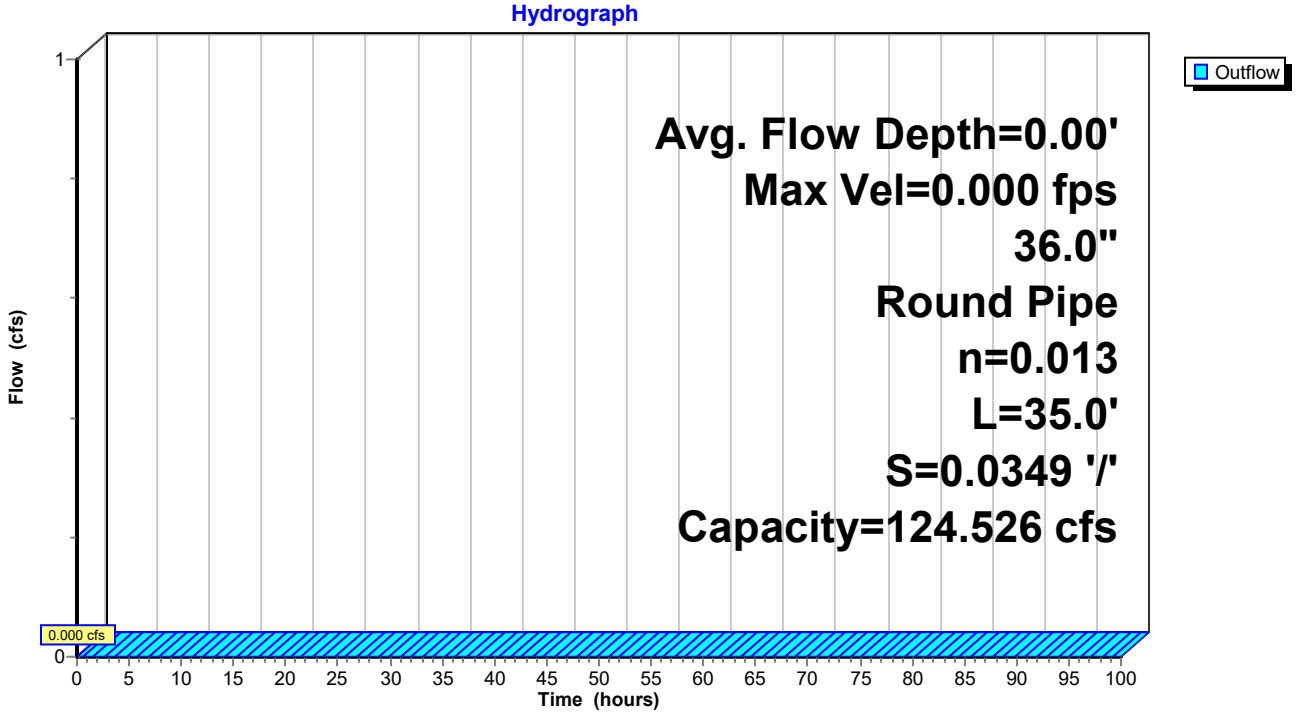
Summary for Reach 449854: Pipe Capacity (48" STM, S=0.0349)

[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 124.526 cfs

36.0" Round Pipe
n= 0.013
Length= 35.0' Slope= 0.0349 '/'
Inlet Invert= 154.64', Outlet Invert= 153.42'





APPENDIX G

GEOTECHNICAL REPORT

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Cornelius Multifamily Development
139 and 273 N 26th Avenue
Cornelius, Oregon

For
Fore Property Company
November 27, 2024

Project: ForeProp-13-01

NV5

November 27, 2024

Fore Property Company
1332 NW Kearney Street
Portland, OR 97209

Attention: Jason Wald

Report of Geotechnical Engineering Services
Cornelius Multifamily Development
139 and 273 N 26th Avenue
Cornelius, Oregon
Project: ForeProp-13-01

NV5 is pleased to present this report of geotechnical engineering services for the proposed Cornelius Multifamily development located at 139 and 273 N 26th Avenue in Cornelius, Oregon. Our services for this project were conducted in accordance with our proposal dated August 9, 2024

We appreciate the opportunity to be of service to you. Please contact us if you have questions regarding this report.

Sincerely,

NV5

Hayden Gluck, P.E.
Associate Engineer

Staci Butler, G.I.T.
Project Manager

SRB:HDG
Attachments
One copy submitted
Document ID: ForeProp-13-01-112724-geor.docx
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EXECUTIVE SUMMARY

Based on review of a preliminary site plan, we understand the proposed development includes demolishing existing structures associated with the current business occupant and utilities and constructing eight three-story, 24-unit, multifamily residential buildings with separate garages and a clubhouse building. Also included are an outdoor recreation area, paved parking and drive aisles, and utilities. We have summarized the pertinent geotechnical issues that will impact design and construction below. The main report should be referenced for a thorough description of the subsurface conditions and geotechnical recommendations.

- The site is currently occupied by a truck yard business surfaced with aggregate base rock. The existing structures and utilities will need to be demolished within the development area and backfilled as necessary with structural fill.

- The on-site soil should be capable of supporting the proposed structures on shallow footings bearing on firm, undisturbed native soil or granular pads underlain by firm, undisturbed native soil, depending on the foundation load. The main report provides detailed information regarding where granular pads are recommended.

- Static groundwater levels of 12 to 14.5 feet BGS were measured during the time of our explorations on October 30, 2024. Review of well logs indicates groundwater between 8 and 10 feet BGS in the vicinity of the site. Earthwork contractors should be prepared to dewater excavations that extend more than approximately 6 feet BGS and particularly during the wet season.

- Due to the fine-grained soil, the observed depth to groundwater at the site, and the results of our infiltration testing, we do not anticipate that on-site infiltration will be an effective stormwater management option.

- The fine-grained soil present at the ground surface is easily disturbed during the wet season. If not carefully executed, site earthwork can create soft areas and moderate repair costs can result. Subgrade protection is essential and may include placing 12 to 18 inches of granular material over subgrade for staging and haul road areas or cement amending the subgrade and covering it with a thin layer of crushed rock.

- The fine-grained soil present at the ground surface can be sensitive to small changes in moisture content and difficult, if not impossible, to adequately compact during wet weather or when the moisture content of the soil is more than a couple of percent above the optimum required for compaction. Depending on the time of year, significant drying will likely be required before using on-site soil as structural fill. Accordingly, the on-site soil can typically only be placed as structural fill during dry summer months.

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AC	asphalt concrete
ACP	Asphalt Concrete Pavement
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
BGS	below ground surface
CPT	cone penetration test
CRBG	Columbia River Basalt Group
DCP	dynamic cone penetrometer
ESAL	equivalent single-axle load
g	gravitational acceleration (32.2 feet/second^2)
H:V	horizontal to vertical
MCE	maximum considered earthquake
OSHA	Occupational Safety and Health Administration
OSSC	2021 Oregon Standard Specifications for Construction
PCC	portland cement concrete
pcf	pounds per cubic foot
pci	pounds per cubic inch
PG	performance grade
psf	pounds per square foot
psi	pounds per square inch
PVC	polyvinyl chloride
SPT	standard penetration test

1.0 INTRODUCTION

NV5 is pleased to submit this report of geotechnical engineering services for the proposed Cornelius Multifamily development located at 139 and 273 N 26th Avenue in Cornelius, Oregon. Figure 1 shows the site vicinity relative to surrounding features. Figure 2 shows the proposed development area and our approximate exploration locations.

We were provided with a preliminary site plan for the proposed development by Fore Property Company. We understand that development will consist of eight three-story, 24-unit, multifamily residential buildings and its associated parking lots and utilities. Preliminary foundation loads were not available at the time of this report; however, it has been assumed that the maximum column loads will be less than 200 kips and maximum wall loads less than 5 kips per square foot. If actual foundation loads differ from those within this report, a revised report should be issued. A grading plan was not available at the time of this report; however, based on existing site topography, we expect cut and fill will be less than 5 feet each.

Acronyms and abbreviations used herein are defined above, immediately following the Table of Contents.

2.0 PURPOSE AND SCOPE

The purpose of our services was to explore subsurface conditions and provide geotechnical engineering recommendations for the proposed development. The specific scope of our services is summarized as follows:

- Reviewed geotechnical and geologic information provided for the site and information from our in-house project files for projects in the site vicinity.
- Coordinated and managed the field explorations, including utility locates and scheduling subcontractors and NV5 field staff.
- Explored subsurface soil and groundwater conditions for the proposed development by conducting the following explorations and testing:
  - Drilled eight borings to of 16.5 feet BGS.
- Maintained a detailed log of each boring, classified the material encountered in the borings, and collected soil samples for laboratory testing.
- Conducted a laboratory testing program consisting of the following tests:
  - Sixteen moisture content determinations in general accordance with ASTM D2216
  - Four particle-size analyses in general accordance with ASTM D1140
  - One Atterberg limits test in general accordance with ASTM D4318
- Provided recommendations for site preparation, grading and drainage, stripping depths, fill type for imported material, compaction criteria, trench excavation and backfill, use of on-site soil, and wet/dry weather earthwork.

- Provided recommendations for the preferred foundation type, including allowable capacity, settlement estimates, and lateral resistance or response parameters. We anticipate the buildings will be supported on shallow foundations.
- Provided recommendations for floor slab subgrade preparation.
- Provided recommendations for design criteria for retaining walls, including lateral earth pressures, backfill, compaction, and drainage.
- Provided recommendations for managing identified groundwater conditions that may affect the performance of structures or pavement.
- Provided recommendations for construction of AC pavement for on-site access roads and parking areas, including subbase, base course, and AC paving thickness.
- Provided recommendations for ASCE 7-16 seismic coefficients and evaluated geologic hazards such as liquefaction and lateral spreading at the site. We have assumed a site-specific seismic hazard analysis is not required for the project.
- Prepared this geotechnical engineering report summarizing the results of our geotechnical evaluation.

3.0 SITE CONDITIONS

3.1 GEOLOGIC SETTING

Cornelius is located on the west margin of the Tualatin Basin physiographic province, which is a northwest- to southeast-trending structural basin bound by the Portland Hills and Tualatin Mountains to the north and east and the Chehalem Mountains and Coast Range to the south and west (Wilson, 1998). The geologic profile in the site vicinity is mapped as predominately alluvial deposits that have been accumulating in the Willamette Valley for over 20 million years, transported by tributaries from the Coast and Cascade ranges, foothills streams, and the upper Willamette River. In addition, the Willamette Valley was back flooded by catastrophic floods that traveled down the Columbia River, caused by drainage of large glacial lakes in western Montana (Allen et al., 1986). Most of these Missoula floods occurred between approximately 15,500 and 12,500 years ago. Flood waters rose to approximately 400 feet above MSL in the valley and deposited silt and fine sand (Willamette Silts) over the surfaces below that elevation. Since then, fluvial processes (stream erosion, avulsion, channel and floodplain deposition, reworking of older sediments, etc.) have created a complex series of terraces, dropping from the foothills down to the current Willamette River channel.

The Troutdale Formation underlies the flood deposits and is the main sedimentary fill for the Tualatin Basin. The basin fill consists of siltstone, claystone, and minor sandstone. In the site vicinity the Troutdale Formation ranges from 750 to 900 feet thick (Gannett and Caldwell, 1998; Madin, 1990; Schlicker and Deacon, 1967). Underlying the Troutdale Formation is the Miocene Age (20 to 10 million years before present) Columbia River Basalt Group that is a series of basalt flows that originated from southeastern Washington and northeastern Oregon. The Columbia River Basalt Group is considered to be the geologic basement unit for this report (Yeats et al., 1991).

3.2 SURFACE CONDITIONS

The 12.32-acre development area is currently occupied by a truck yard business with a building, gravel parking, and drive lanes. The site encompasses Tax Lots 04500 and 04600 of the Washington County Tax Map. The property is bordered by a movie theater to the east, Cornelius self-storage to the north, and grassy lots to the west and south. The development generally slopes east to west with elevations ranging from 187 to 191 feet based on topography available on Google Earth.

3.3 SUBSURFACE CONDITIONS

3.3.1 General

We drilled eight borings (B-1 through B-8) to depths of 16.5 feet BGS. A description of the recent explorations and laboratory testing program, the boring logs, and laboratory testing results are presented in Appendix A.

The subsurface conditions generally consist of sandy silt. We encountered aggregate base rock fill associated with existing parking and drive aisles across the site overlying sandy silt or sandy clay undocumented fill. The following sections present detailed descriptions of the soil units encountered.

3.3.2 Undocumented Fill

Undocumented fill was encountered in each boring to depths between 4 inches and 6 feet BGS. Between 4 and 14 inches of ¾" minus aggregate base was observed in each boring. In borings B-2 and B-4, B-5, B-6, and B-7, the aggregate was overlying sandy silt fill to depths between 2 and 6 feet bgs. In boring B-6, the aggregate was overlying stiff blue sandy clay to approximately 2.5 feet bgs. SPT results indicate the undocumented fill is medium stiff to stiff, and laboratory testing of one sample indicates a moisture content of 27 percent at the time of our explorations. The fill was likely placed during grading of the existing lot.

3.3.3 Silt

The explorations encountered silt with varying proportions of sand below the aggregate base rock and undocumented fill to depths of 16.5 feet BGS in borings B-1 through B-8. SPT results indicate that the silt is medium stiff to stiff. Laboratory testing on select samples of the silt indicates moisture contents between 25 and 38 percent and fines contents between 82 and 93 percent at the time of our explorations. Atterberg limits testing indicates native silt has a plasticity index of 12 percent.

3.3.4 Groundwater

Static groundwater was observed in the borings at depths of 12 to 14.5 feet BGS at the time of our explorations. Our review of water well logs on file with the Oregon Water Resources Department indicates that shallow groundwater is present in the site vicinity at depths between 8 and 10 feet BGS. The depth to groundwater may fluctuate in response to seasonal changes, prolonged rainfall, changes in surface topography, and other factors not observed in this study.

3.4 INFILTRATION TESTING

Infiltration testing was conducted at a depth of 3 feet BGS in boring B-3 and a depth of 5 feet BGS in boring B-6. Testing was performed by inserting a PVC pipe in the open boring using the

falling-head method in general accordance with Washington County's stormwater management manual. The pipe was embedded into soil at the bottom of the boring to create a seal so that water would flow into the subsurface and not between the side of the borehole and the pipe. The soil was saturated before beginning the test for a minimum 4-hour saturation period. The test was conducted by measuring the drop of the water level in the PVC pipe over time under low-head conditions after saturated conditions had been achieved. Based on infiltration test results shown below in Table 1, infiltration capacity of the on-site soil negligible. Given the negligible infiltration capacity of near-surface soil and relatively shallow groundwater at the site, we do not anticipate that infiltration will be an effective stormwater management option.

Table 1. Infiltration Testing Results

Boring	Depth (feet BGS)	Soil Type	Fines Content[1] (percent)	Infiltration Rate (inches per hour)
B-3	3	SILT minor sand (ML)	92	~0
B-6	5	Sandy SILT (ML)	82	~0

1. Fines content - material passing the U.S. Standard No. 200 sieve.

4.0 DESIGN

4.1 GENERAL

The following sections provide our design recommendations for the development. All site preparation and structural fill should be prepared as recommended in the "Construction" section.

4.2 FOUNDATION SUPPORT

4.2.1 General

Preliminary foundation loads have not been provided at the time of this report. We have assumed maximum column and wall loads of 200 kips and 5 kips per foot. Based on the results of our explorations, laboratory testing, and analysis, it is our opinion that the structures can be supported by spread footings bearing on firm, undisturbed native soil or granular pads overlying firm, undisturbed native soil. The recommended granular pad thicknesses are presented in Table 2. If column and wall loads exceed the maximum values in Table 2, we should be contacted to review our recommendations.

Table 2. Recommended Granular Pad Thicknesses for Spread Footings

	Maximum Load			
	Columns (kips)			Continuous Footings (kips per foot)
	0 to 70	70 to 130	130 to 200	0 to 5
Recommend Granular Pad Thickness (inches)	0	6	12	6

Granular pads should extend 6 inches beyond the margins of the footings for every foot excavated below the base grade of the footings. The granular pads should consist of imported granular material, as defined in the "Structural Fill" section. The imported granular material should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557, or until well keyed, as determined by one of our geotechnical staff. We recommend that a member of our geotechnical staff observe the prepared footing subgrade.

Undocumented fill was encountered at depths of up to 6 feet BGS during our explorations at the site. We anticipate fill may also be present in other areas. Spread footings should not be established on undocumented fill. Where encountered below footings, undocumented fill should be completely removed to native soil. Upon verification of native soil by a member of our field staff, the over-excavation should be backfilled with compacted crushed rock to the planned footing base. If performed, over-excavation should extend 6 inches beyond the margins of the footings for every foot excavated below the base grade of the footing.

4.2.2 Dimensions and Capacities

Footings should be established on firm native soil, structural fill, or granular pads overlying firm native soil or structural fill and proportioned for an allowable bearing pressure of 2,500 psf. This value is a net bearing pressure; the weight of the footing and overlying backfill can be ignored in calculating footing sizes. The recommended allowable bearing pressure applies to the total of dead plus long-term live loads and can be increased by one-third for short-term loads resulting from wind or seismic forces.

Continuous wall and isolated spread footings should be at least 18 and 24 inches wide, respectively. The bottom of exterior footings should be at least 18 inches below the lowest adjacent exterior grade. The bottom of interior footings should be established at least 12 inches below the base of the slab. If footings are excavated in the wet season, we recommend they are covered with a minimum of 6 inches of crushed rock shortly after excavation to prevent disturbance of the subgrade soil.

4.2.3 Resistance to Sliding

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction on the base of footings. Our analysis indicates that the allowable passive earth pressure for footings confined by the on-site soil or planned structural fill is 300 pcf. This value should be reduced to 150 pcf below groundwater levels. Adjacent floor slabs, pavement, or the upper 12-inch depth of unpaved areas should not be considered when calculating passive resistance.

An allowable coefficient of friction equal to 0.35 can be used for footings supported on native soil or structural fill. This value can be increased to 0.45 for footings on granular pads.

4.2.4 Subgrade Observation and Preparation

All footing subgrades and granular pads should be evaluated by a representative of NV5 to confirm suitable bearing conditions. Observations should also confirm that loose or soft material, organic material, unsuitable fill, and softened subgrade (if present) have been removed. Localized deepening of footing excavations may be required to penetrate any deleterious material.

4.3 FLOOR SLABS

Satisfactory subgrade support for building floor slabs supporting up to 150 psf can be achieved on the existing undisturbed native soil or on structural fill overlying undisturbed native soil. A minimum 6-inch-thick layer of aggregate base should be placed and compacted over the prepared soil subgrade. Imported granular material placed beneath building floor slabs should meet the requirements for aggregate base rock in the "Structural Fill" and "Fill Placement and Compaction" sections. A subgrade reaction modulus of 150 pci can be used to design floor slabs that bear on the native soil or structural fill over native soil.

The near-surface native soil is generally silty and will tend to maintain high moisture content. In areas where moisture-sensitive floor slab and flooring will be installed, inclusion of a vapor barrier is warranted in order to reduce the potential for moisture transmission through and efflorescence growth on the slab and flooring. In addition, flooring manufacturers often require vapor barriers to protect flooring and flooring adhesives and will warrant their product only if a vapor barrier is installed according to their recommendations.

4.4 SEISMIC DESIGN

4.4.1 Seismic Design Parameters

The soil profile is consistent with Site Class D in accordance with ASCE 7-16. The values presented in Table 3 can be used to compute design levels of ground shaking. ASCE 7-16 Section 11.4.8 requires a ground motion hazard study in accordance with Section 21.2 for structures on Site Class D sites with S_1 greater than or equal to 0.2 g (S_1 at the site is 0.438 g). Exception 2 of ASCE 7-16 Section 11.4.8 indicates a ground motion hazard study is not required, provided the value of the seismic response coefficient C_S is determined by Eq. (12.8-2) for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$.

Table 3. Seismic Design Parameters*

Seismic Design Parameter	Short Period (T_s)	1 Second Period (T_1)
MCE Spectral Acceleration	S_s = 0.900 g	S_1 = 0.438 g
Site Class	D	
Site Coefficient	F_a = 1.14	F_v = 1.862
Adjusted Spectral Acceleration	S_{MS} = 1.026 g	S_{M1} = 0.816 g
Design Spectral Response Acceleration Parameters	S_{DS} = 0.684 g	S_{D1} = 0.544 g

* The above parameters can be used provided the seismic response coefficient (C_s) is determined according to the exception in ASCE 7-16 Section 11.4.8 or else a site-specific response analysis will be required.

4.5 RETAINING STRUCTURES

4.5.1 Assumptions

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 10 feet in height; (3) the backfill is drained and consists of imported granular material; and (4) the backfill has a slope flatter than 4H:1V. Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project varies from these assumptions.

4.5.2 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 (such as basement walls), an at-rest 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 lineal foot of wall, where H is the height of the wall in feet, and applied as a distributed load with the centroid located at a distance of 0.6H from the base of the wall.

If surcharges (e.g., retained slopes, structure foundations, vehicles, steep slopes, 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. Our office should be contacted for appropriate wall surcharges based on the actual magnitude and configuration of the applied loads. The base of the wall footing excavations should extend a minimum of 12 inches below the lowest adjacent grade. The wall footings should be designed in accordance with the “Foundation Support” section.

4.5.3 Wall Drainage and Backfill

The above design parameters have been provided assuming back-of-wall drains will be installed to prevent buildup of hydrostatic pressure behind all walls. If a drainage system is not installed, our office should be contacted for revised design forces.

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 a minimum 1-foot-wide column of angular drain rock wrapped in a 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 to within approximately 1 foot of the ground surface. The angular drain rock should meet the requirements provided in the "Structural Fill" section. All wall backfill should be placed and compacted as recommended for select granular wall backfill in the "Structural Fill" and "Fill Placement and Compaction" sections.

Perforated collector pipes should be placed at the base of the granular backfill behind the walls. The pipe should be embedded in a minimum 1-foot-wide zone of angular drain rock. The drain rock should meet specifications provided in the "Structural Fill" section. The drain rock should be wrapped in a drainage geotextile fabric meeting the requirements in the "Geotextile Fabric" section. The collector pipes should discharge at an appropriate location away from the base of the wall. The discharge pipe should not be tied directly into stormwater drain systems, unless measures are taken to prevent backflow into the drainage system of the wall.

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 backfilling of the wall, unless survey data indicates that settlement is complete prior to that time.

4.6 PAVEMENT

Pavement should be installed on undisturbed native subgrade or new engineered fill prepared in conformance with the "Site Preparation" and "Materials" sections. The recommended pavement sections are for design traffic loads and are not intended for heavy construction traffic. Construction traffic should not be allowed on newly installed AC or NV5 should be contacted to provide alternate pavement sections to account for anticipated construction traffic. If any of the following assumptions vary from project design values, our office should be contacted with the appropriate information so that the pavement designs can be revised for current project needs.

Our pavement recommendations are based on the following assumptions:

- The top 12 inches of soil subgrade below the pavement section is compacted to at least 92 percent of the maximum dry density, as determined by ASTM D1557, or observations indicate that it is in a firm, unyielding condition.
- Resilient moduli of 20,000 psi and 5,100 psi were assumed for the aggregate base and native subgrade, respectively.
- Initial and terminal serviceability indices of 4.2 and 2.5, respectively.
- Reliability of 80 percent and standard deviation of 0.5.
- Structural coefficients of 0.42 and 0.10 for the AC and aggregate base, respectively.
- A 20-year design life with no growth.

- Light traffic consists of passenger vehicles. Heavy traffic consists of 90 percent two-axle and 10 percent three-axle trucks, such as garbage and delivery vehicles.
- Fire access will consist of an imposed fire apparatus load of 80,000 pounds on an infrequent basis.

Design traffic loading was not available at the time of this report. Based on our experience, we evaluated several speculative traffic scenarios for our pavement analysis. The results are summarized in Table 4. The design team can select the appropriate pavement section based on the final design traffic loading in different areas of the site. All recommended sections are suitable to support an 80,000-pound fire truck on an infrequent basis.

Table 4. Recommended Standard Pavement Sections

Pavement Use	Trucks per Day	ESAL	AC Thickness[1] (inches)	Aggregate Base Thickness[1] (inches)
Parking areas	0	3,000	2.5	6.0
Drive Aisles	5	25,000	3.0	8.0

1. All thicknesses are intended to be the minimum acceptable values.

If the subgrade is cement amended to at least 12 inches below the pavement section and in accordance with the "Cement Amendment" section, the aggregate base section can be reduced to 4.0 inches for all recommended pavement sections in Table 4.

All recommended pavement thicknesses are intended to be the minimum acceptable. Pavement design is based on the assumption that construction will be completed during an extended period of dry weather. Wet weather construction could require an increased thickness of aggregate base or cement amendment as discussed in the "Subgrade Protection" section.

The AC, aggregate base, and cement amendment should meet the requirements outlined in the "Materials" section.

4.7 DRAINAGE CONSIDERATIONS

4.7.1 Temporary

During earthwork at the site, 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.

4.7.2 Site Drainage

We recommend the finished ground surface around buildings slope away from the structures at a minimum 2 percent gradient for a distance of at least 5 feet. Downspouts or roof scuppers should discharge into a storm drain system that carries the collected water to an appropriate stormwater system. Trapped planter areas should not be created adjacent to buildings without providing means for positive drainage (e.g., swales or catch basins). Embedded walls should include drainage, as discussed in the "Retaining Structures" section.

4.8 PERMANENT SLOPES

Permanent cut and fill slopes should not exceed 2H:1V. Slopes that will be maintained by mowing and slopes that will be below the potential inundation depth for stormwater detention ponds should not be constructed steeper than 3H:1V. Access roads and pavement should be located at least 5 feet from the top of cut and fill slopes. The setback should be increased to 10 feet for buildings. The 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.

5.0 CONSTRUCTION

5.1 SITE PREPARATION

5.1.1 Demolition

Demolition should include complete removal of existing structures, buried foundations (if present), and pavement within 5 feet of areas to receive new pavement, buildings, retaining walls, or engineered fills. Underground vaults, tanks, wells, and other subsurface structures should be removed in areas of new improvements. Utility lines should be completely removed or grouted full if left in place. Existing basements, crawl spaces, or other voids resulting from removal of existing improvements should be backfilled with compacted structural fill, as discussed in the "Structural Fill" section. The bottom of such excavations should be excavated to expose a firm subgrade before filling and their sides sloped at a minimum of 1.5H:1V to allow for more uniform compaction at the edges of the excavations. Material generated during demolition should be transported off site for disposal or stockpiled in areas designated by the owner. It may be possible to use on-site concrete as structural fill in accordance with the "Structural Fill" section.

5.1.2 Grubbing and Stripping

Trees and shrubs should be removed from development areas. In addition, root balls should be grubbed out to the depth of the roots, which could exceed 3 feet BGS. Depending on the methods used to remove root balls, considerable disturbance and loosening of the subgrade could occur during site grubbing. We recommend that soil disturbed during grubbing operations be removed to expose firm, undisturbed subgrade. The resulting excavations should be backfilled with structural fill.

Any existing root zone in landscaped areas should be stripped and removed from all fill areas. The actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal or used in landscaped areas.

5.1.3 Subgrade Evaluation

A member of our staff should observe the exposed subgrade for floor slabs, pavement areas, and foundation excavations after site preparation has been completed to determine if there are areas of unsuitable or unstable soil. Our representative should observe proof rolling of structural fill, pavement, and slab subgrade with a fully loaded dump truck or similar heavy, rubber tire construction equipment to identify soft, loose, or unsuitable areas. During wet weather or in

areas not accessible to proof rolling equipment, the subgrade should be evaluated by probing. Areas containing soft or loose soil should be improved by replacing it with structural fill or scarifying and recompacting it in accordance with the "Structural Fill" and "Fill Placement and Compaction" sections. Scarifying and recompacting fine-grained soil will be difficult, if not impossible, during the wet season.

5.2 SUBGRADE PROTECTION

The fine-grained soil present at the ground surface on this site is easily disturbed, especially during periods of wet weather. If not carefully executed, site preparation, utility trench work, and roadway excavation can create extensive soft areas and significant repair costs can result. Earthwork planning, regardless of the time of year, should include considerations for minimizing subgrade disturbance.

If construction occurs during the wet season or if the moisture content of the surficial soil is more than a couple percentage points above optimum, demolition, site stripping, and cutting may need to be accomplished using track-mounted equipment. Likewise, the use of granular haul roads and staging areas will be necessary for support of construction traffic during the rainy season or when the moisture content of the surficial soil is more than a few percentage points above optimum. The recommended aggregate base rock thickness for new pavement is intended to support post-construction design traffic loads and may not support construction traffic or paving equipment when the subgrade soil is wet. Accordingly, if construction is planned for periods when the subgrade soil is wet, staging and haul roads with increased thicknesses of aggregate base will be required.

The size of staging and haul road areas, as well as the required thickness of granular material, will vary with the contractor's sequencing of a project and exposure to construction equipment. Based on our experience, between 12 and 18 inches of imported granular material is generally required in staging areas and between 18 and 24 inches in haul roads areas. Stabilization material may be used as a substitute, provided the top 4 inches of material consists of imported granular material. The actual thickness will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. In addition, a geotextile fabric can be placed as a barrier between fine-grained subgrade and imported granular material in areas of repeated construction traffic, such as site entrances. The imported granular material, stabilization material, and geotextile fabric should meet the specifications in the "Materials" section. The existing pavement can remain in place in some areas to provide subgrade protection during wet weather construction.

As an alternative to thickened crushed rock sections, the subgrade can be cement amended to provide wet weather protection from construction traffic. The cement-amended subgrade should be covered by at least 4 inches of granular fill material. This recommendation is based on an assumed minimum unconfined compressive strength of 100 psi for subgrade amended to a depth of 12 to 16 inches. The actual thickness of the amended material and imported granular material will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. Cement amendment is discussed in the "Materials" section.

5.3 EXCAVATION

5.3.1 General

Excavations will be required to construct new foundations, utilities, pavement, and other improvements. Conventional earthmoving equipment in proper working condition should be capable of making the necessary excavations. Static groundwater levels indicated depths of between 12 and 14.5 feet BGS at the time of our explorations, and well logs indicate groundwater as shallow as 8 feet BGS nearby. It is possible that perched groundwater will be present at shallower depths, especially during periods of persistent wet weather. If groundwater is encountered in excavations, sloughing and caving will likely occur. Accordingly, the contractor should expect to flatten excavations or shore excavations as described below where water is encountered. In addition to safety considerations, caving and loss of ground will increase backfill volumes and can result in damage to adjacent structures or utilities.

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 outside the base of the existing elements. 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.

5.3.2 Excavation and Shoring

Temporary excavation sidewalls in the native soil should stand vertical to a depth of approximately 4 feet, provided groundwater seepage is not observed in the sidewalls. Open excavation techniques may be used to excavate trenches with depths between 4 and 8 feet, provided the walls of the excavation are cut at a slope of 1H:1V and groundwater seepage is not present. At this inclination, the slopes may ravel and require some ongoing repair. Excavations should be flattened within the existing undocumented gravel fill and/or if excessive sloughing or raveling occurs. In lieu of large and open cuts, approved temporary shoring may be used for excavation support. A wide variety of shoring and dewatering systems are available. Consequently, we recommend the contractor be responsible for selecting the appropriate shoring and dewatering systems.

If box shoring is used, it should be understood that box shoring is a safety feature used to protect workers and does not prevent caving. If the excavations are left open for extended periods of time, caving of the sidewalls will likely occur. The presence of caved material will limit the ability to properly backfill and compact the trenches. The contractor should be prepared to fill voids between the box shoring and the sidewalls of the trenches with sand or gravel before caving occurs.

If shoring is used, we recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation.

5.3.3 Temporary Dewatering

If groundwater is encountered in shallow excavations, it can likely be dewatered using sumps and pumps. More intense use of pumps may be required at certain times of the year and where more intense seepage occurs. Dewatering systems are best designed by the contractor. Removed water should be routed to a suitable discharge point.

If groundwater is present at the base of utility trench excavations, we recommend placing up to 12 inches of stabilization material at the base of the excavations. Trench stabilization material should meet the requirements provided in the "Structural Fill" section.

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 these systems based on their means and methods.

5.3.4 Safety

All excavations should be made in accordance with applicable OSHA requirements and regulations of the state, county, and local jurisdiction. While this report describes certain approaches to excavation and dewatering, the contract documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety, and providing shoring (as required) to protect personnel and adjacent structural elements.

5.4 MATERIALS

5.4.1 Structural Fill

5.4.1.1 General

Fill should be placed on subgrade that has been prepared in conformance with the "Site Preparation" section. A variety of material may be used as structural fill at the site. However, all material used as structural fill should be free of organic material or other unsuitable material and should meet the specifications provided in OSSC 00330 (Earthwork), OSSC 00400 (Drainage and Sewers), and OSSC 02600 (Aggregates), depending on the application. A brief characterization of some of the acceptable materials and our recommendations for their use as structural fill are provided below. Fill should be compacted as described in the "Fill Placement and Compaction" section.

In locations where fill is to be placed on slopes steeper than 4H:1V, level benches should be cut into the existing sloping surfaces. The benches should be a minimum of 10 feet wide or 1½ times the width of the compaction equipment, whichever is wider. Fill slopes with grades of 3H:1V or steeper should also be overbuilt by at least 2 feet and cut back to finished grade.

5.4.1.2 On-Site Soil

The on-site material should generally be suitable for use as structural fill, provided it is properly moisture conditioned; free of debris, organic material, and particles over 8 inches in diameter; and meets the specifications provided in OSSC 00330.12 (Borrow Material). Laboratory testing indicates that the on-site soil was generally above optimum moisture content at the time of exploration. Significant moisture conditioning (drying) will be required to use on-site soil for structural fill. Accordingly, extended dry weather and a large area will be required to adequately

condition and place the on-site soil as structural fill. It will be difficult, if not impossible, to adequately compact on-site soil during the rainy season or during prolonged periods of rainfall, unless it is cement amended. In general, on-site soil should only be used as structural fill during the dry summer months.

5.4.1.3 Imported Granular Material

Imported granular material used as structural fill should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in OSSC 00330.14 (Selected Granular Backfill) or OSSC 00330.15 (Selected Stone Backfill). The imported granular material should also be angular, should be fairly well graded between coarse and fine material, should have less than 6 percent by dry weight passing the U.S. Standard No. 200 sieve, and should have at least two fractured faces.

5.4.1.4 Stabilization Material

Stabilization material used in staging or haul road areas, in trenches, or for other applications should consist of 4- or 6-inch-minus pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in OSSC 00330.15 (Selected Stone Backfill). 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 material. Stabilization material should be placed in lifts between 12 and 24 inches thick and compacted to a firm condition.

5.4.1.5 Trench Backfill

Trench backfill placed beneath, adjacent to, and for at least 12 inches above utility lines (i.e., the pipe zone) should consist of well-graded granular material with a maximum particle size of 1½ inches and less than 10 percent by dry weight passing the U.S. Standard No. 200 sieve and should meet the specifications provided in OSSC 00405.13 (Pipe Zone Material). Within roadway alignments, the remainder of the trench backfill up to the subgrade elevation should consist of well-graded granular material with a maximum particle size of 2½ inches and less than 10 percent by dry weight passing the U.S. Standard No. 200 sieve and should meet the specifications provided in OSSC 00405.14 (Trench Backfill; Class B, C, or D).

Outside of structural improvement areas (e.g., roadway alignments or building pads), trench backfill placed above the pipe zone may consist of general fill material that is free of organic material and material over 6 inches in diameter and meets the specifications provided in OSSC 00405.14 (Trench Backfill; Class A, B, C, or D).

5.4.1.6 Drain Rock

Drain rock should consist of angular, granular material with a maximum particle size of 2 inches and should meet the specifications provided in OSSC 00430.11 (Granular Drain Backfill Material). The material should be free of roots, organic material, and other unsuitable material; should have less than 2 percent by dry weight passing the U.S. Standard No. 200 sieve (washed analysis); and should have at least two mechanically fractured faces. Drain rock should be compacted to a well-keyed, firm condition.

5.4.1.7 Aggregate Base Rock

Imported granular material used as base rock for building floor slabs and pavement should consist of ¾- or 1½-inch-minus material (depending on the application) and meet the requirements in OSSC 00641 (Aggregate Subbase, Base, and Shoulders). The aggregate should have at least two mechanically fractured faces. In addition, the aggregate should have less than 6 percent by dry weight passing the U.S. Standard No. 200 sieve.

5.4.1.8 Retaining Wall Select 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 select granular material that meets the specifications provided in OSSC 00510.12 (Granular Wall Backfill) or OSSC 00510.13 (Granular Structure Backfill). We recommend the select granular wall 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 backfill should be placed and compacted as recommended for structural fill, with the exception of backfill placed immediately adjacent to walls. Backfill adjacent to walls should be compacted to a lesser standard to reduce the potential generation of excessive pressure on the walls.

5.4.1.9 Recycled On-Site Material

AC and conventional concrete from demolition of on-site structures may be used as fill if it is processed to meet the requirements for its intended use. Processing includes crushing and screening, grinding in place, or other methods to meet the requirements for structural fill as described above. The processed material should be fairly well graded and not contain metal, organic material, or other deleterious material. The processed material may be mixed with on-site soil or imported fill to assist in achieving the gradation requirements. We recommend that processed recycled fill have the maximum particles size as listed in Table 5.

Table 5. Processed Fill Maximum Particle Size

Depth of Placement[1]	Maximum Particle Size (inches)
0 feet to 1 foot	Not recommended
1 foot to 2 feet	2
2 to 6 feet	4
6 to 10 feet	8
Deeper than 10 feet	12

1. Below subgrade of structural element

Recycled on site fill material should not be used within a depth of 1 foot from foundations, floor slabs, pavement, or other subsurface elements. We also caution that excavation through recycled material that is placed as structural fill may be difficult if it has a significant fraction of oversized particles. In addition, these excavations may also be prone to raveling and caving.

5.4.2 Geotextile Fabric

5.4.2.1 Subgrade Geotextile

Subgrade geotextile should conform to OSSC Table 02320-4 and OSSC 00350 (Geosynthetic Installation). A minimum initial aggregate base lift of 6 inches is required over geotextiles.

5.4.2.2 Drainage Geotextile

Drainage geotextile should conform to Type 2 material of OSSC Table 02320-1 and OSSC 00350 (Geosynthetic Installation). A minimum initial aggregate base lift of 6 inches is required over geotextiles.

5.4.3 AC

5.4.3.1 ACP

On-site AC should be Level 2, ½-inch, dense ACP according to OSSC 00744 (Asphalt Concrete Pavement) and compacted to 91 percent of the maximum specific gravity of the mix, as determined by AASHTO T 209. The minimum and maximum lift thicknesses are 2.0 and 3.0 inches, respectively, for ½-inch ACP. Asphalt binder should be performance graded and conform to PG 64-22 or better.

5.4.3.2 Cold Weather Paving Considerations

In general, AC paving is not recommended during cold weather (temperatures less than 40 degrees Fahrenheit). Compacting under these conditions can result in low compaction and premature pavement distress.

Each AC mix design has a recommended compaction temperature range that is specific for the particular AC binder used. In colder temperatures, it is more difficult to maintain the temperature of the AC mix as it can lose heat while stored in the delivery truck, as it is placed, and in the time between placement and compaction. In Oregon, the AC surface temperature during paving should be at least 40 degrees Fahrenheit for lift thickness greater than 2.5 inches and at least 50 degrees Fahrenheit for lift thickness between 2.0 and 2.5 inches.

If paving activities must take place during cold weather construction as defined above, the project team should be consulted and a site meeting should be held to discuss ways to lessen low compaction risks.

5.4.4 PCC

If used, PCC should be Class 4000- ¾-inch or 1½-inch paving concrete according to OSSC 02001 (Concrete) with a minimum 28-day flexural strength of 600 psi and placed in general accordance with OSSC 00756 (Plain Concrete Pavement). Joints should be constructed in general accordance with OSSC 00756.48 (Joints) with a maximum transverse joint spacing of 12 feet (10 feet for pavement over amended subgrade). In addition, the length-to-width ratio for any panel should be at least 0.75 and should not exceed 1.25.

5.4.5 Cement Amendment

5.4.5.1 General

As an alternative to the use of imported granular material for wet weather structural fill, an experienced contractor may be able to amend the on-site 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. Cement amendment should not be used if runoff during construction cannot be directed away from adjacent wetlands.

5.4.5.2 Subbase Stabilization

We recommend a target strength for cement-amended subgrade for building and pavement subbase (below aggregate base) soil of 100 psi. Successful use of soil amendment depends on the use of correct techniques and equipment, soil moisture content, and the amount of cement added to the soil. The recommended percentage of cement is based on soil moisture contents at the time of placing the structural fill. Based on our experience, 6 percent cement by weight of dry soil is generally satisfactory when the soil moisture content does not exceed approximately 25 percent. If the soil moisture content is in the range of 25 to 35 percent, 7 to 9 percent by weight of dry soil is recommended. It is difficult to accurately predict field performance due to the variability in soil response to cement amendment. The amount of cement added to the soil may need to be adjusted based on field observations and performance. Moreover, depending on the time of year and moisture content levels during amendment, water may need to be applied during tilling to appropriately condition the soil moisture content. The amount of cement used during amendment should be based on an assumed soil dry unit weight of 110 pcf. For preliminary design purposes, we recommend a minimum of 7 percent cement based on current soil moisture contents of 30 to 34 percent in the upper several feet of soil. It is not possible to amend soil during heavy or continuous rainfall. Work should be completed during suitable conditions.

We recommend cement-spreading equipment be equipped with balloon tires to reduce rutting and disturbance of the fine-grained soil. A static sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds should be used for initial compaction of the fine-grained soil. A smooth-drum roller with a minimum applied linear force of 700 pounds per inch should be used for final compaction.

A minimum curing time of four days is required between amendment and construction traffic access. Construction traffic should not be allowed on unprotected, cement-amended subgrade. To protect the cement-amended surfaces from abrasion or damage, the finished surface should be covered with 4 to 6 inches of imported granular material.

Amendment depths for building/pavement, haul roads, and staging areas are typically on the order of 12, 16, and 12 inches, respectively. The crushed rock typically becomes contaminated with soil during construction. Contaminated base rock should be removed and replaced with clean rock in pavement areas. The actual thickness of the amended material and imported granular material for haul roads and staging areas will depend on the anticipated traffic, as well as the contractor's means and methods and, accordingly, should be the contractor's

responsibility. Cement amendment should not be attempted when the air temperature is below 40 degrees Fahrenheit or during moderate to heavy precipitation. Cement should not be placed when the ground surface is saturated or standing water exists.

5.4.5.3 Cement-Amended Structural Fill

On-site soil that is not suitable for structural fill due to high moisture content may be amended and placed as fill over a subgrade prepared in conformance with the "Site Preparation" section. Cement-amended fill lift thicknesses should be limited to 12 inches. The cement ratio for general cement-amended fill can generally be reduced by 1 percent (by dry weight). Typically, a minimum curing time of four days is required between amendment and construction traffic access. Consecutive lifts of fill may be amended immediately after the previous lift has been amended and compacted (e.g., the four-day wait period does not apply). However, where the final lift of fill is a building or roadway subgrade, the four-day wait period is in effect for the final lift of cement-amended soil.

5.4.5.4 Other Considerations

Portland cement-amended soil is hard and has low permeability. This soil does not drain well and it is not suitable for planting. Future planted areas should not be cement amended, if practical, or accommodations should be made for drainage and planting. Moreover, cement amending soil within building areas must be done carefully to avoid trapping water under floor slabs. We should be contacted if this approach is considered. Cement amendment should not be used if runoff during construction cannot be directed away from adjacent wetlands (if any). Cement amendment runoff should be collected, monitored, and treated in accordance with Oregon Department of Environmental Quality requirements prior to being discharged.

5.4.5.5 Specification Recommendations

We recommend that the following comments be included in the specifications for the project:

- In general, cement amendment is not recommended during cold weather (temperatures less than 40 degrees Fahrenheit) or during rainfall.
- Mixing Equipment
  - Use a pulverizer/mixer capable of uniformly mixing the cement into the soil to the design depth. Blade mixing will not be allowed.
  - Pulverize the soil-cement mixture such that 100 percent by dry weight passes a 1-inch sieve and a minimum of 70 percent passes a No. 4 sieve, exclusive of gravel or stone retained on these sieves. If water is required, the pulverizer should be equipped to inject water to a tolerance of ¼ gallon per square foot of surface area.
  - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the pulverizer/mixer vehicle. If subgrade is disturbed, the tilling/amendment depth shall extend the full depth of the disturbance.
  - Multiple "passes" of the tiller may be required to adequately blend the cement and soil mixture.
- Spreading Equipment
  - Use a spreader capable of distributing the cement uniformly on the ground to within 5 percent variance of the specified application rate.
  - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the spreader vehicle. If subgrade is disturbed, the tilling/amendment depth shall extend the full depth of the disturbance.

- Compaction Equipment
  - Use a static, sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds for initial compaction of fine-grained soil (silt and clay) or an alternate approved by the geotechnical engineer.

5.5 FILL PLACEMENT AND COMPACTION

Fill soil should be compacted at a moisture content that is within 3 percent of optimum. The maximum allowable moisture content varies with the soil gradation and should be evaluated during construction. Fill and backfill material should be placed in uniform, horizontal lifts and compacted with appropriate equipment. The maximum lift thickness will vary depending on the material and compaction equipment used but should generally not exceed the loose thicknesses provided in Table 6. Fill material should be compacted in accordance with the compaction criteria provided in Table 7.

Table 6. Recommended Uncompacted Lift Thickness

Compaction Equipment	Recommended Uncompacted Lift Thickness (inches)		
	Silty/Clayey Soil	Granular and Crushed Rock Maximum Particle Size ≤ 1½ Inches	Crushed Rock Maximum Particle Size > 1½ Inches
Hand tools: Plate compactor and jumping jack	4 to 8	4 to 8	Not recommended
Rubber tire equipment	6 to 8	10 to 12	6 to 8
Light roller	8 to 10	10 to 12	8 to 10
Heavy roller	10 to 12	12 to 18	12 to 16
Hoe pack equipment	12 to 16	18 to 24	18 to 24

The table above is based on our experience and is intended to serve only as a guideline. The information provided in this table should not be included in the project specifications.

Table 7. Compaction Criteria

Fill Type	Compaction Requirements in Structural Zones		
	Percent Maximum Dry Density Determined by ASTM D1557		
	0 to 2 Feet Below Subgrade (percent)	Greater Than 2 Feet Below Subgrade (percent)	Pipe Zone (percent)
Area fill (granular)	95	95	-----
Area fill (fine grained)	92	92	-----
Aggregate bases	95	95	-----
Trench backfill[1,2]	95	92	90[1,2]
Retaining wall backfill	95[3]	92[3]	-----

1. Trench backfill above the pipe zone in non-structural areas should be compacted to 85 percent.
2. Or as recommended by the pipe manufacturer.
3. Should be reduced to 90 percent within a horizontal distance of 3 feet from the retaining wall.

5.6 EROSION CONTROL

The fine-grained soil at this site is eroded easily by wind and water; therefore, erosion control measures should be carefully planned and in place before construction begins. Measures that can be employed to reduce erosion include the use of silt fences, hay bales, buffer zones of natural growth, sedimentation ponds, and granular haul roads. All erosion control methods should be in accordance with local jurisdiction standards. During earthwork at the site, the contractor should be responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface.

6.0 OBSERVATION OF CONSTRUCTION

Satisfactory earthwork and foundation performance depend to a large degree on the quality of construction. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated. In addition, 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.

7.0 LIMITATIONS

We have prepared this report for use by Fore Property Company and members of the design and construction team for the proposed project. The data and report can be used for estimating purposes, but our report, conclusions, and interpretations should not be construed as a 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. The soil explorations 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. In addition, if design changes are made, we should be retained to review our conclusions and recommendations and to provide a written evaluation or modification.

The site development plans and design details were preliminary at the time this report was prepared. When the design has been finalized and if there are changes in the site grades, location, or 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 modification or verification.

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 the 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,

NV5

Staci Butler, G.I.T.
Project Manager

Hayden Gluck, P.E.
Associate Engineer



REFERENCES

Allen, J.E., M. Burns, and S. Sargent, 1986, Cataclysms on the Columbia: Timber Press, Portland, Oregon; 211 p.

ASCE, 2016. *Minimum Design Loads and Associated Criteria for Buildings and Other Structures.* ASCE Standard ASCE/SEI 7-16.

Gannett, Marshall W., and Caldwell, Rodney R., 1998, Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U. S. Geological Survey Professional Paper 1424-A, 32p, 8 plates.

ODOT, 2019. *ODOT Pavement Design Guide,* Pavement Services Unit, Oregon Department of Transportation, January 2019.

ODOT, 2021. *Oregon Standard Specifications for Construction,* Oregon Department of Transportation, 2021 Edition.

Schlicker, Herbert G., and Deacon, Robert J., 1967, Engineering Geology of the Tualatin Valley Region, Oregon. Oregon Department of Geology and Mineral Industries, Bulletin 60, 103 p. text, 4 plates.

Wilson, Doyle C., 1998, Post-middle Miocene Geologic Evolution of the Tualatin Basin, Oregon, Oregon Geology, vol. 60, no. 5., p. 99-116.

Yeats, Robert S., Graven, Erik P., Werner, Kenneth S., Goldfinger, Chris, and Popowski, Thomas A., 1991, Tectonics of the Willamette Valley, Oregon; U.S. Geological Survey Professional Paper Open-File Report 91-441-P, pp. 47.

FIGURES



VICINITY MAP BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO®

NIV5	FOREPROP-13-01	**VICINITY MAP**	
	NOVEMBER 2024	CORNELIUS MULTIFAMILY DEVELOPMENT CORNELIUS, OREGON	**FIGURE 1**

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File Name: J:\E-L\ForeProp\ForeProp-13\ForeProp-13-01\Figures\CAD\ForeProp-13-01-VM01.dwg | Layout: FIGURE 1



LEGEND:

B-1 BORING

N

0 120 240

(SCALE IN FEET)

SITE PLAN BASED ON AERIAL PHOTOGRAPH DATED MAY 13, 2021, OBTAINED FROM GOOGLE EARTH PRO.

SITE PLAN

CORNELIUS MULTIFAMILY DEVELOPMENT
CORNELIUS, OREGON

FIGURE 2

FOREPROP-13-01

NOVEMBER 2024

NV5

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File Name: J:\E-L\ForeProp\ForeProp-13\ForeProp-13-01\Figures\CAD\ForeProp-13-01-SP01.dwg | Layout: FIGURE 2

APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

We explored subsurface conditions at the site by drilling eight borings (B-1 through B-8) to depths 16.5 feet BGS. The borings were completed by Dan J. Fisher Excavating, Inc. of Forest Grove, Oregon, using a trailer-mounted drill rig with solid stem auger methods on October 30, 2024. The boring logs are presented in this appendix.

The approximate locations of the explorations are shown on Figure 2. The locations were determined in the field by pacing or measuring from existing site features. This information should be considered accurate only to the degree implied by the methods used.

SOIL SAMPLING

We collected representative samples of the various soil encountered during drilling for geotechnical laboratory testing. Samples were collected from the borings using 1½-inside diameter, split-spoon SPT sampler in general accordance with ASTM D1586. Each sampler was driven into the soil with a 140-pound automatic trip hammer free falling 30 inches. Each sampler was driven a total distance of 18 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the exploration logs, unless otherwise noted. Sampling methods and intervals are shown on the exploration logs.

The hammer used to conduct the SPTs was lifted using a rope and cathead system. The hammer was raised using two wraps of the rope around the cathead to conduct the SPTs.

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 soil or their characteristics change, although the change actually could be gradual. If the change occurred between sample locations, the depth was interpreted. Classifications are shown on the exploration logs.

LABORATORY TESTING

CLASSIFICATION

The soil samples were classified in the laboratory to confirm field classifications. The laboratory classifications are shown on the exploration logs if those classifications differed from the field classifications.

MOISTURE CONTENT

The natural moisture content of select soil samples was determined 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

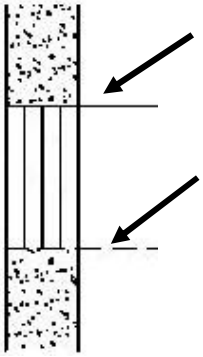
Particle-size analysis was performed on select soil samples in general accordance with ASTM D1140. The test is a qualitative determination of the amount of material finer than the U.S. Standard No. 200 sieve expressed as a percentage of soil weight. The test results are presented in this appendix.

ATTERBERG LIMITS

The plastic limit and liquid limit (Atterberg limits) of a select soil sample were determined in general accordance with ASTM D4318. The Atterberg limits and the plasticity index were completed to aid in the classification of the soil. The plastic limit is defined as the moisture content (in percent) where the soil becomes brittle. The liquid limit is defined as the moisture content where the soil begins to act similar to a liquid. The plasticity index is the difference between the liquid and plastic limits. 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 (SPT) 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-outside diameter 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 Test (SPT) 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 Test (SPT) 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

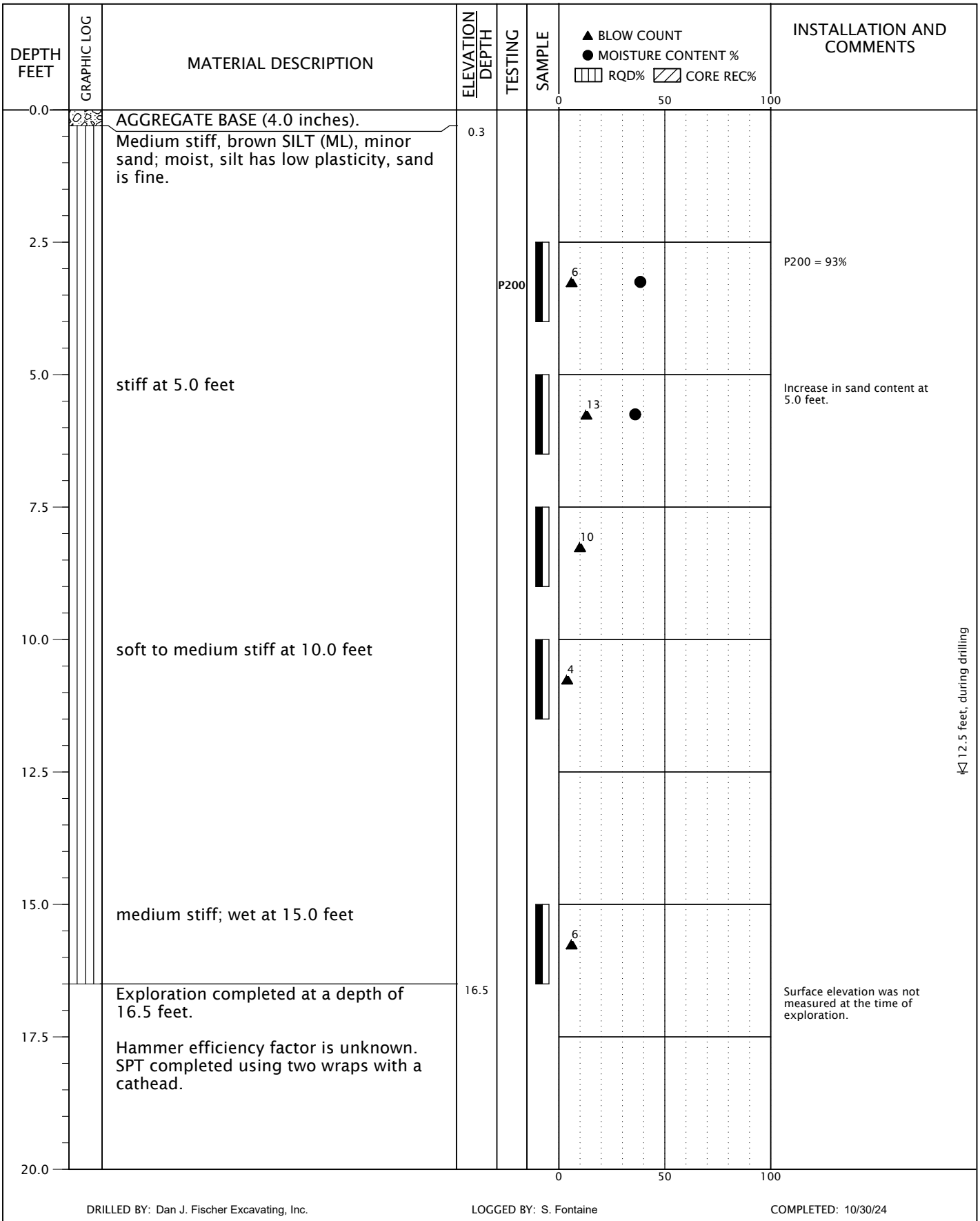
PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOIL (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC 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		ADDITIONAL CONSTITUENTS					
		Secondary granular components or other materials such as organics, man-made debris, etc.					
			Silt and Clay In:			Sand and Gravel In:	
Term	Field Test	Percent	Fine-Grained Soil	Coarse-Grained Soil	Percent	Fine-Grained Soil	Coarse-Grained Soil
dry	very low moisture, dry to touch						
moist	damp, without visible moisture	< 5	trace	trace	< 5	trace	trace
		5 – 12	minor	with	5 – 15	minor	minor
wet	visible free water, usually saturated	> 12	some	silty/clayey	15 – 30	with	with
					> 30	sandy/gravelly	Indicate %

NV5

SOIL CLASSIFICATION SYSTEM

TABLE A-2



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

NV5

FOREPROP-13-01

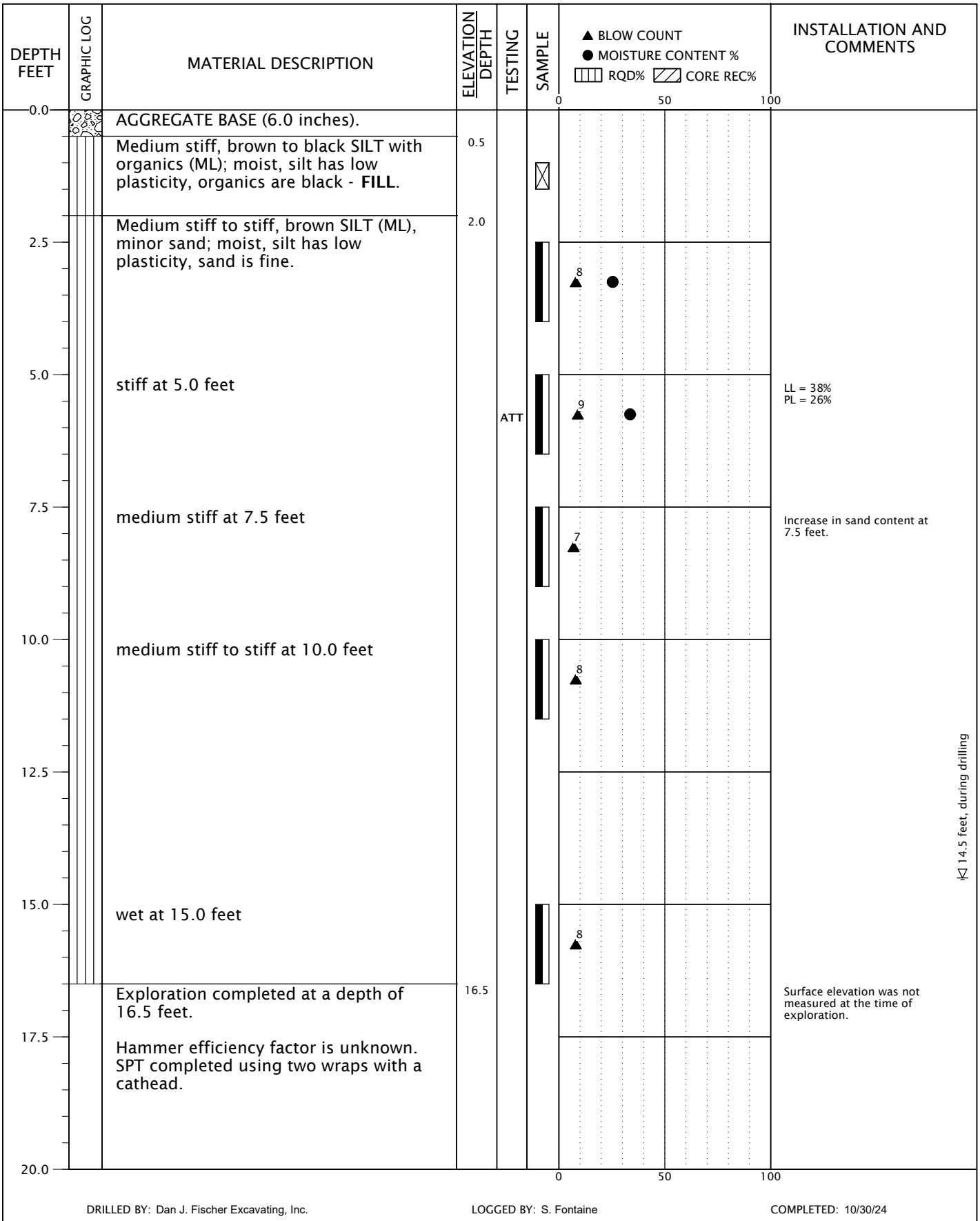
BORING B-1

NOVEMBER 2024

CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-1

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

N|V|5

FOREPROP-13-01

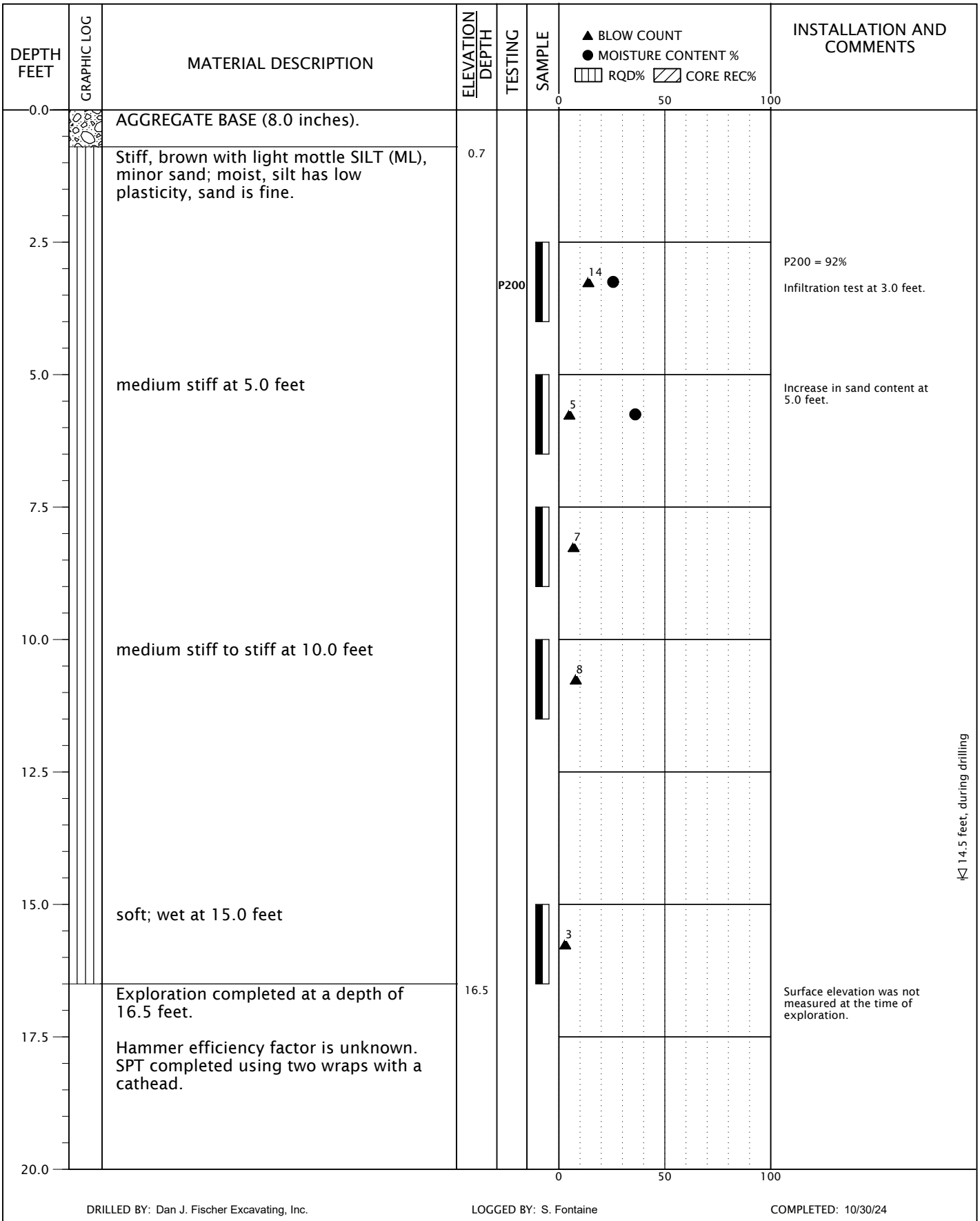
BORING B-2

NOVEMBER 2024

CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-2

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

NV5

FOREPROP-13-01

BORING B-3

NOVEMBER 2024

CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-3

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH
0.0	AGGREGATE BASE (12.0 inches).	
	Medium stiff to stiff, blue, sandy SILT with organics (ML); moist, silt has low plasticity, sand is fine, organics are black - **FILL**.	1.0
2.5		
5.0		
	Very stiff, brown, sandy SILT (ML); moist, silt has low plasticity, sand is fine.	6.0
7.5	stiff at 7.5 feet	
10.0		
12.5		
15.0	soft; wet at 15.0 feet	
	Exploration completed at a depth of 16.5 feet.	16.5
17.5	Hammer efficiency factor is unknown. SPT completed using two wraps with a cathead.	
20.0		

GRAPHIC LOG

TESTING

SAMPLE

▲ BLOW COUNT
● MOISTURE CONTENT %
RQD% CORE REC%

0 50 100

8
20
11
9
2

0 50 100

INSTALLATION AND COMMENTS

Surface elevation was not measured at the time of exploration.

▽ 14.0 feet, during drilling

DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

N|V|5

FOREPROP-13-01

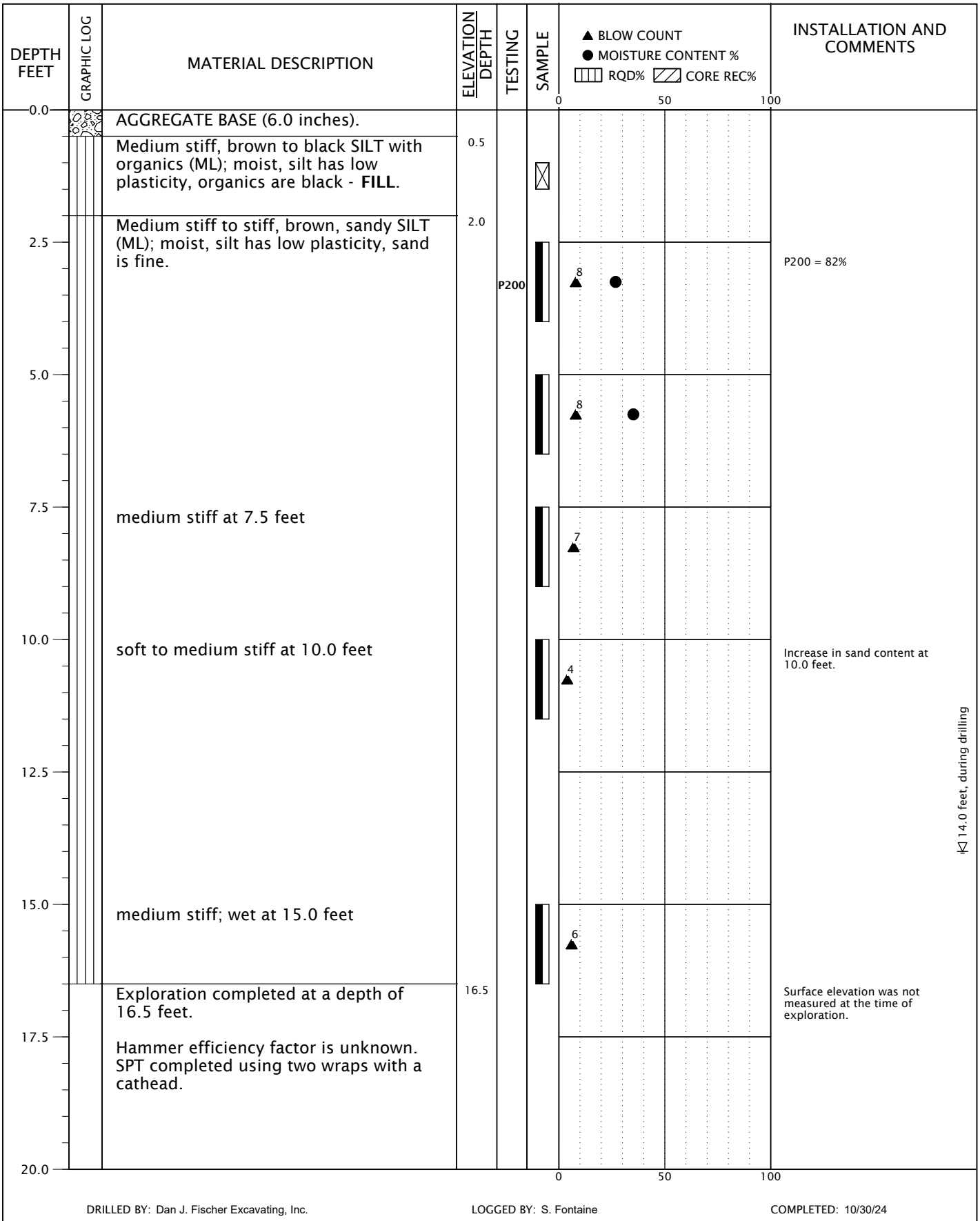
BORING B-4

NOVEMBER 2024

CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-4

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

N|V|5

FOREPROP-13-01

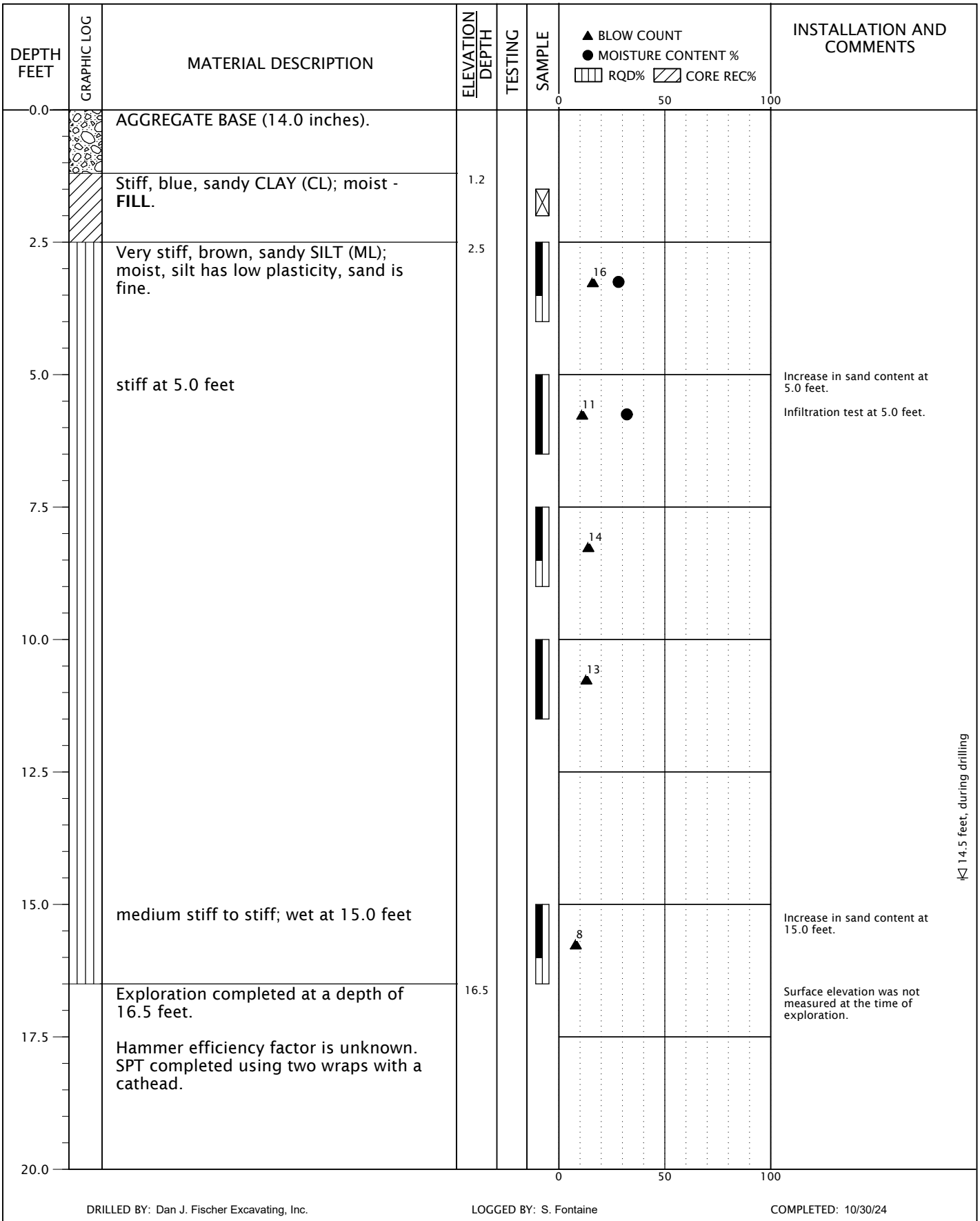
BORING B-5

NOVEMBER 2024

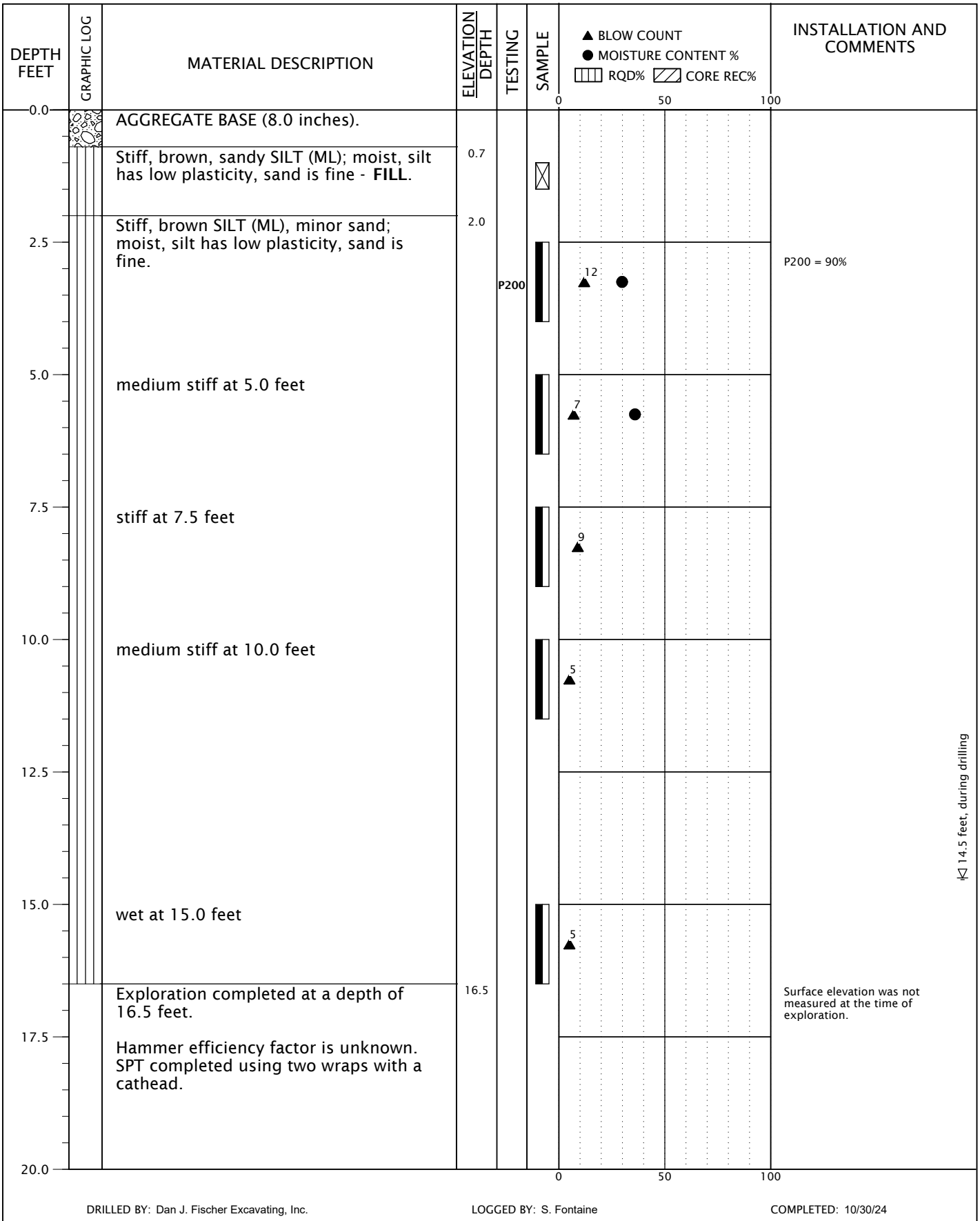
CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-5

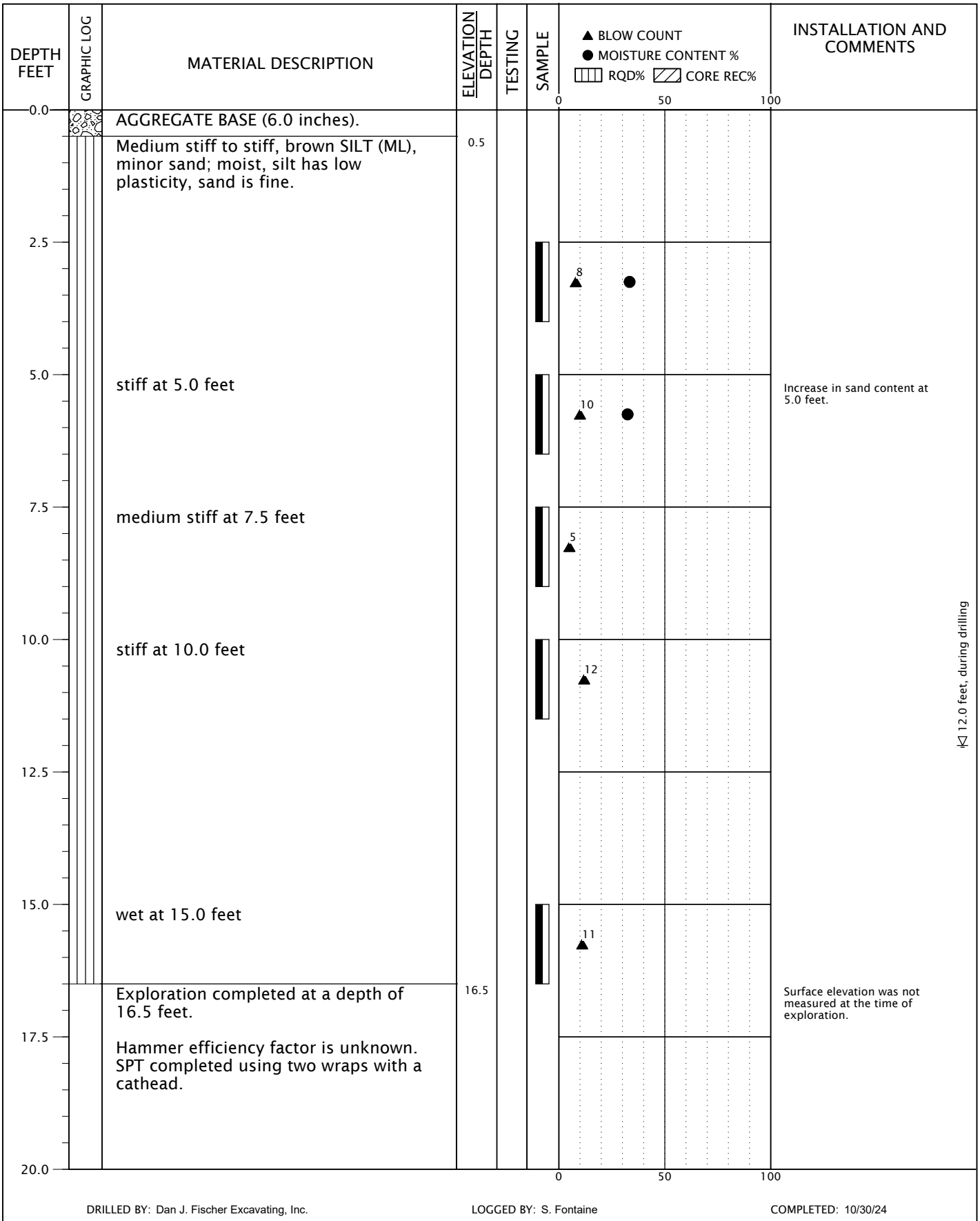
BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



NV5	FOREPROP-13-01	**BORING B-6**
	NOVEMBER 2024	CORNELUS MULTIFAMILY DEVELOPMENT CORNELUS, OR
		FIGURE A-6



NV5	FOREPROP-13-01	**BORING B-7**
	NOVEMBER 2024	CORNELUS MULTIFAMILY DEVELOPMENT CORNELUS, OR
		FIGURE A-7



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

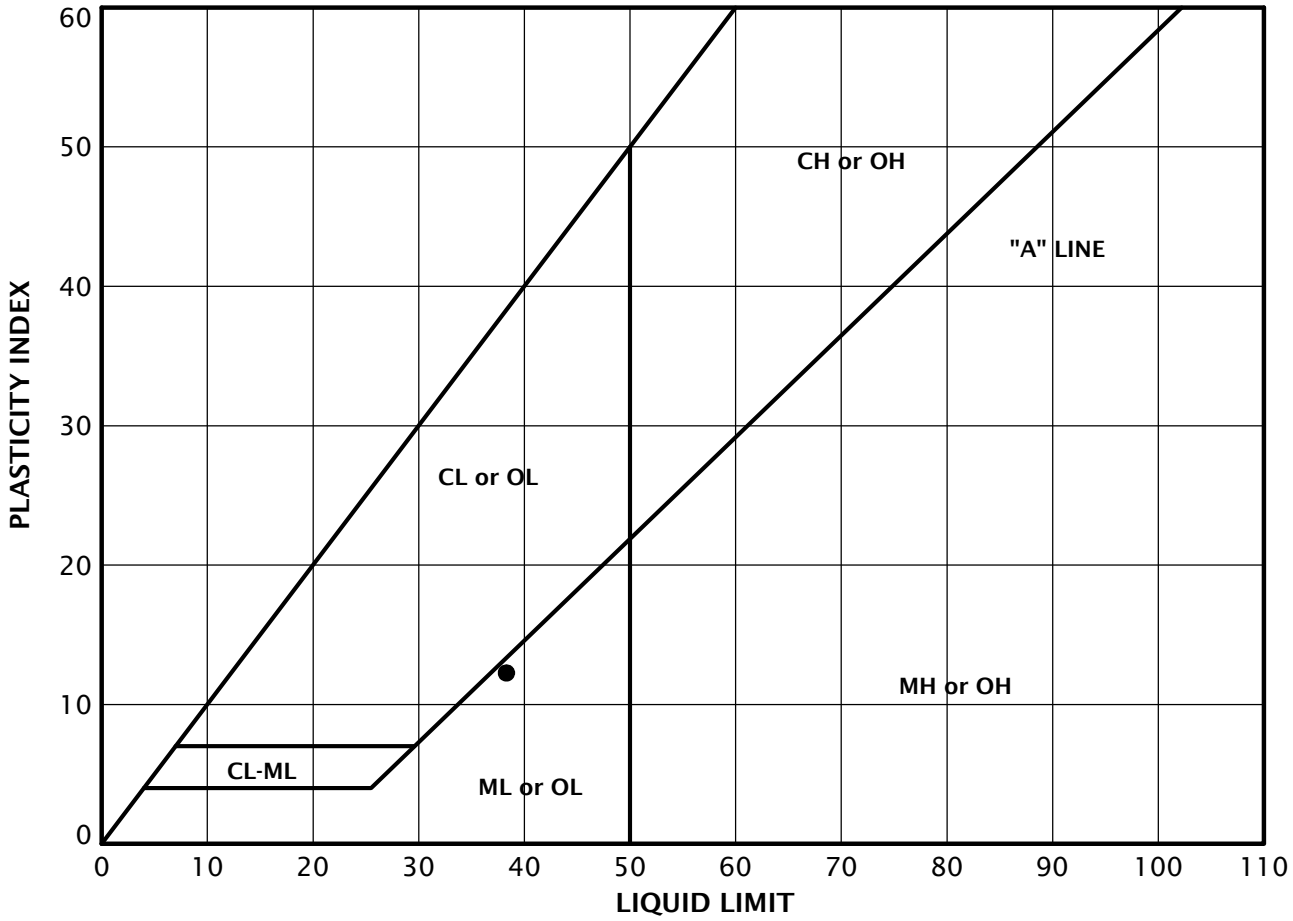
COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

N|V|5	FOREPROP-13-01	**BORING B-8**
	NOVEMBER 2024	CORNELUS MULTIFAMILY DEVELOPMENT CORNELUS, OR
		FIGURE A-8

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
●	B-2	5.0	34	38	26	12

NV5	FOREPROP-13-01	ATTERBERG LIMITS TEST RESULTS	
	NOVEMBER 2024	CORNELUS MULTIFAMILY DEVELOPMENT CORNELUS, OR	FIGURE A-9

_ATTERBERG_LIMITS 7 FOREPROP-13-01-B1_8.GPJ GEODESIGN.GDT PRINT DATE: 25/11/24:SP

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
B-1	2.5		38				93			
B-1	5.0		36							
B-2	2.5		25							
B-2	5.0		34					38	26	12
B-3	2.5		26				92			
B-3	5.0		36							
B-4	2.5		27							
B-4	5.0		30							
B-5	2.5		27				82			
B-5	5.0		35							
B-6	2.5		28							
B-6	5.0		32							
B-7	2.5		30				90			
B-7	5.0		36							
B-8	2.5		33							
B-8	5.0		32							

NV5

Delivering Solutions
Improving Lives

APPENDIX H

OPERATIONS AND MAINTENANCE PLAN

After Recording Return to:
Clean Water Services
2550 SW Hillsboro Hwy.
Hillsboro, OR 97123

PRIVATE STORMWATER FACILITIES AGREEMENT

This Agreement is made and entered into this _____ day of _____ 20___, by and between Clean Water Services (District) and _____ (Owner) whose address is _____.

RECITALS

A. Owner has developed or will develop the Facilities listed below. (List the type of private stormwater facilities on site and the quantity of each type).

Facility type (list each) _____ Quantity_____

B. The Facilities enable development of property while mitigating the impacts of additional surface water and pollutants associated with stormwater runoff prior to discharge from the property to the public stormwater system. The consideration for this Agreement is connection to the public stormwater system.

C. The property benefited by the Facilities and subject to the obligation of this Agreement is described below or in Exhibit A (Property) attached hereto and incorporated by reference.

D. The Facilities are designed by a registered professional engineer to accommodate the anticipated volume of runoff and to detain and treat runoff in accordance with District's Design and Construction Standards.

E. Failure to inspect and maintain the Facilities can result in an unacceptable impact to the public stormwater system.

NOW, THEREFORE, it is agreed by and between the parties as follows:

1. OWNER INSPECTIONS District shall provide Owner an Operations and Maintenance Plan (O&M Plan) for each Facility. Owner agrees to operate, inspect and maintain each Facility in accordance with the current O&M Plan and any subsequent modifications to the Plan. Owner shall maintain a log of inspection activities. The log shall be available to District upon request or during District inspections.

2. DEFICIENCIES All aspects in which the Facilities fail to satisfy the O&M Plan shall be noted as "Deficiencies".

3. OWNER CORRECTIONS All Deficiencies shall be corrected at Owner's expense within thirty (30) days after completion of the inspection. If more than 30 days is reasonably needed to correct a Deficiency, Owner shall have a reasonable period to correct the Deficiency so long as the correction is commenced within the 30-day period and is diligently prosecuted to completion.

4. DISTRICT INSPECTIONS Owner grants District the right to inspect the Facilities. District will endeavor to give ten (10) days prior written notice to Owner, except that no notice shall be required in case of an emergency. District shall determine whether Deficiencies need to be corrected. Owner (at the address provided in this Agreement, or such other address as Owner may designate in writing to District) will be notified in writing through the US Mail of the Deficiencies and shall make corrections within 30 days of the date of the notice.

5. DISTRICT CORRECTIONS If correction of all Owner or District identified Deficiencies is not completed within thirty (30) days after Owner's inspection or District notice, District shall have the right to have any Deficiencies corrected. District (i) shall have access to the Facilities for the purpose of correcting such Deficiencies and (ii) shall bill Owner for all costs reasonably incurred by District for work performed to correct the Deficiencies (District Correction Costs) following Owner's failure to correct any Deficiencies in the Facilities. Owner shall pay District the District Correction Costs within thirty (30) days of the date of the invoice. Owner understands and agrees that upon non-payment, District Correction Costs shall be secured by a lien on the Property for the District Correction Cost amount plus interest and penalties.

6. EMERGENCY MEASURES If at any time District reasonably determines that the Facilities create any imminent threat to public health, safety or welfare, District may immediately and without prior notice to Owner take measures reasonably designed to remedy the threat. District shall provide notice of the threat and the measures taken to Owner as soon as reasonably practicable, and charge Owner for the cost of these corrective measures.

7. FORCE AND EFFECT This Agreement has the same force and effect as any deed covenant running with the land and shall benefit and bind all owners of the Property present and future, and their heirs, successors and assigns.

8. AMENDMENTS The terms of this Agreement may be amended only by mutual agreement of the parties. Any amendments shall be in writing, shall refer specifically to this Agreement, and shall be valid only when executed by the owners of the Property, District and recorded in the Official Records of the county where the Property is located.

9. PREVAILING PARTY In any action brought by either party to enforce the terms of this Agreement, the prevailing party shall be entitled to recover all costs, including reasonable attorney's fees as may be determined by the court having jurisdiction, including any appeal.

10. SEVERABILITY The invalidity of any section, clause, sentence, or provision of this Agreement shall not affect the validity of any other part of this Agreement, which can be given effect without such invalid part or parts.

IN WITNESS WHEREOF, Owner and District have signed this Agreement.

NOTARIZE DOCUMENT BELOW

INDIVIDUAL OWNERS SIGN BELOW

_____
Owner (Individual)

_____
Owner (Individual)

CORPORATE, LLC, PARTNERSHIP, TRUST OR OTHER LEGAL ENTITY SIGN BELOW

_____
(Entity name)

By: _____
(Sign here for entity)

Title: _____

CLEAN WATER SERVICES

By: _____
General Manager or Designee

APPROVED AS TO FORM

_____
District Counsel

[Use this notary block if OWNER is an individual.]

STATE OF _____)
)
County of _____)

This instrument was acknowledged before me this _____day of _____, 20____,
by _____.

_____
Notary Public

[Use this notary block if OWNER is an entity.]

STATE OF _____)
)
County of _____)

This instrument was acknowledged before me on _____(date)
by_____(name of person) as
_____ (title) of _____(name of entity).

_____
Notary Public

Clean Water Services

Private Water Quality
Inspection Log

Attention:

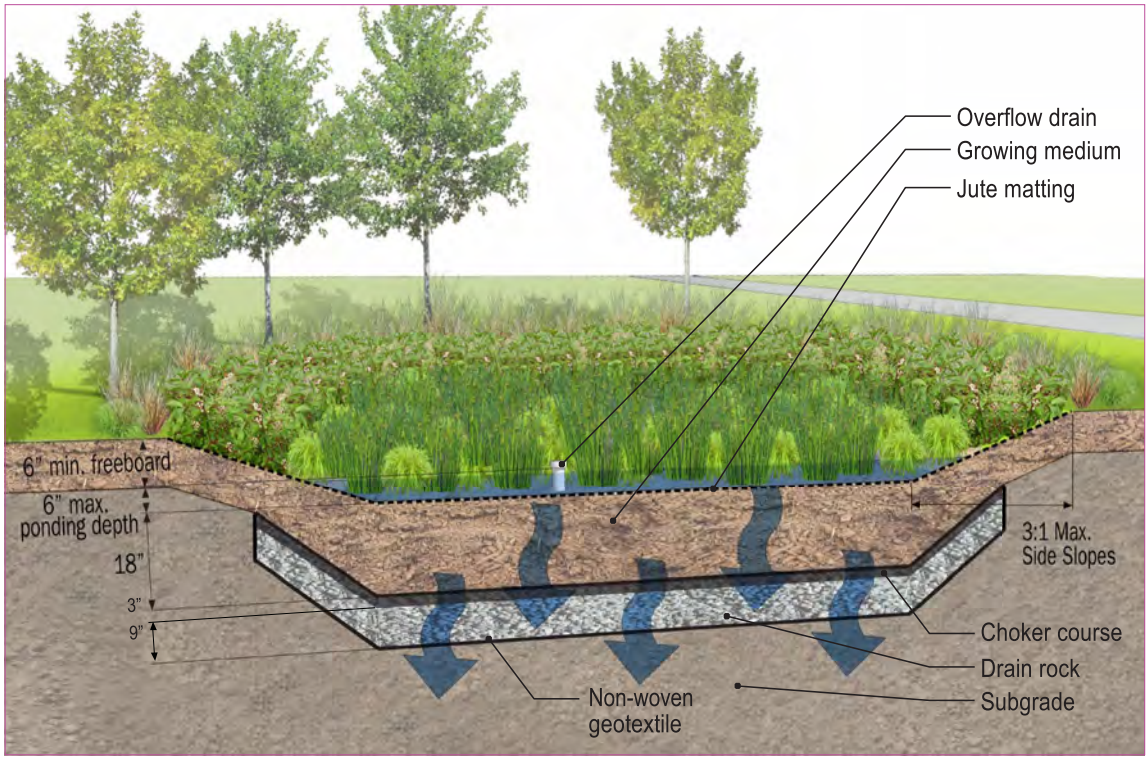
This inspection log is to remain on site and must be made available upon request by District or City employees.

Property description:
Site address:
Inspection Date: _____ Inspected by: _____ Comments: _____ _____ _____
Inspection Date: _____ Inspected by: _____ Comments: _____ _____ _____
Inspection Date: _____ Inspected by: _____ Comments: _____ _____ _____
Inspection Date: _____ Inspected by: _____ Comments: _____ _____ _____
Inspection Date: _____ Inspected by: _____ Comments: _____ _____ _____
Inspection Date: _____ Inspected by: _____ Comments: _____ _____ _____
Inspection Date: _____ Inspected by: _____ Comments: _____ _____ _____

2550 SW Hillsboro Highway Hillsboro, Oregon 97123
Phone: (503) 681-3600 Fax: (503) 681-3603 www.CleanWaterServices.org

Clean Water Services

Non-Structural Infiltration Planter/Rain Garden



parking areas & impermeable landscape

permeable soils

Description

Non-Structural Infiltration planters (also known as rain gardens) are landscaped reservoirs that collect, filter, and infiltrate stormwater runoff, allowing pollutants to settle and filter out as the water percolates through planter soil and infiltrates into the ground. Non-Structural Infiltration planters typically require less piping than flow-through planters and a smaller facility size than traditional swales where native soils allow for infiltration. Depending on the site, Non-Structural Infiltration planters can vary in shape and construction, with or without walls to contain the facility, or formed as a shallow, basin-like depression.

Application & Limitations

Non-Structural Infiltration planters should be integrated into the overall site design and may help fulfill the landscaping area requirement. Non-Structural Infiltration planters can be used to manage stormwater flowing from all types of impervious surfaces, from private property and within the public right-of-way. Check with the local jurisdiction if proposing to use Non-Structural Infiltration planters in the public right-of-way. The size, depth, and use of Non-Structural Infiltration planters are determined by the infiltration rates of the site's existing soils.

Y - Public System Approvable
Y - Quantity for Conveyance
Y - Hydromodification Approach
Y - Water Quality Treatment Approach



Orenco Woods Park

Non-Structural Infiltration Planter/Rain Garden



Design Factors

Soil Suitability and Facility Sizing

The size and depth of the Non-Structural Infiltration planter will depend upon the infiltration rate of existing soils. A sizing factor of 0.06 assumes the site infiltration rate is less than 2 in/hr.

For example, the size of a Non-Structural Infiltration planter managing 1,500 square feet of total impervious area would be 90 square feet (1,500 x 0.06).

Size may be decreased if:

- Demonstrated infiltration rate is greater than 2 in/hr using ASTM D3395-09 method; or
- Amended soil depth is increased

Geometry/Slopes

The shape may be circular, square, rectangular, etc. to suit the site design requirements. Regardless of the shape, a minimum planter width of 30 inches is needed to achieve sufficient time for treatment and avoid short-circuiting. Planters in a relatively flat, landscaped open area should not slope more than 0.5% in any direction.

Piping for Non-Structural Infiltration planters

Follow Plumbing Code requirements for any piping that directs stormwater from impervious surfaces to planters. Stormwater may flow directly from the public street right-of-way or adjacent parking lot areas via curb openings. For Non-Structural Infiltration planters install an overflow drain to allow not more than 6 inches of water to pond. On private property, follow Plumbing Code requirements for this overflow drain and piping, and direct excess stormwater to an approved disposal point as identified on permit drawings. Check with local jurisdiction or use Clean Water Services Design and Construction Standards for additional information on piping material for use in the public right-of-way.

Setbacks

Check with the local building department to confirm site-specific requirements.

- Generally, a minimum setback of 10 feet from building structures is recommended.
- Planters should not be located immediately upslope of building structures.

Before site work begins, clearly mark Non-Structural Infiltration planter areas to avoid soil disturbance during construction. No vehicular traffic should be allowed within 10 feet of Non-Structural Infiltration planter areas, except as necessary to construct the facility. Consider construction of Non-Structural Infiltration planter areas before construction of other impervious surfaces to avoid unnecessary traffic loads. To avoid erosion, use approved erosion control BMPs.

Soil Amendment/Mulch

Amended soils with appropriate compost and sand provide numerous benefits: infiltration; detention; retention; better plant establishment and growth; reduced summer irrigation needs; reduced fertilizer needs; increased physical, chemical and microbial pollution reduction; and, reduced erosion potential.

Primary treatment will occur in the top 18 inches of the Non-Structural Infiltration planter. Amended soil in the treatment area is composed of organic compost, gravelly sand and topsoil. Compost is weed-free, decomposed, non-woody plant material; animal waste is not allowed. Check with the local jurisdiction or Clean Water Services for Seal of Testing Approval Program (STA) Compost provider.

Vegetation

Planted vegetation helps to attenuate stormwater flows and break down pollutants by interactions with bacteria, fungi, and other organisms in the planter soil. Vegetation also traps sediments, reduces erosion, and limits the spread of weeds. Appropriate, carefully selected plantings enhance the aesthetic and habitat value. **For a complete list of allowable plants refer to Appendix A.**

The entire water quality treatment area should be planted appropriately for the soil conditions. Walled infiltration run-on planters will be inundated periodically. Therefore, the entire planter should be planted with herbaceous rushes, sedges, perennials, ferns and shrubs that are well-suited to wet-to-moist soil conditions.

Non-Structural Infiltration Planter/Rain Garden



Fowler Middle School, Tigard

If the Non-Structural Infiltration planter has side slopes (basin without vertical walls), soil conditions will vary from wet to relatively dry; several planting zones should be considered. The flat bottom area will be moist-to-wet, and the side slopes will vary from moist at the bottom to relatively dry near the top where inundation rarely occurs. The moisture gradient will depend upon the designed maximum water depth, total depth of the planter, and steepness of the side slopes. This moisture gradient is a transition zone and should be planted with species that tolerate occasional standing water, and plants that prefer drier conditions toward the top of the slope. Areas above the side slopes, immediately adjacent to the basin, and above the designed high-water line will not be inundated and should be planted with self-sustaining, low- maintenance grasses, perennials, and shrubs suitable for the local climate.

Native plants are encouraged, but non-invasive ornamentals that add aesthetic and functional value are acceptable with approval. All vegetation should be planted densely and evenly to ensure proper hydrological function of the Non-Structural Infiltration planter. For a complete list of allowable plants refer to page 76.

Quantities per 100 square feet:

- 115 herbaceous plants, 1’ on center spacing, ½-gal container size; or
- 100 herbaceous plants, 1’ on center, and 4 shrubs, 1-gal container size 2’ on center.

Small trees are allowed in raingardens and should be selected based ony their adaptability to wet-to-moist conditions and full size at maturity. Trees should be placed along the side slopes of the facility rather than at the bottom. Trees should be a minimum 2 gallon by 2 feet tall. Dig planting area twice the width of tree rootball and the depth of the rootball plus 12” (or total depth of 30”,— whichever is greater) should be backfilled with amended soil for optimal growth, with no sub-surface rock layer.

Required Maintenance Period

- Water-efficient irrigation should be applied for the first two years after construction of the facility, particularly during the dry summer months, while plantings become established. Irrigation after these two years is at the discretion of the owner.
- If public, the permittee is responsible for the maintenance of the Non-Structural Infiltration planter for a minimum of two years following construction and acceptance of the facility.

Long- Term Maintenance

If private, the property owner will be responsible for ongoing maintenance per a recorded maintenance agreement (see page 57 for example maintenance agreement).

For detailed Operation and Maintenance Plans that describe proper maintenance activities, please refer to Appendix C.

All publicly maintained facilities not located in the public right-of-way must have a public easement to ensure access for maintenance.

References

Clean Water Services Design and Construction Standards.

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Cornelius Multifamily Development
139 and 273 N 26th Avenue
Cornelius, Oregon

For
Fore Property Company
November 27, 2024

Project: ForeProp-13-01

NV5

November 27, 2024

Fore Property Company
1332 NW Kearney Street
Portland, OR 97209

Attention: Jason Wald

Report of Geotechnical Engineering Services
Cornelius Multifamily Development
139 and 273 N 26th Avenue
Cornelius, Oregon
Project: ForeProp-13-01

NV5 is pleased to present this report of geotechnical engineering services for the proposed Cornelius Multifamily development located at 139 and 273 N 26th Avenue in Cornelius, Oregon. Our services for this project were conducted in accordance with our proposal dated August 9, 2024

We appreciate the opportunity to be of service to you. Please contact us if you have questions regarding this report.

Sincerely,

NV5

Hayden Gluck, P.E.
Associate Engineer

Staci Butler, G.I.T.
Project Manager

SRB:HDG
Attachments
One copy submitted
Document ID: ForeProp-13-01-112724-geor.docx
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EXECUTIVE SUMMARY

Based on review of a preliminary site plan, we understand the proposed development includes demolishing existing structures associated with the current business occupant and utilities and constructing eight three-story, 24-unit, multifamily residential buildings with separate garages and a clubhouse building. Also included are an outdoor recreation area, paved parking and drive aisles, and utilities. We have summarized the pertinent geotechnical issues that will impact design and construction below. The main report should be referenced for a thorough description of the subsurface conditions and geotechnical recommendations.

- The site is currently occupied by a truck yard business surfaced with aggregate base rock. The existing structures and utilities will need to be demolished within the development area and backfilled as necessary with structural fill.

- The on-site soil should be capable of supporting the proposed structures on shallow footings bearing on firm, undisturbed native soil or granular pads underlain by firm, undisturbed native soil, depending on the foundation load. The main report provides detailed information regarding where granular pads are recommended.

- Static groundwater levels of 12 to 14.5 feet BGS were measured during the time of our explorations on October 30, 2024. Review of well logs indicates groundwater between 8 and 10 feet BGS in the vicinity of the site. Earthwork contractors should be prepared to dewater excavations that extend more than approximately 6 feet BGS and particularly during the wet season.

- Due to the fine-grained soil, the observed depth to groundwater at the site, and the results of our infiltration testing, we do not anticipate that on-site infiltration will be an effective stormwater management option.

- The fine-grained soil present at the ground surface is easily disturbed during the wet season. If not carefully executed, site earthwork can create soft areas and moderate repair costs can result. Subgrade protection is essential and may include placing 12 to 18 inches of granular material over subgrade for staging and haul road areas or cement amending the subgrade and covering it with a thin layer of crushed rock.

- The fine-grained soil present at the ground surface can be sensitive to small changes in moisture content and difficult, if not impossible, to adequately compact during wet weather or when the moisture content of the soil is more than a couple of percent above the optimum required for compaction. Depending on the time of year, significant drying will likely be required before using on-site soil as structural fill. Accordingly, the on-site soil can typically only be placed as structural fill during dry summer months.

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AC	asphalt concrete
ACP	Asphalt Concrete Pavement
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
BGS	below ground surface
CPT	cone penetration test
CRBG	Columbia River Basalt Group
DCP	dynamic cone penetrometer
ESAL	equivalent single-axle load
g	gravitational acceleration (32.2 feet/second^2)
H:V	horizontal to vertical
MCE	maximum considered earthquake
OSHA	Occupational Safety and Health Administration
OSSC	2021 Oregon Standard Specifications for Construction
PCC	portland cement concrete
pcf	pounds per cubic foot
pci	pounds per cubic inch
PG	performance grade
psf	pounds per square foot
psi	pounds per square inch
PVC	polyvinyl chloride
SPT	standard penetration test

1.0 INTRODUCTION

NV5 is pleased to submit this report of geotechnical engineering services for the proposed Cornelius Multifamily development located at 139 and 273 N 26th Avenue in Cornelius, Oregon. Figure 1 shows the site vicinity relative to surrounding features. Figure 2 shows the proposed development area and our approximate exploration locations.

We were provided with a preliminary site plan for the proposed development by Fore Property Company. We understand that development will consist of eight three-story, 24-unit, multifamily residential buildings and its associated parking lots and utilities. Preliminary foundation loads were not available at the time of this report; however, it has been assumed that the maximum column loads will be less than 200 kips and maximum wall loads less than 5 kips per square foot. If actual foundation loads differ from those within this report, a revised report should be issued. A grading plan was not available at the time of this report; however, based on existing site topography, we expect cut and fill will be less than 5 feet each.

Acronyms and abbreviations used herein are defined above, immediately following the Table of Contents.

2.0 PURPOSE AND SCOPE

The purpose of our services was to explore subsurface conditions and provide geotechnical engineering recommendations for the proposed development. The specific scope of our services is summarized as follows:

- Reviewed geotechnical and geologic information provided for the site and information from our in-house project files for projects in the site vicinity.
- Coordinated and managed the field explorations, including utility locates and scheduling subcontractors and NV5 field staff.
- Explored subsurface soil and groundwater conditions for the proposed development by conducting the following explorations and testing:
  - Drilled eight borings to of 16.5 feet BGS.
- Maintained a detailed log of each boring, classified the material encountered in the borings, and collected soil samples for laboratory testing.
- Conducted a laboratory testing program consisting of the following tests:
  - Sixteen moisture content determinations in general accordance with ASTM D2216
  - Four particle-size analyses in general accordance with ASTM D1140
  - One Atterberg limits test in general accordance with ASTM D4318
- Provided recommendations for site preparation, grading and drainage, stripping depths, fill type for imported material, compaction criteria, trench excavation and backfill, use of on-site soil, and wet/dry weather earthwork.

- Provided recommendations for the preferred foundation type, including allowable capacity, settlement estimates, and lateral resistance or response parameters. We anticipate the buildings will be supported on shallow foundations.
- Provided recommendations for floor slab subgrade preparation.
- Provided recommendations for design criteria for retaining walls, including lateral earth pressures, backfill, compaction, and drainage.
- Provided recommendations for managing identified groundwater conditions that may affect the performance of structures or pavement.
- Provided recommendations for construction of AC pavement for on-site access roads and parking areas, including subbase, base course, and AC paving thickness.
- Provided recommendations for ASCE 7-16 seismic coefficients and evaluated geologic hazards such as liquefaction and lateral spreading at the site. We have assumed a site-specific seismic hazard analysis is not required for the project.
- Prepared this geotechnical engineering report summarizing the results of our geotechnical evaluation.

3.0 SITE CONDITIONS

3.1 GEOLOGIC SETTING

Cornelius is located on the west margin of the Tualatin Basin physiographic province, which is a northwest- to southeast-trending structural basin bound by the Portland Hills and Tualatin Mountains to the north and east and the Chehalem Mountains and Coast Range to the south and west (Wilson, 1998). The geologic profile in the site vicinity is mapped as predominately alluvial deposits that have been accumulating in the Willamette Valley for over 20 million years, transported by tributaries from the Coast and Cascade ranges, foothills streams, and the upper Willamette River. In addition, the Willamette Valley was back flooded by catastrophic floods that traveled down the Columbia River, caused by drainage of large glacial lakes in western Montana (Allen et al., 1986). Most of these Missoula floods occurred between approximately 15,500 and 12,500 years ago. Flood waters rose to approximately 400 feet above MSL in the valley and deposited silt and fine sand (Willamette Silts) over the surfaces below that elevation. Since then, fluvial processes (stream erosion, avulsion, channel and floodplain deposition, reworking of older sediments, etc.) have created a complex series of terraces, dropping from the foothills down to the current Willamette River channel.

The Troutdale Formation underlies the flood deposits and is the main sedimentary fill for the Tualatin Basin. The basin fill consists of siltstone, claystone, and minor sandstone. In the site vicinity the Troutdale Formation ranges from 750 to 900 feet thick (Gannett and Caldwell, 1998; Madin, 1990; Schlicker and Deacon, 1967). Underlying the Troutdale Formation is the Miocene Age (20 to 10 million years before present) Columbia River Basalt Group that is a series of basalt flows that originated from southeastern Washington and northeastern Oregon. The Columbia River Basalt Group is considered to be the geologic basement unit for this report (Yeats et al., 1991).

3.2 SURFACE CONDITIONS

The 12.32-acre development area is currently occupied by a truck yard business with a building, gravel parking, and drive lanes. The site encompasses Tax Lots 04500 and 04600 of the Washington County Tax Map. The property is bordered by a movie theater to the east, Cornelius self-storage to the north, and grassy lots to the west and south. The development generally slopes east to west with elevations ranging from 187 to 191 feet based on topography available on Google Earth.

3.3 SUBSURFACE CONDITIONS

3.3.1 General

We drilled eight borings (B-1 through B-8) to depths of 16.5 feet BGS. A description of the recent explorations and laboratory testing program, the boring logs, and laboratory testing results are presented in Appendix A.

The subsurface conditions generally consist of sandy silt. We encountered aggregate base rock fill associated with existing parking and drive aisles across the site overlying sandy silt or sandy clay undocumented fill. The following sections present detailed descriptions of the soil units encountered.

3.3.2 Undocumented Fill

Undocumented fill was encountered in each boring to depths between 4 inches and 6 feet BGS. Between 4 and 14 inches of ¾" minus aggregate base was observed in each boring. In borings B-2 and B-4, B-5, B-6, and B-7, the aggregate was overlying sandy silt fill to depths between 2 and 6 feet bgs. In boring B-6, the aggregate was overlying stiff blue sandy clay to approximately 2.5 feet bgs. SPT results indicate the undocumented fill is medium stiff to stiff, and laboratory testing of one sample indicates a moisture content of 27 percent at the time of our explorations. The fill was likely placed during grading of the existing lot.

3.3.3 Silt

The explorations encountered silt with varying proportions of sand below the aggregate base rock and undocumented fill to depths of 16.5 feet BGS in borings B-1 through B-8. SPT results indicate that the silt is medium stiff to stiff. Laboratory testing on select samples of the silt indicates moisture contents between 25 and 38 percent and fines contents between 82 and 93 percent at the time of our explorations. Atterberg limits testing indicates native silt has a plasticity index of 12 percent.

3.3.4 Groundwater

Static groundwater was observed in the borings at depths of 12 to 14.5 feet BGS at the time of our explorations. Our review of water well logs on file with the Oregon Water Resources Department indicates that shallow groundwater is present in the site vicinity at depths between 8 and 10 feet BGS. The depth to groundwater may fluctuate in response to seasonal changes, prolonged rainfall, changes in surface topography, and other factors not observed in this study.

3.4 INFILTRATION TESTING

Infiltration testing was conducted at a depth of 3 feet BGS in boring B-3 and a depth of 5 feet BGS in boring B-6. Testing was performed by inserting a PVC pipe in the open boring using the

falling-head method in general accordance with Washington County's stormwater management manual. The pipe was embedded into soil at the bottom of the boring to create a seal so that water would flow into the subsurface and not between the side of the borehole and the pipe. The soil was saturated before beginning the test for a minimum 4-hour saturation period. The test was conducted by measuring the drop of the water level in the PVC pipe over time under low-head conditions after saturated conditions had been achieved. Based on infiltration test results shown below in Table 1, infiltration capacity of the on-site soil negligible. Given the negligible infiltration capacity of near-surface soil and relatively shallow groundwater at the site, we do not anticipate that infiltration will be an effective stormwater management option.

Table 1. Infiltration Testing Results

Boring	Depth (feet BGS)	Soil Type	Fines Content[1] (percent)	Infiltration Rate (inches per hour)
B-3	3	SILT minor sand (ML)	92	~0
B-6	5	Sandy SILT (ML)	82	~0

1. Fines content - material passing the U.S. Standard No. 200 sieve.

4.0 DESIGN

4.1 GENERAL

The following sections provide our design recommendations for the development. All site preparation and structural fill should be prepared as recommended in the "Construction" section.

4.2 FOUNDATION SUPPORT

4.2.1 General

Preliminary foundation loads have not been provided at the time of this report. We have assumed maximum column and wall loads of 200 kips and 5 kips per foot. Based on the results of our explorations, laboratory testing, and analysis, it is our opinion that the structures can be supported by spread footings bearing on firm, undisturbed native soil or granular pads overlying firm, undisturbed native soil. The recommended granular pad thicknesses are presented in Table 2. If column and wall loads exceed the maximum values in Table 2, we should be contacted to review our recommendations.

Table 2. Recommended Granular Pad Thicknesses for Spread Footings

	Maximum Load			
	Columns (kips)			Continuous Footings (kips per foot)
	0 to 70	70 to 130	130 to 200	0 to 5
Recommend Granular Pad Thickness (inches)	0	6	12	6

Granular pads should extend 6 inches beyond the margins of the footings for every foot excavated below the base grade of the footings. The granular pads should consist of imported granular material, as defined in the "Structural Fill" section. The imported granular material should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557, or until well keyed, as determined by one of our geotechnical staff. We recommend that a member of our geotechnical staff observe the prepared footing subgrade.

Undocumented fill was encountered at depths of up to 6 feet BGS during our explorations at the site. We anticipate fill may also be present in other areas. Spread footings should not be established on undocumented fill. Where encountered below footings, undocumented fill should be completely removed to native soil. Upon verification of native soil by a member of our field staff, the over-excavation should be backfilled with compacted crushed rock to the planned footing base. If performed, over-excavation should extend 6 inches beyond the margins of the footings for every foot excavated below the base grade of the footing.

4.2.2 Dimensions and Capacities

Footings should be established on firm native soil, structural fill, or granular pads overlying firm native soil or structural fill and proportioned for an allowable bearing pressure of 2,500 psf. This value is a net bearing pressure; the weight of the footing and overlying backfill can be ignored in calculating footing sizes. The recommended allowable bearing pressure applies to the total of dead plus long-term live loads and can be increased by one-third for short-term loads resulting from wind or seismic forces.

Continuous wall and isolated spread footings should be at least 18 and 24 inches wide, respectively. The bottom of exterior footings should be at least 18 inches below the lowest adjacent exterior grade. The bottom of interior footings should be established at least 12 inches below the base of the slab. If footings are excavated in the wet season, we recommend they are covered with a minimum of 6 inches of crushed rock shortly after excavation to prevent disturbance of the subgrade soil.

4.2.3 Resistance to Sliding

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction on the base of footings. Our analysis indicates that the allowable passive earth pressure for footings confined by the on-site soil or planned structural fill is 300 pcf. This value should be reduced to 150 pcf below groundwater levels. Adjacent floor slabs, pavement, or the upper 12-inch depth of unpaved areas should not be considered when calculating passive resistance.

An allowable coefficient of friction equal to 0.35 can be used for footings supported on native soil or structural fill. This value can be increased to 0.45 for footings on granular pads.

4.2.4 Subgrade Observation and Preparation

All footing subgrades and granular pads should be evaluated by a representative of NV5 to confirm suitable bearing conditions. Observations should also confirm that loose or soft material, organic material, unsuitable fill, and softened subgrade (if present) have been removed. Localized deepening of footing excavations may be required to penetrate any deleterious material.

4.3 FLOOR SLABS

Satisfactory subgrade support for building floor slabs supporting up to 150 psf can be achieved on the existing undisturbed native soil or on structural fill overlying undisturbed native soil. A minimum 6-inch-thick layer of aggregate base should be placed and compacted over the prepared soil subgrade. Imported granular material placed beneath building floor slabs should meet the requirements for aggregate base rock in the "Structural Fill" and "Fill Placement and Compaction" sections. A subgrade reaction modulus of 150 pci can be used to design floor slabs that bear on the native soil or structural fill over native soil.

The near-surface native soil is generally silty and will tend to maintain high moisture content. In areas where moisture-sensitive floor slab and flooring will be installed, inclusion of a vapor barrier is warranted in order to reduce the potential for moisture transmission through and efflorescence growth on the slab and flooring. In addition, flooring manufacturers often require vapor barriers to protect flooring and flooring adhesives and will warrant their product only if a vapor barrier is installed according to their recommendations.

4.4 SEISMIC DESIGN

4.4.1 Seismic Design Parameters

The soil profile is consistent with Site Class D in accordance with ASCE 7-16. The values presented in Table 3 can be used to compute design levels of ground shaking. ASCE 7-16 Section 11.4.8 requires a ground motion hazard study in accordance with Section 21.2 for structures on Site Class D sites with S_1 greater than or equal to 0.2 g (S_1 at the site is 0.438 g). Exception 2 of ASCE 7-16 Section 11.4.8 indicates a ground motion hazard study is not required, provided the value of the seismic response coefficient C_S is determined by Eq. (12.8-2) for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$.

Table 3. Seismic Design Parameters*

Seismic Design Parameter	Short Period (T_s)	1 Second Period (T_1)
MCE Spectral Acceleration	S_s = 0.900 g	S_1 = 0.438 g
Site Class	D	
Site Coefficient	F_a = 1.14	F_v = 1.862
Adjusted Spectral Acceleration	S_{MS} = 1.026 g	S_{M1} = 0.816 g
Design Spectral Response Acceleration Parameters	S_{DS} = 0.684 g	S_{D1} = 0.544 g

* The above parameters can be used provided the seismic response coefficient (C_s) is determined according to the exception in ASCE 7-16 Section 11.4.8 or else a site-specific response analysis will be required.

4.5 RETAINING STRUCTURES

4.5.1 Assumptions

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 10 feet in height; (3) the backfill is drained and consists of imported granular material; and (4) the backfill has a slope flatter than 4H:1V. Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project varies from these assumptions.

4.5.2 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 (such as basement walls), an at-rest 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 lineal foot of wall, where H is the height of the wall in feet, and applied as a distributed load with the centroid located at a distance of 0.6H from the base of the wall.

If surcharges (e.g., retained slopes, structure foundations, vehicles, steep slopes, 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. Our office should be contacted for appropriate wall surcharges based on the actual magnitude and configuration of the applied loads. The base of the wall footing excavations should extend a minimum of 12 inches below the lowest adjacent grade. The wall footings should be designed in accordance with the “Foundation Support” section.

4.5.3 Wall Drainage and Backfill

The above design parameters have been provided assuming back-of-wall drains will be installed to prevent buildup of hydrostatic pressure behind all walls. If a drainage system is not installed, our office should be contacted for revised design forces.

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 a minimum 1-foot-wide column of angular drain rock wrapped in a 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 to within approximately 1 foot of the ground surface. The angular drain rock should meet the requirements provided in the "Structural Fill" section. All wall backfill should be placed and compacted as recommended for select granular wall backfill in the "Structural Fill" and "Fill Placement and Compaction" sections.

Perforated collector pipes should be placed at the base of the granular backfill behind the walls. The pipe should be embedded in a minimum 1-foot-wide zone of angular drain rock. The drain rock should meet specifications provided in the "Structural Fill" section. The drain rock should be wrapped in a drainage geotextile fabric meeting the requirements in the "Geotextile Fabric" section. The collector pipes should discharge at an appropriate location away from the base of the wall. The discharge pipe should not be tied directly into stormwater drain systems, unless measures are taken to prevent backflow into the drainage system of the wall.

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 backfilling of the wall, unless survey data indicates that settlement is complete prior to that time.

4.6 PAVEMENT

Pavement should be installed on undisturbed native subgrade or new engineered fill prepared in conformance with the "Site Preparation" and "Materials" sections. The recommended pavement sections are for design traffic loads and are not intended for heavy construction traffic. Construction traffic should not be allowed on newly installed AC or NV5 should be contacted to provide alternate pavement sections to account for anticipated construction traffic. If any of the following assumptions vary from project design values, our office should be contacted with the appropriate information so that the pavement designs can be revised for current project needs.

Our pavement recommendations are based on the following assumptions:

- The top 12 inches of soil subgrade below the pavement section is compacted to at least 92 percent of the maximum dry density, as determined by ASTM D1557, or observations indicate that it is in a firm, unyielding condition.
- Resilient moduli of 20,000 psi and 5,100 psi were assumed for the aggregate base and native subgrade, respectively.
- Initial and terminal serviceability indices of 4.2 and 2.5, respectively.
- Reliability of 80 percent and standard deviation of 0.5.
- Structural coefficients of 0.42 and 0.10 for the AC and aggregate base, respectively.
- A 20-year design life with no growth.

- Light traffic consists of passenger vehicles. Heavy traffic consists of 90 percent two-axle and 10 percent three-axle trucks, such as garbage and delivery vehicles.
- Fire access will consist of an imposed fire apparatus load of 80,000 pounds on an infrequent basis.

Design traffic loading was not available at the time of this report. Based on our experience, we evaluated several speculative traffic scenarios for our pavement analysis. The results are summarized in Table 4. The design team can select the appropriate pavement section based on the final design traffic loading in different areas of the site. All recommended sections are suitable to support an 80,000-pound fire truck on an infrequent basis.

Table 4. Recommended Standard Pavement Sections

Pavement Use	Trucks per Day	ESAL	AC Thickness[1] (inches)	Aggregate Base Thickness[1] (inches)
Parking areas	0	3,000	2.5	6.0
Drive Aisles	5	25,000	3.0	8.0

1. All thicknesses are intended to be the minimum acceptable values.

If the subgrade is cement amended to at least 12 inches below the pavement section and in accordance with the "Cement Amendment" section, the aggregate base section can be reduced to 4.0 inches for all recommended pavement sections in Table 4.

All recommended pavement thicknesses are intended to be the minimum acceptable. Pavement design is based on the assumption that construction will be completed during an extended period of dry weather. Wet weather construction could require an increased thickness of aggregate base or cement amendment as discussed in the "Subgrade Protection" section.

The AC, aggregate base, and cement amendment should meet the requirements outlined in the "Materials" section.

4.7 DRAINAGE CONSIDERATIONS

4.7.1 Temporary

During earthwork at the site, 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.

4.7.2 Site Drainage

We recommend the finished ground surface around buildings slope away from the structures at a minimum 2 percent gradient for a distance of at least 5 feet. Downspouts or roof scuppers should discharge into a storm drain system that carries the collected water to an appropriate stormwater system. Trapped planter areas should not be created adjacent to buildings without providing means for positive drainage (e.g., swales or catch basins). Embedded walls should include drainage, as discussed in the "Retaining Structures" section.

4.8 PERMANENT SLOPES

Permanent cut and fill slopes should not exceed 2H:1V. Slopes that will be maintained by mowing and slopes that will be below the potential inundation depth for stormwater detention ponds should not be constructed steeper than 3H:1V. Access roads and pavement should be located at least 5 feet from the top of cut and fill slopes. The setback should be increased to 10 feet for buildings. The 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.

5.0 CONSTRUCTION

5.1 SITE PREPARATION

5.1.1 Demolition

Demolition should include complete removal of existing structures, buried foundations (if present), and pavement within 5 feet of areas to receive new pavement, buildings, retaining walls, or engineered fills. Underground vaults, tanks, wells, and other subsurface structures should be removed in areas of new improvements. Utility lines should be completely removed or grouted full if left in place. Existing basements, crawl spaces, or other voids resulting from removal of existing improvements should be backfilled with compacted structural fill, as discussed in the "Structural Fill" section. The bottom of such excavations should be excavated to expose a firm subgrade before filling and their sides sloped at a minimum of 1.5H:1V to allow for more uniform compaction at the edges of the excavations. Material generated during demolition should be transported off site for disposal or stockpiled in areas designated by the owner. It may be possible to use on-site concrete as structural fill in accordance with the "Structural Fill" section.

5.1.2 Grubbing and Stripping

Trees and shrubs should be removed from development areas. In addition, root balls should be grubbed out to the depth of the roots, which could exceed 3 feet BGS. Depending on the methods used to remove root balls, considerable disturbance and loosening of the subgrade could occur during site grubbing. We recommend that soil disturbed during grubbing operations be removed to expose firm, undisturbed subgrade. The resulting excavations should be backfilled with structural fill.

Any existing root zone in landscaped areas should be stripped and removed from all fill areas. The actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal or used in landscaped areas.

5.1.3 Subgrade Evaluation

A member of our staff should observe the exposed subgrade for floor slabs, pavement areas, and foundation excavations after site preparation has been completed to determine if there are areas of unsuitable or unstable soil. Our representative should observe proof rolling of structural fill, pavement, and slab subgrade with a fully loaded dump truck or similar heavy, rubber tire construction equipment to identify soft, loose, or unsuitable areas. During wet weather or in

areas not accessible to proof rolling equipment, the subgrade should be evaluated by probing. Areas containing soft or loose soil should be improved by replacing it with structural fill or scarifying and recompacting it in accordance with the "Structural Fill" and "Fill Placement and Compaction" sections. Scarifying and recompacting fine-grained soil will be difficult, if not impossible, during the wet season.

5.2 SUBGRADE PROTECTION

The fine-grained soil present at the ground surface on this site is easily disturbed, especially during periods of wet weather. If not carefully executed, site preparation, utility trench work, and roadway excavation can create extensive soft areas and significant repair costs can result. Earthwork planning, regardless of the time of year, should include considerations for minimizing subgrade disturbance.

If construction occurs during the wet season or if the moisture content of the surficial soil is more than a couple percentage points above optimum, demolition, site stripping, and cutting may need to be accomplished using track-mounted equipment. Likewise, the use of granular haul roads and staging areas will be necessary for support of construction traffic during the rainy season or when the moisture content of the surficial soil is more than a few percentage points above optimum. The recommended aggregate base rock thickness for new pavement is intended to support post-construction design traffic loads and may not support construction traffic or paving equipment when the subgrade soil is wet. Accordingly, if construction is planned for periods when the subgrade soil is wet, staging and haul roads with increased thicknesses of aggregate base will be required.

The size of staging and haul road areas, as well as the required thickness of granular material, will vary with the contractor's sequencing of a project and exposure to construction equipment. Based on our experience, between 12 and 18 inches of imported granular material is generally required in staging areas and between 18 and 24 inches in haul roads areas. Stabilization material may be used as a substitute, provided the top 4 inches of material consists of imported granular material. The actual thickness will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. In addition, a geotextile fabric can be placed as a barrier between fine-grained subgrade and imported granular material in areas of repeated construction traffic, such as site entrances. The imported granular material, stabilization material, and geotextile fabric should meet the specifications in the "Materials" section. The existing pavement can remain in place in some areas to provide subgrade protection during wet weather construction.

As an alternative to thickened crushed rock sections, the subgrade can be cement amended to provide wet weather protection from construction traffic. The cement-amended subgrade should be covered by at least 4 inches of granular fill material. This recommendation is based on an assumed minimum unconfined compressive strength of 100 psi for subgrade amended to a depth of 12 to 16 inches. The actual thickness of the amended material and imported granular material will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. Cement amendment is discussed in the "Materials" section.

5.3 EXCAVATION

5.3.1 General

Excavations will be required to construct new foundations, utilities, pavement, and other improvements. Conventional earthmoving equipment in proper working condition should be capable of making the necessary excavations. Static groundwater levels indicated depths of between 12 and 14.5 feet BGS at the time of our explorations, and well logs indicate groundwater as shallow as 8 feet BGS nearby. It is possible that perched groundwater will be present at shallower depths, especially during periods of persistent wet weather. If groundwater is encountered in excavations, sloughing and caving will likely occur. Accordingly, the contractor should expect to flatten excavations or shore excavations as described below where water is encountered. In addition to safety considerations, caving and loss of ground will increase backfill volumes and can result in damage to adjacent structures or utilities.

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 outside the base of the existing elements. 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.

5.3.2 Excavation and Shoring

Temporary excavation sidewalls in the native soil should stand vertical to a depth of approximately 4 feet, provided groundwater seepage is not observed in the sidewalls. Open excavation techniques may be used to excavate trenches with depths between 4 and 8 feet, provided the walls of the excavation are cut at a slope of 1H:1V and groundwater seepage is not present. At this inclination, the slopes may ravel and require some ongoing repair. Excavations should be flattened within the existing undocumented gravel fill and/or if excessive sloughing or raveling occurs. In lieu of large and open cuts, approved temporary shoring may be used for excavation support. A wide variety of shoring and dewatering systems are available. Consequently, we recommend the contractor be responsible for selecting the appropriate shoring and dewatering systems.

If box shoring is used, it should be understood that box shoring is a safety feature used to protect workers and does not prevent caving. If the excavations are left open for extended periods of time, caving of the sidewalls will likely occur. The presence of caved material will limit the ability to properly backfill and compact the trenches. The contractor should be prepared to fill voids between the box shoring and the sidewalls of the trenches with sand or gravel before caving occurs.

If shoring is used, we recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation.

5.3.3 Temporary Dewatering

If groundwater is encountered in shallow excavations, it can likely be dewatered using sumps and pumps. More intense use of pumps may be required at certain times of the year and where more intense seepage occurs. Dewatering systems are best designed by the contractor. Removed water should be routed to a suitable discharge point.

If groundwater is present at the base of utility trench excavations, we recommend placing up to 12 inches of stabilization material at the base of the excavations. Trench stabilization material should meet the requirements provided in the "Structural Fill" section.

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 these systems based on their means and methods.

5.3.4 Safety

All excavations should be made in accordance with applicable OSHA requirements and regulations of the state, county, and local jurisdiction. While this report describes certain approaches to excavation and dewatering, the contract documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety, and providing shoring (as required) to protect personnel and adjacent structural elements.

5.4 MATERIALS

5.4.1 Structural Fill

5.4.1.1 General

Fill should be placed on subgrade that has been prepared in conformance with the "Site Preparation" section. A variety of material may be used as structural fill at the site. However, all material used as structural fill should be free of organic material or other unsuitable material and should meet the specifications provided in OSSC 00330 (Earthwork), OSSC 00400 (Drainage and Sewers), and OSSC 02600 (Aggregates), depending on the application. A brief characterization of some of the acceptable materials and our recommendations for their use as structural fill are provided below. Fill should be compacted as described in the "Fill Placement and Compaction" section.

In locations where fill is to be placed on slopes steeper than 4H:1V, level benches should be cut into the existing sloping surfaces. The benches should be a minimum of 10 feet wide or 1½ times the width of the compaction equipment, whichever is wider. Fill slopes with grades of 3H:1V or steeper should also be overbuilt by at least 2 feet and cut back to finished grade.

5.4.1.2 On-Site Soil

The on-site material should generally be suitable for use as structural fill, provided it is properly moisture conditioned; free of debris, organic material, and particles over 8 inches in diameter; and meets the specifications provided in OSSC 00330.12 (Borrow Material). Laboratory testing indicates that the on-site soil was generally above optimum moisture content at the time of exploration. Significant moisture conditioning (drying) will be required to use on-site soil for structural fill. Accordingly, extended dry weather and a large area will be required to adequately

condition and place the on-site soil as structural fill. It will be difficult, if not impossible, to adequately compact on-site soil during the rainy season or during prolonged periods of rainfall, unless it is cement amended. In general, on-site soil should only be used as structural fill during the dry summer months.

5.4.1.3 Imported Granular Material

Imported granular material used as structural fill should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in OSSC 00330.14 (Selected Granular Backfill) or OSSC 00330.15 (Selected Stone Backfill). The imported granular material should also be angular, should be fairly well graded between coarse and fine material, should have less than 6 percent by dry weight passing the U.S. Standard No. 200 sieve, and should have at least two fractured faces.

5.4.1.4 Stabilization Material

Stabilization material used in staging or haul road areas, in trenches, or for other applications should consist of 4- or 6-inch-minus pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in OSSC 00330.15 (Selected Stone Backfill). 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 material. Stabilization material should be placed in lifts between 12 and 24 inches thick and compacted to a firm condition.

5.4.1.5 Trench Backfill

Trench backfill placed beneath, adjacent to, and for at least 12 inches above utility lines (i.e., the pipe zone) should consist of well-graded granular material with a maximum particle size of 1½ inches and less than 10 percent by dry weight passing the U.S. Standard No. 200 sieve and should meet the specifications provided in OSSC 00405.13 (Pipe Zone Material). Within roadway alignments, the remainder of the trench backfill up to the subgrade elevation should consist of well-graded granular material with a maximum particle size of 2½ inches and less than 10 percent by dry weight passing the U.S. Standard No. 200 sieve and should meet the specifications provided in OSSC 00405.14 (Trench Backfill; Class B, C, or D).

Outside of structural improvement areas (e.g., roadway alignments or building pads), trench backfill placed above the pipe zone may consist of general fill material that is free of organic material and material over 6 inches in diameter and meets the specifications provided in OSSC 00405.14 (Trench Backfill; Class A, B, C, or D).

5.4.1.6 Drain Rock

Drain rock should consist of angular, granular material with a maximum particle size of 2 inches and should meet the specifications provided in OSSC 00430.11 (Granular Drain Backfill Material). The material should be free of roots, organic material, and other unsuitable material; should have less than 2 percent by dry weight passing the U.S. Standard No. 200 sieve (washed analysis); and should have at least two mechanically fractured faces. Drain rock should be compacted to a well-keyed, firm condition.

5.4.1.7 Aggregate Base Rock

Imported granular material used as base rock for building floor slabs and pavement should consist of ¾- or 1½-inch-minus material (depending on the application) and meet the requirements in OSSC 00641 (Aggregate Subbase, Base, and Shoulders). The aggregate should have at least two mechanically fractured faces. In addition, the aggregate should have less than 6 percent by dry weight passing the U.S. Standard No. 200 sieve.

5.4.1.8 Retaining Wall Select 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 select granular material that meets the specifications provided in OSSC 00510.12 (Granular Wall Backfill) or OSSC 00510.13 (Granular Structure Backfill). We recommend the select granular wall 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 backfill should be placed and compacted as recommended for structural fill, with the exception of backfill placed immediately adjacent to walls. Backfill adjacent to walls should be compacted to a lesser standard to reduce the potential generation of excessive pressure on the walls.

5.4.1.9 Recycled On-Site Material

AC and conventional concrete from demolition of on-site structures may be used as fill if it is processed to meet the requirements for its intended use. Processing includes crushing and screening, grinding in place, or other methods to meet the requirements for structural fill as described above. The processed material should be fairly well graded and not contain metal, organic material, or other deleterious material. The processed material may be mixed with on-site soil or imported fill to assist in achieving the gradation requirements. We recommend that processed recycled fill have the maximum particles size as listed in Table 5.

Table 5. Processed Fill Maximum Particle Size

Depth of Placement[1]	Maximum Particle Size (inches)
0 feet to 1 foot	Not recommended
1 foot to 2 feet	2
2 to 6 feet	4
6 to 10 feet	8
Deeper than 10 feet	12

1. Below subgrade of structural element

Recycled on site fill material should not be used within a depth of 1 foot from foundations, floor slabs, pavement, or other subsurface elements. We also caution that excavation through recycled material that is placed as structural fill may be difficult if it has a significant fraction of oversized particles. In addition, these excavations may also be prone to raveling and caving.

5.4.2 Geotextile Fabric

5.4.2.1 Subgrade Geotextile

Subgrade geotextile should conform to OSSC Table 02320-4 and OSSC 00350 (Geosynthetic Installation). A minimum initial aggregate base lift of 6 inches is required over geotextiles.

5.4.2.2 Drainage Geotextile

Drainage geotextile should conform to Type 2 material of OSSC Table 02320-1 and OSSC 00350 (Geosynthetic Installation). A minimum initial aggregate base lift of 6 inches is required over geotextiles.

5.4.3 AC

5.4.3.1 ACP

On-site AC should be Level 2, ½-inch, dense ACP according to OSSC 00744 (Asphalt Concrete Pavement) and compacted to 91 percent of the maximum specific gravity of the mix, as determined by AASHTO T 209. The minimum and maximum lift thicknesses are 2.0 and 3.0 inches, respectively, for ½-inch ACP. Asphalt binder should be performance graded and conform to PG 64-22 or better.

5.4.3.2 Cold Weather Paving Considerations

In general, AC paving is not recommended during cold weather (temperatures less than 40 degrees Fahrenheit). Compacting under these conditions can result in low compaction and premature pavement distress.

Each AC mix design has a recommended compaction temperature range that is specific for the particular AC binder used. In colder temperatures, it is more difficult to maintain the temperature of the AC mix as it can lose heat while stored in the delivery truck, as it is placed, and in the time between placement and compaction. In Oregon, the AC surface temperature during paving should be at least 40 degrees Fahrenheit for lift thickness greater than 2.5 inches and at least 50 degrees Fahrenheit for lift thickness between 2.0 and 2.5 inches.

If paving activities must take place during cold weather construction as defined above, the project team should be consulted and a site meeting should be held to discuss ways to lessen low compaction risks.

5.4.4 PCC

If used, PCC should be Class 4000- ¾-inch or 1½-inch paving concrete according to OSSC 02001 (Concrete) with a minimum 28-day flexural strength of 600 psi and placed in general accordance with OSSC 00756 (Plain Concrete Pavement). Joints should be constructed in general accordance with OSSC 00756.48 (Joints) with a maximum transverse joint spacing of 12 feet (10 feet for pavement over amended subgrade). In addition, the length-to-width ratio for any panel should be at least 0.75 and should not exceed 1.25.

5.4.5 Cement Amendment

5.4.5.1 General

As an alternative to the use of imported granular material for wet weather structural fill, an experienced contractor may be able to amend the on-site 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. Cement amendment should not be used if runoff during construction cannot be directed away from adjacent wetlands.

5.4.5.2 Subbase Stabilization

We recommend a target strength for cement-amended subgrade for building and pavement subbase (below aggregate base) soil of 100 psi. Successful use of soil amendment depends on the use of correct techniques and equipment, soil moisture content, and the amount of cement added to the soil. The recommended percentage of cement is based on soil moisture contents at the time of placing the structural fill. Based on our experience, 6 percent cement by weight of dry soil is generally satisfactory when the soil moisture content does not exceed approximately 25 percent. If the soil moisture content is in the range of 25 to 35 percent, 7 to 9 percent by weight of dry soil is recommended. It is difficult to accurately predict field performance due to the variability in soil response to cement amendment. The amount of cement added to the soil may need to be adjusted based on field observations and performance. Moreover, depending on the time of year and moisture content levels during amendment, water may need to be applied during tilling to appropriately condition the soil moisture content. The amount of cement used during amendment should be based on an assumed soil dry unit weight of 110 pcf. For preliminary design purposes, we recommend a minimum of 7 percent cement based on current soil moisture contents of 30 to 34 percent in the upper several feet of soil. It is not possible to amend soil during heavy or continuous rainfall. Work should be completed during suitable conditions.

We recommend cement-spreading equipment be equipped with balloon tires to reduce rutting and disturbance of the fine-grained soil. A static sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds should be used for initial compaction of the fine-grained soil. A smooth-drum roller with a minimum applied linear force of 700 pounds per inch should be used for final compaction.

A minimum curing time of four days is required between amendment and construction traffic access. Construction traffic should not be allowed on unprotected, cement-amended subgrade. To protect the cement-amended surfaces from abrasion or damage, the finished surface should be covered with 4 to 6 inches of imported granular material.

Amendment depths for building/pavement, haul roads, and staging areas are typically on the order of 12, 16, and 12 inches, respectively. The crushed rock typically becomes contaminated with soil during construction. Contaminated base rock should be removed and replaced with clean rock in pavement areas. The actual thickness of the amended material and imported granular material for haul roads and staging areas will depend on the anticipated traffic, as well as the contractor's means and methods and, accordingly, should be the contractor's

responsibility. Cement amendment should not be attempted when the air temperature is below 40 degrees Fahrenheit or during moderate to heavy precipitation. Cement should not be placed when the ground surface is saturated or standing water exists.

5.4.5.3 Cement-Amended Structural Fill

On-site soil that is not suitable for structural fill due to high moisture content may be amended and placed as fill over a subgrade prepared in conformance with the "Site Preparation" section. Cement-amended fill lift thicknesses should be limited to 12 inches. The cement ratio for general cement-amended fill can generally be reduced by 1 percent (by dry weight). Typically, a minimum curing time of four days is required between amendment and construction traffic access. Consecutive lifts of fill may be amended immediately after the previous lift has been amended and compacted (e.g., the four-day wait period does not apply). However, where the final lift of fill is a building or roadway subgrade, the four-day wait period is in effect for the final lift of cement-amended soil.

5.4.5.4 Other Considerations

Portland cement-amended soil is hard and has low permeability. This soil does not drain well and it is not suitable for planting. Future planted areas should not be cement amended, if practical, or accommodations should be made for drainage and planting. Moreover, cement amending soil within building areas must be done carefully to avoid trapping water under floor slabs. We should be contacted if this approach is considered. Cement amendment should not be used if runoff during construction cannot be directed away from adjacent wetlands (if any). Cement amendment runoff should be collected, monitored, and treated in accordance with Oregon Department of Environmental Quality requirements prior to being discharged.

5.4.5.5 Specification Recommendations

We recommend that the following comments be included in the specifications for the project:

- In general, cement amendment is not recommended during cold weather (temperatures less than 40 degrees Fahrenheit) or during rainfall.
- Mixing Equipment
  - Use a pulverizer/mixer capable of uniformly mixing the cement into the soil to the design depth. Blade mixing will not be allowed.
  - Pulverize the soil-cement mixture such that 100 percent by dry weight passes a 1-inch sieve and a minimum of 70 percent passes a No. 4 sieve, exclusive of gravel or stone retained on these sieves. If water is required, the pulverizer should be equipped to inject water to a tolerance of ¼ gallon per square foot of surface area.
  - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the pulverizer/mixer vehicle. If subgrade is disturbed, the tilling/amendment depth shall extend the full depth of the disturbance.
  - Multiple "passes" of the tiller may be required to adequately blend the cement and soil mixture.
- Spreading Equipment
  - Use a spreader capable of distributing the cement uniformly on the ground to within 5 percent variance of the specified application rate.
  - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the spreader vehicle. If subgrade is disturbed, the tilling/amendment depth shall extend the full depth of the disturbance.

- Compaction Equipment
  - Use a static, sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds for initial compaction of fine-grained soil (silt and clay) or an alternate approved by the geotechnical engineer.

5.5 FILL PLACEMENT AND COMPACTION

Fill soil should be compacted at a moisture content that is within 3 percent of optimum. The maximum allowable moisture content varies with the soil gradation and should be evaluated during construction. Fill and backfill material should be placed in uniform, horizontal lifts and compacted with appropriate equipment. The maximum lift thickness will vary depending on the material and compaction equipment used but should generally not exceed the loose thicknesses provided in Table 6. Fill material should be compacted in accordance with the compaction criteria provided in Table 7.

Table 6. Recommended Uncompacted Lift Thickness

Compaction Equipment	Recommended Uncompacted Lift Thickness (inches)		
	Silty/Clayey Soil	Granular and Crushed Rock Maximum Particle Size ≤ 1½ Inches	Crushed Rock Maximum Particle Size > 1½ Inches
Hand tools: Plate compactor and jumping jack	4 to 8	4 to 8	Not recommended
Rubber tire equipment	6 to 8	10 to 12	6 to 8
Light roller	8 to 10	10 to 12	8 to 10
Heavy roller	10 to 12	12 to 18	12 to 16
Hoe pack equipment	12 to 16	18 to 24	18 to 24

The table above is based on our experience and is intended to serve only as a guideline. The information provided in this table should not be included in the project specifications.

Table 7. Compaction Criteria

Fill Type	Compaction Requirements in Structural Zones		
	Percent Maximum Dry Density Determined by ASTM D1557		
	0 to 2 Feet Below Subgrade (percent)	Greater Than 2 Feet Below Subgrade (percent)	Pipe Zone (percent)
Area fill (granular)	95	95	-----
Area fill (fine grained)	92	92	-----
Aggregate bases	95	95	-----
Trench backfill[1,2]	95	92	90[1,2]
Retaining wall backfill	95[3]	92[3]	-----

1. Trench backfill above the pipe zone in non-structural areas should be compacted to 85 percent.
2. Or as recommended by the pipe manufacturer.
3. Should be reduced to 90 percent within a horizontal distance of 3 feet from the retaining wall.

5.6 EROSION CONTROL

The fine-grained soil at this site is eroded easily by wind and water; therefore, erosion control measures should be carefully planned and in place before construction begins. Measures that can be employed to reduce erosion include the use of silt fences, hay bales, buffer zones of natural growth, sedimentation ponds, and granular haul roads. All erosion control methods should be in accordance with local jurisdiction standards. During earthwork at the site, the contractor should be responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface.

6.0 OBSERVATION OF CONSTRUCTION

Satisfactory earthwork and foundation performance depend to a large degree on the quality of construction. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated. In addition, 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.

7.0 LIMITATIONS

We have prepared this report for use by Fore Property Company and members of the design and construction team for the proposed project. The data and report can be used for estimating purposes, but our report, conclusions, and interpretations should not be construed as a 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. The soil explorations 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. In addition, if design changes are made, we should be retained to review our conclusions and recommendations and to provide a written evaluation or modification.

The site development plans and design details were preliminary at the time this report was prepared. When the design has been finalized and if there are changes in the site grades, location, or 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 modification or verification.

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 the 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,

NV5

Staci Butler, G.I.T.
Project Manager

Hayden Gluck, P.E.
Associate Engineer



REFERENCES

Allen, J.E., M. Burns, and S. Sargent, 1986, Cataclysms on the Columbia: Timber Press, Portland, Oregon; 211 p.

ASCE, 2016. *Minimum Design Loads and Associated Criteria for Buildings and Other Structures.* ASCE Standard ASCE/SEI 7-16.

Gannett, Marshall W., and Caldwell, Rodney R., 1998, Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U. S. Geological Survey Professional Paper 1424-A, 32p, 8 plates.

ODOT, 2019. *ODOT Pavement Design Guide,* Pavement Services Unit, Oregon Department of Transportation, January 2019.

ODOT, 2021. *Oregon Standard Specifications for Construction,* Oregon Department of Transportation, 2021 Edition.

Schlicker, Herbert G., and Deacon, Robert J., 1967, Engineering Geology of the Tualatin Valley Region, Oregon. Oregon Department of Geology and Mineral Industries, Bulletin 60, 103 p. text, 4 plates.

Wilson, Doyle C., 1998, Post-middle Miocene Geologic Evolution of the Tualatin Basin, Oregon, Oregon Geology, vol. 60, no. 5., p. 99-116.

Yeats, Robert S., Graven, Erik P., Werner, Kenneth S., Goldfinger, Chris, and Popowski, Thomas A., 1991, Tectonics of the Willamette Valley, Oregon; U.S. Geological Survey Professional Paper Open-File Report 91-441-P, pp. 47.

FIGURES



VICINITY MAP BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO®

NIV5	FOREPROP-13-01	**VICINITY MAP**	
	NOVEMBER 2024	CORNELIUS MULTIFAMILY DEVELOPMENT CORNELIUS, OREGON	**FIGURE 1**

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LEGEND:

B-1 BORING

N

0 120 240

(SCALE IN FEET)

SITE PLAN BASED ON AERIAL PHOTOGRAPH DATED MAY 13, 2021, OBTAINED FROM GOOGLE EARTH PRO.

SITE PLAN

CORNELIUS MULTIFAMILY DEVELOPMENT
CORNELIUS, OREGON

FIGURE 2

FOREPROP-13-01

NOVEMBER 2024

NV5

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File Name: J:\E-L\ForeProp\ForeProp-13\ForeProp-13-01\Figures\CAD\ForeProp-13-01-SP01.dwg | Layout: FIGURE 2

APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

We explored subsurface conditions at the site by drilling eight borings (B-1 through B-8) to depths 16.5 feet BGS. The borings were completed by Dan J. Fisher Excavating, Inc. of Forest Grove, Oregon, using a trailer-mounted drill rig with solid stem auger methods on October 30, 2024. The boring logs are presented in this appendix.

The approximate locations of the explorations are shown on Figure 2. The locations were determined in the field by pacing or measuring from existing site features. This information should be considered accurate only to the degree implied by the methods used.

SOIL SAMPLING

We collected representative samples of the various soil encountered during drilling for geotechnical laboratory testing. Samples were collected from the borings using 1½-inside diameter, split-spoon SPT sampler in general accordance with ASTM D1586. Each sampler was driven into the soil with a 140-pound automatic trip hammer free falling 30 inches. Each sampler was driven a total distance of 18 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the exploration logs, unless otherwise noted. Sampling methods and intervals are shown on the exploration logs.

The hammer used to conduct the SPTs was lifted using a rope and cathead system. The hammer was raised using two wraps of the rope around the cathead to conduct the SPTs.

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 soil or their characteristics change, although the change actually could be gradual. If the change occurred between sample locations, the depth was interpreted. Classifications are shown on the exploration logs.

LABORATORY TESTING

CLASSIFICATION

The soil samples were classified in the laboratory to confirm field classifications. The laboratory classifications are shown on the exploration logs if those classifications differed from the field classifications.

MOISTURE CONTENT

The natural moisture content of select soil samples was determined 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

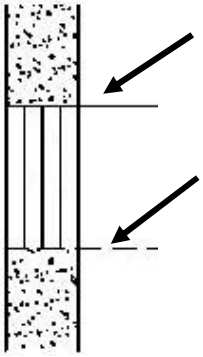
Particle-size analysis was performed on select soil samples in general accordance with ASTM D1140. The test is a qualitative determination of the amount of material finer than the U.S. Standard No. 200 sieve expressed as a percentage of soil weight. The test results are presented in this appendix.

ATTERBERG LIMITS

The plastic limit and liquid limit (Atterberg limits) of a select soil sample were determined in general accordance with ASTM D4318. The Atterberg limits and the plasticity index were completed to aid in the classification of the soil. The plastic limit is defined as the moisture content (in percent) where the soil becomes brittle. The liquid limit is defined as the moisture content where the soil begins to act similar to a liquid. The plasticity index is the difference between the liquid and plastic limits. 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 (SPT) 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-outside diameter 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 Test (SPT) 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 Test (SPT) 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

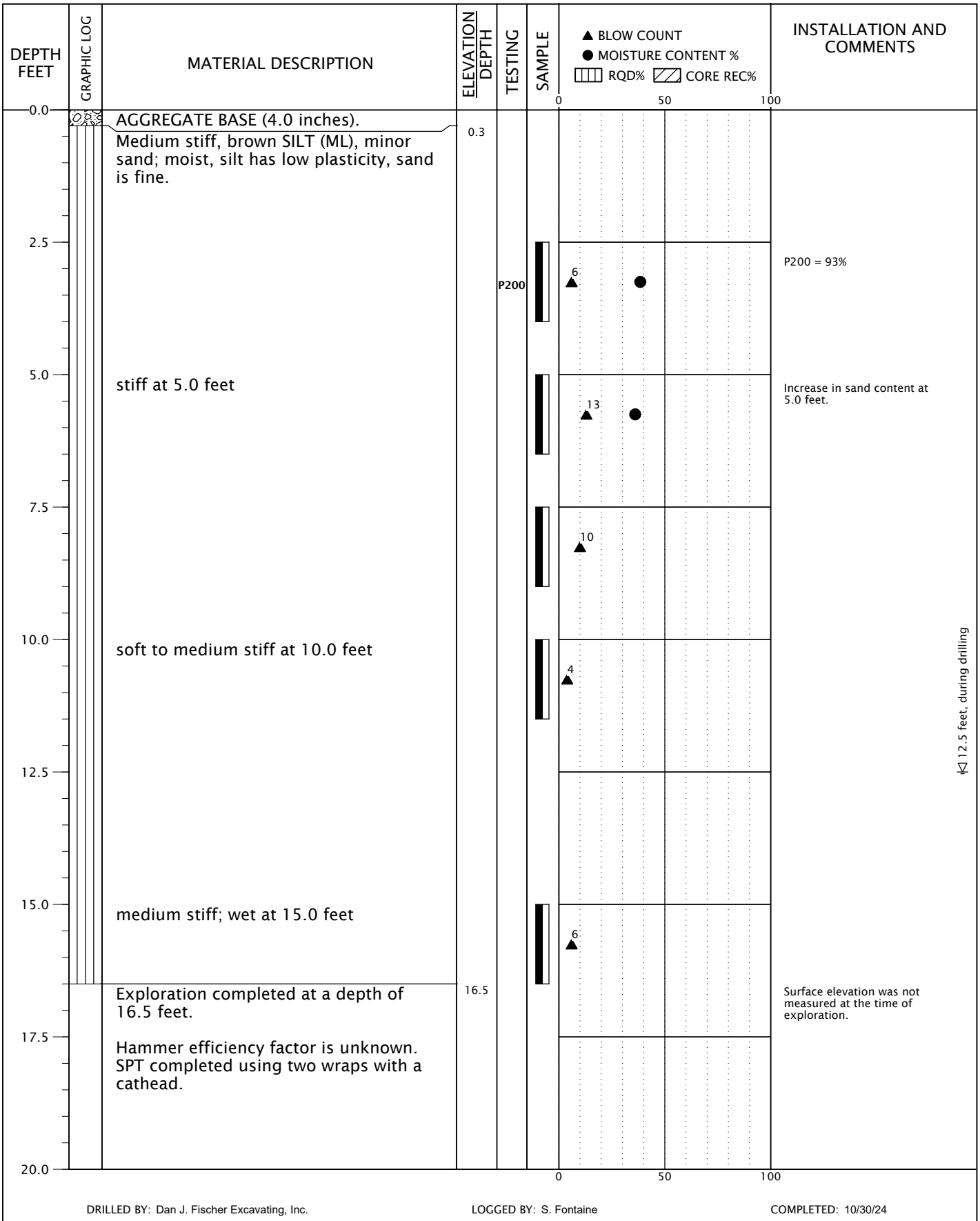
PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOIL (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC 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		ADDITIONAL CONSTITUENTS					
		Secondary granular components or other materials such as organics, man-made debris, etc.					
			Silt and Clay In:			Sand and Gravel In:	
Term	Field Test	Percent	Fine-Grained Soil	Coarse-Grained Soil	Percent	Fine-Grained Soil	Coarse-Grained Soil
dry	very low moisture, dry to touch						
moist	damp, without visible moisture	< 5	trace	trace	< 5	trace	trace
		5 – 12	minor	with	5 – 15	minor	minor
wet	visible free water, usually saturated	> 12	some	silty/clayey	15 – 30	with	with
					> 30	sandy/gravelly	Indicate %

NV5

SOIL CLASSIFICATION SYSTEM

TABLE A-2



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

NV5

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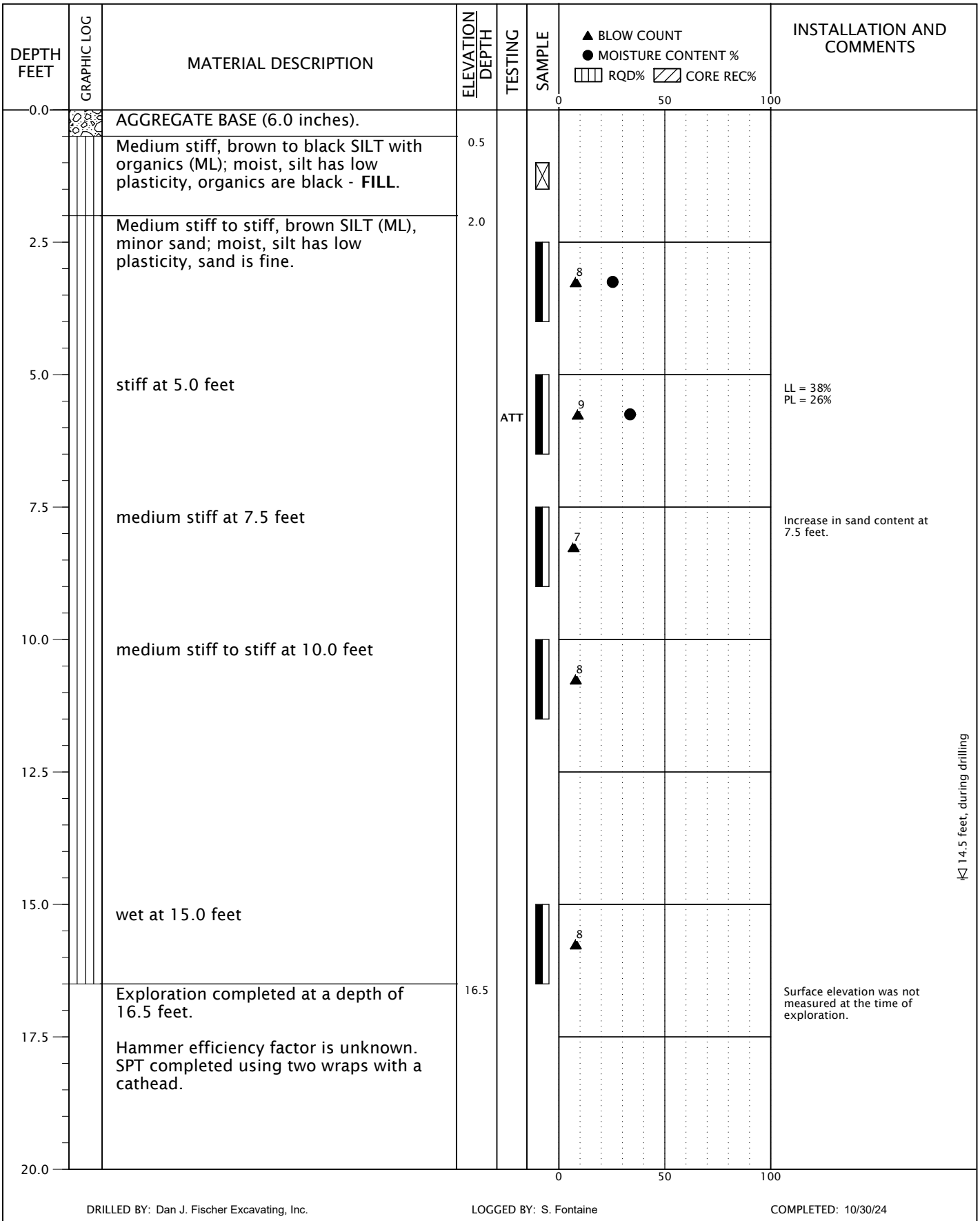
BORING B-1

NOVEMBER 2024

CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-1

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

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FOREPROP-13-01

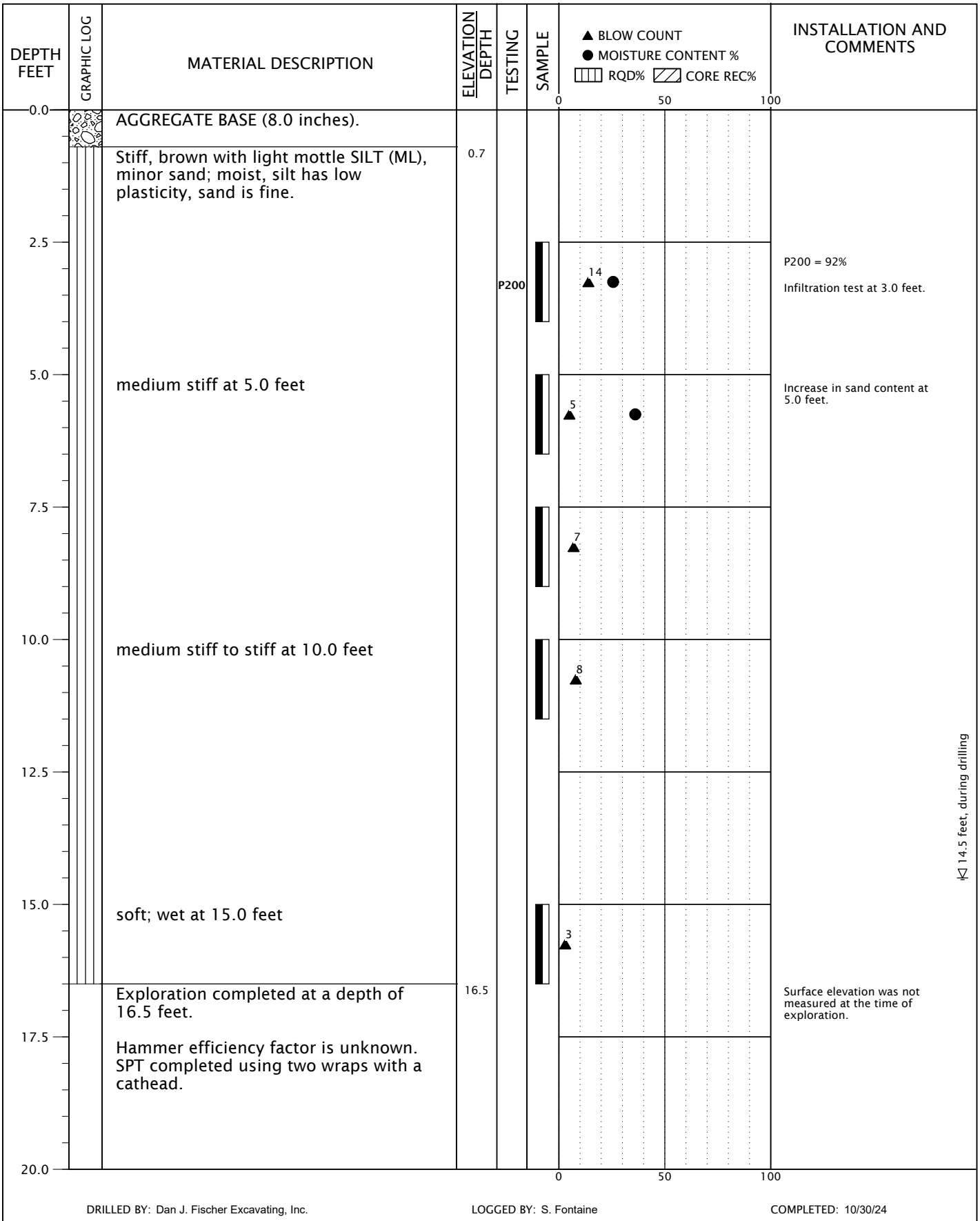
BORING B-2

NOVEMBER 2024

CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-2

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

NV5

FOREPROP-13-01

BORING B-3

NOVEMBER 2024

CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-3

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH
0.0	AGGREGATE BASE (12.0 inches).	
	Medium stiff to stiff, blue, sandy SILT with organics (ML); moist, silt has low plasticity, sand is fine, organics are black - **FILL**.	1.0
2.5		
5.0		
	Very stiff, brown, sandy SILT (ML); moist, silt has low plasticity, sand is fine.	6.0
7.5	stiff at 7.5 feet	
10.0		
12.5		
15.0	soft; wet at 15.0 feet	
	Exploration completed at a depth of 16.5 feet.	16.5
17.5	Hammer efficiency factor is unknown. SPT completed using two wraps with a cathead.	
20.0		

GRAPHIC LOG

TESTING

SAMPLE

▲ BLOW COUNT
● MOISTURE CONTENT %
RQD% CORE REC%

0 50 100

8
20
11
9
2

0 50 100

INSTALLATION AND COMMENTS

Surface elevation was not measured at the time of exploration.

▽ 14.0 feet, during drilling

DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

N|V|5

FOREPROP-13-01

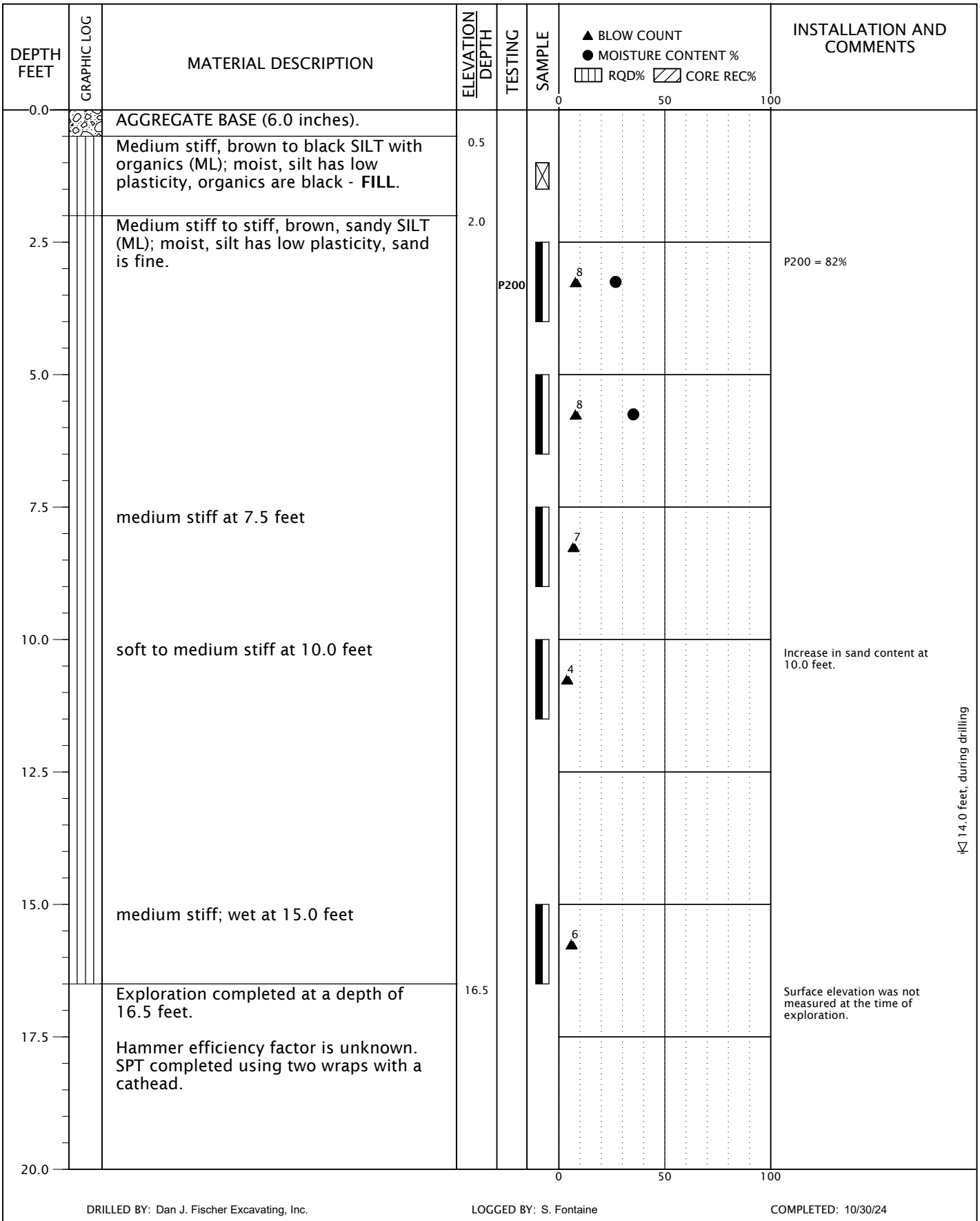
BORING B-4

NOVEMBER 2024

CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-4

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

N|V|5

FOREPROP-13-01

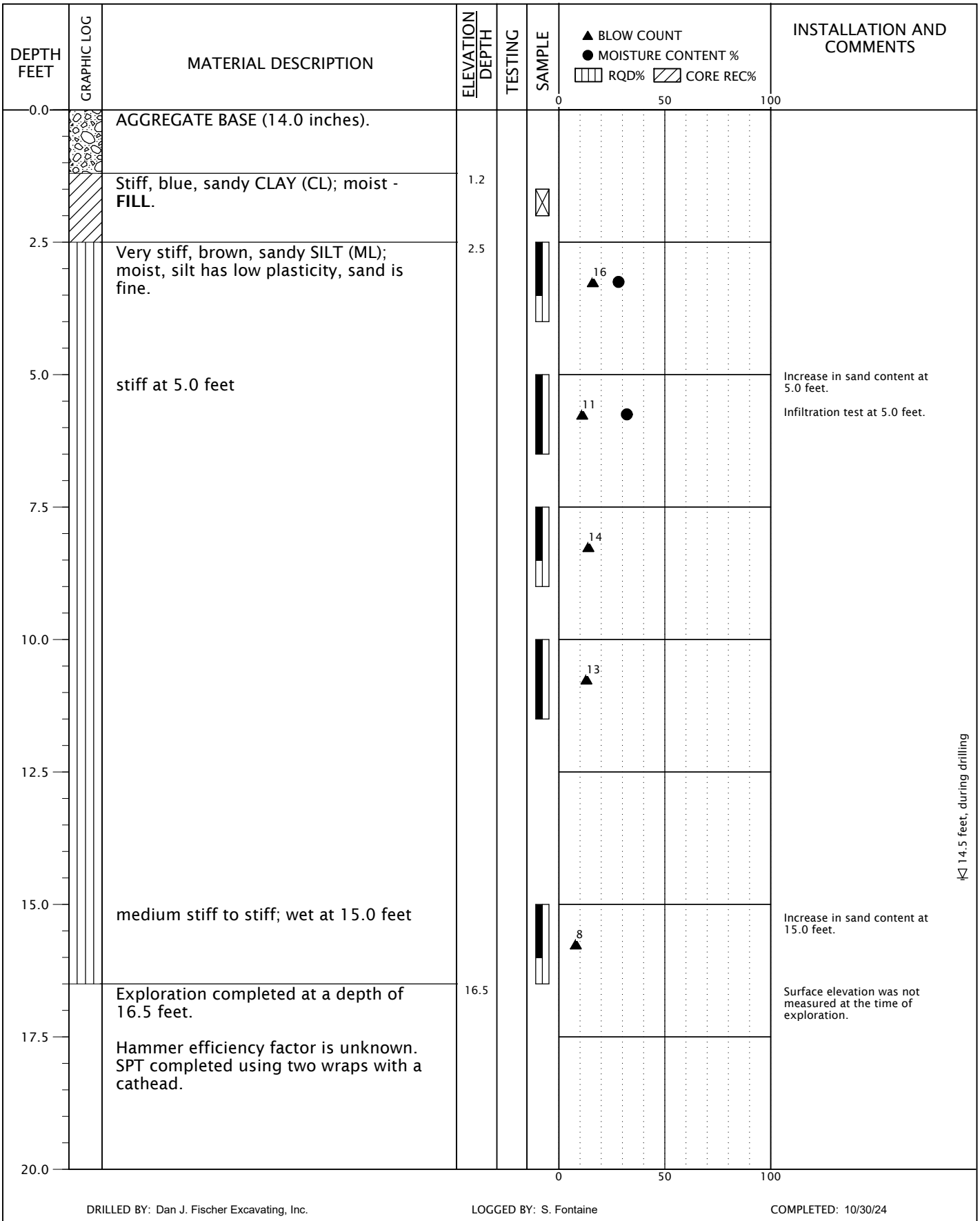
BORING B-5

NOVEMBER 2024

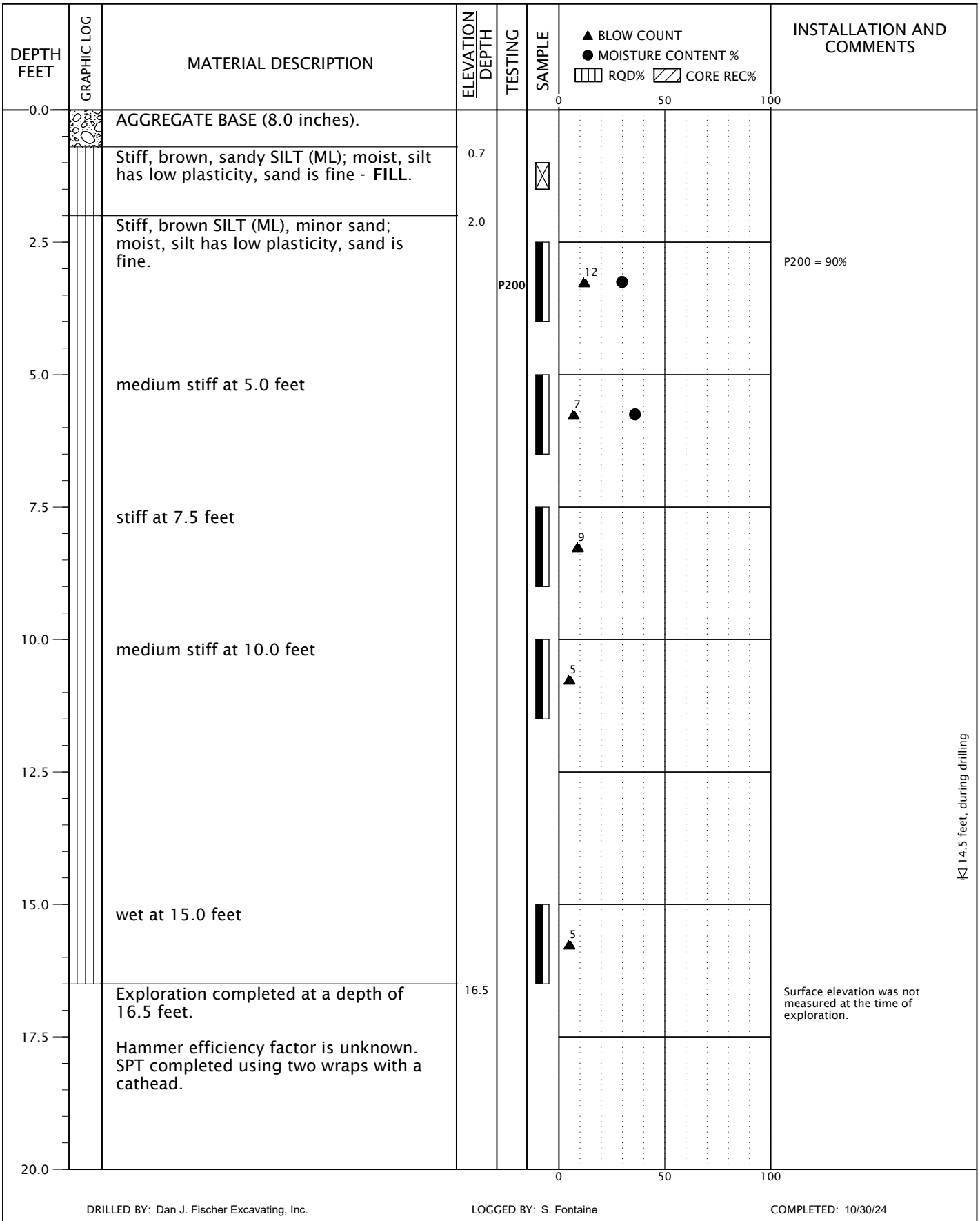
CORNELUS MULTIFAMILY DEVELOPMENT
CORNELUS, OR

FIGURE A-5

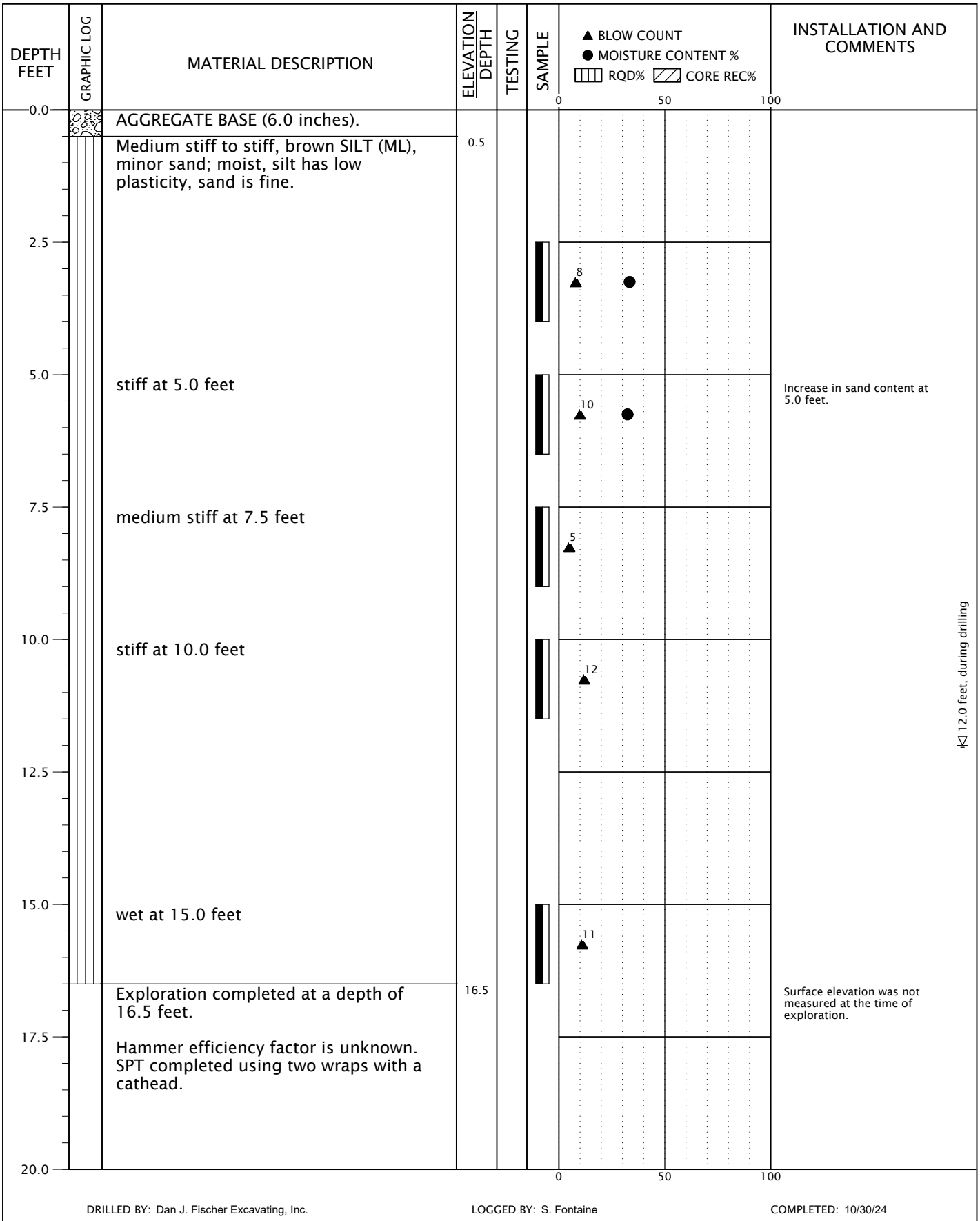
BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



NV5	FOREPROP-13-01	**BORING B-6**
	NOVEMBER 2024	CORNELUS MULTIFAMILY DEVELOPMENT CORNELUS, OR
		FIGURE A-6



NV5	FOREPROP-13-01	**BORING B-7**
	NOVEMBER 2024	CORNELUS MULTIFAMILY DEVELOPMENT CORNELUS, OR
		FIGURE A-7



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Fontaine

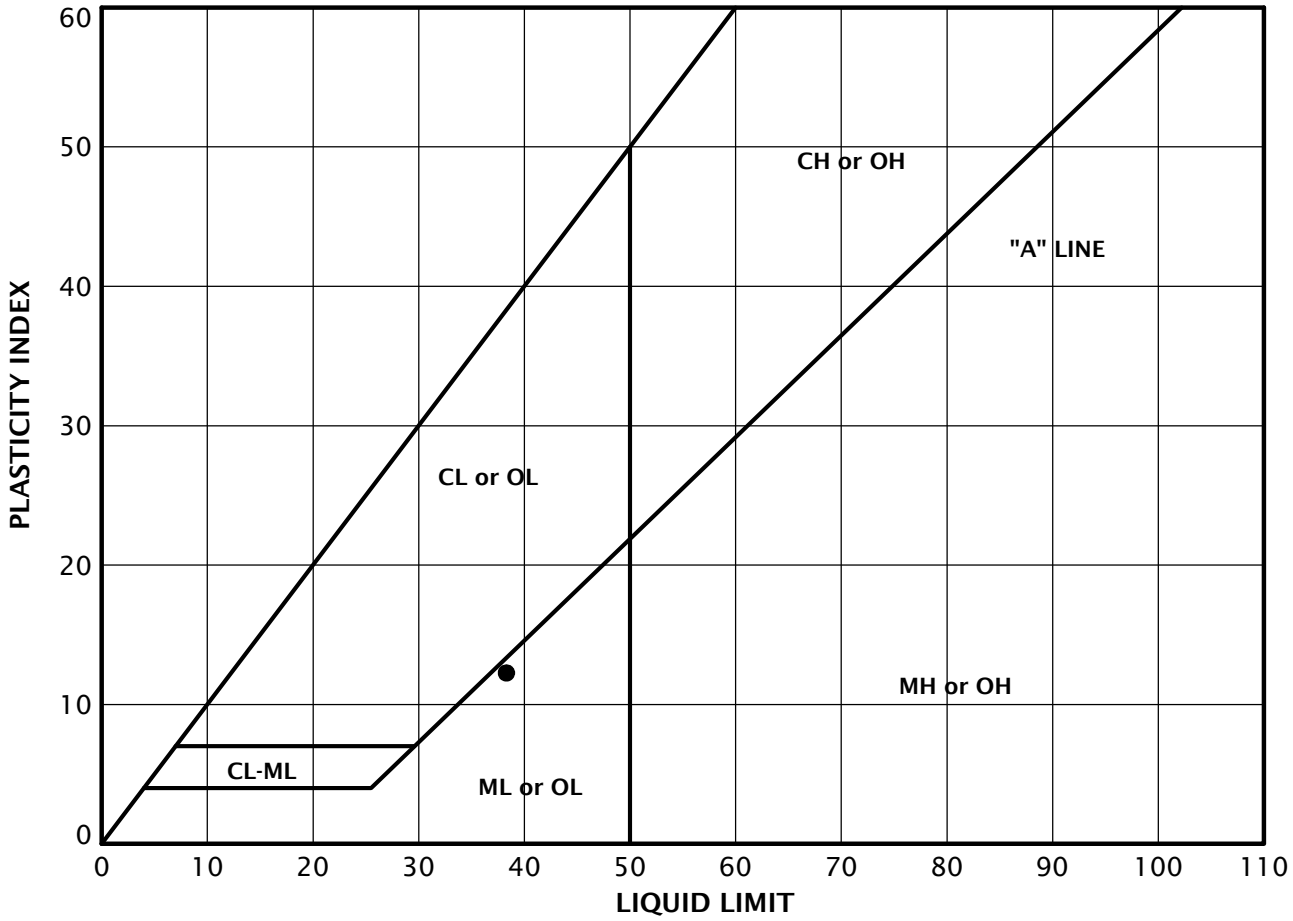
COMPLETED: 10/30/24

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 4 inches

N|V|5	FOREPROP-13-01	**BORING B-8**
	NOVEMBER 2024	CORNELUS MULTIFAMILY DEVELOPMENT CORNELUS, OR
		FIGURE A-8

BORING LOG - NV5 - 1 PER PAGE FOREPROP-13-01-B1_8.GPJ GDI_NV5.GDT PRINT DATE: 25/11/24:SP



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
●	B-2	5.0	34	38	26	12

NV5	FOREPROP-13-01	ATTERBERG LIMITS TEST RESULTS	
	NOVEMBER 2024	CORNELUS MULTIFAMILY DEVELOPMENT CORNELUS, OR	FIGURE A-9

_ATTERBERG_LIMITS 7 FOREPROP-13-01-B1_8.GPJ GEODESIGN.GDT PRINT DATE: 25/11/24:SP

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
B-1	2.5		38				93			
B-1	5.0		36							
B-2	2.5		25							
B-2	5.0		34					38	26	12
B-3	2.5		26				92			
B-3	5.0		36							
B-4	2.5		27							
B-4	5.0		30							
B-5	2.5		27				82			
B-5	5.0		35							
B-6	2.5		28							
B-6	5.0		32							
B-7	2.5		30				90			
B-7	5.0		36							
B-8	2.5		33							
B-8	5.0		32							

NV5

Delivering Solutions
Improving Lives

Outlook

Fw: Evergreen Disposal Specs

From Richard Wiley <rwiley@foreproperty.com>
Date Thu 7/3/2025 1:17 PM
To Jason Wald <jwald@ForeProperty.com>

2 attachments (36 KB)
image001.jpg; image002.png;

Richard Wiley

Development Associate
Fore Property Company
1332 NW Kearney St
Portland, OR 97209

C: 435-862-5780
rwiley@foreproperty.com | ForeProperty.com

From: Tim <tim@evergreendisposalrecycling.com>
Sent: Thursday, May 22, 2025 2:55:51 PM
To: Richard Wiley <rwiley@foreproperty.com>
Subject: RE: Evergreen Disposal Specs

Hi Richard,

All the rear load containers are 7 feet wide. No matter the size of the container. This is the front of the container our trucks hook on to dump. At the rear of the container is a hook that a winch cable is attached from the truck to assist in dumping the container.

2-yard containers are: 7 feet wide X 4 feet deep

All the 3 and 4 yard containers have 4 lids and open towards the front and back. These containers are also sloped in the back to accommodate the additional yards of garbage, making them quite (deep) long. These containers need to be accessible for the truck to back to and hook on to the truck. They are very heavy and difficult to move when they are full. The gate opening needs to be at a minimum 10 feet for the truck and driver to access each containers.

3-yard containers are: 7 feet wide X 8 feet deep.
4-yard containers are: 7 feet wide X 9 feet deep

The image below is a 3 yard



Let me know if this helps

Regards,

Tim

Tim Brady

Evergreen
DISPOSAL & RECYCLING INC.

8145 NE Nicholas, Ct.
Hillsboro, Oregon 97123
P.O. Box 5069 | Aloha OR 97006
(503)357-3510 office
(971)424-8237 cell

From: Richard Wiley <rwiley@foreproperty.com>
Sent: Thursday, May 22, 2025 1:31 PM
To: Tim <tim@evergreendisposalrecycling.com>
Subject: FW: Evergreen Disposal Specs

Hey Tim

As per our conversation the other day I was wondering if you could jot down here the specs for larger bins so we can figure out if that's an option.

Thanks!

From: Manjusree Deb <manjusreedeb@abbasidesign.com>
Sent: Monday, May 19, 2025 4:08 PM
To: tim@evergreendisposalrecycling.com
Cc: Richard Wiley <rwiley@foreproperty.com>; Rahim Abbasi <rahim@abbasidesign.com>; Henry Miller <hmiller@ForeProperty.com>; Jason Wald <jwald@ForeProperty.com>
Subject: Re: Evergreen Disposal Specs

Hi Tim!

I wanted to follow up with you on this.

On Thu, May 15, 2025 at 3:37 PM Manjusree Deb <manjusreedeb@abbasidesign.com> wrote:

> Hi Tim!
>
> Could you please share the sizes of the 3 yard and 4 yard containers? We are trying to reduce the frequency of service and need the specs of the 3 yard and 4 yard containers.
>
> On Thu, May 8, 2025 at 2:35 PM Jason Wald <jwald@foreproperty.com> wrote:
>
> > Don't forget we need to include an ADA compliant man door in each enclosure. Also, at 12' wide, the gates on these enclosures might get a bit unwieldy. I would reduce the openings down to 10' unless the hauler has a requirement.
> >
> > I'd keep the trash enclosures the same size and have more dumpsters to reduce the number of pickups each week. If we add two more dumpsters to each enclosure, we should be able to reduce the number of trips.
> >
> > At our project in Happy Valley, we have three 16' x 26' trash enclosures. Within each enclosure are two 4yd garbage, one 4yd recycling, and two 35 Gal glass containers. Trash service twice per week for 216 units.
> >
> > Jason Wald
> > Partner – PNW
> > Fore Property Company
> > 1332 NW Kearney St
> > Portland, OR 97209
> > O: 503.964.5658
> > C: 972.415.4214
> > jwald@foreproperty.com<mailto:jwald@foreproperty.com> | ForeProperty.com<http://foreproperty.com/>
> >
> > From: Manjusree Deb <manjusreedeb@abbasidesign.com>
> > Sent: Thursday, May 8, 2025 12:08 PM
> > To: Richard Wiley <rwiley@foreproperty.com>
> > Cc: Rahim Abbasi <rahim@abbasidesign.com>; Jason Wald <jwald@ForeProperty.com>; Henry Miller <hmiller@ForeProperty.com>; Kareem Abbasi <kareem@abbasidesign.com>
> > Subject: Re: Evergreen Disposal Specs
> >
> > Hi Richard,
> >
> > Apologies for the delay in responding to you on this. I asked my coworker Kareem to help me out with this and he laid out the containers in the Trash Enclosures and it seems like we have provided very large Trash Enclosures. I think we could switch to larger containers and reduce the frequency of service or provide smaller Trash Enclosures. Please see the attached drawing for your reference. Let us know your thoughts on this.

On Wed, Apr 30, 2025 at 1:56 PM Richard Wiley <rwiley@foreproperty.com<mailto:rwiley@foreproperty.com>> wrote:

_____
From: Tim <tim@evergreendisposalrecycling.com<mailto:tim@evergreendisposalrecycling.com>>
Sent: Wednesday, April 30, 2025 1:53 PM
To: Richard Wiley <rwiley@foreproperty.com<mailto:rwiley@foreproperty.com>>
Subject: RE: Site plan - Richard Wiley - Fore Property

Hi Richard,

Approximately 36 yard of trash a week with three enclosures.

TRASH (3) enclosures, (2) 2-yard containers each enclosure @ 3-times a week is 36 yards of trash service.

RECYCLING (3) enclosures, (2) 2-yard containers each enclosure @ 3-times a week is 36 yards of recycling service.

The frequency of service, and number of containers can be adjusted based on the materials demand.

The container specifications are attached, add 6 inches to the height to account for the wheels. Add 3 – 4 feet at the open end of the containers for access.

Please call with questions.

Tim

Tim Brady

[Evergreen Disposal & Recycling Logo]

8145 NE Nicholas, Ct.

Hillsboro, Oregon 97123

P.O. Box 5069|Aloha OR 97006

(503)357-3510 office

(971)424-8237 cell

From: Richard Wiley <rwiley@foreproperty.com<mailto:rwiley@foreproperty.com>>
Sent: Monday, April 28, 2025 1:37 PM
To: Tim <tim@evergreendisposalrecycling.com<mailto:tim@evergreendisposalrecycling.com>>
Subject: Site plan - Richard Wiley - Fore Property

Preliminary site plan

Richard Wiley

Development Associate – PNW

Fore Property Company

1332 NW Kearney St

Portland, OR 97209

C: 435.862.5780

rwiley@foreproperty.com<mailto:rwiley@foreproperty.com>
<mailto:rwiley@foreproperty.com<mailto:rwiley@foreproperty.com>> |
ForeProperty.com<http://foreproperty.com/>

--
Regards.

Manjusree Deb
Job Captain

Abbasi Design Works
manjusreedeb@abbasidesign.com<mailto:manjusreedeb@abbasidesign.com>
C: 920.375.9635

--
Regards.

Manjusree Deb
Job Captain

Abbasi Design Works
manjusreedeb@abbasidesign.com
C: 920.375.9635

--
Regards.

Manjusree Deb
Job Captain

Abbasi Design Works
manjusreedeb@abbasidesign.com
C: 920.375.9635

Outlook

Fw: Site plan - Richard Wiley - Fore Property

From Richard Wiley <rwiley@foreproperty.com>
Date Thu 7/3/2025 1:17 PM
To Jason Wald <jwald@ForeProperty.com>

1 attachment (235 KB)
CONTAINER SPECS.pdf;

Richard Wiley

Development Associate
Fore Property Company
1332 NW Kearney St
Portland, OR 97209

C: 435-862-5780
rwiley@foreproperty.com | ForeProperty.com

From: Tim <tim@evergreendisposalrecycling.com>
Sent: Wednesday, April 30, 2025 1:53:11 PM
To: Richard Wiley <rwiley@foreproperty.com>
Subject: RE: Site plan - Richard Wiley - Fore Property

Hi Richard,

Approximately 36 yard of trash a week with three enclosures.

TRASH (3) enclosures, (2) 2-yard containers each enclosure @ 3-times a week is 36 yards of trash service.

RECYCLING (3) enclosures, (2) 2-yard containers each enclosure @ 3-times a week is 36 yards of recycling service.

The frequency of service, and number of containers can be adjusted based on the materials demand.

The container specifications are attached, add 6 inches to the height to account for the wheels. Add 3 – 4 feet at the open end of the containers for access.

Please call with questions.

Tim

Tim Brady

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From: Richard Wiley <rwiley@foreproperty.com>
Sent: Monday, April 28, 2025 1:37 PM
To: Tim <tim@evergreendisposalrecycling.com>
Subject: Site plan - Richard Wiley - Fore Property

Preliminary site plan

Richard Wiley

Development Associate – PNW

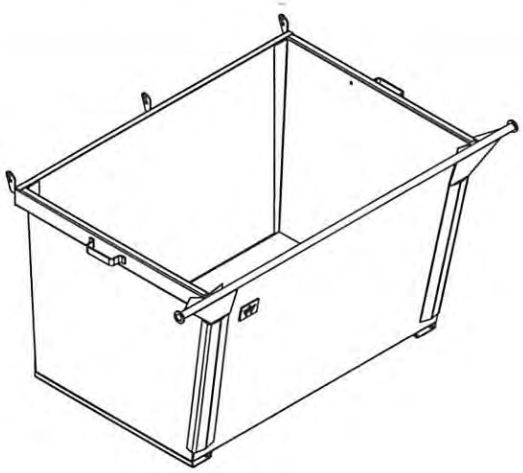
Fore Property Company

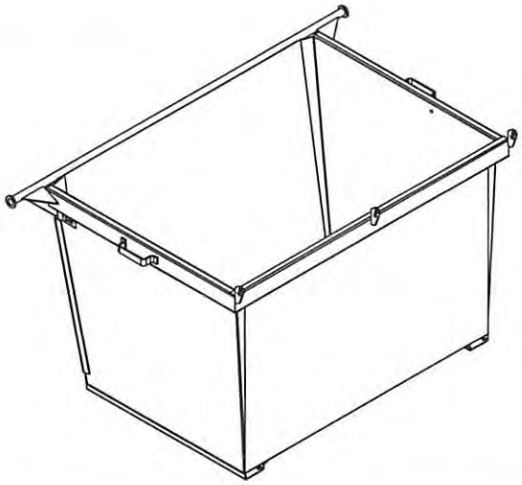
1332 NW Kearney St

Portland, OR 97209

C: 435.862.5780

rwiley@foreproperty.com | ForeProperty.com





DRAWING APPROVAL

THIS PRINT IS FORWARDED FOR YOUR APPROVAL.
PLEASE REVIEW BEFORE SIGNING THIS DRAWING.
PLEASE MARK CHANGES.
ALL CHANGES WILL BE REVIEWED.

FIRM _____

SIGNATURE _____ DATE _____

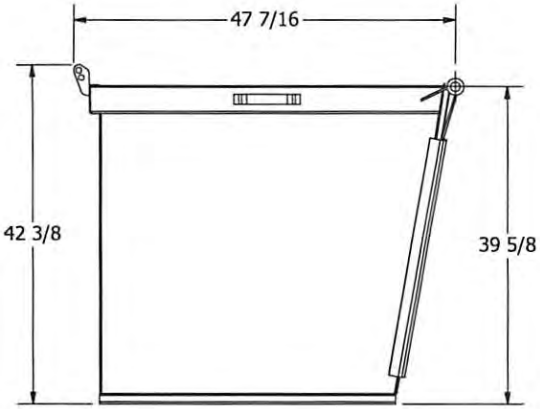
TITLE _____

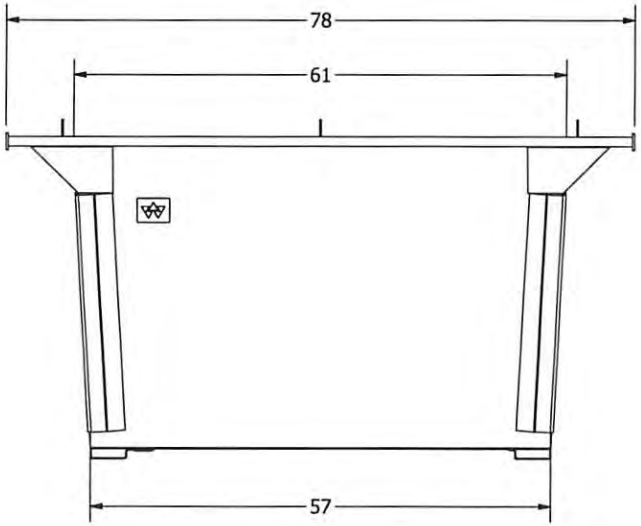
PRODUCTION CANNOT BEGIN UNTIL WASTEQUIP, INC. RECEIVES THIS SIGNED APPROVAL

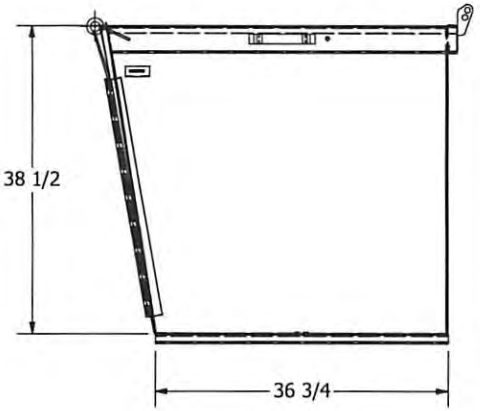
WQ SALES _____

CONTAINER WILL COMPLY WITH ANSI Z245.30 & Z245.60 CURRENT RELEASE, UNLESS SPECIFICALLY REQUESTED, WITH SUBMITTED DRAWINGS TO BE OTHERWISE.

THE ACTUAL VOLUME MAY VARY FROM THE NOMINAL YARDAGE STATED.







Rev.	Date	By	Revision Details
A	9/21	TW	INITIAL RELEASE

WASTEQUIP

REF.

DXF:

Drawn By: TW (TRIZ)

Date: 9/1/2021

Weight: 311.33 lbmass

Scale: 1 / 15

Job No/Parent:

Dwg Type: SALES

Revision: A

Drawing Number: **160710**

UNLESS OTHERWISE SPEFICIED: UNITS ARE INCHES AND TOLERANCES:

Fractional: ±1/16" Angular: ±1°

Previous Part #:

Description: **2 YD RL STD 14G 1.25 BAR M-63 LEACH**

Sheet No. 1 of 1

Location ID:

THIS DRAWING IS THE PROPERTY OF WASTEQUIP, LLC, IS CONFIDENTIAL MUST NOT BE MADE PUBLIC OR COPIED, AND IS SUBJECT TO RETURN ON DEMAND. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.

Hi Richard,

Date: July 7, 2025

Subject: Haney Site – Fore Property – Preliminary Waste Collection Plan

I have summarized the two preliminary options we have discussed to address the waste collection and equipment requirements for this apartment development project. I highly recommend the 2-yard container option. It provides adequate service for this multifamily development and provides flexibility in both service requirements and the collection process with more mobile, lighter containers for handling.

The frequency of service and number of containers can be adjusted based on the materials demand. Regardless of the size of containers selected and the frequency of service, Evergreen Disposal will need to be on site to service the recycling and trash containers a minimum of 3 times a week for 36 yards of garbage and 36 yards of recycling each week.

Approximately 36 yards of trash a week with three enclosures.

Option one: 2-yard container option

2-yard containers are: 7 feet wide X 4 feet deep

TRASH (3) enclosures, (2) 2-yard containers in each enclosure @ 3-times a week is 36 yards of trash service.

RECYCLING (3) enclosures, (2) 2-yard containers in each enclosure @ 3-times a week is 36 yards of recycling service.

Option 2: 3 OR 4-yard container option

3-yard containers are: 7 feet wide X 8 feet deep.
4-yard containers are: 7 feet wide X 9 feet deep

All the rear load containers are 7 feet wide. No matter the size of the container. This is the front of the container that our trucks hook on to dump. At the rear of the container is a hook that a winch cable is attached from the truck to assist in dumping the container.

All the 3 and 4-yard containers have 4 lids and open towards the front and back. These containers are also sloped in the back to accommodate the additional yards of garbage, making them quite (deep) long. These containers need to be accessible for the truck to back to and hook on to directly with the truck without moving them. They are very heavy and difficult to move when they are full. The gate opening needs to be at a minimum 10 feet for each container, so the truck and driver has room to access each container.

The image below is a 3 yard



Tim Brady

Evergreen
DISPOSAL & RECYCLING INC.

8145 NE Nicholas, Ct.
Hillsboro, Oregon 97123
P.O. Box 5069 | Aloha OR 97006
(503)357-3510 office
(971)424-8237 cell

Oregon
Tina Kotek, Governor

Department of Transportation
Transportation Region 1
123 NW Flanders St.
Portland, OR 97209-4012
(503) 731-8200
Fax: (503) 731-8259

November 4, 2024 ODOT # 13448

ODOT Pre-Application Response

Project Name: Cornelius Multifamily	**Applicant:** Richard Wiley
Jurisdiction: City of Cornelius	**State Highway:** E Baseline Street (OR 8)
Site Address: 273 N 26th Avenue	

The site of this proposed land use action is adjacent to E Baseline Street (OR 8). ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation.

These comments, standards, and requirements are current as of the date of this letter. If the project scope and/or timeline is modified, the applicant should contact the ODOT Region 1 Development Review program (ODOT_R1_DevRev@odot.oregon.gov) for an updated letter as updated comments may be necessary.

LAND USE PROPOSAL

ODOT attended a pre-application conference for the proposed construction of a 220-unit apartment complex on tax lots 4500 and 4600. No access to the State highway is proposed.

COMMENTS/FINDINGS

After attending the pre-application conference, ODOT understands that the applicant intends to partition the southern portion of the site that fronts OR 8 and, in the future, propose a commercial, mixed-use development. ODOT looks forward to providing comments when this development is proposed.

From the submitted materials, it appears that no work associated with the proposed residential development will impact the State highway right of way. However, the applicant is advised that if the applicant and/or the City of Cornelius determine that work within the State highway right of way is needed, permits with ODOT will be required. Further information regarding permitting requirements that may be applicable, has been included below.

Vehicular Access to the State Highway

A State Highway Approach Road Permit is required by ODOT for access to the State highway. ODOT understands no access is intended to be taken from OR 8 from the future proposed commercial tax lot, to the south of the current proposed development. Once further information is provided for the redevelopment of southern portion of the subject site, ODOT will need to review for potential concerns.

ADVISORY INFORMATION

Permits and Agreements to Work in State Highway Right of Way

☒ An ODOT Miscellaneous Permit must be obtained for all work in the State highway right of way.

☒ The applicant must obtain an ODOT Miscellaneous Permit to place trees in the State right of way. Tree placement must be consistent with the ODOT Highway Design Manual section 406.1.

If the proposed tree placement does not meet ODOT Highway Design Manual criteria, a Design Exception must be prepared by an Oregon-registered Professional Engineer (P.E.) for review by the Region 1 Technical Center. The preparation of a Design Exception request does not guarantee its ultimate approval.

Note: It may take **6 months or longer** to process a Design Exception.

☒ Illumination within the State right of way must be consistent with AASHTO illumination standards, ODOT Traffic Lighting Design Manual, and the ODOT Lighting Policy and Guidelines, which states that local jurisdictions must enter into an Intergovernmental Agreement (IGA) with ODOT wherein the local jurisdiction is responsible for installation, maintenance, operation, and energy costs. ODOT Region Traffic Engineer (RTE) approval will be required and is how the design will be documented to meet the above stated standards.

Note: It may take **6 months or longer** to process a RTE approval.

☒ An ODOT Miscellaneous Permit is required for new or modified connections to State highway drainage facilities. Connections will only be considered if the site's drainage naturally enters the State highway drainage facility. The applicant must provide ODOT District with a preliminary drainage plan showing impacts to the State highway drainage facility.

A drainage study prepared by an Oregon-registered Professional Engineer (P.E.) is usually required by ODOT if:

1. Modification to site development or State highway facility trigger the need for treatment, detention and drainage modifications per both local and state standards; or
2. Total peak runoff entering the State highway drainage facility is more significant than 1.77 cubic feet per second; or
3. The improvements increase the impervious surface area to greater than 10,758 square feet.

Note: If a drainage study is required, it shall be prepared to meet the requirements of the ODOT Hydraulics Manual. The applicant is advised that ODOT standards may differ from the local jurisdiction.

Contact the ODOT Development Review Planner identified below for further coordination or questions regarding ODOT comments and requirements during the land use process.

Please send a copy of the Land Use Notice to: ODOT_R1_DevRev@odot.oregon.gov

Development Review Planner: Melissa Gonzalez	Melissa.gonzalez-gabriel2@odot.oregon.gov
District Contact: District 2B	d2bup@odot.oregon.gov

Neighborhood Review Meeting

Neighborhood Meeting on a Preliminary Development Proposal affecting:

139 N 26th Avenue
Cornelius, OR 97223

Proposed as

240 Unit Multi-Family Apartments

A meeting to discuss the preliminary development proposal is scheduled for:

Thursday, May 22
6pm

At

Cornelius Public Library
Walters Gallery

All interested persons may attend.

For more information, please contact
Hillary Harris, AICP
(503) 221-1131
hillaryh@hhpr.com

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CREATED 4/22/25
BY TERI HEINO, WASHCO LUT
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CORNELIUS OR 97113

1S303AB04700
CASTANEDA, JORGE L GUZMAN
FRANCO, NOEMI SANCHEZ
2680 S ALPINE ST
CORNELIUS OR 97113

1N334DC04700
CORNELIUS CINEMAS 2 LLC
16055 SW WALKER RD #425
BEAVERTON OR 97006

1N334CD06700
CORNELIUS PROPERTY OWNER SPE LLC
BY CALIDA RESIDENTIAL LLC
ATTN GENERAL COUNSEL
10777 W TWAIN AVE STE 115
LAS VEGAS NV 89135

1N334CD00201
CORNELIUS, CITY OF
1355 N BARLOW ST
CORNELIUS OR 97113

1S303AB12400
CORNELIUS, CITY OF
1355 N BARLOW ST
CORNELIUS OR 97113

1S303AB10900
FILOTEO, ARNOLD L
FILOTEO, CHRISTIAN L
2431 S ALPINE ST
CORNELIUS OR 97113

1S303AB09000
G&K INVESTMENT PROPERTIES LLC
160 NW 336TH AVE
HILLSBORO OR 97124

1S303AB04400
GONZALEZ, JOSE
VARGAS, MARIA NELLY
2628 S ALPINE ST
CORNELIUS OR 97113

1S303AB11600
AH4R PROPERTIES TWO LLC
23975 PARK SORRENTO STE300
CALABASAS CA 91302

1N334CD00800
BK2200 VENTURE LLC
BY AMNON MIZRAHI
16255 VENTURA BLVD #700
ENCINO CA 91436

CORNELIUS
CITY OF CORNELIUS
1355 N BARLOW ST
CORNELIUS OR 97113

1N334CD00100
CORNELIUS PROPERTY OWNER SPE LLC
BY CALIDA RESIDENTIAL LLC
ATTN GENERAL COUNSEL
10777 W TWAIN AVE STE 115
LAS VEGAS NV 89135

1N334DC04400
CORNELIUS SELF STORAGE LLC
35 CORTE MADERA AVE
MILL VALLEY CA 94941

1N334CD00302
CORNELIUS, CITY OF
1355 N BARLOW ST
CORNELIUS OR 97113

1N334DC01900
CVP-CORNELIUS OR LLC
2188 SW PARK PL STE 100
PORTLAND OR 97205

1S303AB09900
FLORES-AGUIRRE, RAUL
2336 S ALPINE ST
CORNELIUS OR 97113

1S303AB10300
GARCIA, JOSE RAMON LARA
JASSI, ARACELI LARA
2353 S ALPINE ST
CORNELIUS OR 97113

1S303AB09700
GUTIERREZ, LAURA ANGELICA
RODRIGUEZ, ISIDORO MANRRIQUEZ
2350 S ALPINE ST
CORNELIUS OR 97113

1S303AB02300
AMADOR, MARIA SELENE
CAMPUZANO, ANA CECILIA DELGADO
101 S 26TH AVE
CORNELIUS OR 97113

1S303AB04600
BROCKWAY, ANDREW
2666 S ALPINE ST
CORNELIUS OR 97113

1S303AB05400
COLE, SPENCER A & SANDRA C
2655 S ALPINE ST
CORNELIUS OR 97113

1N334CD00200
CORNELIUS PROPERTY OWNER SPE LLC
BY CALIDA RESIDENTIAL LLC
ATTN GENERAL COUNSEL
10777 W TWAIN AVE STE 115
LAS VEGAS NV 89135

1N334CD00101
CORNELIUS, CITY OF
1355 N BARLOW ST
CORNELIUS OR 97113

1N334DC04601
CORNELIUS, CITY OF
1355 N BARLOW ST
CORNELIUS OR 97113

1S303AB04300
EWERS, MICHAEL W & PAMELA A
2604 S ALPINE ST
CORNELIUS OR 97113

1N334DC01801
FRATERNAL ORDER OF EAGLES
CORNELIUS AERIE #4177
PO BOX 643
CORNELIUS OR 97113

1S303AB04800
GARLAND, MARVIN J & MARLA J KENT REVOCAB
BY GARLAND, MARVIN J & KENT, MARLA J TRS
32333 SW LAUREL RD
HILLSBORO OR 97123

1N334DC04500
HANEY INDUSTRIAL PROPERTIES INC
BY NAI ELLIOTT
901 NE GLISAN ST STE 200
PORTLAND OR 97232

1N334DC04600
HANEY INDUSTRIAL PROPERTIES INC
BY NAI ELLIOTT
901 NE GLISAN ST STE 200
PORTLAND OR 97232

1S303AB02200
HERRERA, ADAM M & ANDREA J
125 S 26TH AVE
CORNELIUS OR 97113

1S303AB08600
JACOBSEN, WANDA M
2478 S ALPINE ST
CORNELIUS OR 97113

1S303AB08100
KNOX, ZACHARY TITUS
KNOX, ERIN NICOLLE HARMAN
126 S 25TH AVE
CORNELIUS OR 97113

1N334DC04800
LEWIS CONTROLS INC
PO BOX 526
CORNELIUS OR 97113

1S303AB10200
LOPEZ, AMELIA M
2349 S ALPINE ST
CORNELIUS OR 97113

1S303AB08800
MEDEL, GAMALIEL
2460 S ALPINE ST
CORNELIUS OR 97113

1S303AB08300
MORELOS, BIANCA C
MARTINEZ, IRMA
MARTINEZ, MARTIN R MORELOS
110 S 25TH AVE
CORNELIUS OR 97113

ODOT1
ODOT_R1_DevRev@odot.state.or.us
123 NW FLANDERS ST
PORTLAND OR 97209

1N334CD00500
OREGON, STATE OF
BY OREGON DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY SECTION
355 CAPITOL ST NE, RM 420
SALEM OR 97301

1S303AA00550
HANS & EUGENE LLC
14425 SW ALLEN BLVD
BEAVERTON OR 97005

SDHILLSBORO
HILLSBORO SCH DIST - J LYON
3083 NE 49TH PL, #200
HILLSBORO OR 97124

CPO12C
JOSEPH AUTH
325 NW 334TH AVE
HILLSBORO OR 97124

1S303AB05600
LAZARO, AMPARO HERNANDEZ
VALDEZ, ELOY CARRANZA
2609 S ALPINE ST
CORNELIUS OR 97113

1S303AB04500
LEYVA, JONATHON GONZALEZ
2642 S ALPINE ST
CORNELIUS OR 97113

1S303AB10400
LUNA, SINUHE
2365 S ALPINE ST
CORNELIUS OR 97113

1S303AB11400
MITCHELL, RYAN E & LISA M
MITCHELL, JASON K
111 S 25TH AVE
CORNELIUS OR 97113

1S303AB08700
NAVAS, ROBERTO
NAVAS-GONZALEZ, BLANCA RUBIA
2466 S ALPINE ST
CORNELIUS OR 97113

1S303BA09800
OLNEY, PAUL & SIOBHAN
2300 S ALPINE ST
CORNELIUS OR 97113

1N334DB23800
OREGON, STATE OF
BY OREGON DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY SECTION
355 CAPITOL ST NE, RM 420
SALEM OR 97301

1S303AB08200
HEALY, BRIAN P
DENNIS, LAURIE L
8800 SW BRABHAM WAY
GASTON OR 97119

1S303AB03100
HILLSBORO SCHOOL DISTRICT 1J
3083 NE 49TH PL
HILLSBORO OR 97124

1S303AB10800
JUAREZ, NICOLAS A & STEPHANIE L
2423 S ALPINE ST
CORNELIUS OR 97113

1S303AB00100
LEE, JOHN
9167 NW KAISER RD
PORTLAND OR 97231

1S303AB09100
LONG, KENNETH R
HABIB, SERENA N
2428 S ALPINE ST
CORNELIUS OR 97113

1N334DC01902
MARDIC LLC
BY RICHARD E CAMPBELL
16193 NW CANTERWOOD WAY
PORTLAND OR 97229

1S303AB05300
MOEN, TERRY A & DEBORAH L
2673 S APLINE ST
CORNELIUS OR 97113

1S303AB09800
NORTH, TERRY ALAN II & LISA ANN
2348 S ALPINE ST
CORNELIUS OR 97113

1S303AB08900
OLSON, NATALIE R
OLSON, RUSSELL LEE
2454 S ALPINE ST
CORNELIUS OR 97113

1S303AB09300
ORTIZ, MARIA ARROYO
LOPEZ, JESUS VILLANUEVA
2398 S ALPINE ST
CORNELIUS OR 97113

1S303AB10100
PENLAND, RICHARD S & DARLENE
2312 S ALPINE ST
CORNELIUS OR 97113

1S303AB11500
POWELL, JON
119 S 25TH AVE
CORNELIUS OR 97113

1S303AB05500
RONDEL, ADRIEN L TRUST
RONDEL, KARLA K TRUST
2637 S ALPINE ST
CORNELIUS OR 97113

1S303AB09500
SALINAS, LETICIA
2232 S ALPINE ST
CORNELIUS OR 97113

1N334DC01802
SHELDON MANUFACTURING INC
PO BOX 627
CORNELIUS OR 97113

1S303AB09200
SMITH, RICHARD
2416 S ALPINE ST
CORNELIUS OR 97113

1S303AB12500
VANDEHEY, ADAM
102 S 23RD AVE
CORNELIUS OR 97113

1S303AB09400
VILLANUEVA, FLORENCIA L
LOPEZ, TEOBALDO
LOPEZ, JUAN
2621 N KAMIAKAN ST
CORNELIUS OR 97113

1S303AB02700
VO, ERIK
6521 SE 139TH AVE
PORTLAND OR 97236

1S303AB10600
WHITE, PHILIP N
2389 S ALPINE ST
CORNELIUS OR 97113

UPAACORNELIU
PLANNING DIRECTOR
1355 N BARLOW ST
CORNELIUS OR 97113

1S303AB11000
RAMIREZ, SAMUEL
2449 S ALPINE ST
CORNELIUS OR 97113

1S303AB02800
ROOHANDEH, BEHZAD
ARJOMAND, MOJDEH
2955 SW GRAYSON ST
MCMINNVILLE OR 97128

1S303AB11200
SCHMIDT, BRIAN D
PHILLIPS, KAMBRIA A
2465 S ALPINE ST
CORNELIUS OR 97113

1N334DC01901
SHELDON MANUFACTURING INC
PO BOX 627
CORNELIUS OR 97113

1S303AB08400
STRUNK-HINTZ, SAMANTHA M
102 S 25TH AVE
CORNELIUS OR 97113

1S303BA10000
VANDEHEY, ADAM D
102 S 23RD AVE
CORNELIUS OR 97113

1S303AB08500
VILLARALDO, GUILLERMO &
RIOS DEVILLARALDO, JUANA &
VILLARALDO RIOS, VICTORINA
2486 S ALPINE ST
CORNELIUS OR 97113

1S303AB10700
WEST, MARK ANTHONY JR
KILSDONK, MAKAELA RHEA
2405 S ALPINE ST
CORNELIUS OR 97113

1S303AB09600
WILLIAMS, MICHAEL ANTHONY
2362 S ALPINE ST
CORNELIUS OR 97113

1S303AB02900
POWELL STREET COMMERCIAL RENTAL LLC
BY THURMAN, W V
16331 NW AVAMERE CT
PORTLAND OR 97229

1S303AB10000
RODRIGUEZ, JOSE N
CALDARON, MARIA DE LA PAZ GARCIA
2324 S ALPINE ST
CORNELIUS OR 97113

1S303AB02400
RUTLEDGE, DYLAN J & JAYCIE L
73 S 26TH AVE
CORNELIUS OR 97113

1S303BA00202
SHALIMAR PROPERTIES, INC
BY THURMAN, W V
16331 NW AVAMERE CT
PORTLAND OR 97229

1S303AB11300
SLEDGE, CHRISTOPHER & ERICKA CHRISTINE
2473 S ALPINE ST
CORNELIUS OR 97113

1N334CD00301
TOM MOYER THEATRES LLC
BY FRED MEYER INC
1014 VINE ST
PROPERTY TAX 7TH FLOOR
CINCINNATI OH 45202

1S303BA09700
VIDAL, MONSERRAT Z
2288 S ALPINE ST
CORNELIUS OR 97113

1S303AB02600
VO, ERIK
6521 SE 139TH AVE
PORTLAND OR 97236

1S303AB11100
WETMORE, JAMES D & KAREN M
2457 S ALPINE ST
CORNELIUS OR 97113

1S303AB10500
ZABALA, JOSEPH
6506 SW HOFFERT PL
ALOHA OR 97078

DEVELOPER OR AGENT: Harper Houf Peterson Righellis

PROJECT LOCATION: 139 N 26th Avenue

AFFIDAVIT OF MAILING NOTICE

I, McKenna Aichele, being first duly sworn; say that I am (represent) the party intended to submit an application to the City of Cornelius for a proposed Multi-Family Development affecting land located at 139 N 26th Avenue, and that pursuant to Ordinance 810, Chapter 18.10, and the guidelines set out by the Community Development Director, did on the 29 day of April, 2025, personally mail notice to affected property owners within 250 feet of the proposed development site.

Sign and Date in the presence of a Notary Public. Certain City staff are Notary Publics and are available for witnessing.

Signature: _____

Dated this 20th day of May, 2025.

State of Oregon
County of Multnomah

Subscribed and sworn to (or affirmed) before me this 20 *day of* May, 2025

Notary Public for the State of Oregon

My Commission expires: 5/9/2026

OFFICIAL STAMP
KAY LYNN MITCHELL
NOTARY PUBLIC - OREGON
COMMISSION NO. 1023721
MY COMMISSION EXPIRES MAY 09, 2026

SIGN IN SHEET

Name	Address
Spencer Cole	
Jason Wald	
Robert Perkins III	rhperkins3 @ outlook.com
Rob Perkins IV	rob @ ecbvtheaters.com

Neighborhood Meeting – Haney Apartments

May 22, 2025 6pm

Cornelius Public Library

Three members of the public attended the neighborhood meeting, as well as two individuals from the applicant team. The meeting began a couple minutes after 6pm with a description of the project, including both on-site improvements and off-site, public improvements associated with the application.

One individual (Spencer C.) voiced his concern about traffic at the intersection of Baseline and 26th and the lack of a protected left turn lane. He lives on the south side of Baseline and states there have been a number of accidents at the intersection. The applicant team explained that we were providing a traffic study by Lancaster Mobley, and the project would be paying SDC's to the City that would go towards transportation improvements.

Two members of the public (Robert P. II and Robert P. III) voiced their interest in the project as they are local business owners and are looking forward to having more houses and people in the neighborhood.

Questions were asked and answered about pedestrian facilities that would be provided, timeline for development, and target tenants that would be living in the future development.

The meeting wrapped up shortly after 6:30pm, with one attendee providing a written comment (attached with the meeting notes).

COMMENT CARD

Increased traffic is my largest concern. There's already a large number of accidents at 26th Baseline. I would use a real Left Turn signal both North + South.

Clean Water Services

SENSITIVE AREA PRE-SCREENING SITE ASSESSMENT

Clean Water Services File Number 25-001221

1. **Jurisdiction:** Cornelius

2. **Property Information** (example: 1S234AB01400)
   Tax lot ID(s): 1N334DC04500; 1N334DC04600

   ***OR* Site Address:** 139 N. 26th Avenue
   City, State, Zip: Cornelius,OR,97113
   Nearest cross street:

3. **Owner Information**
   Name: Haney Industrial Properties, Inc.
   Company:
   Address: 901 N. Glisan Street, Ste 200
   City, State, Zip: Portland,OR,97232
   Phone/fax: Contact Applicant
   Email: bradk@hhpr.com

4. **Development Activity** (check **all** that apply)
   - ☐ Addition to single family residence (rooms, deck, garage)
   - ☐ Lot line adjustment
   - ☐ Minor land partition
   - ☐ Residential condominium
   - ☐ Commercial condominium
   - ☐ Residential subdivision
   - ☒ Commercial subdivision
   - ☐ Single lot commercial
   - ☐ Multi lot commercial

   Other 240 Unit Apartments

4. **Applicant Information**
   Name: Brad m. Kilby
   Company: HHPR, Inc.
   Address: 205 SE Spokane Street, #200
   City, State, Zip: Portland,OR,97202
   Phone/fax: 5032211131
   Email: bradk@hhpr.com

6. **Will the project involve any off-site work?** ☐ Yes ☐ No ☒ Unknown
   Location and description of off-site work: Street Improvements along 26th Avenue and at perimeter of site.

7. **Additional comments or information that may be needed to understand your project:**

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

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

Print/type name Brad m. Kilby Print/type title Planning Manager

Signature ONLINE SUBMITTAL Date 4/28/2025

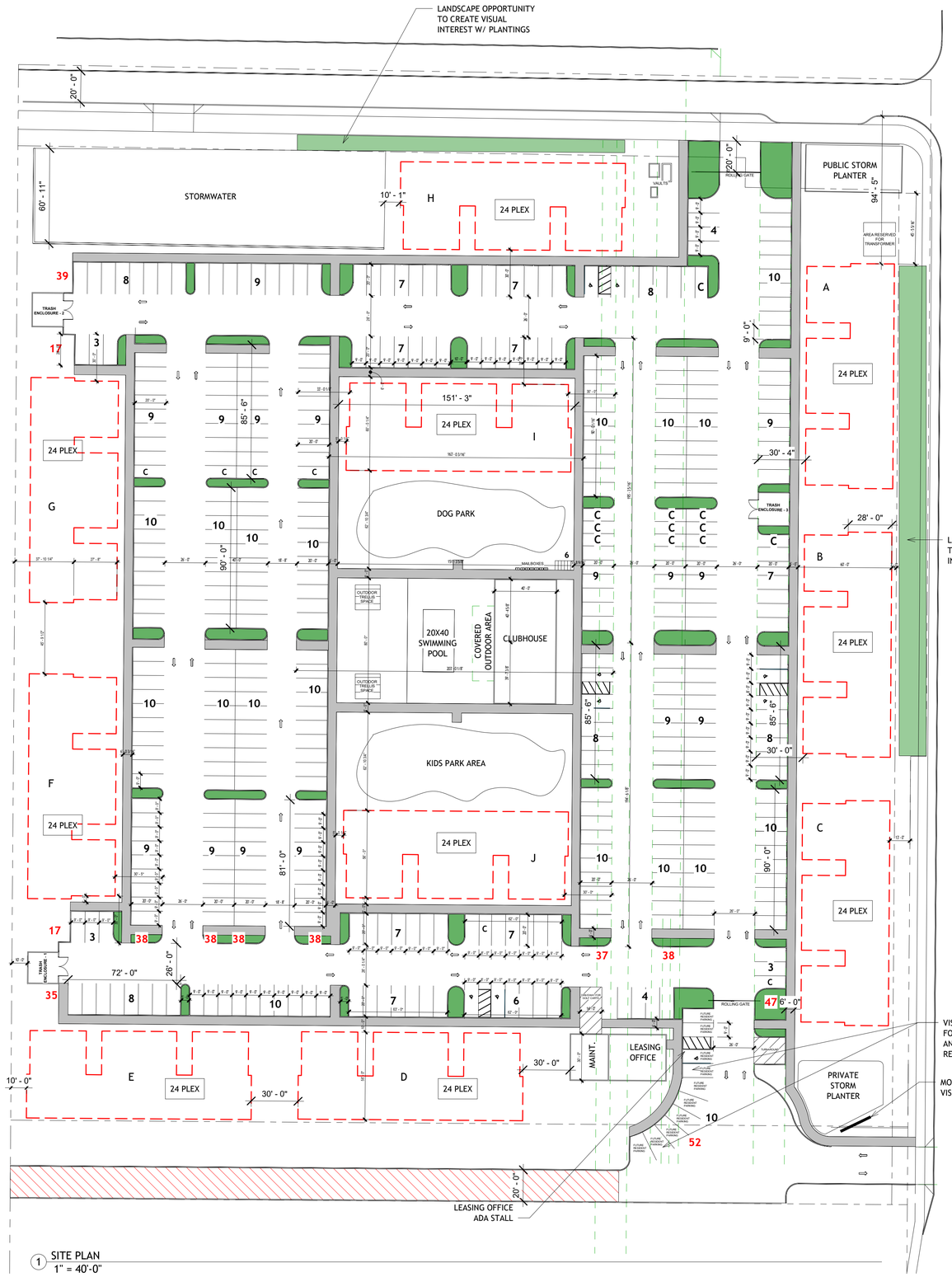
FOR DISTRICT USE ONLY

- ☐ Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.
- ☐ Based on review of the submitted materials and best available information sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, State and federal law.
- ■ Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, state and federal law.
- ■ **THIS SERVICE PROVIDER LETTER IS NOT VALID UNLESS** 1 **CWS APPROVED SITE PLAN(S) ARE ATTACHED.**
- ☐ The proposed activity does not meet the definition of development or the lot was platted after 9/9/95 ORS 92.040(2). **NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.**

Reviewed by Chealsey Rosebrook Date 4/30/2025

Once complete, email to: **SPLReview@cleanwaterservices.org** • Fax: **(503) 681-4439**
OR mail to: SPL Review, Clean Water Services, 2550 SW Hillsboro Highway, Hillsboro, Oregon 97123

Revised 2/2020



1 SITE PLAN
1" = 40'-0"

SITE DATA:

UNIT COUNT = 240

STANDARD PARKING STALLS = 398
COMPACT PARKING STALLS = 17
ADA STALLS = 9 (VAN-ACCESSIBLE)
FUTURE RESIDENT PARKING STALLS = 10

TOTAL PARKING SPACES = 434

BIKE STALLS = 120 IN UNITS, 6 NEAR CLUBHOUSE

3 TRASH ENCLOSURES

SWIMMING POOL = 20 FT X 40 FT

CLUBHOUSE = 40' x 80'

OUTDOOR GRILL = 800 SF

LEASING OFFICE W/ MAINT. = 1821 SF

Approved by: Chealsey Rosebrook
Date 4/30/2025
Attachment 1 **of** 1
Clean Water Services

abbasi design works LLC
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

No.	Date

HANEY MULTIFAMILY
Enter address here
Address Line 2

ADW # Project Number

Project Status

SITE PLAN

Date 4/25/2025 1:54:28 PM
Drawn Author
Checked Checker

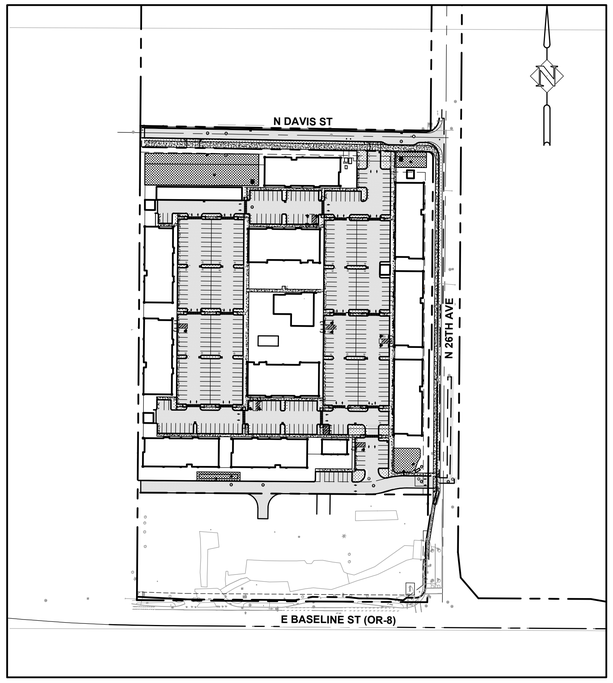
A1.0

1" = 40'-0"

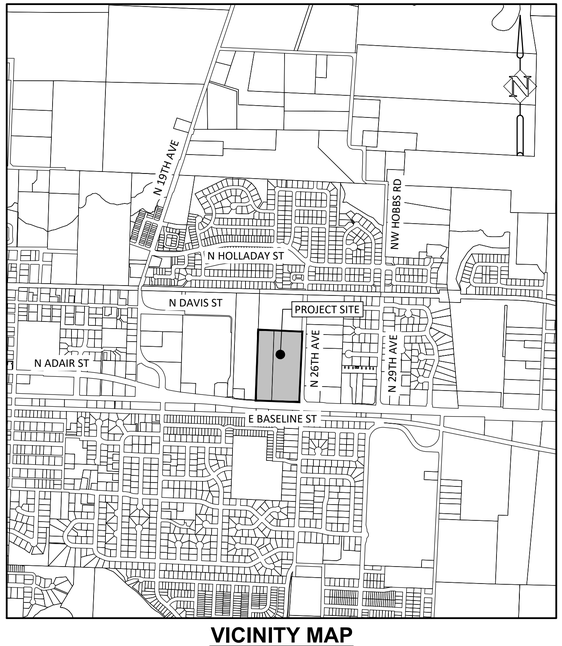
4/25/2025 1:54:28 PM

HANEY MULTIFAMILY

85 N 26TH AVE CORNELIUS, OREGON 97113



SITE MAP
SCALE: 1" = 150'



VICINITY MAP
SCALE: 1" =1000'

OWNER/APPLICANT

FORE GREEN DEVELOPMENT, LLC
1332 NW KEARNEY ST
PORTLAND, OREGON 97209
CONTACT: JASON WALD
EMAIL: JWALD@FOREPROPERTY.COM

CIVIL ENGINEER

HARPER HOUF PETERSON RIGHELLIS, INC.
530 CENTER ST NE, SUITE 240
SALEM, OREGON 97202
503-365-1131
CONTACT: RYAN MOSHER, P.E.
EMAIL: RYANM@HHPR.COM

ARCHITECT

ABBASI DESIGN GROUP
500 E 24TH STREET
VANCOUVER, WASHINGTON 98663
503-816-9466
CONTACT: RAHIM ABBASI, PE
EMAIL: RAHIM@ABBASIDESIGN.COM

LAND USE PLANNER/ SURVEYOR/ LANDSCAPE ARCHITECT

HARPER HOUF PETERSON RIGHELLIS, INC.
205 SE SPOKANE STREET, SUITE 200
PORTLAND, OREGON 97202
503-221-1131
PLANNING CONTACT: BRAD KILBY, AICP
EMAIL: BRADK@HHPR.COM

TAX LOT INFORMATION

TAX LOTS 4500 & 4600, TAX MAP 1N334DC
LOCATED IN THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 34, TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN, CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

ATTENTION EXCAVATORS

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6699.

SHEET INDEX

SHEET NUMBER	SHEET TITLE
C000	COVER SHEET
C001	GENERAL NOTES
C100	EX. CONDITIONS & DEMO PLAN
C200	OVERALL CIVIL SITE PLAN
C210	CIVIL SITE PLAN - NW
C211	CIVIL SITE PLAN - NE
C212	CIVIL SITE PLAN - SW
C213	CIVIL SITE PLAN - SE
C300	OVERALL GRADING PLAN
C310	ENLARGED GRADING & DRAINAGE PLAN
C311	ENLARGED GRADING & DRAINAGE PLAN
C312	ENLARGED GRADING & DRAINAGE PLAN
C313	ENLARGED GRADING & DRAINAGE PLAN
C314	ENLARGED GRADING & DRAINAGE PLAN
C315	ENLARGED GRADING & DRAINAGE PLAN
C316	ENLARGED GRADING & DRAINAGE PLAN
C317	ENLARGED GRADING & DRAINAGE PLAN
C318	ENLARGED GRADING & DRAINAGE PLAN
C319	ENLARGED GRADING & DRAINAGE PLAN
C320	ENLARGED GRADING & DRAINAGE PLAN
C321	ENLARGED GRADING & DRAINAGE PLAN
C400	COMPOSITE UTILITY PLAN
C401	ENLARGED UTILITY PLAN
C402	ENLARGED UTILITY PLAN
C403	ENLARGED UTILITY PLAN
C404	ENLARGED UTILITY PLAN
C801	PUBLIC WORKS NOTES
C802	TYPICAL SECTIONS
C810	ROADWAY PLAN & PROFILE - N DAVIS ST
C811	ROADWAY PLAN & PROFILE - N DAVIS ST
C812	ROADWAY PLAN & PROFILE - N DAVIS ST
C815	ROADWAY PLAN & PROFILE - N 26TH AVE
C816	ROADWAY PLAN & PROFILE - N 26TH AVE
C817	ROADWAY PLAN & PROFILE - N 26TH AVE
C818	ROADWAY PLAN & PROFILE - N 26TH AVE
C900	DETAILS
C901	DETAILS
C902	DETAILS
C903	DETAILS
C904	DETAILS

LIST OF ABBREVIATIONS

EL	ELEVATION
LT	LEFT
RT	RIGHT
CB	CATCH BASIN
MH	MANHOLE
EP	EDGE OF PAVEMENT
CL, C/L	CENTERLINE
R.O.W., R/W	RIGHT-OF-WAY
PL, P/L	PROPERTY LINE
ESMT	EASMENT
DED.	RIGHT-OF-WAY DEDICATION
STD	STANDARD
AC	ASPHALT CONCRETE
EJ	EXPANSION JOINT
DI	DUCTILE IRON
CI	CAST IRON
STL	STEEL
CSP	CONCRETE SEWER PIPE
PVC	POLYVINYL CHLORIDE
HDPE	HIGH DENSITY POLYETHYLENE
STM	STORM
SAN	SANITARY
WTR	WATER
BC	BEGIN CURVE
EC	END CURVE
PRC	POINT OF REVERSE CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCC	PORTLAND CEMENT CONCRETE
STA	STREET STATION
CR	CURB RETURN
FL	FLOWLINE ELEVATION
GUT	GUTTER ELEVATION
FFE	FINISHED FLOOR ELEVATION
TC	TOP OF CURB
BC	BOTTOM OF CURB
FG	FINISHED GRADE
FS	FINISHED SURFACE
TW	TOP OF WALL
BW	BOTTOM OF WALL
EX	EXISTING
PROP	PROPOSED

LEGEND:

PROPOSED

- RIGHT-OF-WAY
- EASEMENT
- SAWCUT
- CURB
- SAN — SANITARY LINE
- W — W — WATER LINE
- F — F — FIRE LINE
- STORM LINE
- 101 — PROPOSED CONTOUR
- UTILITY DEMOLTION
- CLEANOUT
- PORTLAND CEMENT CONCRETE
- ASPHALT CONCRETE RESURFACING
- LANDSCAPING

XX.XX TC
XX.XX BC

TC	= TOP OF CURB
BC	= BOTTOM OF CURB
FS	= FINISH SURFACE
FG	= FINISH GRADE
TW	= TOP OF WALL
BW	= BOTTOM OF WALL
FF	= FINISHED FLOOR
TG	= TOP OF GRATE

EXISTING

- STM — STORM SEWER LINE
- SAN — SANITARY SEWER LINE
- W — WATER LINE
- G — GAS LINE
- OW — OVERHEAD WIRE
- X — X — X — FENCE LINE, TYPE AS NOTED
- FO — FIBER OPTIC LINE
- T — TELEPHONE LINE
- E — ELECTRIC LINE
- TV — CABLE TELEVISION LINE
- FLOWLINE
- BUILDING LINE
- UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
- MAJOR CONTOUR – 5' INTERVALS
- MINOR CONTOUR – 1' INTERVALS

- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- CATCH BASIN SQUARE
- ROOF DRAIN DOWN SPOUT
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER STAND PIPE
- WATER VAULT
- IRRIGATION BOX
- GAS METER
- GAS VALVE
- POWER RISER
- POWER METER
- ELECTRIC BOX
- POWER TRANSFORMER
- CABLE TELEVISION BOX
- CABLE TELEVISION RISER
- TELEPHONE RISER
- SIGNAL POLE
- SEE TOPO/SURVEY NOTES TABLE
- EXCEPTION NUMBER PER TITLE REPORT
- FOUND MONUMENT AS NOTED IN TABLE. PROTECT.
- UNKNOWN UTILITY VAULT
- UNKNOWN RISER/CABINET
- GUY WIRE
- LIGHT POLE
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
- UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
- SINGLE POST SIGN
- FLAG POLE
- GATE POST
- BOLLARD
- MAIL–BOX
- HANDI–CAP PARKING SPACE
- CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- TRAFFIC SIGNAL BOX
- TRAFFIC SIGNAL CABINET
- POLE WITH PEDESTRIAN PUSH BUTTON
- FIRE DEPT. CONNECTION

NOTE: SYMBOLS SHOWN HEREON ARE FOR GRAPHICAL REPRESENTATION PURPOSES AND DO NOT NECESSARILY SHOW SHAPE, SIZE, ROTATION, CONDITION, TYPE, ETC. OF THE ACTUAL PHYSICAL IMPROVEMENTS THAT THEY REPRESENT. CONDITION, TYPE, ROTATION, ETC. MAY VARY AMONGST ITEMS SHOWN BY THE SAME SYMBOL.

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR # FPC-02

Project Status

COVER SHEET

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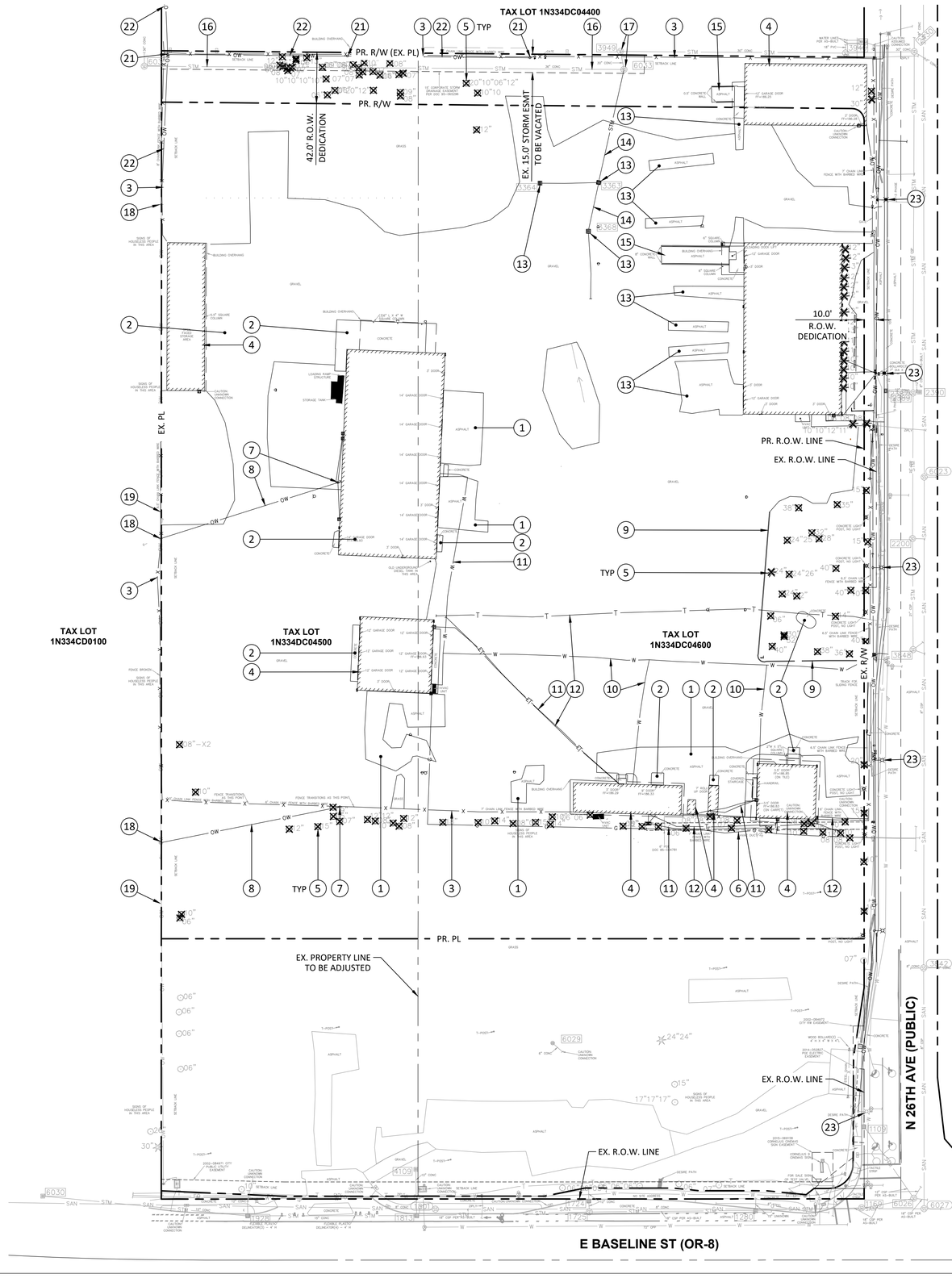
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GENERAL CIVIL NOTES

1. OWNER SHALL PROCURE AND CONFORM TO ALL CONSTRUCTION PERMITS REQUIRED BY THE CITY OF CORNELIUS.
2. OWNER TO PAY ALL PROJECT PERMIT COSTS, INCLUDING BUT NOT LIMITED TO UTILITY TAPPING, TV, AND CHLORINATION COSTS. THE CONTRACTOR SHALL COORDINATE WITH THE GOVERNING JURISDICTION TO DETERMINE APPROPRIATE FEES AND PROVIDE THE OWNER WITH 48 HOURS NOTICE PRIOR TO THE REQUIRED PAYMENT OF FEES OR COSTS.
3. OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (800) 332-2344.
4. CONTRACTOR TO NOTIFY CITY, ODOT AND ALL UTILITY COMPANIES A MINIMUM OF 48 BUSINESS HOURS PRIOR TO START OF CONSTRUCTION, AND COMPLY WITH ALL OTHER NOTIFICATION REQUIREMENTS OF AGENCIES WITH JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL PROVIDE ALL BONDS AND INSURANCE REQUIRED BY PUBLIC AND/OR PRIVATE AGENCIES HAVING JURISDICTION. WHERE REQUIRED BY PUBLIC AND/OR PRIVATE AGENCIES HAVING JURISDICTION, THE CONTRACTOR SHALL SUBMIT A SUITABLE MAINTENANCE BOND PRIOR TO FINAL PAYMENT.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DOCUMENTS AND PLANS ASSOCIATED WITH THE PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS/PLANS RELATIVE TO THE SPECIFICATIONS OR THE APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE OWNER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DOCUMENTS/PLANS IN FULL COMPLIANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS AND CODES.
7. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE APPROVED PLANS AND THE APPLICABLE PROVISIONS OF THE APPROVING AGENCIES' CONSTRUCTION STANDARDS, THE MOST RECENT EDITION OF THE OREGON PLUMBING SPECIALITY CODE (OPSC), THE MOST RECENT EDITION OF THE INTERNATIONAL BUILDING CODE (IBC), APWA STANDARDS, OREGON HEALTH DIVISION (OHD), AND THE DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) WHEREIN EACH HAS JURISDICTION.
8. CONTRACTOR SHALL AT ALL TIMES ABIDE BY APPLICABLE SAFETY RULES OF OSHA, IN PARTICULAR THOSE REGULATIONS PERTAINING TO ADEQUATE SHORING AND TRENCH PROTECTION FOR WORKMEN.
9. CONSTRUCTION OF ALL PUBLIC FACILITIES SHALL BE DONE WITHIN THE HOURS PERMITTED BY THE GOVERNING JURISDICTION.
10. THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO COMPLETE THE PROJECT IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DRAWINGS INCLUDING SUCH INCIDENTALS AS MAY BE NECESSARY TO MEET APPLICABLE AGENCY REQUIREMENTS AND PROVIDE A COMPLETED PROJECT.
11. ALL DIMENSIONS SHOWN ON THE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL REVIEW AND COORDINATE THE BUILDING LAYOUT BY CAREFUL REVIEW OF THE SITE PLAN AND LATEST ARCHITECTURAL PLANS (INCLUDING, BUT NOT LIMITED TO, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE SUPPRESSION PLAN, WHERE APPLICABLE). CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND ARCHITECT OF ANY DISCREPANCIES.
12. CONTRACTOR SHALL REFER TO ARCHITECTURAL BUILDING PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF BUILDING ENTRY/EXIT LOCATIONS, ELEVATIONS, PRECISE BUILDING DIMENSIONS, AND EXACT UTILITY CONNECTION LOCATIONS.
13. ANY INSPECTION BY THE CITY, HHPR INC., OWNER, OR OTHER AGENCIES SHALL NOT, IN ANY WAY, RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM THE WORK IN STRICT COMPLIANCE WITH THE CONTRACT DOCUMENTS, APPLICABLE CODES, AND AGENCY REQUIREMENTS.
14. IF THE CONTRACTOR DEVIATES FROM THE APPROVED PLANS, INCLUDING THESE NOTES, WITHOUT FIRST OBTAINING THE PRIOR WRITTEN AUTHORIZATION OF THE ENGINEER FOR SUCH DEVIATIONS, CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PAYMENT OF ALL COSTS INCURRED IN CORRECTING ANY WORK DONE WHICH DEVIATES FROM THE PLANS.
15. THE ENGINEER HAS NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK.
16. CONTRACTOR SHALL MAINTAIN ONE (1) COMPLETE SET OF APPROVED PLANS ON THE CONSTRUCTION SITE AT ALL TIMES WHEREON HE WILL RECORD ALL APPROVED DEVIATIONS IN CONSTRUCTION FROM THE APPROVED DRAWINGS, AS WELL AS LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES ENCOUNTERED. THESE FIELD RECORD DRAWING SHALL BE KEPT UP TO DATE AT ALL TIMES AND SHALL BE AVAILABLE FOR INSPECTION BY THE CITY OR OWNER UPON REQUEST.
17. UPON COMPLETION OF CONSTRUCTION OF ALL NEW FACILITIES, CONTRACTOR SHALL SUBMIT A CLEAN SET OF FIELD RECORD DRAWINGS CONTAINING ALL AS-BUILT INFORMATION TO THE OWNER. ALL INFORMATION SHOWN ON THE CONTRACTOR'S FIELD RECORD DRAWINGS SHALL BE SUBJECT TO VERIFICATION. IF SIGNIFICANT ERRORS OR DEVIATIONS ARE NOTED, AN AS-BUILT SURVEY PREPARED AND STAMPED BY A REGISTERED PROFESSIONAL LAND SURVEYOR SHALL BE COMPLETED AT THE CONTRACTOR'S EXPENSE.
18. THE CONTRACTOR SHALL INSTALL AND MAINTAIN ALL EROSION CONTROL MEASURES IN ACCORDANCE WITH DEQ'S EROSION AND SEDIMENT CONTROL MANUAL, CURRENT EDITION, AND EROSION CONTROL STANDARDS OF THE LOCAL JURISDICTION.
19. ELEVATION SHOWN ON THE DRAWINGS ARE BASED ON CITY OF CORNELIUS BENCHMARK 2000. ELEVATION = 187.94 FEET (NGVD 29). SURVEYING FOR DESIGN WAS COMPLETED BY AKS ENGINEERING AT (503) 400-6028.
20. THE CONTRACTOR SHALL COORDINATE WITH THE SURVEYOR, RETAINED BY THE OWNER AND LICENSED IN THE STATE OF OREGON, TO ESTABLISH CONSTRUCTION CONTROL AND PERFORM INITIAL CONSTRUCTION SURVEYS TO ESTABLISH THE LINES AND GRADES OF IMPROVEMENTS AS INDICATED ON THE DRAWINGS. STAKING FOR BUILDINGS, STRUCTURES, CURBS, GRAVITY DRAINAGE PIPES/STRUCTURES AND OTHER CRITICAL IMPROVEMENTS SHALL BE COMPLETED USING EQUIPMENT ACCURATE TO 0.04 FEET HORIZONTALLY AND 0.02 FEET VERTICALLY, OR BETTER. USE OF GPS EQUIPMENT FOR CONSTRUCTION STAKING OF THESE IMPROVEMENTS IS PROHIBITED.
21. CONTRACTOR SHALL ERECT AND MAINTAIN BARRICADES, WARNING SIGNS, AND TRAFFIC CONES PER CITY AND/OR ODOT REQUIREMENTS IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) INCLUDING OREGON AMENDMENTS. ACCESS TO DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES. ALL TRAFFIC CONTROL MEASURES SHALL BE APPROVED AND IN PLACE PRIOR TO ANY CONSTRUCTION ACTIVITY.
22. PRIOR TO ANY WORK IN THE EXISTING PUBLIC RIGHT-OF-WAY, CONTRACTOR SHALL SUBMIT FINAL TRAFFIC CONTROL PLANS TO THE CITY OF CORNELIUS FOR REVIEW AND ISSUANCE OF A LANE CLOSURE OR WORK IN RIGHT-OF-WAY PERMIT.
23. PRIOR TO FINAL ACCEPTANCE AND PAYMENT, THE CONTRACTOR SHALL CLEAN THE PROJECT SITE AND ADJACENT AREAS OF ANY DEBRIS, DISCARDED MATERIAL, OR OTHER ITEMS DEPOSITED BY THE CONTRACTOR'S PERSONNEL DURING THE PERFORMANCE OF THE WORK.
24. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL REQUIRED OR NECESSARY INSPECTIONS ARE COMPLETED BY AUTHORIZED INSPECTORS PRIOR TO PROCEEDING WITH SUBSEQUENT WORK WHICH COVERS OR THAT IS DEPENDENT ON THE WORK TO BE INSPECTED. FAILURE TO OBTAIN NECESSARY INSPECTION(S) AND APPROVAL(S) SHALL RESULT IN THE CONTRACTOR BEING FULLY RESPONSIBLE FOR ALL PROBLEMS ARISING FROM UNINSPECTED WORK.
25. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY INSPECTION OR NECESSARY OBSERVATION FOR ALL WORK PERFORMED INCLUDING ANY RE-TESTING THAT MAY BE REQUIRED TO MEET SPECIFICATIONS. THE CONTRACTOR SHALL PERFORM PRE-TESTS PRIOR TO SCHEDULING TESTS THAT MUST BE WITNESSED. TESTING MUST BE PERFORMED BY AN APPROVED THIRD PARTY INDEPENDENT TESTING LABORATORY RETAINED BY THE CONTRACTOR. CONTRACTOR IS SOLELY RESPONSIBLE FOR SCHEDULING TESTING. ALL TESTING MUST BE COMPLETED PRIOR TO PERFORMING SUBSEQUENT WORK. A COPY OF ALL TESTING RESULTS MUST BE PROVIDED TO THE OWNER IMMEDIATELY UPON COMPLETION OF THE TEST.
26. THE FOLLOWING TESTING IS THE MINIMUM REQUIRED FOR THE PROJECT.

SUBGRADE	1 TEST/4,000 SF/LIFT (4 TESTS MINIMUM)
ENGINEERED FILLS	1 TEST/4,000 SF/LIFT (4 TESTS MINIMUM)
BASE ROCK	1 TEST/4,000 SF/LIFT (4 TESTS MINIMUM)
ASPHALT	1 TEST/6,000 SF/LIFT (4 TESTS MINIMUM)
TRENCH BACKFILL	1 TEST/200 FOOT TRENCH/LIFT (4 TESTS MINIMUM)
TRENCH AC RESTORATION	1 TEST/200 FOOT TRENCH/LIFT (4 TESTS MINIMUM)
WATER PRESSURE	WITNESSED BY CITY OR OWNER'S REP.
WATER BACTERIAL	PER OREGON HEALTH DIVISION REQUIREMENTS
WATER CHLORINE	RESIDUAL TEST PER CITY REQUIREMENTS
SEWER AIR TEST	PER CITY/APWA REQUIREMENT. WITNESSED BY OWNER'S REP.
SEWER MANDREL	95% OF ACTUAL PIPE DIAMETER. WITNESSED BY OWNER'S REP.
SEWER MANHOLE	1 VACUUM TEST PER MANHOLE (CITY/APWA STANDARDS). WITNESSED BY OWNER'S REP.
STORM MANDREL	95% OF ACTUAL PIPE DIAMETER. WITNESSED BY OWNER'S REP.
CONCRETE SLUMP	1 SET OF CYLINDERS/100 CY OF CONCRETE POURED PER DAY. SLUMP AND AIR TESTS REQUIRED ON SAME LOAD AS CYLINDERS.

27. IN ADDITION TO IN-PLACE DENSITY TESTING, THE SUBGRADE AND BASE ROCK SHALL PROOF-ROLLED WITH A LOADED 10-YARD DUMP TRUCK PROVIDED BY THE CONTRACTOR. BASE ROCK PROOF ROLL SHALL TAKE PLACE IMMEDIATELY PRIOR TO (WITHIN24 HOURS OF) PAVING, AND SHALL BE WITNESSED BY THE OWNER. LOCATION AND PATTERN OF PROOF ROLL TO BE AS DIRECTED BY OWNER OR APPROVING AGENCY.
28. ALL ENGINEERED FILLS REQUIRE AN APPROVED INDEPENDENT TESTING LABORATORY RETAINED BY THE CONTRACTOR, TO PROVIDE WRITTEN CERTIFICATION STAMPED BY AN OREGON REGISTERED PROFESSIONAL ENGINEER STATING THAT THE SUBGRADE WAS PREPARED AND ALL ENGINEERED FILLS WERE PLACED IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS AND CONTRACT DOCUMENTS.
29. THE LOCATION AND DESCRIPTION OF EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE COMPILED FROM AVAILABLE RECORDS AND/OR FIELD SURVEYS. WE DO NOT GUARANTEE THE ACCURACY OR THE COMPLETENESS OF SUCH RECORDS. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA. CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND SIZES OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
30. ANY UTILITIES LOCATED IN THE FIELD THAT THE CONTRACTOR DISRUPTS OR DAMAGES SHALL BE PROMPTLY REPAIRED TO NEW CONDITION. IF REQUIRED, CONTRACTOR SHALL INSTALL SUITABLE TEMPORARY SERVICE UNTIL REPAIR CAN BE COMPLETED. THE COST OF THE REPAIR AND/OR TEMPORARY SERVICE SHALL BE BORNE BY THE CONTRACTOR.
31. NOTIFY THE OWNER IMMEDIATELY OF ALL UTILITIES EXPOSED. UNIDENTIFIED UTILITIES SHALL NOT BE DISRUPTED OR CUT UNTIL OWNER HAS APPROVED THE CUT OR DISRUPTION.
32. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MARKING ALL EXISTING SURVEY MONUMENTS OF RECORD (INCLUDING BUT NOT LIMITED TO PROPERTY AND STREET MONUMENTS) PRIOR TO CONSTRUCTION. IF ANY SURVEY MONUMENTS ARE REMOVED, DISTURBED OR DESTROYED DURING CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL RETAIN AND PAY FOR THE SERVICES OF A REGISTERED PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF OREGON TO REFERENCE AND REPLACE SUCH MONUMENTS PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT. THE MONUMENTS SHALL BE REPLACED WITHIN A MAXIMUM OF 90 DAYS, AND THE COUNTY SURVEYOR SHALL BE NOTIFIED IN WRITING AS REQUIRED BY PER ORS 209.150.
33. CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITIES WHERE NEW FACILITIES CROSS. ALL UTILITY CROSSINGS SHOWN ON THE DRAWINGS SHALL BE POTHOLED USING HAND TOOLS OR OTHER NON-INVASIVE METHODS PRIOR TO EXCAVATING OR BORING. CONTRACTOR SHALL BE RESPONSIBLE FOR EXPOSING POTENTIAL UTILITY CONFLICTS FAR ENOUGH AHEAD OF CONSTRUCTION TO MAKE NECESSARY GRADE OR ALIGNMENT MODIFICATIONS WITHOUT DELAYING THE WORK. IF GRADE OR ALIGNMENT MODIFICATION IS NECESSARY, CONTRACTOR SHALL NOTIFY THE ENGINEER, AND THE ENGINEER OR THE OWNER SHALL OBTAIN APPROVAL FROM THE CITY PRIOR TO CONSTRUCTION.
34. ALL FACILITIES SHALL BE MAINTAINED IN PLACE 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 TO LEAVE EXISTING FACILITIES IN AN EQUAL OR BETTER-THAN-ORIGINAL CONDITION.
35. UTILITIES OR INTERFERING PORTIONS OF UTILIZES THAT ARE ABANDONED IN PLACE SHALL BE REMOVED BY THE CONTRACTOR TO THE EXTENT NECESSARY TO ACCOMPLISH THE WORK. THE CONTRACTOR SHALL HAVE ALL OPENINGS CLOSED WITH CONCRETE PLUGS WITH A MINIMUM LENGTH EQUAL TO 2 TIMES THE DIAMETER OF THE ABANDONED PIPE.
36. CONTRACTOR SHALL REMOVE ALL EXISTING SIGNS, MAILBOXES, FENCES, LANDSCAPING, ETC. AS REQUIRED TO AVOID DAMAGE DURING CONSTRUCTION AND REPLACE THEM TO EXISTING OR BETTER CONDITION.
37. IF SPRINGS OR GROUNDWATER ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE OWNER OF THE CONDITIONS FOUND AND COORDINATE THE ACTIVITIES IN A MANNER THAT WILL ALLOW TIME TO REVIEW THE SITUATION AND PREPARE A PLAN TO PROPERLY MITIGATE THE WATER ENCOUNTERED.
38. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MANAGING CONSTRUCTION ACTIVITIES TO ENSURE THAT PUBLIC STREET AND RIGHTS-OF-WAY ARE KEPT CLEAN OF MUD, DUST OR DEBRIS. DUST ABATEMENT SHALL BE MAINTAINED BY ADEQUATE WATERING OF THE SITE BY THE CONTRACTOR.
39. PRIVATE GRADING, ROCKING AND PAVING TO CONFORM TO OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION (OSSC/ODOT/APWA) AND IBC, CURRENT EDITIONS.
40. CLEAR AND GRUB WITHIN WORK LIMITS ALL SURFACE VEGETATION, TREES, STUMPS, BRUSH, ROOTS, ETC. DO NOT DAMAGE OR REMOVE TREES EXCEPT AS APPROVED BY THE OWNER OR AS SHOWN ON THE DRAWINGS. PROTECT ALL ROOTS TWO INCHES IN DIAMETER OR LARGER.
41. STRIP WORK LIMITS, REMOVING ALL ORGANIC MATTER, WHICH CANNOT BE COMPACTED INTO A STABLE MASS. ALL TREE, BRUSH AND DEBRIS ASSOCIATED WITH CLEARING, STRIPPING OR GRADING SHALL BE REMOVED AND DISPOSED OF OFF-SITE.
42. IMMEDIATELY FOLLOWING STRIPPING AND GRADING OPERATIONS, COMPACT SUBGRADE TO 95% OF THE MAXIMUM DRY DENSITY PER AASHTO T-180 TEST METHOD (MODIFIED PROCTOR). SUBGRADE MUST BE INSPECTED AND APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE AND WRITTEN COMPACTION TEST RESULTS FROM AN INDEPENDENT TESTING LABORATORY MUST BE RECEIVED BEFORE PLACING EMBANKMENTS, ENGINEERED FILLS OR FINE GRADING FOR BASE ROCK.
43. ALL FILLS SHALL BE ENGINEERED EXCEPT FOR FILLS LESS THAN 18 INCHES IN DEPTH WHICH ARE LOCATED OUTSIDE THE PUBLIC RIGHT-OF-WAY, BUILDING PADS, PARKING LOTS OR OTHER AREAS TO BE IMPROVED. ENGINEERED FILL SHALL BE CONSTRUCTED WITH MAXIMUM 8" LIFTS (LOOSE MEASURE) OVER APPROVED SUBGRADE. EACH LIFT SHALL BE COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY PER AASHTO T-180 TEST METHOD (MODIFIED PROCTOR).
44. AREAS TO RECEIVE ENGINEERED OR STRUCTURAL FILL SHALL BE PREPARED BY REMOVING ALL ORGANIC AND UNSUITABLE MATERIALS AND PROOF ROLLING. MATERIAL IN SOFT SPOTS WITHIN AREAS TO BE IMPROVED SHALL BE REMOVED TO THE DEPTH REQUIRED (AS DIRECTED BY THE OWNER) TO PROVIDE A FIRM FOUNDATION AND SHALL BE REPLACED WITH SUITABLE COMPACTED BACKFILL.
45. GRANULAR BASE ROCK SHALL CONFORM TO THE REQUIREMENTS OF OSSC (ODOT/APWA) 02630.10 (DENSE GRADED BASE AGGREGATE). COMPACT BASE ROCK TO 95% OF THE MAXIMUM DRY DENSITY PER AASHTO T-180 TEST METHOD (MODIFIED PROCTOR). WRITTEN BASE ROCK COMPACTION TEST RESULTS FROM AN INDEPENDENT TESTING LABORATORY MUST BE RECEIVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE BE FOR PLACING AC PAVEMENT.
46. AC PAVEMENT SHALL BE ½" DENSE GRADED MIX CONFORMING TO OSSC (ODOT/APWA) 00744 HOT MIXED ASPHALT CONCRETE (HMAC) PAVEMENT. AC PAVEMENT WITHIN PUBLIC ROW (ODOT/ROW) SHALL BE LEVEL 3 AND ALL OTHER AC PAVEMENT SHALL BE LEVEL 2 HMAC PER OSSC (ODOT/APWA) 00744.13. AC PAVEMENT SHALL BE COMPACTED TO A MINIMUM OF 92% OF MAXIMUM DENSITY DETERMINED BY THE RICE STANDARD METHOD. WRITTEN AC PAVEMENT COMPACTION TEST RESULTS FROM AN INDEPENDENT TESTING LABORATORY MUST BE RECEIVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE BE FOR FINAL PAYMENT.
47. FOR PARKING LOTS OR PRIVATE ACCESS DRIVES, THE FINAL LIFT OF AC PAVEMENT SHALL NOT BE PLACED UNTIL AFTER THE BUILDING IS FULLY ENCLOSED AND WEATHERPROOF, UNLESS OTHERWISE APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE.
48. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, STRAIGHT GRADES SHALL BE RUN BETWEEN ALL FINISH GRADE ELEVATION AND/OR FINISH CONTOUR LINES SHOWN.
49. FINISH PAVEMENT GRADES AT TRANSITION TO EXISTING PAVEMENT SHALL MATCH EXISTING PAVEMENT GRADES OR BE FEATHERED PAST JOINTS WITH EXISTING PAVEMENT AS REQUIRED TO PROVIDE A SMOOTH, FREE DRAINING SURFACE.
50. ALL EXISTING OR CONSTRUCTED MANHOLES, CLEANOUTS, MONUMENT BOXES, GAS VALVES, WATER VALVES AND SIMILAR STRUCTURES SHALL BE ADJUSTED TO MATCH FINISH GRADE OF THE PAVEMENT, SIDEWALK, LANDSCAPED AREA OR MEDIAN STRIP WHEREIN THEY LIE. VERIFY THAT ALL VALVE BOXES AND RISER ARE CLEAN AND CENTERED OVER THE OPERATING NUT.
51. NO CUT OR FILL SLOPES SHALL BE CONSTRUCTED STEEPER THAN 2 FT. HORIZONTAL TO 1 FT. VERTICAL (2H:1V) UNLESS OTHERWISE SHOWN ON THE DRAWINGS AND APPROVED BY THE GEOTECHNICAL ENGINEER FOR THE PROJECT.
52. ALL PLANTER AREAS AND OPEN SPACE SHALL BE BACKFILLED WITH APPROVED TOPSOIL IN CONFORMANCE WITH THE LANDSCAPE PLAN FOR THE PROJECT. STRIPPING MATERIALS SHALL NOT BE USED FOR BACKFILL, UNLESS APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.
53. CONTRACTOR SHALL SEED AND MULCH ALL EXPOSED SLOPES AND DISTURBED AREAS, WHICH ARE NOT SCHEDULED TO BE LANDSCAPED
54. GRADING SHOWN ON THE DRAWINGS IS CRITICAL TO FUNCTIONING OF STORMWATER SYSTEM AND SHALL BE STRICTLY FOLLOWED.
55. THE CONTRACTOR IS RESPONSIBLE TO ENSURE 1.0% MINIMUM SLOPE ON ALL NEW CONCRETE AND ASPHALT SURFACES TO PREVENT PONDING. ANY DISCREPANCIES THAT MAY AFFECT ADA COMPLIANCE, PUBLIC SAFETY, OR PROJECT COST MUST BE IDENTIFIED IN WRITING TO THE OWNER'S REPRESENTATIVE IMMEDIATELY. PROCEEDING WITH CONSTRUCTION WITHOUT OWNER'S REPRESENTATIVE AUTHORIZATION AND REVIEW OF THE DISCREPANCY IS AT THE CONTRACTOR'S OWN COST AND RISK.
56. 6-INCH NOMINAL CURB EXPOSURE USED FOR DESIGN OF ALL PARKING LOT GRADES, UNLESS OTHERWISE SHOWN OR INDICATED ON THE DRAWINGS.
57. WHERE NEW CURBING CONNECTS TO EXISTING CURBING OR IS INSTALLED ALONG EXISTING STREETS OR PAVEMENT, THE GUTTER GRADE SHALL MATCH THE EXISTING STREET GRADES SO AS TO ALLOW DRAINAGE FROM THE STREET TO THE GUTTER AND THROUGH ANY TRANSITIONS. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING OF ANY GRADE DISCREPANCIES OR PROBLEMS PRIOR TO CURB PLACEMENT.
58. SIDEWALKS SHALL BE A MINIMUM OF 4 INCHES THICK. COMMERCIAL USE DRIVEWAYS SHALL BE MINIMUM 6 INCHES THICK. ALL CURBS, SIDEWALKS AND DRIVEWAYS SHALL BE CONSTRUCTED USING 3300-PSI CONCRETE (OR AS SHOWN IN DETAILS), AND SHALL BE CURED WITH TYPE 1 OR TYPE 10 CLEAR CURBING COMPOUND.
59. PRIOR TO INSTALLATION OF CURB, GUTTER, ADA RAMPS, OR SIDEWALK THE OWNER'S REPRESENTATIVE AND/OR CITY INSPECTOR SHALL BE CONTACTED TO INSPECT STRING LINE, BASE ROCK AND FORMWORK.
60. WHERE TRENCH EXCAVATION REQUIRES REMOVAL OF PCC CURBS AND/OR SIDEWALKS, THE CURBS AND/OR SIDEWALKS SHALL BE SAWCUT AND REMOVED AT A TOOLED JOINT UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE CITY OR OWNER'S REPRESENTATIVE. THE SAWCUT LINES SHOWN ON THE DRAWINGS ARE SCHEMATIC AND NOT INTENDED TO SHOW THE EXACT ALIGNMENT OF SUCH CUTS.
61. ALL TAPPING OF EXISTING MUNICIPAL WATER, SANITARY SEWER, STORM DRAIN MAINS, AND MANHOLES MUST BE DONE BY CITY FORCES.
62. THE CONTRACTOR SHALL HAVE APPROPRIATE EQUIPMENT ON SITE TO PRODUCE A FIRM, SMOOTH, UNDISTURBED SUBGRADE AT THE TRENCH BOTTOM, TRUE TO GRADE. THE BOTTOM OF THE TRENCH EXCAVATION SHALL BE SMOOTH, FREE OF LOOSE MATERIALS OR TOOTH GROOVES FOR THE ENTIRE WIDTH OF THE TRENCH PRIOR TO PLACING THE GRANULAR BEDDING MATERIAL.
63. ALL PIPES SHALL BE BEDDED WITH MINIMUM 6 INCHES OF ¾"-0 CRUSHED ROCK BEDDING AND BACKFILLED WITH COMPACTED ¾"-0 CRUSHED ROCK IN THE PIPE ZONE (CRUSHED ROCK SHALL EXTEND A MINIMUM OF 12 INCHES OVER THE TOP OF THE PIPE IN ALL CASES). CRUSHED ROCK TRENCH BACKFILL SHALL BE USED UNDER ALL AREAS TO BE IMPROVED, INCLUDING PAVEMENT, SIDEWALKS, FOUNDATION SLABS, BUILDINGS, ETC.
64. GRANULAR TRENCH BEDDING AND BACKFILL SHALL CONFORM TO THE REQUIREMENTS OF OSSC (ODOT/APWA) 02630.10 (DENSE GRADED BASE AGGREGATE), ¾"-0". COMPACT GRANULAR BACKFILL TO 92% OF THE MAXIMUM DRY DENSITY PER AASHTO T-180 TEST METHOD (MODIFIED PROCTOR).
65. CONTRACTOR SHALL ARRANGE TO ABANDON EXISTING SANITARY AND WATER SERVICES NOT SCHEDULED TO REMAIN IN SERVICE IN ACCORDANCE WITH APPROVING AGENCY REQUIREMENTS.
66. ALL NON-METALLIC WATER, SANITARY AND STORM SEWER PIPING SHALL HAVE AN ELECTRICALLY CONDUCTIVE INSULATED 12-GAUGE COPPER TRACER WIRE THE FULL LENGTH OF THE INSTALLED PIPE USING BLUE WIRE FOR WATER AND GREEN WIRE FOR STORM AND SANITARY PIPING. TRACER WIRE SHALL BE EXTENDED UP INTO ALL VALVE BOXES, CATCH BASINS, MANHOLES AND LATERAL CLEANOUT BOXES. TRACER WIRE PENETRATION INTO MANHOLES SHALL BE WITHIN 18 INCHES OF THE RIM ELEVATION AND ADJACENT TO MANHOLE STEPS. THE TRACER WIRE SHALL BE TIED TO THE TOP MANHOLE STEP OR OTHERWISE SUPPORTED TO ALLOW RETRIEVAL FROM THE OUTSIDE OF THE MANHOLE.
67. NO TRENCHES IN SIDEWALKS, ROADS, OR DRIVEWAYS SHALL BE LEFT IN AN OPEN CONDITION OVERNIGHT. ALL SUCH TRENCHES SHALL BE CLOSED BEFORE THE END OF EACH WORKDAY AND NORMAL TRAFFIC AND PEDESTRIAN FLOWS RESTORED.
68. CITY FORCES TO OPERATE ALL VALVES, INCLUDING FIRE HYDRANTS, ON EXISTING PUBLIC MAINS.
69. NO CONNECTION TO EXISTING WATER LINES SHALL BE MADE WITHOUT AUTHORIZATION FROM THE CITY.
70. ALL WATER LINES AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA STANDARDS, OREGON ADMINISTRATIVE RULES (OAR), THE OREGON PLUMBING SPECIALTY CODE (OPSC), AND LOCAL APPROVING JURISDICTION STANDARD.
71. DOMESTIC, IRRIGATION AND FIRE BACKFLOW PREVENTION DEVICES AND VAULTS SHALL CONFORM TO REQUIREMENTS OF PUBLIC AND/OR PRIVATE AGENCIES HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING BACKFLOW DEVICES TESTED AND CERTIFIED PRIOR TO FINAL ACCEPTANCE OF THE WORK.
72. CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT AND MATERIALS (INCLUDING PLUGS, BLOWOFFS, VALVES, SERVICE TAPS, ETC.) REQUIRED TO FLUSH, TEST AND DISINFECT WATERLINES PER PUBLIC AGENCY REQUIREMENTS PRIOR TO PLACING INTO SERVICE.
73. THE WORK SHALL BE PERFORMED IN A MANNER DESIGNATED TO MAINTAIN WATER SERVICE TO BUILDINGS SUPPLIED FROM THE EXISTING WATERLINES. IN NO CASE SHALL SERVICE TO ANY MAIN LINE OR BUILDING BE INTERRUPTED FOR MORE THAN FOUR (4) HOURS IN ANY ONE DAY. CONTRACTOR SHALL NOTIFY THE CITY AND ALL AFFECTED RESIDENTS AND BUSINESSES A MINIMUM OF 24 BUSINESS HOURS (1 BUSINESS DAY) BEFORE ANY INTERRUPTION OF SERVICE.
74. PRIVATE WATER LINES SHALL HAVE A MINIMUM OF 12 INCHES CLEAR ABOVE THE TOP OF PRIVATE SANITARY SEWER LINES AND A MINIMUM OF 12 INCHES OF HORIZONTAL SEPARATION IN ACCORDANCE WITH CURRENT OREGON PLUMBING SPECIALITY CODE (OPSC).
75. SANITARY SEWER PIPE SHALL BE SOLID WALL PVC IN CONFORMANCE WITH ASTM D3034, SDR 35. MINIMUM STIFFNESS SHALL BE 46 PSI PER ASTM D-2412 AND JOINT TYPE SHALL BE ELASTOMETRIC GASKET CONFORMING TO ASTM D-3212. ALL OTHER APPURTENANCES AND INSTALLATION TO CONFORM TO THE CITY SPECIFICATIONS. ALL MATERIALS AND WORKMANSHIP FOR PRIVATE SANITARY SEWERS SHALL BE INSTALLED IN CONFORMANCE WITH OPSC REQUIREMENTS.
76. CONTRACTOR SHALL PROVIDE ALL NECESSARY MATERIALS, EQUIPMENT AND FACILITIES TO TEST SANITARY SEWER PIPE AND APPURTENANCES FOR LEAKAGE IN ACCORDANCE WITH TESTING SCHEDULE STATED ABOVE OR THE CITY'S CONSTRUCTION STANDARDS, WHICHEVER ARE MORE STRINGENT. SANITARY SEWER PIPE AND APPURTENANCES SHALL BE TESTED FOR LEAKAGE. LEAKAGE TESTS SHALL INCLUDE AN AIR TEST OF ALL SEWER MAINS AND LATERALS AND VACUUM TESTING OF THE MANHOLES. MANHOLES TESTING SHALL BE PERFORMED AFTER COMPLETION OF AC PAVEMENT AND FINAL SURFACE RESTORATION.
77. BEFORE MANDREL TESTING AND/OR TV INSPECTION, FLUSH AND CLEAN ALL SEWERS, AND REMOVE ALL FOREIGN MATERIAL FROM THE MAINLINES AND MANHOLES.
78. CONTRACTOR SHALL CONDUCT DEFLECTION TEST OF FLEXIBLE SANITARY SEWER PIPES BY PULLING AN APPROVED MANDREL THROUGH THE COMPLETED PIPELINE FOLLOWING TRENCH COMPACTION. THE DIAMETER O



DEMOLITION NOTES:

1. EXISTING ASPHALT PAVEMENT TO BE REMOVED.
2. EXISTING CONCRETE TO BE REMOVED.
3. EXISTING FENCE AND POSTS TO BE REMOVED.
4. EXISTING BUILDING AND ASSOCIATED OVERHANGS, DECKS AND STAIRWAYS TO BE REMOVED. UTILITES TO BE DECOMISSIONED PRIOR TO BUILDING DEMOLITION IN COORDINATION WITH UTILITY PROVIDERS.
5. EXISTING TREE TO BE REMOVED.
6. EXISTING GAS LINE TO BE REMOVED.
7. EXISTING UTILITY POLE TO BE REMOVED.
8. EXISTING OVERHEAD WIRE TO BE REMOVED.
9. EXISTING CURB TO BE REMOVED.
10. EXISTING WATER LINE TO BE REMOVED.
11. EXISTING UNDERGROUND ELECTRICAL TO BE REMOVED.
12. ELECTRICAL COMMUNICATIONS LINE TO BE REMOVED.
13. EXISTING CATCH BASIN TO BE REMOVED.
14. EXISTING STORM LINE TO BE REMOVED.
15. EXISTING RAMP AND CONCRETE WALLS TO BE REMOVED.
16. EXISTING PUBLIC STORM MAIN TO REMAIN AND BE PROTECTED.
17. EXISTING PUBLIC STORM MANHOLE TO REMAIN AND BE PROTECTED.
18. EXISTING UTILILTY POLE TO REMAIN AND BE PROTECTED.
19. EXISTING OVERHEAD WIRE TO REMAIN AND BE PROTECTED.
21. EXISTING UTILITY POLE TO BE RELOCATED.
22. EXISTING OVERHEAD WIRE TO BE RELOCATED.
23. EXISTING OVERHEAD WIRE TO BE UNDERGROUNDED AND STREET LIGHT REPLACED. COORDINATE WITH PGE AND STREET LIGHTING PLANS.

DEMOLITION LEGEND:

- SAWCUT
- UTILITY DEMO/ABANDONMENT
- STRUCTURE TO BE REMOVED
- TREE TO BE REMOVED

GENERAL ESC NOTES

1. BMP'S SHOWN ARE THE MINIMUM REQUIRED. ADDITIONAL MEASURES MAY BE NECESSARY DURING CONSTRUCTION AS FIELD CONDITIONS DICTATE IN ACCORDANCE WITH CITY AND DEQ PERMIT REQUIREMENTS.
2. ALL PROPOSED SLOPE GRADING SHALL CONFORM TO I.B.C. REQUIREMENTS FOR BENCHING AND DRAINAGE.

GENERAL DEMO NOTES:

1. ALL DEMOLITION WITHIN PUBLIC RIGHT-OF-WAY OR EASEMENT ARE PER SEPARATE PERMIT.
2. REFER TO LANDSCAPE PLANS FOR TREE REMOVAL.
3. CONTRACTOR TO VERIFY LIMITS AND QUANTITIES OF DEMOLITION. DEMOLITION INFORMATION PROVIDED AS REFERENCE ONLY.
4. ALL TREES NOT SHOWN FOR REMOVAL ARE TO BE PROTECTED TO THE APPROVAL OF AN ARBORIST.
5. ALL UTILITIES NOT SHOWN FOR REMOVAL ARE TO BE FIELD LOCATED BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND PROTECTED IN PLACE.

0 25 50 100
SCALE: 1" = 50'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

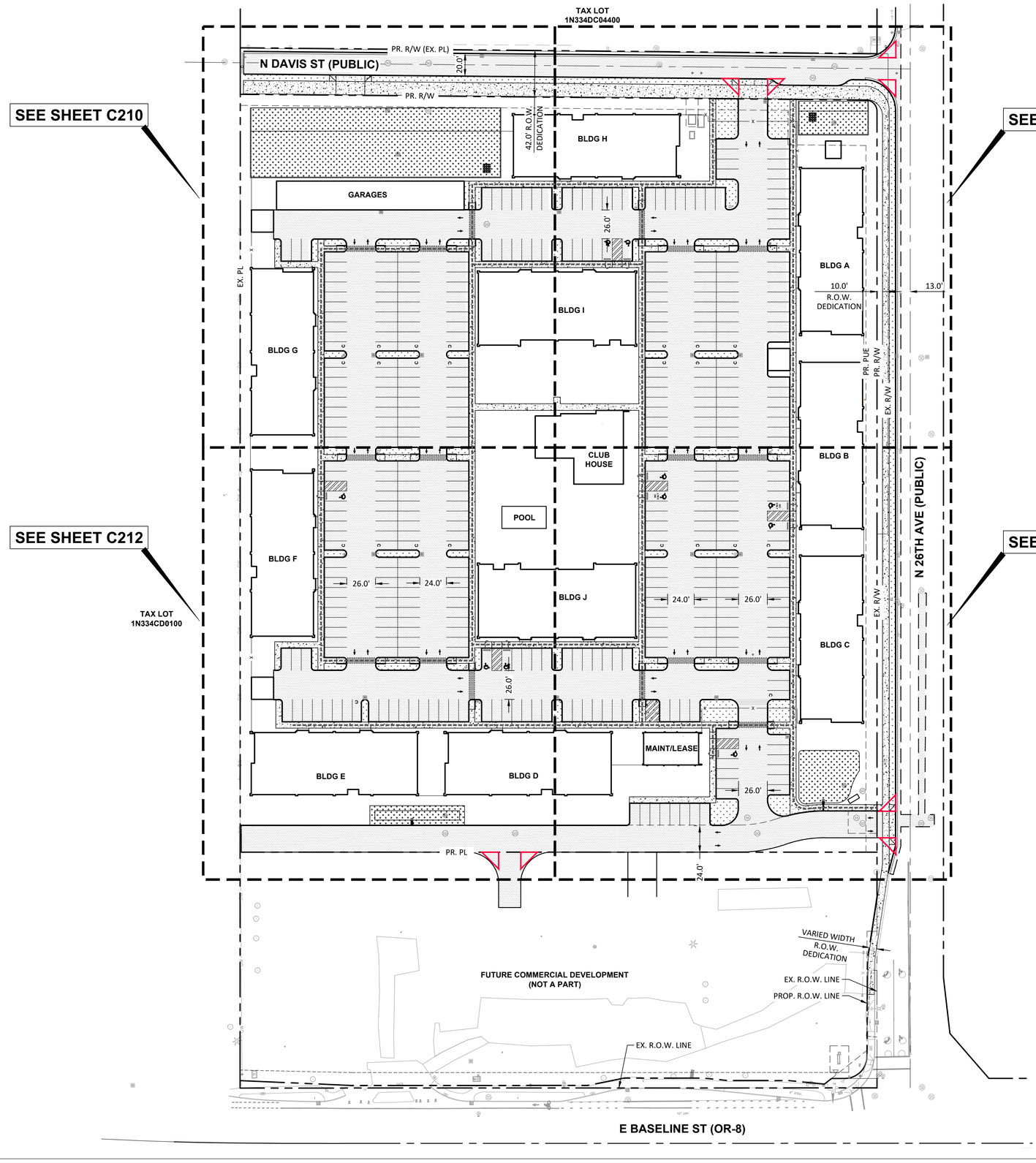
Project Status

EX. CONDITIONS & DEMO PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C100

4/23/2025 8:13:40 PM



PARKING STALL QUANTITIES	
STANDARD / COMPACT	ADA ACCESSIBLE
391 / 24	10

TOTAL PROJECT AREA = 439,950 SF (10.01 AC)
EXISTING IMPERVIOUS AREA = 284,740 SF (6.54 AC)
PROPOSED IMPERVIOUS AREA = 307,039 SF (6.83 AC)

GENERAL NOTES:

1. ELECTRONIC FILES WILL BE PROVIDED TO CONTRACTOR FOR SITE LAYOUT.
2. THE OWNER SHALL RETAIN A LICENSED SURVEYOR TO PROVIDE CONSTRUCTION STAKING FOR ALL SITE WORK, INCLUDING BUT NOT LIMITED TO GRADING, PAVING, CURBS, UTILITIES, SITE ELETRICAL, ETC.
3. SEE ARCHITECTURAL AND LANDSCAPE DRAWINGS FOR SCORING PATTERNS, SPECIALTY SURFACING, AND OTHER INFORMATION.
4. FOR STANDARD AND HEAVY DUTY ASPHALT PAVEMENT AREAS AND STRIPING, SEE STRIPING AND SURFACING PLANS.

LEGEND

ACCESSIBLE ROUTE TO ROW
15' CLEAR VISION ZONE

0 25 50 100
SCALE: 1" = 50'

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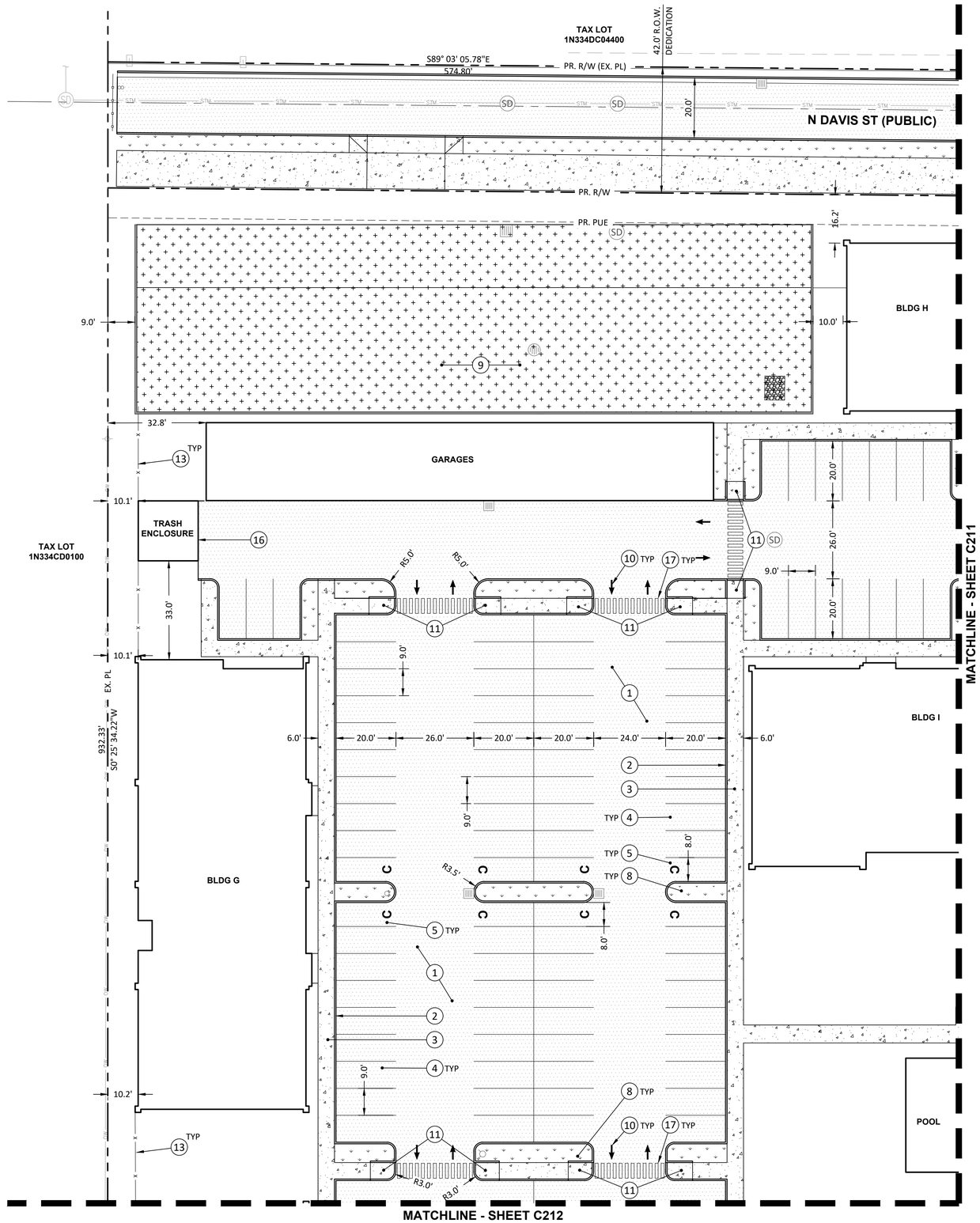
OVERALL CIVIL SITE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
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C200

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CONSTRUCTION NOTES:

1. PROPOSED ASPHALT PAVING.
2. PROPOSED 6" STANDARD CONCRETE CURB.
3. PROPOSED CONCRETE SIDEWALK.
4. PROPOSED STANDARD PARKING STALL.
5. PROPOSED COMPACT PARKING STALL.
8. PROPOSED LANDSCAPE AREA. REFER TO LANDSCAPE PLANS FOR INFORMATION.
9. PROPOSED STORMWATER FACILITY. REFER TO GRADING & DRAINAGE PLANS FOR INFORMATION.
10. PROPOSED ARROW MARKINGS.
11. PROPOSED ACCESSIBLE CURB RAMP.
13. PROPOSED SITE FENCING.
16. TRASH ENCLOSURE. REFER TO ARCHITECTURAL PLANS FOR INFORMATION.
17. PROPOSED CROSSWALK STRIPING.

PARKING STALL QUANTITIES	
STANDARD / COMPACT	ADA ACCESSIBLE
391 / 24	10

TOTAL PROJECT AREA = 439,950 SF (10.01 AC)
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3. SEE ARCHITECTURAL AND LANDSCAPE DRAWINGS FOR SCORING PATTERNS, SPECIALTY SURFACING, AND OTHER INFORMATION.
4. FOR STANDARD AND HEAVY DUTY ASPHALT PAVEMENT AREAS AND STRIPING, SEE STRIPING AND SURFACING PLANS.

0 10 20 40
SCALE: 1" = 20'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
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Cornelius, OR 97113

HHPR #
FPC-02

Project Status

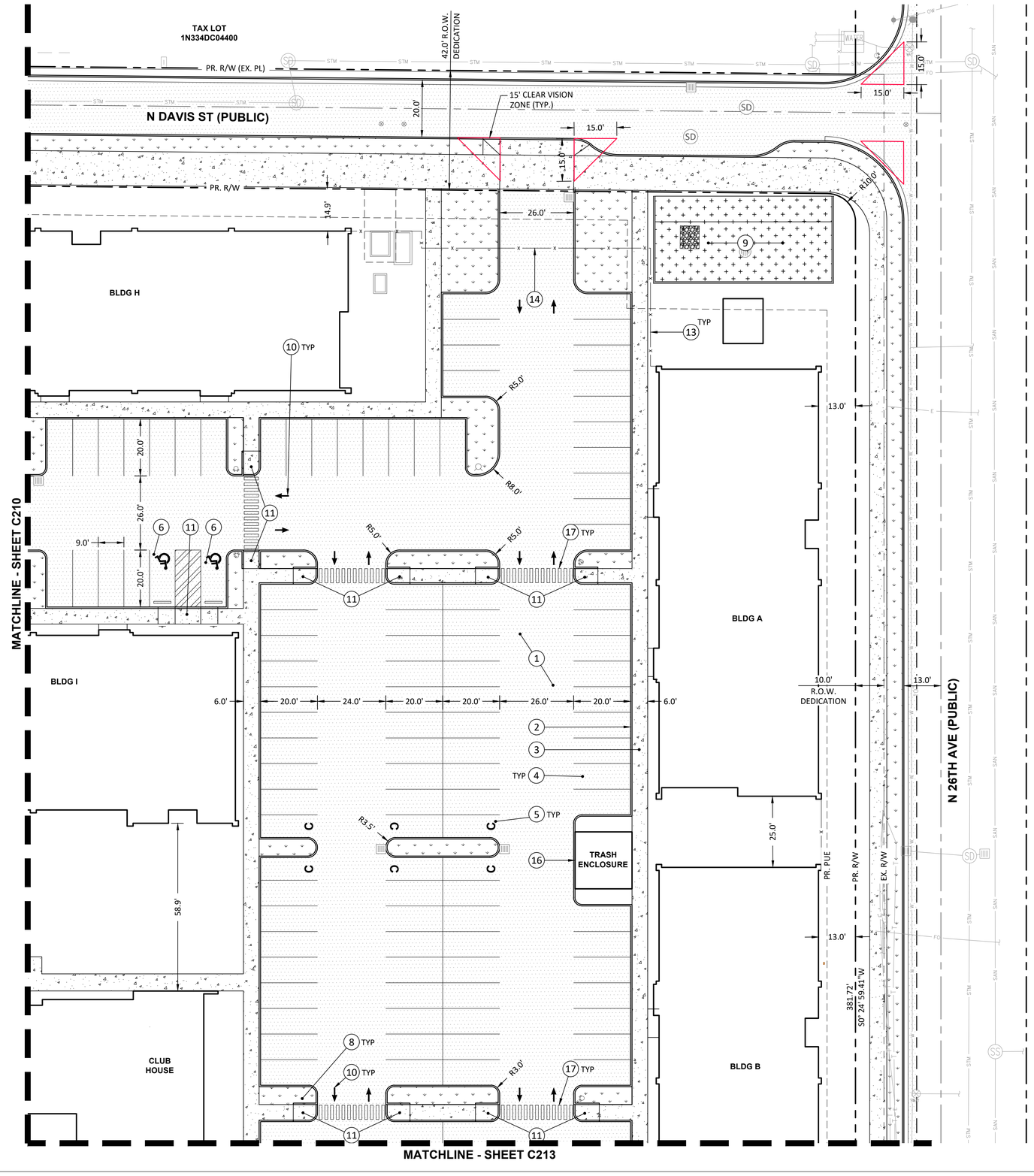
CIVIL SITE PLAN - NW

Date 4/23/2025 8:13:40 PM
Drawn HHPR
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C210

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CONSTRUCTION NOTES:

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2. PROPOSED 6" STANDARD CONCRETE CURB.
3. PROPOSED CONCRETE SIDEWALK.
4. PROPOSED STANDARD PARKING STALL.
5. PROPOSED COMPACT PARKING STALL.
6. PROPOSED STANDARD ACCESSIBLE STALL.
8. PROPOSED LANDSCAPE AREA. REFER TO LANDSCAPE PLANS FOR INFORMATION.
9. PROPOSED STORMWATER FACILITY. REFER TO GRADING & DRAINAGE PLANS FOR INFORMATION.
10. PROPOSED ARROW MARKINGS.
11. PROPOSED ACCESSIBLE CURB RAMP.
13. PROPOSED SITE FENCING.
14. PROPOSED ACCESS CONTROL GATE.
16. TRASH ENCLOSURE. REFER TO ARCHITECTURAL PLANS FOR INFORMATION.
17. PROPOSED CROSSWALK STRIPING.

PARKING STALL QUANTITIES	
STANDARD / COMPACT	ADA ACCESSIBLE
391 / 24	10

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3. SEE ARCHITECTURAL AND LANDSCAPE DRAWINGS FOR SCORING PATTERNS, SPECIALTY SURFACING, AND OTHER INFORMATION.
4. FOR STANDARD AND HEAVY DUTY ASPHALT PAVEMENT AREAS AND STRIPING, SEE STRIPING AND SURFACING PLANS.

SCALE: 1" = 20'

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No.	Date

HANEY MULTIFAMILY
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HHPR #
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Project Status

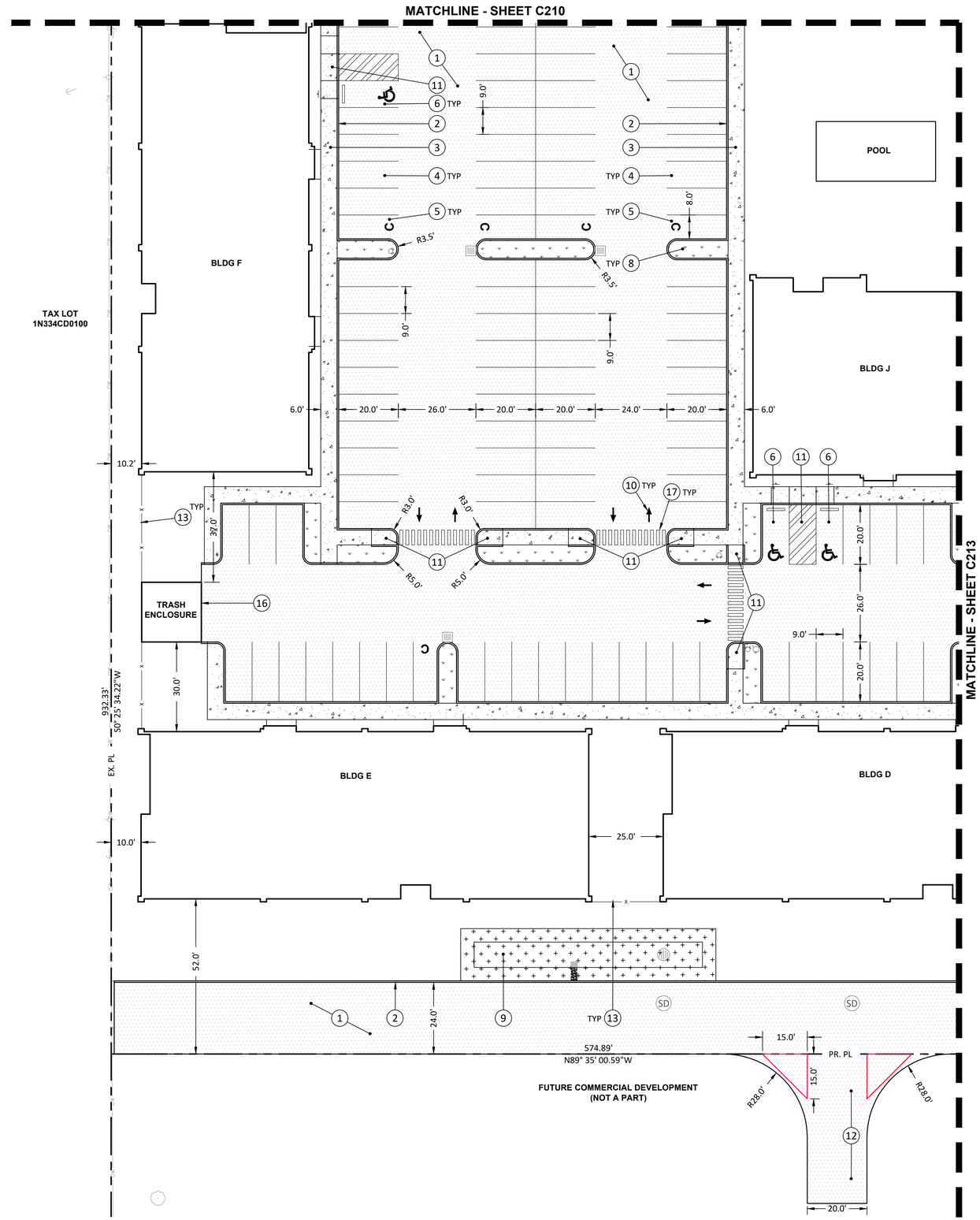
CIVIL SITE PLAN - NE

Date 4/23/2025 8:13:40 PM
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C211

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CONSTRUCTION NOTES:

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2. PROPOSED 6" STANDARD CONCRETE CURB.
3. PROPOSED CONCRETE SIDEWALK.
4. PROPOSED STANDARD PARKING STALL.
5. PROPOSED COMPACT PARKING STALL.
6. PROPOSED STANDARD ACCESSIBLE STALL.
8. PROPOSED LANDSCAPE AREA. REFER TO LANDSCAPE PLANS FOR INFORMATION.
9. PROPOSED STORMWATER FACILITY. REFER TO GRADING & DRAINAGE PLANS FOR INFORMATION.
10. PROPOSED ARROW MARKINGS.
11. PROPOSED ACCESSIBLE CURB RAMP.
12. PROPOSED ASPHALT FIRE TURNAROUND.
13. PROPOSED SITE FENCING.
16. TRASH ENCLOSURE. REFER TO ARCHITECTURAL PLANS FOR INFORMATION.
17. PROPOSED CROSSWALK STRIPING.

PARKING STALL QUANTITIES	
STANDARD / COMPACT	ADA ACCESSIBLE
391 / 24	10

TOTAL PROJECT AREA = 439,950 SF (10.01 AC)
EXISTING IMPERVIOUS AREA = 284,740 SF (6.54 AC)
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3. SEE ARCHITECTURAL AND LANDSCAPE DRAWINGS FOR SCORING PATTERNS, SPECIALTY SURFACING, AND OTHER INFORMATION.
4. FOR STANDARD AND HEAVY DUTY ASPHALT PAVEMENT AREAS AND STRIPING, SEE STRIPING AND SURFACING PLANS.

SCALE: 1" = 20'

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HHPR #
FPC-02

Project Status

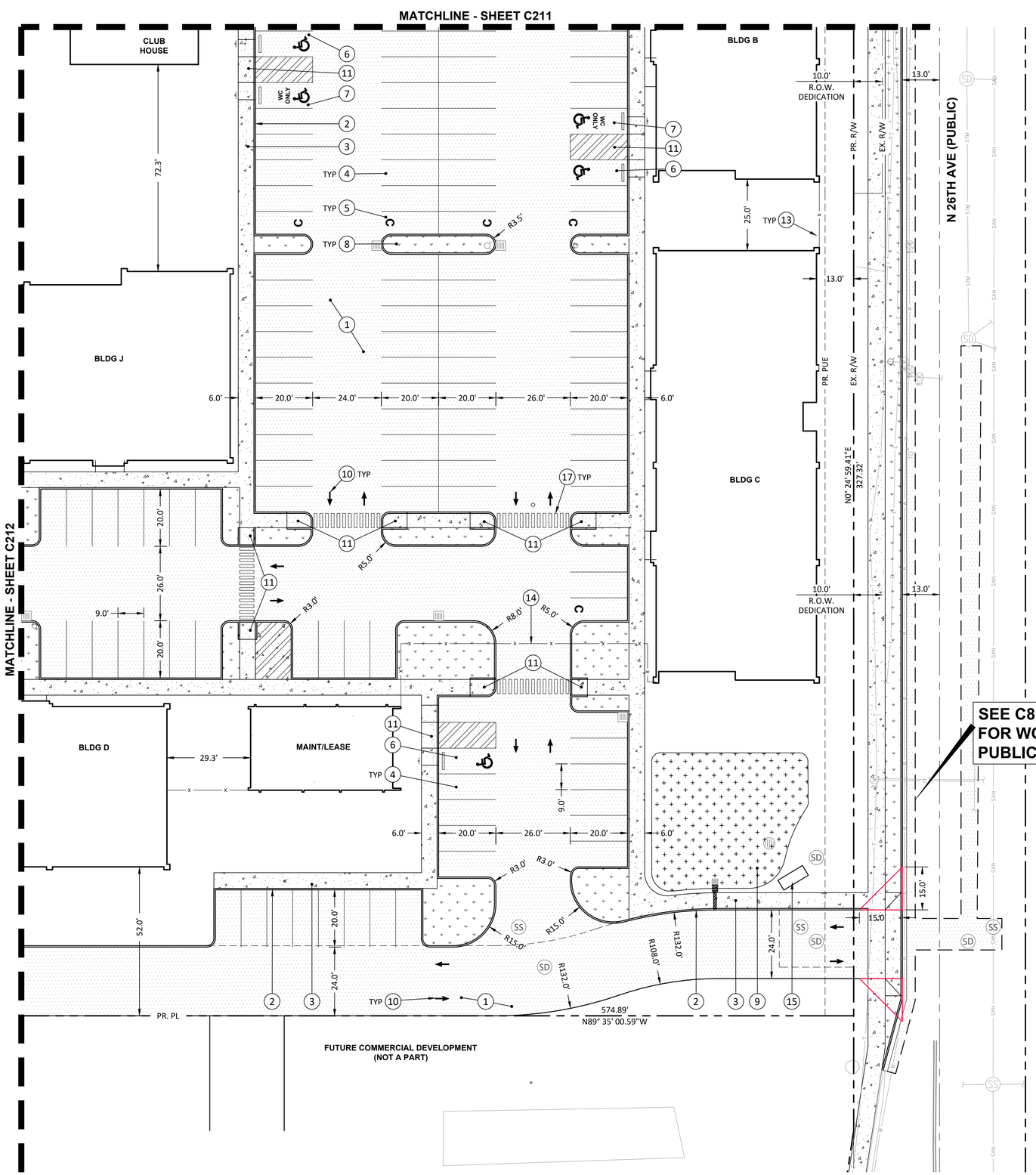
CIVIL SITE PLAN - SW

Date 4/23/2025 8:13:40 PM
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C212

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CONSTRUCTION NOTES:

1. PROPOSED ASPHALT PAVING.
2. PROPOSED 6" STANDARD CONCRETE CURB.
3. PROPOSED CONCRETE SIDEWALK.
4. PROPOSED STANDARD PARKING STALL.
5. PROPOSED COMPACT PARKING STALL.
6. PROPOSED STANDARD ACCESSIBLE STALL.
7. PROPOSED WHEELCHAIR ONLY VAN ACCESSIBLE STALL.
8. PROPOSED LANDSCAPE AREA. REFER TO LANDSCAPE PLANS FOR INFORMATION.
9. PROPOSED STORMWATER FACILITY. REFER TO GRADING & DRAINAGE PLANS FOR INFORMATION.
10. PROPOSED ARROW MARKINGS.
11. PROPOSED ACCESSIBLE CURB RAMP.
13. PROPOSED SITE FENCING.
14. PROPOSED ACCESS CONTROL GATE.
15. PROPOSED MONUMENT SIGN.
17. PROPOSED CROSSWALK STRIPING.

PARKING STALL QUANTITIES	
STANDARD / COMPACT	ADA ACCESSIBLE
391 / 24	10

TOTAL PROJECT AREA = 439,950 SF (10.01 AC)
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GENERAL NOTES:

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3. SEE ARCHITECTURAL AND LANDSCAPE DRAWINGS FOR SCORING PATTERNS, SPECIALTY SURFACING, AND OTHER INFORMATION.
4. FOR STANDARD AND HEAVY DUTY ASPHALT PAVEMENT AREAS AND STRIPING, SEE STRIPING AND SURFACING PLANS.

SCALE: 1" = 20'

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HHPR # FPC-02

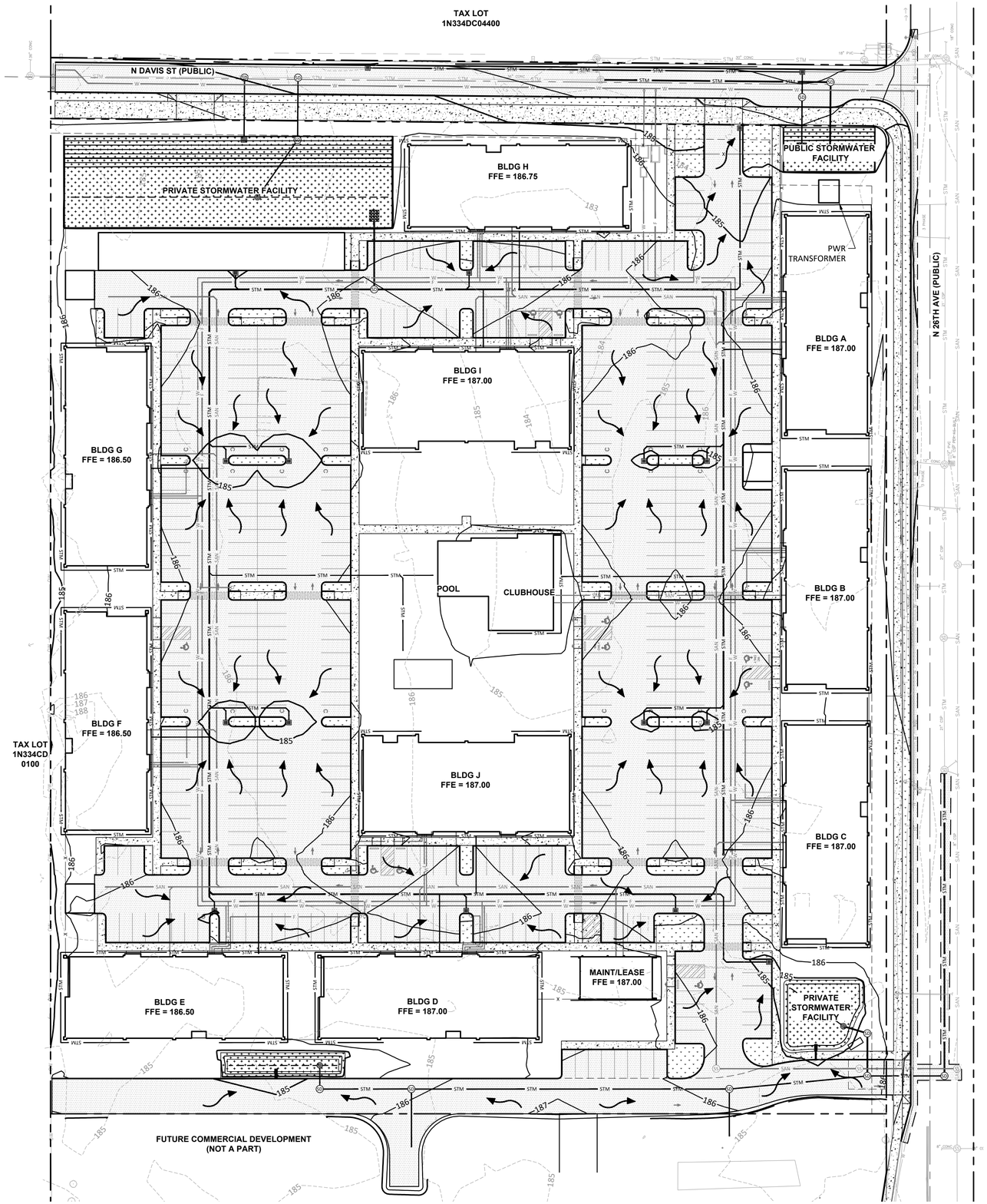
Project Status

CIVIL SITE PLAN - SE

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C213

4/23/2025 8:13:40 PM



PROPOSED LEGEND:

- XXX — PROPOSED MAJOR CONTOUR (5')
- XXX — PROPOSED MINOR CONTOUR (1')
- XXX — EXISTING CONTOUR (1')
- FLOW PATH
- GRADING LIMITS
- FLOW DIRECTION
- XXX.XX TC / XXX.XX G

TC = TOP OF CURB
EG = EXISTING GRADE
FG = FINISH GRADE
FFE = FINISH FLOOR ELEVATION
G = GUTTER LINE
RIM = RIM
SW = SIDEWALK

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.

0 20 40 80
SCALE: 1" = 40'

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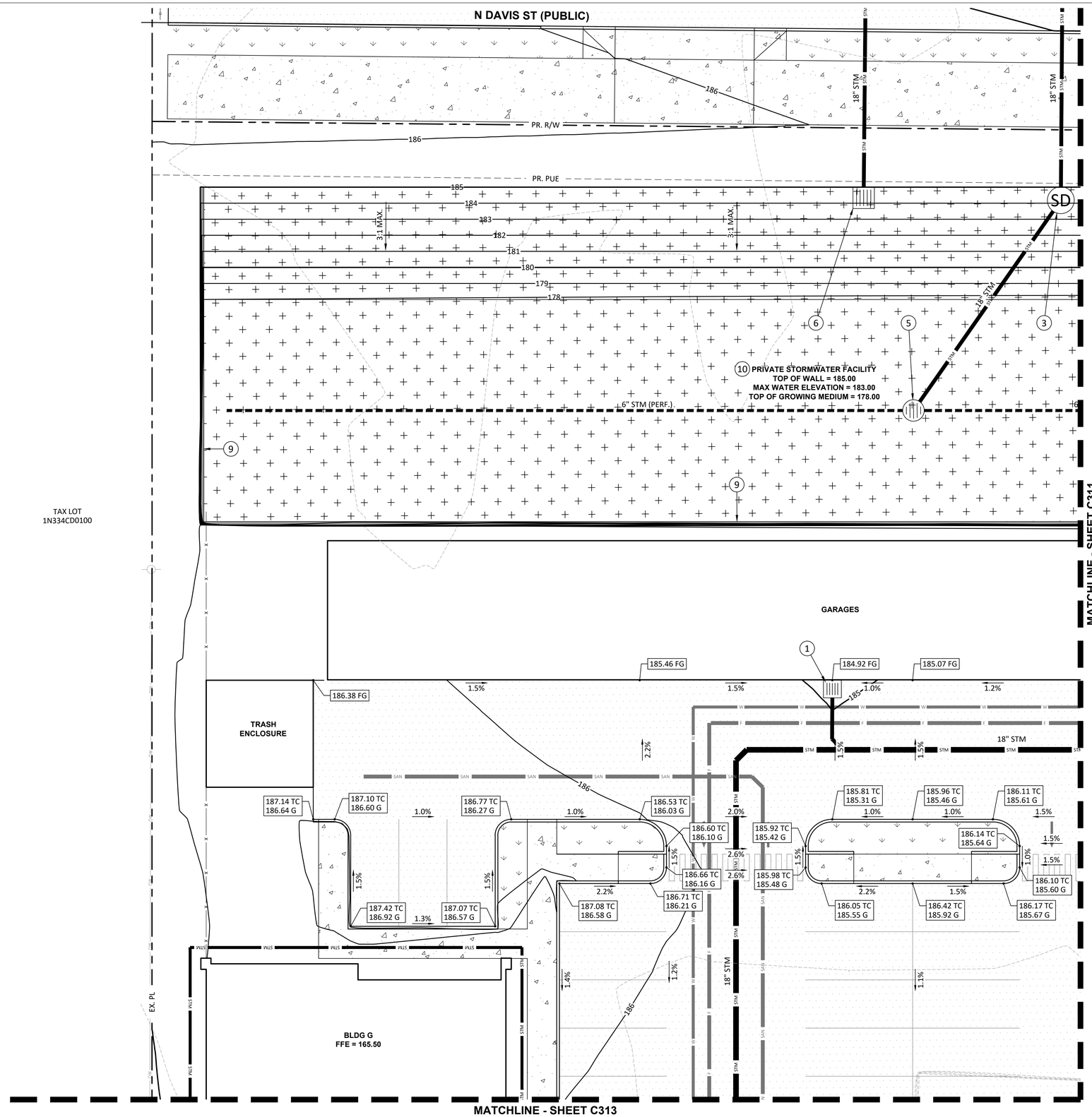
Project Status

OVERALL GRADING PLAN

Date	4/23/2025 8:13:40 PM
Drawn	HHPR
Checked	HHPR

C300

4/23/2025 8:13:40 PM



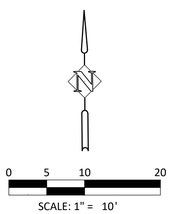
TAX LOT
1N334CD0100

CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.
3. PROPOSED FLOW CONTROL MANHOLE PER CWS.
5. PROPOSED BEEHIVE OVERFLOW INLET.
6. PROPOSED SECONDARY OVERFLOW INLET FOR EMERGENCY OVERFLOW.
9. PROPOSED ECOBLOCK RETAINING WALL. DESIGN BY OTHERS.
10. PROPOSED LINED DETENTION POND WITH PERFORATED UNDERDRAIN PER CWS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.



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FPC-02

Project Status

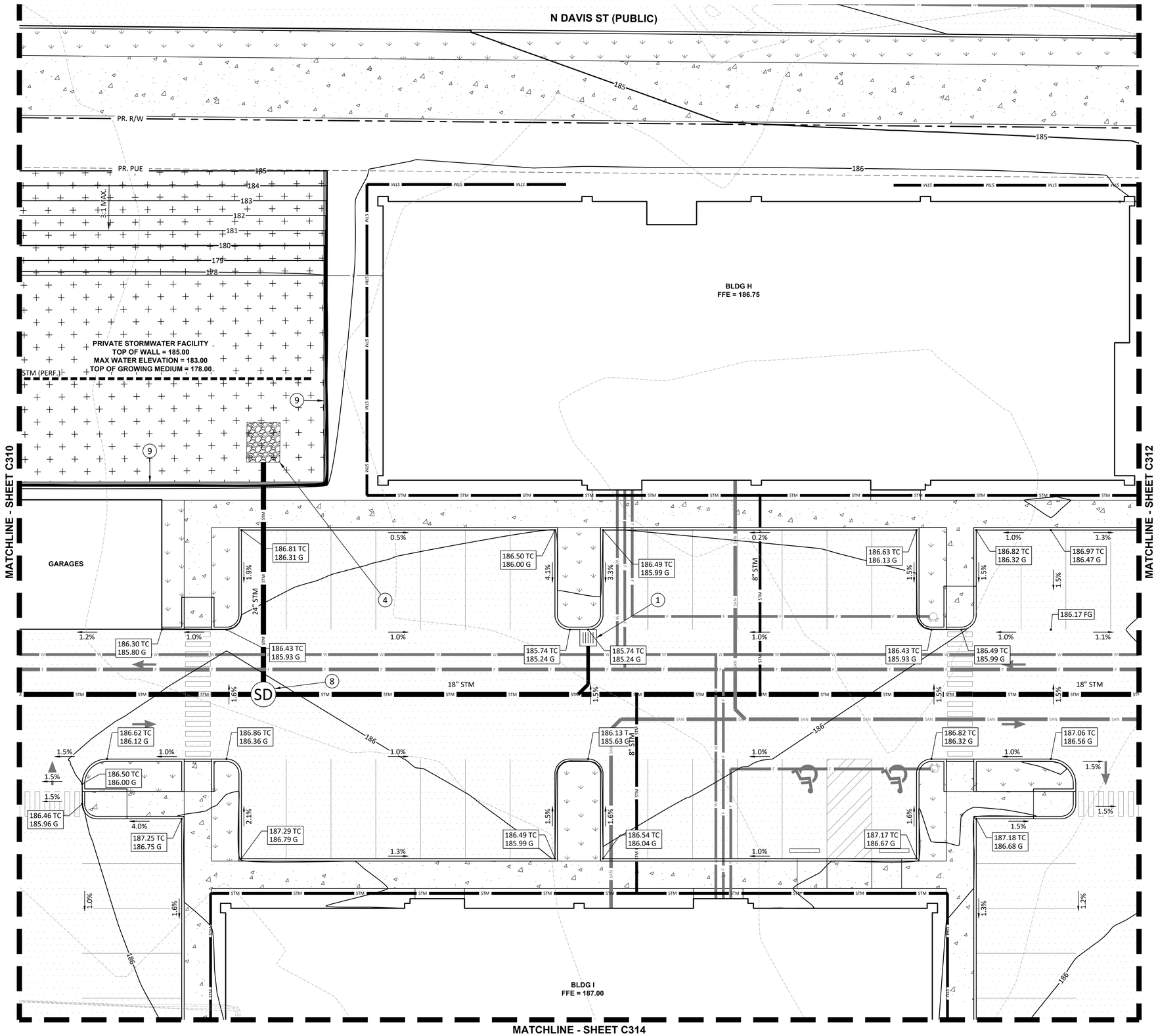
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C310

HHPR Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS • LANDSCAPE ARCHITECTS • SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

4/23/2025 8:13:40 PM



CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.
4. PROPOSED RIP RAP STORM OUTFALL.
8. PROPOSED WATER QUALITY MANHOLE WITH SNOUT PER CWS.
9. PROPOSED ECOBLOCK RETAINING WALL. DESIGN BY OTHERS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

design works LLC
abbasi
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

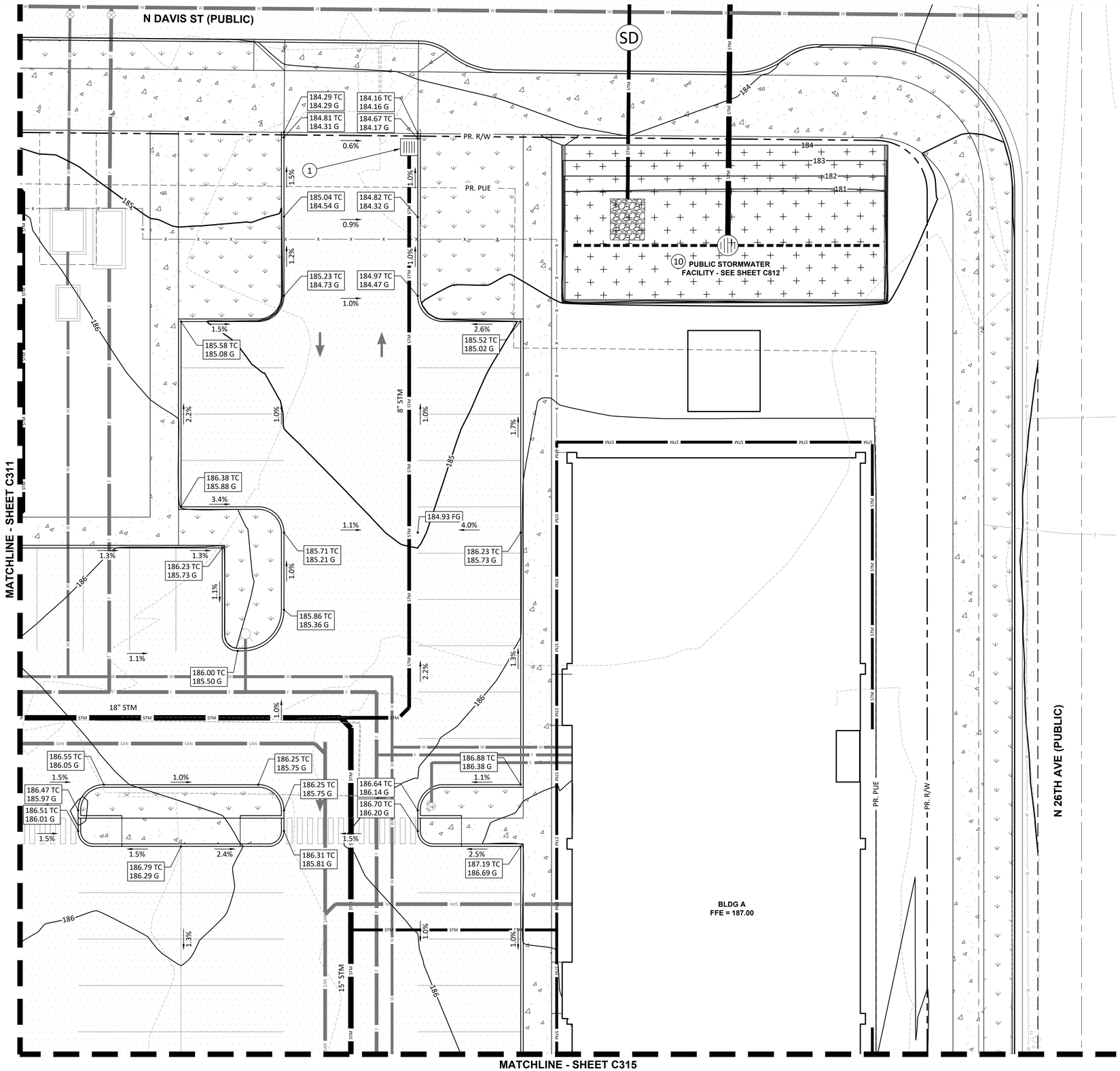
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

C311

Harper Houf Peterson Righellis Inc.
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CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.
10. PROPOSED LINED DETENTION POND WITH PERFORATED UNDERDRAIN PER CWS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
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HHPR # FPC-02

Project Status

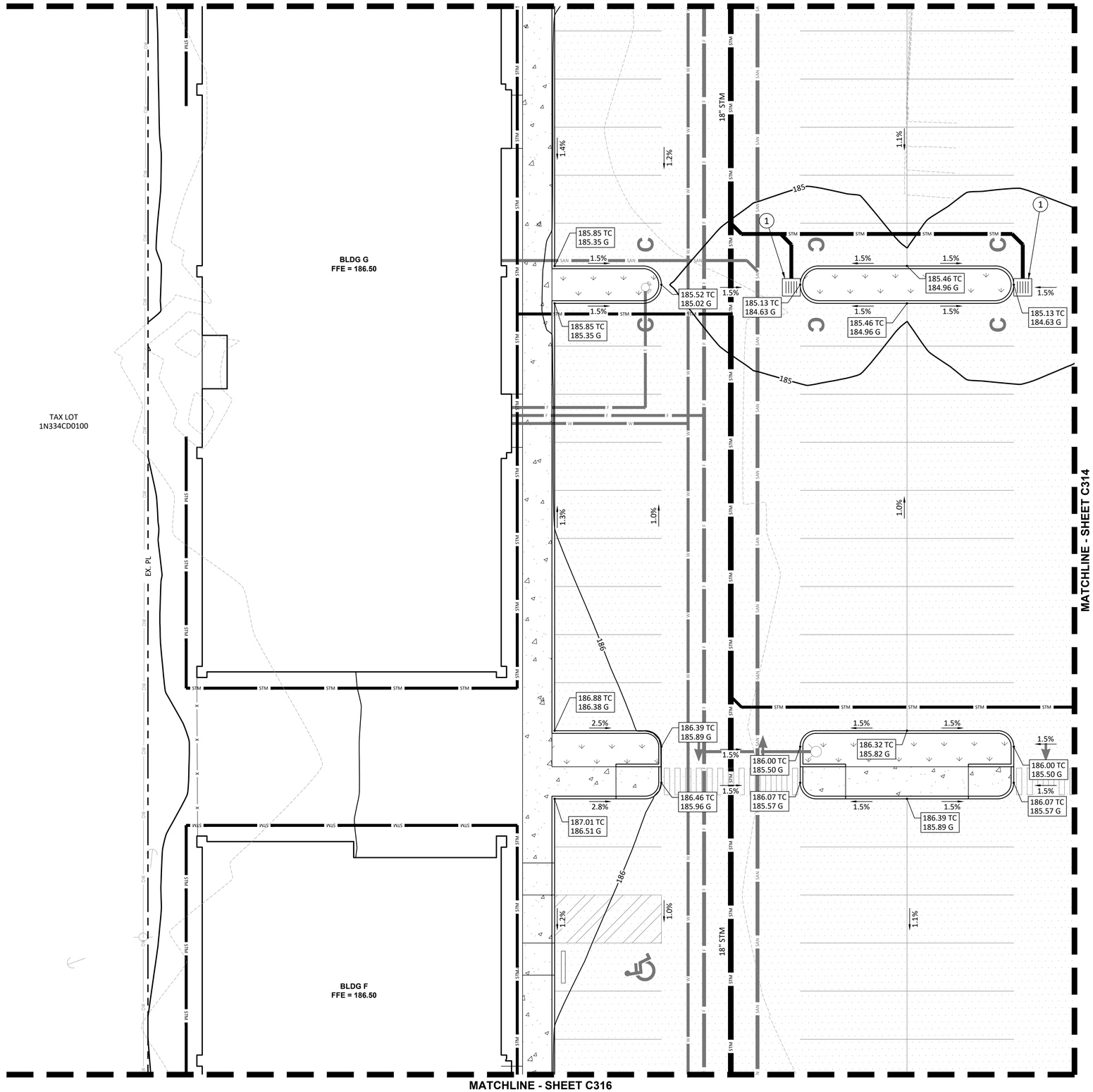
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
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C312

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CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

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No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
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Project Status

ENLARGED GRADING & DRAINAGE PLAN

Date	4/23/2025 8:13:40 PM
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C313

SCALE: 1" = 10'

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MATCHLINE - SHEET C311

MATCHLINE - SHEET C313

MATCHLINE - SHEET C315

MATCHLINE - SHEET C317

BLDG I
FFE = 187.00

CLUBHOUSE

POOL

185.82 TC
185.32 G

185.49 TC
184.99 G

185.82 TC
185.32 G

186.04 TC
185.54 G

185.71 TC
185.21 G

186.04 TC
185.54 G

186.62 TC
186.12 G

186.36 TC
185.86 G

186.43 TC
185.93 G

186.75 TC
186.25 G

186.96 TC
186.46 G

186.63 TC
186.13 G

186.70 TC
186.20 G

187.00 TC
186.50 G

1.0%
1.6%
1.5%
1.3%
1.2%
1.1%
1.4%

STM
SAN
W
C

WC ONLY

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

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+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
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C314

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

4/23/2025 8:13:40 PM

MATCHLINE - SHEET C312

MATCHLINE - SHEET C314

MATCHLINE - SHEET C318

BLDG A
FFE = 187.00

BLDG B
FFE = 187.00

PR. R/W

PR. PUE

N 26TH AVE (PUBLIC)

15" STM

12" STM

12" STM

185.68 TC
185.18 G

185.35 TC
184.85 G

185.68 TC
185.18 G

185.35 TC
184.85 G

186.22 TC
185.72 G

185.83 TC
185.33 G

185.74 TC
185.24 G

185.97 TC
185.47 G

186.36 TC
185.86 G

186.60 TC
186.10 G

186.27 TC
185.77 G

186.27 TC
185.77 G

186.66 TC
186.16 G

186.34 TC
185.84 G

186.66 TC
186.16 G

186.73 TC
186.23 G

187.02 TC
186.52 G

187.11 TC
186.61 G

WC ONLY

CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

abbasi design works LLC
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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

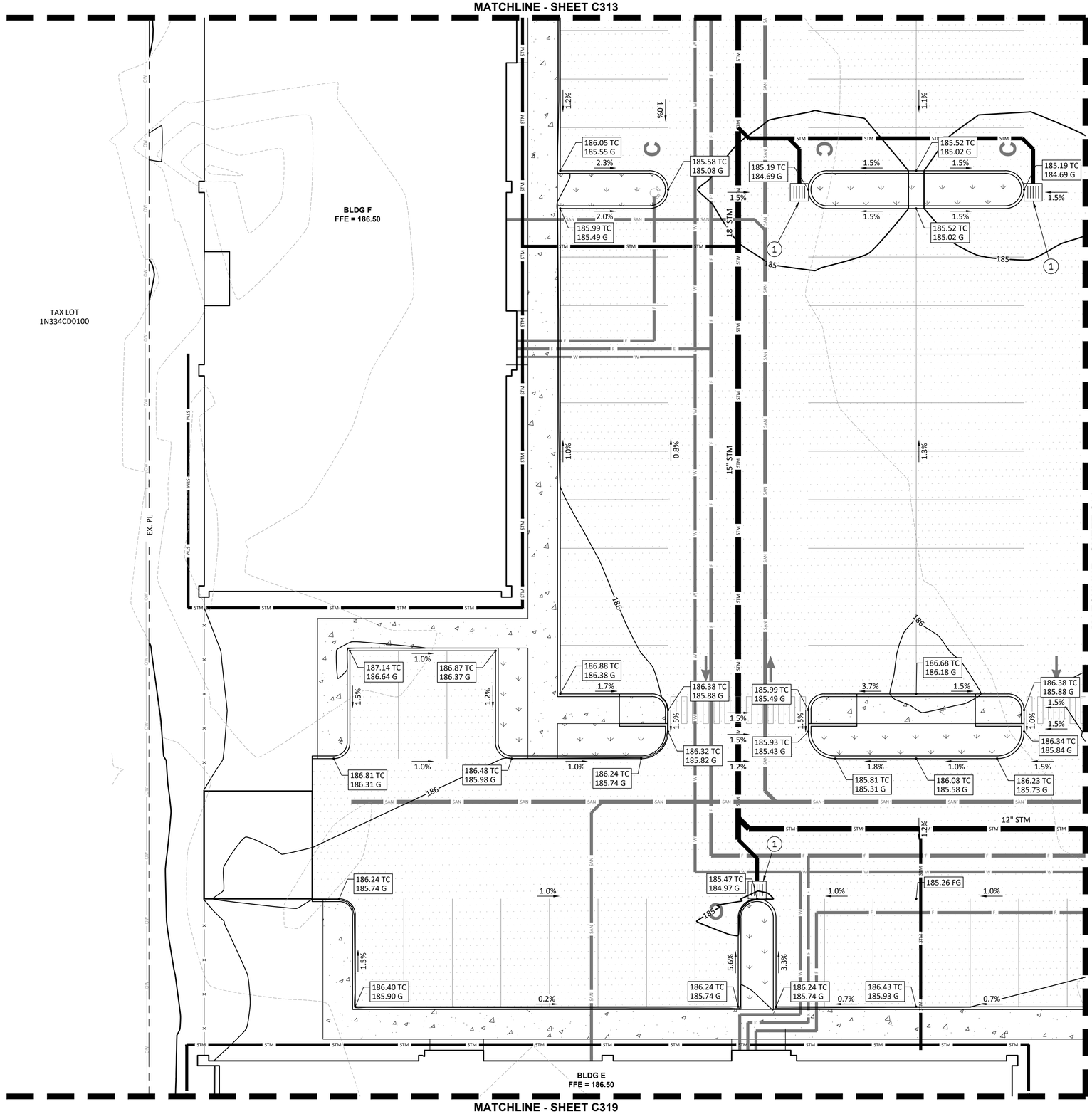
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
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C315

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CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR # FPC-02

Project Status

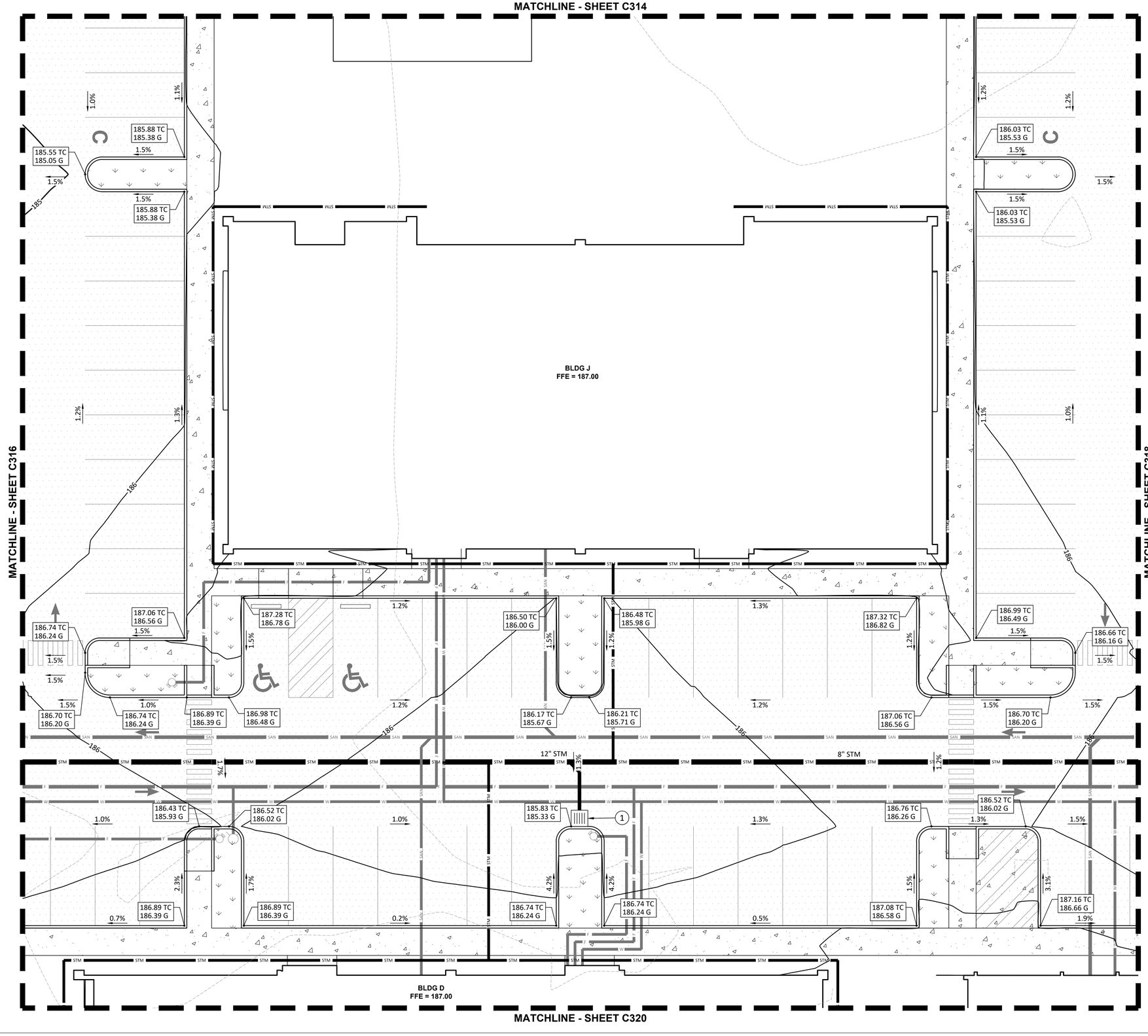
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
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C316

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LANDSCAPE ARCHITECTS • SURVEYORS
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CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR # FPC-02

Project Status

ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
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C317

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phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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MATCHLINE - SHEET C315

MATCHLINE - SHEET C317

MATCHLINE - SHEET C321

BLDG B
FFE = 187.00

BLDG C
FFE = 187.00

N 26TH AVE (PUBLIC)

PR. PUE

PR. R/W

12" STM

8" STM

8" STM

185.67 TC
185.17 G

185.34 TC
184.84 G

185.67 TC
185.17 G

185.34 TC
184.84 G

185.73 TC
185.23 G

186.06 TC
185.56 G

186.15 TC
185.65 G

186.63 TC
186.13 G

186.30 TC
185.80 G

186.30 TC
185.80 G

186.69 TC
186.19 G

187.31 TC
186.81 G

186.19 TC
185.69 G

185.97 TC
185.47 G

186.19 TC
185.69 G

186.73 TC
186.23 G

186.90 TC
186.40 G

185.89 TC
185.39 G

185.89 TC
185.39 G

186.47 TC
185.97 G

186.63 TC
186.13 G

185.71 TC
185.21 G

186.28 TC
185.78 G

186.31 TC
185.81 G

186.47 TC
185.97 G

186.13 TC
185.63 G

185.77 TC
185.27 G

185.58 TC
185.08 G

186.36 TC
185.86 G

185.27 TC
184.77 G

CONSTRUCTION NOTES:

1. PROPOSED CATCHBASIN.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

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No.	Date

HANEY MULTIFAMILY
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HHPR #
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Project Status

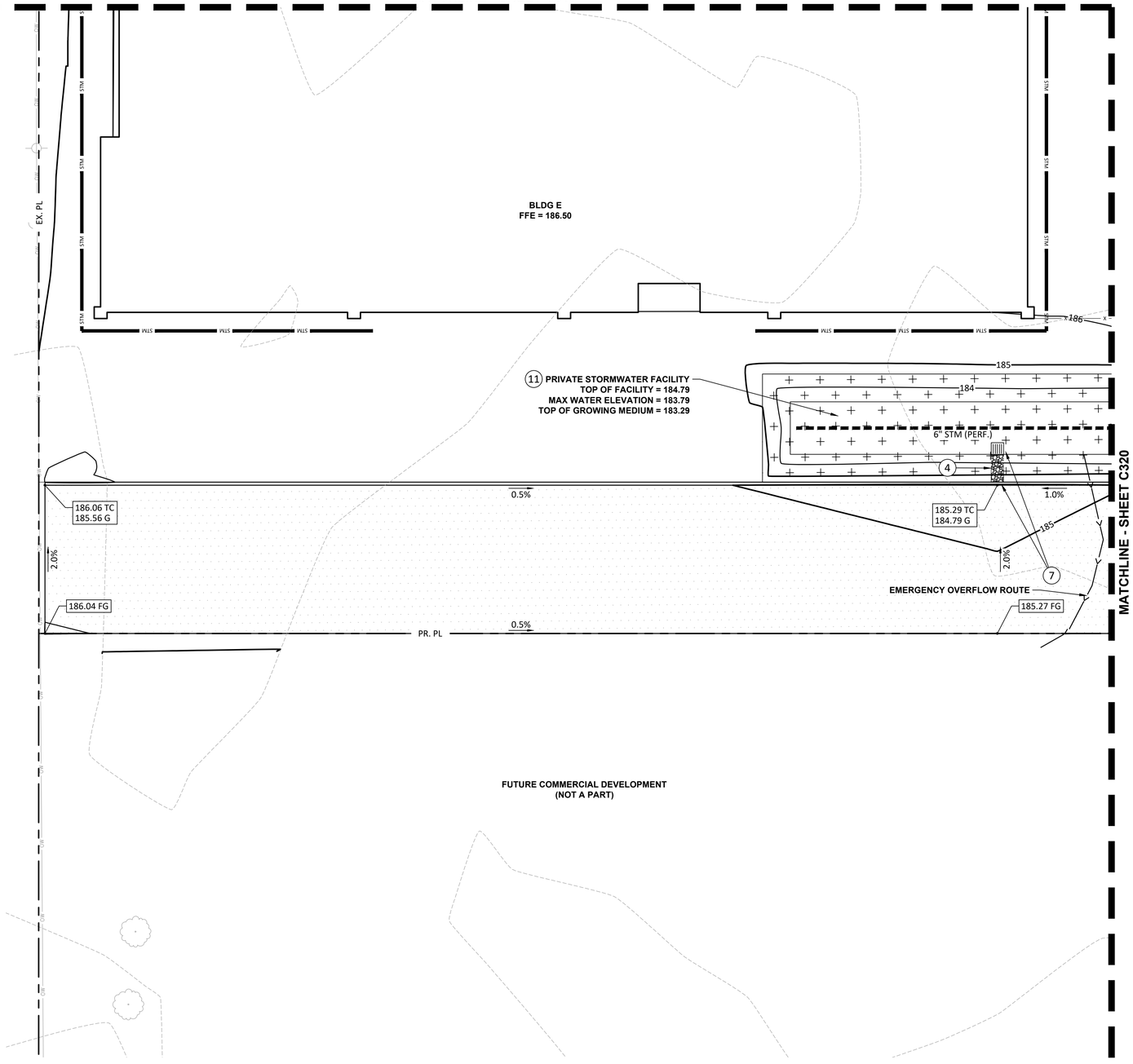
ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
Drawn HHPR
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C318

Harper Houf Peterson Righellis Inc.
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phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

4/23/2025 8:13:40 PM



CONSTRUCTION NOTES:

4. PROPOSED RIP RAP STORM OUTFALL.
7. PROPOSED CURB CUT PER CWS AND INLET STRUCTURE WITH SUMP PER CWS.
11. PROPOSED LINED RAINGARDEN WITH PERFORATED UNDERDRAIN PER CWS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

abbasi design works LLC
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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

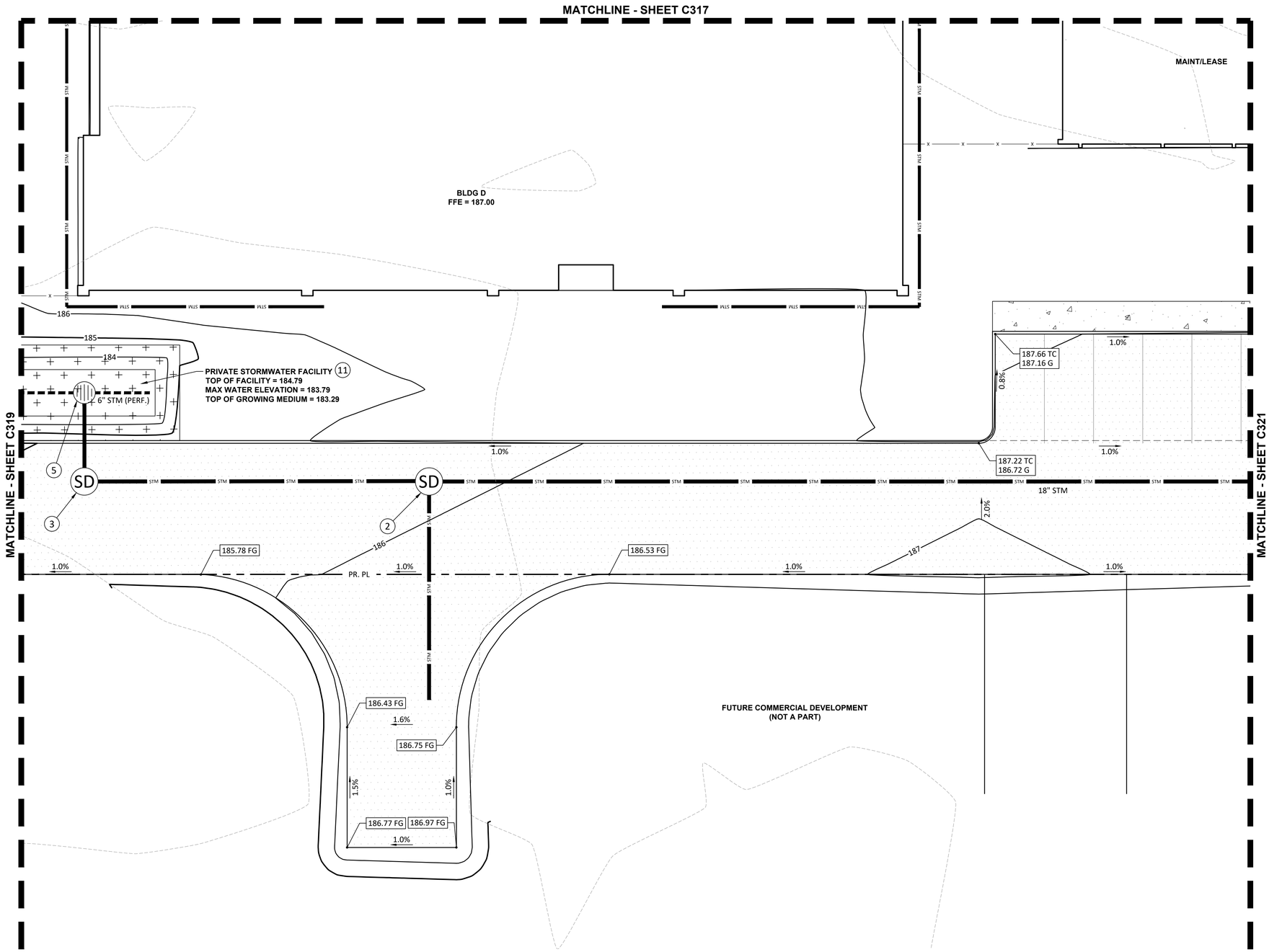
ENLARGED GRADING & DRAINAGE PLAN

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C319

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CONSTRUCTION NOTES:

2. PROPOSED 48" MANHOLE.
3. PROPOSED FLOW CONTROL MANHOLE PER CWS.
5. PROPOSED BEEHIVE OVERFLOW INLET.
11. PROPOSED LINED RAINGARDEN WITH PERFORATED UNDERDRAIN PER CWS.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 10'

design works LLC
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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
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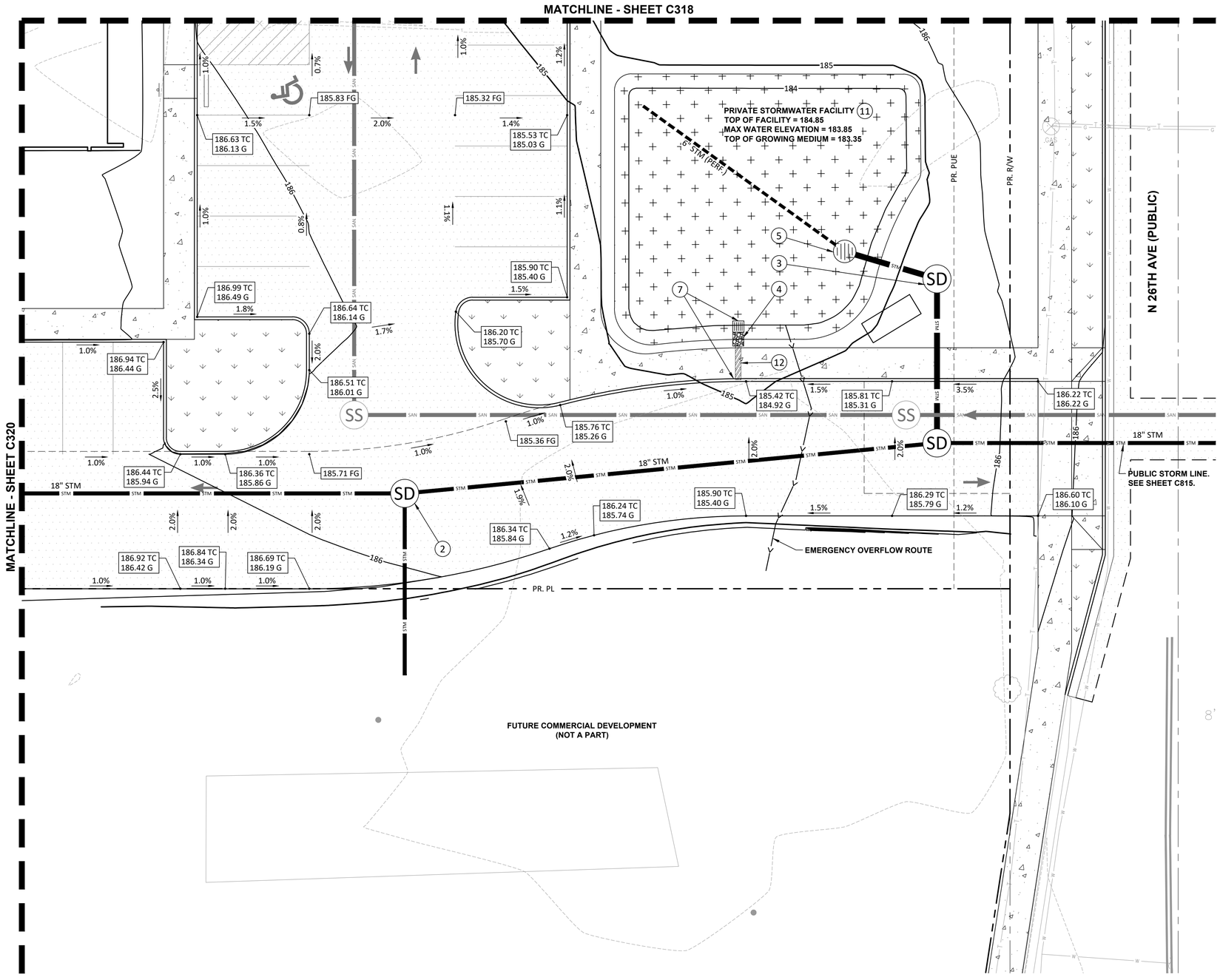
ENLARGED GRADING & DRAINAGE PLAN

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C320

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CONSTRUCTION NOTES:

(2) PROPOSED 48" MANHOLE.

(3) PROPOSED FLOW CONTROL MANHOLE PER CWS.

(4) PROPOSED RIP RAP STORM OUTFALL.

(5) PROPOSED BEEHIVE OVERFLOW INLET.

(7) PROPOSED CURB CUT PER CWS AND INLET STRUCTURE WITH SUMP PER CWS.

(11) PROPOSED LINED RAINGARDEN WITH PERFORATED UNDERDRAIN PER CWS.

(12) PROPOSED SIDEWALK DRAINAGE GRATE.

GRADING NOTES:

1. FINISHED PAVEMENT SURFACE IS 6" BELOW TOP OF CURB (TC) ELEVATIONS UNLESS OTHERWISE NOTED.
2. SEE LANDSCAPE PLANS FOR DETAILS OF SPECIALTY SURFACING, STAIRS, AND PLANTER AREAS.
3. SEE C800 SERIES FOR WORK IN PUBLIC RIGHT-OF-WAY.

N

0 5 10 20

SCALE: 1" = 10'

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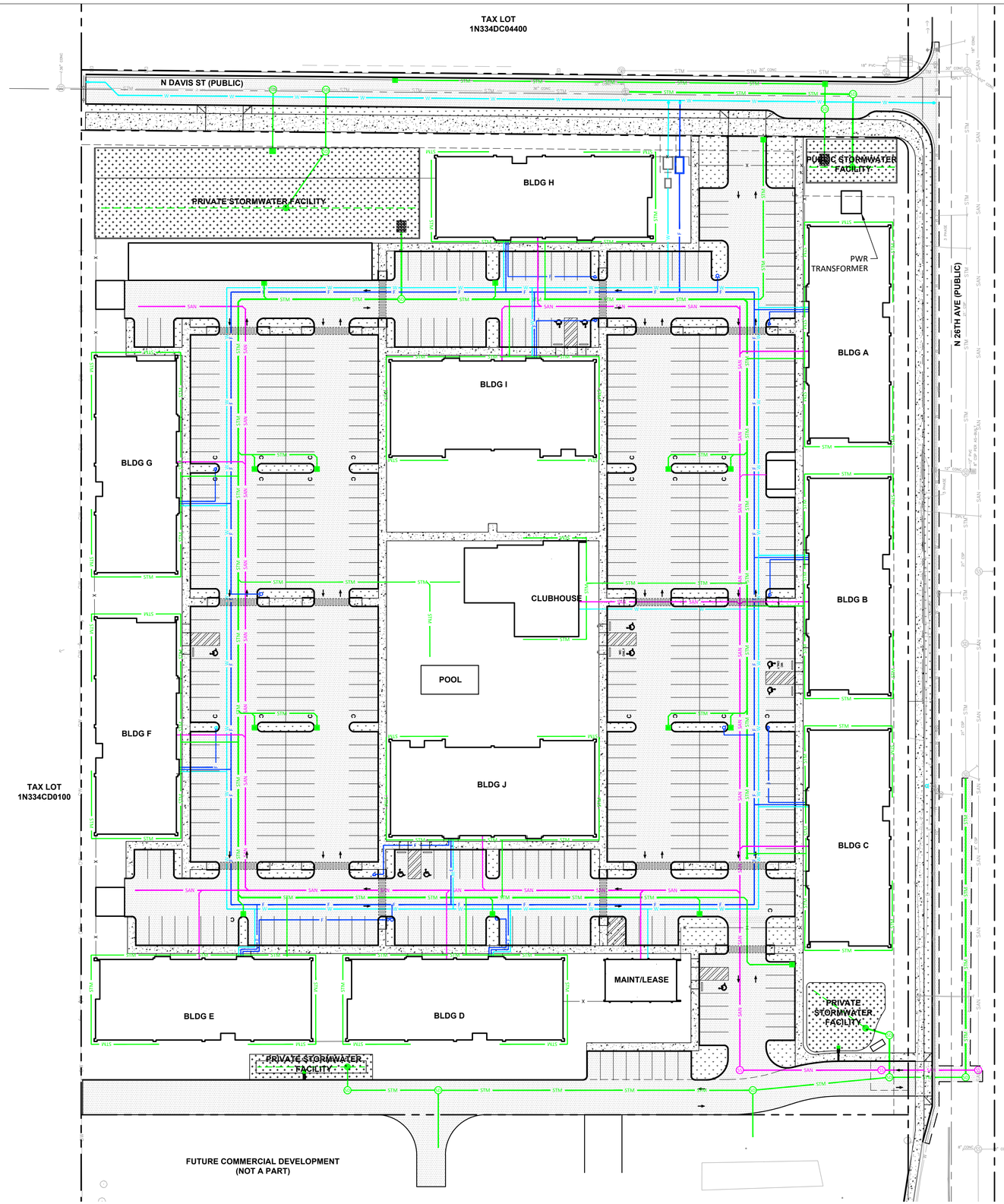
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ENLARGED GRADING & DRAINAGE PLAN

Date 4/23/2025 8:13:40 PM
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C321

4/23/2025 8:13:40 PM



LEGEND:

- STM — STORM SEWER LINE
- SAN — SANITARY SEWER LINE
- W — DOMESTIC WATER LINE
- F — FIRE WATER LINE

0 20 40 80

SCALE: 1" = 40'

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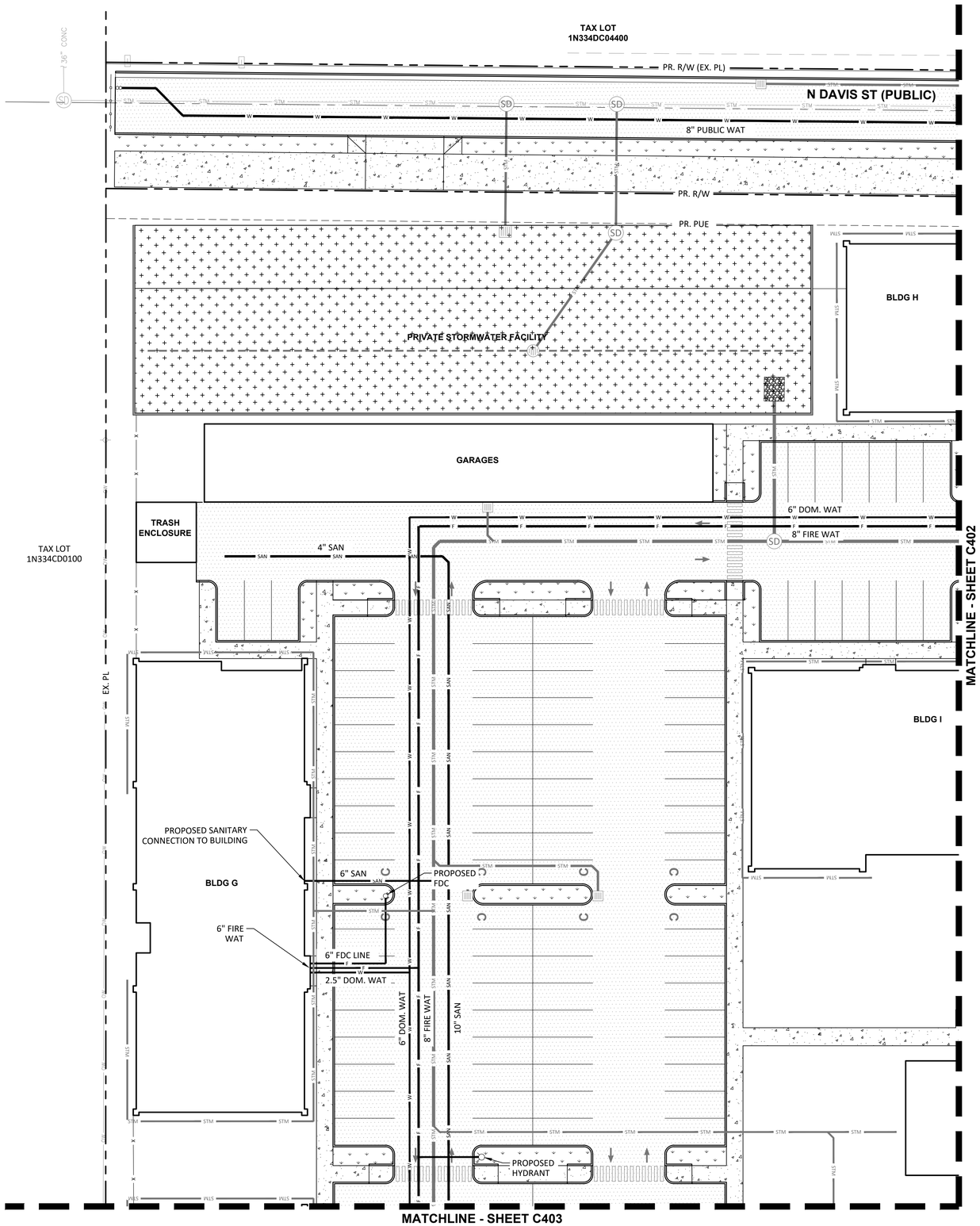
Project Status

COMPOSITE UTILITY PLAN

Date	4/23/2025 8:13:40 PM
Drawn	HHPR
Checked	HHPR

C400

4/23/2025 8:13:40 PM



SANITARY SEWER NOTES:

1. SEWER PIPE SHALL BE SDR34. ASTM D-3034 PVC, UNLESS OTHERWISE NOTED.
2. ALL CONNECTORS TO PUBLIC STORM AND SANITARY SEWERS TO BE MADE WITH GASKETED SADDLES OR MANUFACTURED TEE CONNECTIONS.
3. ALL PRIVATE SANITARY CONNECTIONS TO BE MADE WITH TEE/WYES OR WYES.
4. ALL PIPES AND CLEANOUTS ARE PRIVATE UNLESS INDICATED OTHERWISE.
5. CLEANOUTS SHALL BE INSTALLED PER OREGON SPECIALTY PLUMBING CODE, LATEST EDITION, MAX 100' SPACING.
6. COORDINATE WITH PLUMBING AND BUILDING PLANS FOR CONTINUATION OF ALL UTILITIES INTO BUILDING.

WATER NOTES:

1. ON-SITE DOMESTIC WATER SERVICE SHALL BE SCHEDULE 80 PVC PIPE AND FIRE SERVICE PIPE SHALL BE C900, UNLESS OTHERWISE NOTED.
2. COORDINATE WITH PLUMBING AND BUILDING PLANS FOR CONTINUATION OF ALL UTILITIES INTO BUILDINGS.
3. JOINT RESTRAINT MAY BE USED IN LIEU OF THRUST BLOCKS.

GENERAL NOTES:

1. SEE C800 SERIES FOR UTILITY WORK IN PUBLIC RIGHT-OF-WAY.

0 10 20 40
SCALE: 1" = 20'

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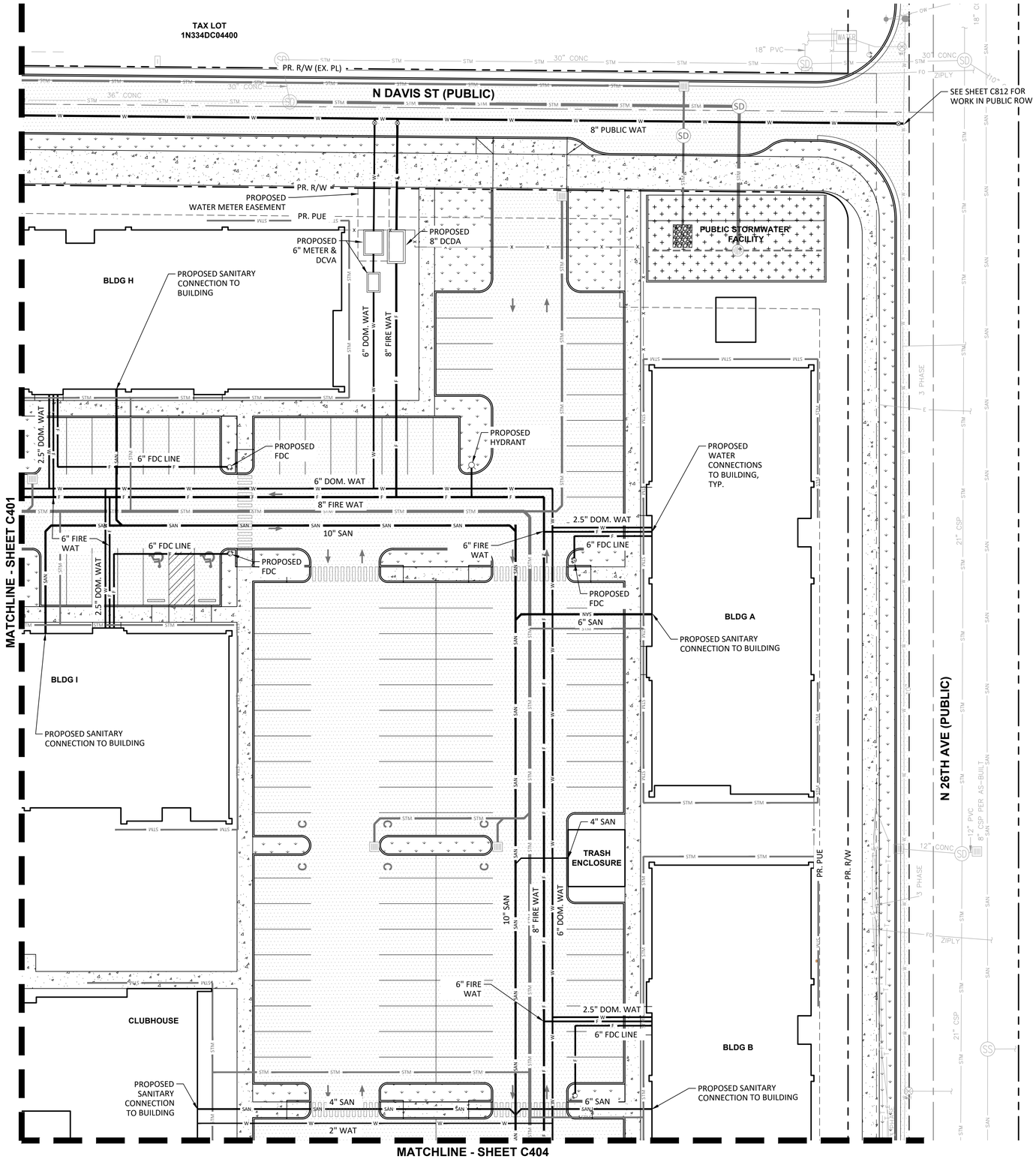
Project Status

ENLARGED UTILITY PLAN

Date	4/23/2025 8:13:40 PM
Drawn	HHPR
Checked	HHPR

C401

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SANITARY SEWER NOTES:

1. SEWER PIPE SHALL BE SDR34. ASTM D-3034 PVC, UNLESS OTHERWISE NOTED.
2. ALL CONNECTORS TO PUBLIC STORM AND SANITARY SEWERS TO BE MADE WITH GASKETED SADDLES OR MANUFACTURED TEE CONNECTIONS.
3. ALL PRIVATE SANITARY CONNECTIONS TO BE MADE WITH TEE/WYES OR WYES.
4. ALL PIPES AND CLEANOUTS ARE PRIVATE UNLESS INDICATED OTHERWISE.
5. CLEANOUTS SHALL BE INSTALLED PER OREGON SPECIALTY PLUMBING CODE, LATEST EDITION, MAX 100' SPACING.
6. COORDINATE WITH PLUMBING AND BUILDING PLANS FOR CONTINUATION OF ALL UTILITIES INTO BUILDING.

WATER NOTES:

1. ON-SITE DOMESTIC WATER SERVICE SHALL BE SCHEDULE 80 PVC PIPE AND FIRE SERVICE PIPE SHALL BE C900, UNLESS OTHERWISE NOTED.
2. COORDINATE WITH PLUMBING AND BUILDING PLANS FOR CONTINUATION OF ALL UTILITIES INTO BUILDINGS.
3. JOINT RESTRAINT MAY BE USED IN LIEU OF THRUST BLOCKS.

GENERAL NOTES:

1. SEE C800 SERIES FOR UTILITY WORK IN PUBLIC RIGHT-OF-WAY.

SCALE: 1" = 20'

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PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

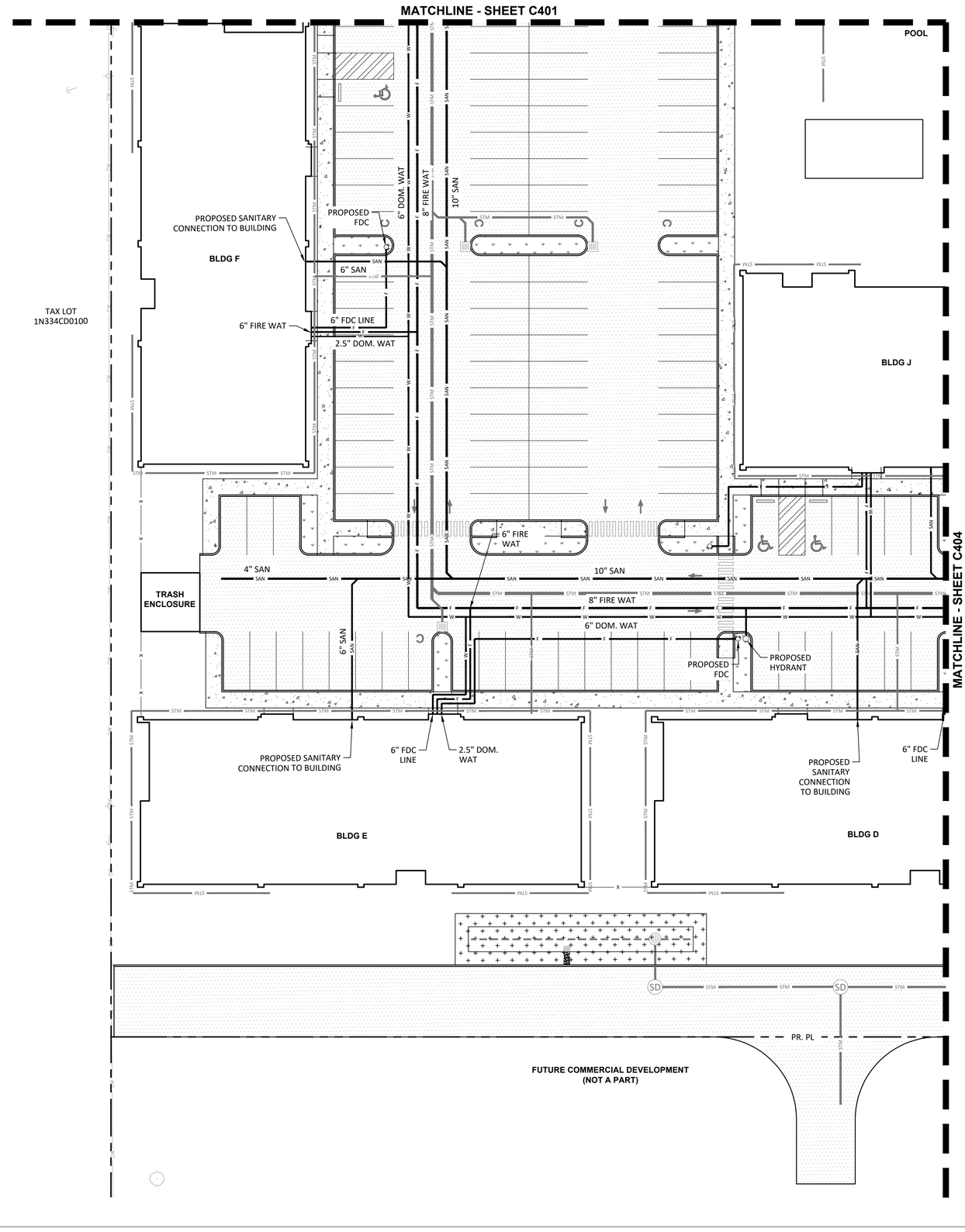
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SANITARY SEWER NOTES:

1. SEWER PIPE SHALL BE SDR34. ASTM D-3034 PVC, UNLESS OTHERWISE NOTED.
2. ALL CONNECTORS TO PUBLIC STORM AND SANITARY SEWERS TO BE MADE WITH GASKETED SADDLES OR MANUFACTURED TEE CONNECTIONS.
3. ALL PRIVATE SANITARY CONNECTIONS TO BE MADE WITH TEE/WYES OR WYES.
4. ALL PIPES AND CLEANOUTS ARE PRIVATE UNLESS INDICATED OTHERWISE.
5. CLEANOUTS SHALL BE INSTALLED PER OREGON SPECIALTY PLUMBING CODE, LATEST EDITION, MAX 100' SPACING.
6. COORDINATE WITH PLUMBING AND BUILDING PLANS FOR CONTINUATION OF ALL UTILITIES INTO BUILDING.

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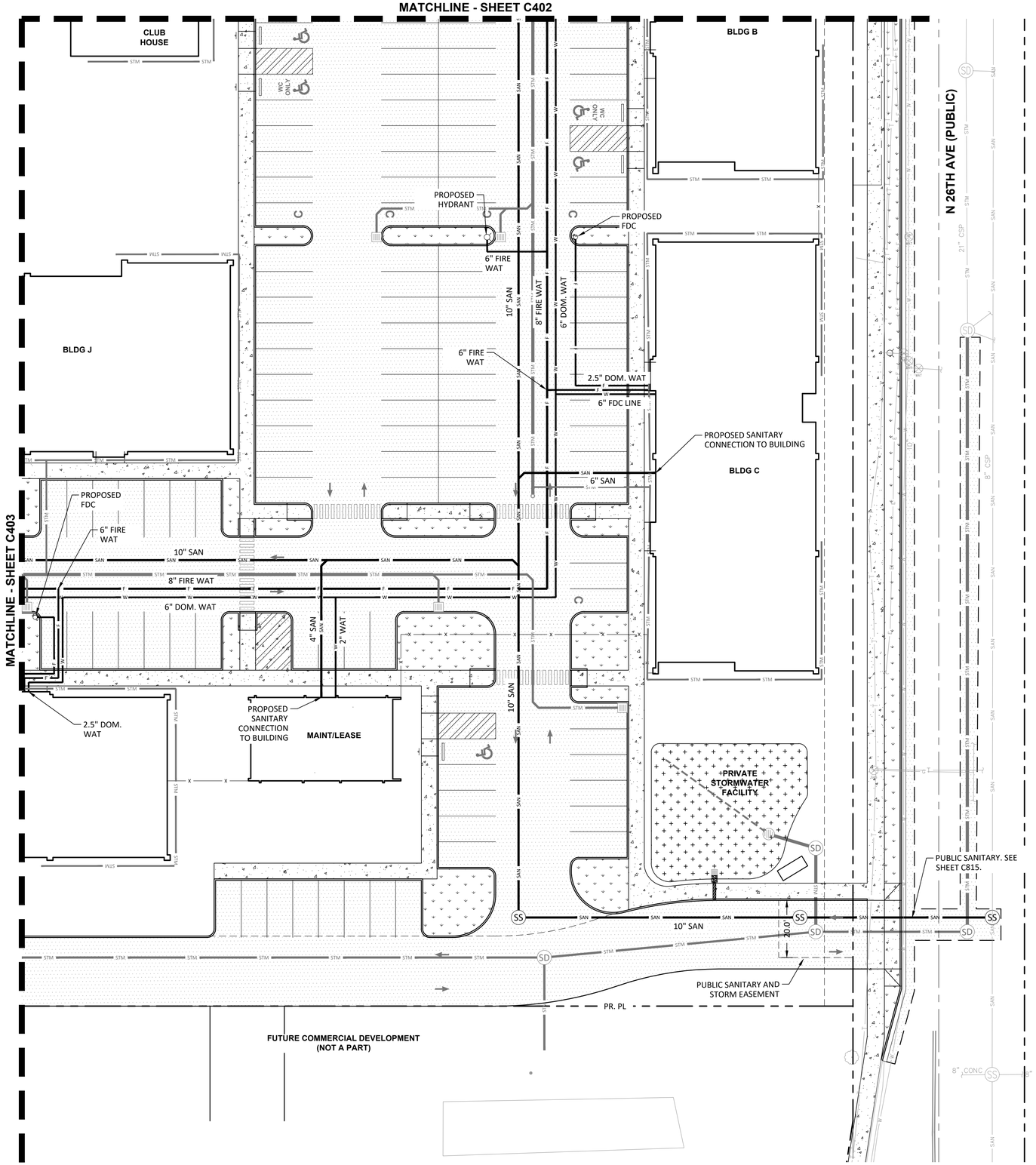
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SANITARY SEWER NOTES:

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GENERAL NOTES:

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CITY OF CORNELIUS PUBLIC WORKS NOTES:

WATER

1. ALL NEW AND REPLACEMENT PUBLIC WATER MAINS SHALL BE CLASS DR18 C900.

2. HYDRANT ASSEMBLIES SHALL USE CLASS 52 DUCTILE IRON PIPE TO CONNECT THE GATE VALVE TO THE HYDRANT AND SHALL BE INSTALLED AS SHOWN IN CITY OF CORNELIUS DETAIL W-1.

3. VALVES SHALL BE RESILIENT SEATED GATE VALVES.

4. ALL VALVES SHALL BE MUELLER BRAND.

5. VALVES SHALL BE SET AS SHOWN IN CITY OF CORNELIUS DETAIL W-2.

6. A MINIMUM OF THREE LENGTHS OF PIPE SHALL BE RESTRAINED AT ALL WATER SYSTEM DEAD-ENDS.).

7. MECHANICAL RESTRAINTS SHALL BE USED ON ALL TEES, CROSSES, VALVES, AND CHANGES IN PIPE DIRECTION OF MORE THAN 10 DEGREES. FIELD LOCK GASKETS ALONE ARE INSUFFICIENT TO MEET THIS REQUIREMENT FOR MECHANICAL RESTRAINTS.

8. CONCRETE THRUST BLOCKS SHALL ONLY BE USED IN SPECIAL CASES AND WHEN DIRECTED BY THE CITY ENGINEER OR CITY'S ENGINEERING INSPECTOR. WHEN REQUIRED, THRUST BLOCKS SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF CORNELIUS DETAILS W-3 AND W-4.

9. WATER SERVICES 2-INCH AND SMALLER SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF CORNELIUS DETAIL W-7.

10. THE PARTY CONSTRUCTING A NEW WATER MAIN SHALL BE RESPONSIBLE FOR CONSTRUCTING ALL 2-INCH AND SMALLER SERVICE CONNECTIONS. THESE CONNECTIONS INCLUDE THE CONNECTION TO THE MAIN LINE, SERVICE, METER BOX, AND CURB STOP. THE CITY WILL SET THE METER.

11. WHERE SERVICE LINES WILL BE CONSTRUCTED FOR ADJOINING LOTS, THE SERVICE LINES SHALL BE LAID IN THE SAME TRENCH, WHENEVER POSSIBLE, TO MINIMIZE STREET CUTS. THE TAPS INTO THE MAIN LINE AND THE CENTERLINE OF THE METER BOXES SHALL BE A MINIMUM OF 24" APART. SERVICE LINES SHALL BE A MINIMUM OF 12" APART.

12. 12-GAUGE COPPER TRACER WIRE IS REQUIRED ON ALL SERVICE LINES BETWEEN THE WATER MAIN AND THE METER.

13. 12-GAUGE COPPER TRACER WIRE IS REQUIRED ON MAIN LINES WHERE THE RUN BETWEEN VALVE BOXES IS NOT LINEAR.

14. TRENCHING BACKFILL IN PUBLIC RIGHT-OF-WAY OR PUBLIC EASEMENTS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH CITY OF CORNELIUS DETAIL S-3.

15. PAVEMENT SHALL BE RESTORED TO PRE-EXISTING CONDITIONS OR BETTER. PAVEMENT RESTORATION SHALL FOLLOW THE REQUIREMENTS OF CITY OF CORNELIUS DETAILS S-4 AND S-5.

SANITARY AND STORM SEWERS

16. IN GENERAL, THE LATEST VERSION OF THE CLEAN WATER SERVICES (CWS) DESIGN AND CONSTRUCTION STANDARDS FOR SANITARY SEWER AND SURFACE WATER MANAGEMENT STANDARDS SHALL GOVERN CONSTRUCTION AND DESIGN OF SANITARY SEWER AND STORM AND EROSION CONTROL FACILITIES. WHERE CONFLICTS EXIST BETWEEN THE CITY OF CORNELIUS PUBLIC WORKS STANDARDS AND THE CWS STANDARDS, THE CITY STANDARDS SHALL PREVAIL.

17. ALL NON-METALLIC PIPE, INCLUDING MAIN LINES AND LATERALS, SHALL HAVE 12-GAUGE, GREEN-COATED TRACER WIRE INSTALLED DIRECTLY ON TOP OF THE PIPE. THE TRACER WIRE SHALL CLIMB THE OUTSIDE OF THE MANHOLE TO THE TOP PICK HOLE AND GO BEHIND STEPS AND TIE TO THE TOP STEP WITH A 30" TAIL.

18. TRACER WIRE IS NOT REQUIRED ON STRAIGHT SECTIONS OF PIPE BETWEEN STRUCTURES (MANHOLES AND CATCH BASINS).

19. TRENCHING BACKFILL IN PUBLIC RIGHT-OF-WAY OR PUBLIC EASEMENTS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH CITY OF CORNELIUS DETAIL S-3.

20. PAVEMENT SHALL BE RESTORED TO PRE-EXISTING CONDITIONS OR BETTER. PAVEMENT RESTORATION SHALL FOLLOW THE REQUIREMENTS OF CITY OF CORNELIUS DETAILS S-4 AND S-5.

STREETS

21. WHERE STORM AND SANITARY LATERALS TRAVERSE UNDER A CURB, THE CURB SHALL BE STAMPED TO IDENTIFY THE LATERAL TYPE.

22. RESTORATION OF AN EXISTING CURB AND GUTTER IS SHOWN IN CITY OF CORNELIUS DETAIL S-15

23. SIDEWALKS SHALL MEET ADA REQUIREMENTS UNLESS STEEP TERRAIN MAKES THIS IMPOSSIBLE.

24. THE PEDESTRIAN ZONE, WHICH INCLUDES SIDEWALKS, PATHWAYS, AND BULB-OUTS, MUST REMAIN FREE OF OBSTACLES. OBSTACLES INCLUDE ABOVE GROUND OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO: FIRE HYDRANTS, MAILBOXES, UTILITY PEDESTALS, UTILITY POLES, ABOVE GROUND UTILITY VAULTS, TREES, SIGN POSTS AND SIGNS, STREET LIGHT POLES, SIGNAL POLES, AND SIGNAL CONTROL EQUIPMENT. THE ONLY EXCEPTION TO THIS RULE IS WHERE THE SIDEWALK IS MORE THAN 6 FEET WIDE. IN THE CASES OF THESE WIDE SIDEWALKS, THE ABOVE GROUND OBSTRUCTIONS SHOULD BE PLACED AS CLOSE AS POSSIBLE TO THE CURB SO THAT A CLEAR CORRIDOR FOR PEDESTRIANS AT LEAST 5-FEET WIDE IS MAINTAINED.

25. PEDESTALS, POWER METER BOXES, POWER TRANSFORMERS, CABLE CLOSURES, AND SIMILAR FRANCHISE UTILITY FACILITIES SHALL BE LOCATED OUTSIDE THE RIGHT-OF-WAY IN THE PUBLIC UTILITY EASEMENT, UNLESS APPROVED BY THE CITY ENGINEER.

26. SIDEWALK FINISHING REQUIREMENTS ARE SHOWN IN CITY OF CORNELIUS DETAIL S-25.

SIGNING AND STRIPING

27. SIGNS PROJECTING OVER SIDEWALKS SHALL BE MOUNTED SUCH THAT THEY ARE AT LEAST 7 FEET ABOVE A SIDEWALK OR PATHWAY.

28. THE WIDTH OF THE BOTTOM OF THE ADA RAMP SHALL BE AT LEAST AS WIDE AS THE SIDEWALK OR PATHWAY IT SERVES.

29. SIGNING AND STRIPING SHALL FOLLOW THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS BY THE FEDERAL HIGHWAY ADMINISTRATION EXCEPT AS NOTED IN THESE NOTES.

30. ARTERIALS SHALL BE STRIPED WITH THE APPROPRIATE LANE MARKINGS.

31. BIKE LANES SHALL BE STRIPED.

32. PARKING SPACES IN PARALLEL PARKING BAYS CAN BE MARKED WITH A SIMPLE "T" AT THE CORNER OF THE SPACES ADJACENT TO THE TRAVEL LANES.

33. PARKING SPACES IN HEAD-IN PARKING BAYS MUST BE STRIPED BETWEEN THE SPACES.

34. ALL STRIPING SHALL BE THERMOPLASTIC.

35. PERMANENT SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF CORNELIUS DETAIL S-31.

LANDSCAPING

36. BROADLEAF TREES PLANTED IN SINGLE-FAMILY AND DUPLEX NEIGHBORHOODS, SHALL BE A MINIMUM CALIPER SIZE OF 1.5".

37. BROADLEAF TREES PLANTED IN OTHER THAN SINGLE-FAMILY AND DUPLEX NEIGHBORHOODS SHALL BE A MINIMUM CALIPER SIZE OF 2".

38. CONIFERS MUST BE A MINIMUM 5 FEET IN HEIGHT AT TIME OF PLANTING.

39. TREES IN PARKWAY STRIPS SHALL BE INSTALLED WITH AN 18-INCH DEEP ROOT BARRIER.

40. THE APPROPRIATE PLANTING METHODS FOR TREES ARE SHOWN IN CITY OF CORNELIUS DETAIL S-41.

41. WATERING OF NEWLY PLANTED TREES IS REQUIRED. WATERING SHALL BE ACCOMPLISHED THROUGH USE OF A TEMPORARY IRRIGATION SYSTEM OR WITH INDIVIDUAL PORTABLE TREE WATERING DEVICES SUCH AS "GATOR BAGS."

STREET LIGHTING

42. STREET LIGHTING SHALL BE LED.

43. STREET LIGHT FIXTURES SHALL EMIT NO LIGHT UPWARD.

44. COLOR TEMPERATURE (CCT) SHALL NOT EXCEED 3000K.

45. ALL STREET LIGHTING SHALL BE OPTION C, IN OTHER WORDS, OWNED AND MAINTAINED BY THE CITY.

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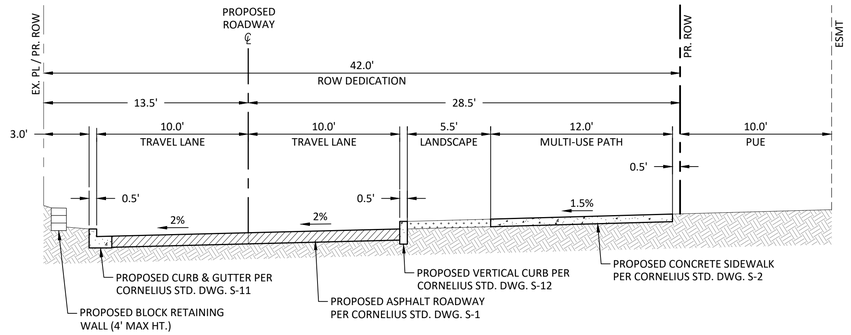
PUBLIC WORKS NOTES

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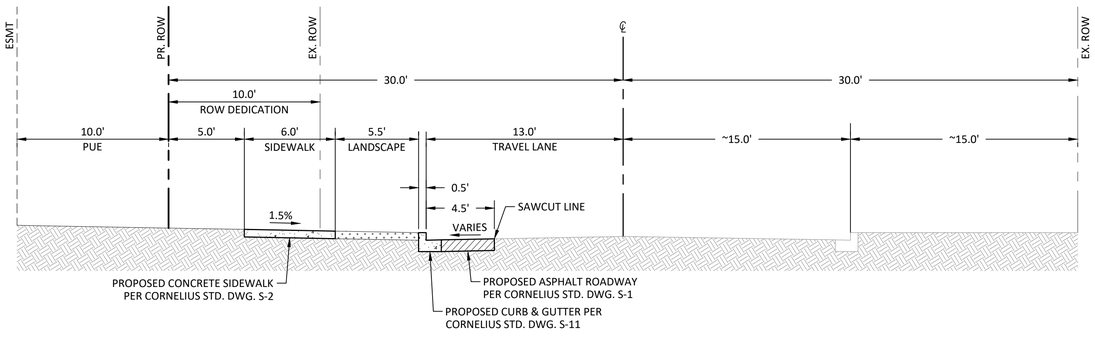
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N DAVIS STREET TYPICAL SECTION

NTS



N 26TH AVENUE TYPICAL SECTION

NTS

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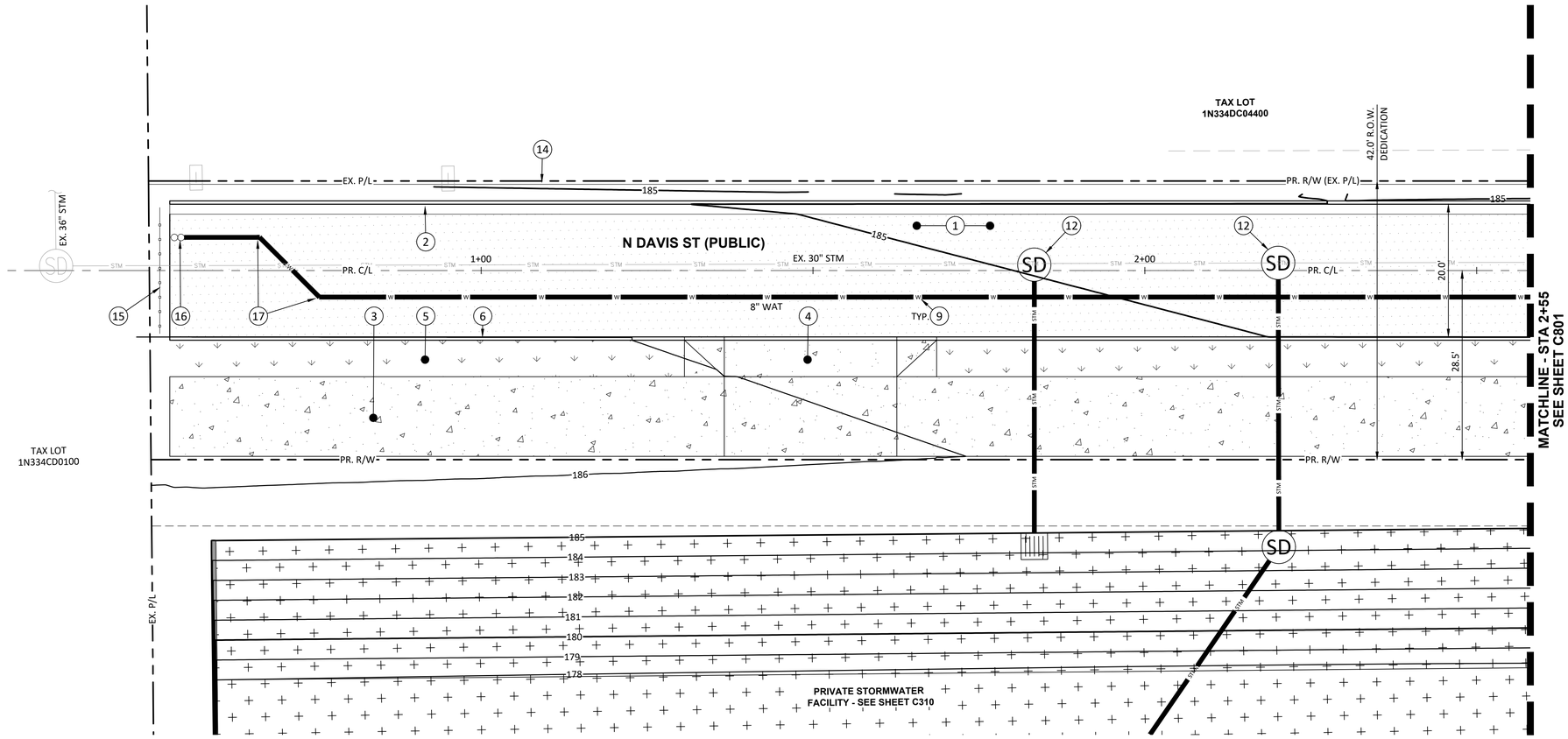
TYPICAL SECTIONS

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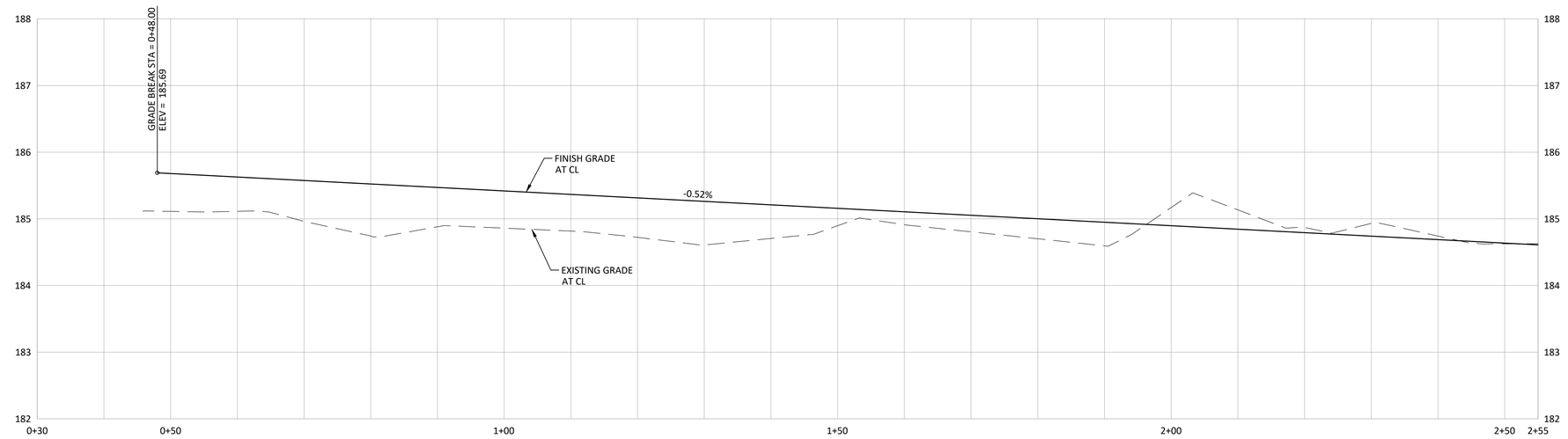
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N DAVIS ST - PLAN

SCALE: 1" = 10'

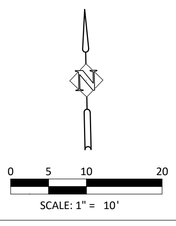


N DAVIS ST - PROFILE

HORIZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 1'

CONSTRUCTION NOTES:

1. PROPOSED ASPHALT PAVEMENT SECTION PER CITY OF CORNELIUS.
2. PROPOSED CURB & GUTTER PER CITY OF CORNELIUS.
3. PROPOSED MULTIUSE PATH WITH CONCRETE SECTION PER CITY OF CORNELIUS.
4. PROPOSED COMMERCIAL DRIVEWAY WITH PARKWAY STRIP PER CITY OF CORNELIUS.
5. PROPOSED LANDSCAPE STRIP. REFER TO LANDSCAPE PLANS FOR INFORMATION.
6. PROPOSED STANDARD CURB PER CITY OF CORNELIUS.
9. PROPOSED TRENCH BACKFILL PER CITY OF CORNELIUS.
12. PROPOSED DOGHOUSE MANHOLE WITH CAST-IN-PLACE BASE PER CWS.
14. PROPOSED ECOBLOCK RETAINING WALL.
15. PROPOSED TEMPORARY ROAD BARRICADE.
16. PROPOSED 2" BLOWOFF ASSEMBLY.
17. PROPOSED DI HORIZONTAL ELBOW BEND.



SCALE: 1" = 10'

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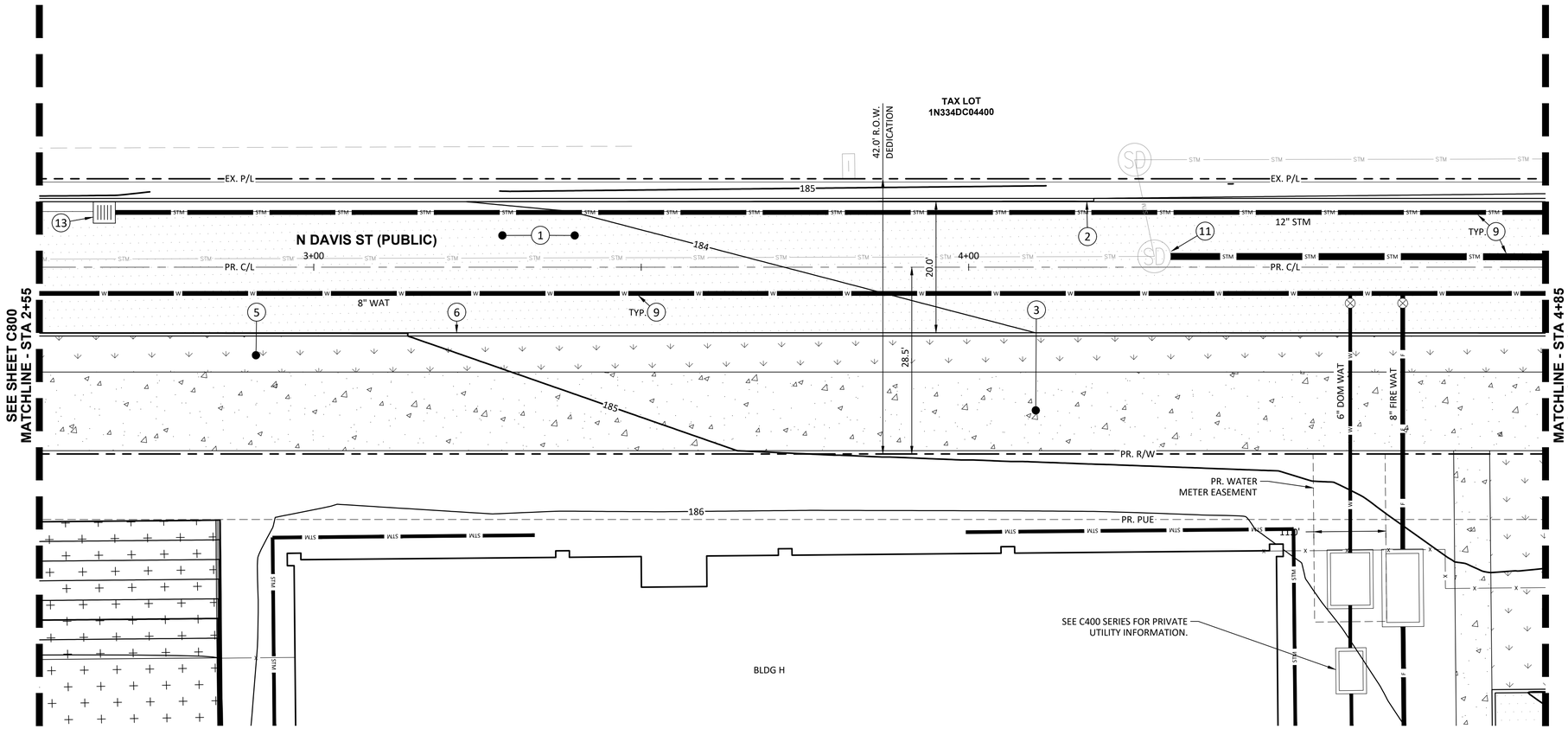
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ROADWAY PLAN & PROFILE - N DAVIS ST

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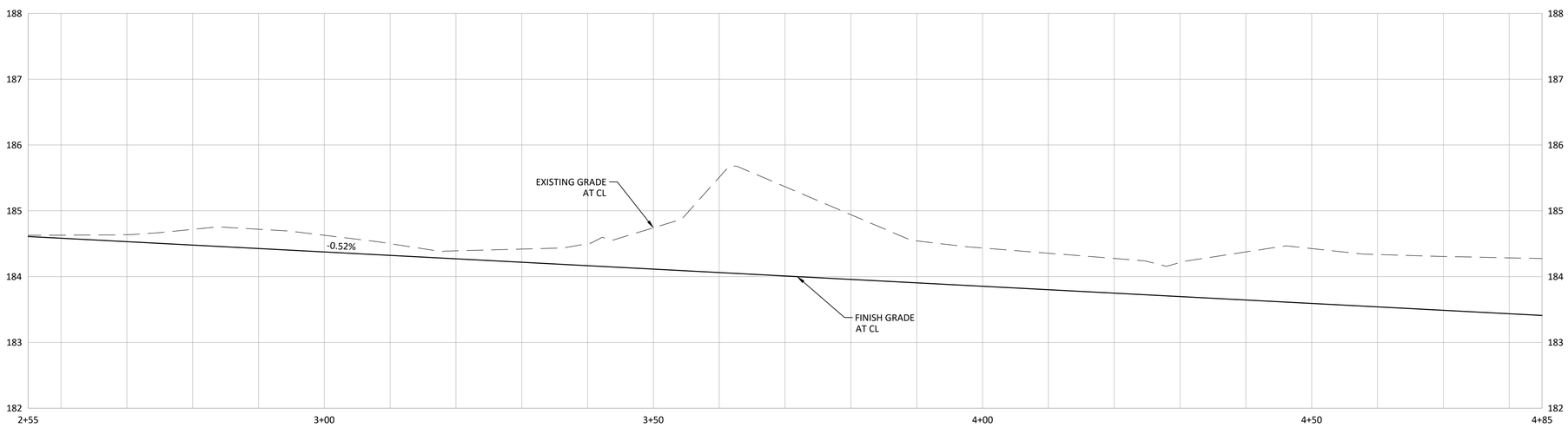
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N DAVIS ST - PLAN

SCALE: 1" = 10'



N DAVIS ST - PROFILE

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VERT. SCALE: 1" = 1'

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5. PROPOSED LANDSCAPE STRIP. REFER TO LANDSCAPE PLANS FOR INFORMATION.
6. PROPOSED STANDARD CURB PER CITY OF CORNELIUS.
9. PROPOSED TRENCH BACKFILL PER CITY OF CORNELIUS.
11. CONNECT TO EXISTING PUBLIC STORM SEWER MANHOLE PER CWS.
13. PROPOSED CATCH BASIN PER CWS.

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SCALE: 1" = 10'

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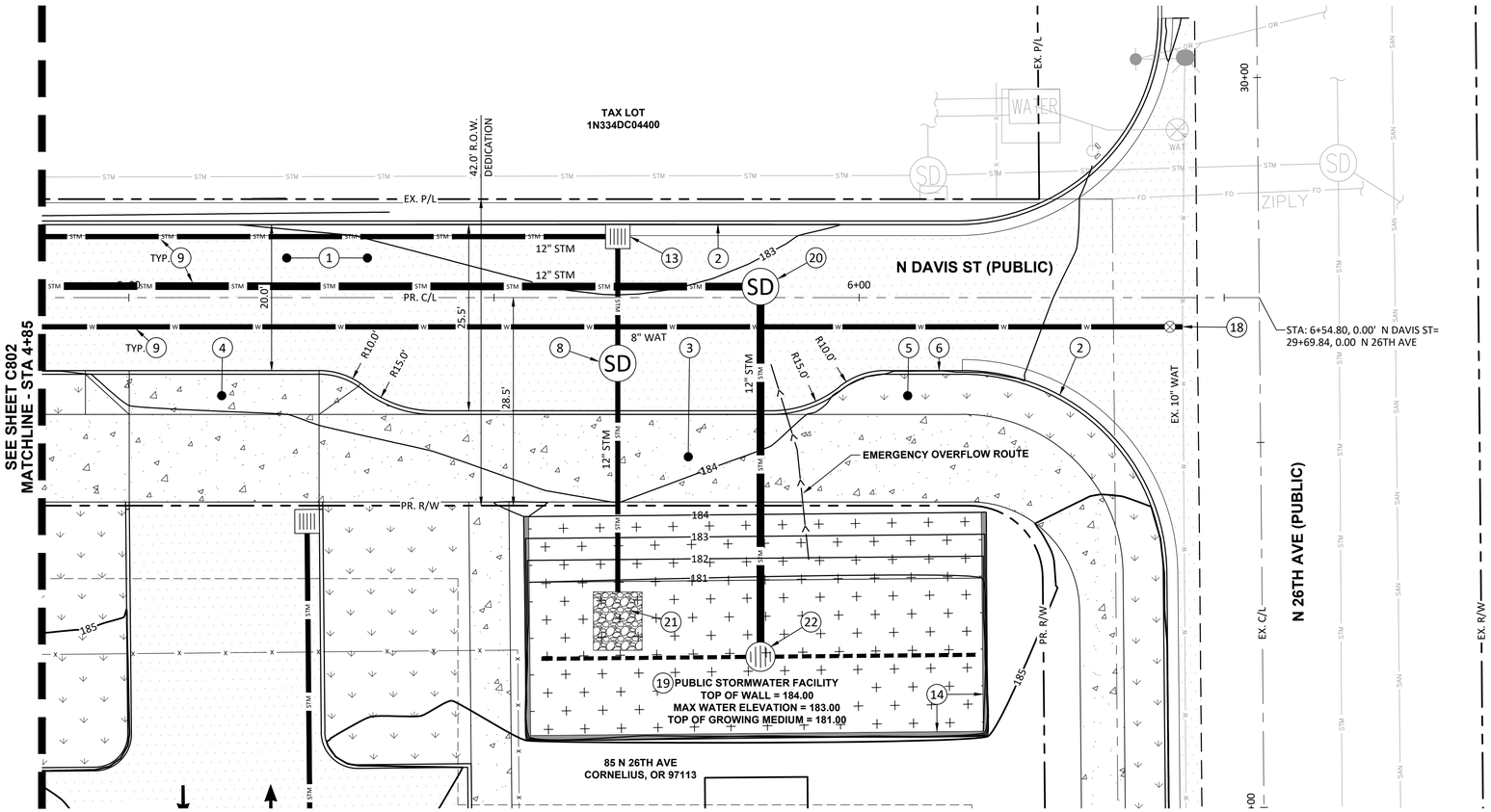
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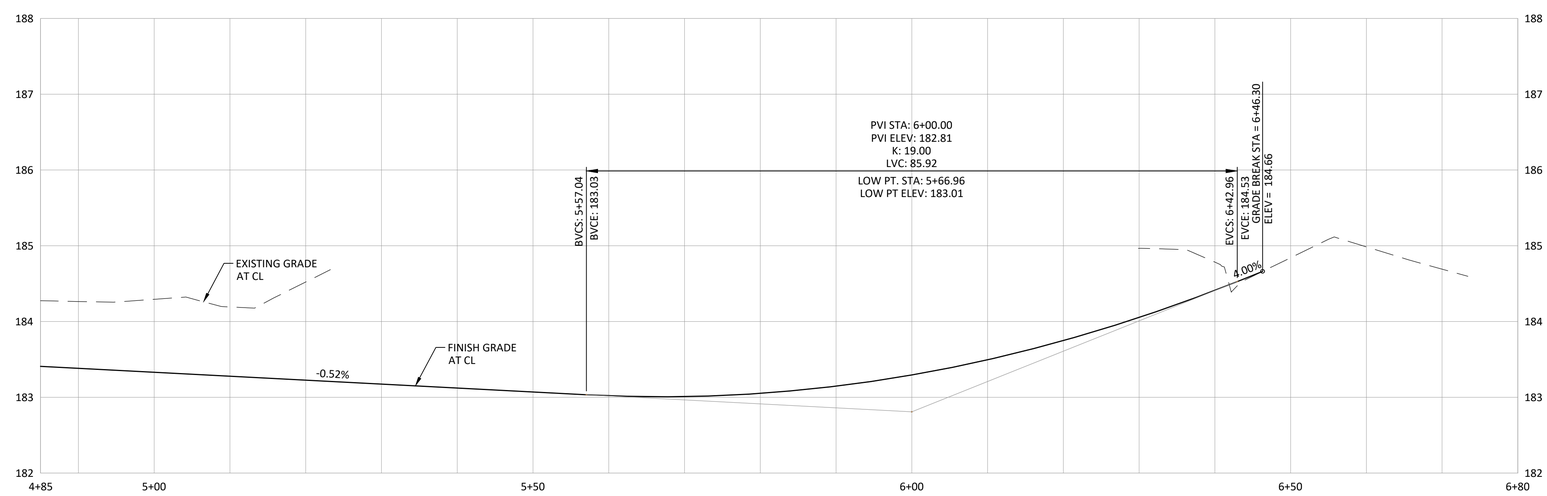
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N DAVIS ST - PLAN

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N DAVIS ST - PROFILE

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5. PROPOSED LANDSCAPE STRIP. REFER TO LANDSCAPE PLANS FOR INFORMATION.
6. PROPOSED STANDARD CURB PER CITY OF CORNELIUS.
8. PROPOSED WATER QUALITY MANHOLE WITH SNOUT PER CWS.
9. PROPOSED TRENCH BACKFILL PER CITY OF CORNELIUS.
13. PROPOSED CATCH BASIN PER CWS.
14. PROPOSED ECOBLOCK RETAINING WALL.
18. CONNECT TO EXISTING 10" PUBLIC WATER LINE WITH TAPPING TEE.
19. PROPOSED LINED DETENTION POND WITH PERFORATED UNDERDRAIN PER CWS.
20. PROPOSED FLOW CONTROL MANHOLE PER CWS.
21. PROPOSED RIP RAP STORM OUTFALL.
22. PROPOSED BEEHIVE OVERFLOW PER CWS.

SCALE: 1" = 10'

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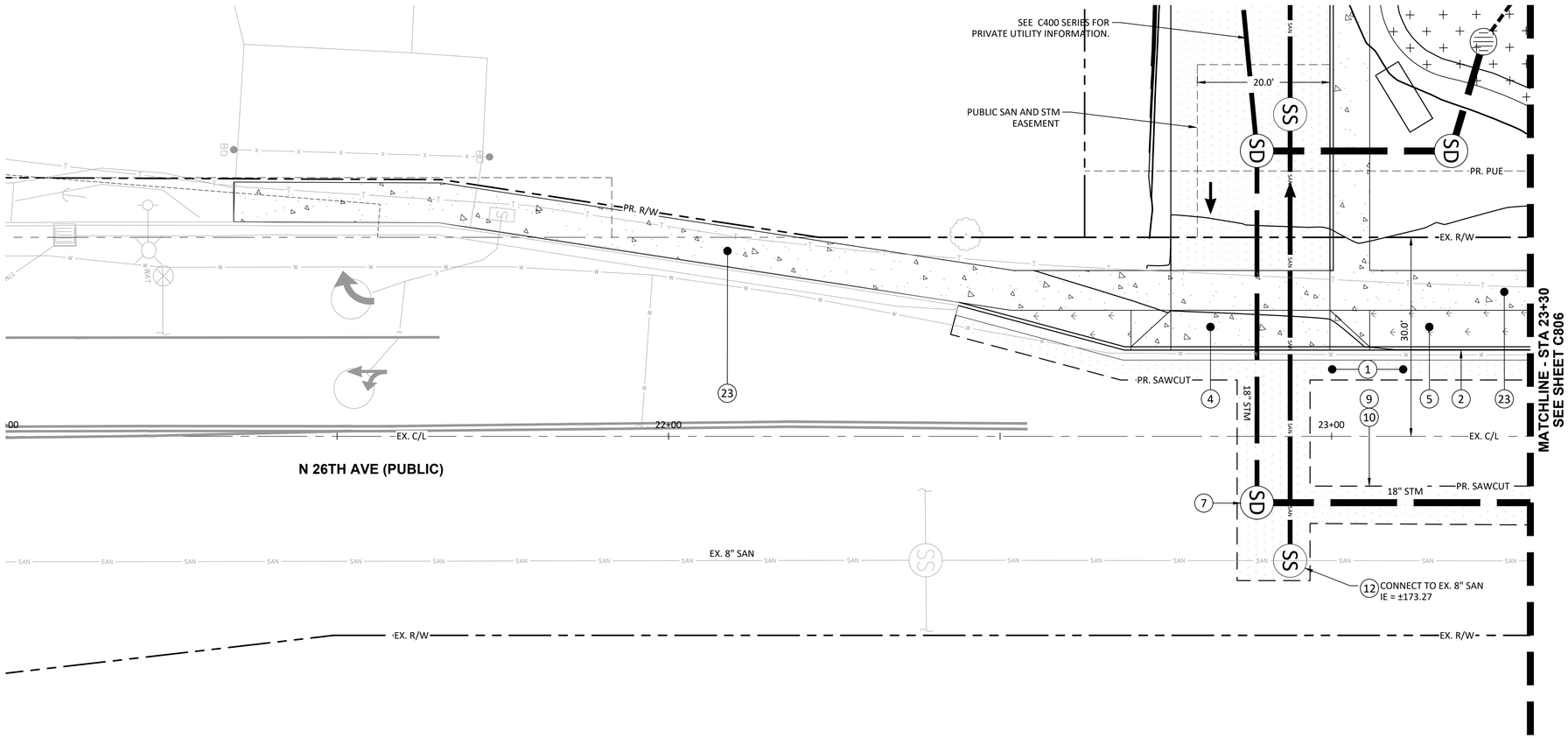
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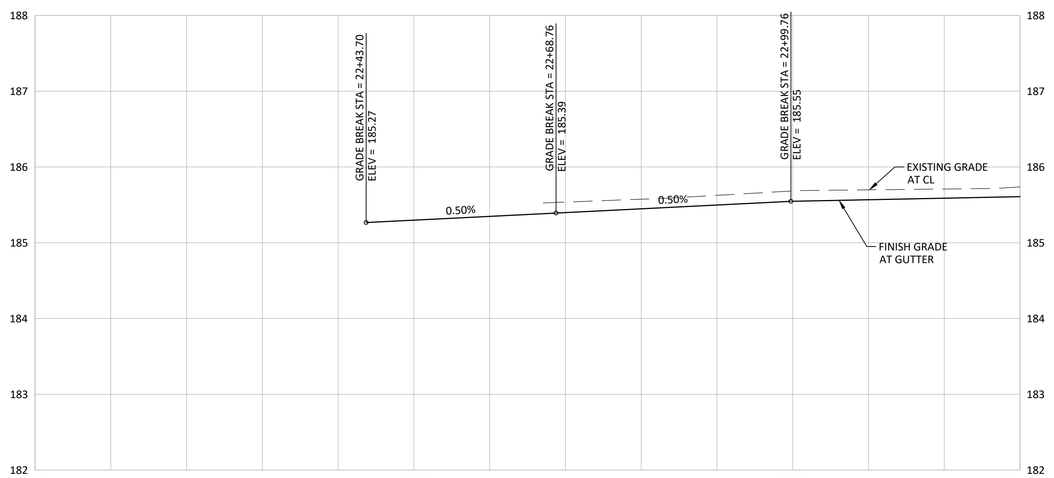
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N 26TH AVE - PLAN

SCALE: 1" = 10'

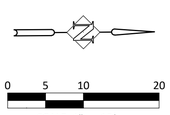


N 26TH AVE - PROFILE

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VERT. SCALE: 1" = 1'

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2. PROPOSED CURB & GUTTER PER CITY OF CORNELIUS.
4. PROPOSED COMMERCIAL DRIVEWAY WITH PARKWAY STRIP PER CITY OF CORNELIUS.
5. PROPOSED LANDSCAPE STRIP. REFER TO LANDSCAPE PLANS FOR INFORMATION.
7. PROPOSED STANDARD MANHOLE PER CWS.
9. PROPOSED TRENCH BACKFILL PER CITY OF CORNELIUS.
10. PROPOSED ASPHALT PAVEMENT RESTORATION PER CITY OF CORNELIUS.
12. PROPOSED DOGHOUSE MANHOLE WITH CAST-IN-PLACE BASE PER CWS.
23. PROPOSED CONCRETE SIDEWALK PER CITY OF CORNELIUS.



design works LLC
abbasi
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

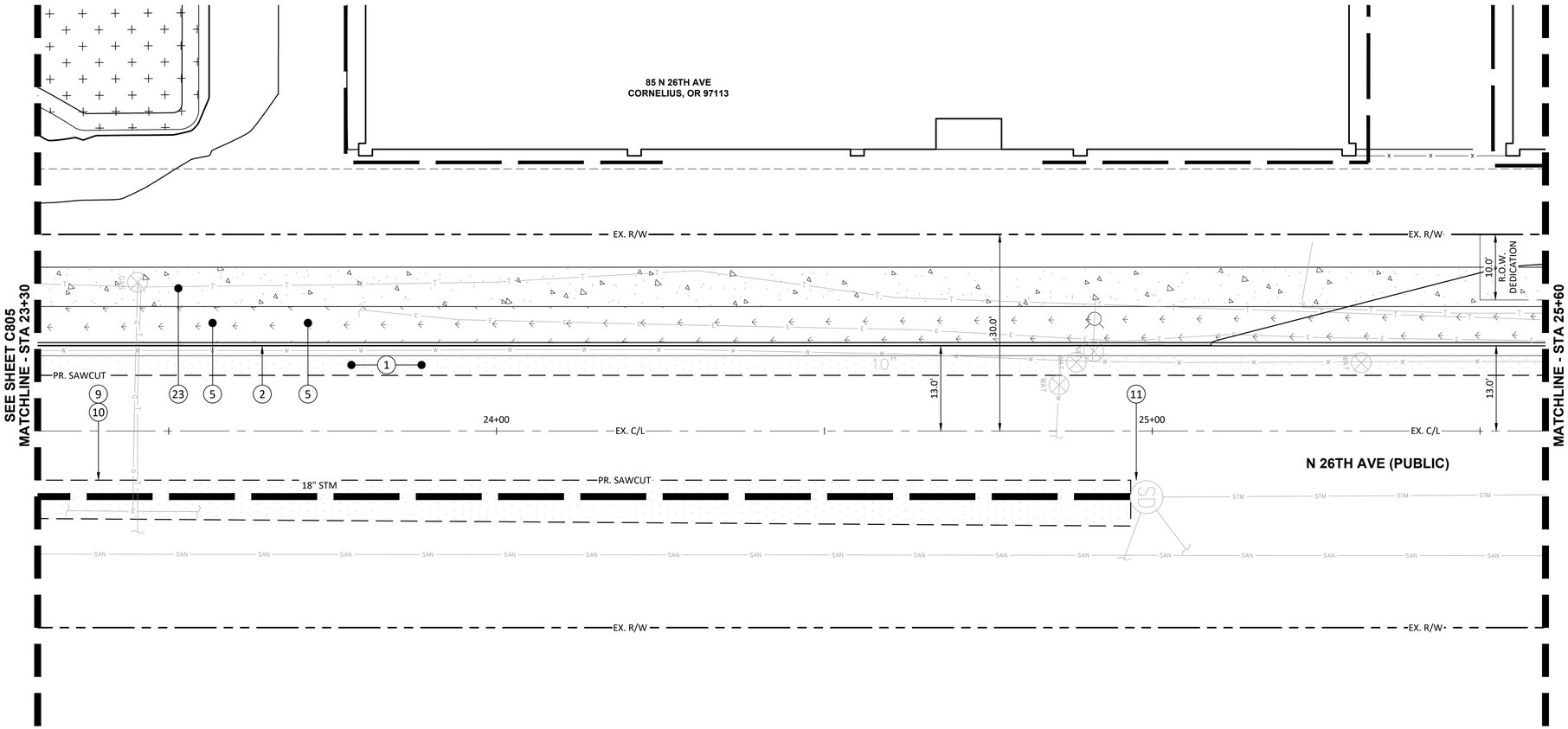
ROADWAY PLAN & PROFILE - N 26TH AVE

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Drawn	HHPR
Checked	HHPR

C815

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530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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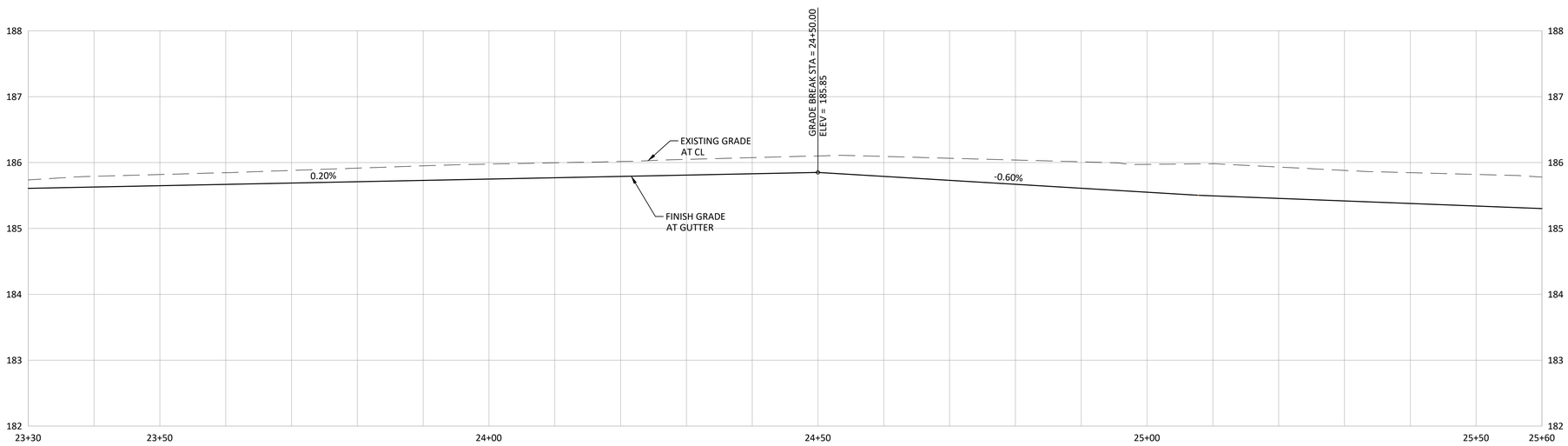


CONSTRUCTION NOTES:

1. PROPOSED ASPHALT PAVEMENT SECTION PER CITY OF CORNELIUS.
2. PROPOSED CURB & GUTTER PER CITY OF CORNELIUS.
5. PROPOSED LANDSCAPE STRIP. REFER TO LANDSCAPE PLANS FOR INFORMATION.
9. PROPOSED TRENCH BACKFILL PER CITY OF CORNELIUS.
10. PROPOSED ASPHALT PAVEMENT RESTORATION PER CITY OF CORNELIUS.
11. CONNECT TO EXISTING PUBLIC STORM SEWER MANHOLE PER CWS.
23. PROPOSED CONCRETE SIDEWALK PER CITY OF CORNELIUS.

N 26TH AVE - PLAN

SCALE: 1" = 10'



N 26TH AVE - PROFILE

HORIZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 1'

0 5 10 20

SCALE: 1" = 10'

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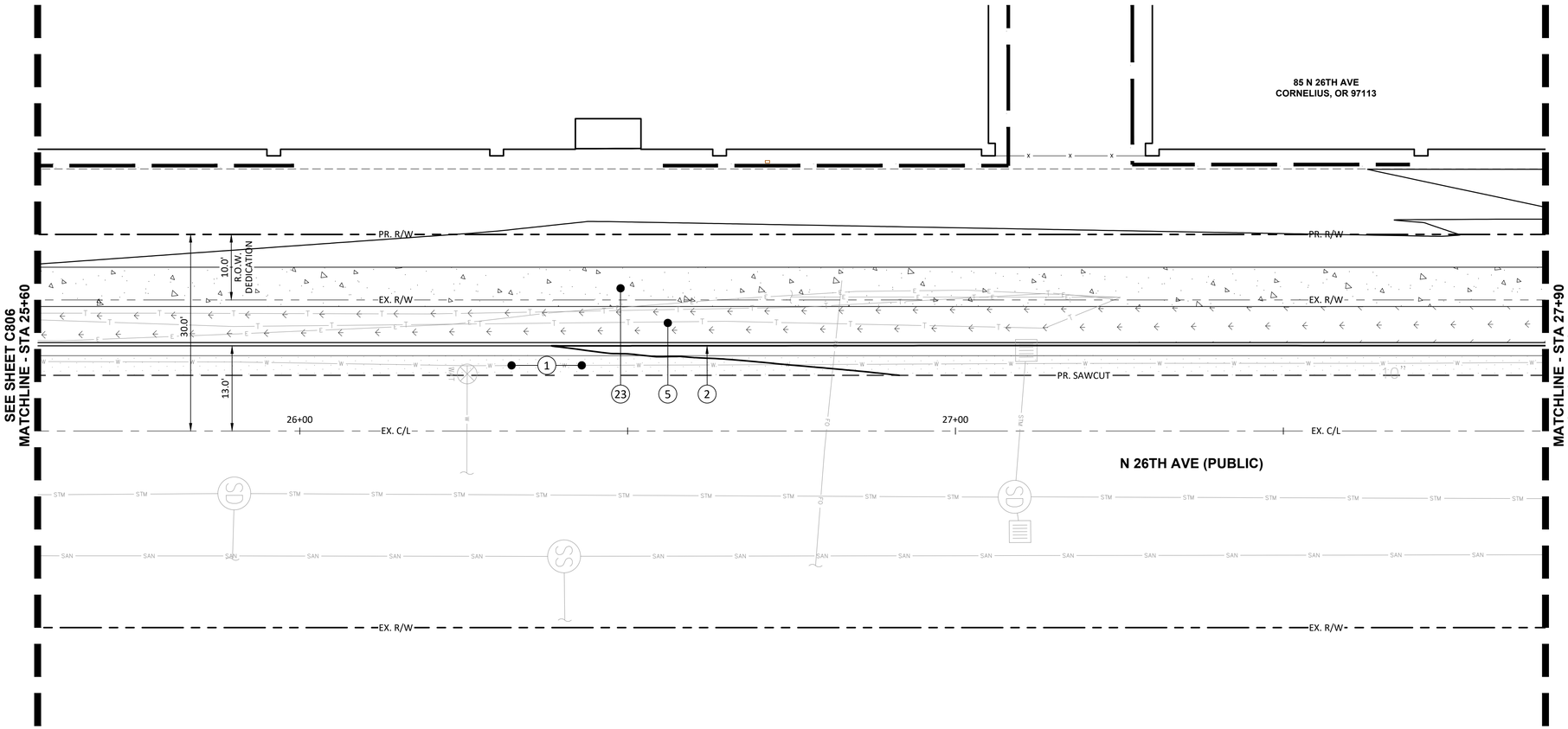
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C816

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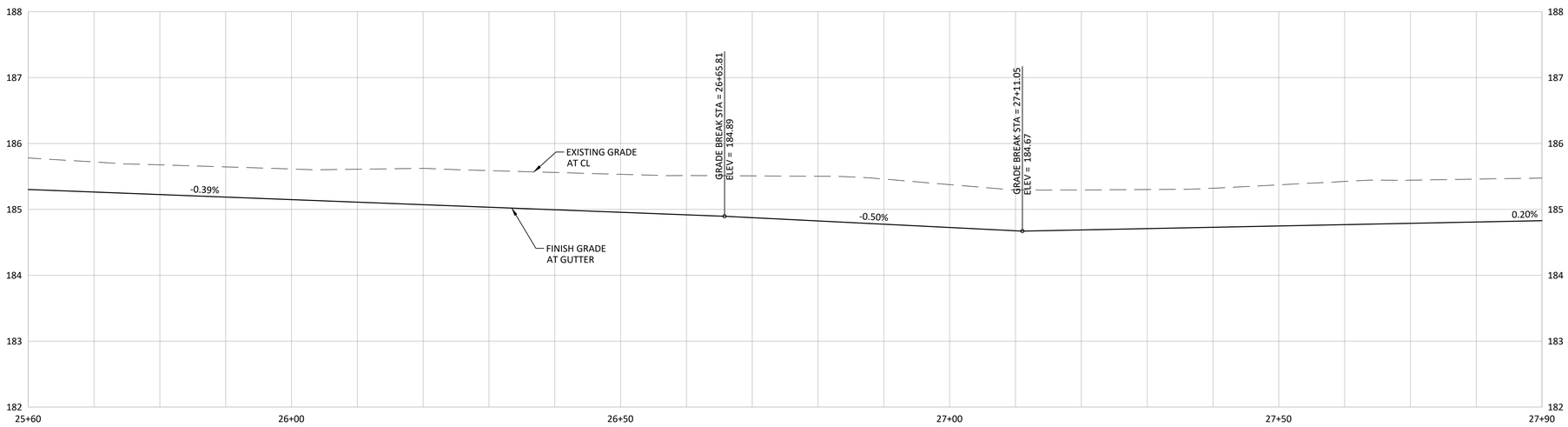


CONSTRUCTION NOTES:

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2. PROPOSED CURB & GUTTER PER CITY OF CORNELIUS.
5. PROPOSED LANDSCAPE STRIP. REFER TO LANDSCAPE PLANS FOR INFORMATION.
23. PROPOSED CONCRETE SIDEWALK PER CITY OF CORNELIUS.

N 26TH AVE - PLAN

SCALE: 1" = 10'



N 26TH AVE - PROFILE

HORIZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 1'

0 5 10 20

SCALE: 1" = 10'

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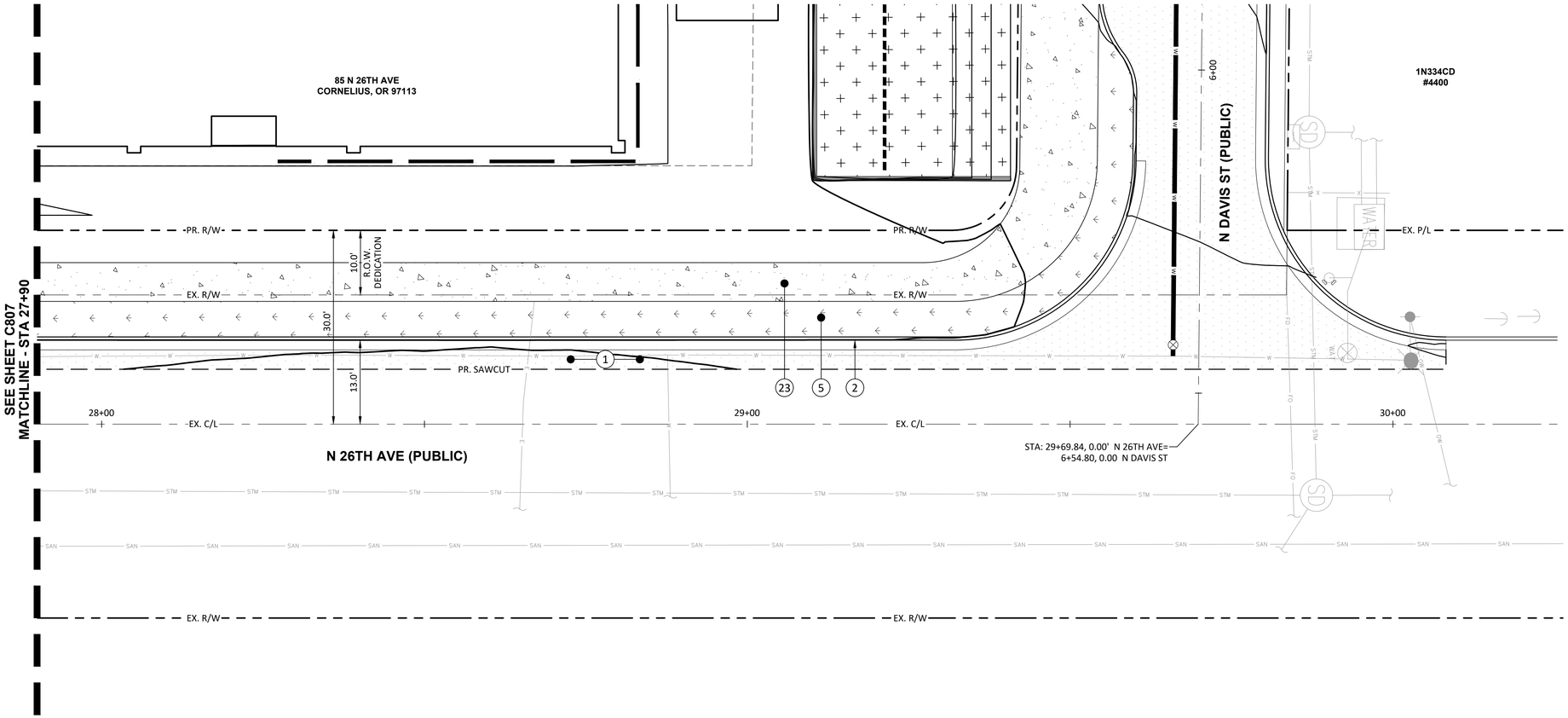
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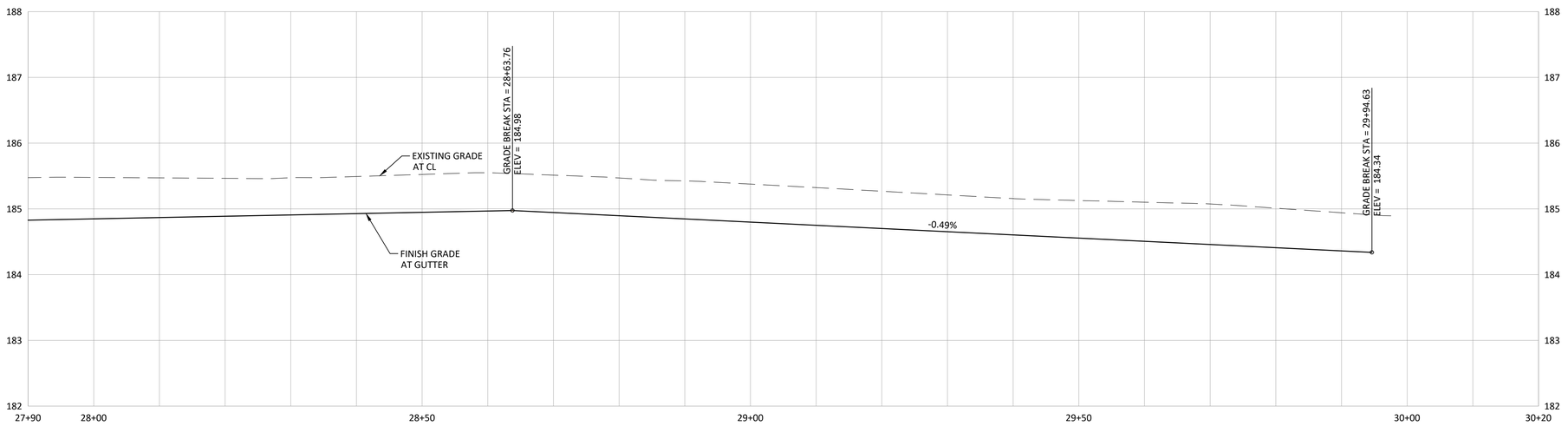


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N 26TH AVE - PLAN

SCALE: 1" = 10'



N 26TH AVE - PROFILE

HORIZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 1'

0 5 10 20
SCALE: 1" = 10'

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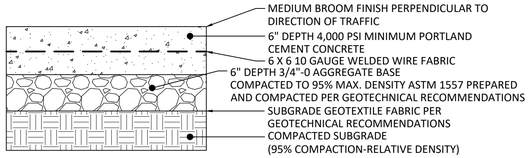
Project Status

ROADWAY PLAN & PROFILE - N 26TH AVE

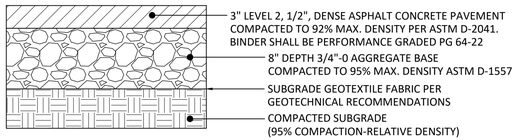
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C818

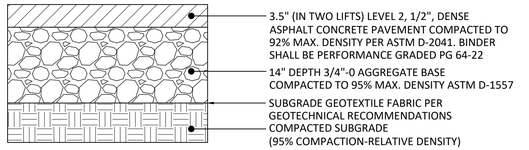
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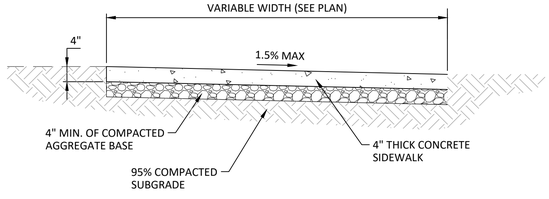
CONCRETE PAVING SECTION (PRIVATE)
(VEHICLE AREAS)
NTS



ASPHALT PAVING SECTION (PRIVATE)
(CAR PARKING AREAS)
NTS

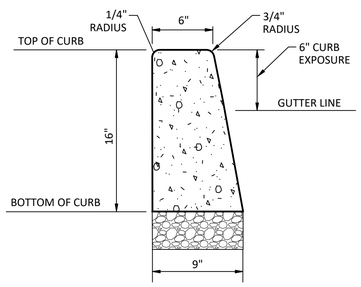


ASPHALT PAVING SECTION (PRIVATE)
(DRIVE AISLE AREAS)
NTS



SIDEWALK SECTION NOTES:
1. PROVIDE EXPANSION JOINT WHERE NEW WORK ABUTS EXISTING CONSTRUCTION. PROVIDE EXPANSION JOINTS AROUND CURB RAMP.
2. PROVIDE WEAKENED PLANE CONTRACTION JOINTS IN SIDEWALK AT A MAXIMUM SPACING OF 15 FT.
3. SIDEWALKS SHALL BE LIGHTLY BROOM-FINISHED WITH DIRECTION OF BROOMING PERPENDICULAR TO DIRECTION OF TRAFFIC UNLESS OTHERWISE INDICATED.
4. CONCRETE STRENGTH SHALL BE 3,500 PSI.
5. VEHICULAR CONCRETE TO BE 6" CONCRETE OVER 8" BASE.
6. PEDESTRIAN RATED CONCRETE TO BE 4" CONCRETE OVER 4" BASE.

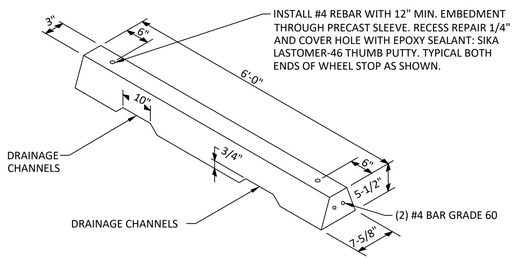
CONCRETE SIDEWALK SECTION
NTS



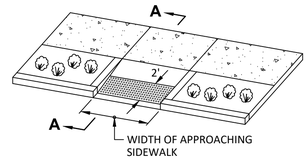
1. SEE CURB NOTES, THIS SHEET

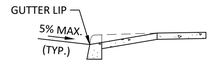
STANDARD CURB DETAIL
NTS

CURB NOTES:
1. CONCRETE SHALL BE 4000 PSI MIN. 3-1/2: SLUMP (MAX).
2. CURBS ADJACENT TO PAVEMENT OR SIDEWALK TO HAVE EXPANSION AND/OR CONTRACTION JOINTS TO MATCH EXISTING PATTERNS.
3. EXPANSION JOINTS TO BE PROVIDED AT EACH; POINT OF TANGENCY, COLD JOINT, SIDE OF INLET STRUCTURE, SIDE OF DRIVEWAYS.
4. EXPANSION JOINT MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF ½ INCH.
5. CONTRACTION JOINTS SHALL HAVE; SPACING OF NOT MORE THAN 15FEET, DEPTH OF JOINT OF AT LEAST 1 ½ INCHES.
6. BASE ROCK SHALL BE ¾"-0, COMPACTED TO 95% ASTM D 1557. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4 INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 12" BEHIND THE CURB.

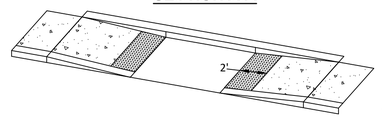


PRECAST CONCRETE WHEEL STOP
NTS



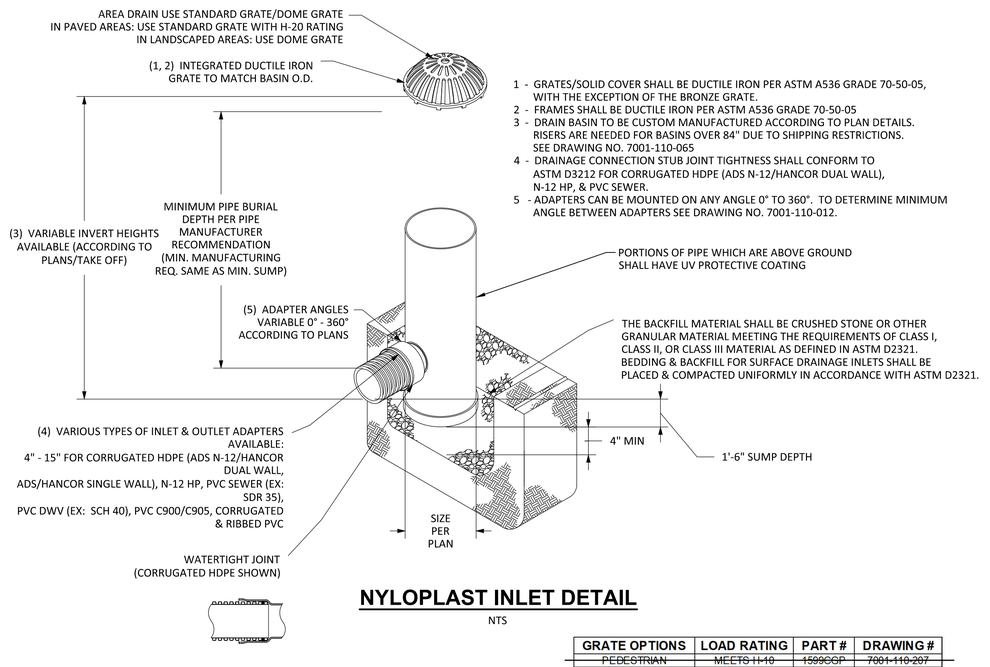


SECTION A-A



GENERAL NOTES:
1. PLACE TRUNCATED DOME DETECTABLE WARNING TEXTURE IN THE LOWER 2' OF THROAT OF RAMP ONLY. ARRANGE DOMES USING IN-LINE PATTERN AS SHOWN IN DETAIL BELOW. COLOR OF TEXTURE TO BE SAFETY YELLOW. FOR CONSTRUCTION OF SIDEWALK RAMPS OUTSIDE OF PUBLIC RIGHT-OF-WAY, CHECK OSSC AND FEDERAL ADA GUIDELINES AS WELL AS STATE BUILDING CODE REQUIREMENTS.
2. SIDEWALK CURB RAMP SLOPES SHOWN ARE RELATIVE TO THE TRUE LEVEL HORIZON (ZERO BUBBLE).
3. SIDE FLARES THAT ARE NOT PART OF THE PATH OF TRAVEL MAY BE ANY SLOPE.
4. RAMPS FOR PATHS INTERSECTING A ROADWAY SHOULD BE FULL WIDTH OF PATH. WHEN A RAMP IS USED TO PROVIDE BICYCLE ACCESS FROM A ROADWAY TO A SIDEWALK, THE RAMP SHOULD BE 8' WIDE WITH NO TEXTURING.
5. FOR THE PURPOSE OF THIS DRAWING, A CURB RAMP IS CONSIDERED "PERPENDICULAR" IF THE ANGLE BETWEEN THE LONGITUDINAL AXIS OF THE RAMP AND A TANGENT TO THE CURB AT THE RAMP CENTER IS 75° OR GREATER.
6. TOOLED JOINTS ARE REQUIRED AT ALL SIDEWALK RAMP SLOPE BREAK LINES.
7. SIDEWALK FLARE IS NOT NECESSARY WHERE THE RAMP IS PROTECTED FROM PEDESTRIAN CROSS-TRAVEL.

CURB RAMP DETAIL
NTS



NYLOPLAST INLET DETAIL
NTS

GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
~~PEDESTRIAN~~	~~MEETS H-10~~	~~1599CGP~~	~~7001-110-207~~
STANDARD	MEETS H-20	1599CGS	7001-110-208
~~SOLID COVER~~	~~MEETS H-20~~	~~1599CGC~~	~~7001-110-209~~
~~PEDESTRIAN BRONZE~~	~~N/A~~	~~1599CGPB~~	~~7001-110-210~~
DOME	N/A	1599CGD	7001-110-211
~~DROP IN GRATE~~	~~LIGHT DUTY~~	~~1501DI~~	~~7001-110-073~~

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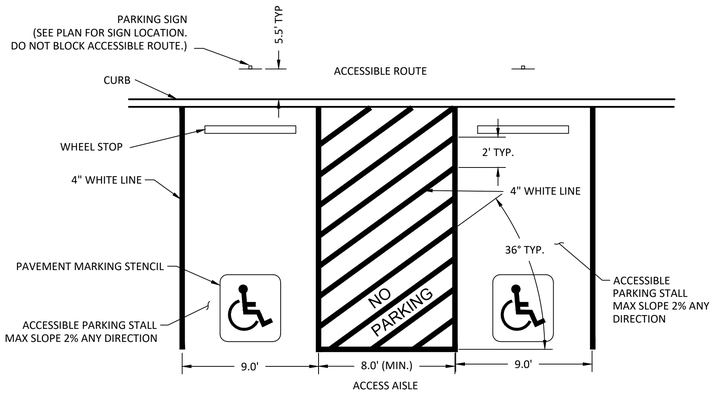
Project Status

DETAILS

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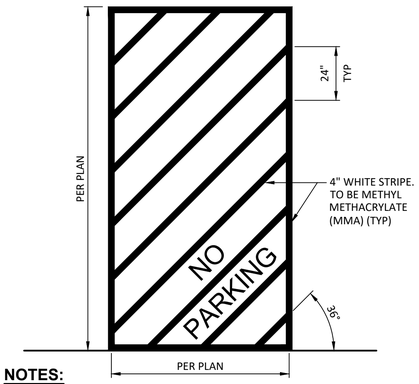
C900

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VAN/STANDARD ACCESSIBLE PARKING STALL & AISLE STRIPING DETAIL

NTS

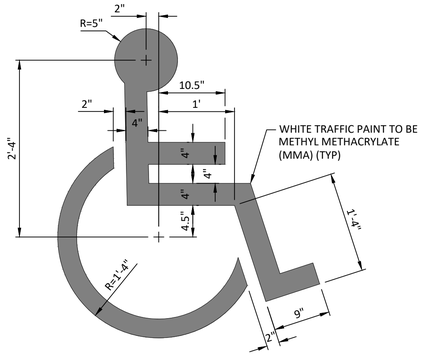


NOTES:

ALL PARKING LOT STRIPING SHALL BE 4" WHITE STRIPE. TO BE METHYL METHACRYLATE (MMA) (TYP)
OMIT "NO PARKING" STENCILING FOR CROSSWALK INSTALLATIONS

LOADING AREA/CROSSWALK STRIPING DETAIL

NTS

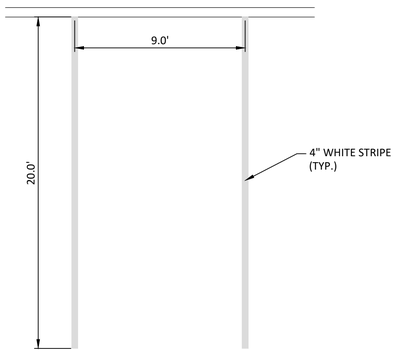


NOTES:

1. SYMBOL AND PAINT SHALL MEET CURRENT A.D.A. ACCESSIBILITY GUIDELINE AND OREGON TRANSPORTATION COMMISSION REQUIREMENTS.
2. SYMBOL SHALL HAVE A BACKGROUND MEETING CURRENT A.D.A. ACCESSIBILITY GUIDELINE AND OREGON TRANSPORTATION COMMISSION REQUIREMENTS.

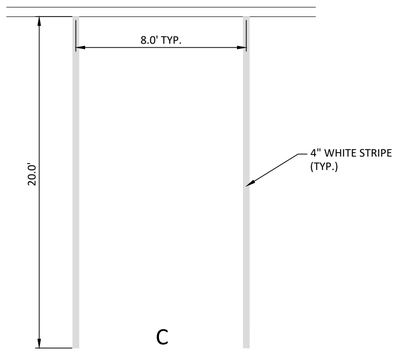
ACCESSIBLE PARKING SYMBOL

NTS



STANDARD PARKING STALL STRIPING DETAIL

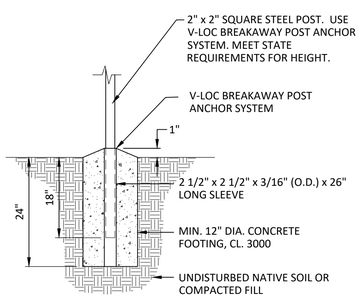
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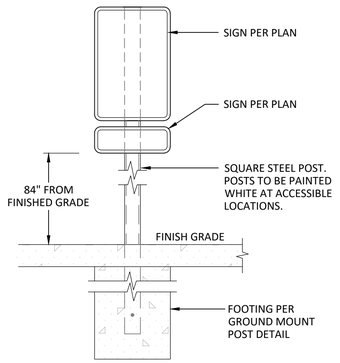
COMPACT PARKING STALL STRIPING DETAIL

NTS



GROUND MOUNT POST DETAIL

NTS



SIGNS SHALL MEET CURRENT MUTCD AND
OREGON TRANSPORTATION REQUIREMENTS

SIGN INSTALL DETAIL

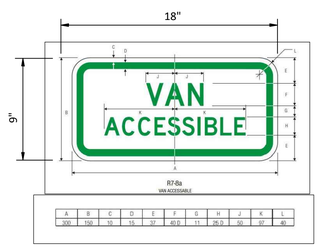
NTS



NOTES:
SIGN BACKGOUND: WHITE, RETRO-REFLECTIVE SHEETING
SIGN LEGEND: GREEN, RETRO-REFLECTIVE
SYMBOL: WHITE ON BLUE BACKGROUND, RETRO-REFLECTIVE

RESERVED PARKING SIGN DETAIL

NTS



NOTES:
SIGN BACKGOUND: WHITE, RETRO-REFLECTIVE SHEETING
SIGN LEGEND: GREEN, RETRO-REFLECTIVE SHEETING

VAN ACCESSIBLE PARKING SIGN DETAIL

NTS

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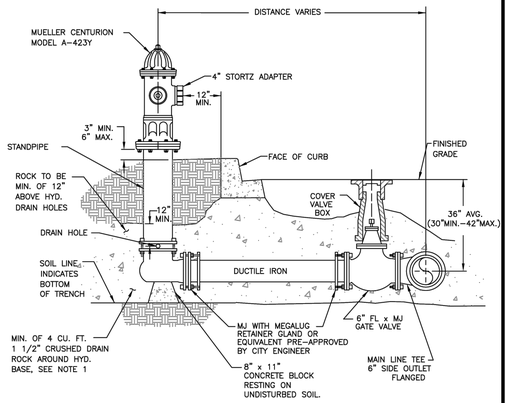
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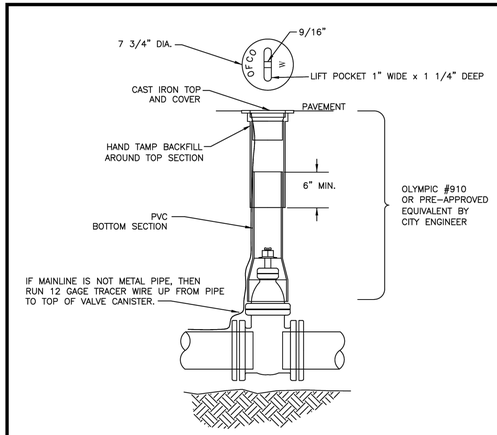
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NOTES:

1. IF DISTANCE IS GREATER THAN 10' FROM CENTER OF MAINLINE TO CENTER OF HYDRANT ELBOW THRUST BLOCK OR RODDING IS REQUIRED.
2. ALL FITTINGS TO BE MUELLER UNLESS EQUIVALENT PRE-APPROVED BY CITY ENGINEER.
3. GATE VALVE TO BE DUCTILE IRON BODY, RESILIENT WEDGE ONLY PER AWWA C515.

Cornelius Oregon's Family Town	FIRE HYDRANT ASSEMBLY	WATER W - 1 7/18/16



NOTES:

1. VALVE BOX NOT TO REST ON OPERATING ASSEMBLY.
2. CENTER VALVE BOX ON AXIS OF OPERATING NUT.
3. GATE VALVE TO BE DUCTILE IRON BODY, RESILIENT WEDGE ONLY PER AWWA #C515.

Cornelius Oregon's Family Town	GATE VALVE SETTING DETAIL	WATER W - 2 7/18/16

(HORIZONTAL) BEARING AREA OF THRUST BLOCKS IN SQUARE FEET									(VERTICAL) VOLUME OF THRUST BLOCK IN CUBIC YARDS			
FITTING SIZE	TEE, WYE, DEAD END AND HYDRANT	STRADDLE BLOCK	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN A-1	TEE PLUGGED ON RUN A-2	45° BEND	22-1/2° BEND	11-1/4° BEND	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4	1.0	1.6	1.4	1.9	1.4	1.0	---	---	---	---	---	---
6	2.1	3.7	3.0	4.3	3.0	1.6	1.0	---	1.3	---	---	---
8	3.8	6.5	5.3	7.6	5.4	2.9	1.5	1.0	2.3	1.1	---	---
10	5.9	10.2	8.4	11.8	8.4	4.6	2.4	1.2	3.7	1.8	---	---
12	8.5	14.7	12.0	17.0	12.0	8.6	3.4	1.7	5.5	2.8	1.2	---

NOTES:

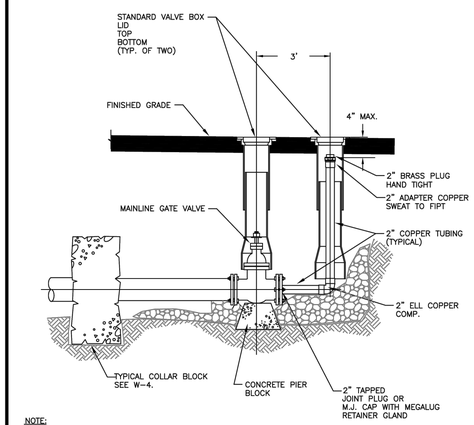
1. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:

   BEARING AREA = (TEST PRESSURE/150) x (2000/SOIL BEARING STRESS) x (TABLE VALUE)

2. ABOVE VOLUMES BASED ON TEST PRESSURE OF 150 PSI AND THE WEIGHT OF CONCRETE = 4050 POUNDS PER CUBIC YARD. TO COMPUTE FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION:

   VOLUME = (TEST PRESSURE/150) x (TABLE VALUE)

Cornelius Oregon's Family Town	THRUST BLOCK TABLE	WATER W - 3 7/18/16

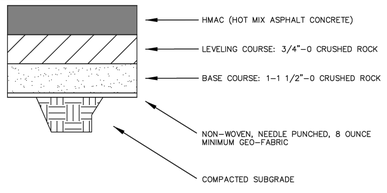


NOTE:

1. THREADED BRASS PIPING MAY BE USED IN PLACE OF COPPER TUBING
2. 8" MAXIMUM PIPE SIZE ALLOWED FOR 2" BLOW-OFF. 10" AND 12" PIPE SIZE SHALL HAVE 4" AND 6" BLOW-OFFS RESPECTIVELY.
3. BLOW-OFF SHALL BE LOCATED AS NEEDED, AS CLOSE AS POSSIBLE TO EDGE OF PAVEMENT TO MINIMIZE PAVEMENT PATCH WHEN LINE IS EXTENDED.

Cornelius Oregon's Family Town	STANDARD BLOWOFF (FUTURE EXTENSION)	WATER W - 5 7/18/16

CROSS-SECTION



THICKNESS

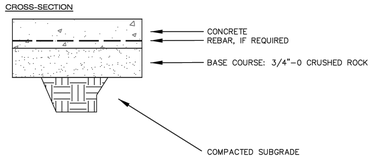
	ARTERIALS AND INDUSTRIAL STREETS	COLLECTORS	LOCAL STREETS	ALLEYS	MAINTENANCE ACCESS ROADS
HMAC	LEVEL 3 6"	LEVEL 2 6"	LEVEL 2 4"	LEVEL 2 3"	LEVEL 2 3"
LEVELING COURSE	2"	2"	2"	2"	2"
BASE COURSE	14"	14"	10"	10"	6"

NOTE:

1. THE MAXIMUM LIFT THICKNESS FOR HMAC SHALL BE 2 INCHES.
2. SUBGRADE COMPACTED TO 95% AASHTO T-99
3. ALLEYS ARE GENERALLY PAVED WITH CONCRETE. THE ALLEY COLUMN IN THE TABLE ABOVE IS FOR SITUATIONS WHERE ONLY A PORTION OF AN EXISTING ALLEY IS PAVED.

Cornelius Oregon's Family Town	ASPHALT PAVEMENT THICKNESS	STREETS S - 1 2/6/17

CROSS-SECTION



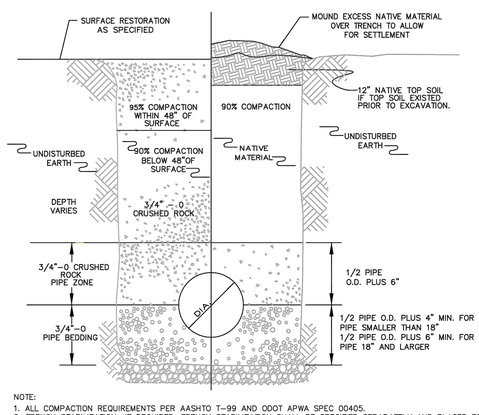
THICKNESS

	ON-STREET PARKING BAYS	ALLEYS AND WOONERFS	MAINTENANCE ACCESS ROADS	COMMERCIAL DRIVEWAYS	RESIDENTIAL DRIVEWAYS	SIDEWALK AND MULTI-USE PATHS
CONCRETE	6"	6"	6"	8"	6"	4"
REBAR	NO	NO	NO	YES	NO	NO
BASE COURSE	6"	8"	6"	4"	4"	4"

NOTE:

1. CONCRETE SHALL BE 4000 PSI, 28 DAY STRENGTH EXCEPT RESIDENTIAL DRIVEWAYS, SIDEWALKS AND MULTI-USE PATHS WHERE THE CONCRETE STRENGTH SHALL BE 3,300 PSI, 28-DAY.
2. SUBGRADE COMPACTED TO 95% AASHTO T-99
3. WHEREVER SIDEWALK CROSSES A ROADWAY, ALLEY, OR DRIVEWAY, THE ROADWAY CROSS-SECTION SHALL PREVAIL.

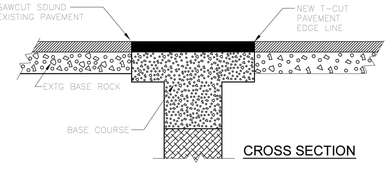
Cornelius Oregon's Family Town	CONCRETE PAVEMENT THICKNESS	STREETS S - 2 3/17/17



NOTE:

1. ALL COMPACTION REQUIREMENTS PER AASHTO T-99 AND ODOT APWA SPEC 00405.
2. TRENCH STABILIZATION: IF REQUIRED, TRENCH STABILIZATION SHALL BE SPECIFIED SEPARATELY AND PLACED PRIOR TO PLACEMENT OF BEDDING MATERIAL.
3. THE TRENCH WIDTH AT THE GROUND SURFACE SHALL BE KEPT TO THE MINIMUM NECESSARY TO INSTALL THE PIPE IN A SAFE MANNER.
4. THE MINIMUM WIDTH IN THE PIPE ZONE SHALL PROVIDE A CLEAR WORKING SPACE OF AT LEAST SIX INCHES OUTSIDE THE OUTSIDE DIAMETER OF THE PIPE BEING INSTALLED.
5. IN ALL CASES, TRENCHES SHALL BE OF SUFFICIENT WIDTH TO ALLOW FOR SHORING, PROPER JOINING OF PIPE, AND BACKFILLING OF MATERIAL ALONG THE SIDES OF THE PIPE.
6. TRACER WIRE SHALL BE PLACED ABOVE NON-METALLIC PIPE, EXCEPT WHERE SECTIONS BETWEEN STRUCTURES (MANHOLES AND CATCH BASINS) ARE STRAIGHT.

Cornelius Oregon's Family Town	TRENCH BACKFILL	STREETS S - 3 10/17/19



NOTES:

1. SAWCUT EXISTING PAVEMENT TO FULL DEPTH.
2. CITY STREETS SHALL BE RESTORED TO THE PAVEMENT AND BASE THICKNESS AND DESIGN IDENTIFIED FOR THAT TYPE OF STREET IN THESE STANDARDS.
3. HWY 8 PAVEMENT RESTORATION WILL BE DICTATED BY ODOT.
4. ALL CUT EDGES OF AC SHALL BE SAND SEALED WITH CRS-1 OR CRS-2 EMULSIFIED ASPHALT OR EQUAL.
5. IF NEW EDGE OF PAVEMENT IS LESS THAN THREE FEET FROM ANOTHER PATCH, CURB OR EDGE OF STREET, REPLACE THE PAVEMENT IN BETWEEN, IF REQUIRED BY CITY ENGINEER.
6. IF ANY PART OF MORE THAN ONE PRE-EXISTING PATCH EDGE IS WITHIN 3 FEET OF THE T-CUT, THE PAVEMENT TO THE FAR EDGE OF THE FURTHEST PRE-EXISTING PATCH SHALL BE REMOVED AND RESTORED.
7. ON LONGITUDINAL PAVEMENT CUTS, THE EDGE OF THE T-CUT SHALL NOT LIE IN A WHEEL PATH.
8. IF AN EDGE OF A T-CUT IS WITHIN 5 FEET OR LESS OF AN AREA OF DISTRESSED EXISTING PAVEMENT, THE LENGTH AND WIDTH OF THE PAVEMENT RESTORATION MAY BE MODIFIED BY THE CITY ENGINEER TO ENSURE THE INTEGRITY OF THE PAVEMENT RESTORATION.
9. THE WIDTH FROM EDGE OF TRENCH SHALL BE 6 INCHES MINIMUM FOR TRENCHES THAT ARE 12 INCHES WIDE OR LESS AND 12 INCHES MINIMUM FOR TRENCHES WIDER THAN 12 INCHES. THE CITY ENGINEER MAY INCREASE THE WIDTH UP TO 10 FEET ON BOTH SIDES OF THE PAVEMENT CUT IF NEEDED TO ENSURE LONG-TERM INTEGRITY OF THE PAVEMENT.

Cornelius Oregon's Family Town	ASPHALT PAVEMENT CUT RESTORATION	STREETS S - 4 7/18/16

abbasi design works LLC
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

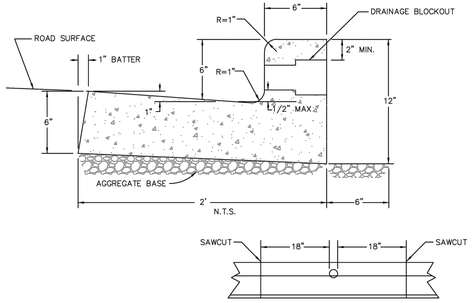
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Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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DETAIL A
N.T.S.

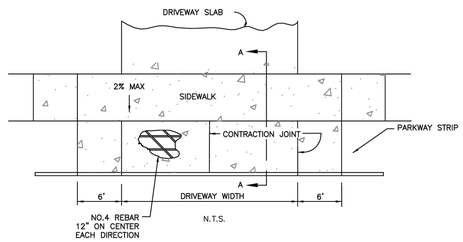
NOTES:

1. CONCRETE TO HAVE A COMPRESSIVE STRENGTH (fc) OF 3300 P.S.I. AFTER 28 DAYS.
2. CONTRACTION JOINTS.
   A. SPACE NOT MORE THAN 10 FEET
   B. DEPTH OF JOINT SHALL BE AT LEAST 1/3 DEPTH OF CONCRETE
   C. CENTER WEEPHOLES WITH CONTRACTION JOINTS
3. USE 1-1/2"-0" OR 3/4"-0" AGGREGATE BASE COMPACTED TO 100% OF AASHTO T-99. PLACE TO SUBGRADE, STREET STRUCTURE, OR 10" DEPTH, WHICHEVER IS GREATER. EXTEND AT LEAST 6" BEHIND CURB.
4. DRAINAGE BLOCKOUT (REQUIRE CITY ENGINEER APPROVAL)
   A. 3" DIAMETER ABS PLASTIC PIPE WITH COUPLING
   B. 2 PER LOT, 5' IN FROM PROPERTY LINES OR LOCATE TO EXISTING ROOF DOWNSPOUTS
   C. CORE DRILL DRAINAGE ACCESS THROUGH EXISTING CURBS OR VERTICALLY SAWCUT CURB AND GUTTER 18" ON EACH SIDE OF DRAIN AND REPOUR TO FULL DEPTH OF CURB AS SHOWN IN DETAIL A.

Cornelius Oregon's Family Town

CURB & GUTTER

STREETS
S - 11
7/18/16



SECTION A-A
N.T.S.

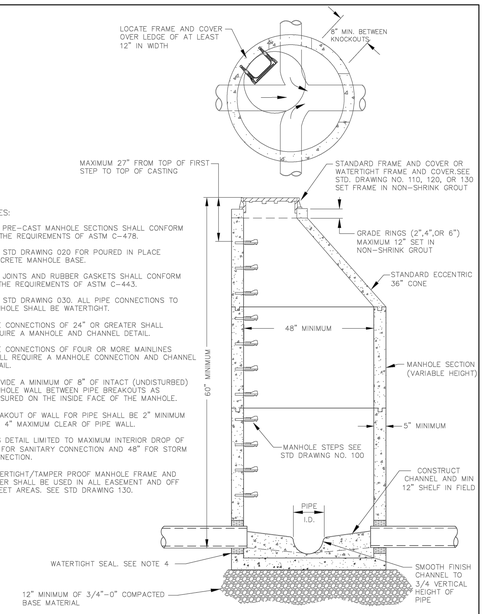
NOTES:

1. CALL PUBLIC WORKS (503) 357-3011 FOR FORM INSPECTION AT LEAST 24 HRS. PRIOR TO PLACEMENT.
2. DRIVEWAY APPROACH MUST EXTEND TO BACK OF RIGHT-OF-WAY (R/W).
3. CONCRETE SHALL HAVE A MINIMUM BEARING STRENGTH OF 4000 PSI AFTER 28 DAYS.
4. REBAR TO BE SUPPORTED ON 1-1/2" BLOCKS.

Cornelius Oregon's Family Town

COMMERCIAL DRIVEWAY WITH PARKWAY STRIP

STREETS
S - 22
7/18/16



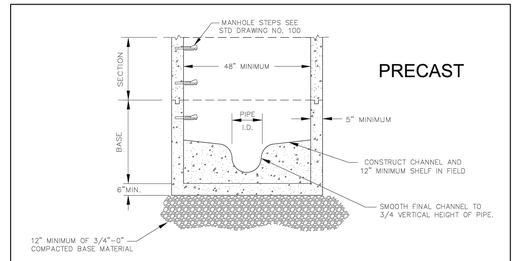
NOTES:

1. ALL PRE-CAST MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
2. SEE STD DRAWING 020 FOR POURED IN PLACE CONCRETE MANHOLE BASE.
3. ALL JOINTS AND RUBBER GASKETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-443.
4. SEE STD DRAWING 030. ALL PIPE CONNECTIONS TO MANHOLE SHALL BE WATERTIGHT.
5. PIPE CONNECTIONS OF 24" OR GREATER SHALL REQUIRE A MANHOLE AND CHANNEL DETAIL.
6. PIPE CONNECTIONS OF FOUR OR MORE MAINLINES SHALL REQUIRE A MANHOLE CONNECTION AND CHANNEL DETAIL.
7. PROVIDE A MINIMUM OF 8" OF INTACT (UNDISTURBED) MANHOLE WALL BETWEEN PIPE BREAKOUTS AS MEASURED ON THE INSIDE FACE OF THE MANHOLE.
8. BREAKOUT OF WALL FOR PIPE SHALL BE 2" MINIMUM AND 4" MAXIMUM CLEAR OF PIPE WALL.
9. THIS DETAIL LIMITED TO MAXIMUM INTERIOR DROP OF 12" FOR SANITARY CONNECTION AND 48" FOR STORM CONNECTION.
10. WATERTIGHT/TAMPER PROOF MANHOLE FRAME AND COVER SHALL BE USED IN ALL EASEMENT AND OFF STREET AREAS. SEE STD DRAWING 130.

STANDARD MANHOLE

DRAWING NO. 010 REVISED 10-31-19

CleanWater Services



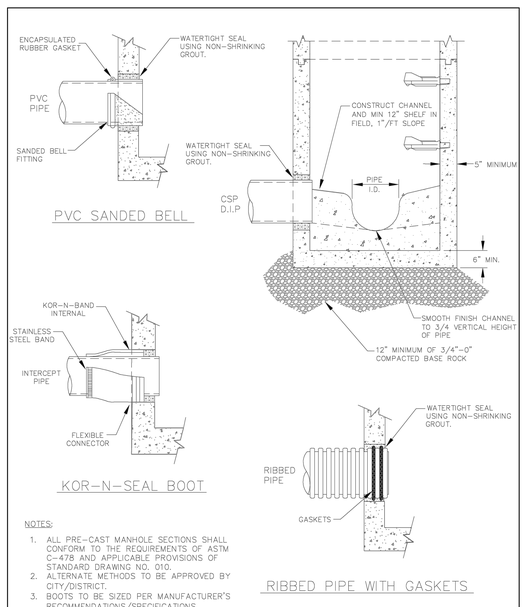
NOTES:

1. ALL MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STANDARD MANHOLE, DRAWING NO. 010.
2. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 PSI AND A SLUMP OF 2" TO 4".

PRE-CAST/POURED IN PLACE MANHOLE BASE

DRAWING NO. 020 REVISED 10-31-19

CleanWater Services



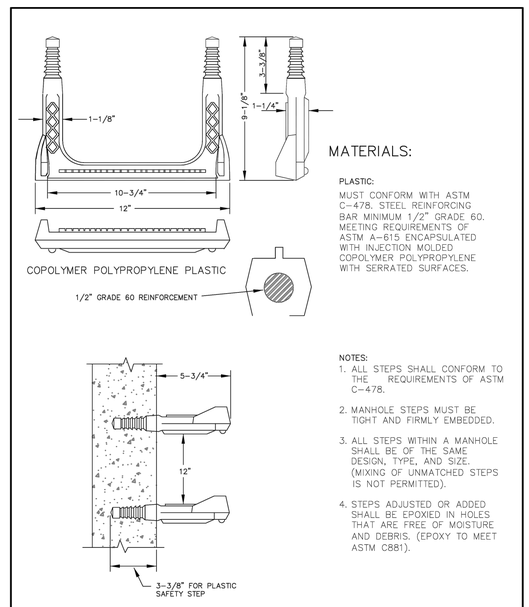
NOTES:

1. ALL PRE-CAST MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STANDARD DRAWING NO. 010.
2. ALTERNATE METHODS TO BE APPROVED BY CITY/DISTRICT.
3. BOOTS TO BE SIZED PER MANUFACTURER'S RECOMMENDATIONS/SPECIFICATIONS.

MANHOLE CONNECTIONS

DRAWING NO. 030 REVISED 10-31-19

CleanWater Services



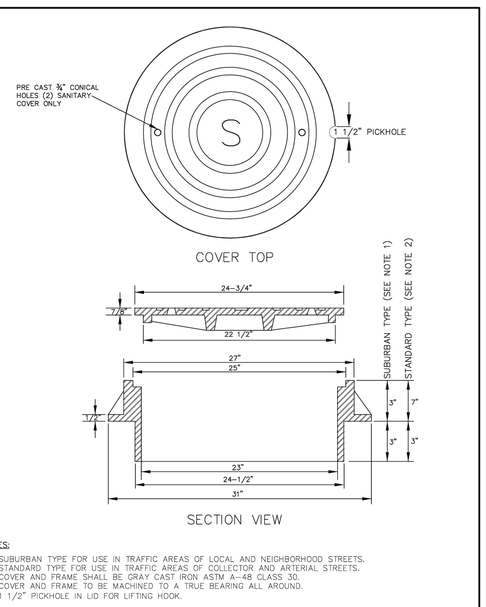
NOTES:

1. ALL STEPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
2. MANHOLE STEPS MUST BE TIGHT AND FIRMLY EMBEDDED.
3. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME DESIGN, TYPE, AND SIZE. (MIXING OF UNMATCHED STEPS IS NOT PERMITTED).
4. STEPS ADJUSTED OR ADDED SHALL BE EPOXIED IN HOLES THAT ARE FREE OF MOISTURE AND DEBRIS. (EPOXY TO MEET ASTM C881).

MANHOLE STEP

DRAWING NO. 100 REVISED 10-31-19

CleanWater Services



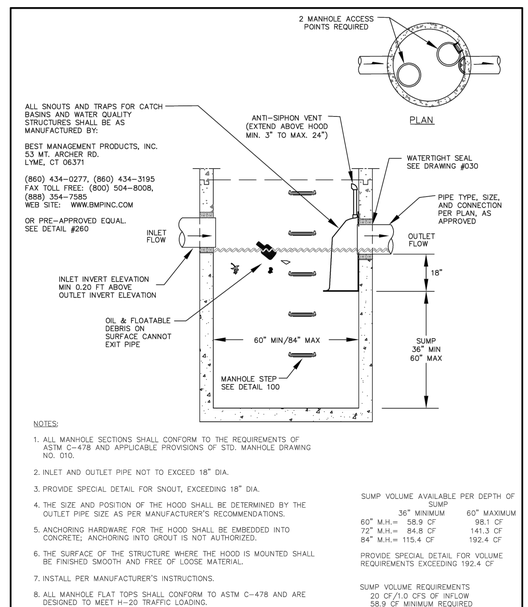
NOTES:

1. SUBURBAN TYPE FOR USE IN TRAFFIC AREAS OF LOCAL AND NEIGHBORHOOD STREETS.
2. STANDARD TYPE FOR USE IN TRAFFIC AREAS OF COLLECTOR AND ARTERIAL STREETS.
3. COVER AND FRAME SHALL BE GRAY CAST IRON ASTM A-48 CLASS 30.
4. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
5. 1 1/2" PICKHOLE IN LID FOR LIFTING HOOK.

SUBURBAN AND STANDARD MANHOLE FRAME AND COVER SANITARY

DRAWING NO. 110 REVISED 10-31-19

CleanWater Services



NOTES:

1. ALL MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STD. MANHOLE DRAWING NO. 010.
2. INLET AND OUTLET PIPE NOT TO EXCEED 18" DIA.
3. PROVIDE SPECIAL DETAIL FOR SNOUT, EXCEEDING 18" DIA.
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY THE OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATIONS.
5. ANCHORING HARDWARE FOR THE HOOD SHALL BE EMBEDDED INTO CONCRETE; ANCHORING INTO GROUT IS NOT AUTHORIZED.
6. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
7. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
8. ALL MANHOLE FLAT TOPS SHALL CONFORM TO ASTM C-478 AND ARE DESIGNED TO MEET H-20 TRAFFIC LOADING.

SUMP VOLUME AVAILABLE PER DEPTH OF SUMP		
	36" MINIMUM	60" MAXIMUM
60" M.H.=	58.9 CF	98.1 CF
72" M.H.=	84.8 CF	141.3 CF
84" M.H.=	115.4 CF	192.4 CF

PROVIDE SPECIAL DETAIL FOR VOLUME REQUIREMENTS EXCEEDING 192.4 CF

SUMP VOLUME REQUIREMENTS
20 CF/1.0 CFS OF INFLOW
58.9 CF MINIMUM REQUIRED

WATER QUALITY MANHOLE (SNOUT) A

DRAWING NO. 250 REVISED 10-31-19

CleanWater Services

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vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #
FPC-02

Project Status

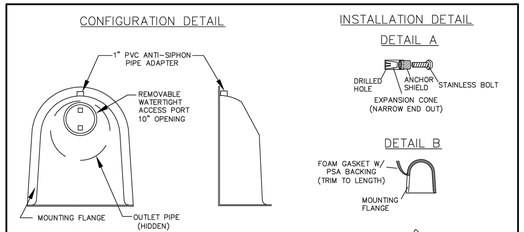
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Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS • LANDSCAPE ARCHITECTS • SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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NOTES:

1. ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY BEST MANAGEMENT PRODUCTS, INC. OR PRE-APPROVED EQUAL.
2. ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
3. ALL HOODS SHALL BE EQUIPPED WITH A MINIMUM 10", WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT AS DRAWN. (SEE CONFIGURATION DETAIL)
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION.
5. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE OF 18" FROM I.E. OUT.
6. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
7. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
8. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET.
9. ANCHOR BOLTS SHALL BE INSTALLED INTO THE CONCRETE OF THE STRUCTURE'S WALL (NOT WITHIN GROUT)
10. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT.
    KIT SHALL INCLUDE:
    A. INSTALLATION INSTRUCTIONS
    B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER
    C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
    D. 3/8" STAINLESS STEEL BOLTS
    E. ANCHOR SHIELDS

BEST MANAGEMENT PRODUCTS, INC.
53 MT. ARCHER RD.
LYME, CT 06371
TOLL FREE: (800) 504-8008 (888) 354-7585
WEB SITE: WWW.BMPINC.COM

WHEN ORDERING, SPECIFY IF THE STRUCTURE IN WHICH THE HOOD WILL BE ATTACHED IS FLAT OR ROUND.

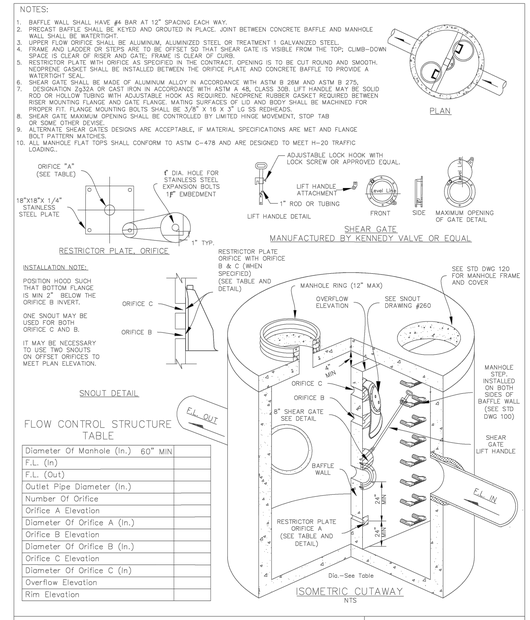
WATER QUALITY MANHOLE (SNOUT) B

DRAWING NO. 260 REVISED 10-31-19

CleanWater Services

NOTES:

1. BAFFLE WALL SHALL HAVE #4 BAR AT 12" SPACING EACH WAY.
2. PRECAST BAFFLE SHALL BE KEYED AND GROUTED IN PLACE. JOINT BETWEEN CONCRETE BAFFLE AND MANHOLE WALL SHALL BE WATERTIGHT.
3. UPPER FLOW ORIFICE SHALL BE ALUMINUM, ALUMINIZED STEEL OR TREATMENT 1 GALVANIZED STEEL.
4. FRAME AND LADDER OR STEPS ARE TO BE OFFSET SO THAT SHEAR GATE IS VISIBLE FROM THE TOP; CLIMB-DOWN SPACE IS CLEAR OF RISER AND GATE; FRAME IS CLEAR OF CURB.
5. RESTRICTOR PLATE WITH ORIFICE AS SPECIFIED IN THE CONTRACT. OPENING IS TO BE CUT ROUND AND SMOOTH. NEOPRENE GASKET SHALL BE INSTALLED BETWEEN THE ORIFICE PLATE AND CONCRETE BAFFLE TO PROVIDE A WATERTIGHT SEAL.
6. SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26M AND ASTM B 275, DESIGNATION 356.0 T6, OR CAST IRON IN ACCORDANCE WITH ASTM A 48, CLASS 30B. LIFT HANDLE MAY BE SOLID ROD OR HOLLOW TUBING WITH ADJUSTABLE LOCK AS REQUIRED. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE. MATING SURFACES OF LID AND BODY SHALL BE MACHINED FOR PROPER FIT. FLANGE MOUNTING BOLTS SHALL BE 3/8" X 1" X 1" LG SS PEDHEADS.
7. SHEAR GATE MAXIMUM OPENING SHALL BE CONTROLLED BY LIMITED HINGE MOVEMENT, STOP TAB OR SOME OTHER DEVISE.
8. ALTERNATE SHEAR GATES DESIGNS ARE ACCEPTABLE, IF MATERIAL SPECIFICATIONS ARE MET AND FLANGE BOLT PATTERN MATCHES.
9. ALL MANHOLE FLAT TOPS SHALL CONFORM TO ASTM C-478 AND ARE DESIGNED TO MEET H-20 TRAFFIC LOADING.



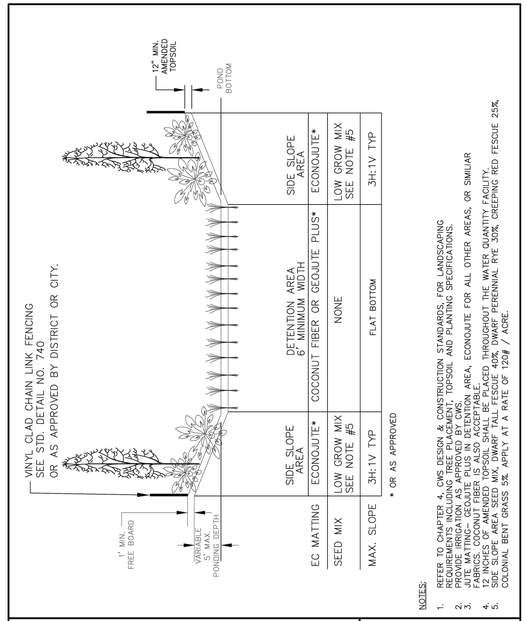
FLOW CONTROL STRUCTURE TABLE

Diameter Of Manhole (in.) 60" MIN	
F.L. (in)	
F.L. (Out)	
Outlet Pipe Diameter (in.)	
Number Of Orifice	
Orifice A Elevation	
Diameter Of Orifice A (in.)	
Orifice B Elevation	
Diameter Of Orifice B (in.)	
Orifice C Elevation	
Diameter Of Orifice C (in)	
Overflow Elevation	
Rim Elevation	

FLOW CONTROL STRUCTURE DETAIL

DRAWING NO. 270 REVISED 10-31-19

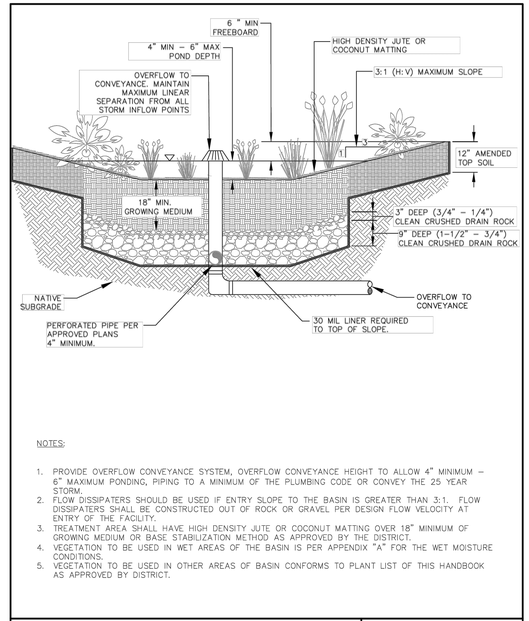
CleanWater Services



DETENTION POND

DRAWING NO. 700 REVISED 10-31-19

CleanWater Services



NOTES:

1. PROVIDE OVERFLOW CONVEYANCE SYSTEM, OVERFLOW CONVEYANCE HEIGHT TO ALLOW 4" MINIMUM – 6" MAXIMUM PONDING, PIPING TO A MINIMUM OF THE PLUMBING CODE OR CONVEY THE 25 YEAR STORM.
2. FLOW DISSIPATERS SHOULD BE USED IF ENTRY SLOPE TO THE BASIN IS GREATER THAN 3:1. FLOW DISSIPATERS SHALL BE CONSTRUCTED OUT OF ROCK OR GRAVEL PER DESIGN FLOW VELOCITY AT ENTRY OF THE FACILITY.
3. TREATMENT AREA SHALL HAVE HIGH DENSITY JUTE OR COCONUT MATTING OVER 18" MINIMUM OF GROWING MEDIUM OR BASE STABILIZATION METHOD AS APPROVED BY THE DISTRICT.
4. VEGETATION TO BE USED IN WET AREAS OF THE BASIN IS PER APPENDIX "A" FOR THE WET MOISTURE CONDITIONS.
5. VEGETATION TO BE USED IN OTHER AREAS OF BASIN CONFORMS TO PLANT LIST OF THIS HANDBOOK AS APPROVED BY DISTRICT.

NON-STRUCTURAL FLOW THROUGH PLANTER/SWALE

DRAWING NO. 735 REVISED 10-31-19

CleanWater Services

STORMWATER FACILITY GROWING MEDIUM

FURNISH IMPORTED BLENDED SOIL FOR ALL VEGETATED LIDA FACILITIES CONFORMING TO THE FOLLOWING:

- GENERAL COMPOSITION – SOIL MATERIAL THAT IS ANY BLEND OF LOAMY SOIL, SAND, AND COMPOST THAT IS 30–40% COMPOST (BY VOLUME) AND MEETS THE OTHER CRITERIA IN THIS SPECIFICATION.
- ANALYSIS REQUIREMENTS FOR THE BLENDED MATERIAL:
  - PARTICLE GRADATION – A SIEVE ANALYSIS OF THE BLENDED MATERIAL, NOT INCLUDING COMPOST, SHALL BE CONDUCTED IN CONFORMANCE WITH ASTM C117/C136, AASHTO T11/T27, ASTM D422/D1140, OR ASTM D6913. THE ANALYSIS SHALL INCLUDE THE FOLLOWING SIEVE SIZES: 1 INCH, 3/8 INCH, #4, #10, #20, #40, #60, #100, #200. THE GRADATION OF THE BLEND SHALL MEET THE FOLLOWING GRADATION CRITERIA.

SIEVE SIZE	PERCENT PASSING
1 INCH	100
# 4	85 –100
# 10	50–100
# 40	20–60
# 100	10–40
# 200	10–20

- THE MATERIAL SHALL BE LOOSE AND EASILY BROKEN INTO SMALL PIECES
- IT SHALL BE WELL MIXED AND HOMOGENOUS.
- IT SHALL BE FREE OF WOOD PIECES, PLASTIC, AND OTHER FOREIGN MATTER.
- IT SHALL HAVE NO VISIBLE FREE WATER.
- THE PH (POWER OF HYDROGEN) OF THE BLENDED MATERIAL SHALL BE TESTED AND BE BETWEEN 6 TO 8.

COMPOST

THE COMPOST SHALL BE DERIVED FROM PLANT MATERIAL AND PROVIDED BY A MEMBER OF THE US COMPOSTING COUNCIL SEAL OF TESTING ASSURANCE (STA) PROGRAM. SEE WWW.COMPOSTINGCOUNCIL.ORG FOR A LIST OF LOCAL PROVIDERS.

THE COMPOST SHALL BE THE RESULT OF THE BIOLOGICAL DEGRADATION AND TRANSFORMATION OF PLANT-DERIVED MATERIALS UNDER CONDITIONS DESIGNED TO PROMOTE AEROBIC DECOMPOSITION. THE MATERIAL SHALL BE WELL COMPOSTED, FREE OF VIABLE WEED SEEDS, AND STABLE WITH REGARD TO OXYGEN CONSUMPTION AND CARBON DIOXIDE GENERATION. THE COMPOST SHALL HAVE NO VISIBLE FREE WATER AND PRODUCE NO DUST WHEN HANDLED. IT SHALL MEET THE FOLLOWING CRITERIA, AS REPORTED BY THE US COMPOSTING COUNCIL STA COMPOST TECHNICAL DATA SHEET PROVIDED BY THE VENDOR.

- 100% OF THE MATERIAL MUST PASS THROUGH A 1/2-INCH SCREEN.
- THE PH OF THE MATERIAL SHALL BE BETWEEN 6 MIN. AND 8 MAX.
- MANUFACTURED INERT MATERIAL (PLASTIC, CONCRETE, CERAMICS, METAL, ETC.) SHALL BE LESS THAN 1.0% BY WEIGHT.
- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 30 AND 70% (DRY WEIGHT BASIS).
- SOLUBLE SALT CONTENT SHALL BE LESS THAN 6.0 MMHOS/CM.
- MATURITY INDICATOR SHALL BE GREATER THAN 80% FOR GERMINATION AND VIGOR.
- STABILITY SHALL BE 'STABLE' TO 'VERY STABLE'.
- CARBON/NITROGEN (C/N) RATIO SHALL BE LESS THAN 25:1.
- TRACE METALS TEST RESULT = "PASS."

CONSTRUCTION

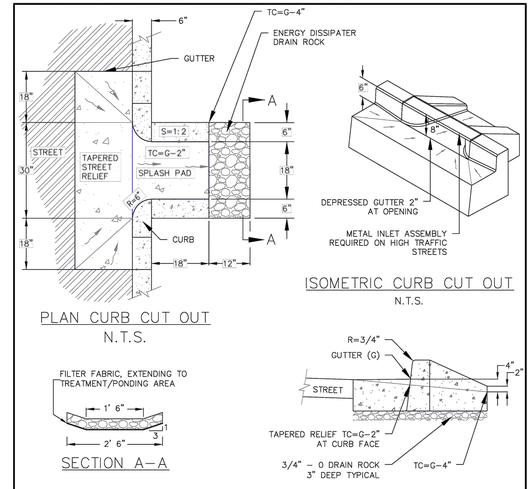
STORMWATER FACILITY GROWING MEDIUM:

- PROTECTION OF THE SOIL – THE MATERIAL SHALL BE PROTECTED FROM ALL SOURCES OF CONTAMINATION, INCLUDING WEED SEEDS, WHILE AT THE SUPPLIER, IN CONVEYANCE, AND AT THE PROJECT SITE.
- WET AND WINTER CONDITIONS – HAULING AND PLACEMENT OF THE MATERIAL WILL NOT BE ALLOWED WHEN THE WEATHER IS TOO WET OR THE GROUND IS FROZEN OR SATURATED AS DETERMINED BY THE OWNERS REPRESENTATIVE.
- PLACEMENT OF THE SOIL – PLACE THE MATERIAL IN LOOSE LIFTS, NOT TO EXCEED 8 INCHES EACH AND EACH LIFT SHALL BE COMPACTED WITH A WATER-FILLED LANDSCAPE ROLLER. DO NOT OTHERWISE MECHANICALLY COMPACT THE MATERIAL.
- TIMING OF PLANT INSTALLATION – WEATHER PERMITTING AND AS APPROVED, INSTALL PLANTS AS SOON AS POSSIBLE AFTER PLACING AND GRADING THE SOIL IN ORDER TO MINIMIZE EROSION AND FURTHER COMPACTION.
- EROSION CONTROL – TEMPORARY EROSION CONTROL MEASURES ARE REQUIRED UNTIL PERMANENT STABILIZATION MEASURES ARE FUNCTIONAL.
- PROTECTION OF THE INSTALLED SOIL – IN ALL CASES, THE PROTECT INSTALLED MATERIAL FROM FOOT OR EQUIPMENT TRAFFIC AND SURFACE WATER RUNOFF. INSTALL TEMPORARY FENCING OR WALKWAYS AS NEEDED TO KEEP WORKERS, PEDESTRIANS, AND EQUIPMENT OUT OF THE AREA. UNDER NO CIRCUMSTANCES SHOULD MATERIALS AND EQUIPMENT BE STORED ON TOP OF THE INSTALLATION AREA.

GROWING MEDIUM SPECIFICATION FOR VEGETATED FACILITIES

DRAWING NO. 742 REVISED 10-31-19

CleanWater Services



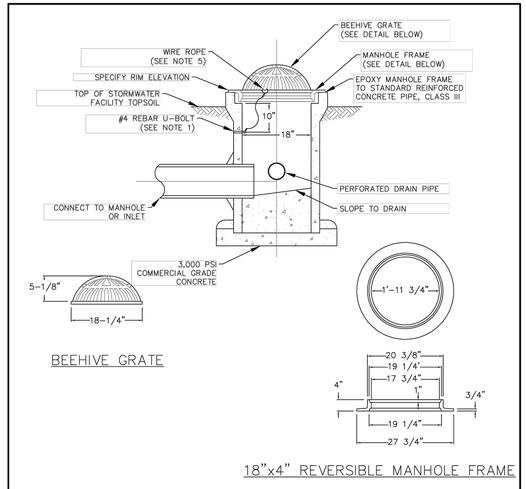
NOTES:

1. INFLOW STRUCTURE PER LOCAL JURISDICTION. CURB CUT OUTS NOT ALLOWED ON WASHINGTON COUNTY ROADS – USE MODIFIED CG-30 SEE DETAIL 755, FOR INLET STRUCTURE.
2. INFLOW STRUCTURE – CURB CUT OUT SHALL HAVE MINIMUM 2" DROP AT THE FLOW LINE LEADING TO THE SPLASH PAD, SEE DETAIL.
3. ENERGY DISSIPATER DRAIN ROCK: ROCK SIZE 4-1/2" – 2-1/2" OR SIZED BY DESIGN INFLOW. PLACE ROCK 6" DEEP BEHIND SPLASH PAD.
4. CURB PROFILE PER LOCAL JURISDICTION.
5. ENSURE THAT DOWNSTREAM CATCH BASINS ARE IN PLACE FOR HIGH FLOW CONVEYANCE.

CURB CUT OUT

DRAWING NO. 752 REVISED 10-31-19

CleanWater Services



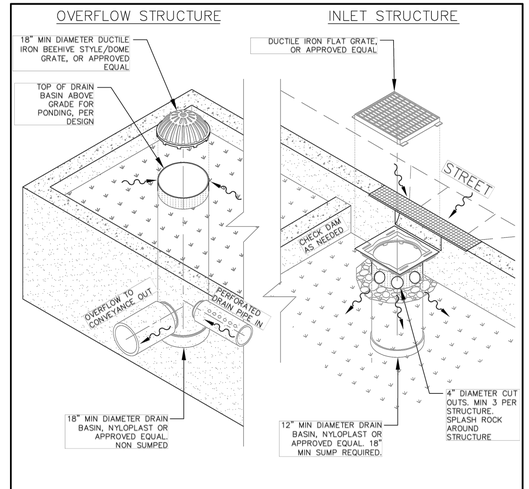
NOTES

1. SECURE GRATE IN PLACE WITH 54" OF WIRE ROPE. LOOP ENDS OF WIRE ROPE AROUND U-BOLT AND GRATE. CRIMP EACH END OF WIRE ROPE WITH 3" OVERLAP.
2. DRILL 2" DEEP HOLES INTO PIPE AND EPOXY #4 REBAR U-BOLT (2"X 4") IN HOLES.
3. GRATE TO BE CAST IRON, ASTM A48 CL30.
4. SIZE INLET BASED ON CALCULATED FLOWS AND MANUFACTURERS RECOMMENDATIONS.
5. WIRE ROPE BETWEEN 1/8"-3/16" DIAMETER, STAINLESS STEEL, 7 STRANDS OF 19 WIRES.

BEEHIVE INLET

DRAWING NO. 758 REVISED 10-31-19

CleanWater Services



NOTE:

1. PLACE STRUCTURE ON 3/4" TO 0" BASE ROCK PLACED OVER NATIVE SUBGRADE.

OVERFLOW/INLET STRUCTURE

DRAWING NO. 760 REVISED 10-31-19

CleanWater Services

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rahim@abbasidesign.com
+1.503.816.9466

PRELIMINARY

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR # FPC-02

Project Status

DETAILS

Date 4/23/2025 8:13:40 PM
Drawn HHPR
Checked HHPR

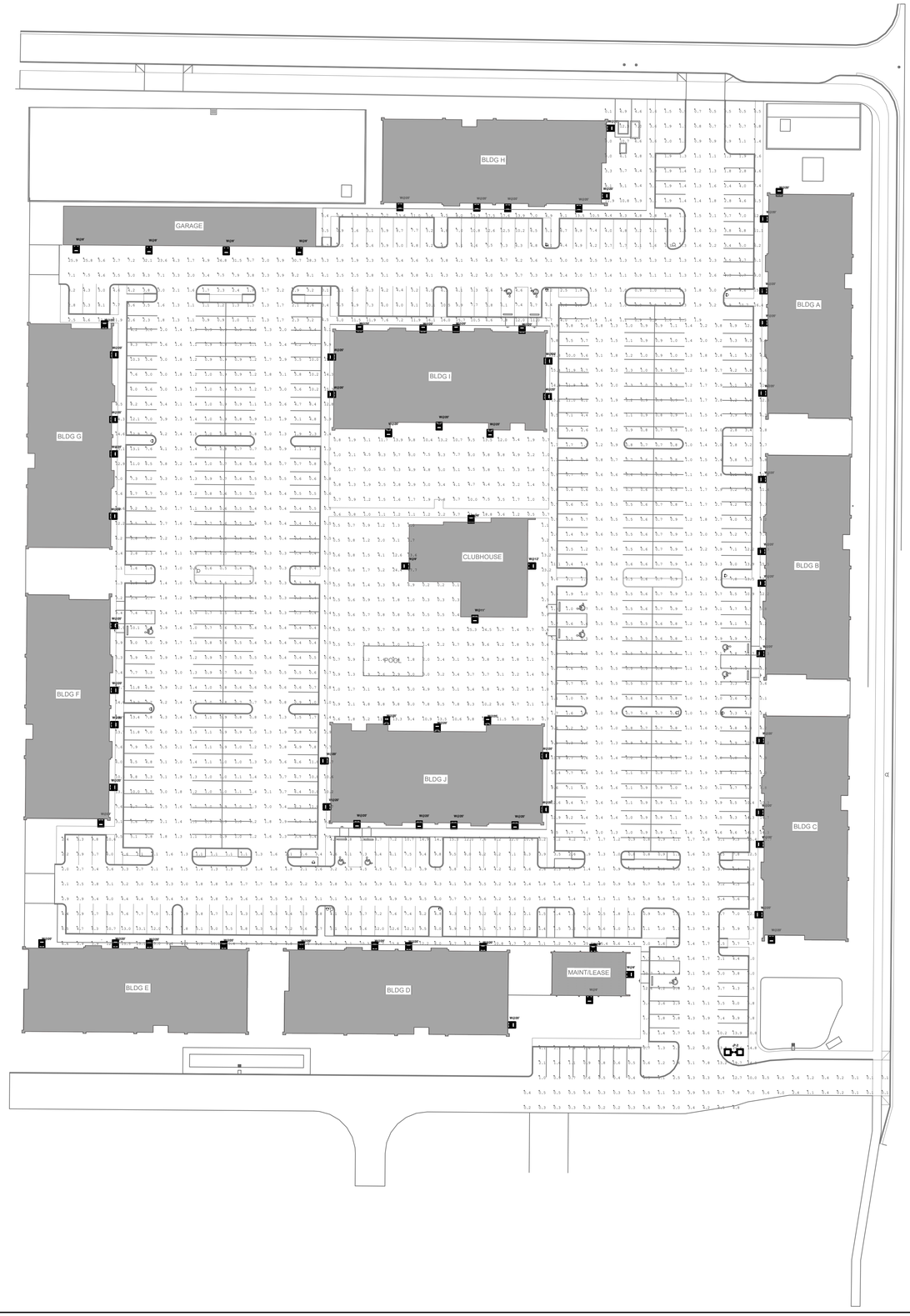
C904

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS • LANDSCAPE ARCHITECTS • SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE CENTRAL AREA	Illuminance	Fc	4.86	41.1	0.5	9.72	82.20
SITE CLUBHOUSE AREA	Illuminance	Fc	4.08	47.7	0.1	40.80	477.00
SITE PARKING EAST	Illuminance	Fc	3.06	15.8	0.4	7.65	39.50
SITE PARKING NORTH	Illuminance	Fc	4.75	32.1	0.0	N.A.	N.A.
SITE PARKING SOUTH	Illuminance	Fc	4.48	35.4	0.1	44.80	354.00
SITE PARKING WEST	Illuminance	Fc	2.94	15.4	0.3	9.80	51.33

Luminaire Schedule						
Symbol	Qty	Label	Tag	Luminaire Lumens	Luminaire Watts	Total Watts
	1	LWAX-LG-120W-120V_1_1_1	W@11'	15740	124.85	124.85
	1	LWAX-LG-120W-120V_1_1	W@12'	15740	124.85	124.85
	9	LWAX-LG-120W-120V_1	W@9'	15740	124.85	1123.65
	1	RSX2 LED P5 40K R3	P-2	28618	213.48	426.96
	61	LWAX-LG-120W-120V	W@20'	15740	124.85	7615.85



SUNLIGHT ELECTRIC
7524 NE 88TH ST, VANCOUVER, WA 98662
(971)222-5758
PETER@SUNLIGHTELECTRICINC.COM
WA:SUNLIE1984PG / CCB:172549

HANEY CORNELIUS
FORE PROPERTIES

ISSUE RECORD:

05/27/25 PRELIMINARY

CONTENTS:
SITE LIGHTING PHOTOMETRICS

SCALE
1" = 40'

E0.0



RSX2 LED
Area Luminaire

Catalog Number

Notes

Type

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

Specifications

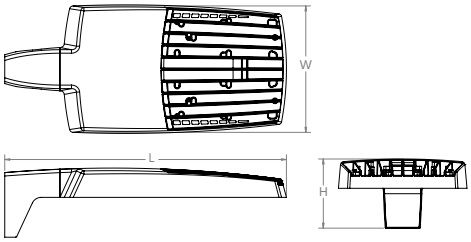
EPA (ft²@0°): 0.69 ft² (0.06 m²)

Length: 29.3" (74.4 cm) (SPA mount)

Width: 13.4" (34.0 cm)

Height: 3.0" (7.6 cm) Main Body 7.2" (18.3 cm) Arm

Weight: (SPA mount) 30.0 lbs (13.6 kg)



Introduction

The new RSX LED Area family delivers maximum value by providing significant energy savings, long life and outstanding photometric performance at an affordable price. The RSX2 delivers 11,000 to 31,000 lumens allowing it to replace 250W to 1000W HID luminaires.

The RSX features an integral universal mounting mechanism that allows the luminaire to be mounted on most existing drill hole patterns. This "no-drill" solution provides significant labor savings. An easy-access door on the bottom of mounting arm allows for wiring without opening the electrical compartment. A mast arm adaptor, adjustable integral slipfitter and other mounting configurations are available.

design select

Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect.
*See ordering tree for details

Design Select options indicated by this color background.

Ordering Information

EXAMPLE: RSX2 LED P6 40K R3 MVOLT SPA DDBXD

RSX2 LED

Series	Performance Package	Color Temperature	Distribution	Voltage	Mounting
RSX2 LED	P1	30K 3000K	R2 Type 2 Wide	MVOLT (120V-277V) [2]	SPA Square pole mounting (3.0" min. SQ pole for 1 at 90°, 3.5" min. SQ pole for 2, 3, 4 at 90°)
	P2	40K 4000K	R3 Type 3 Wide	HVOLT (347V-480V) [3]	RPA Round pole mounting (3.2" min. dia. RND pole for 2, 3, 4 at 90°, 3.0" min. dia. RND pole for 1 at 90°, 2 at 180°, 3 at 120°)
	P3	50K 5000K	R3S Type 3 Short	XVOLT (277V-480V) [4]	MA Mast arm adaptor (fits 2-3/8" OD horizontal tenon)
	P4		R4 Type 4 Wide	(use specific voltage for options as noted)	IS Adjustable slipfitter (fits 2-3/8" OD tenon) [6]
	P5		R4S Type 4 Short	120 [3] 277 [5]	WBA Wall bracket [1]
	P6		R5 Type 5 Wide [1]	208 [3] 347 [5]	WBASC Wall bracket with surface conduit box
			R5S Type 5 Short [1]	240 [3] 480 [5]	AASP Adjustable tilt arm square pole mounting [6]
			AFR Automotive Front Row		AARP Adjustable tilt arm round pole mounting [6]
			AFRR90 Automotive Front Row Right Rotated		AAWB Adjustable tilt arm with wall bracket [6]
			AFRL90 Automotive Front Row Left Rotated		AAWSC Adjustable tilt arm wall bracket and surface conduit box [6]

Options

Shipped Installed

HS	House-side shield [7]
PE	Photocontrol, button style [8,9]
PER7	Seven-wire twist-lock receptacle only (no controls) [9, 10, 11]
SF	Single fuse (120, 277, 347) [5]
DF	Double fuse (208, 240, 480) [5]
SPD20KV	20KV Surge pack (10KV standard)
FAO	Field adjustable output [9]
DMG	0-10V dimming extend out back of housing for external control (control ordered separate) [9]
DS	Dual switching [9,12]

Shipped Installed

***Standalone and Networked Sensors/Controls (factory default settings, see table page 9)**

NLTAIR2 PIRHN	nLight AIR generation 2 ,with Networked, Bi-Level motion/ambient sensor [9, 13, 14, 15]
BAA	Buy America(n) Act and/or Build America Buy America Qualified
CCE	Coastal Construction [16]

*Note: NLTAIR2 PIRHN with nLight Air can be used as a standalone dimming sensor with out-of-box settings or as a wireless networked solution. See factory default settings table. Sensor coverage pattern is affected when luminaire is tilted.

Shipped Separately (requires some field assembly)

EGS	External glare shield [7]
EGFV	External glare full visor (360° around light aperture) [7]
BS	Bird spikes [17]

Finish

DDBXD	Dark Bronze
DBLXD	Black
DNAXD	Natural Aluminum
DWHXD	White
DDBTXD	Textured Dark Bronze
DBLBXD	Textured Black
DNATXD	Textured Natural Aluminum
DWHGXD	Textured White

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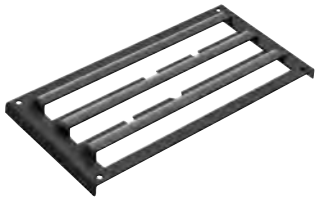
Ordering Information

Accessories
Ordered and shipped separately.

RSX2HS	RSX2 House side shield (includes 2 shields)
RSX2EGS (FINISH) U	External glare shield (specify finish)
RSX2HSAFRR (FINISH) U	RSX2 House side shields for AFR rotated optics (includes 2 shields)
RSX2EGFV (FINISH) U	External glare full visor (specify finish)
RSXRPA (FINISH) U	RSX Universal round pole adaptor plate (specify finish)
RSXWBA (FINISH) U	RSX WBA wall bracket (specify finish) [1]
RSXSCB (FINISH) U DLL127F 1.5 JU	RSX Surface conduit box (specify finish, for use with WBA, WBA not included) Photocell -SSL twist-lock (120-277V) [18]
DLL347F 1.5 CUL JU	Photocell -SSL twist-lock (347V) [18]
DLL480F 1.5 CUL JU	Photocell -SSL twist-lock (480V) [18]
DSHORT SBK U	Shorting cap [18]

NOTES
1 Any Type 5 distribution, is not available with WBA.
2 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
3 HVOLT driver operates on any line voltage from 347-480V (50/60 Hz).
4 XVOLT driver not available with P1. XVOLT driver operates on any line voltage from 277V-480V (50/60 Hz). XVOLT not available with fusing (SF or DF) and not available with PE.
5 Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
6 Maximum tilt is 90° above horizontal.
7 It may be ordered as an accessory.
8 Requires MVOLT or 347V.
9 Two or more of the following options cannot be combined including PE, DMG, PER7, FAO, DS and NLTAIR2 PIRHN. (Exception: PE and FAO can be combined; also PE and DMG can be combined.)
10 Compatible with standard twist-lock photocells for dusk to dawn operation or advanced control nodes that provide 0-10V dimming signals. Wire 4/Wire 5 wired to dimming leads on driver. Wire6/Wire7 capped inside luminaire. Twistlock photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Shorting Cap included.
11 For units with option PER7, the mounting must be restricted to +/- 45° from horizontal aim per ANSI C136.10-2010.
12 DS requires (2) separately switched circuits. DS provides 50/50 fixture operation via (2) different sets of leads using (2) drivers. DS only available with packages P5 and P6.
13 Must be ordered with PIRHN.
14 Requires MVOLT or HVOLT.
15 Must be ordered with NLTAIR2. For additional information on PIRHN visit here.
16 CCE option not available with WBA, WBASC, AASP, AARP, AAWB, AAWBSC, EGS, EGFV and BS.
17 Must be ordered with fixture for factory pre-drilling.
18 Requires luminaire to be specified with PER7 option. Ordered and shipped as a separate line item from Acuity Brands Controls.

External Shields



House Side Shield



External Glare Shield

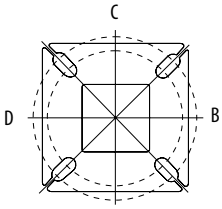


External 360 Full Visor

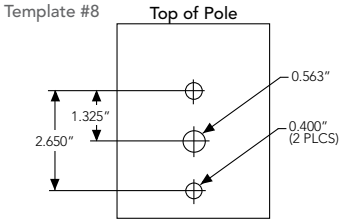
Pole/Mounting Informatiion

Accessories including bullhorns, cross arms and other adpaters are available under the accessories tab at Lithonia's Outdoor Poles and Arms product page. Click here to visit Accessories.

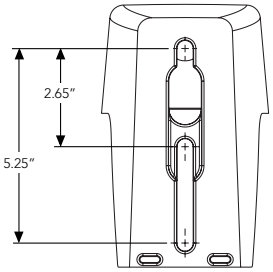
HANDHOLE ORIENTATION



RSX POLE DRILLING



RSX STANDARD ARM & ADJUSTABLE ARM



Round Tenon Mount - Pole Top Slipfitters

Tenon O.D.	RSX Mounting	Single	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2 - 3/8"	RPA, AARP	AS3-5 190	AS3-5 280	AS3-5 290	AS3-5 320	AS3-5 390	AS3-5 490
2 - 7/8"	RPA, AARP	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	RPA, AARP	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

Drill/Side Location by Configuration Type

Drilling Template	Mounting Option	Single	2 @ 180	2 @ 90	3 @ 120	3 @ 90	4 @ 90
	Head Location	Side B	Side B & D	Side B & C	Round Pole Only	Side B, C & D	Side A, B, C & D
#8	**Drill Nomenclature**	DM19AS	DM28AS	DM29AS	DM32AS	DM39AS	DM49AS

RSX2 - Luminaire EPA

*Includes luminaire and integral mounting arm. Other tenons, arms, brackets or other accessories are not included in this EPA data.

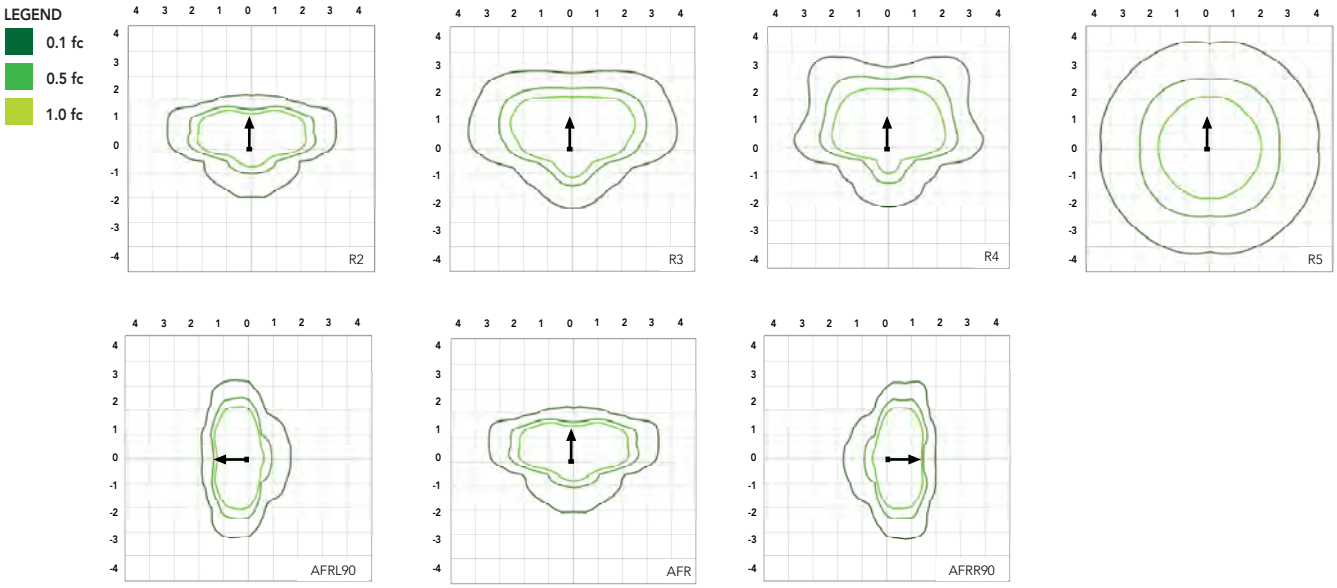
Fixture Quantity & Mounting Configuration		Single	2 @ 90	2 @ 180	3 @ 90	3 @ 120	4 @ 90	2 Side by Side	3 Side by Side	4 Side by Side
Mounting Type	**Tilt**									
SPA - Square Pole Adaptor	0°	0.69	1.22	1.27	1.8	1.61	2.39	1.37	2.06	2.74
RPA - Round Pole Adaptor		0.74	1.27	1.37	1.9	1.71	2.49	1.42	2.16	2.84
MA - Mast Arm Adaptor		0.61	1.14	1.11	1.64	1.45	2.23	1.29	1.9	2.58
IS - Integral Slipfitter AASP/AARP - Adjustable Arm Square/Round Pole	0°	0.69	1.22	1.27	1.8	1.61	2.39	1.37	2.06	2.74
	10°	0.53	1.06	1.05	1.58	1.37	2.08	1.06	1.59	2.12
	20°	0.52	1.02	1.03	1.52	1.33	2.02	1.03	1.55	2.07
	30°	0.64	1.11	1.18	1.63	1.45	2.21	1.27	1.91	2.54
	40°	0.81	1.21	1.35	1.74	1.65	2.39	1.62	2.43	3.23
	45°	0.91	1.25	1.5	1.81	1.75	2.48	1.82	2.73	3.64
	50°	1.34	1.83	2.17	2.61	2.56	3.62	2.68	4.02	5.36
	60°	2.2	2.97	3.57	4.24	4.17	5.89	4.41	6.61	8.82
	70°	2.86	4.13	4.7	5.89	5.71	8.21	5.71	8.57	11.42
	80°	3.4	5.13	5.67	7.34	7.09	10.21	6.79	10.19	13.59
	90°	3.85	5.96	6.55	8.58	8.31	11.88	7.70	11.56	15.41

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Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's RSX Area homepage.

Isofootcandle plots for the RSX2 LED P6 40K. Distances are in units of mounting height (30').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-50°C (32-122°F).

Ambient	Ambient	Lumen Multiplier
0°C	32°F	1.05
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97
45°C	113°F	0.96
50°C	122°F	0.95

Electrical Load

		Current (A)					
Performance Package	System Watts (W)	120V	208V	240V	277V	347V	480V
P1	71W	0.59	0.34	0.30	0.26	0.20	0.15
P2	111W	0.93	0.53	0.46	0.40	0.32	0.23
P3	147W	1.23	0.70	0.61	0.53	0.42	0.31
P4	187W	1.55	0.90	0.78	0.68	0.53	0.38
P5	210W	1.75	1.01	0.87	0.76	0.60	0.44
P6	244W	2.03	1.17	1.01	0.88	0.70	0.51

Projected LED Lumen Maintenance

Operating Hours	50,000	75,000	100,000
Lumen Maintenance Factor	>0.97	>0.95	>0.92

Values calculated according to IESNA TM-21-11 methodology and valid up to 40°C.

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Performance Data

Lumen Output

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

Performance Package	System Watts	Distribution. Type	30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	71W	R2	10,040	2	0	1	139	11,031	2	0	1	153	11,031	2	0	1	153
		R3	10,005	2	0	2	141	10,992	2	0	2	155	10,992	2	0	2	155
		R3S	10,271	2	0	2	143	11,285	2	0	2	157	11,285	2	0	2	157
		R4	10,136	2	0	2	143	11,136	2	0	2	157	11,136	2	0	2	157
		R4S	9,779	2	0	2	138	10,744	2	0	2	151	10,744	2	0	2	151
		R5	10,271	4	0	2	145	11,285	4	0	2	159	11,285	4	0	2	159
		R5S	10,544	3	0	1	149	11,585	3	0	2	163	11,585	3	0	2	163
		AFR	10,026	2	0	1	141	11,016	2	0	1	155	11,016	2	0	1	155
		AFRR90	10,122	3	0	2	140	11,121	3	0	2	154	11,121	3	0	2	154
		AFRL90	10,164	3	0	2	141	11,167	3	0	2	155	11,167	3	0	2	155
P2	111W	R2	15,712	2	0	2	138	17,263	2	0	2	151	17,263	2	0	2	151
		R3	15,657	2	0	3	141	17,202	3	0	3	155	17,202	3	0	3	155
		R3S	16,075	2	0	2	141	17,661	2	0	2	155	17,661	2	0	2	155
		R4	15,862	2	0	3	143	17,427	2	0	3	157	17,427	2	0	3	157
		R4S	15,304	2	0	2	138	16,815	2	0	2	151	16,815	2	0	2	151
		R5	16,075	4	0	2	145	17,661	5	0	3	159	17,661	5	0	3	159
		R5S	16,502	4	0	2	149	18,130	4	0	2	163	18,130	4	0	2	163
		AFR	15,691	2	0	2	141	17,240	2	0	2	155	17,240	2	0	2	155
		AFRR90	15,841	3	0	3	139	17,404	4	0	3	153	17,404	4	0	3	153
		AFRL90	15,907	3	0	3	139	17,477	4	0	3	153	17,477	4	0	3	153
P3	147W	R2	19,855	3	0	2	132	21,814	3	0	2	145	21,814	3	0	2	145
		R3	19,785	3	0	3	135	21,737	3	0	4	148	21,737	3	0	4	148
		R3S	20,312	3	0	3	135	22,317	3	0	3	149	22,317	3	0	3	149
		R4	20,044	3	0	3	136	22,022	3	0	4	150	22,022	3	0	4	150
		R4S	19,339	3	0	3	132	21,247	3	0	3	145	21,247	3	0	3	145
		R5	20,313	5	0	3	138	22,317	5	0	3	152	22,317	5	0	3	152
		R5S	20,852	4	0	2	142	22,910	4	0	2	156	22,910	4	0	2	156
		AFR	19,828	3	0	2	135	21,785	3	0	2	148	21,785	3	0	2	148
		AFRR90	20,017	4	0	3	133	21,992	4	0	3	147	21,992	4	0	3	147
		AFRL90	20,101	4	0	3	134	22,084	4	0	3	147	22,084	4	0	3	147
P4	187W	R2	22,836	3	0	2	120	25,090	3	0	2	132	25,090	3	0	2	132
		R3	22,756	3	0	4	122	25,002	3	0	4	134	25,002	3	0	4	134
		R3S	23,363	3	0	3	123	25,668	3	0	3	135	25,668	3	0	3	135
		R4	23,054	3	0	4	123	25,329	3	0	4	135	25,329	3	0	4	135
		R4S	22,243	3	0	3	119	25,059	3	0	3	134	25,059	3	0	3	134
		R5	23,363	5	0	3	125	25,669	5	0	4	137	25,669	5	0	4	137
		R5S	23,983	4	0	2	128	26,350	4	0	2	141	26,350	4	0	2	141
		AFR	22,806	3	0	2	122	25,056	3	0	2	134	25,056	3	0	2	134
		AFRR90	23,023	4	0	3	121	25,295	4	0	3	133	25,295	4	0	3	133
		AFRL90	23,120	4	0	3	122	25,401	4	0	3	134	25,401	4	0	3	134
P5	210W	R2	26,141	3	0	2	122	28,721	3	0	2	135	28,721	3	0	2	135
		R3	26,049	3	0	4	124	28,620	3	0	4	136	28,620	3	0	4	136
		R3S	26,744	3	0	3	125	29,383	3	0	4	138	29,383	3	0	4	138
		R4	26,390	3	0	4	126	28,994	3	0	4	138	28,994	3	0	4	138
		R4S	25,462	3	0	3	121	27,974	3	0	3	133	27,974	3	0	3	133
		R5	26,744	5	0	4	127	29,383	5	0	4	140	29,383	5	0	4	140
		R5S	27,454	4	0	2	131	30,163	4	0	2	144	30,163	4	0	2	144
		AFR	26,106	3	0	2	124	28,682	3	0	2	137	28,682	3	0	2	137
		AFRR90	26,354	4	0	3	123	28,955	5	0	3	136	28,955	5	0	3	136
		AFRL90	26,465	4	0	3	124	29,077	5	0	3	136	29,077	5	0	3	136
P6	244W	R2	27,646	3	0	2	112	30,374	3	0	2	123	30,374	3	0	2	123
		R3	27,549	3	0	4	113	30,267	3	0	4	124	30,267	3	0	4	124
		R3S	28,283	3	0	3	115	31,075	3	0	4	126	31,075	3	0	4	126
		R4	27,909	3	0	4	114	30,663	3	0	4	126	30,663	3	0	4	126
		R4S	26,928	3	0	3	110	29,585	3	0	3	121	29,585	3	0	3	121
		R5	28,284	5	0	4	116	31,075	5	0	4	127	31,075	5	0	4	127
		R5S	29,035	4	0	2	119	31,900	5	0	3	131	31,900	5	0	3	131
		AFR	27,608	3	0	2	112	30,332	3	0	2	123	30,332	3	0	2	123
		AFRR90	27,872	4	0	3	113	30,622	5	0	3	124	30,622	5	0	3	124
		AFRL90	27,989	4	0	3	113	30,751	5	0	3	125	30,751	5	0	3	125

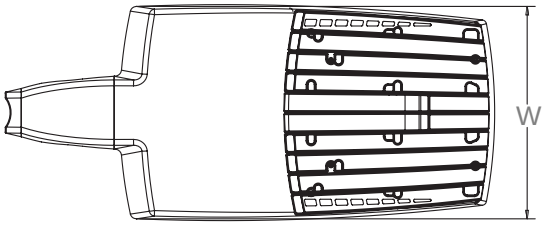
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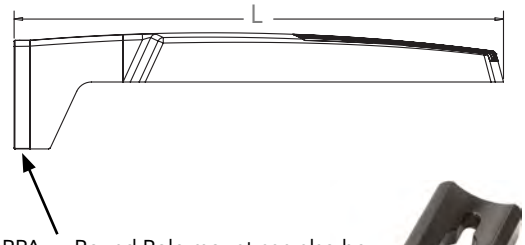
Dimensions & Weights

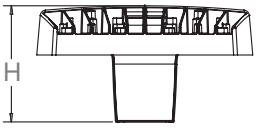
Luminaire Weight by Mounting Type

Mounting Configuration	Total Luminaire Weight
SPA	30 lbs
RPA	32 lbs
MA	30 lbs
WBA	33 lbs
WBASC	36 lbs
IS	33 lbs
AASP	33 lbs
AARP	35 lbs
AAWB	36 lbs
AAWSC	39 lbs

RSX2 with Round Pole Adapter (RPA)





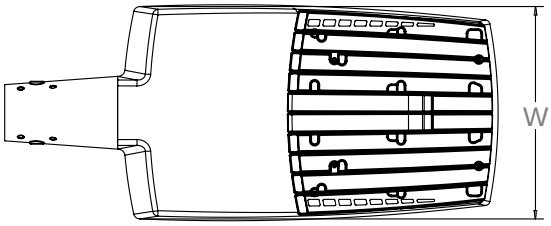


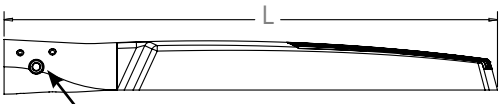
Length: 30.3" (77.0 cm)
Width: 13.4" (34.0 cm)
Height: 3.0" (7.6 cm) Main Body
7.2" (18.3 cm) Arm

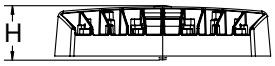
Note: RPA — Round Pole mount can also be used to mount on square poles by omitting the round pole adapter plate shown here.



RSX2 with Mast Arm Adapter (MA)



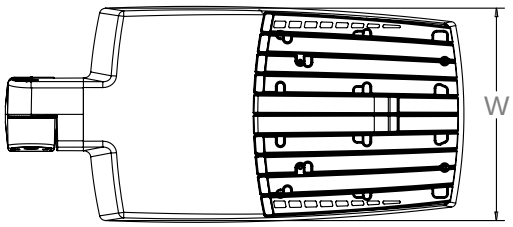


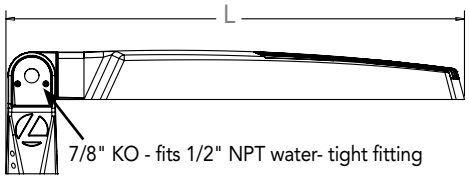


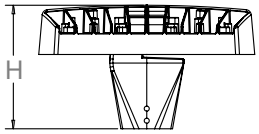
7/16" locking thru bolt/nut provided

Length: 30.6" (77.7 cm)
Width: 13.4" (34.0 cm)
Height: 3.0" (7.6 cm) Main Body
3.5" (8.9 cm) Arm

RSX2 with Adjustable Slipfitter (IS)







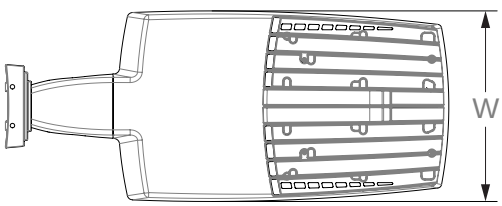
7/8" KO - fits 1/2" NPT water- tight fitting

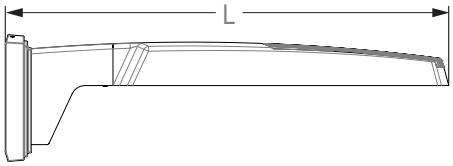
Length: 28.3" (71.9 cm)
Width: 13.4" (34.0 cm)
Height: 3.0" (7.6 cm) Main Body
7.6" (19.3 cm) Arm

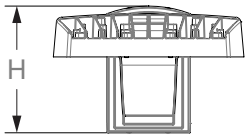
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Dimensions

RSX2 with Wall Bracket (WBA)

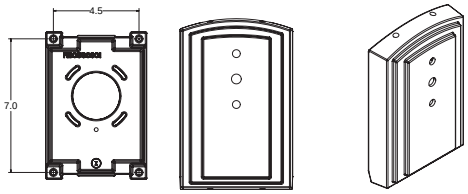




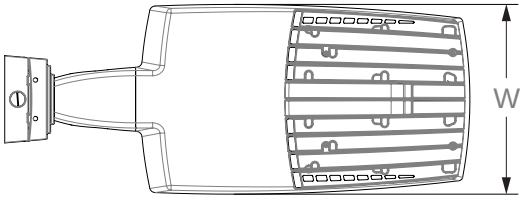


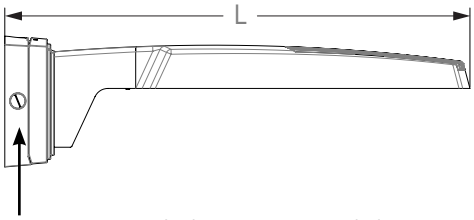
Length: 31.2" (79.2 cm)
Width: 13.4" (41.7 cm)
Height: 3.0" (7.6 cm) Main Body
8.9" (22.6 cm) Arm

Wall Bracket (WBA) Mounting Detail

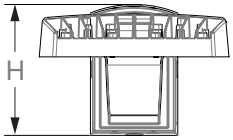


RSX2 with Wall Bracket with Surface Conduit Box (WBASC)



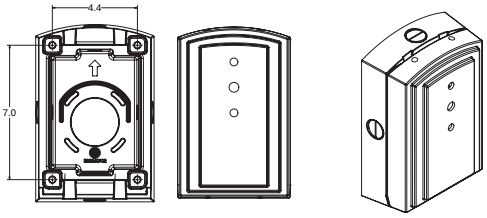


3/4" NPT taps with plugs - Qty (4) provided



Length: 32.8" (83.3 cm)
Width: 13.4" (41.7 cm)
Height: 3.0" (7.6 cm) Main Body
9.2" (23.4 cm) Arm

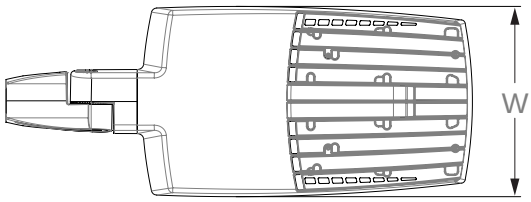
Surface Conduit Box (SCB) Mounting Detail

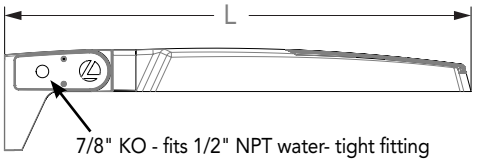


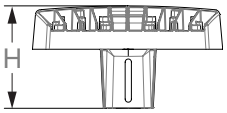
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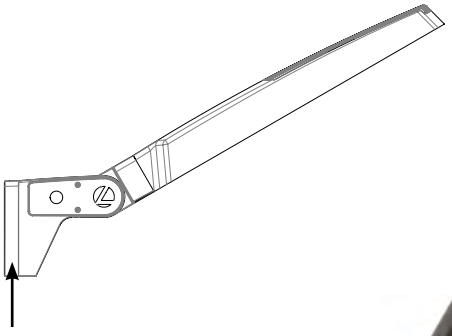
Dimensions

RSX2 with Adjustable Tilt Arm - Square or Round Pole (AASP or AARP)









Length: 32.8" (83.3 cm) **AASP**
33.8" (85.9 cm) **AARP**
Width: 13.4" (34.0 cm)
Height: 3.0" (7.6 cm) Main Body
7.2" (18.2 cm) Arm

NOTE:
RPA - Round Pole mount can also be used to mount on square poles by omitting the round pole adapter plate shown here.

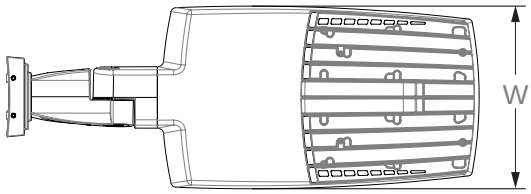


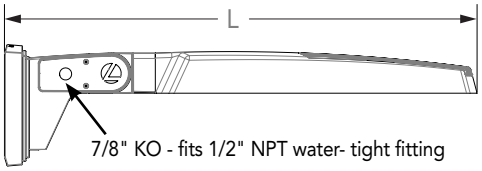
Notes

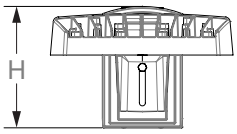
AASP: Requires 3.0" min. square pole for 1 at 90°. Requires 3.5" min. square pole for mounting 2, 3, 4 at 90°.

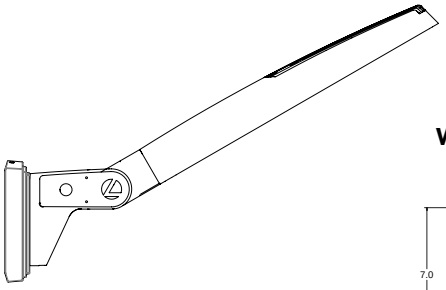
AARP: Requires 3.2" min. dia. round pole for 2, 3, 4 at 90°. Requires 3.0" min. dia. round pole for mounting 1 at 90°, 2 at 180°, 3 at 120°.

RSX2 with Adjustable Tilt Arm with Wall Bracket (AAWB)



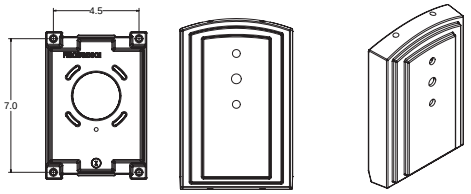






Length: 34.7" (88.0 cm)
Width: 13.4" (34.0 cm)
Height: 3.0" (7.6 cm) Main Body
8.9" (22.6 cm) Arm

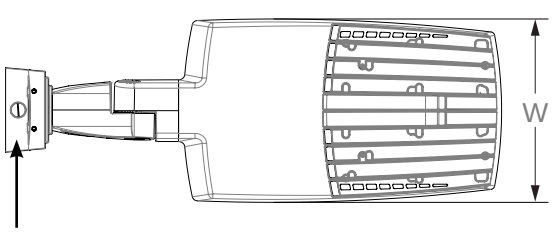
Wall Bracket (WBA) Mounting Detail

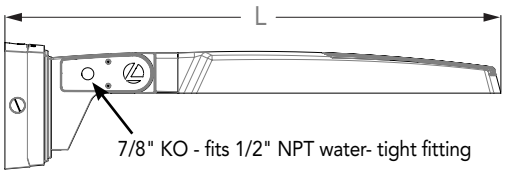


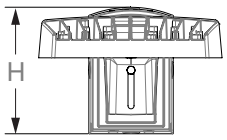
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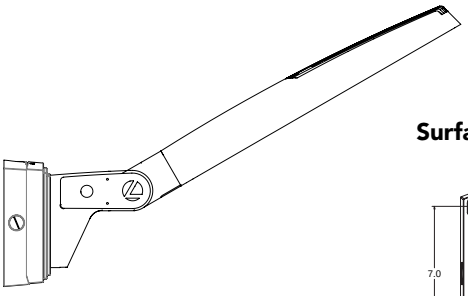
Dimensions

RSX2 with Adjustable Tilt Arm with Wall Bracket and Surface Conduit Box (AAWSC)



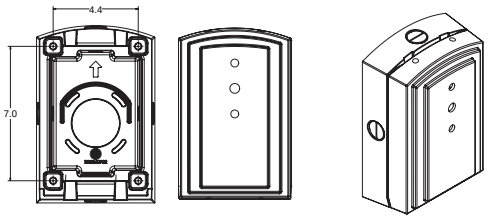




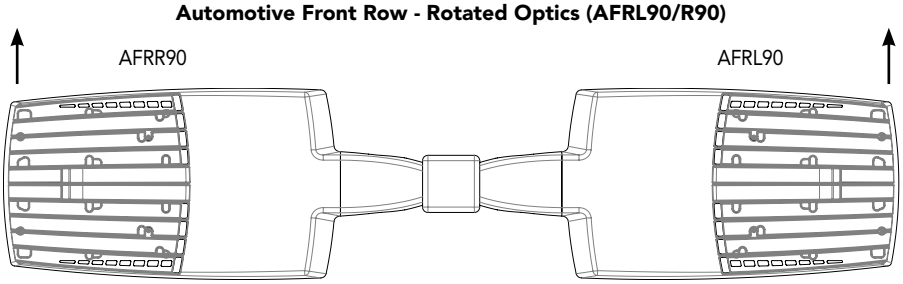


Length: 36.2" (91.9 cm)
Width: 13.4" (40.0 cm)
Height: 3.0" (7.6 cm) Main Body
9.2" (23.4 cm) Arm

Surface Conduit Box (SCB) Mounting Detail



Automotive Front Row - Rotated Optics (AFRL90/R90)



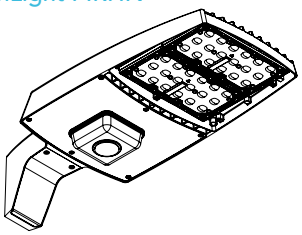
(Example: 2@180 - arrows indicate direction of light exiting the luminaire)

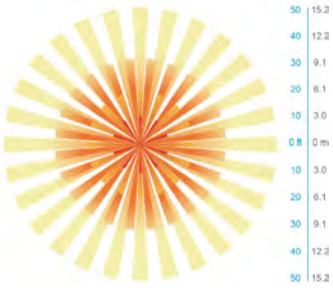
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nLight Control - Sensor Coverage and Settings

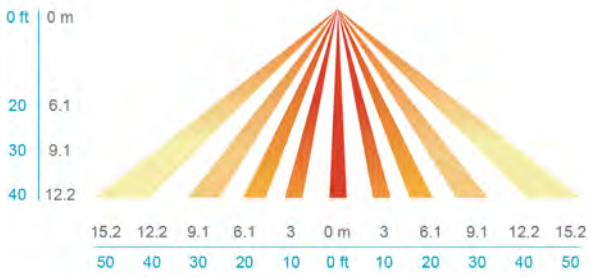
NLTAIR2 PIRHN nLight Sensor Coverage Pattern

nLight PIRHN





Top



Side

Motion Sensor Default Settings - Option PIRHN						
Option	Dimmed State (unoccupied)	High Level (when occupied)	Photocell Operation	Dwell Time (occupancy time delay)	Ramp-up Time (from unoccupied to occupied)	Ramp-down Time (from occupied to unoccupied)
NLTAIR2 PIRHN	Approx. 30% Output	100% Output	Enabled @ 1.5FC	7.5 minutes	3 seconds	5 minutes

*Note: NLTAIR2 PIRHN default settings including photocell set-point, high/low dim rates, and occupancy sensor time delay are all configurable using the Clairity Pro App. Sensor coverage pattern shown with luminaire at 0°. Sensor coverage pattern is affected when luminaire is titled.

FEATURES & SPECIFICATIONS

INTENDED USE
The RSX LED area family is designed to provide a long-lasting, energy-efficient solution for the one-for-one replacement of existing metal halide or high pressure sodium lighting. The RSX2 delivers 11,000 to 31,000 lumens and is ideal for replacing 250W to 1000W HID pole-mounted luminaires in parking lots and other area lighting applications.

CONSTRUCTION AND DESIGN
The RSX LED area luminaire features a rugged die-cast aluminum main body that uses heat-dissipating fins and flow-through venting to provide optimal thermal management that both enhances LED performance and extends component life. Integral "no drill" mounting arm allows the luminaire to be mounted on existing pole drillings, greatly reducing installation labor. The light engines and housing are sealed against moisture and environmental contaminants to IP66. The low-profile design results in a low EPA, allowing pole optimization. Vibration rated per ANSI C136.31: 3G Mountings: Include SPA, RPA, MA, IS, AASP, AARP rated for 3G vibration. 1.5G Mountings: Include WBA, WBASC, AAWB and AAWSC rated for 1.5G vibration.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures superior adhesion as well as a minimum finish thickness of 3 mils. The result is a high-quality finish that is warrantied not to crack or peel.

OPTICS
Precision acrylic refractive lenses are engineered for superior application efficiency, distributing the light to where it is needed most. Available in short and wide pattern distributions including Type 2, Type 3, Type 3S, Type 4, Type 4S, Type 5, Type 5S, AFR (Automotive Front Row) and AFR rotated AFRR90 and ARFL90.

COASTAL CONSTRUCTION (CCE)
Optional corrosion resistant construction is engineered with added corrosion protection in materials and/or pre-treatment of base material under super durable paint. Provides additional corrosion protection for applications near coastal areas. Finish is salt spray tested to over 5,000 hours per ASTM B117 with scribe rating of 10. Additional lead-times apply.

ELECTRICAL
Light engine(s) configurations consist of high-efficacy LEDs mounted on metal-core circuit boards and aluminum heat sinks to maximize heat dissipation. Light engines are IP66 rated. LED lumen maintenance is >L92/100,000 hours. CCT's of 3000K, 4000K and 5000K (minimum 70 CRI) are available. Fixtures ship standard with 0-10v dimming driver. Class 1 electronic drivers ensure system power factor >90% and THD <20%. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

STANDARD CONTROLS
The RSX LED area luminaire has a wide assortment of control options. Dusk to dawn controls include MVOLT and 347V button-type photocells and NEMA twist-lock photocell receptacles.

nLIGHT AIR CONTROLS
The RSX LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing with photocontrol functionality and is suitable for mounting heights up to 40 feet. No commissioning is required when using factory default settings that provide basic stand-alone motion occupancy dimming that is switched on and off with a built-in photocell. See chart above for motion sensor default out-of-box settings. For more advanced wireless functionality, such as group dimming, nLight AIR can be commissioned using a smartphone and the easy-to-use CLAIRITY app. nLight AIR equipped luminaries can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclypse. Additional information about nLight Air can be found here.

INSTALLATION
Integral "no-drill" mounting arm allows for fast, easy mounting using existing pole drillings. Select the "SPA" option for square poles and the "RPA" option to mount to round poles. Note, the RPA mount can also be used for mounting to square poles by omitting the RPA adapter plate. Select the "MA" option to attach the luminaire to a 2 3/8" horizontal mast arm or the "IS" option for an adjustable slipfitter that mounts on a 2 3/8" OD tenon. The adjustable slipfitter has an integral junction box and offers easy installation. Can be tilted up to 90° above horizontal. Additional mountings are available including a wall bracket, adjustable tilt arm for direct-to-pole and wall and a surface conduit box for wall mount applications.

LISTINGS
CSA Certified to meet U.S. and Canadian standards. Suitable for wet locations. Rated for -40°C minimum ambient. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.
International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only. US Patent No. D882, 146S

GOVERNMENT PROCUREMENT
BAA – Buy America(n) Act: Product with the BAA option qualifies as a domestic end product under the Buy American Act as implemented in the FAR and DFARS. Product with the BAA option also qualifies as manufactured in the United States under DOT Buy America regulations.
BABA – Build America Buy America: Product with the BAA option also qualifies as produced in the United States under the definitions of the Build America, Buy America Act.
Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY
5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at:
www.acuitybrands.com/support/warranty/terms-and-conditions

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

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LWAX SERIES Outdoor Lighting

LWAX-LG-50-120W-MCTP

WESTGATE
THE FUTURE IS HERE...AND IT'S QUITE BRIGHT!

Customer Name:

Project Name:

Note: | Type:

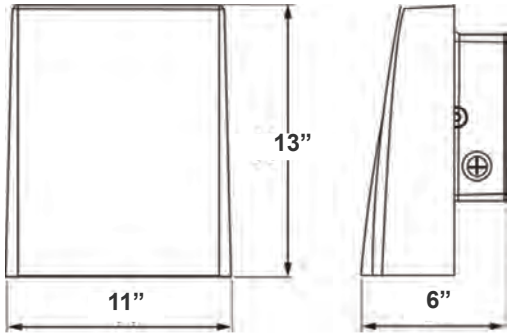


Multi-CCT & Power

MCTP



Selection:



11” (W) x 13” (H) x 6” (D)

Ideal for general site lighting, alleys, loading docks, doorway, pathway, and parking areas. Great for use with motion sensors or another instant on/off controls.

Features

- High Light Transmittance, Anti-UV and Fire Resistant PC Lens
- Four 1/2” Knockouts: 1 Top. 1 on Each Side, 1 Back
- Die-Cast Aluminum With Powder Coat Finish (Dark Bronze)
- 7-Year Warranty
- Multi CCT and Power (Switches are inside fixture)

Technical Specifications

Electrical:

- Voltage: 120-277V AC 60Hz
- Wattage: 50W/ 80W/ 100W/120W
- Power Factor: >0.95
- Efficacy: 130 LPW

Mechanical:

- Die-Cast Aluminum With Powder Coat Finish
- High Light Transmittance, Anti-UV and Fire Resistant Shatterproof PC Lens
- Light Head Can Be Adjusted From 0° to 90°
- Full Cutoff, Dark Sky Compliant
- Four 1/2” Knockouts: 1 Top. 1 on Each Side, 1 Back
- Operating Temperature: -4ºF -104ºF
- Wet Location
- 7-Year Warranty
- IP65

Lighting:

- Dimming: 0~10V Dimmable
- Multi CCT and Power (Switches are inside fixture)
- The Type II Distribution is Used For Wide Walkways, On Ramps and Entrance Roadways, As Well As Other Long, Narrow Lighting
- Total Lumens: 15000LM Max
- Color Temperatures: 3000K/ 4000K/ 5000K/ 5700K
- Color Rendering Index: CRI ≥ 80
- Beam angle: 80° x 100°
- Rated life: 70,000 Hrs

Applications:

- General site Lighting
- Alleys
- Loading docks
- Doorways
- Pathways
- Parking areas

Other Models:

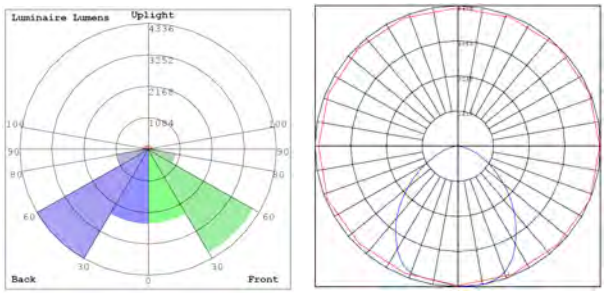
- 50W | 6150LM | LWAX-MD-20-50W-MCTP

UL LISTED | DIMMING 0-10V | IP65

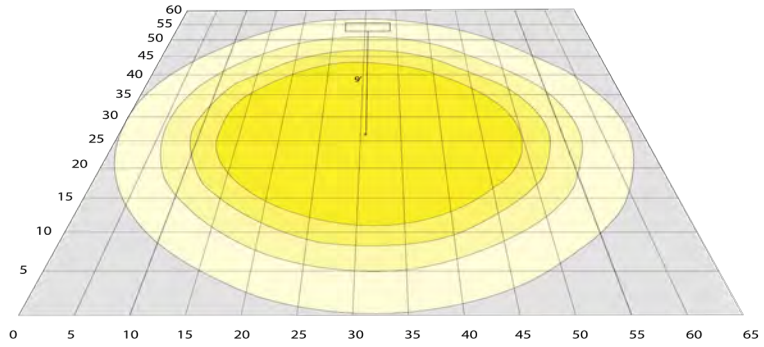
Phone: (877) 805-2252 | Fax: (877) 805-2252
www.westgatemfg.com |

WG-ZY-Z4-2Z

Photometrics: LWA-LG-50-120W-MCTP



BUD Rating: B4-U3-G3



Area 60'x 65' Mounting Height: 9'

Other Views:



Side View



Front View



Back View

Performance Table: LWA-LG-50-120W-MCTP

MODEL NO.	Wattage	Voltage	Lumens	Color Temp.	BUG Rating	LPW
LWAX-LG-50-120W-MCTP	50W	120~277V	7000LM	3000K 4000K 5000K 5700K	B4-U3-G3	130
			7200LM			
			7400LM			
			7400LM			
	80W		10200LM			
			10500LM			
			10800LM			
			10800LM			
	100W		12000LM			
			12300LM			
			12650LM			
			12650LM			
	120W		13900LM			
			14200LM			
			15000LM			
			14900LM			

Sample Ordering

Model	Size	Min.	Max.Wattage	Color Temp.
LWAX	LG	50	120W	MCTP

Accessories:

LWA-SH3 = SHROUD

Factory-Installed Options:

Blank = No Option For Accessories
OPT-EM-OD2INT = INTERNAL EMERGENCY BACKUP BATTERY
OPT-SEN-3MRLV-5 = PROGRAMMABLE MICROWAVE BI-LEVEL
OPT-CLR-85 = COLOR PAINT
OPT-PC-B = BUTTON
OPT-TRS-T120 = TAMPER RESISTANT SCREW
WEC-8RC = OPTIONAL REMOTE

ACCESSORIES:



LWA-SH3

FACTORY-INSTALLED OPTIONS:



OPT-EM-OD2INT



OPT-SEN-3MRLV-5



WEC-8RC



OPT-PC-B

Example:

1. **LWAX-LG-50--120W-MCTP** (FOR LWAX 120W MCTP FIXTURE 120-277V)

2. **LWAX-LG-50--120W-MCTP** (FOR LWAX 120W MCTP FIXTURE 120-277V)
   LWA-SH3 (SHROUD)

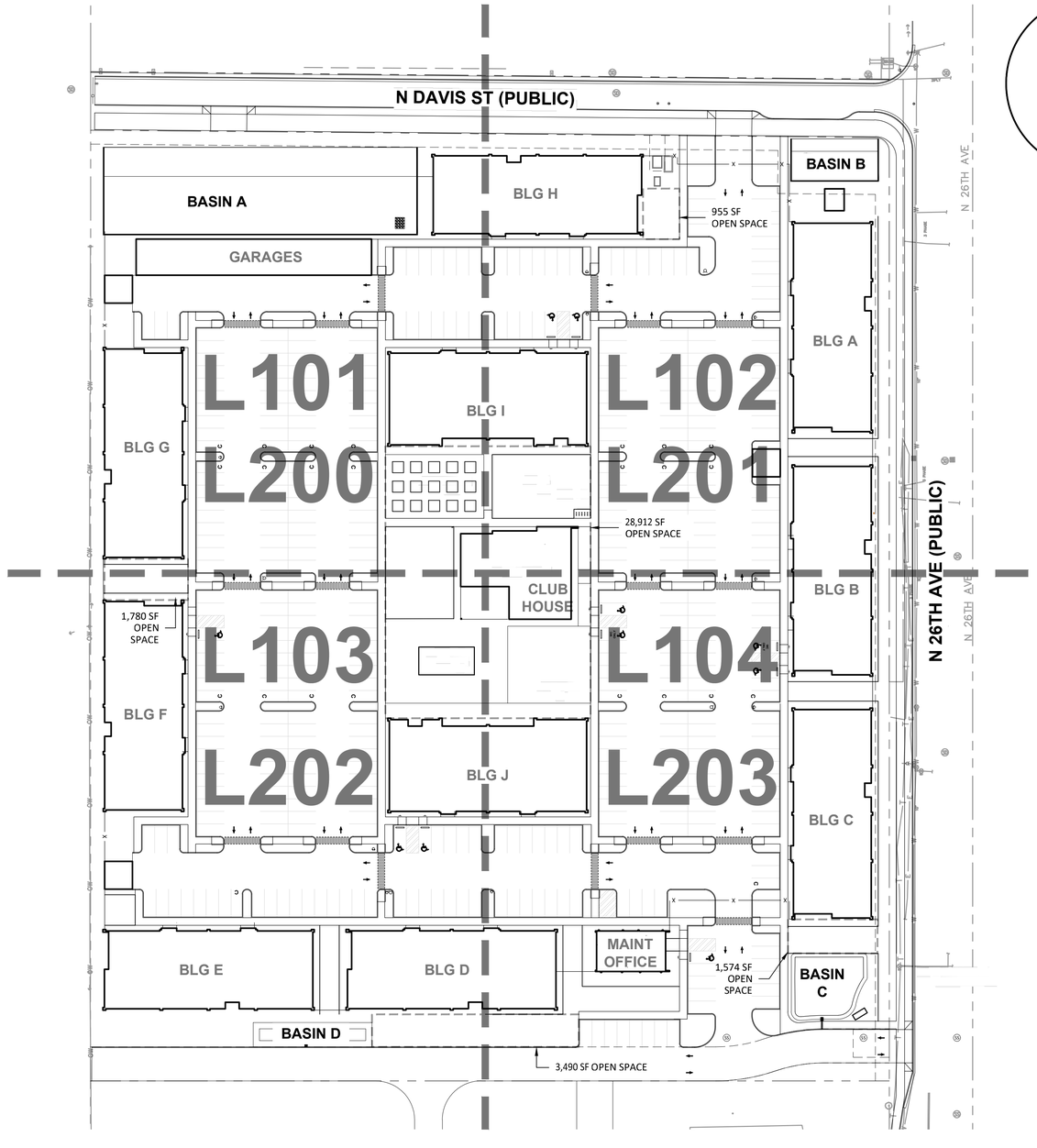
3. **LWAX-LG-50--120W-MCTP** (FOR LWAX 120W MCTP FIXTURE 120-277V)
   LWA-SH3 (SHROUD)
   OPT-EM-OD2INT (INTERNAL EMERGENCY BACKUP BATTERY)

LANDSCAPE PLANNING CALCULATIONS

PROJECT AREA = 391,719 SF (9 AC)
REQUIRED MINIMUM LANDSCAPE AREA (15%) = 58,758 SF
REQUIRED OPEN SPACE AREA (240 UNITS) = 36,00 SF

PROPOSED LANDSCAPE AREA = 94,641 SF (24%)

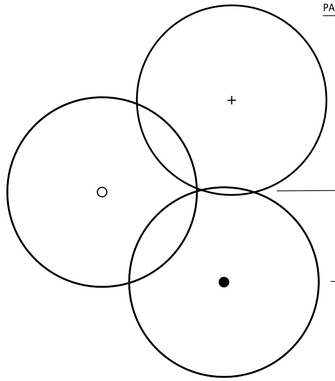
PROPOSED OPEN SPACE AREAS = 36,711 SF



KEY PLAN

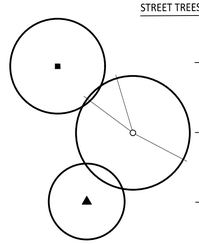
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SCALE: 1" = 50'

PLANTING SCHEDULE



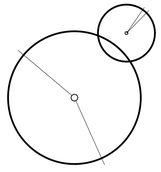
PARKING LOT TREES

15	Ulmus americana 'Jefferson' - Jefferson Elm	2" CAL.	B&B, WELL BRANCHED, LIMBED TO 6' 60' H X 50 W
14	Fagus sylvatica 'Riversii' - Rivers Purple Beech	2" CAL.	B&B, WELL BRANCHED, LIMBED TO 6' 60' H X 50 W
13	Quercus bicolor - Swamp White Oak	2" CAL.	B&B, WELL BRANCHED, LIMBED TO 6' 60' H X 50 W



STREET TREES

14	Ostrya virginiana - American Hornbeam	2" CAL.	B&B, WELL BRANCHED, LIMBED TO 6' MATURE SIZE: 35'H x 25'W
15	Zelkova serrata 'Green Vase' - Greenvase Zelkova	2" CAL.	B&B, WELL BRANCHED, LIMBED TO 6' MATURE SIZE: 40'H x 30'W
8	Parrotia persica 'Vanessa' - Persian Ironwood	2" CAL.	B&B, WELL BRANCHED, LIMBED TO 6' MATURE SIZE: 30'H x 20'W



SITE TREES

14	Ginkgo biloba 'Princeton Sentry' - Princeton Sentry Ginkgo	1.5" CAL.	B&B, WELL BRANCHED, LIMBED TO 6' MATURE SIZE: 40-50'H x 15'W
3	Cercidiphyllum japonica - Katsura	1.5" CAL.	B&B, WELL BRANCHED, LIMBED TO 6' MATURE SIZE: 40-60'H x 35'W

SHRUBS

10	Arbutus unedo 'Compacta' - Compact Strawberry Tree	5 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 8' x 6'
144	Aronia melanocarpa 'Low Scape Snowfire' - Low Scape Snowfire Aronia	5 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 3' x 3'
11	Cistus x platysephalus - Hardy White Rock Rose	5 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 3' x 4'
170	Daphne cneorum - Rock Daphne	1 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 2.5' x 2.5'
119	Escallonia 'Newport Dwarf' - Dwarf Escallonia	1 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 3' x 3'
34	Helictotrichon sempervirens - Blue Oat Grass	1 GAL	CONT., FULL PLANTS, 24" O.C. SIZE AT MATURITY: 2.5'H x 2.5'W
29	Holodiscus discolor - Oceanspray	5 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 6' x 6'
22	Lonicera involucrata - Twinberry Honeysuckle	2 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 6' x 6'
28	Mahonia aquifolium - Tall Oregon Grape	2 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 6' x 6'
99	Nandina domestica 'Gulf Stream' - Compact Nandina	1 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 3' x 3'
58	Perovskia atriplicifolia - Russian Sage	1 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 3' x 3'
35	Philadelphus lewisii - Mock Orange	5 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 5' x 6'
48	Rubus spectabilis - Salmonberry	1 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 2.5' x 2.5'
147	Symphoricarpos albus - Snowberry	1 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 4' x 4'
27	Viburnum davidii - David Viburnum	5 GAL	CONT., FULL PLANTS, SPACING AS SHOWN SIZE AT MATURITY: 3' x 4'

GROUNDCOVER

163	Arctostaphylos uva-ursi - Kinnikinnick	1 GAL	CONT., FULL PLANTS, 30" O.C. SIZE AT MATURITY: 1'H x 4'W
693	Deschampsia cespitosa - Tufted Hairgrass	1 GAL	CONT., FULL PLANTS, 24" O.C. SIZE AT MATURITY: 1'H x 1.5'W
308	Epimedium x rubrum - Bishop's Hat	1 GAL	CONT., FULL PLANTS, 18" O.C. SIZE AT MATURITY: 1.5'H x 6'W
412	Hemerocallis fulva 'DHEMYELLOW' - Endlessliily Yellow Daylily	4" POT	CONT., FULL PLANTS, 18" O.C. SIZE AT MATURITY: 1.5'H x 1.5'W
364	Mahonia repens - Creeping Oregon Grape	1 GAL	CONT., FULL PLANTS, 24" O.C. SIZE AT MATURITY: 1'H x 1.5'W
341	Panicum virgatum 'Dallas Blues' - Dallas Blues Switch Grass	1 GAL	CONT., FULL PLANTS, 24" O.C. SIZE AT MATURITY: 1'H x 1.5'W
497	Pennisetum alopecuroides 'Hameln' - Dwarf Fountain Grass	1 GAL	CONT., FULL PLANTS, 24" O.C. SIZE AT MATURITY: 2'H x 4'W
78	Rubus calycinoides - Crinkle-leaf Creeper	1 GAL	CONT., FULL PLANTS, 30" O.C. SIZE AT MATURITY: .5'H x 3'W
525	Sarcococca hookeriana var. humilis - Himalayan Sweet Box	1 GAL	CONT., FULL PLANTS, 30" O.C. SIZE AT MATURITY: 1.5'H x 3'W
433	Schizachyrium scoparium 'Twilight Zone' - Twilight Zone Little Bluestem	1 GAL	CONT., FULL PLANTS, 24" O.C. SIZE AT MATURITY: 1'H x 1.5'W
829	Sesleria autumnalis - Autumn Moor Grass	1 GAL	CONT., FULL PLANTS, 18" O.C. SIZE AT MATURITY: 1'H x 1.5'W

SEED MIXES

0 SF

SEED MIX 1 (LAWN AREAS)	% PLS	LBS OF PLA/ 1000 SF
Festuca rubra var. Garnet	20	1.60
Festuca rubra spp. fallax var Windward	20	1.60
Lolium perenee var. Dasher III	30	2.40
Lolium perenee var Cutter II	30	2.40
	TOTAL	8.00

MISC.

TUMBLED BARK MULCH SURFACING

GENERAL PLANTING NOTES

1. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT CITY OF CORNELIUS STANDARDS AND OREGON BUILDING AND SPECIALITY CODES.
2. INSTALL EROSION CONTROL SYSTEMS IN ACCORDANCE WITH CITY OF CORNELIUS STANDARDS PRIOR TO SITE WORK AND LANDSCAPE INSTALLATION.
3. CONTRACTOR SHALL MARK AND PROTECT ALL UTILITIES, SITE FEATURES, AND VEGETATION TO REMAIN IN PLACE.
4. CONTRACTOR SHALL REMOVE ALL WEEDS AND INVASIVE SPECIES PRIOR TO PLANTING OR SEEDING.
5. ALL AREAS DISTURBED BY STAGING AND CONSTRUCTION ACTIVITIES SHALL BE SEEDED AT NO ADDITIONAL COST TO THE OWNER.
6. PRIOR TO PLANTING, CONTRACTOR SHALL TEST ON-SITE SOILS FOR SOIL FERTILITY BY CERTIFIED TESTING LAB. IF NECESSARY, BACKFILL SOILS FOR TREE PITS, SHRUB AND GROUNDCOVER AREAS SHALL BE AMENDED AS RECOMMENDED BY SOIL ANALYSIS REPORT.
7. ALL SEEDED AREAS SHALL BE STRIPPED OF VEGETATION, SCARIFIED AND RECEIVE 4" OF TOPSOIL PRIOR TO APPLICATION OF SEED.
8. ALL PLANTER BEDS SHALL BE SCARIFIED 12" BELOW FINISHED GRADE AND HAVE 12" OF TOPSOIL ADDED TO BRING BACK TO FINISHED GRADE PRIOR TO PLANTING.
9. CONTRACTOR TO INSTALL 3" LAYER OF COMPOST MULCH AT ALL TREE, SHRUB AND GROUNDCOVER AREAS.
10. LANDSCAPE INSTALLATION SHALL INCLUDE PROVISION OF AN AUTOMATIC IRRIGATION SYSTEM TO SUSTAIN LANDSCAPE PLANTINGS, MEETING LOCAL AND STATE BUILDING CODES.
11. PLANT MATERIAL INSTALLED SHALL CONFORM IN SIZE AND GRADE TO THE "AMERICAN STANDARD FOR NURSERY STOCK" CURRENT EDITION.
12. QUANTITIES OF PLANT MATERIALS SHALL BE AS DETERMINED BY CONTRACTOR IN ACCORDANCE WITH SPECIFIED SPACING OR LOCATION ON PLAN. MATERIAL QUANTITIES SHOWN ON PLAN ARE FOR CONTRACTOR CONVENIENCE ONLY AND SHALL BE VERIFIED BY CONTRACTOR PRIOR TO INSTALLATION. SURPLUS OR SHORTAGES OF PLANT QUANTITIES SHALL BE RESPONSIBILITY OF CONTRACTOR.
13. LANDSCAPE CONTRACTOR SHALL WATER PLANTINGS FOR DURATION OF 1-YEAR WARRANTY PERIOD AFTER INSTALLATION AND GUARANTEE ALL PLANTINGS TO BE IN SATISFACTORY HEALTH. LANDSCAPE CONTRACTOR SHALL REPLACE ALL DAMAGED, DEAD, OR DYING PLANTS COVERED BY WARRANTY WITHIN 30 DAYS OF INITIAL IDENTIFICATION OF CONDITION.

abbasi design works LLC
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

REGISTERED LANDSCAPE ARCHITECT
747
PRELIMINARY
Jeffery P. Creel
OREGON
EXPIRES: 05/31/26

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #

Project Status

KEY PLAN AND PLANTING SCHEDULE

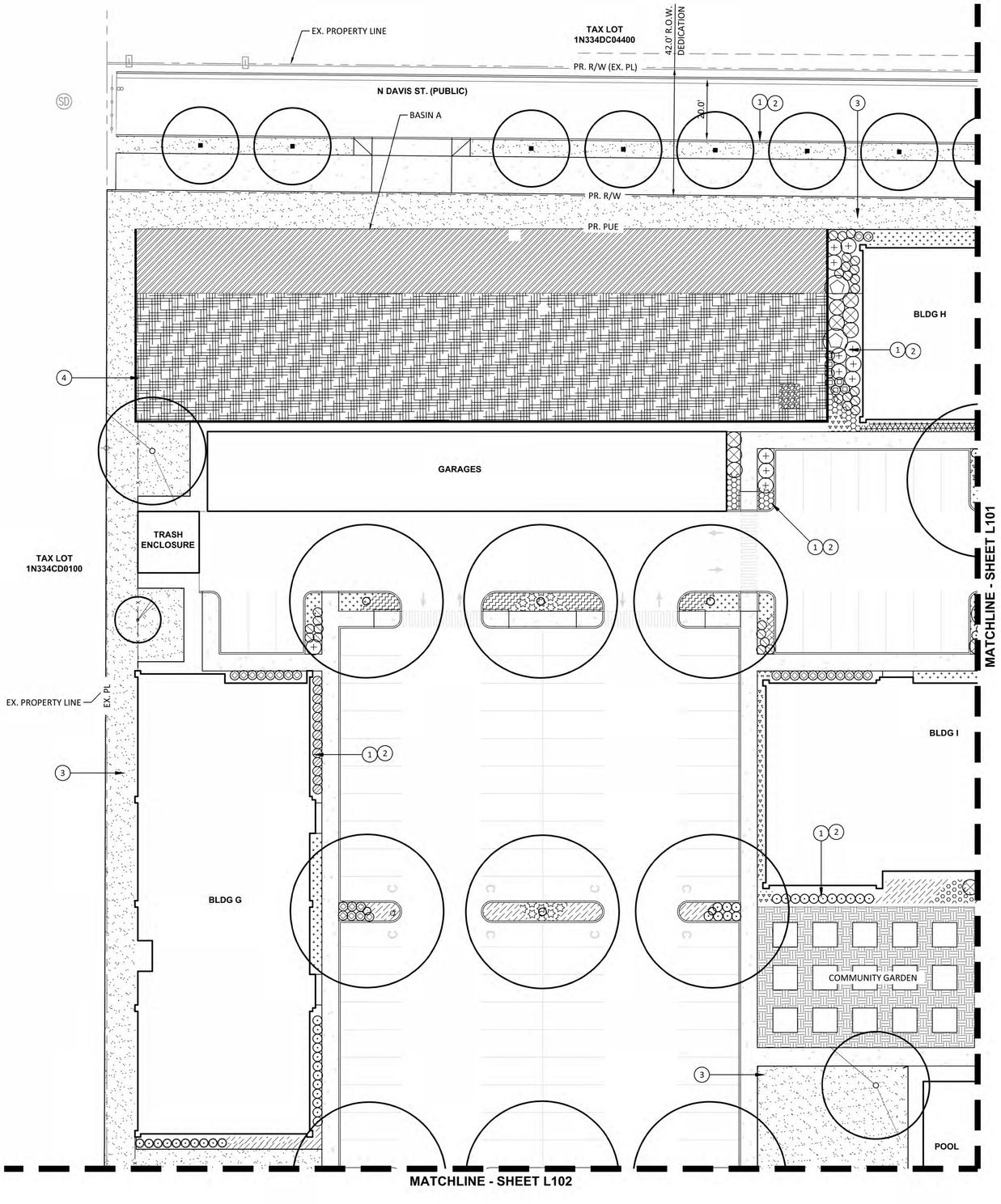
Date 5/28/2025
Drawn HHPR
Checked HHPR

L100

As indicated

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS
530 Center Street NE, Suite 240, Salem, OR 97301
phone: 503.365.1131 www.hhpr.com fax: 503.221.1171

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WATER QUALITY PLANTING TABLE

	Water Quality Swale (Swale Bottom Area) 12,381 SF Plant Communities	Min. Species Composition	Plant Catagory	Water Requirements	Light Requirements	Min. Rooting Size	Min. Plant Height (1" Dia.)	On Centered / Seeding Rate	Spacing Format
Herbaceous	Scientific name (Common name)								
	Carex obnupta (Slough Sedge)	18,572	Herb	Moist	Part	Plug	6"	6/ SF	Mass
	Scirpus microcarpus (Small-Fruited Bulrush)	18,572	Herb	Moist	Part	Plug	6"	6/ SF	Mass
	Juncus patens - Spreading Rush	18,572	Herb	Moist	Part	Plug	6"	6/ SF	Mass
	Deschampsia cespitosa (Tufted Hair Grass)	18,570	Herb	Moist	Part	Plug	6"	6/ SF	Mass
	Total Plants	74286							
	Mid-slope (Freeboard Area) 5,769 SF Plant Communities	**Min. Species Composition**	**Plant Catagory**	**Water Requirements**	**Light Requirements**	**Min. Rooting Size**	**Min. Plant Height (1" Dia.)**	**On Centered / Seeding Rate**	**Spacing Format**
Shrubs	Scientific name (Common name)								
	Cornus serica (Kelsey Dogwood)	58	Shrub	Wet	Part	1 GAL	2'	4-5'	Cluster
	Spiraea douglasii (Douglas Spirea)	58	Shrub	Wet	Sun	1 GAL	1.5'	3-6'	Cluster
	Rosa pisocarpa (Clustered Rose)	58	Shrub	Moist	Sun	1 GAL	1.5'	3-6'	Cluster
	Mahonia nervosa (Cascade Oregon Grape)	58	Shrub	Moist	Part	1 GAL	4"	4-5'	Cluster
	Symphoricarpos albus (Snowberry)	56	Shrub	Moist	Part	1 GAL	1.5'	3-4'	Cluster
	Total Shrubs	288							
GC	Arctostaphylos uva-ursi (Kinnikinnick)	740	GC	Dry	Part/Sun	#SP4	4"	3'	Cluster

WATER QUALITY PLANTING RATE CALCULATION

BASIN NUMBER	SW FACILITY SF	SWALE BOTTOM SF	MIDSLOPE AREA SF	UP-LAND SLOPE SF	BOTTOM HERB. (6 / SF)	MIDSLOPE SHRUBS	UP-LAND SHRUBS	UPLAND TREES
A	14047	9338	4709	0	56028	235	0	0
B	1731	1173	558	0	7038	28	0	0
C	2372	1870	502	0	11220	25	0	0
D	1471	634	837	0	3804	42	0	0
TOTAL	18150	12381	5769	0	74286	288	0	0

WATER QUALITY PLANTING NOTES

1. ALL INVASIVE, NON-NATIVE OR NOXIOUS PLANT MATERIAL IS TO BE REMOVED. METHODS FOR REMOVAL AND CONTROL OF INVASIVE/NON-NATIVE AND/OR NOXIOUS PLANTS ARE TO FOLLOW STRATEGIES AS OUTLINED WITHIN THE CWS IVAM GUIDANCE MANUAL. THE SUBJECT SITE IS TO EMPLOY MANUAL/MECHANICAL MANAGEMENT STRATEGIES AND PESTICIDE MANAGEMENT STRATEGIES THROUGHOUT MAINTENANCE PERIOD OR UNTIL HEALTHY STAND OF DESIRABLE VEGETATION IS ESTABLISHED.
2. PRESERVE SITE'S EXISTING NATIVE VEGETATION TO THE MAXIMUM EXTENT PRACTICABLE. EVERY EFFORT SHALL BE MADE TO PROTECT A SITE'S EXISTING NATIVE VEGETATION. NATIVE VEGETATION ALONG SENSITIVE AREAS AND VEGETATED CORRIDORS SHALL BE RETAINED TO THE MAXIMUM EXTENT PRACTICABLE.
3. REPLANTING/ENHANCEMENT AS FOLLOWS:
   * REFER TO PLANT TABLE AND PLAN FOR PLANT SPECIES, LOCATION, DISTRIBUTION, QUANTITIES, SIZE, CONDITION AND REQUIREMENTS.
   * A NATIVE SEED MIX HAS BEEN SPECIFIED FOR THE BUFFER AREA ONLY. ALL PLANTS TO BE PIT PLANTED WITH ADDITIONAL ORGANIC MATTER IF REQUIRED BUT NO TRADITIONAL FERTILIZER IS NECESSARY. PLANT PLACEMENT SHALL BE CONSISTENT WITH THE FORM OF THE NATURALLY OCCURRING PLANT COMMUNITY. SHRUBS SHALL BE PLACED IN SINGLES OR CLUSTERS OF THE SAME SPECIES TO PROVIDE A NATURAL PLANTING SCHEME.
4. PLANT INSTALLATION REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF SITE PLANTING AS SPECIFIED. ALL TREES AND SHRUBS PLANTED IN THE UPLAND AREA ARE TO BE MULCHED A MINIMUM OF THREE INCHES IN DEPTH AND 18 INCHES IN DIAMETER. APPROPRIATE MULCHES INCLUDE THOSE MADE FROM COMPOSTED LEAVES OR BARK THAT HAVE NOT BEEN CHEMICALLY TREATED. TEMPORARY IRRIGATION WILL BE PROVIDED AND USED DURING THE TWO YEAR MAINTENANCE PERIOD.
5. MONITORING AND MAINTENANCE. CONTRACTOR IS RESPONSIBLE FOR MONITORING AND MAINTAINING THE SITE. ALL NEW PLANT MATERIAL IS TO BE TAGGED. THE REMOVAL OF NON-NATIVE, INVASIVE WEEDS IS NECESSARY THROUGHOUT THE TWO YEAR MAINTENANCE PERIOD, OR UNTIL A HEALTHY STAND OF DESIRABLE VEGETATION IS ESTABLISHED. THE SITE IS TO BE MONITORED A MIN. OF 4 TIMES PER YEAR, OR 3 TIMES PER GROWING SEASON. IF AT ANY TIME THE LANDSCAPING FALLS BELOW THE 80% SURVIVAL LEVEL, THE CONTRACTOR SHALL REINSTALL ALL DEFICIENT PLANTING AT THE NEXT APPROPRIATE OPPORTUNITY AND THE TWO YEAR MAINTENANCE PERIOD SHALL BEGIN AGAIN FROM THE DATE OF THE REPLANTING.
6. CONTRACTOR IS REQUIRED TO PROVIDE AND INSTALL A TEMPORARY IRRIGATION SYSTEM TO MAINTAIN VEGETATIVE CORRIDOR PLANT ESTABLISHMENT DURING THE MONITORING AND MAINTENANCE PERIOD. THE IRRIGATION SYSTEM WILL BE FED FROM A CITY-OWNED METER AND SHALL BE DESIGNED TO NOT EXCEED SITE AVAILABLE GPM AND PSI. REFER TO IRRIGATION INDUSTRY BEST PRACTICES AND STANDARDS FOR ACCEPTABLE DESIGN/BUILD PRACTICES. CONTRACTOR TO PROVIDE IRRIGATION AS-BUILT RECORD DRAWING UPON COMPLETION AND ACCEPTANCE OF IRRIGATION SYSTEM.
7. PLANT TIMING. CONTAINERIZED STOCK SHALL BE INSTALLED ONLY FROM FEBRUARY 1 THROUGH MAY 1 AND OCTOBER 1 THROUGH NOVEMBER 15. BARE ROOT STOCK SHALL BE INSTALLED ONLY FROM DECEMBER 15 THROUGH APRIL 15. PLANTINGS OUTSIDE THESE TIMES MAY REQUIRE ADDITIONAL MEASURES TO ENSURE SURVIVAL WHICH SHALL BE SPECIFIED ON THE PLANS.

CONSTRUCTION NOTES:

1. INSTALL 12" TOPSOIL IN PLANTER BEDS, TYP.
2. INSTALL 3" BARK MULCH IN SHRUB BEDS, TYP.
3. INSTALL 6" TOPSOIL IN SEEDED AREAS, TYP.
4. BASIN A. INSTALL 12" WATER QUALITY FACILITY MEDIUM IN BASIN.

SEE SHEET L100 FOR PLANTING SCHEDULE & NOTES

0 10 20 40
SCALE: 1" = 20'

HHPR Harper Houf Peterson Righellis Inc.
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REGISTERED 747 PRELIMINARY Jeffery P. Creel OREGON LANDSCAPE ARCHITECT
EXPIRES: 05/31/26

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave
Cornelius, OR 97113

HHPR #

Project Status

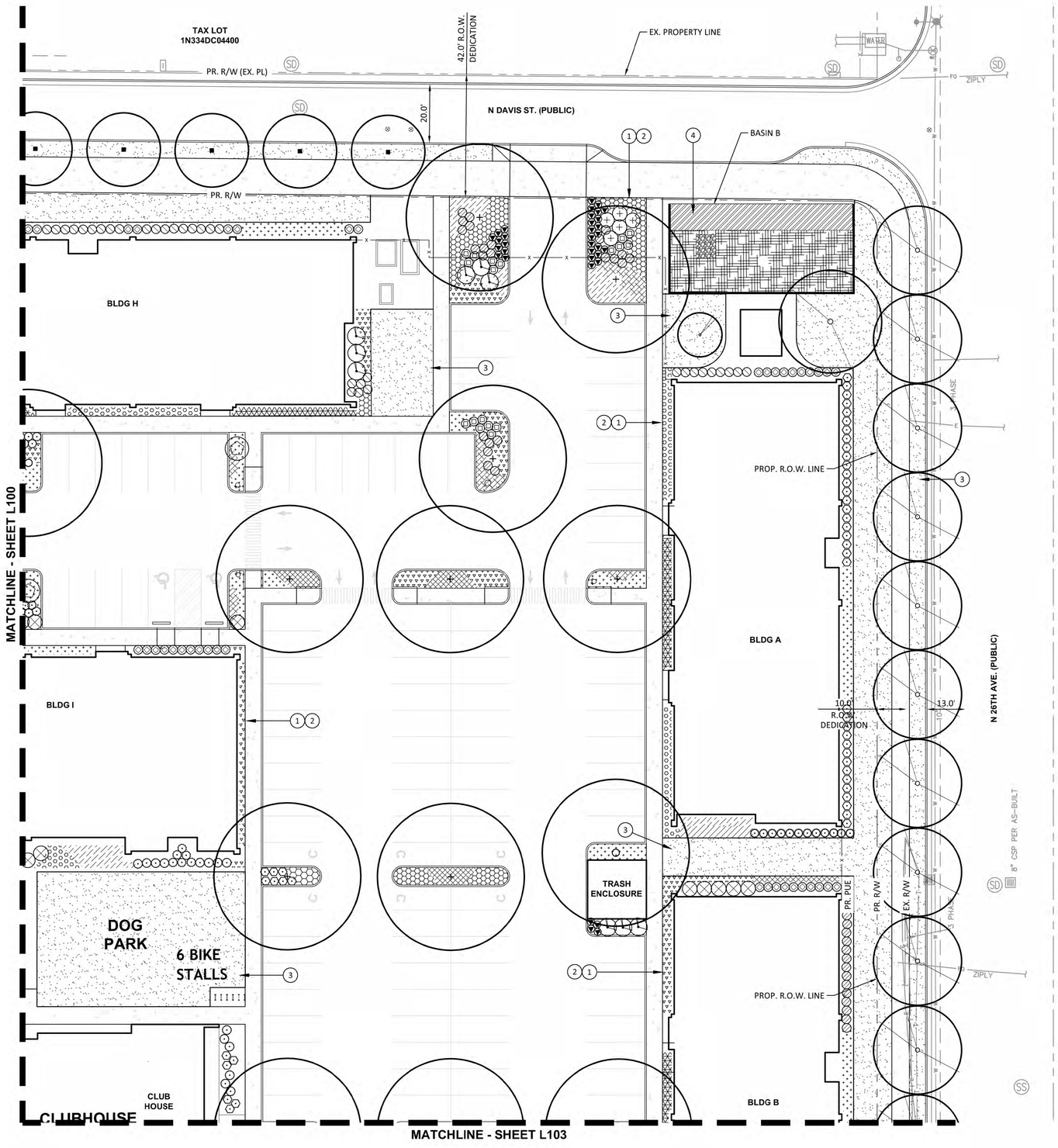
PLANTING PLAN

Date 5/28/2025
Drawn HHPR
Checked HHPR

L101

As indicated

4/23/2025 8:13:40 PM



CONSTRUCTION NOTES:

1. INSTALL 12" TOP SOIL IN PLANTER BEDS, TYP.
2. INSTALL 3" BARK MULCH IN SHRUB BEDS, TYP.
3. INSTALL 6" TOP SOIL IN SEEDED AREAS, TYP.
4. BASIN B. INSTALL 12" WATER QUALITY FACILITY MEDIUM IN BASIN.

SEE SHEET L101 FOR WATER QUALITY PLANTING SCHEDULE & NOTES

SEE SHEET L100 FOR PLANTING SCHEDULE & NOTES

SCALE: 1" = 20'

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OREGON
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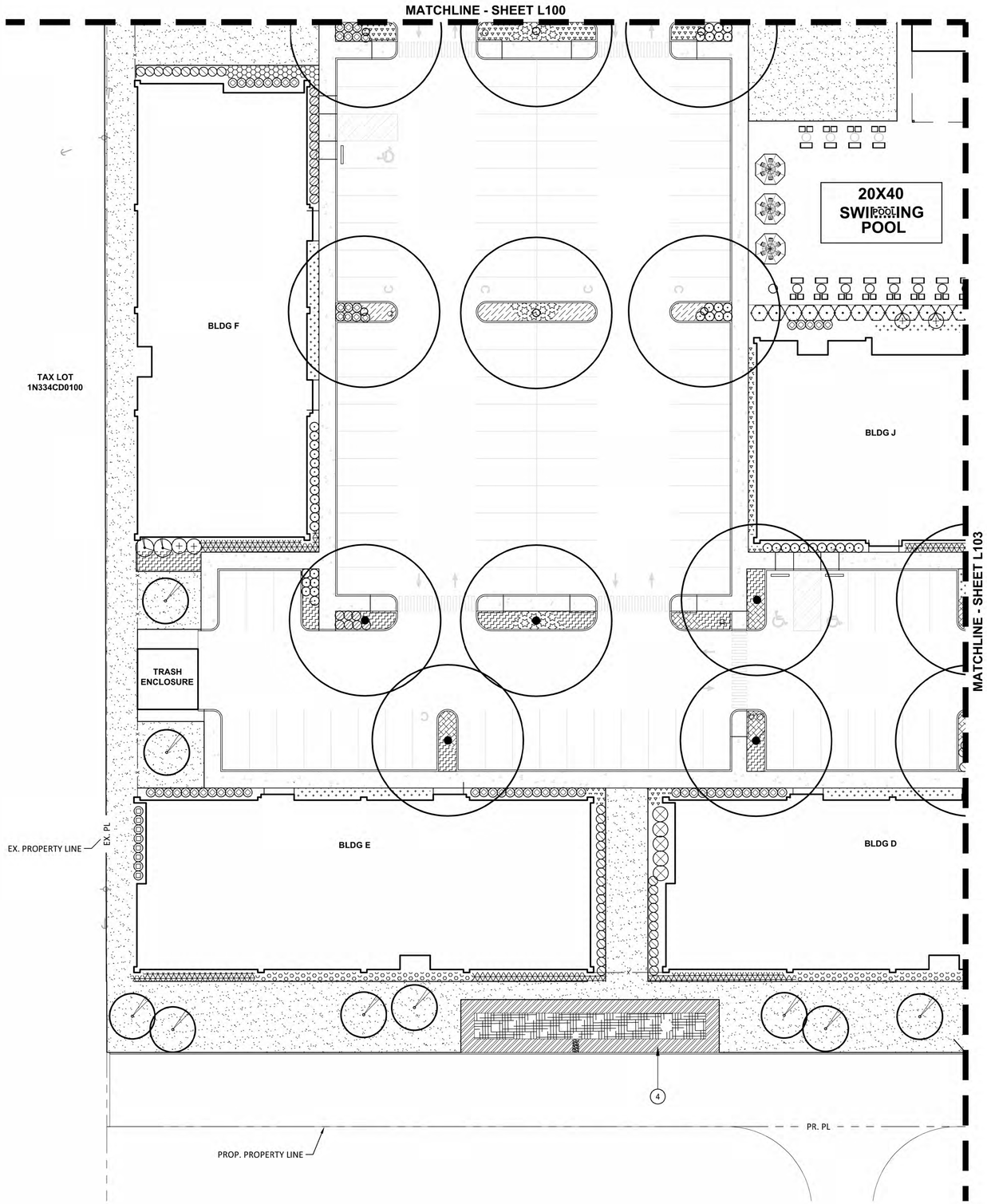
PLANTING PLAN

Date 5/28/2025
Drawn HHPR
Checked HHPR

L102

As indicated

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CONSTRUCTION NOTES:

1. INSTALL 12" TOP SOIL IN PLANTER BEDS, TYP.
2. INSTALL 3" BARK MULCH IN SHRUB BEDS, TYP.
3. INSTALL 6" TOP SOIL IN SEEDED AREAS, TYP.
4. BASIN D. INSTALL 12" WATER QUALITY FACILITY MEDIUM IN BASIN.

SEE SHEET L101 FOR WATER QUALITY PLANTING SCHEDULE & NOTES

SEE SHEET L100 FOR PLANTING SCHEDULE & NOTES

N

0 10 20 40

SCALE: 1" = 20'

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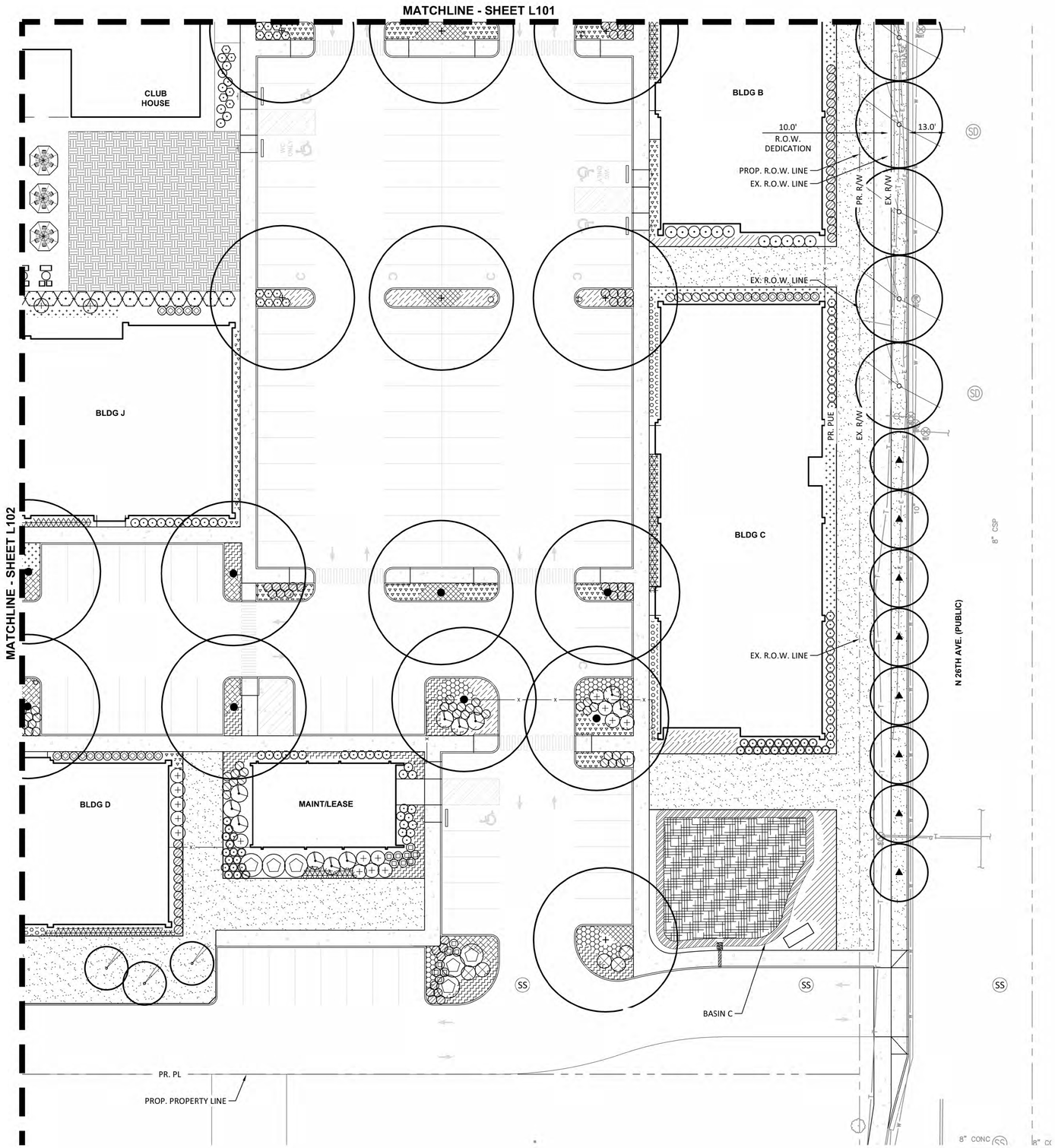
PLANTING PLAN

Date 5/28/2025
Drawn HHPR
Checked HHPR

L103

As indicated

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CONSTRUCTION NOTES:

1. INSTALL 12" TOP SOIL IN PLANTER BEDS, TYP.
2. INSTALL 3" BARK MULCH IN SHRUB BEDS, TYP.
3. INSTALL 6" TOP SOIL IN SEEDED AREAS, TYP.
4. BASIN C. INSTALL 12" WATER QUALITY FACILITY MEDIUM IN BASIN.

SEE SHEET L101 FOR WATER QUALITY PLANTING SCHEDULE & NOTES

SEE SHEET L100 FOR PLANTING SCHEDULE & NOTES

0 10 20 40
SCALE: 1" = 20'

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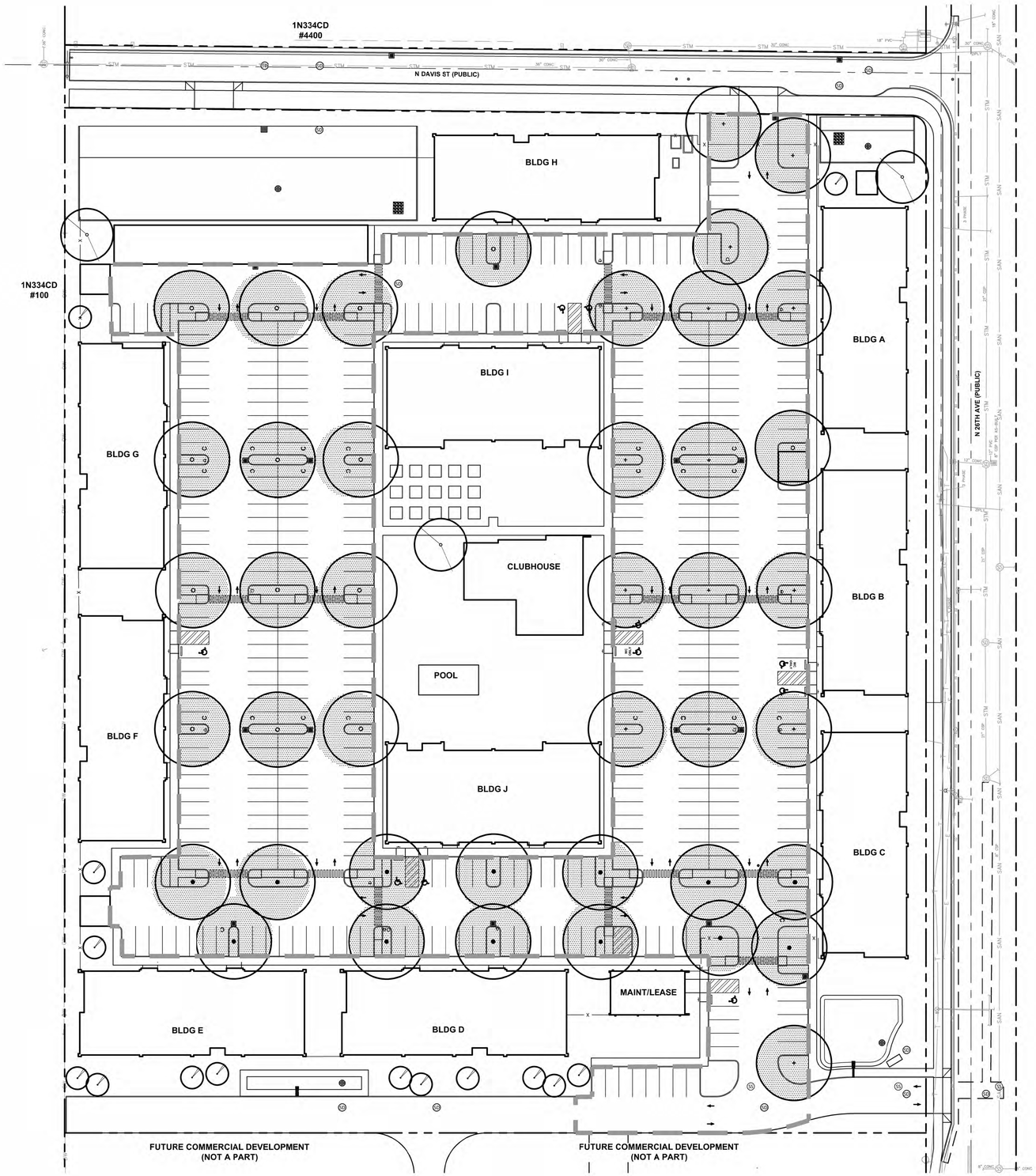
PLANTING PLAN

Date 5/28/2025
Drawn HHPR
Checked HHPR

L104

As indicated

4/23/2025 8:13:40 PM



NOTES

PARKING LOT AREA	165,293 SF
REQUIRED CANOPY COVERAGE	66,117 SF (40%)
CANOPY PROVIDED	67,142 SF (40%)

LEGEND

JEFFERSON ELM
-60' H X 50 W AT MATURITY*
-6' MIN. PLANTER*

RIVERS PURPLE BEACH
-60' H X 50 W AT MATURITY*
-6' MIN. PLANTER*

SWAMP OAK
-60' H X 50 W AT MATURITY*
-6' MIN. PLANTER*

*PER CITY OF PORTLAND
STREET TREE GUIDE

SHADE WITH PARKING LOT AREA

PARKING AREA LIMITS

0 20' 40' 80'
SCALE: 1" = 40'

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PARKING LOT SHADE PLAN

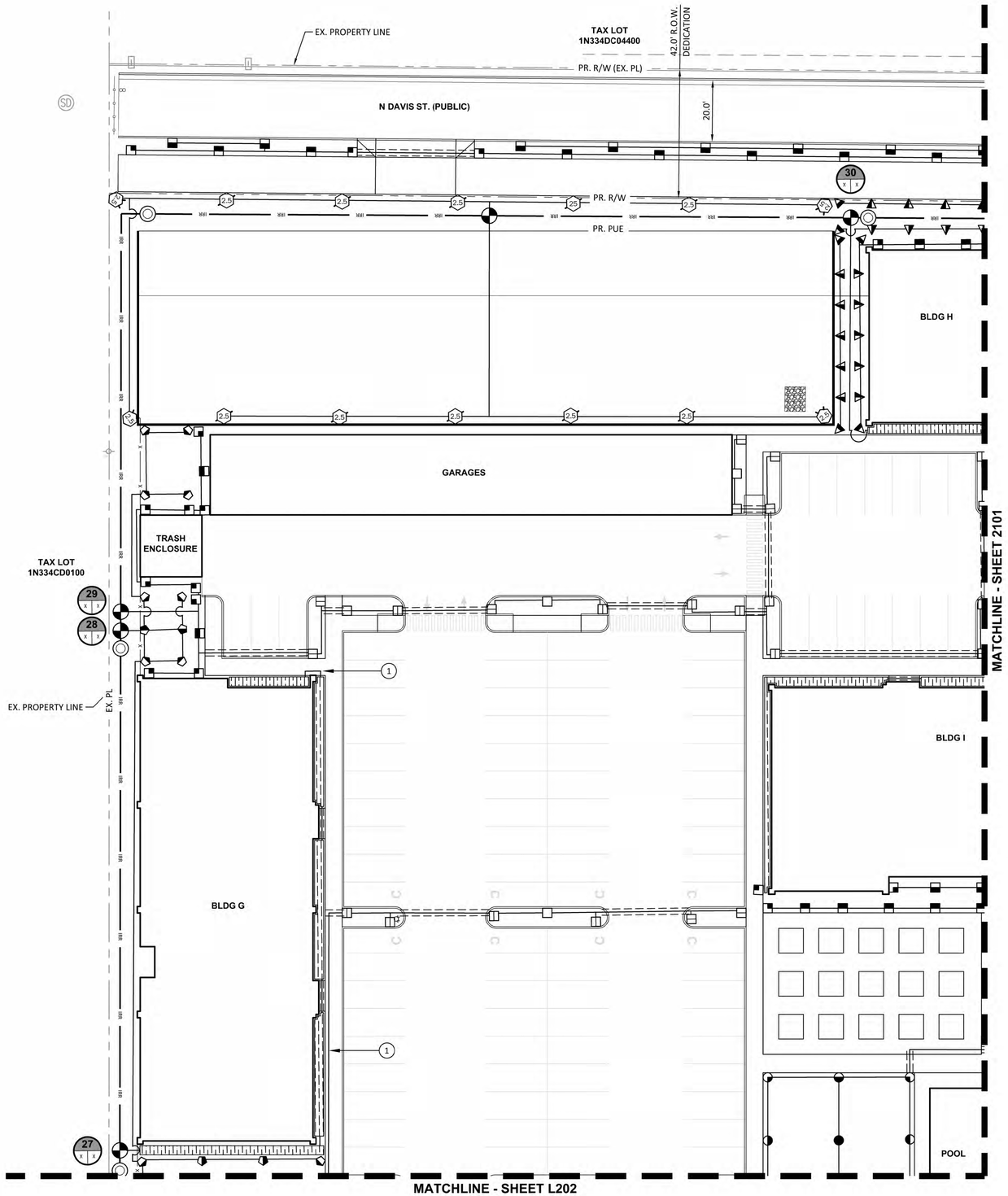
Date 5/28/2025
Drawn HHPR
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L105

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CONSTRUCTION NOTES:

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IRRIGATION LEGEND

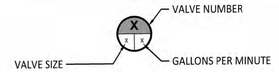
EQUIPMENT

SYMBOL	DESCRIPTION
	BACKFLOW PREVENTER - FEBCO MODEL 850 Y, 2" OR APPROVED EQ.
	BALL VALVE - NIBCO T-560 OR APPROVED EQUAL.
	REMOTE CONTROL VALVE - HUNTER ICV OR APPVD EQ, SIZE AS SHOWN REMOTE CONTROL VALVE
	QUICK COUPLER - HUNTER HQ3 OR APPROVED EQUAL.
C	CONTROLLER - HUNTER HCC EXPANDED TO 48 STATIONS. TWO WIRE SYSTEM. RAIN CLIK RAIN SENSOR. # STATIONS. LOCATION TO BE APPROVED BY OWNER. INSTALL IN HUNTER SS PEDESTAL.

PIPE

IRR	MAINLINE - 2 1/2" SCH. 40 PVC
	SLEEVING - 4" SLEEVE FOR PIPES < 2", 6" SLEEVE FOR PIPES 2.5"-4"
	LATERAL LINE - .75", CLASS 200 PVC
	LATERAL LINE - 1.0", 1.25" & 1.5" CLASS 200 PVC
#	LATERAL LINE - SIZE AS INDICATED, CLASS 200 PVC
	DRIPLINE - HUNTER HDL SUB SURFACE DRIPLINE IN SHRUB ZONES. ECO MAT IN LAWN ZONES.

VALVE ZONE KEY



HEAD SCHEDULE

SYMBOL	DESCRIPTION	PSI	RADIUS	GPM
	HUNTER PRS30 HEADS W/ PRO-SPRAY NOZZLES			
	PROS-PRS30-5 (F, H & Q)	30	5'	.47, .23, .12
	PROS-PRS30-8 (F, H & Q)	30	8'	.97, .47, .24
	PROS-PRS30-10 (F, H & Q)	30	10'	1.59, .88, .42
	PROS-PRS30-12 (F, H & Q)	30	12'	2.70, 1.30, .67
	PROS-PRS30-15 (F, H & Q)	30	15'	3.75, 1.86, .97
	PROS-PRS30-STRIP (SS, RCS & LCS)	30	5'X30', 5'X15'	1.30, .65
	HUNTER MPR40 HEADS W/ MP ROTATOR NOZZLES			
	MPSS530, MPLCS515 & MPRCS515	40	5X30', 5'X15'	.44, .22
	MP1000 (360, 180, 90)	40	8'-15'	.75, .37, .19
	MP2000 (360, 180, 90)	40	13'-21'	1.47, .74, .40
	MP3000 (360, 180, 90)	40	22'-30'	3.64, 1.82, .86
	HUNTER ROTORS			
	PGP-ADG-BLUE NOZZLE ROTORS (360°, 180°, 45°)	45	31'-44'	1.5-8.0

0 10 20 40
SCALE: 1" = 20'

SEE SHEET L203 FOR IRRIGATION GENERAL NOTES

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Jeffery P. Creel
OREGON
LANDSCAPE ARCHITECT
EXPIRES: 05/31/26

No.	Date

HANEY MULTIFAMILY
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Cornelius, OR 97113

HHPR #

Project Status

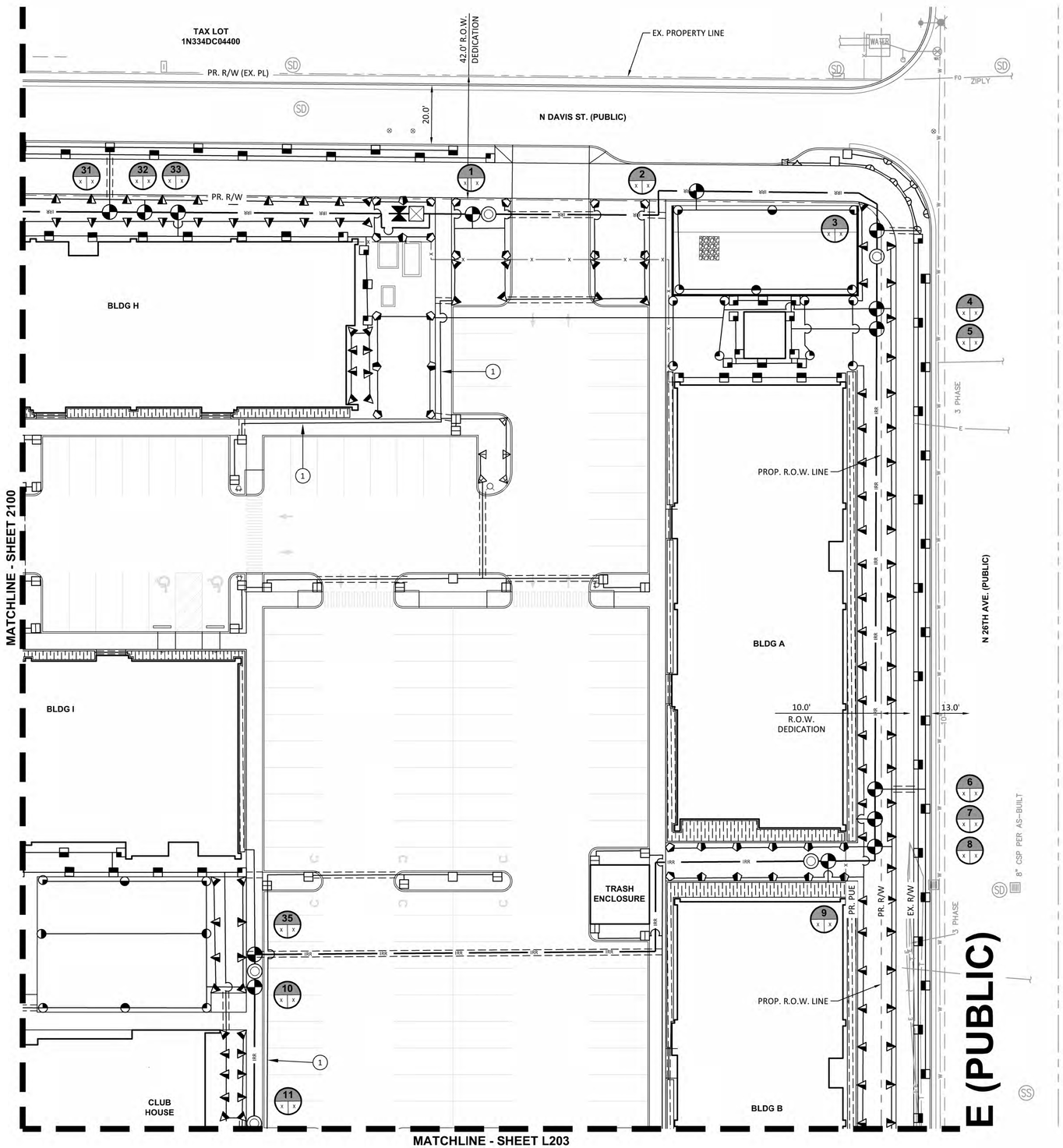
IRRIGATION PLAN

Date 5/28/2025
Drawn HHPR
Checked HHPR

L200

As indicated

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CONSTRUCTION NOTES:

1. IRRIGATION LATERALS AND MAINLINE PIPE SHOW OUTSIDE OF PLANTING AREAS FOR CLARIFICATION ONLY. PLACE LATERAL AND MAINLINE PIPE IN PLANTER AREAS UNLESS IRRIGATION SLEEVES ARE SHOWN.
2. POINT OF CONNECTION: PROPOSED DOMESTIC WATER LINE (SEE CIVIL DRAWINGS)

IRRIGATION LEGEND

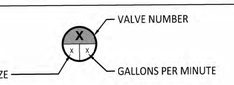
EQUIPMENT

SYMBOL	DESCRIPTION
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	BALL VALVE - NIBCO T-560 OR APPROVED EQUAL.
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	QUICK COUPLER - HUNTER HQ3 OR APPROVED EQUAL.
C	CONTROLLER - HUNTER HCC EXPANDED TO 48 STATIONS. TWO WIRE SYSTEM. RAIN CLIK RAIN SENSOR. # STATIONS. LOCATION TO BE APPROVED BY OWNER. INSTALL IN HUNTER SS PEDESTAL.

PIPE

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	LATERAL LINE - 1.0", 1.25" & 1.5" CLASS 200 PVC
6"	LATERAL LINE - SIZE AS INDICATED, CLASS 200 PVC
	DRIPLINE - HUNTER HDL SUB SURFACE DRIPLINE IN SHRUB ZONES.

VALVE ZONE KEY



HEAD SCHEDULE

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SCALE: 1" = 20'

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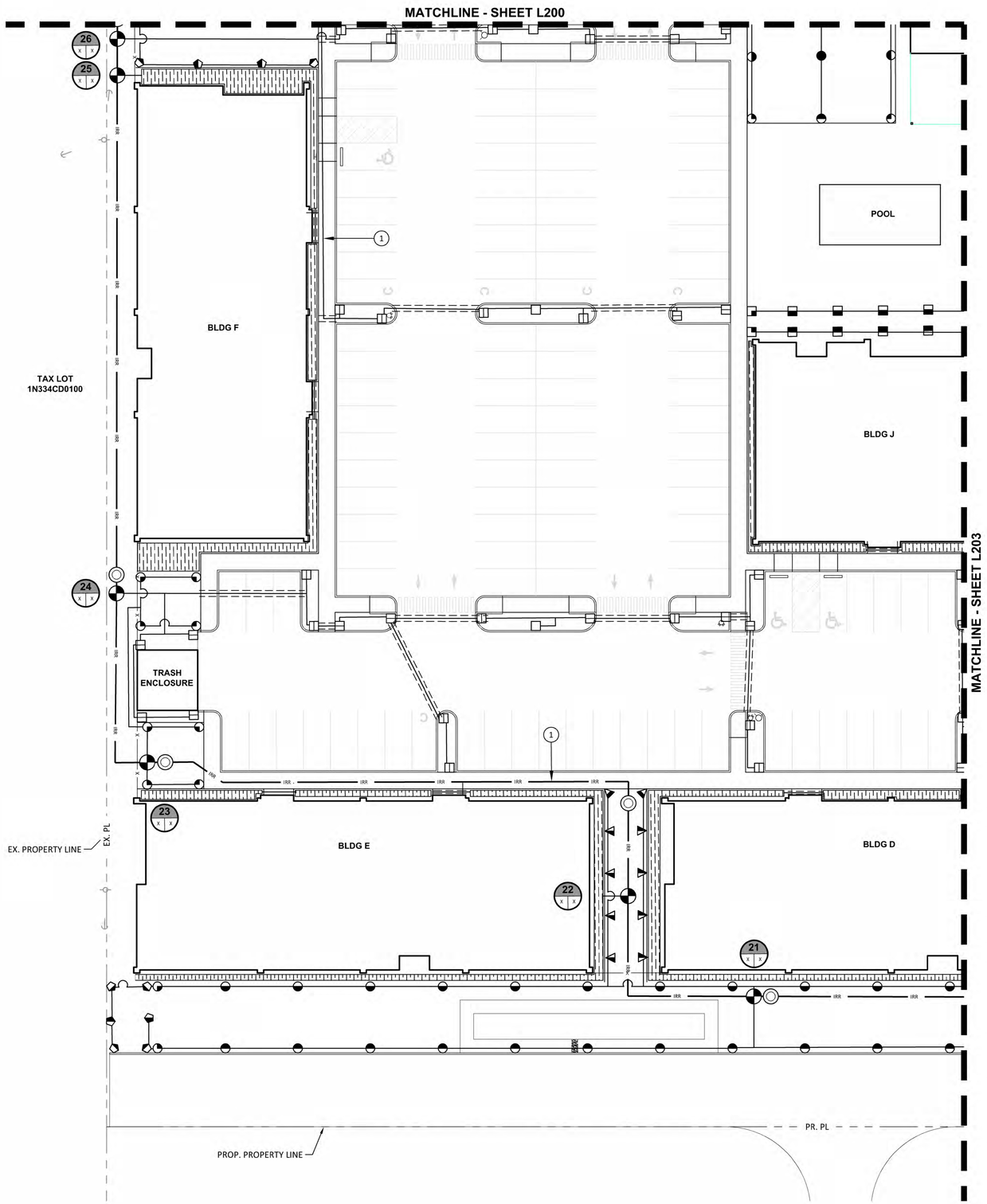
IRRIGATION PLAN

Date 5/28/2025
Drawn HHPR
Checked HHPR

L201

As indicated

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CONSTRUCTION NOTES:

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IRRIGATION LEGEND

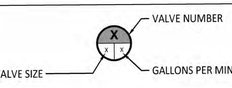
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PIPE

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	LATERAL LINE - 1.0", 1.25" & 1.5" CLASS 200 PVC
6"	LATERAL LINE - SIZE AS INDICATED, CLASS 200 PVC
	DRIPLINE - HUNTER HDL SUB SURFACE DRIPLINE IN SHRUB ZONES.

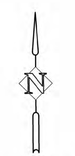
VALVE ZONE KEY



HEAD SCHEDULE

SYMBOL	DESCRIPTION	PSI	RADIUS	GPM
	HUNTER PRS30 HEADS W/ PRO-SPRAY NOZZLES			
	PROS-PRS30-5 (F, H & Q)	30	5'	.47, .23, .12
	PROS-PRS30-8 (F, H & Q)	30	8'	.97, .47, .24
	PROS-PRS30-10 (F, H & Q)	30	10'	1.59, .88, .42
	PROS-PRS30-12 (F, H & Q)	30	12'	2.70, 1.30, .67
	PROS-PRS30-15 (F, H & Q)	30	15'	3.75, 1.86, .97
	PROS-PRS30-STRIP (SS, RCS & LCS)	30	5'X30', 5'X15'	1.30, .65
	HUNTER MPR40 HEADS W/ MP ROTATOR NOZZLES			
	MPSS530, MPLCS515 & MPRCS515	40	5X30', 5'X15'	.44, .22
	MP1000 (360, 180, 90)	40	8'-15'	.75, .37, .19
	MP2000 (360, 180, 90)	40	13'-21'	1.47, .74, .40
	MP3000 (360, 180, 90)	40	22'-30'	3.64, 1.82, .86
	HUNTER ROTORS			
	PGP-ADG-BLUE NOZZLE ROTORS (360°, 180°, 45°)	45	31'-44'	1.5-8.0

SEE SHEET L203 FOR IRRIGATION GENERAL NOTES



0 10 20 40
SCALE: 1" = 20'

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OREGON
LANDSCAPE ARCHITECT
EXPIRES: 05/31/26

No.	Date

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85 N 26th Ave
Cornelius, OR 97113

HHPR #

Project Status

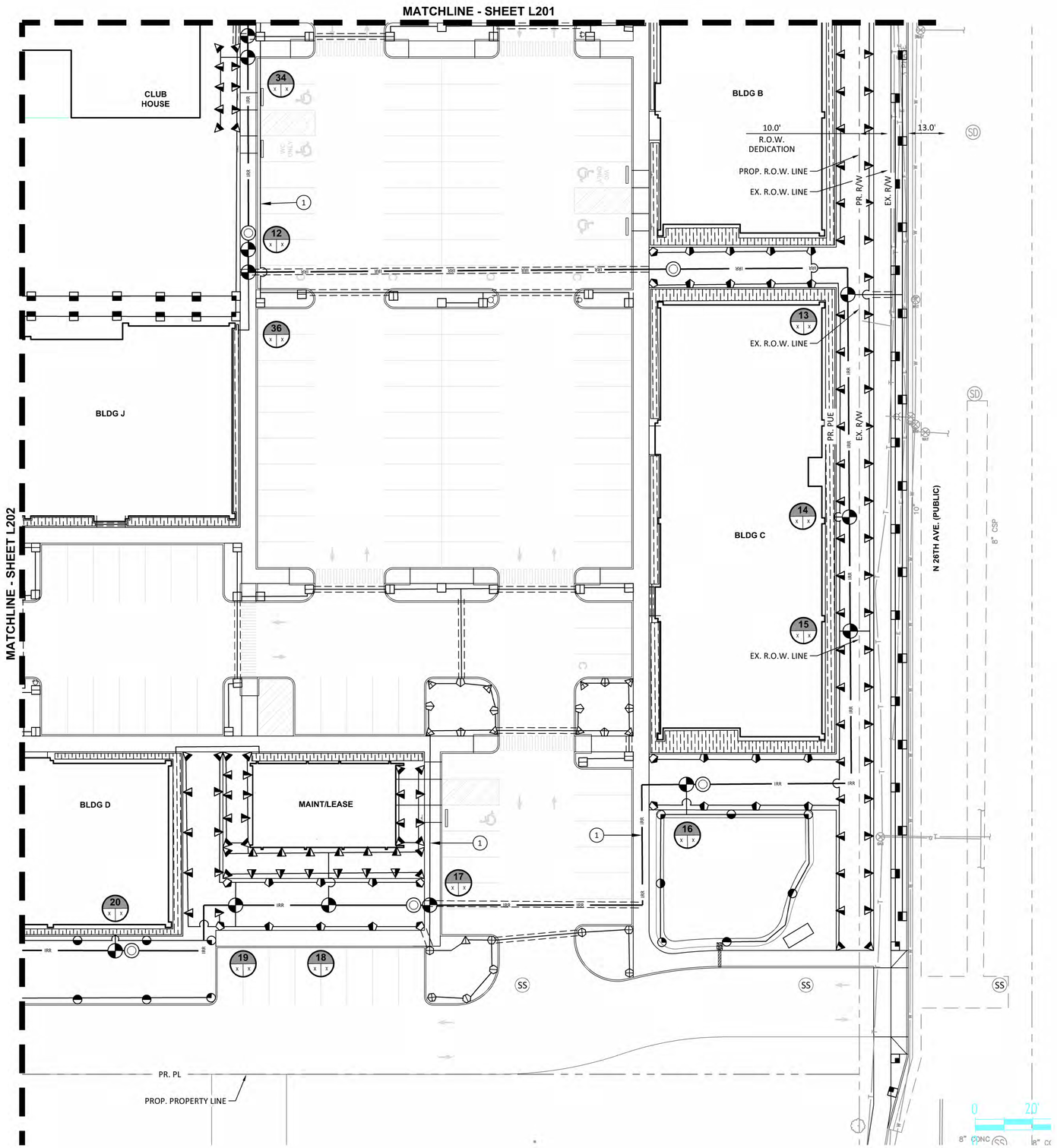
IRRIGATION PLAN

Date 5/28/2025
Drawn HHPR
Checked HHPR

L202

As indicated

4/23/2025 8:13:40 PM



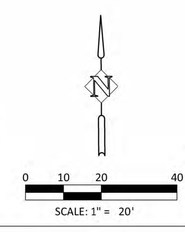
CONSTRUCTION NOTES:

(1) IRRIGATION LATERALS AND MAINLINE PIPE SHOW OUTSIDE OF PLANTING AREAS FOR CLARIFICATION ONLY. PLACE LATERAL AND MAINLINE PIPE IN PLANTER AREAS UNLESS IRRIGATION SLEEVES ARE SHOWN.

IRRIGATION NOTES

1. CONTRACTOR SHALL INSPECT SITE AND VERIFY CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION.
2. IRRIGATION PLANS ARE SCHEMATIC REPRESENTATIONS ONLY. PLACE LINES IN COMMON TRENCH WHENEVER POSSIBLE. FIELD ADJUST LINES TO AVOID CONFLICT WITH UTILITIES.
3. IRRIGATION LATERAL AND MAINLINE PIPE SHOW OUTSIDE OF PLANTING AREAS FOR CLARIFICATION ONLY. PLACE LATERAL AND MAINLINE PIPE IN PLANTER AREAS UNLESS IRRIGATION SLEEVES ARE SHOWN.
4. COORDINATE IRRIGATION WITH PLANTING PLAN AND SITE IMPROVEMENTS AND USE HEAD TO HEAD SPACING. COORDINATE IRRIGATION HEAD LAYOUT WITH NEW PLANT MATERIALS, LOCATE SPRAY HEADS 30" FROM BASE OF TREE. DO NOT ALTER HEAD LOCATION, PIPE LAYOUT, OR VALVE LOCATION WITHOUT WRITTEN APPROVAL FROM CONSTRUCTION MANAGER. NOTIFY OWNER'S REPRESENTATIVE IF DISCREPANCIES OCCUR BETWEEN PLANS AND FIELD CONDITIONS.
5. ALL COMPONENTS OF IRRIGATION SYSTEM SHALL BE INSTALLED AND PROPERLY ADJUSTED TO PROVIDE ADEQUATE COVERAGE AND MINIMIZATION OF OVER-SPRAY ONTO WALKS, BUILDINGS, PARKING AREAS, ETC.
6. ALL PIPE SIZES INDICATED ARE MINIMUMS. CONTRACTOR MAY NOT DECREASE PIPE SIZE. LARGER PIPE SIZES MAY BE USED AT NO ADDITIONAL COST TO OWNER.
7. INSTALL ALL IRRIGATION PIPE AND CONTROL WIRES IN MINIMUM 4" PVC SLEEVE BELOW ALL PAVED SURFACES UNLESS OTHERWISE INDICATED ON PLANS. INSTALL SLEEVES PRIOR TO PLACEMENT OF PAVEMENTS AND PAVEMENT SUB-BASE.
8. COORDINATE IRRIGATION POINTS OF CONNECTION AND LOCATION OF AUTOMATIC CONTROL VALVES WITH PROJECT MANAGER. COORDINATE ALL WORK WITH OTHER TRADES, I.E. ELECTRICAL, MASONRY, ETC.
9. CONTRACTOR TO PROGRAM AUTOMATIC CONTROLLER TO ALLOW FOR EQUIVALENT OF 1" OF WATER PER WEEK, OR PER SITE AND PLANTING NEEDS FOR BEST PLANT HEALTH.
10. ALL PIPES SHALL BE TRENCHED. PROVIDE POSITIVE DRAINAGE OF MAINLINE. PLACE MANUAL DRAIN AT LOW POINTS IN MAINLINE. IDENTIFY LOCATIONS ON AS-BUILTS.
11. USE 45° ELLS INSTEAD OF 90° ELLS ON ALL MAINLINES 2-1/2" AND LARGER. INSTALL CONCRETE THRUST BLOCKS AT ALL MAINLINE CHANGES IN DIRECTION. POUR MINIMUM OF 1 CUBIC FOOT OF CONCRETE ON UNDISTURBED SOIL. WRAP PIPE IN PLASTIC WRAP PRIOR TO COVERING WITH CONCRETE.
12. CONTRACTOR TO INSTALL CONTROLLER AND ACCESSORIES AS REQUIRED. CONTRACTOR TO FURNISH CONTROL WIRES FROM VALVES TO CONTROLLER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING 110 VOLT SERVICE FROM BUILDING AND CONNECTION TO CONTROLLER SERVICE.
13. IRRIGATION SYSTEMS SHALL BE TWO (2) WIRE DECODER CONTROL SYSTEMS UNLESS MULTI-WIRE SYSTEM IS SPECIFIED. CONTRACTOR TO PROVIDE DECODERS FOR EACH REMOTE CONTROL VALVE.
14. ALL SPRINKLER BODIES TO BE 6" POP-UP IN LAWN AREAS AND 12-INCH POP-UP IN SHRUB, GROUNDCOVER AND STORM WATER PLANTER AREAS.

SEE SHEET L200 FOR IRRIGATION LEGEND



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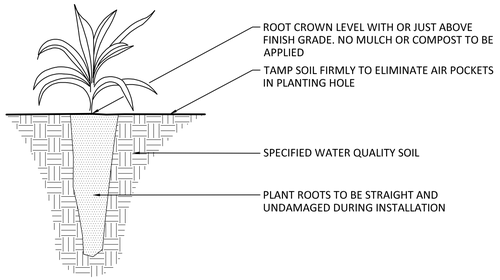
IRRIGATION PLAN

Date 5/28/2025
Drawn HHPR
Checked HHPR

L203

As indicated

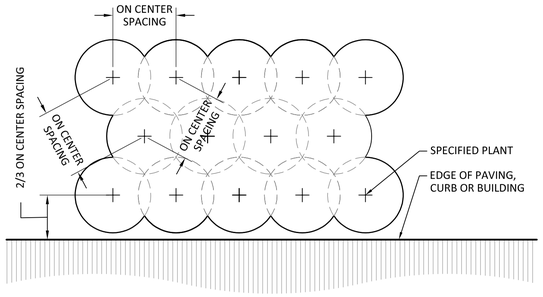
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NOTE:
CREATE PLANTING HOLE BY DRIVING A STEEL SPIKE OR DIBBLE INTO THE GROUND AND WORKING BACK AND FORTH

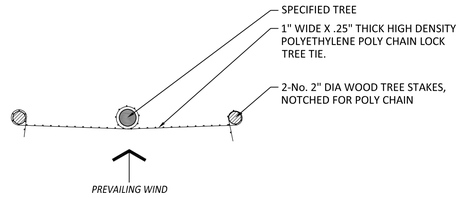
6 PLUG PLANTING
Section — NOT TO SCALE

NOTE:
ON CENTER SPACING SHALL BE AS INDICATED IN PLANTING LEGEND.



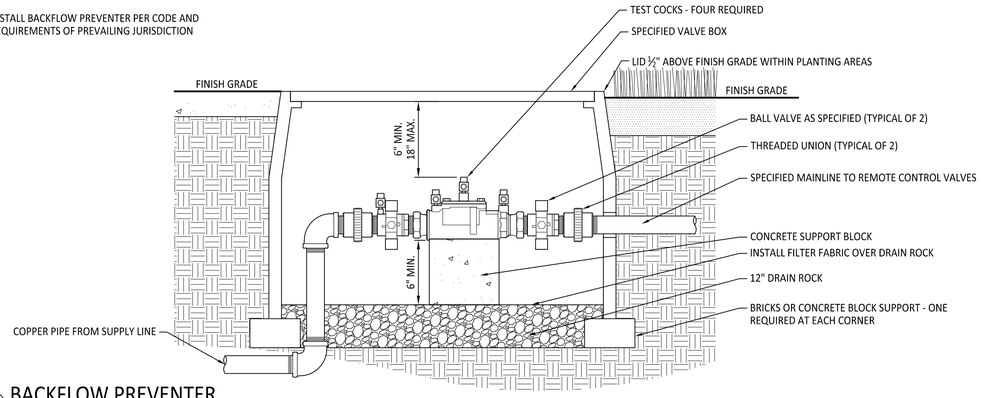
5 TRIANGULAR SPACING
Plan — NOT TO SCALE

NOTE:
WRAP POLY CHAIN AROUND NOTCHED STAKE AND LOCK TO SECURE. WRAP CENTER OF POLY CHAIN AROUND TREE TRUNK TO MOVE 3" IN ALL DIRECTIONS.



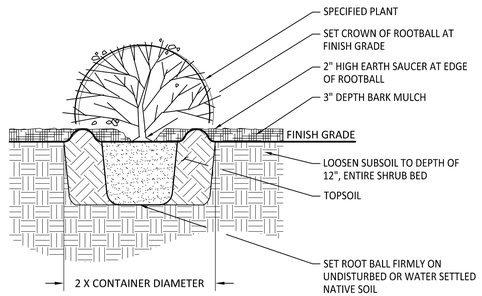
2 TREE STAKING
Section — *NOT TO SCALE*

NOTE:
1. INSTALL BACKFLOW PREVENTER PER CODE AND REQUIREMENTS OF PREVAILING JURISDICTION

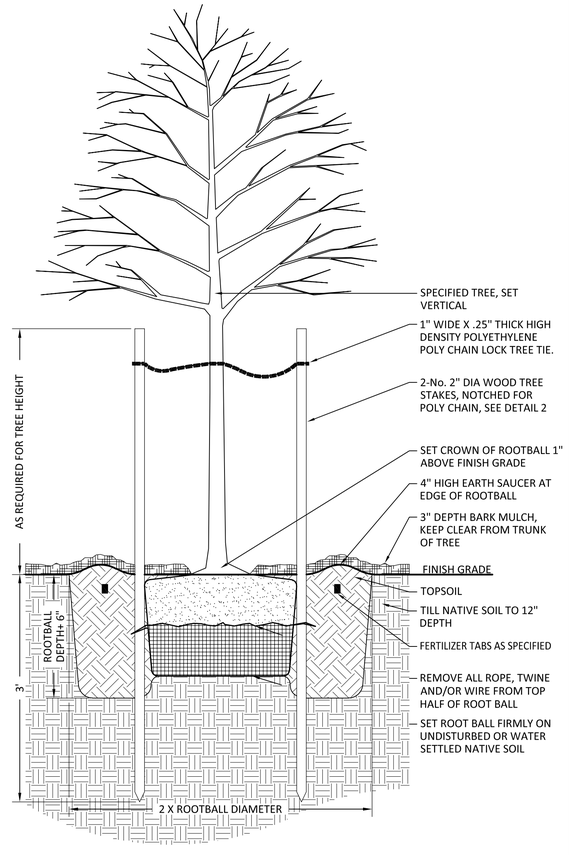


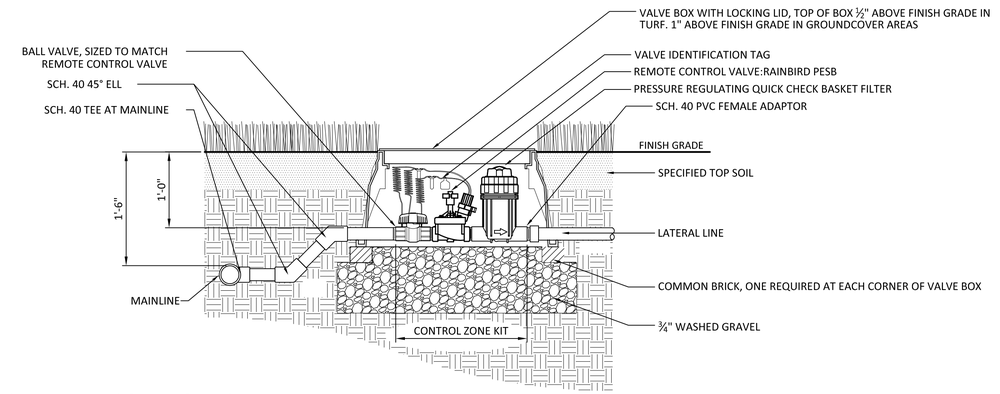
7 BACKFLOW PREVENTER
Section — NOT TO SCALE

NOTE:
PROVIDE 36" DIAMETER MULCH OR COMPOST RING, AS SPECIFIED.

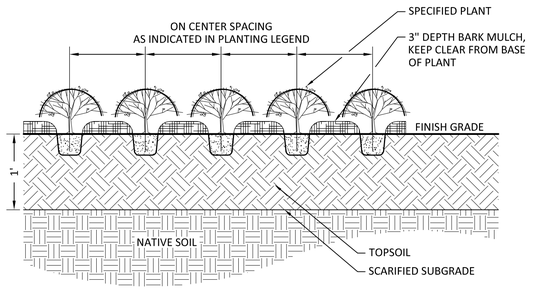


3 SHRUB PLANTING
Section — NOT TO SCALE





8 LANDSCAPE DRIP CONTROL ZONE KIT
Section — 0 .25 .5 1' SCALE: 1" = 12"



4 GROUNDCOVER PLANTING
Section — NOT TO SCALE

1 DECIDUOUS TREE PLANTING
Section — NOT TO SCALE

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LANDSCAPE ARCHITECT
EXPIRES: 05/31/26

No.	Date

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Cornelius, OR 97113

HHPR #

Project Status

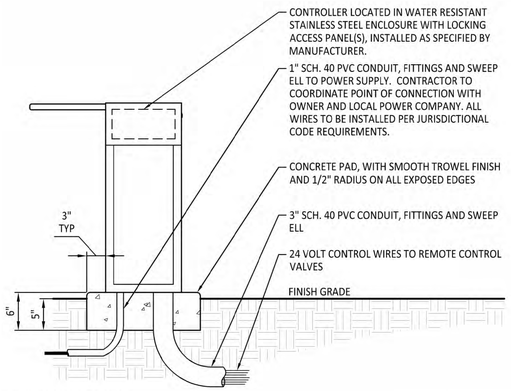
LANDSCAPE DETAILS

Date 5/28/2025
Drawn HHPR
Checked HHPR

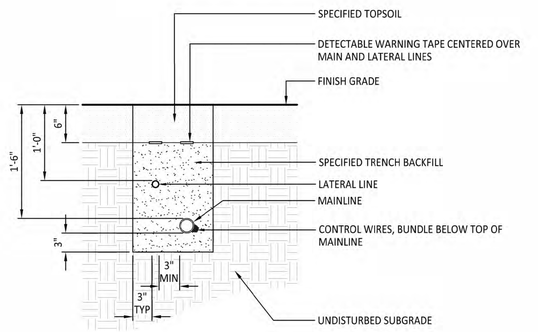
L300

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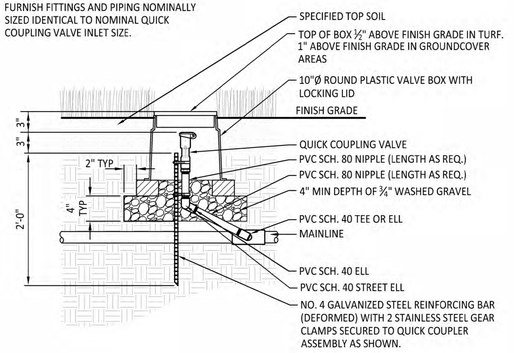


8 CONTROLLER
Section
NOT TO SCALE

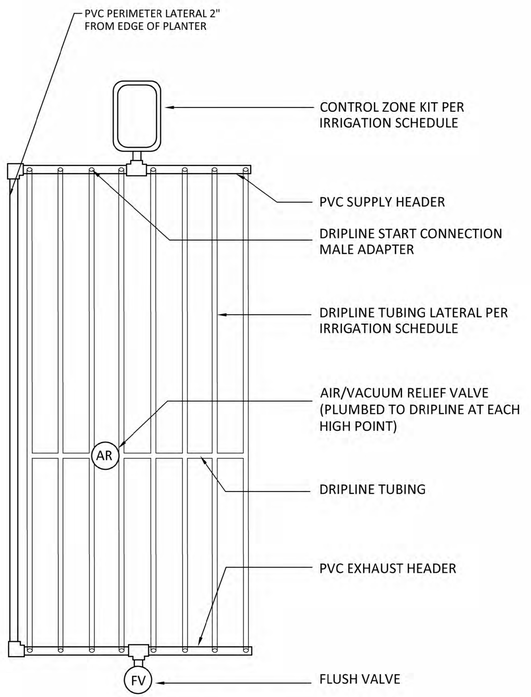


5 TYPICAL TRENCHING
Section
NOT TO SCALE

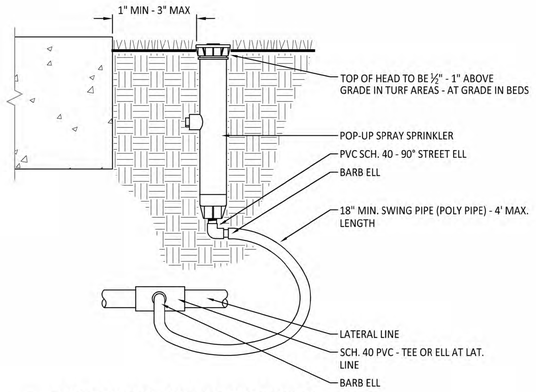
NOTE:
1. FURNISH FITTINGS AND PIPING NOMINALLY SIZED IDENTICAL TO NOMINAL QUICK COUPLING VALVE INLET SIZE.



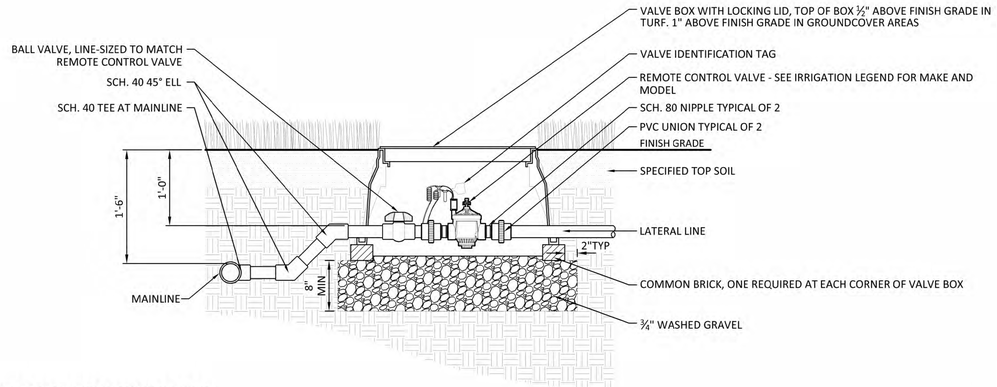
3 QUICK COUPLER
Section
NOT TO SCALE



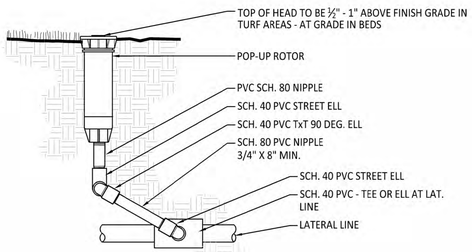
9 TYPICAL DRIPLINE LAYOUT
Section
NTS



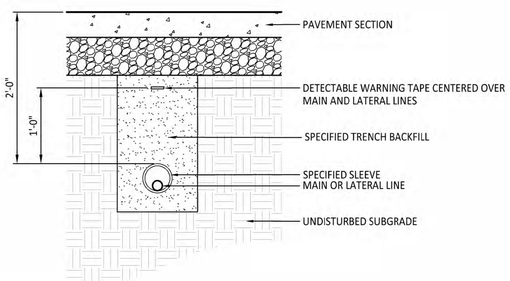
6 12" POP-UP SPRAY SPRINKLER
Section



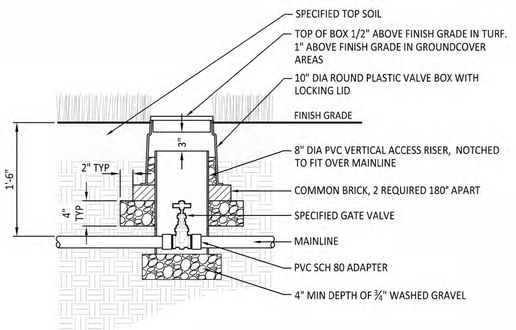
2 REMOTE CONTROL VALVE
Section
0 3" 6" 12"
SCALE: 1" = 12"



7 ROTOR - SWING JOINT ASSEMBLY
Section



4 SLEEVING
Section
NOT TO SCALE



3 ISOLATION VALVE
Section
NOT TO SCALE

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LANDSCAPE DETAILS

Date 5/28/2025
Drawn HHPR
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4/23/2025 8:13:40 PM



1 SITE PLAN
1" = 40'-0"

SITE DATA:

UNIT COUNT = 240

STANDARD PARKING STALLS (9' x 20') = 391 INCLUDES THE FUTURE RESIDENT PARKING STALLS
COMPACT PARKING STALLS (8' x 16') = 24
ADA STALLS (9' x 18') = 10 (VAN-ACCESSIBLE)
FUTURE RESIDENT PARKING STALLS (9' x 20') = 20 (19 STANDARD + 1 ADA)

TOTAL PARKING STALLS = 425

GARAGES (12' x 20') = 14

TOTAL PARKING STALLS AND GARAGES = 439

BIKE STALLS = 120 IN UNITS, 6 NEAR CLUBHOUSE

3 TRASH ENCLOSURES

SWIMMING POOL = 20 FT X 40 FT

CLUBHOUSE = 5722 SF

LEASING OFFICE = 1025 SF

MAINTENANCE = 543 SF

TOTAL BUILDING AREAS = (21,972 SF X 8) + (25,092 SF X 2)
= 225,960 SF

PROPOSED BUILDING HT = 40' 8"

LOT AREA = 539744.40 SF (12.39 ACRES)

LEGEND

- CONCRETE SIDEWALK AND TRASH ENCLOSURE FLOOR
- LAWN
- PLANTINGS
- HEAVY DUTY ASPHALT PAVEMENT
- OUTDOOR USPS MAIL UNDER CLUBHOUSE ROOF
- STORMWATER
- BUILDING ROOF LINE

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ADW #
24012.00

DESIGN REVIEW

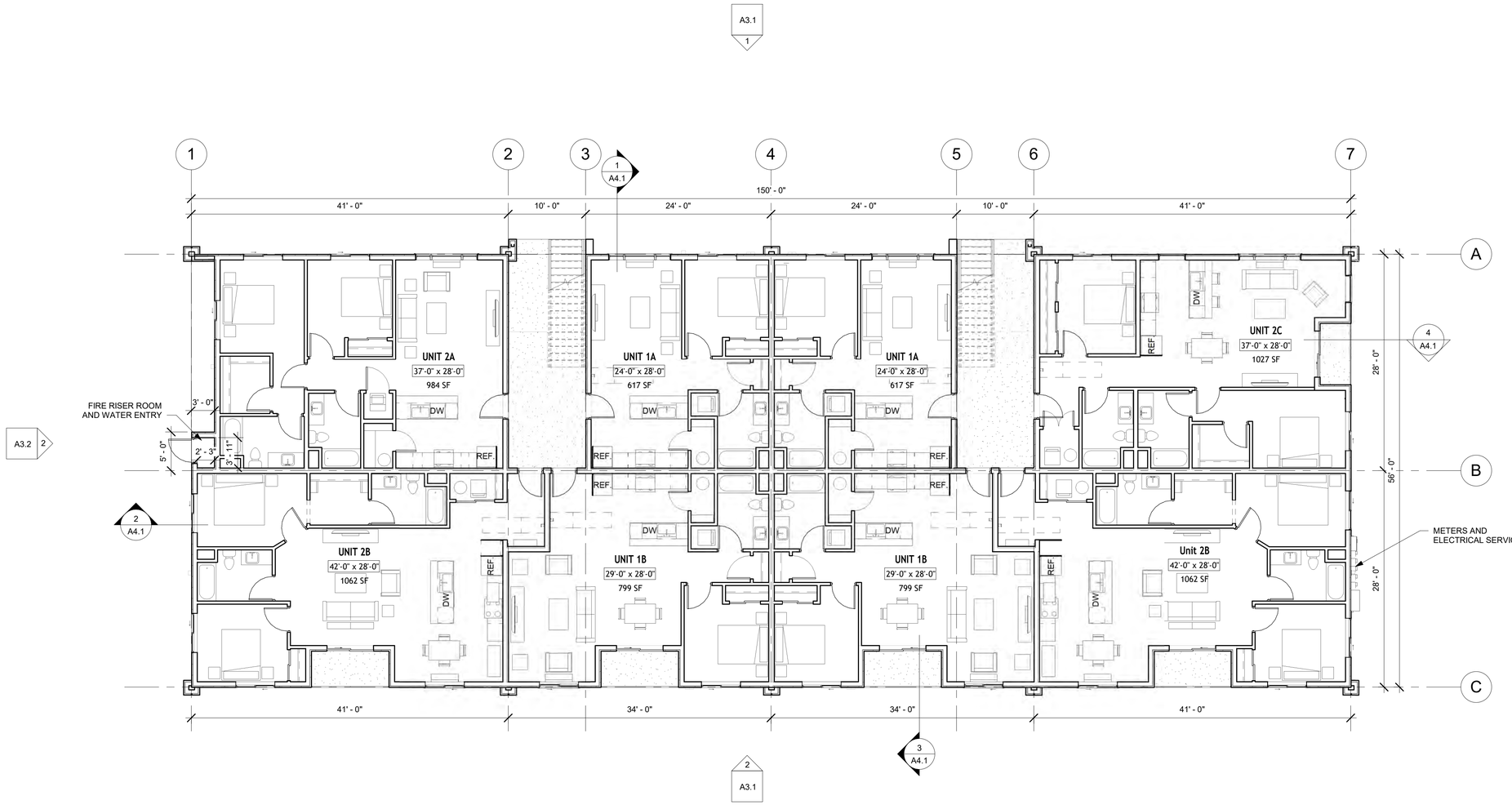
SITE PLAN

Date 7/3/2025 3:03:03 PM
Drawn MD
Checked Checker

A1.0

As indicated

7/3/2025 3:03:03 PM



1 FIRST FLOOR PLAN - BUILDING A
1/8" = 1'-0"

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No.	Date

Haney Apartments

BUILDING TYPE [A]
139 N 26th Ave,
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ADW #
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Design Review

FIRST FLOOR
BUILDING A

Date 6/2/2025 5:30:46 PM
Drawn Author
Checked Checker

A1.1

1/8" = 1'-0"

6/2/2025 5:30:46 PM



1 NORTH ELEVATION - BUILDING A
1/8" = 1'-0"



2 SOUTH ELEVATION - BUILDING A
1/8" = 1'-0"

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ADW #
24012.00

Design Review

NORTH / SOUTH ELEVATIONS

Date 6/2/2025 5:30:49 PM
Drawn Author
Checked Checker

A3.1

1/8" = 1'-0"

6/2/2025 5:30:49 PM



1 EAST ELEVATION - BUILDING A
1/8" = 1'-0"



2 WEST ELEVATION - BUILDING A
1/8" = 1'-0"

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Design Review

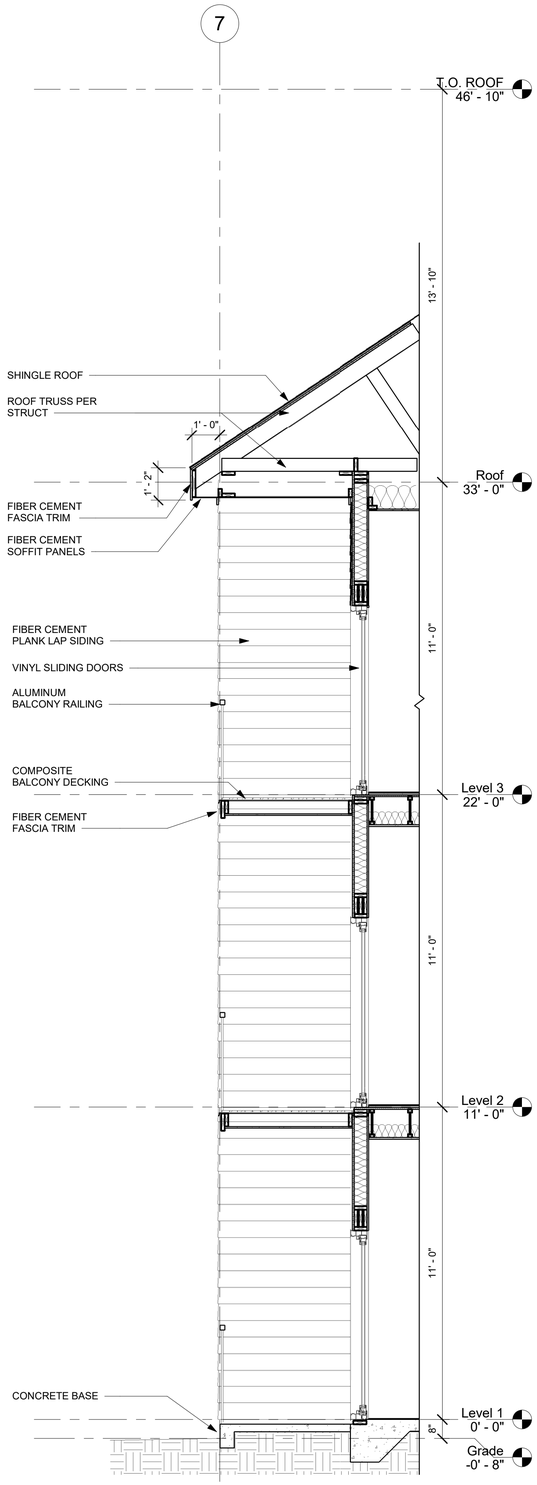
EAST / WEST ELEVATIONS

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Drawn Author
Checked Checker

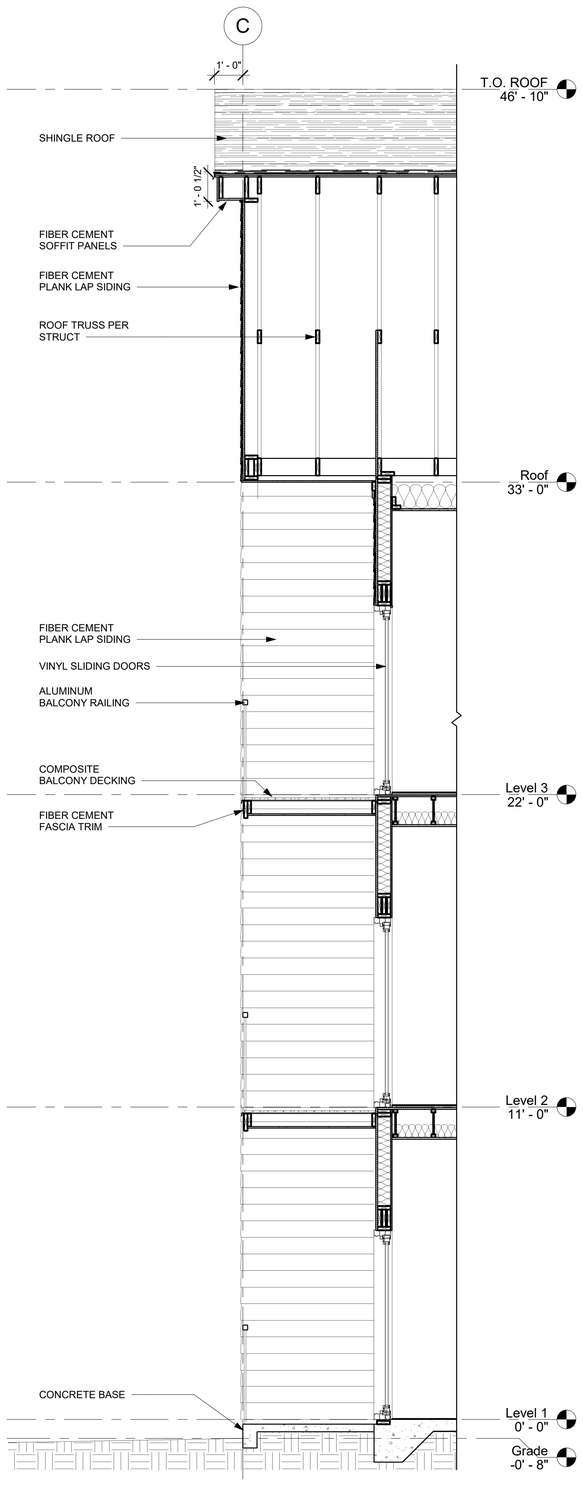
A3.2

1/8" = 1'-0"

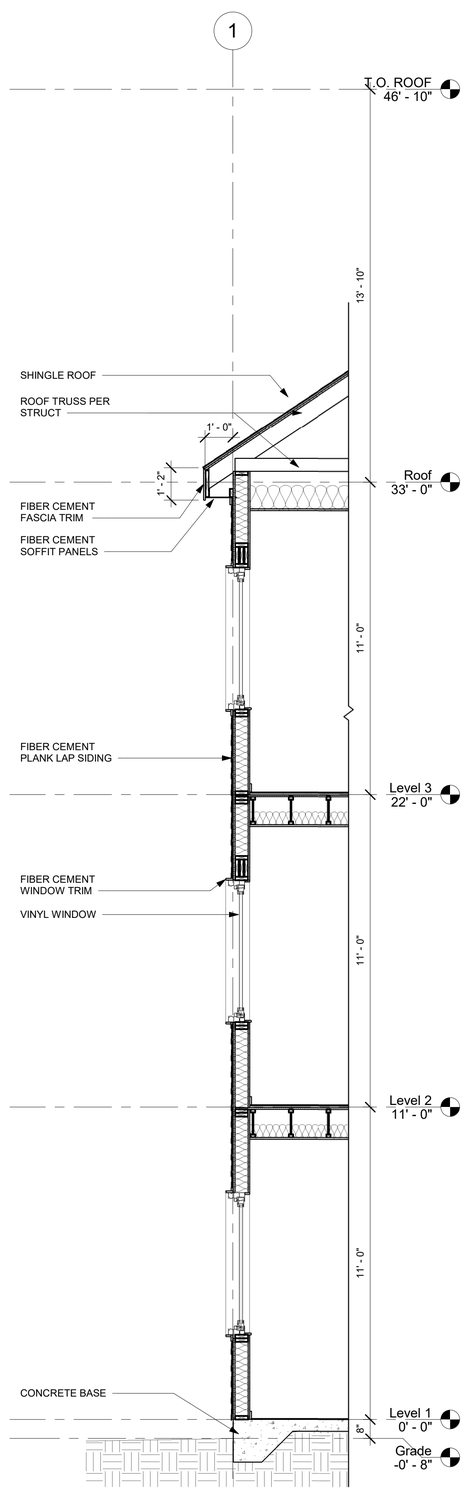
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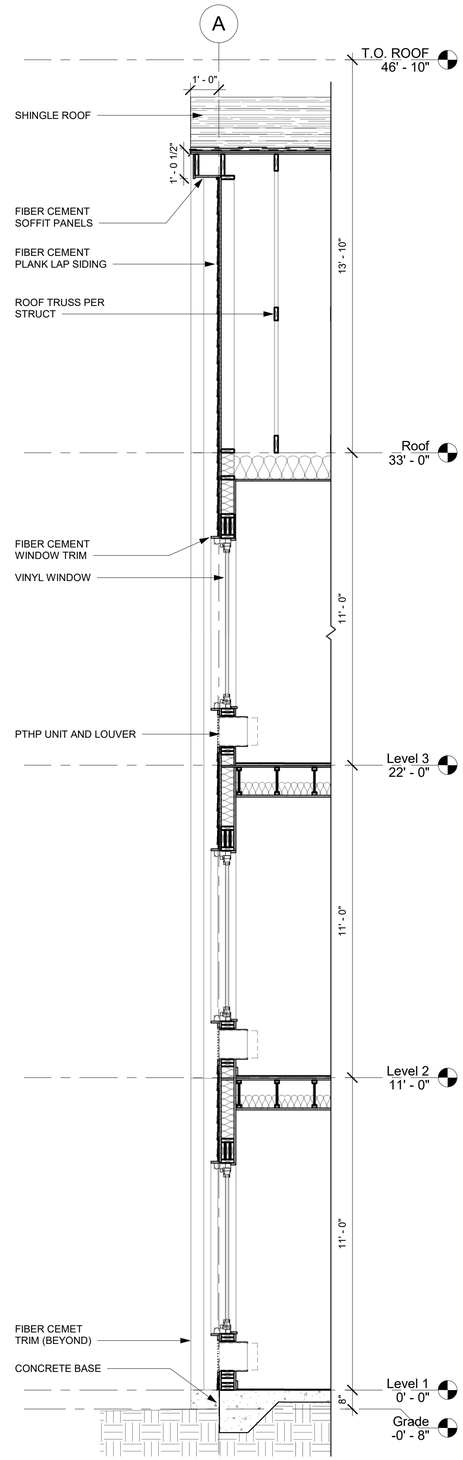
4 TYP SECTION AT E/W BALCONIES
3/8" = 1'-0"



3 TYP SECTION AT N/S BALCONIES
3/8" = 1'-0"



2 TYP SECTION AT E/W ROOF EAVE
3/8" = 1'-0"



1 TYP SECTION AT N/S ROOF RAKE
3/8" = 1'-0"

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Design Review

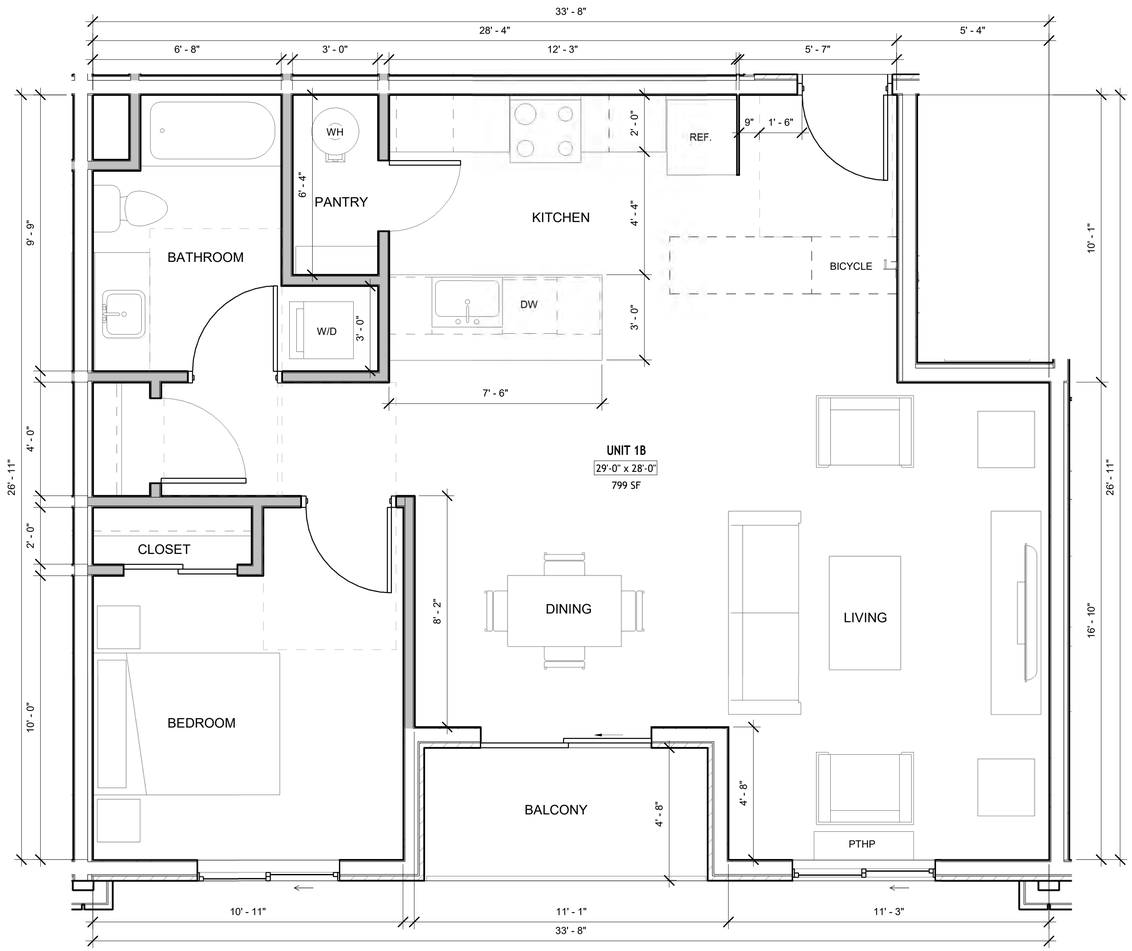
TYPICAL WALL SECTIONS

Date 6/2/2025 5:30:53 PM
Drawn Author
Checked Checker

A4.1

3/8" = 1'-0"

6/2/2025 5:30:53 PM



2 UNIT 1B - ENLARGED PLAN
3/8" = 1'-0"

abbasi design works LLC
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

No.	Date

Haney Apartments
BUILDING TYPE [A]
139 N 26th Ave,
Cornelius, OR 97223

ADW #
24012.00

Design Review

1B ENLARGED UNIT PLAN

Date 6/2/2025 5:30:54 PM
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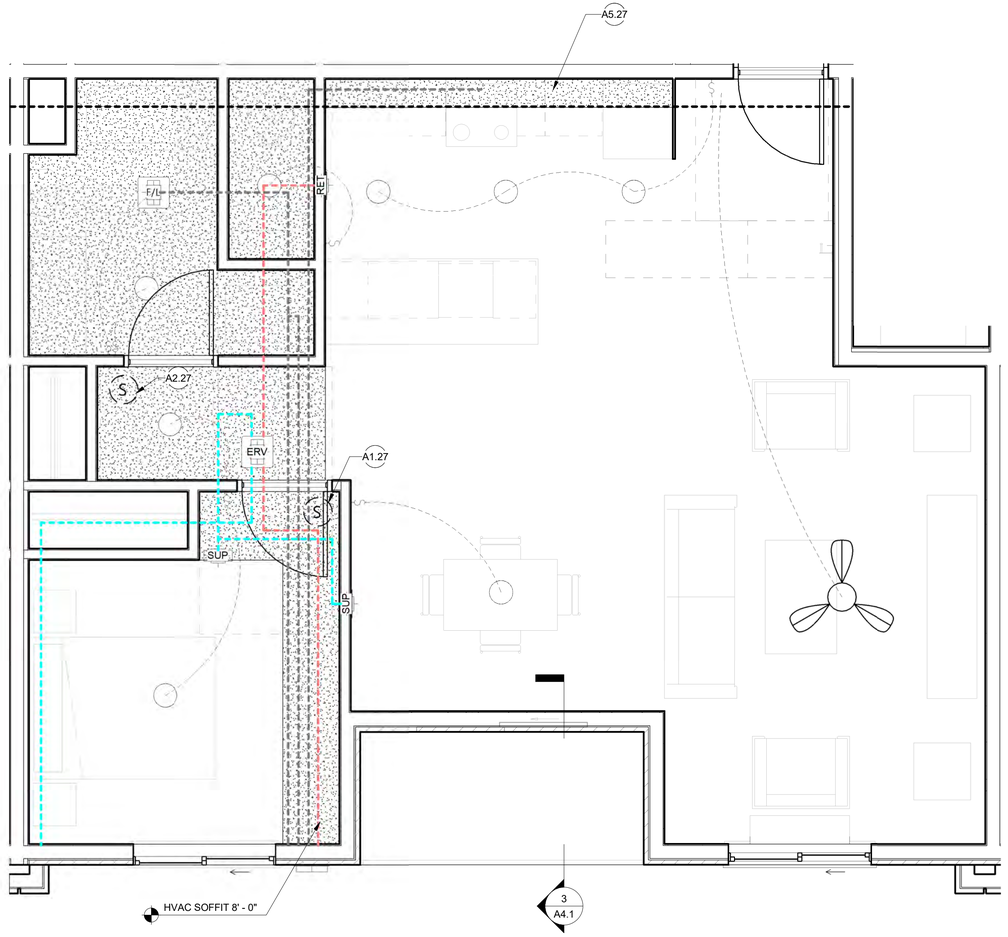
A5.2.1

3/8" = 1'-0"

6/2/2025 5:30:54 PM

KEYNOTES

A1.27	SMOKE DETECTORS / ALARMS TO BE PLACED W/IN EA BEDROOM & OUTSIDE OF EA BEDROOM @ 15'-0" MAX FROM ALL BEDROOM DOORS. ALL SMOKE ALARMS W/IN EA UNIT ARE TO BE INTERCONNECTED SUCH THAT THE ACTIVATION OF ONE ALARM ACTIVATES ALL ALARMS PER SECTION 907.2.11.3 OF THE OREGON FIRE CODE 2014
A2.27	CARBON MONOXIDE ALARMS ARE TO BE LOCATED W/IN EA BEDROOM OR IN DIRECT VICINITY TO BEDROOMS AT A MAX 15'-0" FROM ANY BEDROOM DOOR PER SECTION 908.7.2.1 OF THE OREGON FIRE CODE 2014
A5.27	FINISH FACE OF SOFFIT ABV KITCHENS TO BE 7'-1/2" ABV FINISH FLOOR HT.



1 UNIT 1B - ENLARGED RCP
3/8" = 1'-0"

RCP LEGEND

- FAN / LIGHT COMBO
- HEAVY DUTY JUNCTION BOX W/ BLANK COVER FOR CEILING FAN
- CEILING SURFACE MOUNTED LIGHT FLAT ROUND, 60W-120V
- DUAL SMOKE / C0 DETERCTOR
- FIRE ALARM BEACON
- RESIDENTIAL SPRINKLER
- 1/2" THREAD V2708 PENDENT ON DROP
- 1" THREAD RA1664 SPRINKLER HEAD
- 1" THREAD V3610 SPRINKLER HEAD
- 1" THREAD V2738 SPRINKLER HEAD
- AS BUILT SPRINKLER HEAD REMOVED AND CAPPED
- SINGLE POLE SWITCH
- 3 WAY SWITCH
- CEILING FAN
- SELF ILLUMINATED EXIT SIGN
- CEILING SOFFIT @ 8'-0" ABV FINISH FLOOR, UNLESS OTHERWISE NOTED
- HVAC DUCT PER MECHANICAL PLANS
- SPRINKER PIPE, IN JOISTS, ACROSS UNITS

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No.	Date

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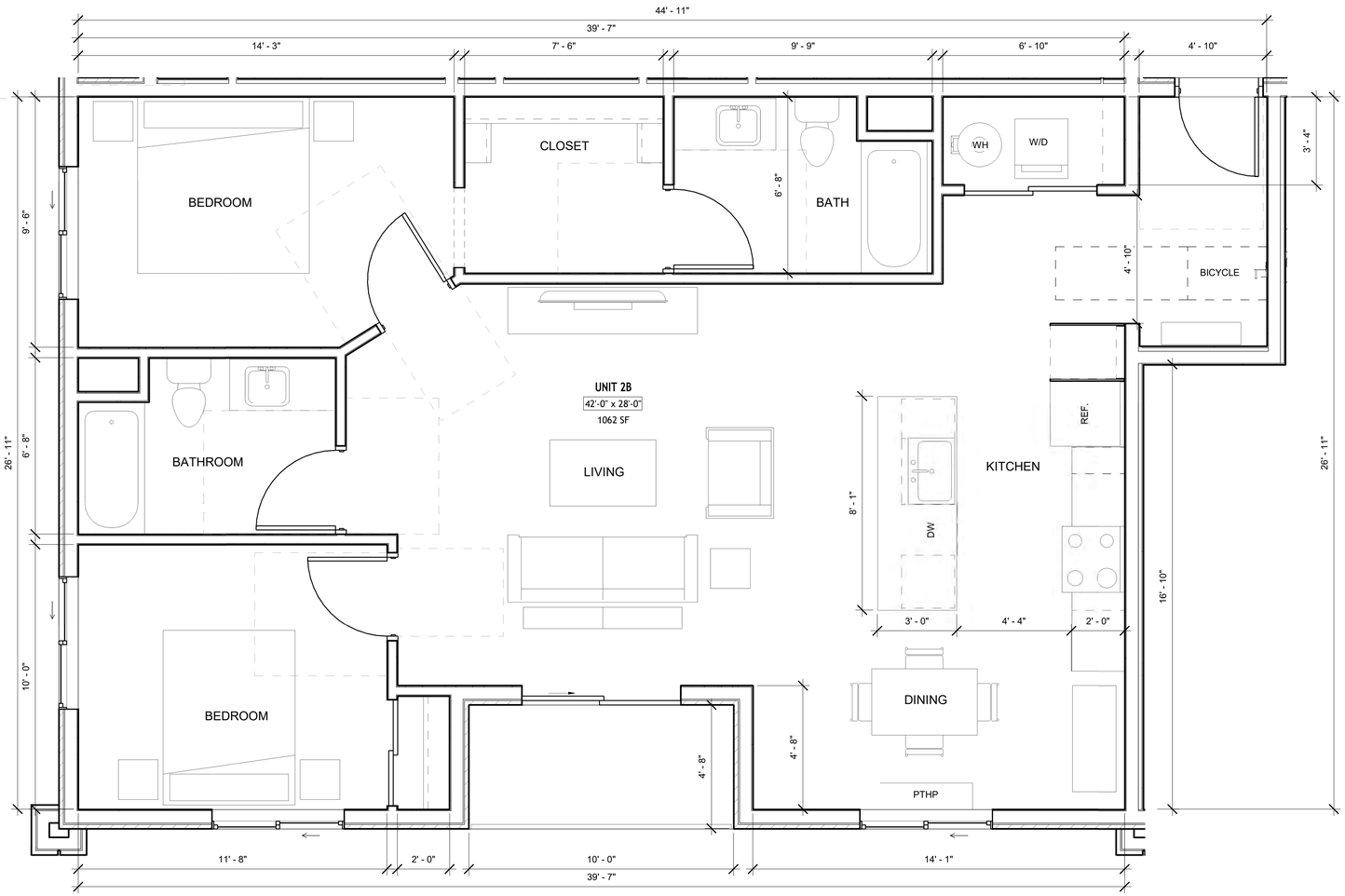
1B ENLARGED UNIT REFLECTED CEILING PLAN

Date 6/2/2025 5:30:55 PM
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A5.2.2

As indicated

6/2/2025 5:30:55 PM



1 UNIT 2B - ENLARGED PLAN
3/8" = 1'-0"

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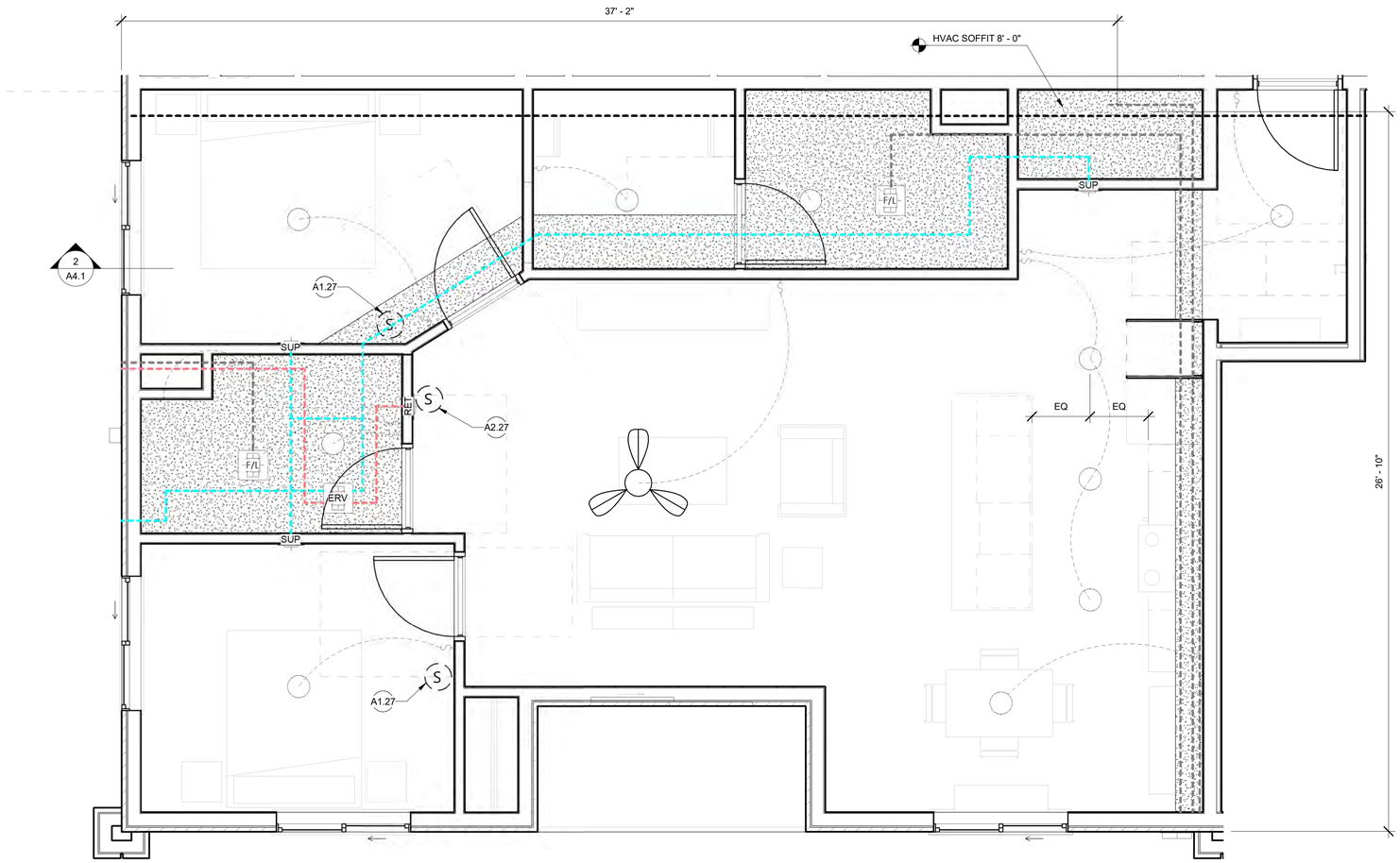
2B ENLARGED UNIT PLAN

Date 6/2/2025 5:30:57 PM
Drawn Author
Checked Checker

A5.4.1

3/8" = 1'-0"

6/2/2025 5:30:57 PM



2 UNIT 3A - ENLARGED RCP
3/8" = 1'-0"

KEYNOTES

A1.27 SMOKE DETECTORS / ALARMS TO BE PLACED W/IN EA BEDROOM & OUTSIDE OF EA BEDROOM @ 15'-0" MAX FROM ALL BEDROOM DOORS. ALL SMOKE ALARMS W/IN EA UNIT ARE TO BE INTERCONNECTED SUCH THAT THE ACTIVATION OF ONE ALARM ACTIVATES ALL ALARMS PER SECTION 907.2.11.3 OF THE OREGON FIRE CODE 2014

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RCP LEGEND

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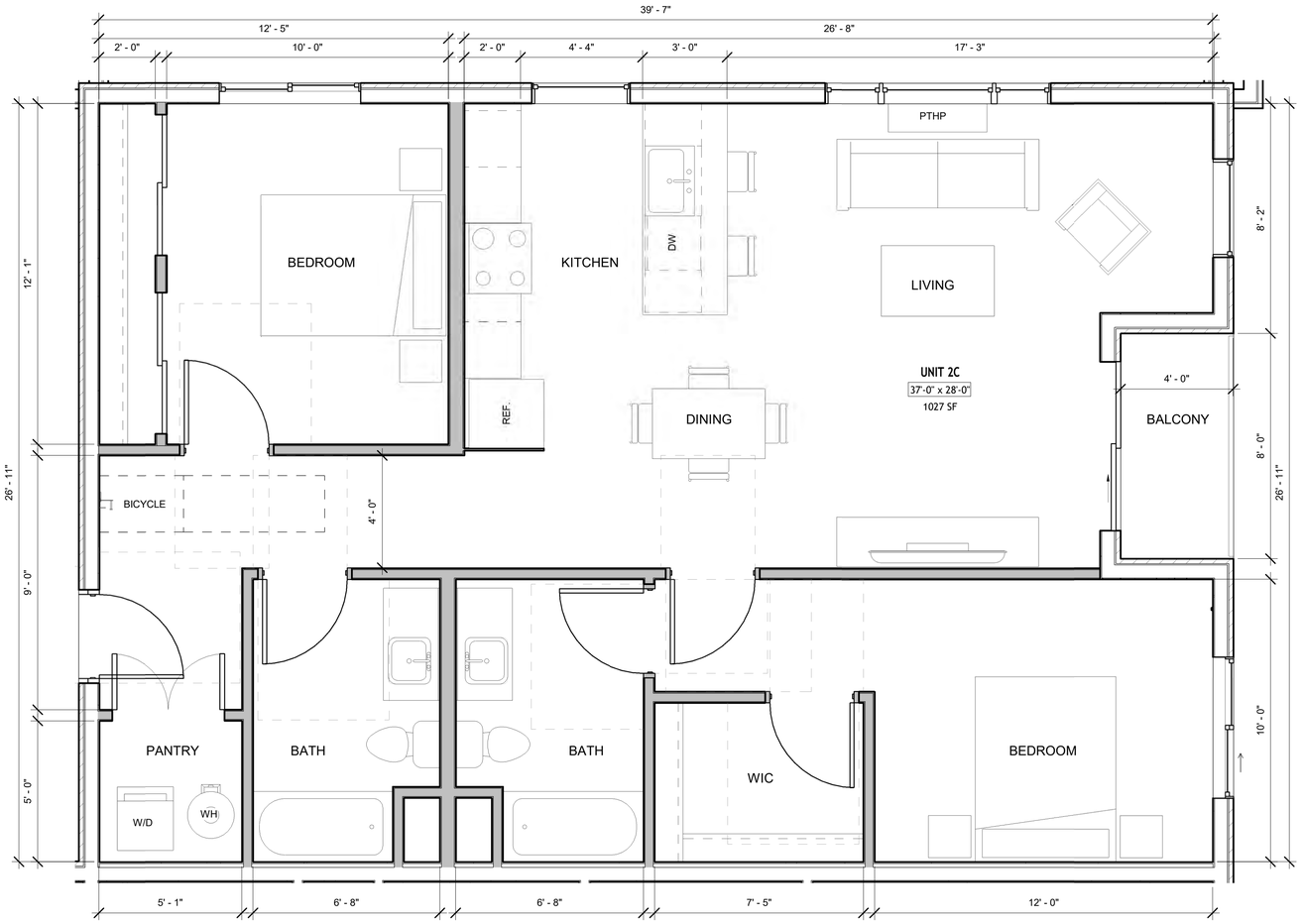
2B ENLARGED UNIT REFLECTED CEILING PLAN

Date 6/2/2025 5:30:58 PM
Drawn Author
Checked Checker

A5.4.2

As indicated

6/2/2025 5:30:58 PM



1 UNIT 2C - ENLARGED PLAN
3/8" = 1'-0"

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No.	Date

Haney Apartments
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ADW #
24012.00

Design Review

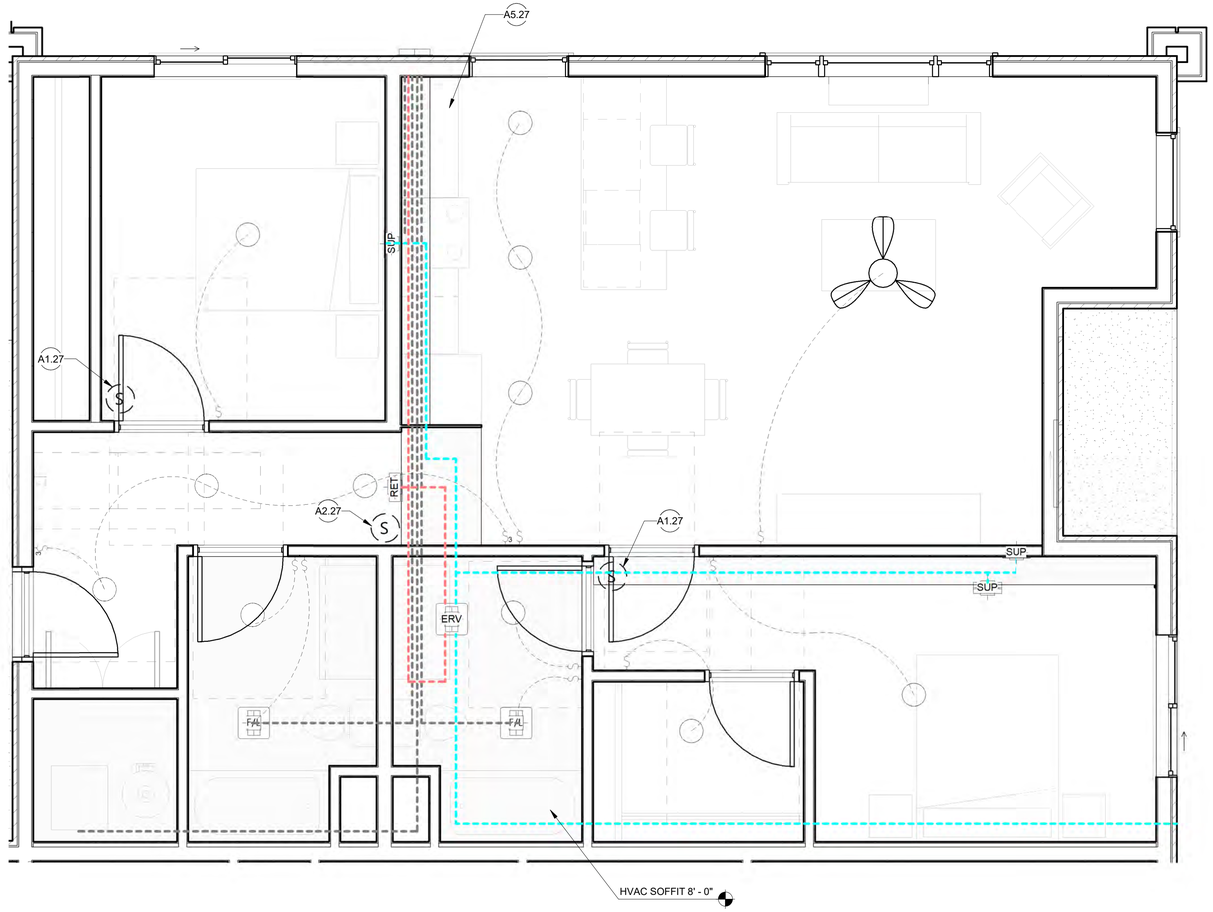
2C ENLARGED UNIT PLAN

Date 6/2/2025 5:30:59 PM
Drawn Author
Checked Checker

A5.5.1

3/8" = 1'-0"

6/2/2025 5:30:59 PM



2 UNIT 2C - ENLARGED RCP
3/8" = 1'-0"

KEYNOTES

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A5.27 FINISH FACE OF SOFFIT ABV KITCHENS TO BE 7'-1/2" ABV FINISH FLOOR HT.

RCP LEGEND

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ADW #
24012.00

Design Review

2C ENLARGED UNIT REFLECTED CEILING PLAN

Date 6/2/2025 5:31:00 PM
Drawn Author
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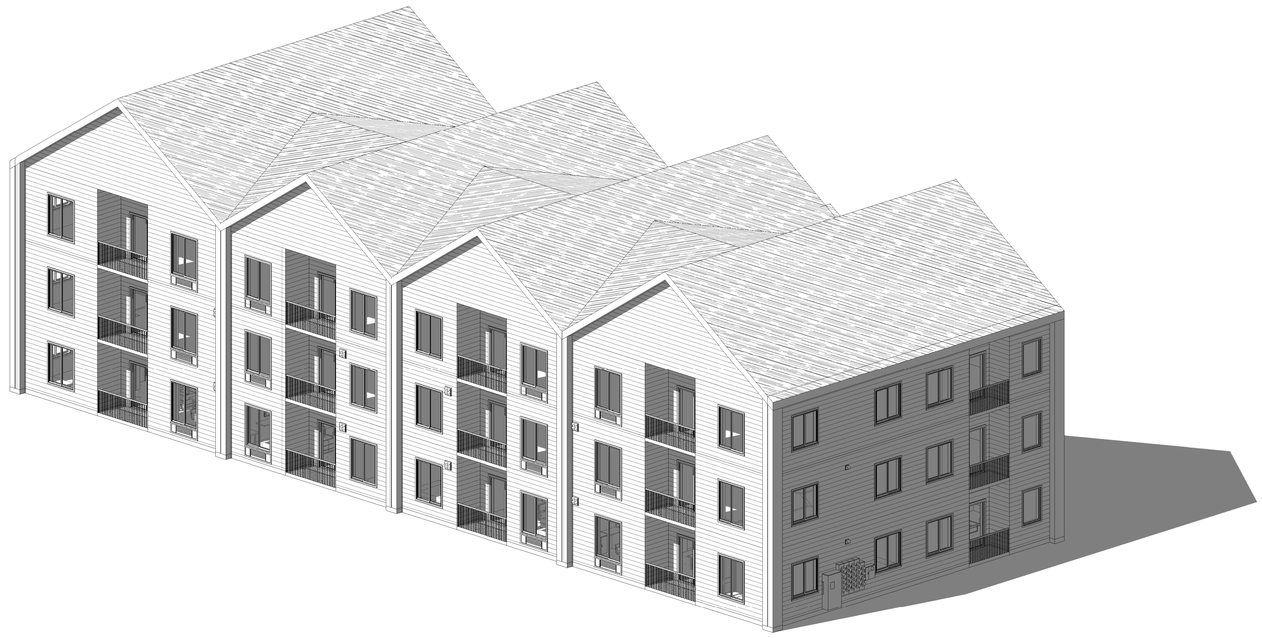
A5.5.2

As indicated

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1 Building A NE Axon



2 Building A SE Axon

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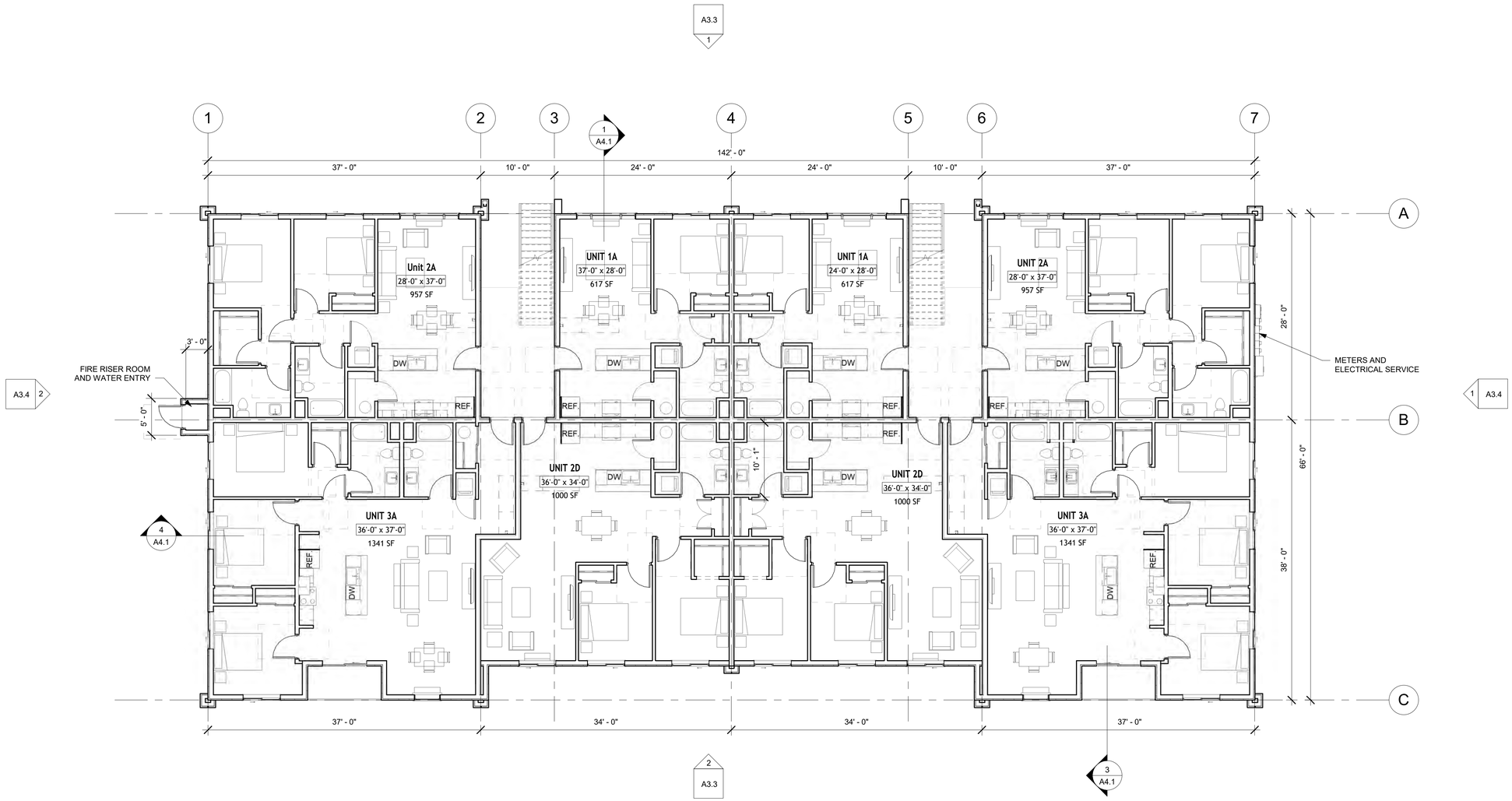
Design Review

BUILDING A
3D VIEWS

Date 6/2/2025 5:31:02 PM
Drawn Author
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A10.1

6/2/2025 5:31:02 PM



1 FIRST FLOOR PLAN - BUILDING B
1/8" = 1'-0"

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+1.503.816.9466

No.	Date

Haney Apartments
BUILDING TYPE [B]

ADW # 24012.00

Project Status

FIRST FLOOR
BUILDING B

Date 6/2/2025 5:34:23 PM
Drawn Author
Checked Checker

A1.2

1/8" = 1'-0"

6/2/2025 5:34:23 PM



1 NORTH ELEVATION - BUILDING B
1/8" = 1'-0"



2 SOUTH ELEVATION - BUILDING B
1/8" = 1'-0"

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No.	Date

Haney Apartments
BUILDING TYPE [B]

ADW #
24012.00

Project Status

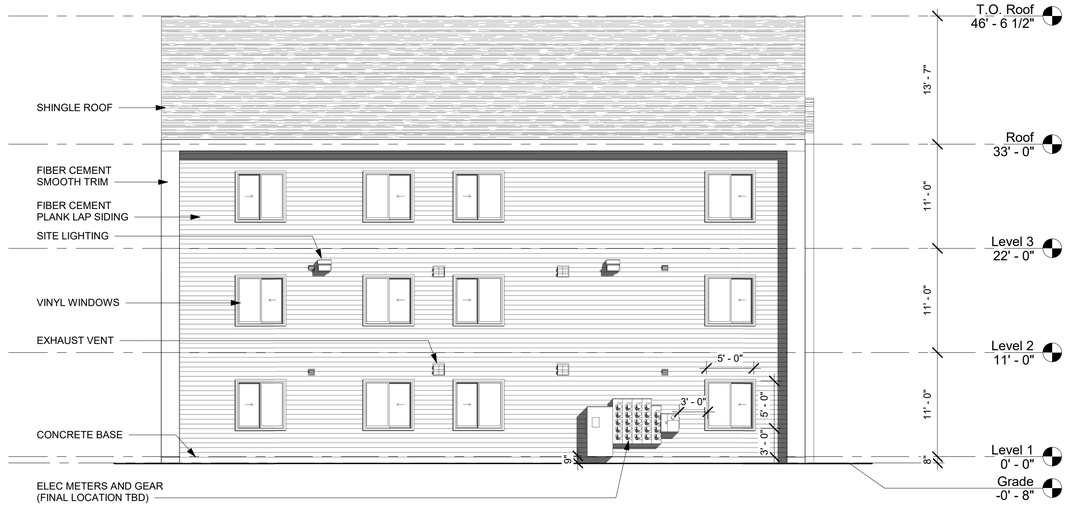
NORTH/ SOUTH ELEVATIONS

Date 6/2/2025 5:34:27 PM
Drawn Author
Checked Checker

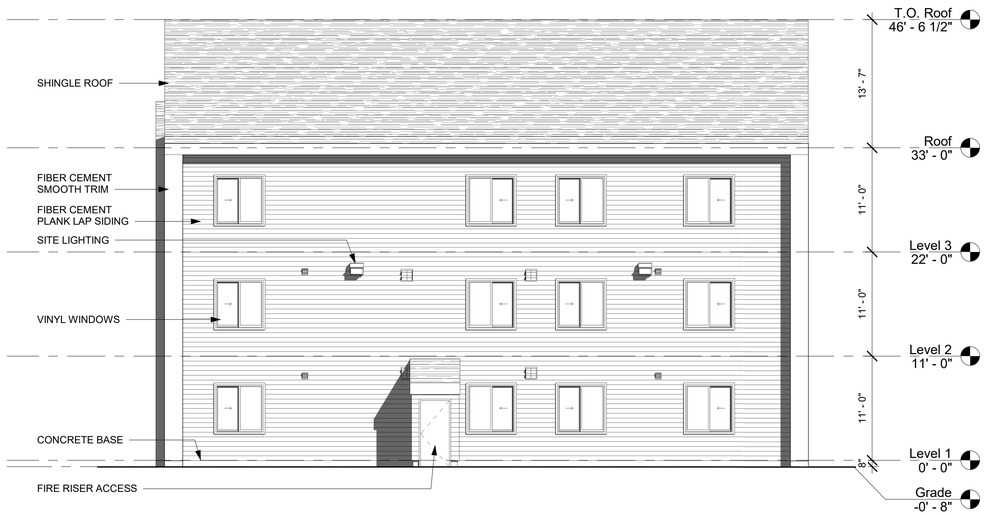
A3.3

1/8" = 1'-0"

6/2/2025 5:34:27 PM



1 EAST ELEVATION - BUILDING B
1/8" = 1'-0"



2 WEST ELEVATION - BUILDING B
1/8" = 1'-0"

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No.	Date

Haney Apartments
BUILDING TYPE [B]

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24012.00

Project Status

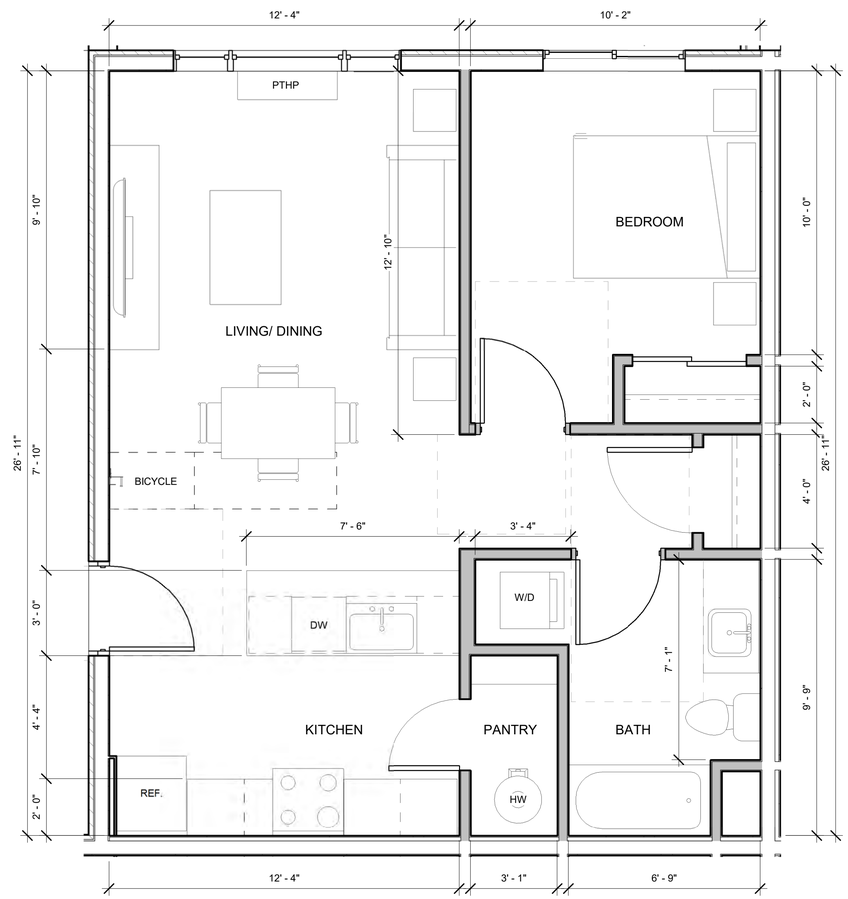
EAST / WEST ELEVATIONS

Date 6/2/2025 5:34:31 PM
Drawn Author
Checked Checker

A3.4

1/8" = 1'-0"

6/2/2025 5:34:31 PM



1 UNIT 1A - ENLARGED PLAN
3/8" = 1'-0"

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No.	Date

Haney Apartments
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Project Status

1A ENLARGED UNIT PLAN

Date 6/2/2025 5:34:32 PM
Drawn Author
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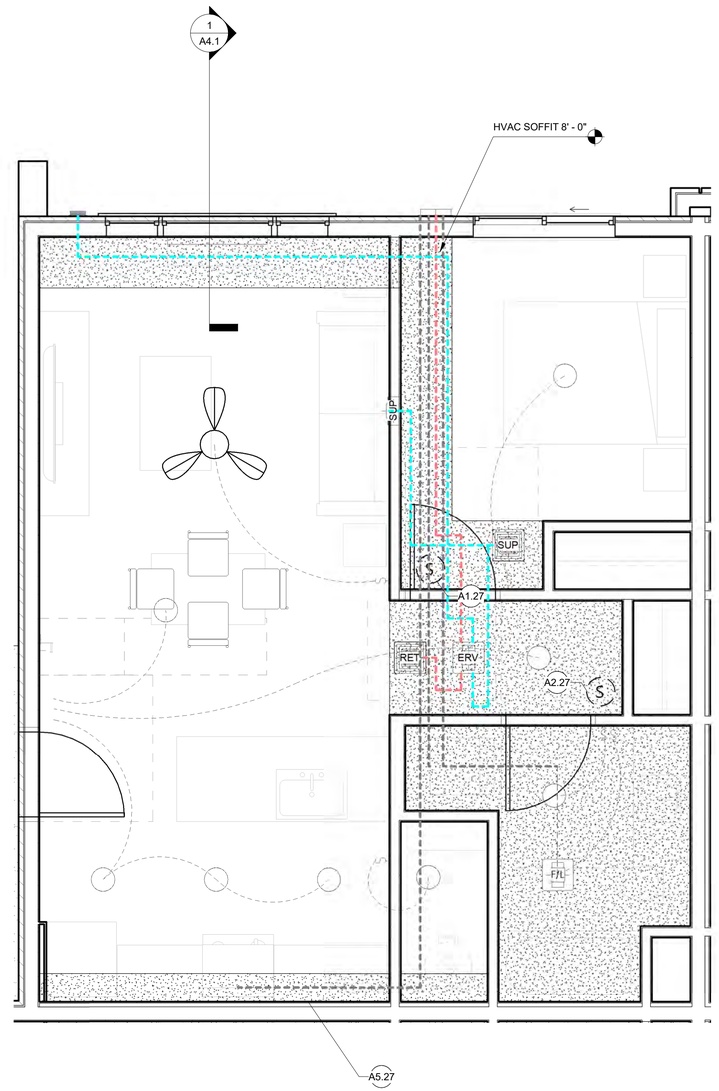
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3/8" = 1'-0"

6/2/2025 5:34:32 PM

KEYNOTES

A1.27	SMOKE DETECTORS / ALARMS TO BE PLACED W/IN EA BEDROOM & OUTSIDE OF EA BEDROOM @ 15'-0" MAX FROM ALL BEDROOM DOORS. ALL SMOKE ALARMS W/IN EA UNIT ARE TO BE INTERCONNECTED SUCH THAT THE ACTIVATION OF ONE ALARM ACTIVATES ALL ALARMS PER SECTION 907.2.11.3 OF THE OREGON FIRE CODE 2014
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A5.27	FINISH FACE OF SOFFIT ABV KITCHENS TO BE 7'-1/2" ABV FINISH FLOOR HT.



1 UNIT 1A - ENLARGED RCP
3/8" = 1'-0"

RCP LEGEND

- F/L — FAN / LIGHT COMBO
- JB — HEAVY DUTY JUNCTION BOX W/ BLANK COVER FOR CEILING FAN
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No.	Date

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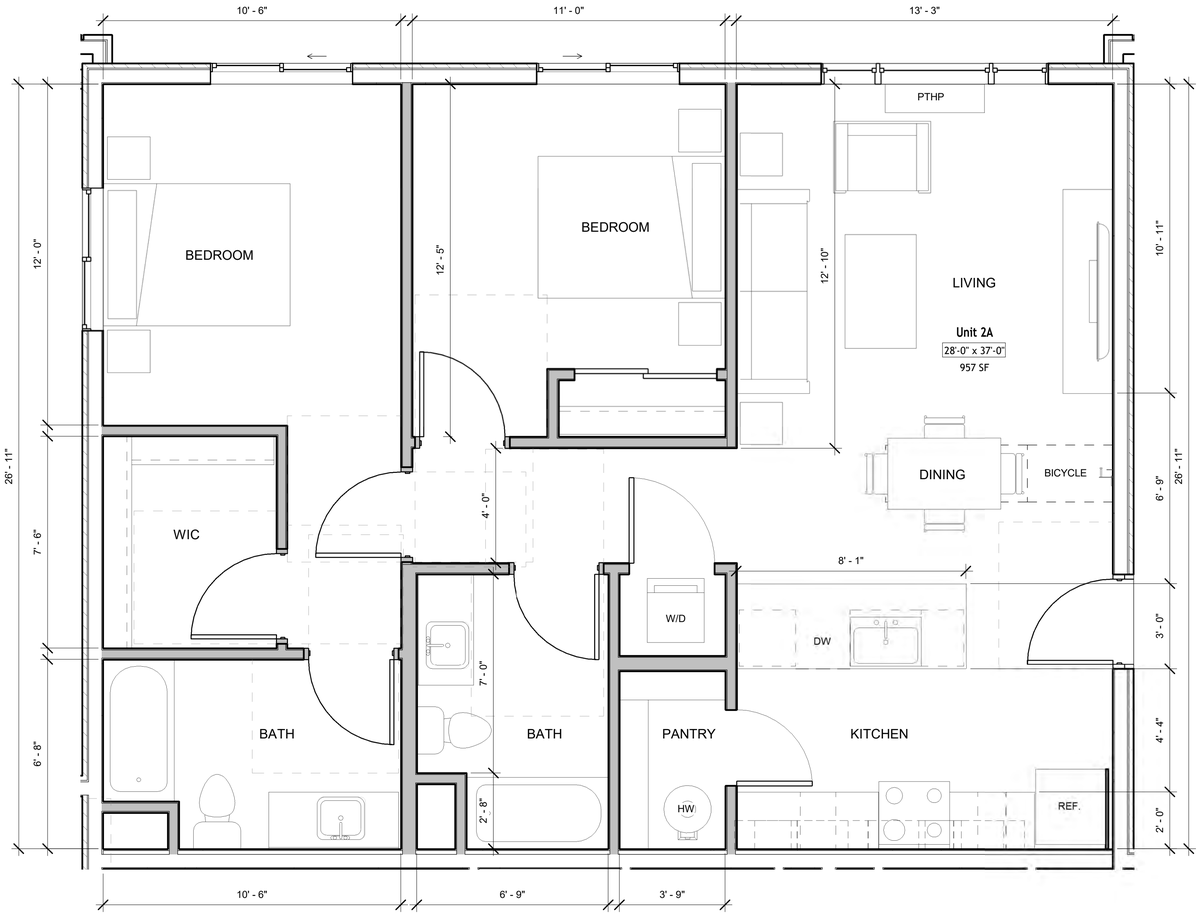
1A ENLARGED UNIT REFLECTED CEILING PLAN

Date 6/2/2025 5:34:33 PM
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A5.1.2

As indicated

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1 UNIT 2A - ENLARGED PLAN
3/8" = 1'-0"

KITCHEN ACCESSIBILITY	
RF	30" X 48" CLR PARALLEL APPROACH @ REFRIGERATOR'S CENTERLINE
R	30" X 48" CLR PARALLEL APPROACH @ RANGE
S	30"X48" CLR PARALLEL APPROACH @ SINK
DW	30x48" CLR PARALLEL APPROACH ADJACENT TO DOOR DOOR SHALL NOT OBSTRUCT CLEAR FLOOR SPACE AT DISHWASHER

BATHROOM ACCESSIBILITY	
WC	48"X56" PARALLEL APPROACH / 48"X66" FORWARD APPROACH @TOILET. LAVATORY PERMITTED IN CLEARANCE.
L	30" X 48" CLR PARALLEL APPROACH @ LAVATORY. CABINETRY TO BE REMOVABLE WITHOUT REPLACEMENT OF LAV. EXTEND FLOOR FINISH BENEATH CABINET
T	48"X60" CLR FORWARD APPROACH 30"X60" CLR PARALLEL APPROACH @ TUB. TOILET AND LAVATORY ALLOWED IN CLEARANCE

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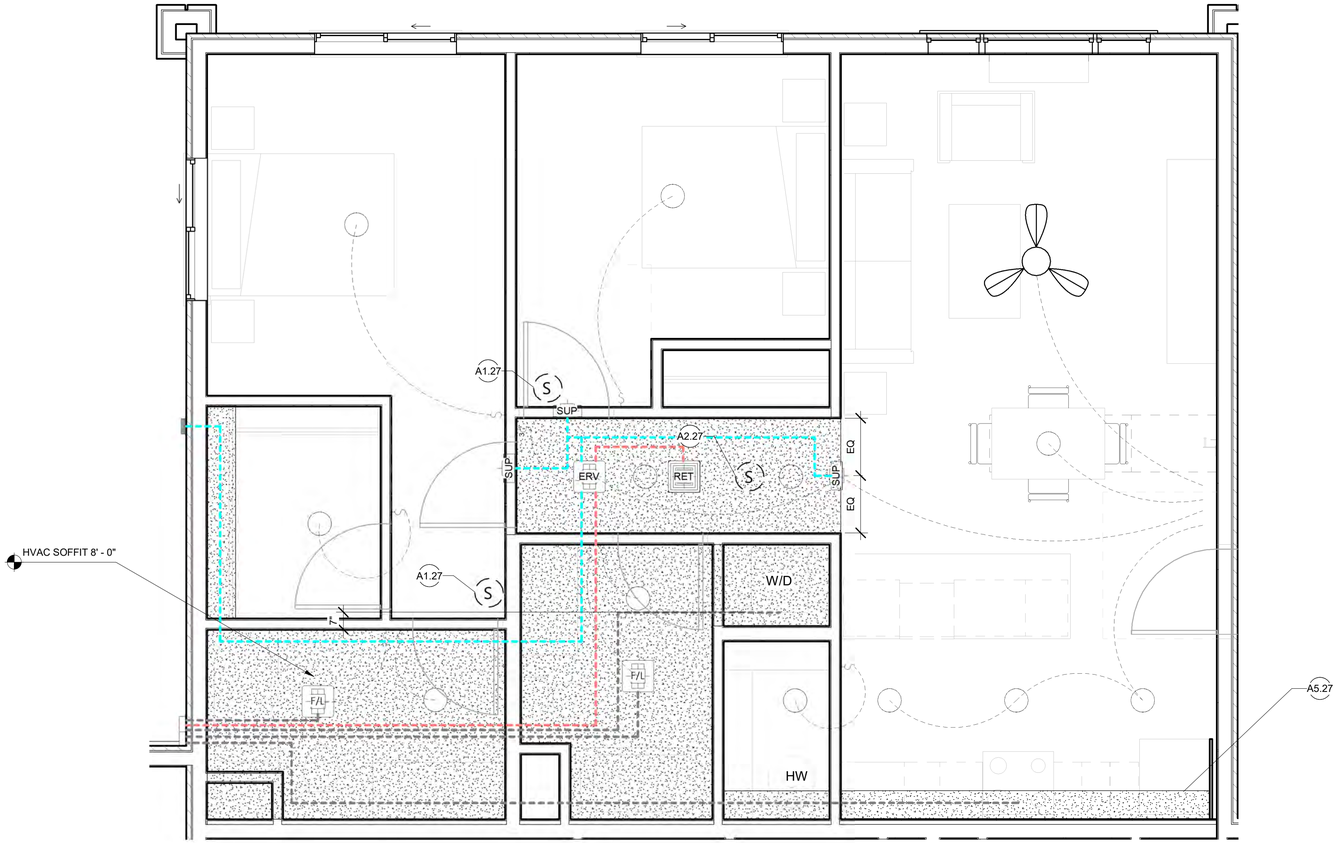
2A ENLARGED UNIT PLAN

Date 6/2/2025 5:34:34 PM
Drawn Author
Checked Checker

A5.3.1

As indicated

6/2/2025 5:34:34 PM



2 UNIT 2A - ENLARGED RCP
3/8" = 1'-0"

KEYNOTES

A1.27	SMOKE DETECTORS / ALARMS TO BE PLACED W/IN EA BEDROOM & OUTSIDE OF EA BEDROOM @ 15'-0" MAX FROM ALL BEDROOM DOORS. ALL SMOKE ALARMS W/IN EA UNIT ARE TO BE INTERCONNECTED SUCH THAT THE ACTIVATION OF ONE ALARM ACTIVATES ALL ALARMS PER SECTION 907.2.11.3 OF THE OREGON FIRE CODE 2014
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RCP LEGEND

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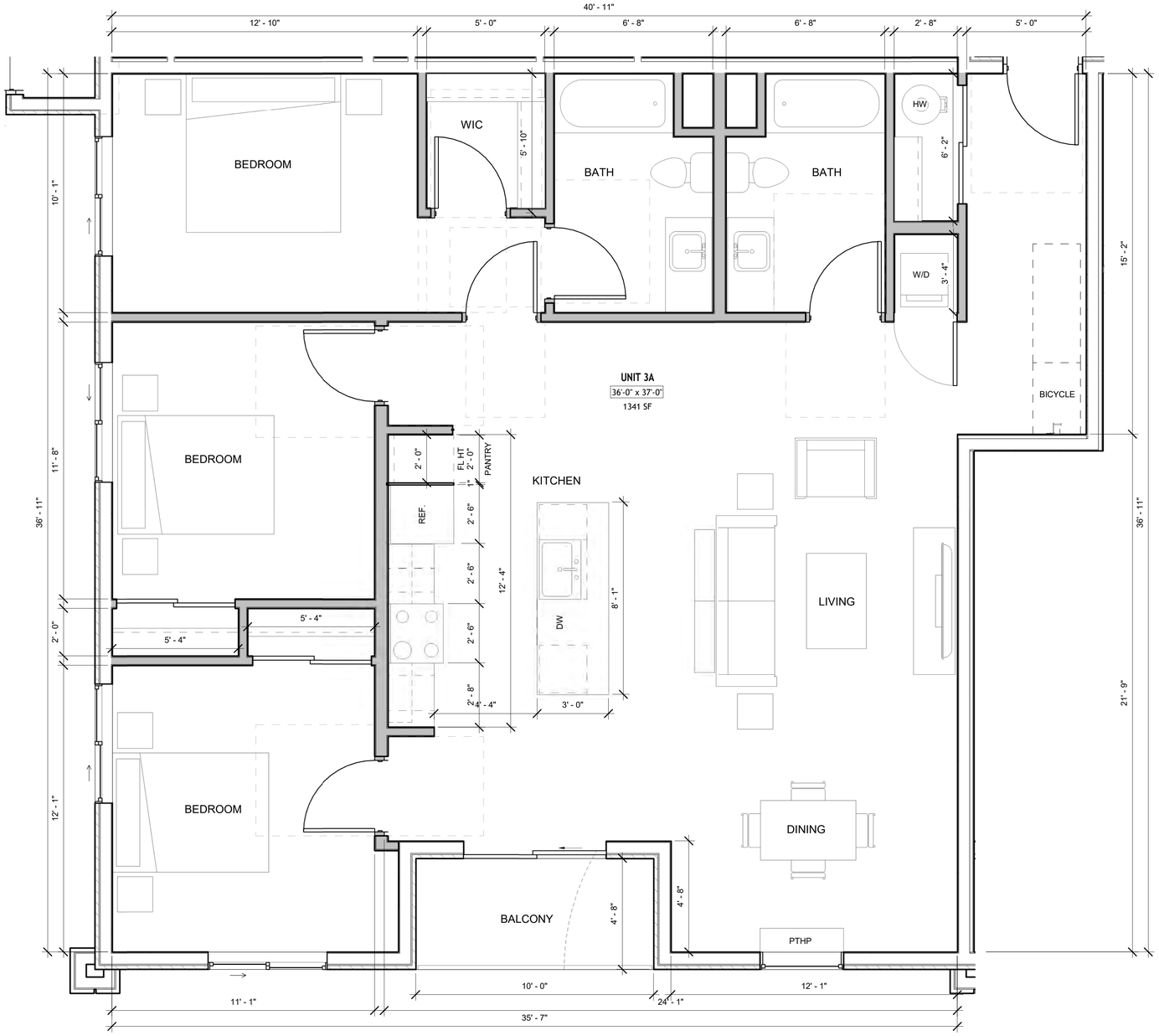
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Date 6/2/2025 5:34:35 PM
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A5.3.2

As indicated

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1 UNIT 3A - ENLARGED PLAN
3/8" = 1'-0"

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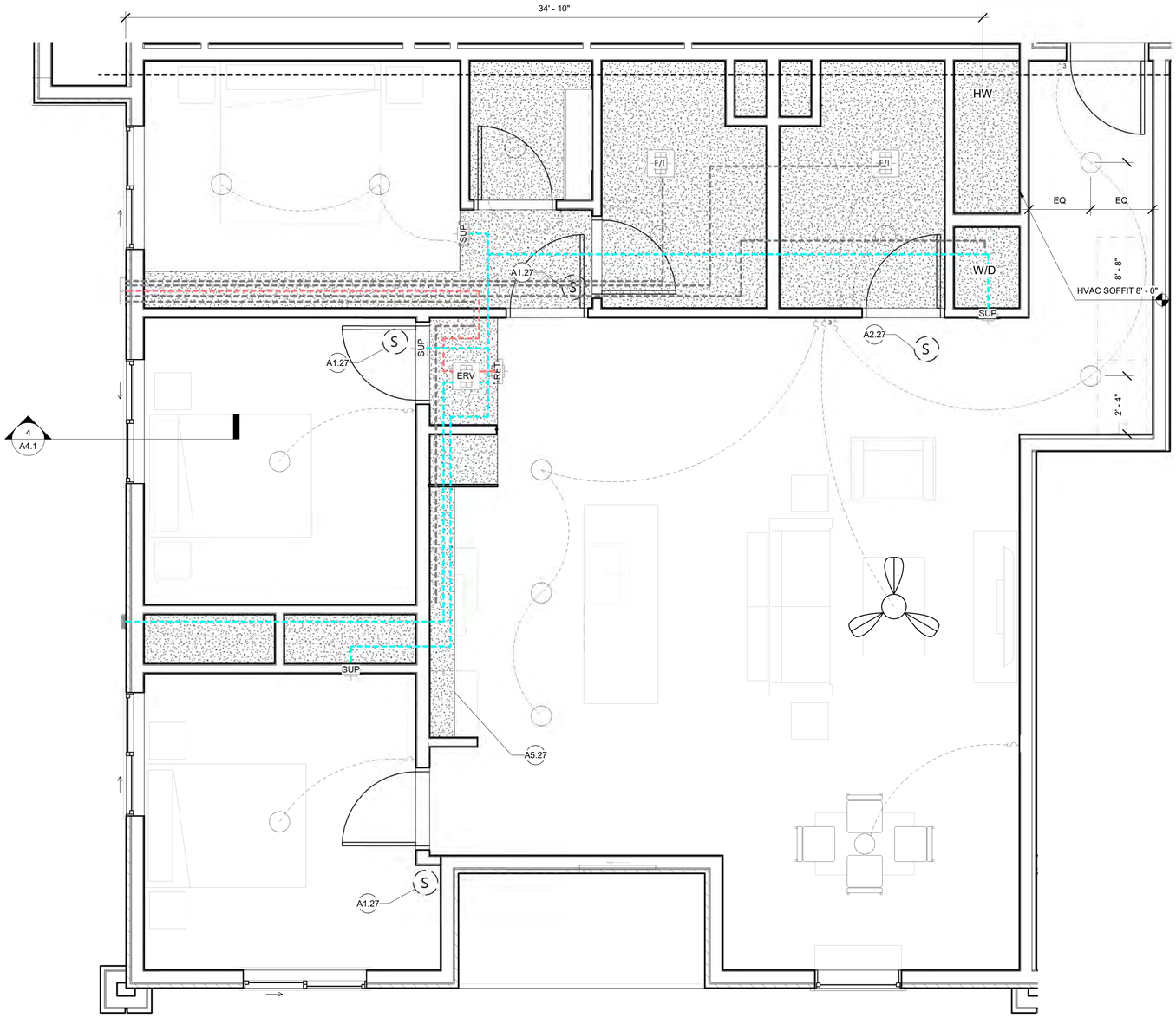
3A ENLARGED UNIT PLAN

Date 6/2/2025 5:34:37 PM
Drawn Author
Checked Checker

A5.7.1

3/8" = 1'-0"

6/2/2025 5:34:37 PM



2 UNIT 3A - ENLARGED RCP
3/8" = 1'-0"

KEYNOTES

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- S3 — 3 WAY SWITCH
- CEILING FAN
- EXIT — SELF ILLUMINATED EXIT SIGN
- CEILING SOFFIT @ 8'-0" ABV FINISH FLOOR, UNLESS OTHERWISE NOTED
- HVAC DUCT PER MECHANICAL PLANS
- SPRINKER PIPE, IN JOISTS, ACROSS UNITS

abbasi design works LLC
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

No.	Date

Haney Apartments
BUILDING TYPE [B]

ADW # 24012.00

Project Status

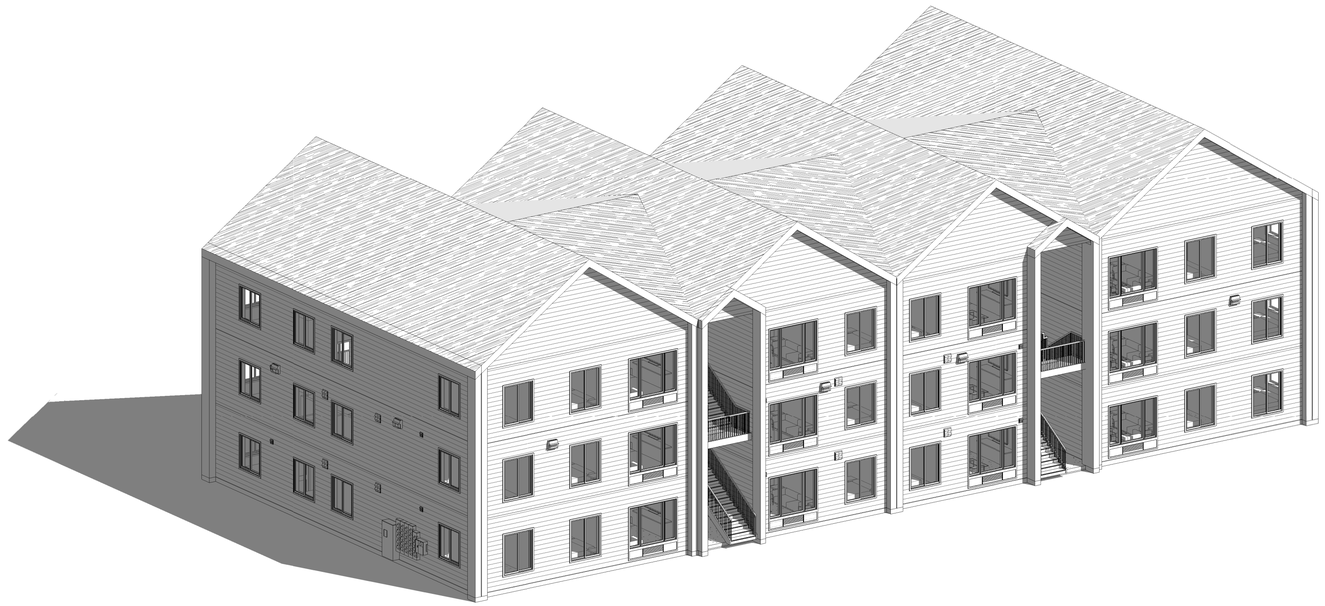
3A ENLARGED UNIT REFLECTED CEILING PLAN

Date 6/2/2025 5:34:38 PM
Drawn Author
Checked Checker

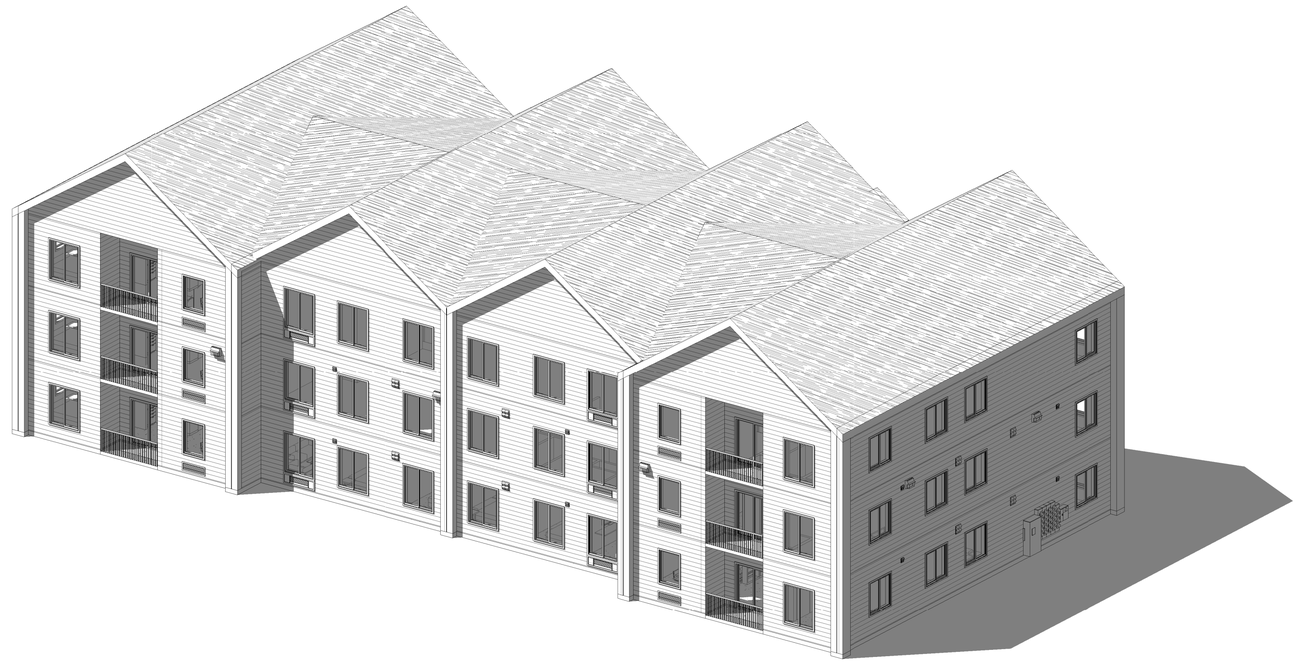
A5.7.2

As indicated

6/2/2025 5:34:38 PM



2 BUILDING B - NE AXON



1 BUILDING B - SE AXON

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No.	Date

Haney Apartments
BUILDING TYPE [B]

ADW #
24012.00

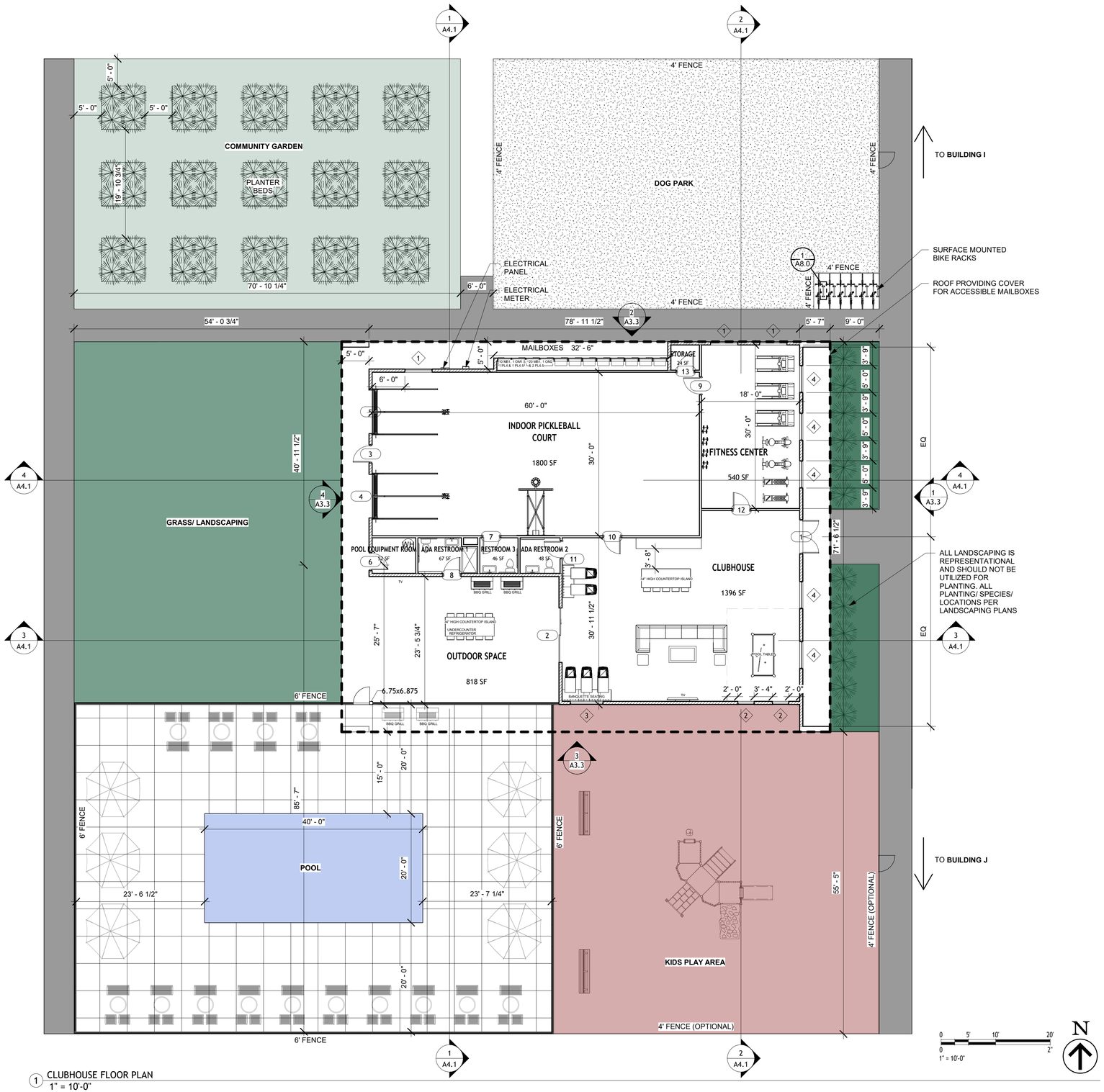
Project Status

BUILDING B
3D VIEWS

Date 6/2/2025 5:34:42 PM
Drawn Author
Checked Checker

A10.2

6/2/2025 5:34:42 PM



1 CLUBHOUSE FLOOR PLAN
1" = 10'-0"

FLOOR PLAN LEGEND

- EXTERIOR SHEARWALL - 2x6 DFL @ 16" OC. FACE w/ HARDIE LAP SIDING w/ 6" EXPOSURE, OVER WRB
- INTERIOR FULL HEIGHT WALL
- 101 DOOR TYPE
- 1t WINDOW TYPE

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No.	Date

HANEY MULTIFAMILY
85 N 26th Ave,
Cornelius, OR 97113

ADW #
24012.00

DESIGN REVIEW

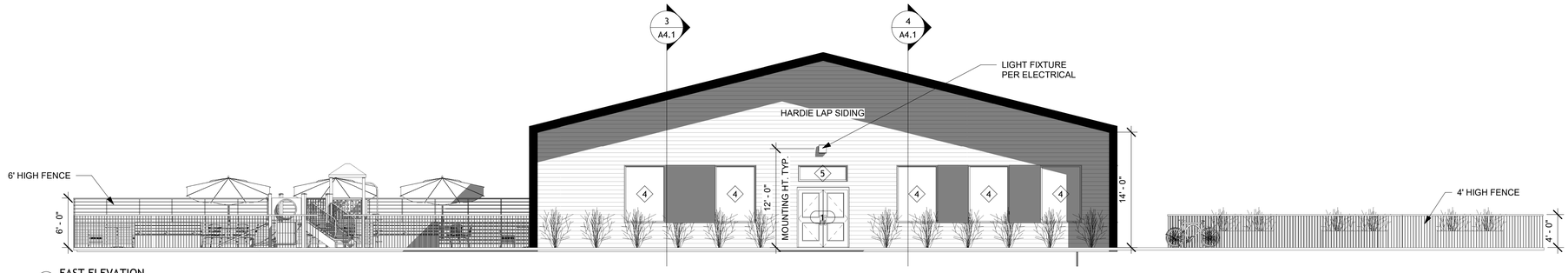
CLUBHOUSE FLOOR PLAN

Date 6/2/2025 10:17:55 PM
Drawn Author
Checked Checker

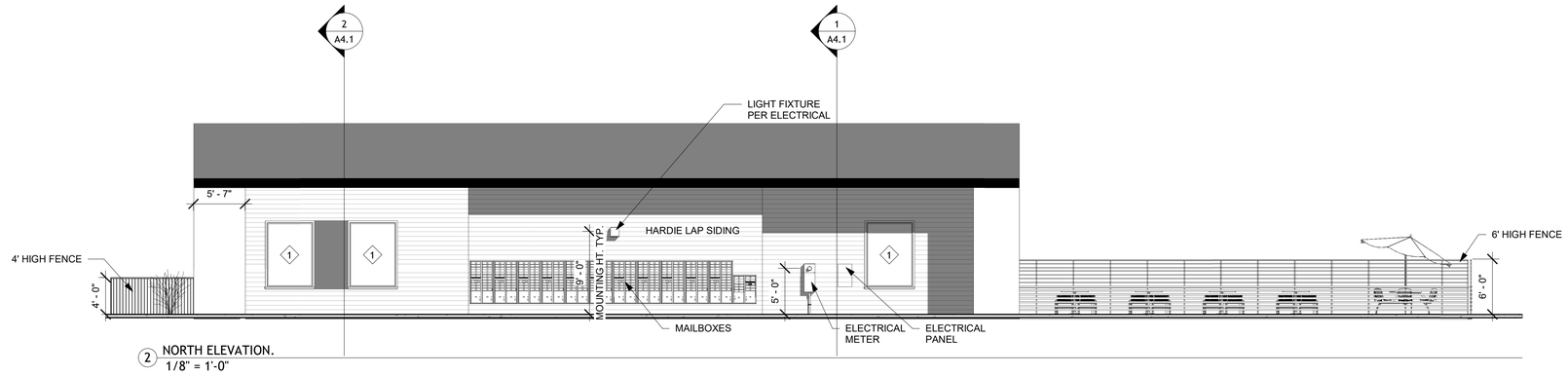
A2.1

As indicated

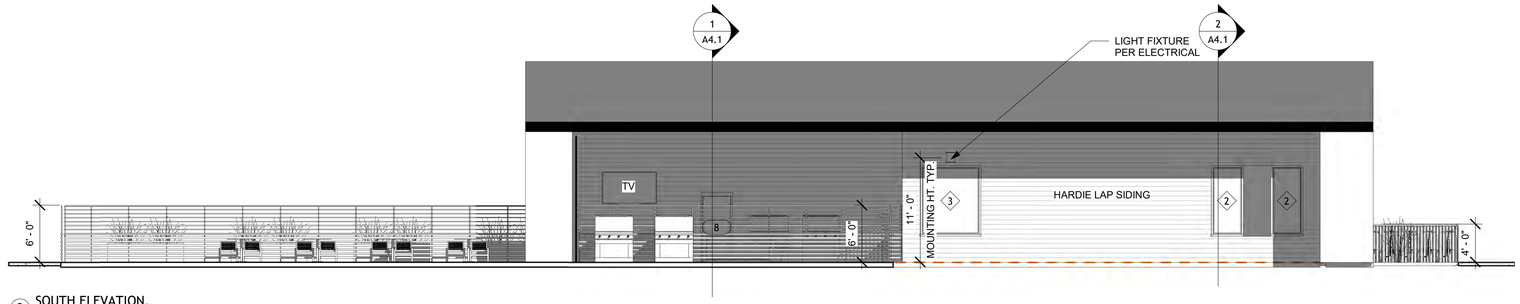
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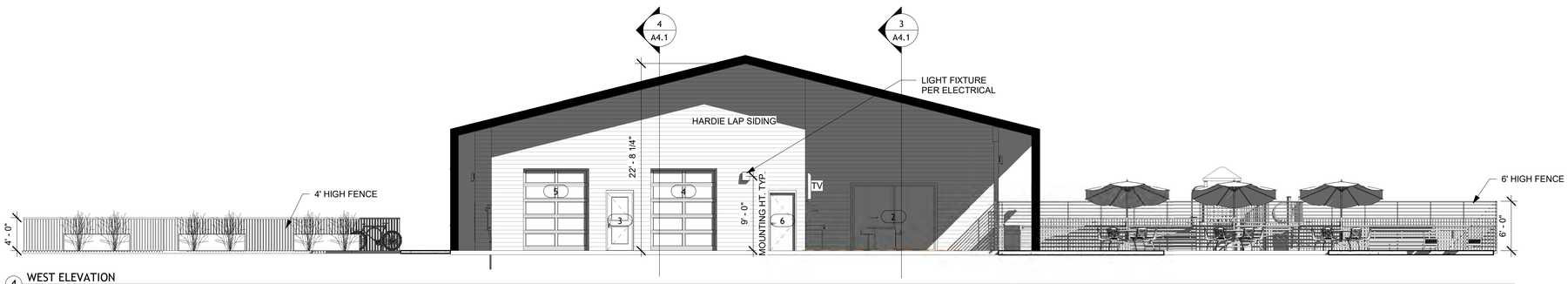
1 EAST ELEVATION.
1/8" = 1'-0"



2 NORTH ELEVATION.
1/8" = 1'-0"



3 SOUTH ELEVATION.
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

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No.	Date

HANEY MULTIFAMILY
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ADW #
24012.00

DESIGN REVIEW

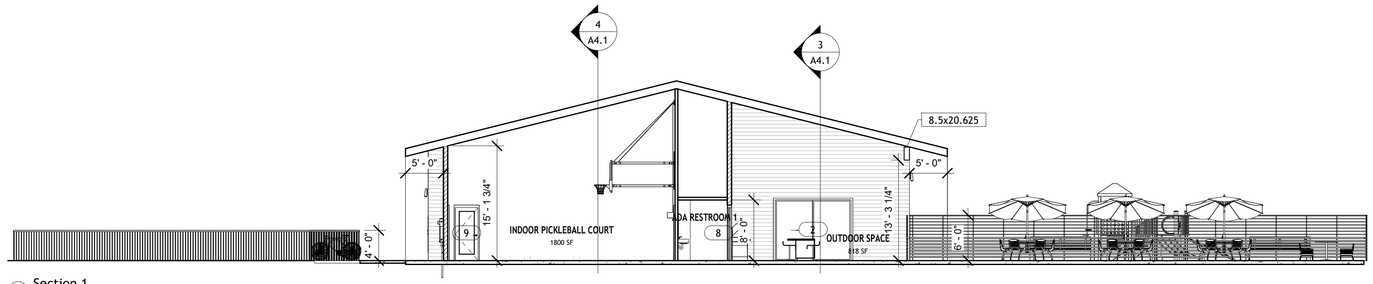
ELEVATIONS FOR DESIGN REVIEW

Date 6/2/2025 10:18:07 PM
Drawn Author
Checked Checker

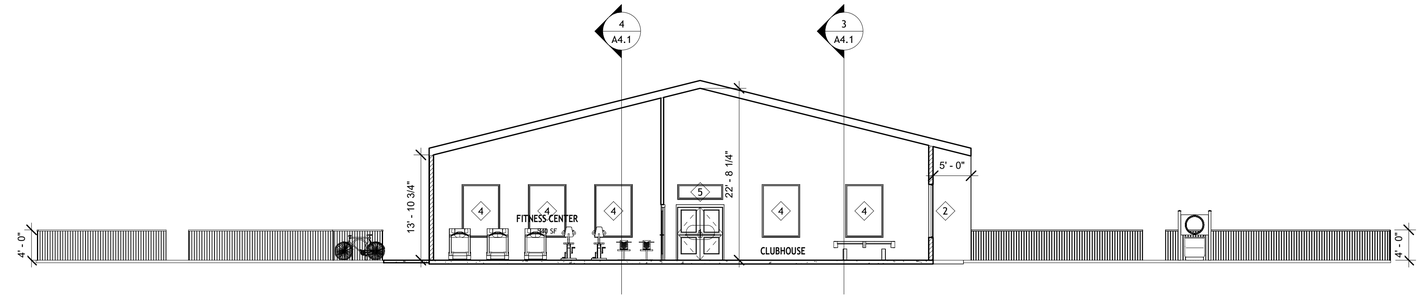
A3.2

1/8" = 1'-0"

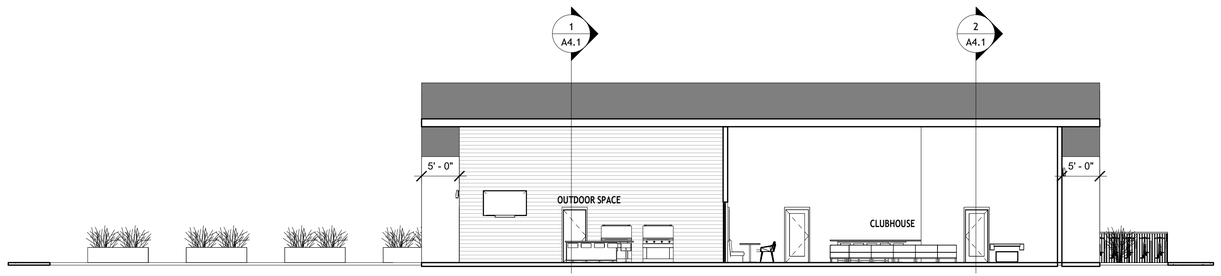
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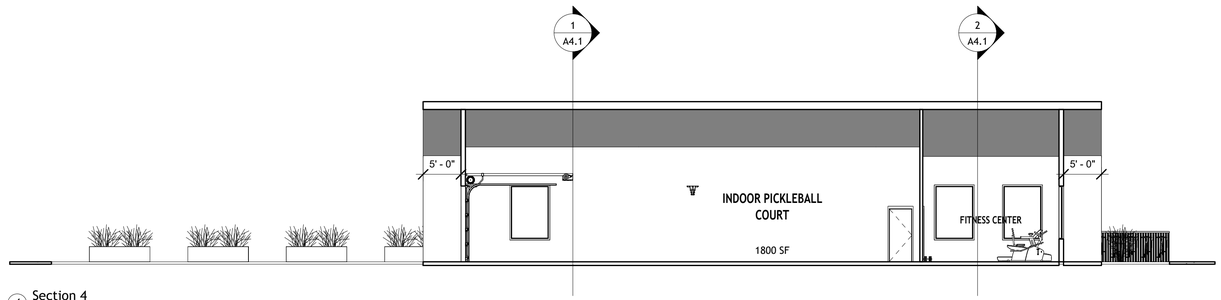
1 Section 1
1" = 10'-0"



2 Section 2
1" = 10'-0"



3 Section 3
1" = 10'-0"



4 Section 4
1" = 10'-0"

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ADW #
24012.00

DESIGN REVIEW

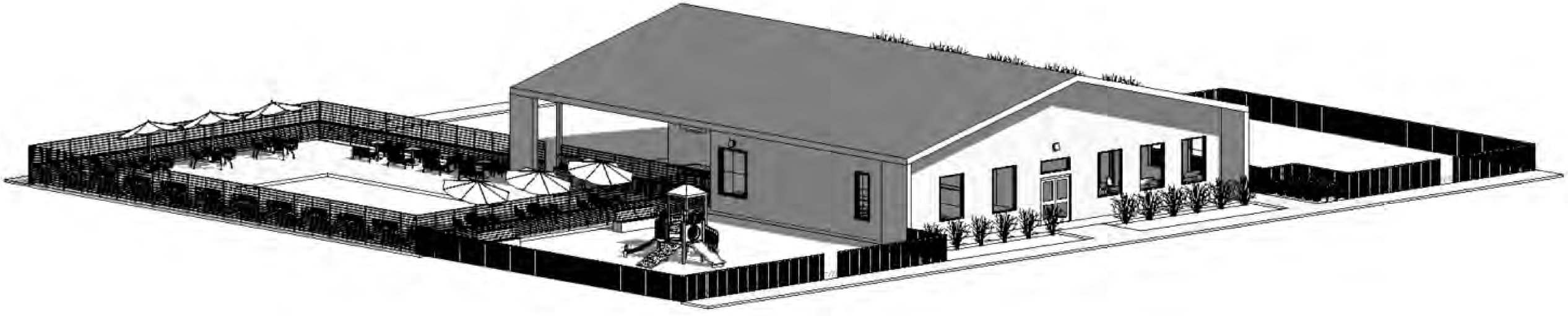
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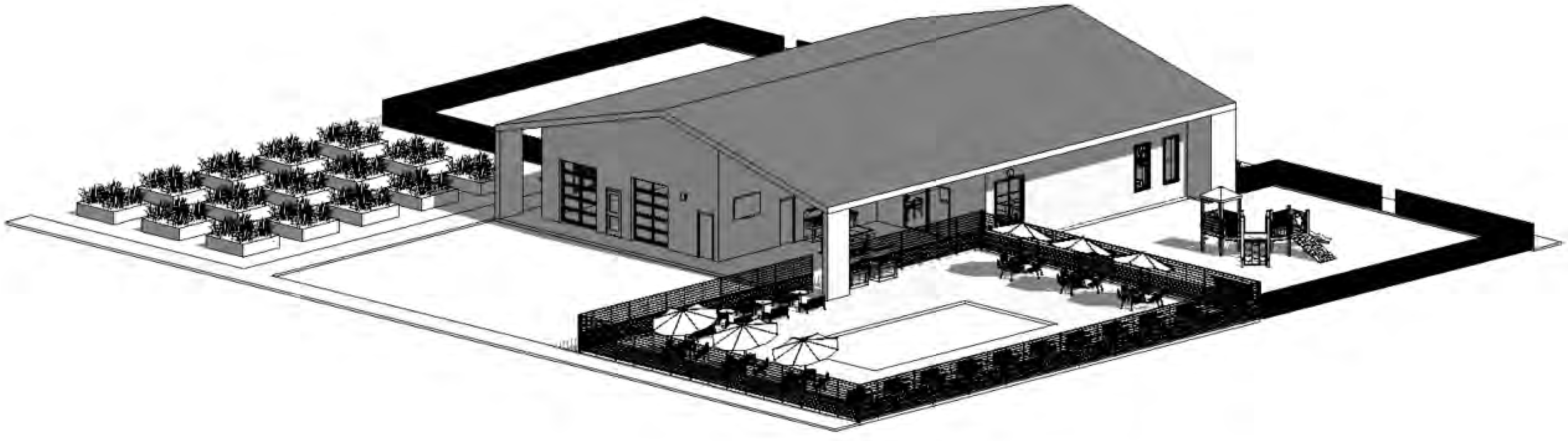
Date 6/2/2025 10:18:12 PM
Drawn Author
Checked Checker

A4.1

1" = 10'-0"

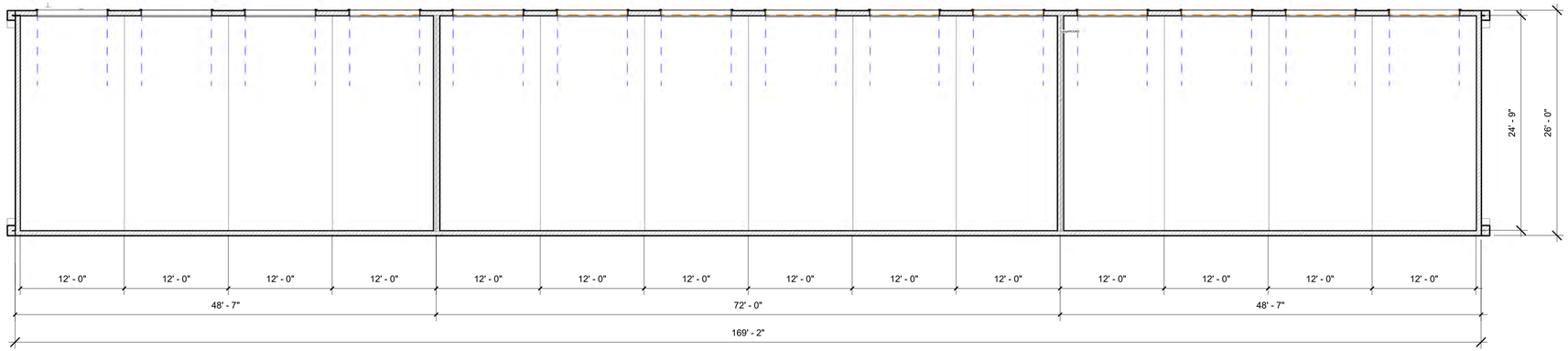
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SITE DATA:

LEASING OFFICE W/ MAINT. = 2268 SF



1 FLOOR PLAN
1/8" = 1'-0"

WALL LEGEND

EXTERIOR SHEARWALL - 2x6 DFL @ 16" OC. FACE w/ HARDIE LAP SIDING w/ 6" EXPOSURE, OVER WRB

INTERIOR SHEARWALL - 2x6 DFL @ 16" OC. FACE w/ (1) LAYER OF 15/32" OSB SHEATHING ONE SIDE & (1) LAYER OF 5/8" TH. GYP BOARD EA. SIDE

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rahim@abbasidesign.com
+1.503.816.9466

No.	Date

HANEY MULTIFAMILY
Enter address here
Address Line 2

ADW #
Project Number

Project Status

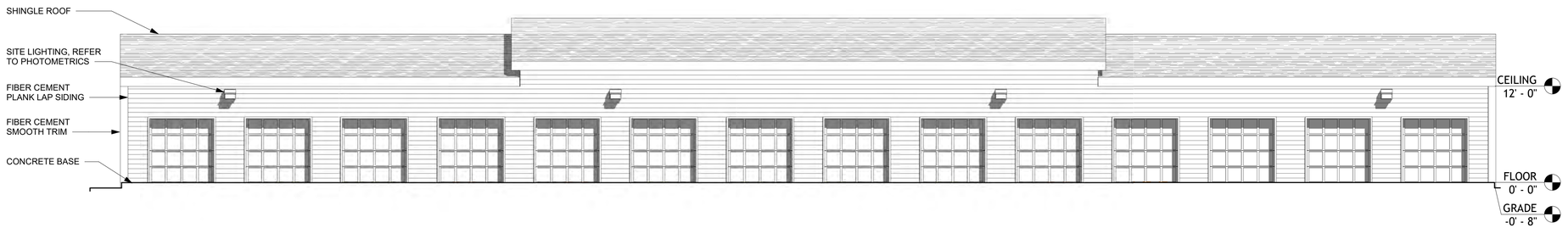
FLOOR PLAN

Date 5/28/2025 8:40:57 AM
Drawn Author
Checked Checker

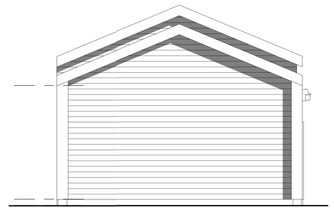
A2.1

As indicated

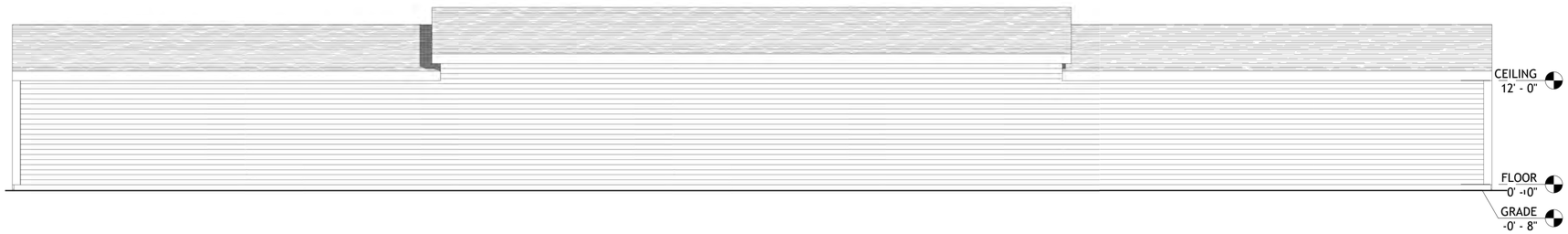
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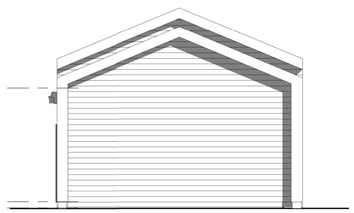
1 SOUTH ELEVATION
1/8" = 1'-0"



4 EAST ELEVATION
1/8" = 1'-0"



5 NORTH ELEVATION
1/8" = 1'-0"



8 WEST ELEVATION
1/8" = 1'-0"

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Address Line 2

ADW # Project Number

Project Status

ELEVATIONS

Date 5/28/2025 8:24:03 AM
Drawn Author
Checked Checker

A3.1.4

1/8" = 1'-0"

5/28/2025 8:24:03 AM



1 SOUTH ELEVATION
1/8" = 1'-0"



4 EAST ELEVATION
1/8" = 1'-0"



5 NORTH ELEVATION
1/8" = 1'-0"



8 WEST ELEVATION
1/8" = 1'-0"

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Address Line 2

ADW #
Project Number

Project Status

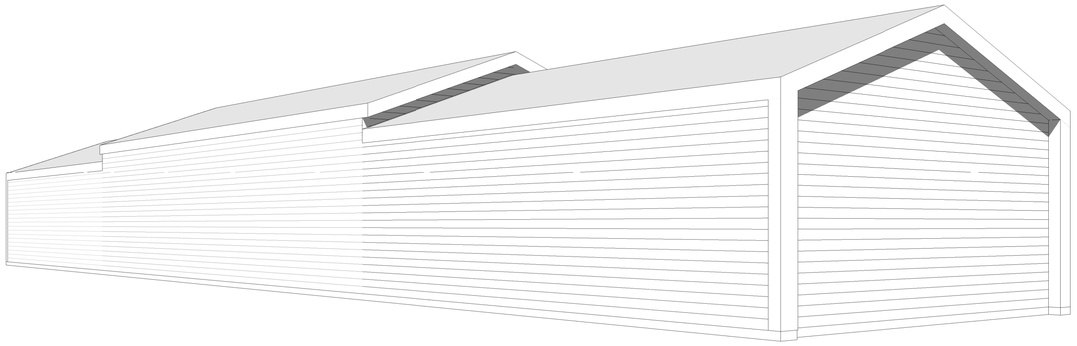
ELEVATIONS COLORED

Date 5/28/2025 12:48:56 PM
Drawn Author
Checked Checker

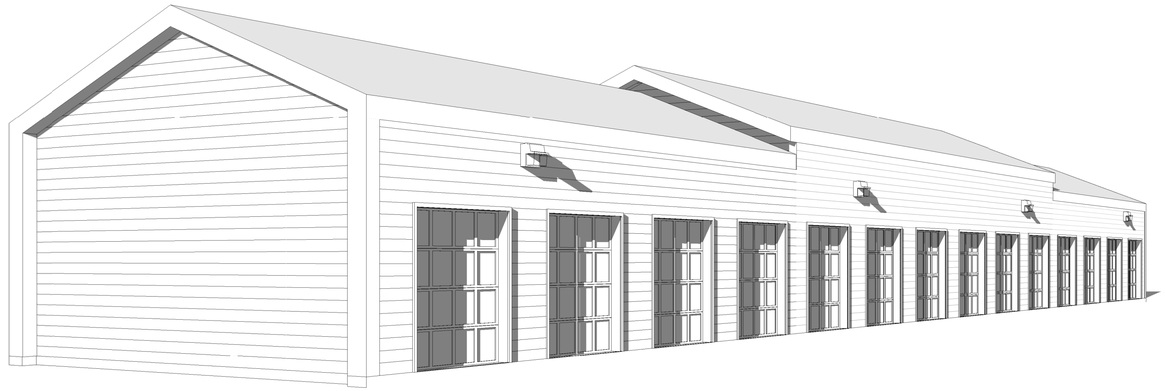
A3.1.6

1/8" = 1'-0"

5/28/2025 12:48:56 PM



5 3D View 3



1 3D View 2



3 3D View 1

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No.	Date

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Address Line 2

ADW # Project Number

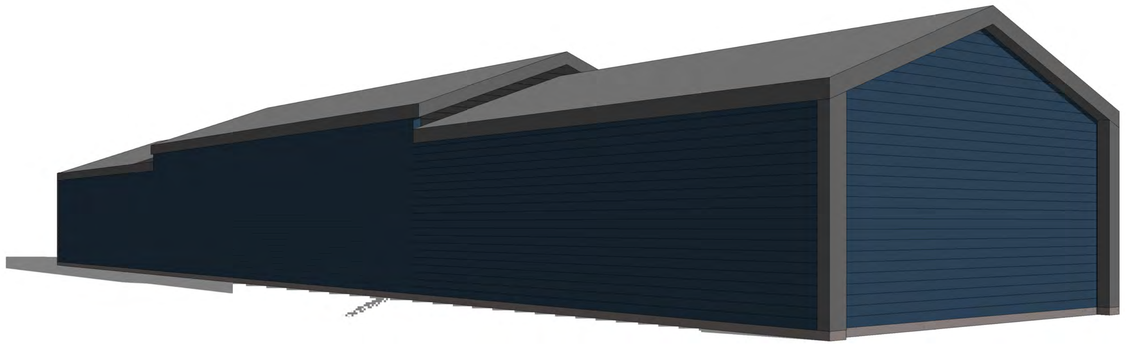
Project Status

3D VIEWS

Date 5/28/2025 8:23:58 AM
Drawn Author
Checked Checker

A10.1

5/28/2025 8:23:58 AM



5 3D View 3



1 3D View 2



3 3D View 1

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No.	Date

HANEY MULTIFAMILY
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Address Line 2

ADW # Project Number

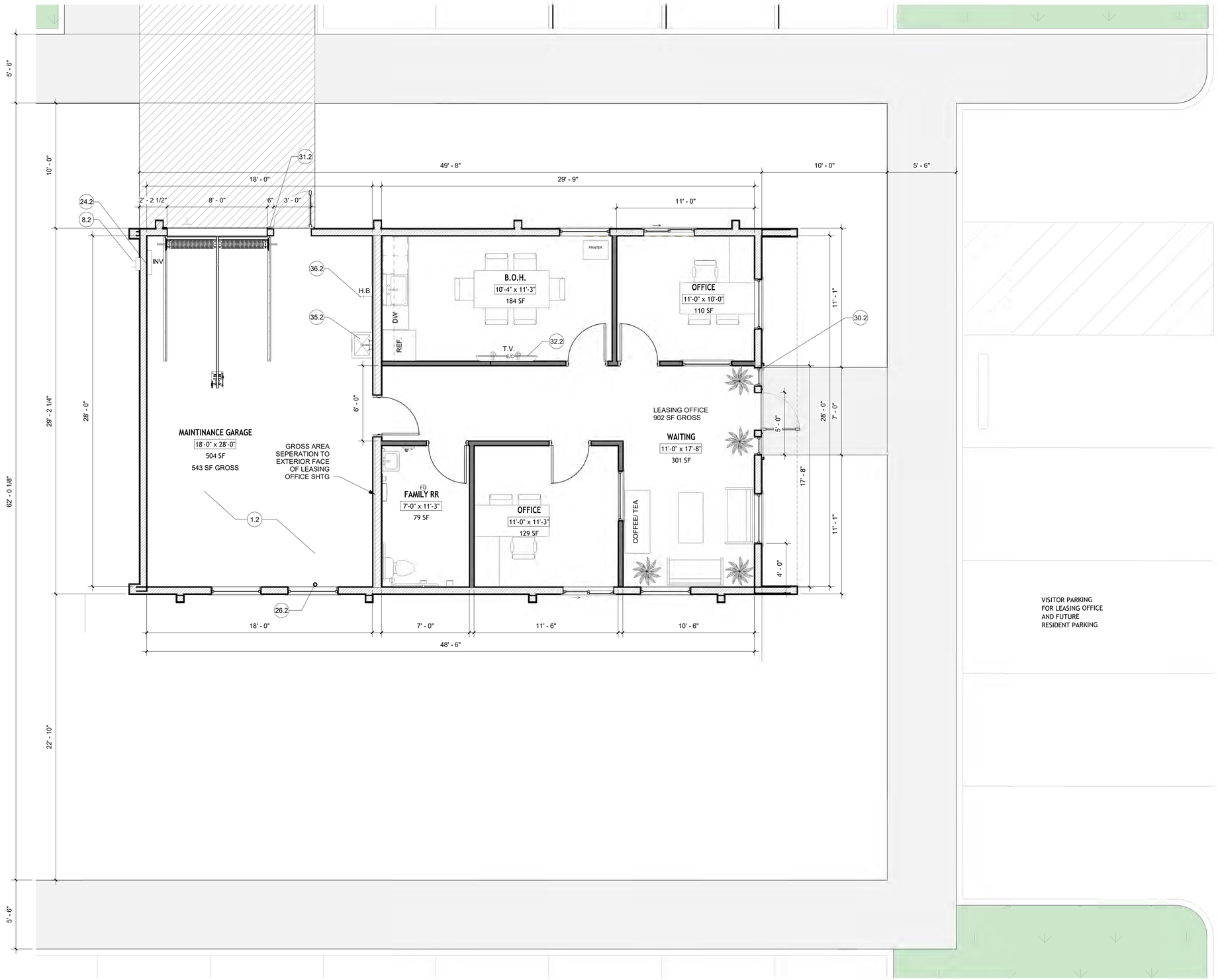
Project Status

3D VIEWS COLORED Copy 1

Date 5/28/2025 11:47:02 AM
Drawn Author
Checked Checker

A10.3

5/28/2025 11:47:02 AM



1 FLOOR PLAN
1/4" = 1'-0"

SITE DATA:

LEASING OFFICE W/ MAINT. = 2268 SF

WALL LEGEND

- EXTERIOR SHEARWALL - 2x6 DFL @ 16" OC. FACE w/ HARDIE LAP SIDING w/ 7" EXPOSURE, OVER WRB
- INTERIOR SHEARWALL - 2x6 DFL @ 16" OC. FACE w/ (1) LAYER OF 15/32" OSB SHEATHING ONE SIDE & (1) LAYER OF 5/8" TH. GYP BOARD EA. SIDE
- INTERIOR FULL HEIGHT WALL

VISITOR PARKING
FOR LEASING OFFICE
AND FUTURE
RESIDENT PARKING

KEYNOTES

1.2 4" THICK CONCRETE SLAB-ON-GRADE PER STRUCT. PROVIDE 6 MIL VAPOR BARRIER BELOW AND OVER IMPROVED SUBGRADE AS REQUIRED BY GEOTECH.
8.2 ELECTRIC METERS
24.2 ELECTRICAL PANEL LOCATED INSIDE CLOSET. MAINTAIN 36" WIDE CLEARANCE IN FRONT OF PANEL.
26.2 DOWNSPOUT IN ENTRY CAVITY. CONNECT TO DRAIN UNDERGROUND & PIPE TO RAIN GARDEN PER CIVIL.
30.2 POWER ACTUATOR FOR ADA ACCESS.
31.2 CARD READER
32.2 IF WALL-MOUNTED TV PROJECTS MORE THAN 4", A CANE-DETECTABLE BARRIER MUST BE PROVIDED BELOW THE TV FOR THE ENTIRE LENGTH OF THE TV.
35.2 DUMP SINK w/ WALL MOUNTED FAUCET
36.2 HOSE BIBB

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No.	Date

HANEY MULTIFAMILY
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Address Line 2

ADW # Project Number

Project Status

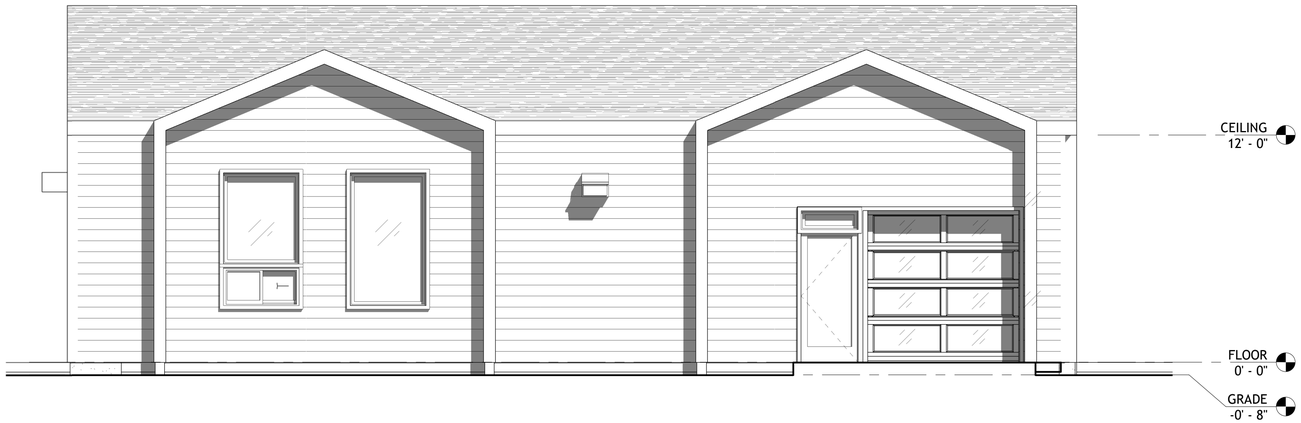
LEASING OFFICE FLOOR PLAN.

Date 5/28/2025 8:32:43 AM
Drawn Author
Checked Checker

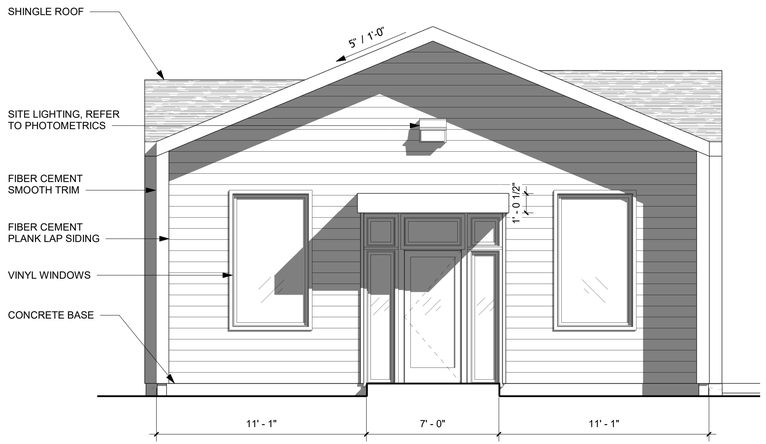
A2.3

1/4" = 1'-0"

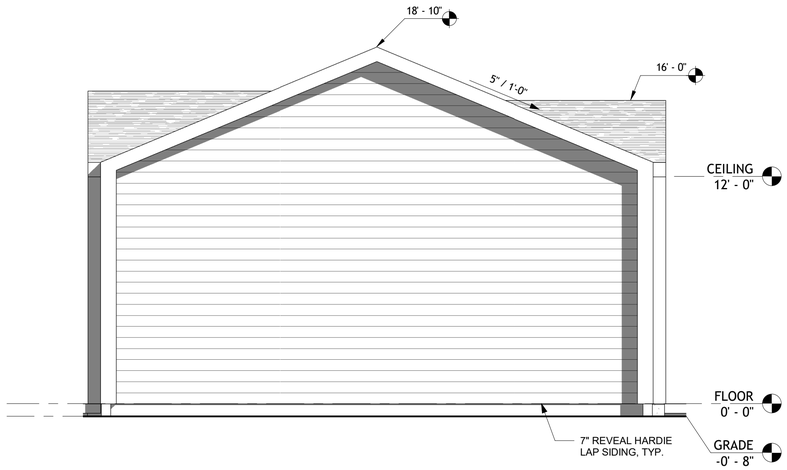
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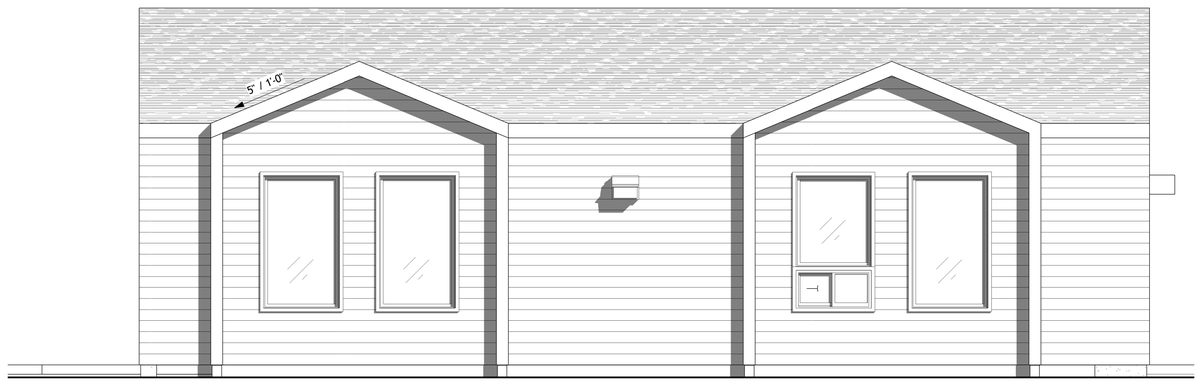
4 NORTH ELEVATION
1/4" = 1'-0"



1 EAST ELEVATION1
1/4" = 1'-0"



3 WEST ELEVATION
1/4" = 1'-0"



2 SOUTH ELEVATION
1/4" = 1'-0"

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No.	Date

HANEY MULTIFAMILY
Enter address here
Address Line 2

ADW # Project Number

Project Status

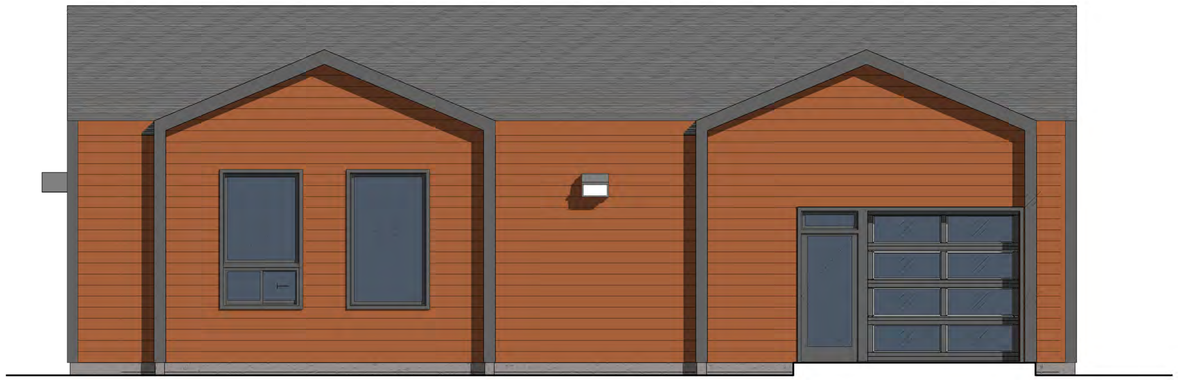
ELEVATIONS

Date 5/28/2025 8:32:47 AM
Drawn Author
Checked Checker

A3.1

1/4" = 1'-0"

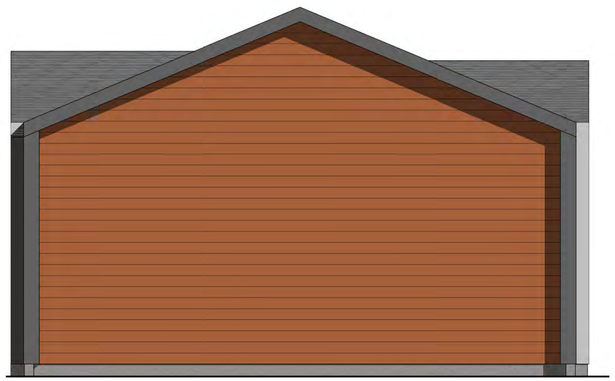
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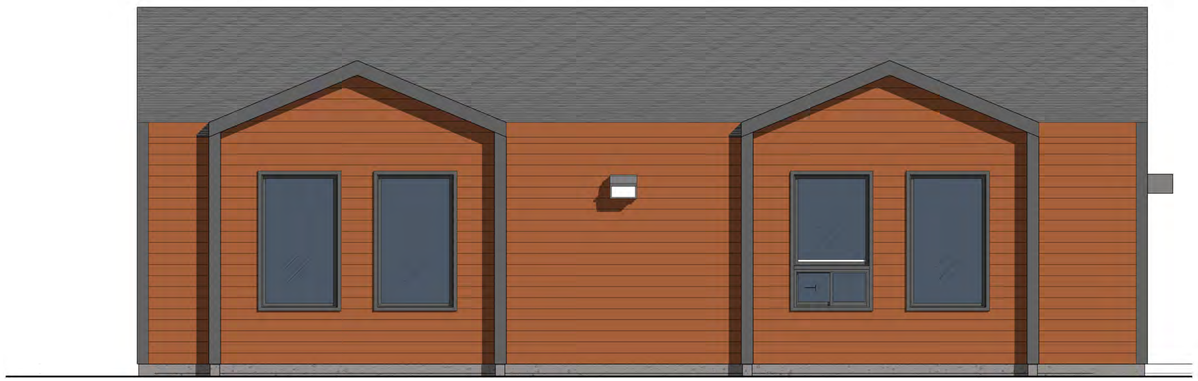
4 COLORED - NORTH ELEVATION
1/4" = 1'-0"



1 COLORED - EAST ELEVATION
1/4" = 1'-0"



3 COLORED - WEST ELEVATION
1/4" = 1'-0"



2 COLORED - SOUTH ELEVATION
1/4" = 1'-0"

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No.	Date

HANEY MULTIFAMILY
Enter address here
Address Line 2

ADW # Project Number

Project Status

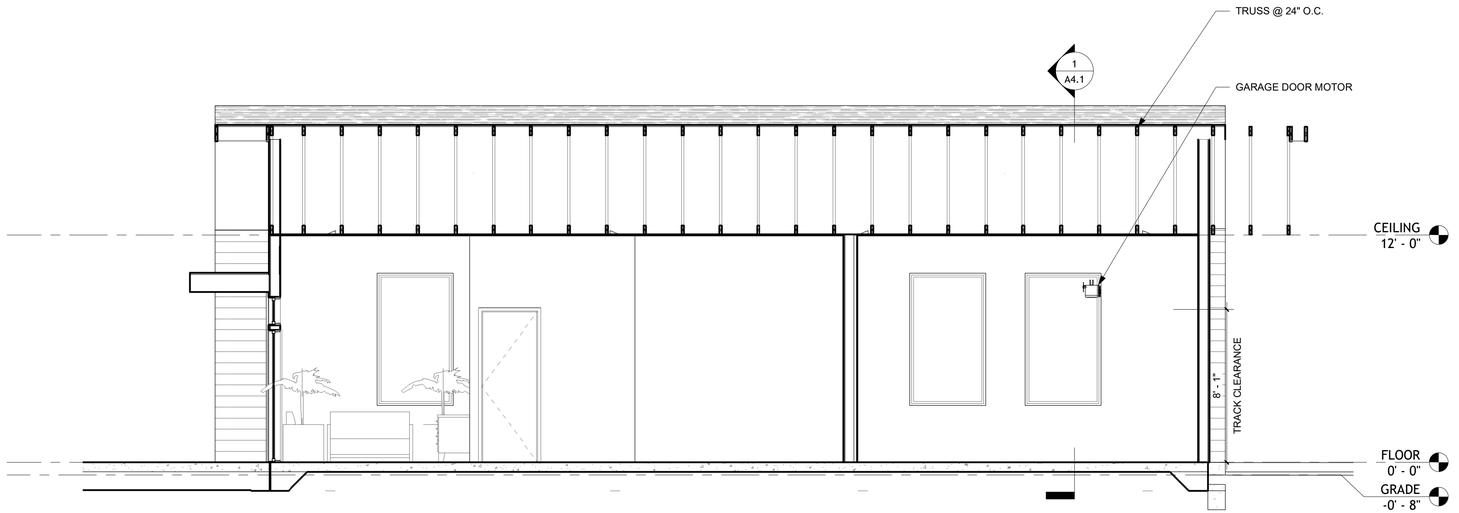
ELEVATIONS COLORED

Date 5/28/2025 12:32:13 PM
Drawn Author
Checked Checker

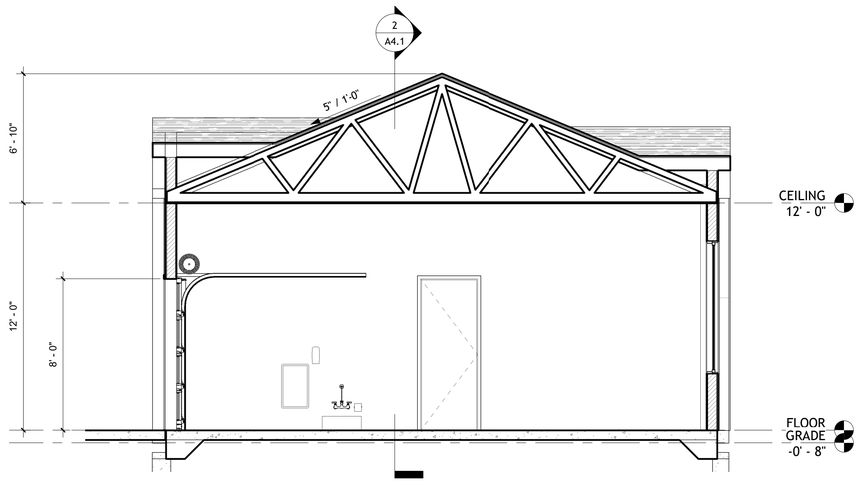
A3.2

1/4" = 1'-0"

5/28/2025 12:32:13 PM



2 Section 3
1/4" = 1'-0"



1 Section 2
1/4" = 1'-0"

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No.	Date

HANEY MULTIFAMILY
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Address Line 2

ADW #
Project Number

Project Status

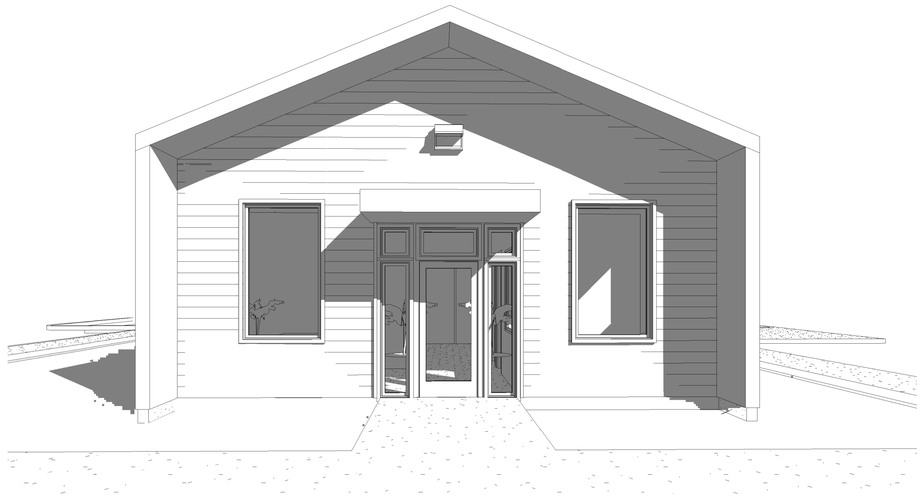
SECTIONS

Date 5/28/2025 8:32:53 AM
Drawn Author
Checked Checker

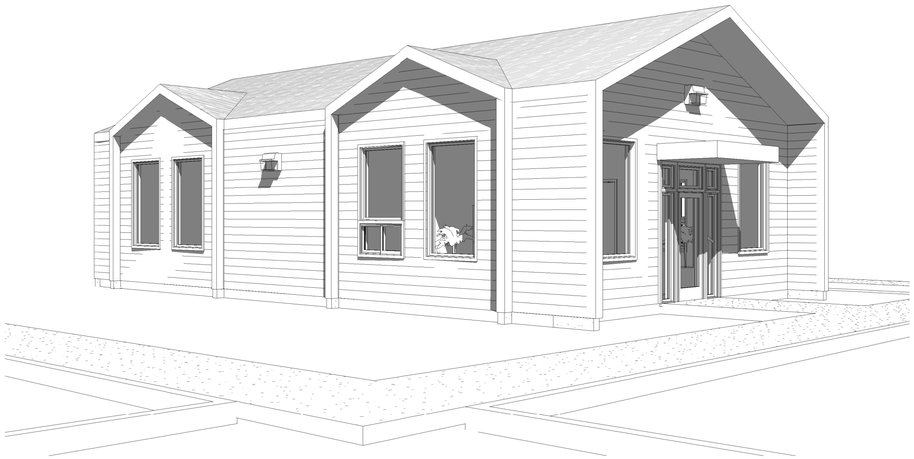
A4.1

1/4" = 1'-0"

5/28/2025 8:32:53 AM



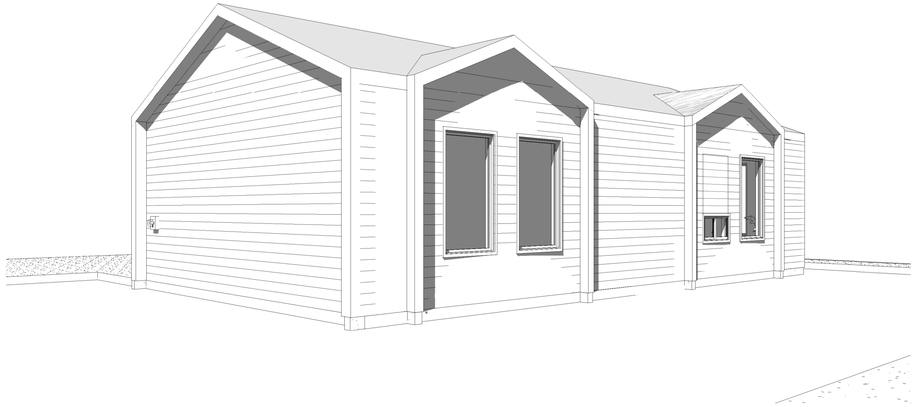
2 3D View 3



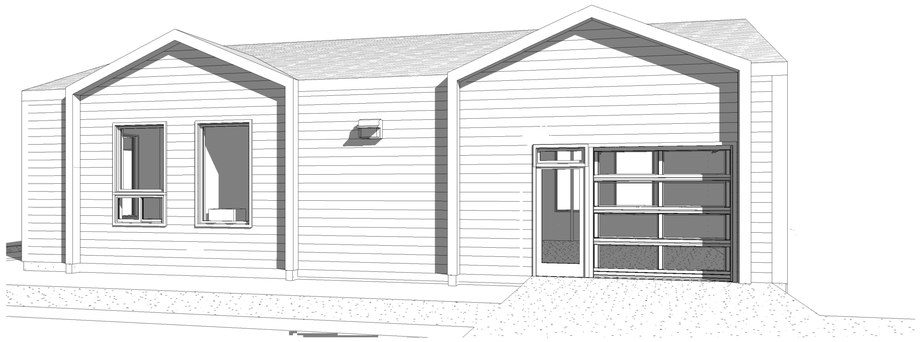
5 3D View 6



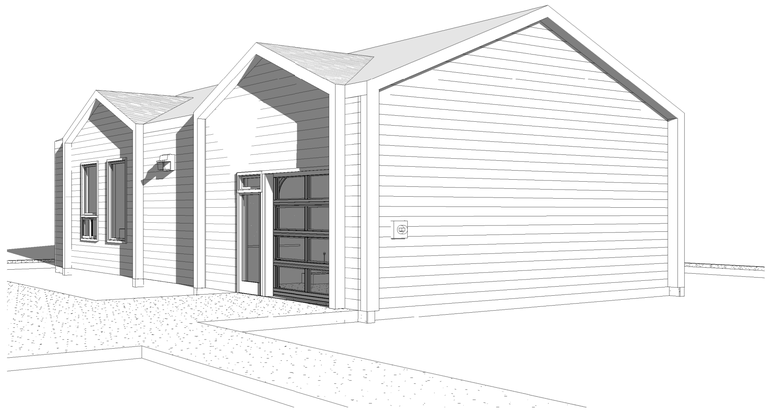
1 3D View 2



6 3D View 7



3 3D View 4



4 3D View 5

abbasi design works LLC
500 e 24th st
vancouver wa 98663
rahim@abbasidesign.com
+1.503.816.9466

No.	Date

HANEY MULTIFAMILY
Enter address here
Address Line 2

ADW # Project Number

Project Status

3D VIEWS

Date 5/28/2025 8:32:41 AM
Drawn Author
Checked Checker

A10.1

5/28/2025 8:32:41 AM



2 3D View 3



5 3D View 6



1 3D View 2



6 3D View 7



3 3D View 4



4 3D View 5

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+1.503.816.9466

No.	Date

HANEY MULTIFAMILY
Enter address here
Address Line 2

ADW #
Project Number

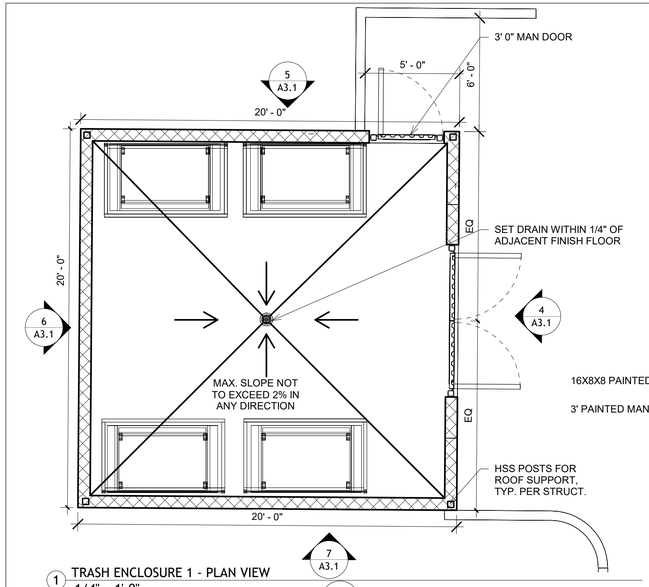
Project Status

3D VIEWS
COLOR Copy 1

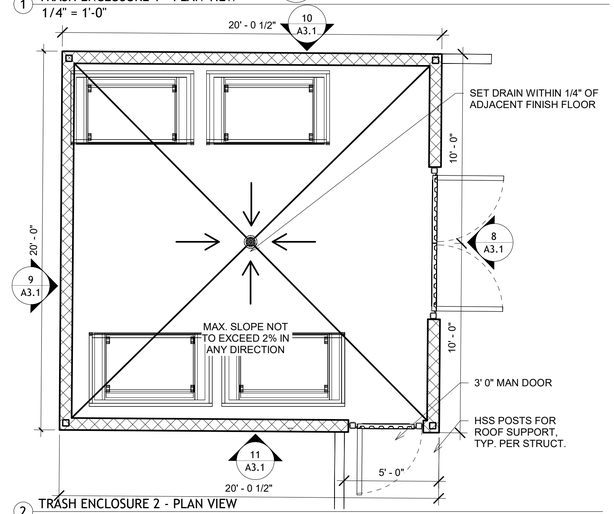
Date 5/28/2025 12:40:44 PM
Drawn Author
Checked Checker

A10.3

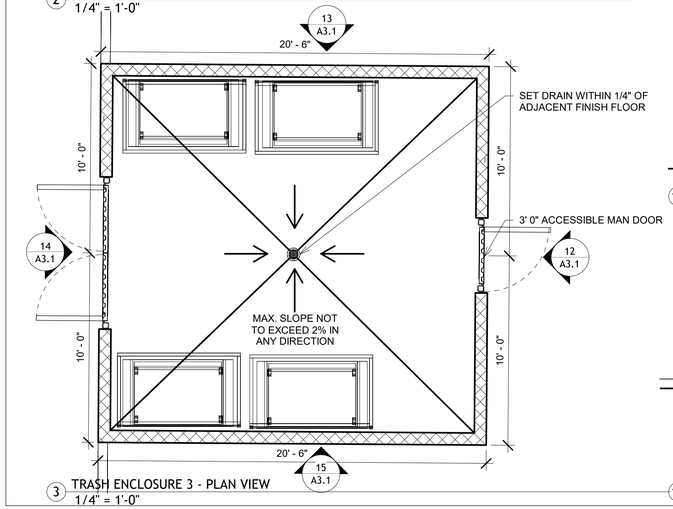
5/28/2025 12:40:44 PM



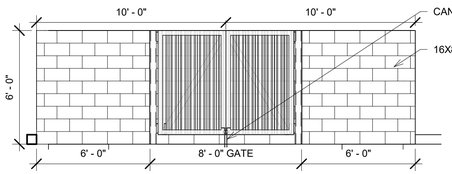
1 TRASH ENCLOSURE 1 - PLAN VIEW
1/4" = 1'-0"



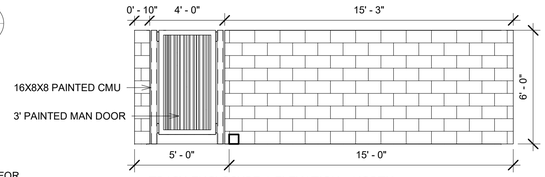
2 TRASH ENCLOSURE 2 - PLAN VIEW
1/4" = 1'-0"



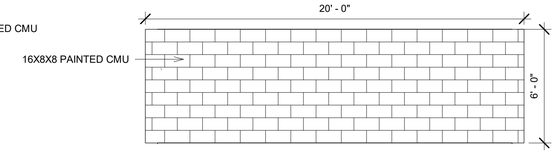
3 TRASH ENCLOSURE 3 - PLAN VIEW
1/4" = 1'-0"



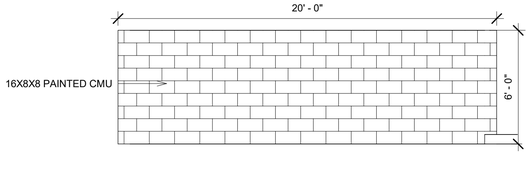
4 TRASH ENCLOSURE 1 ELEVATION - EAST
1/4" = 1'-0"



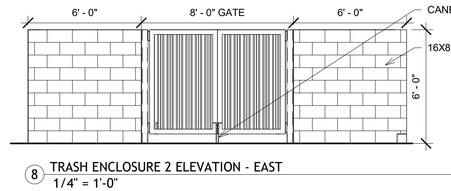
5 TRASH ENCLOSURE 1 ELEVATION - NORTH
1/4" = 1'-0"



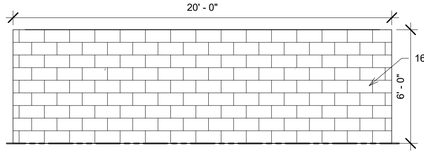
6 TRASH ENCLOSURE 1 ELEVATION - WEST
1/4" = 1'-0"



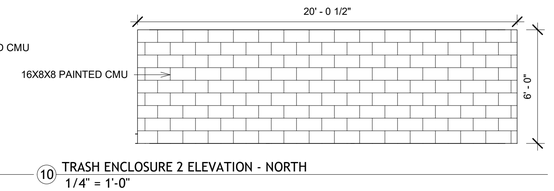
7 TRASH ENCLOSURE 1 ELEVATION - SOUTH
1/4" = 1'-0"



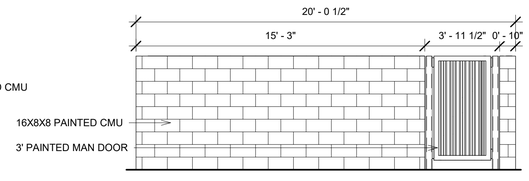
8 TRASH ENCLOSURE 2 ELEVATION - EAST
1/4" = 1'-0"



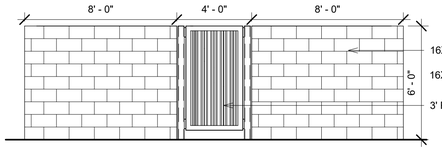
9 TRASH ENCLOSURE 2 ELEVATION - WEST
1/4" = 1'-0"



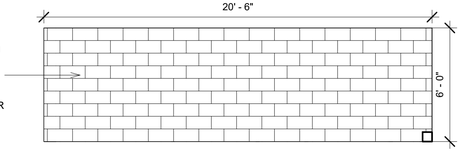
10 TRASH ENCLOSURE 2 ELEVATION - NORTH
1/4" = 1'-0"



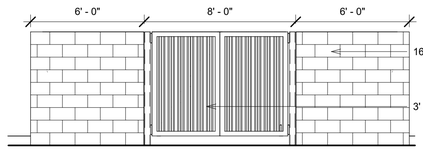
11 TRASH ENCLOSURE 2 ELEVATION - SOUTH
1/4" = 1'-0"



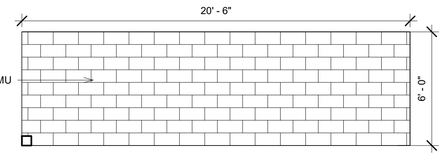
12 TRASH ENCLOSURE 3 ELEVATION - EAST
1/4" = 1'-0"



13 TRASH ENCLOSURE 3 ELEVATION - NORTH
1/4" = 1'-0"



14 TRASH ENCLOSURE 3 ELEVATION - WEST
1/4" = 1'-0"



15 TRASH ENCLOSURE 3 ELEVATION - SOUTH
1/4" = 1'-0"

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No.	Date

HANEY MULTIFAMILY
85 N 26TH AVE,
CORNELIUS, OR 97113

ADW #
24012.00

DESIGN REVIEW

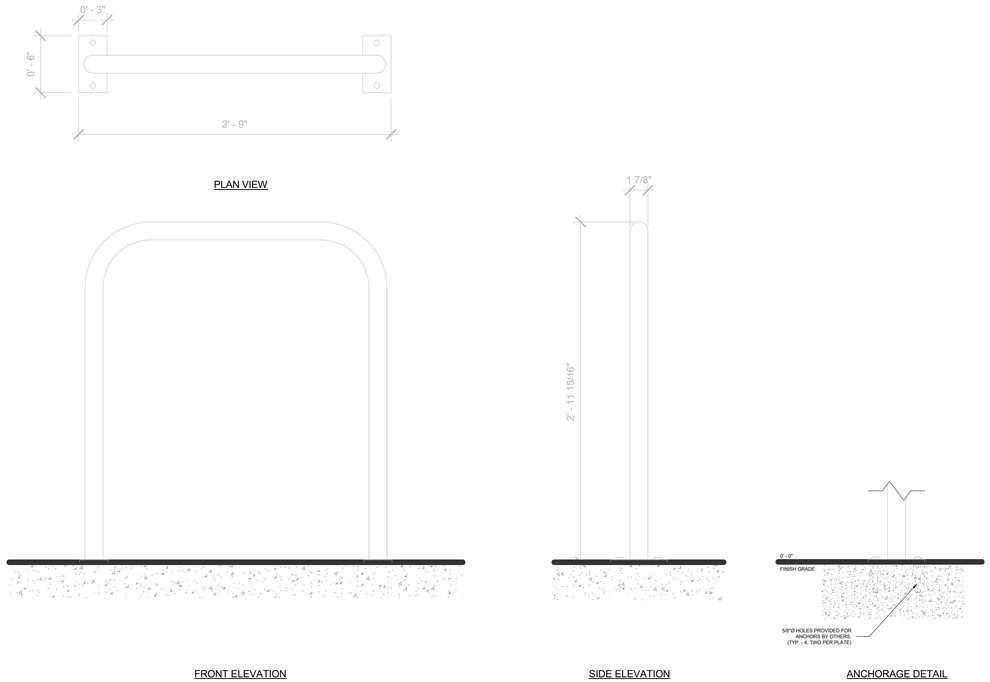
ENLARGED TRASH ENCLOSURE PLANS

Date 5/28/2025 2:57:59 PM
Drawn Author
Checked Checker

A3.1

1/4" = 1'-0"

5/28/2025 2:57:59 PM



1 BIKE RACK DETAIL
1 1/2" = 1'-0"

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HANEY MULTIFAMILY
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CORNELIUS, OR 97113

ADW #
24012.00

DESIGN REVIEW

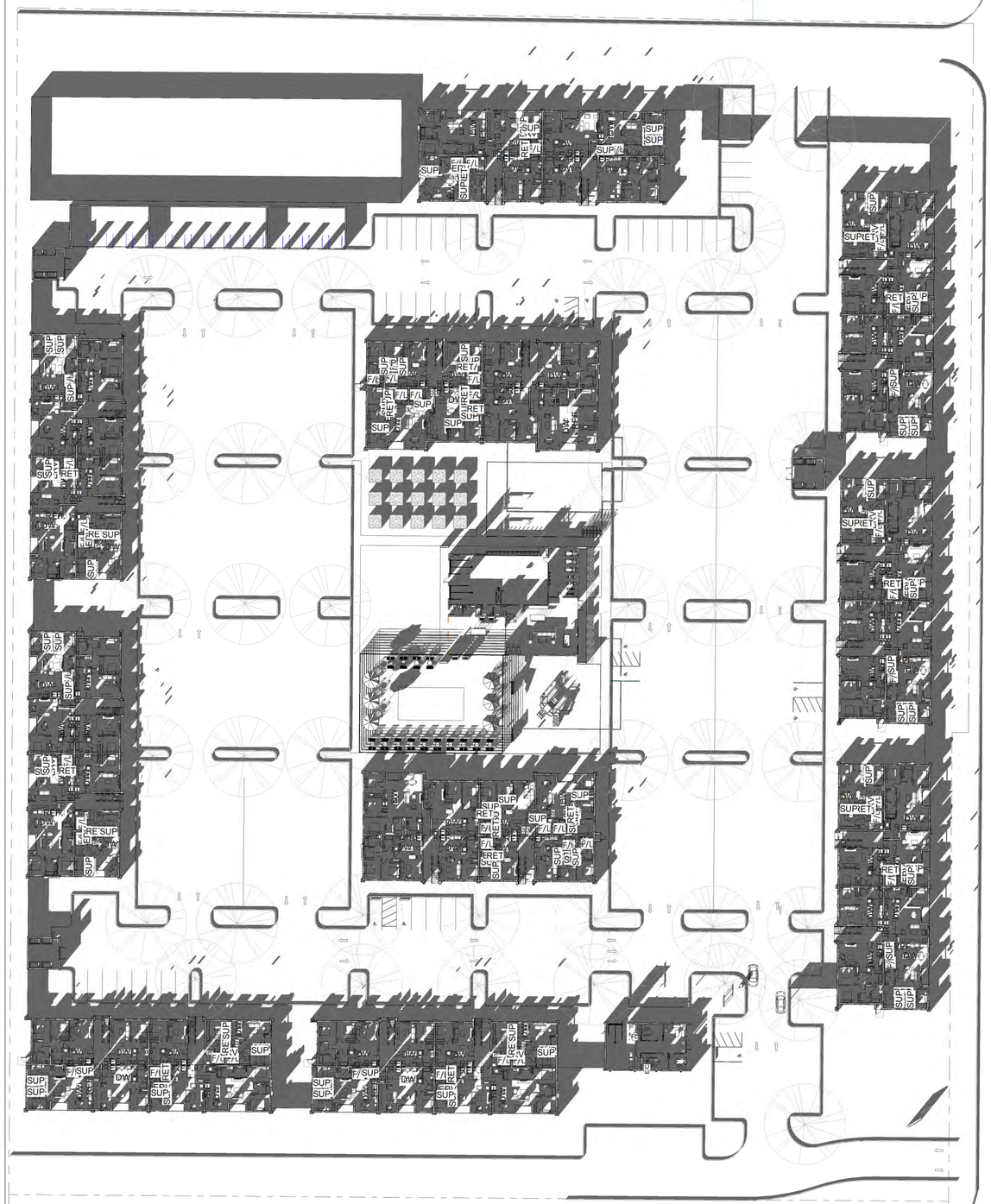
BIKE RACK DETAILS

Date 5/28/2025 2:48:45 PM
Drawn Author
Checked Checker

A8.0

1 1/2" = 1'-0"

5/28/2025 2:48:45 PM



SHADING STUDY CAST BY THE PHYSICAL ELEMENTS OF THE DEVELOPMENT AT 3 PM PST ON 21ST DECEMBER, 2025

SHADING STUDY CAST BY A 25 FEET TALL HYPOTHETICAL WALL ALONG THE PROPERTY LINES AT 3 PM PST ON 21ST DECEMBER, 2025

SUMMARY:

PER SECTION 18.155.050 (A), IT IS CLEARLY DISTINGUISHED THAT THE SHADOW CAST BY THE PROPOSED DEVELOPMENT WILL CREATE ANY ADVERSE IMPACT ONTO ADJACENT PROPERTIES.

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No.	Date

HANEY MULTIFAMILY
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CORNELIUS, OR 97113

ADW #
24012.00

DESIGN REVIEW

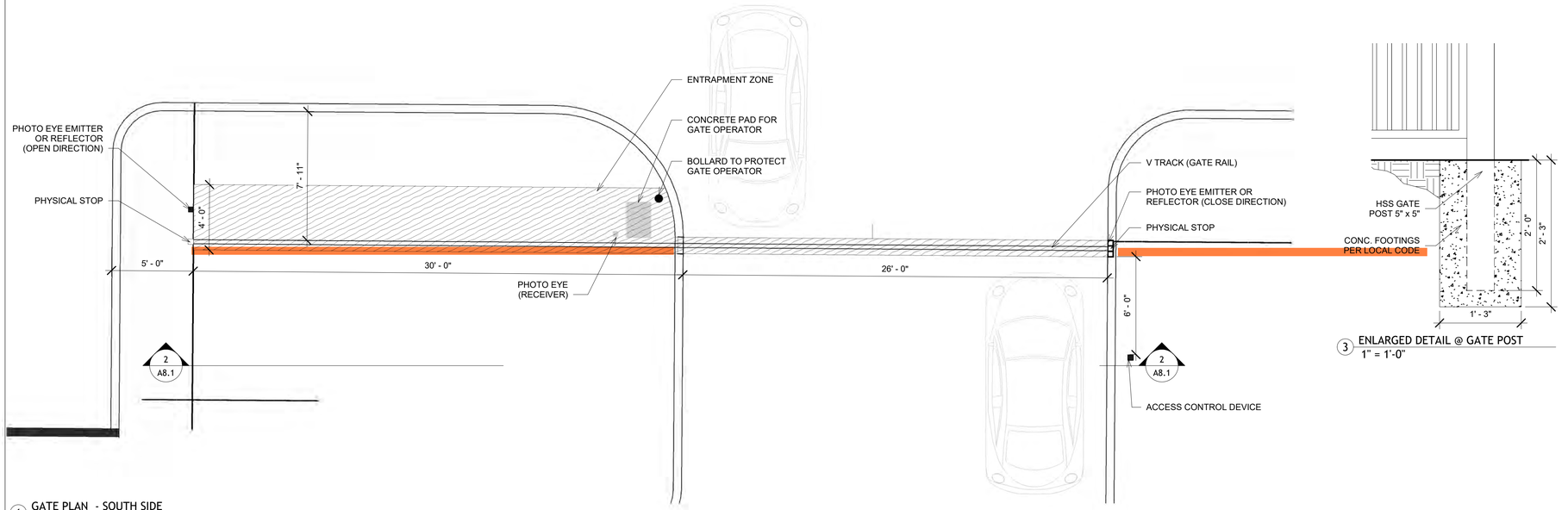
SHADING PLAN

Date 7/3/2025 12:33:37 PM
Drawn Author
Checked Checker

A1.1

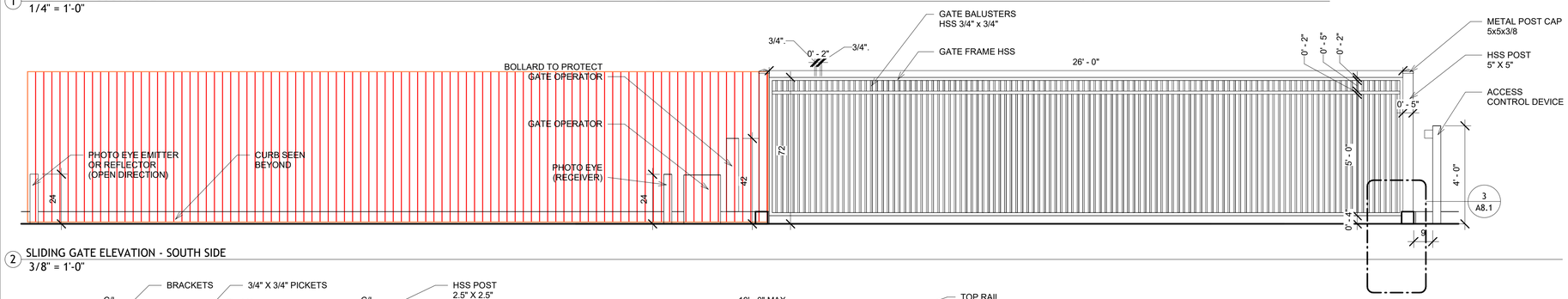
1" = 40'-0"

7/3/2025 12:33:37 PM

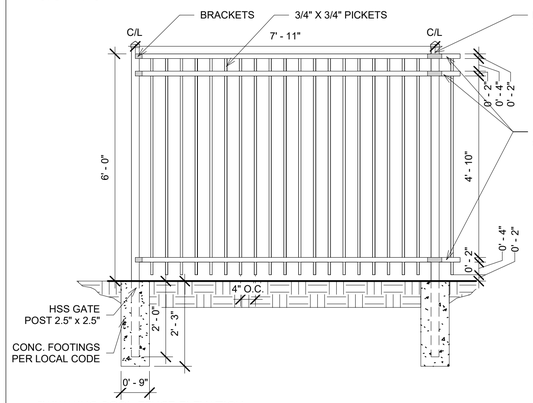


1 GATE PLAN - SOUTH SIDE
1/4" = 1'-0"

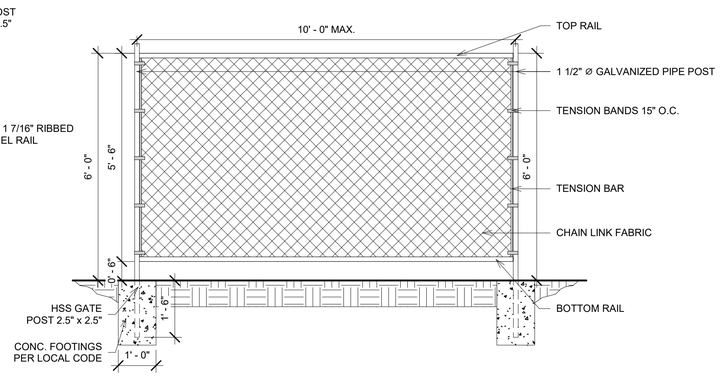
3 ENLARGED DETAIL @ GATE POST
1" = 1'-0"



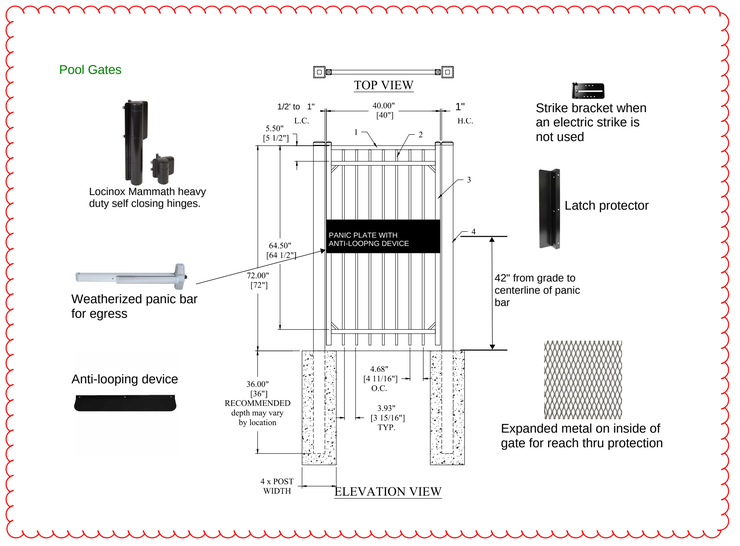
2 SLIDING GATE ELEVATION - SOUTH SIDE
3/8" = 1'-0"



4 SWIMMING POOL FENCE ELEVATION
1/2" = 1'-0"



CHAIN LINK FENCE ELEVATION BETWEEN BUILDINGS
5 1/2" = 1'-0"



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No.	Date

HANEY MULTIFAMILY
85 N 26TH AVE,
CORNELIUS, OR 97113

ADW #
24012.00

DESIGN REVIEW

SLIDING GATE, SWIMMING POOL FENCE & CHAINLINK FENCE

Date 7/2/2025 12:16:10 PM
Drawn Author
Checked Checker

A8.1

As indicated

7/2/2025 12:16:10 PM

MATERIALS BOARD (1 of 2)

Haney Multifamily Development

85 North 26th Avenue, Cornelius, OR 97113
Tax Lot: 1N334DC04500 and 04600

Building Siding:

Fiber Cement Lap Siding
Product : Hardie Plank Lap Siding
Texture: Smooth
Color: Heron White (SW 7627)



Detail



Application

Building Trim / Soffits:

Fiber Cement Trim and Soffit Boards
Product: Hardie Trim /Soffit
Texture: Smooth
Color: Iron Ore (SW 7069)



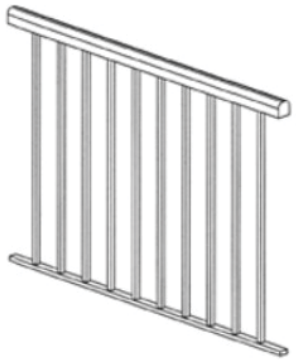
Trim



Soffit

Railings:

Powder Coated Aluminim Picket Rail
Manufacturer: Rail Pro (or equal)
Style: Standard
Color: Black



Standard Profile



Application

Windows:

Vinyl Framed W
Product: Casc
Operability: Sli
Frame Color: W



Exerior



Interior

MATERIALS BOARD (2 of 2)

Haney Multifamily Development

85 North 26th Avenue, Cornelius, OR 97113
Tax Lot: 1N334DC04500 and 04600

Roofing:

3-Tab Asphalt Shingle
Manufacturer: Owens Corning (or sim.)
Product: Supreme
Color: Onyx Black



Detail



Application

Concrete Base

Exposed Concrete Base
Texture: Trowel Finish
Color: Unpainted



Detail



Application


Costco









1 EAST ELEVATION Copy 2
1/8" = 1'-0"



2 NORTH ELEVATION Copy 2
1/8" = 1'-0"



3 SOUTH ELEVATION Copy 2
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

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REGISTERED PROFESSIONAL ENGINEER
82291
OREGON
Jan. 13, 2009
RAHIM A. ABBASI
EXPIRES:

No.	Date

HANEY MULTIFAMILY
85 N 26th Ave,
Cornelius, OR 97113

ADW #
24012.00

Project Status

ELEVATIONS W/O SHADOWS

Date 5/23/2025 12:03:12 PM
Drawn Author
Checked Checker

A3.3

1/8" = 1'-0"

5/23/2025 12:03:12 PM



1 EAST ELEVATION - BUILDING A
1/8" = 1'-0"



2 WEST ELEVATION - BUILDING A
1/8" = 1'-0"

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No.	Date

Haney Apartments
BUILDING TYPE [A]
139 N 26th Ave,
Cornelius, OR 97223

ADW #
24012.00

Project Status

EAST / WEST ELEVATIONS

Date 5/23/2025 12:01:04 PM
Drawn Author
Checked Checker

A3.2

1/8" = 1'-0"

5/23/2025 12:01:04 PM



1 NORTH ELEVATION - BUILDING A
1/8" = 1'-0"



2 SOUTH ELEVATION - BUILDING A
1/8" = 1'-0"

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rahim@abbasidesign.com
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No.	Date

Haney Apartments
BUILDING TYPE [A]
139 N 26th Ave,
Cornelius, OR 97223

ADW #
24012.00

Project Status

NORTH / SOUTH ELEVATIONS

Date 5/23/2025 11:57:33 AM
Drawn Author
Checked Checker

A3.1

1/8" = 1'-0"

5/23/2025 11:57:33 AM



1 EAST ELEVATION - BUILDING B
1/8" = 1'-0"



2 WEST ELEVATION - BUILDING B
1/8" = 1'-0"

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No.	Date

Haney Apartments
BUILDING TYPE [B]

ADW #
24012.00

Project Status

EAST / WEST ELEVATIONS

Date 5/23/2025 11:56:03 AM
Drawn Author
Checked Checker

A3.4

1/8" = 1'-0"

5/23/2025 11:56:03 AM



1 NORTH ELEVATION - BUILDING B
1/8" = 1'-0"



2 SOUTH ELEVATION - BUILDING B
1/8" = 1'-0"

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No.	Date

Haney Apartments
BUILDING TYPE [B]

ADW #
24012.00

Project Status

NORTH/ SOUTH ELEVATIONS

Date 5/23/2025 11:51:22 AM
Drawn Author
Checked Checker

A3.3

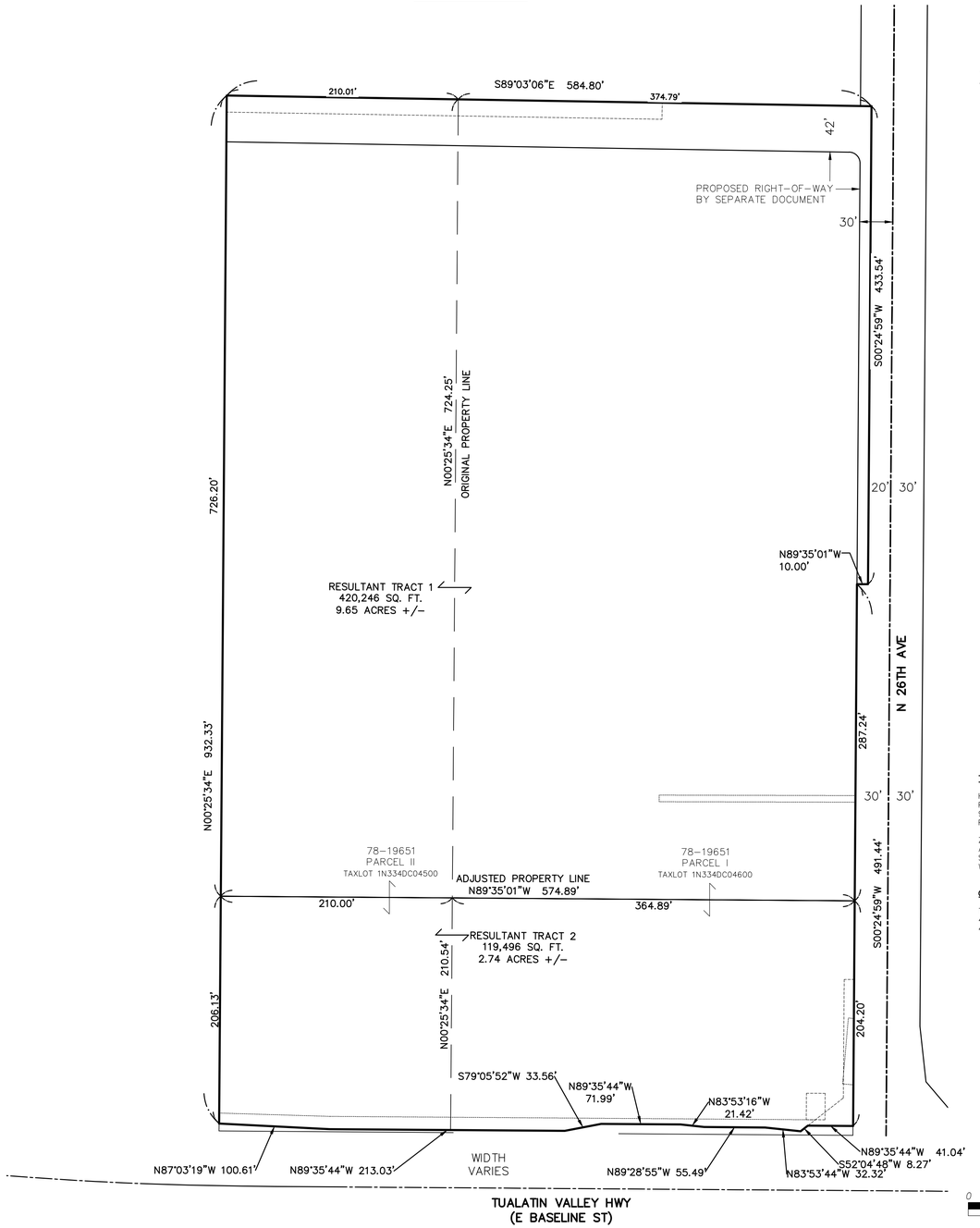
1/8" = 1'-0"

5/23/2025 11:51:22 AM

EXISTING CONDITIONS PLAN

LOCATED IN THE SOUTHWEST ONE-QUARTER OF THE
SOUTHEAST ONE-QUARTER OF SECTION 34,
TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN
CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON

OVERVIEW MAP



TOPOGRAPHIC LEGEND:

- STM — STORM SEWER LINE
- SAN — SANITARY SEWER LINE
- W — WATER LINE
- G — GAS LINE
- OW — OVERHEAD WIRE
- X — X — X — FENCE LINE, TYPE AS NOTED
- FO — FIBER OPTIC LINE
- T — TELEPHONE LINE
- E — ELECTRIC LINE
- TV — CABLE TELEVISION LINE
- FLOWLINE
- BUILDING LINE
- UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
- MAJOR CONTOUR – 5' INTERVALS
- MINOR CONTOUR – 1' INTERVALS

- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- CATCH BASIN SQUARE
- ROOF DRAIN DOWN SPOUT
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER STAND PIPE
- WATER VAULT
- IRRIGATION BOX
- GAS METER
- GAS VALVE
- POWER RISER
- POWER METER
- ELECTRIC BOX
- POWER TRANSFORMER
- CABLE TELEVISION BOX
- CABLE TELEVISION RISER
- TELEPHONE RISER
- SIGNAL POLE
- SEE TOPO/SURVEY NOTES TABLE
- EXCEPTION NUMBER PER TITLE REPORT
- FOUND MONUMENT AS NOTED IN TABLE. PROTECT.
- UNKNOWN UTILITY VAULT
- UNKNOWN RISER/CABINET
- GUY WIRE
- LIGHT POLE
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
- UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
- SINGLE POST SIGN
- FLAG POLE
- GATE POST
- BOLLARD
- MAIL-BOX
- HANDI-CAP PARKING SPACE
- CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- TRAFFIC SIGNAL BOX
- TRAFFIC SIGNAL CABINET
- POLE WITH PEDESTRIAN PUSH BUTTON
- FIRE DEPT. CONNECTION

NOTE: SYMBOLS SHOWN HEREON ARE FOR GRAPHICAL REPRESENTATION PURPOSES AND DO NOT NECESSARILY SHOW SHAPE, SIZE, ROTATION, CONDITION, TYPE, ETC. OF THE ACTUAL PHYSICAL IMPROVEMENTS THAT THEY REPRESENT. CONDITION, TYPE, ROTATION, ETC. MAY VARY AMONGST ITEMS SHOWN BY THE SAME SYMBOL.

UTILITY STATEMENT:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM LOCATE PAINT MARKINGS TIED IN THE FIELD SURVEY AND AS-BUILT DRAWINGS PROVIDED BY UTILITY COMPANIES. THIS SURVEY DOES NOT SHOW ANY PAINT MARKINGS PROVIDED AFTER THE FIELD SURVEY WAS COMPLETED. AS-BUILT DRAWING INFORMATION THAT WAS NOT PROVIDED IS NOT REFLECTED ON THIS SURVEY. AS-BUILT INFORMATION, IF PROVIDED, WAS USED TO IDENTIFY UNDERGROUND PIPE SIZE AND TYPE (IF SHOWN, AND NOT MEASURED). PAINTED SIZE INFORMATION, IF PROVIDED, WAS USED TO IDENTIFY UNDERGROUND PIPE SIZE AND TYPE (IF SHOWN, AND NOT MEASURED). IF NO LOCATE PAINT MARKINGS WERE PROVIDED, AS-BUILT INFORMATION WAS USED TO HORIZONTALLY LOCATE THE UNDERGROUND UTILITIES.

THIS SURVEY MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE OF ALL SUCH UTILITIES IN THE AREA. THE UNDERGROUND UTILITIES SHOWN MAY NOT BE IN THE EXACT LOCATION AS NOTED ON THIS SURVEY, BUT ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION PROVIDED. MANHOLES OTHER THAN SANITARY AND STORM SEWER WERE IDENTIFIED BY MANHOLE LIDS AND MAY NOT BE LABELED CORRECTLY.

PRIVATE UTILITY LOCATES WERE PERFORMED BY MARK IT OUT, LLC.

UTILITY LOCATIONS MUST BE VERIFIED BY THE STATE UTILITY NOTIFICATION CENTER IMMEDIATELY PRIOR TO ANY EXCAVATION.

UTILITY LOCATES WERE REQUESTED 08/08/2024 UNDER TICKET NUMBERS 24225788, 24225796, 24225837 & 24225846

FOLLOWING IS A LIST OF UTILITY PROVIDERS NOTIFIED:

CCOR01	COMCAST CABLE	(800)778-9140
CORN01	CORNELIUS PUB. WORKS	(503)357-3011
HILLS01	CITY OF HILLSBORO – WATER	(503)615-6700
HILLS03	CITY OF HILLSBORO	(503)803-1106
NWN01	NW NATURAL	(971)277-4474
ODOTRE01	OREGON DOT ELECTRICAL	(971)283-0909
PGE03	PORTLAND GENERAL ELECTRIC	(503)255-4634
ZIPOR01	ZIPLY FIBER	(800)778-9140

* – DENOTES AS-BUILT MAPS RECEIVED

MANHOLE LOCATION INFORMATION:

DUE TO THE HAZARDOUS NATURE AND APPLICABLE OSHA REQUIREMENTS REGARDING CONFINED SPACES, IT IS COMPANY POLICY TO NOT SEND OUR FIELD STAFF INTO UTILITY MANHOLES TO RETRIEVE DEPTH AND SIZE INFORMATION (PIPE SIZES AND DEPTHS ARE OBTAINED THROUGH ABOVE GROUND METHODS). THEREFORE, ANY MANHOLE ELEVATION INFORMATION SHOWN HEREON IS SUBJECT TO AN UNCERTAINTY IN ACCURACY OF PLUS OR MINUS 0.1' OR GREATER (DEPENDING ON DEPTH, SIZE, FLOW, AND CONSTRUCTION OF MANHOLE). MANHOLE PIPE SIZES ARE ALSO SUBJECT TO AN UNCERTAINTY OF TWO INCHES OR MORE (DEPENDING ON DEPTH, SIZE, FLOW, AND CONSTRUCTION OF MANHOLE). IF A HIGHER ACCURACY IS NEEDED, ADDITIONAL TIME, EQUIPMENT, AND PERSONNEL WILL BE REQUIRED TO ENTER THE MANHOLE AND RETRIEVE SAID INFORMATION.

MANHOLE LOCATIONS SHOWN ARE TO CENTER OF LID, NOT CENTER OF STRUCTURE.

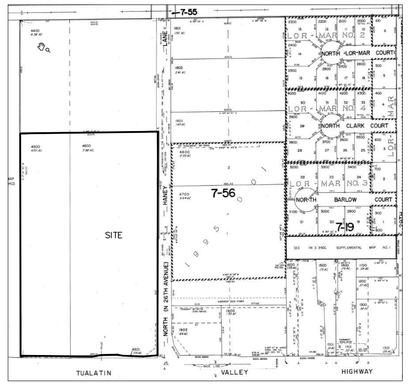
VERTICAL DATUM:

NAVD88 BASED ON GPS OBSERVATIONS.

HORIZONTAL DATUM

OREGON COORDINATE REFERENCE SYSTEM (OCRS), PORTLAND ZONE, NAD83(2011). EPOCH(2010.0000) INTERNATIONAL FEET.

VICINITY MAP



TAX LOT 1N334DC04500

HANEY INDUSTRIAL
PROPERTIES INC
901 NE GLISAN ST STE 200
PORTLAND, OR 97232

ZONING: GMU
ACREAGE: 4.51 ACRES
SEWAGE: CWS
WATER: CITY OF HILLSBORO

TAX LOT 1N334DC04600

HANEY INDUSTRIAL
PROPERTIES INC
901 NE GLISAN ST STE 200
PORTLAND, OR 97232

ZONING: GMU
ACREAGE: 7.88 ACRES
SEWAGE: CWS
WATER: CITY OF HILLSBORO

CALCULATED AREAS:

TAX LOT	BEFORE ADJUSTMENT	AFTER ADJUSTMENT
4500	4.51 ACRES	9.65 ACRES
4600	7.88 ACRES	2.74 ACRES

NOTES:

PER FLOOD INSURANCE RATE MAP NUMBER 410261-0318-E MAP, THE SUBJECT PROPERTY LIES IN ZONE "X", DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

0 30 60 120
SCALE: 1" = 60'

DATE	NO.	DESCRIPTION
		R E V I S I O N S

DESIGNED: ---
DRAWN: ACY
CHECKED: JWH
DATE: 05/23/2025

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS
205 SE Spokane Street, Suite 200, Portland, OR 97202
phone: 503.221.1131 www.hhpr.com fax: 503.221.1171

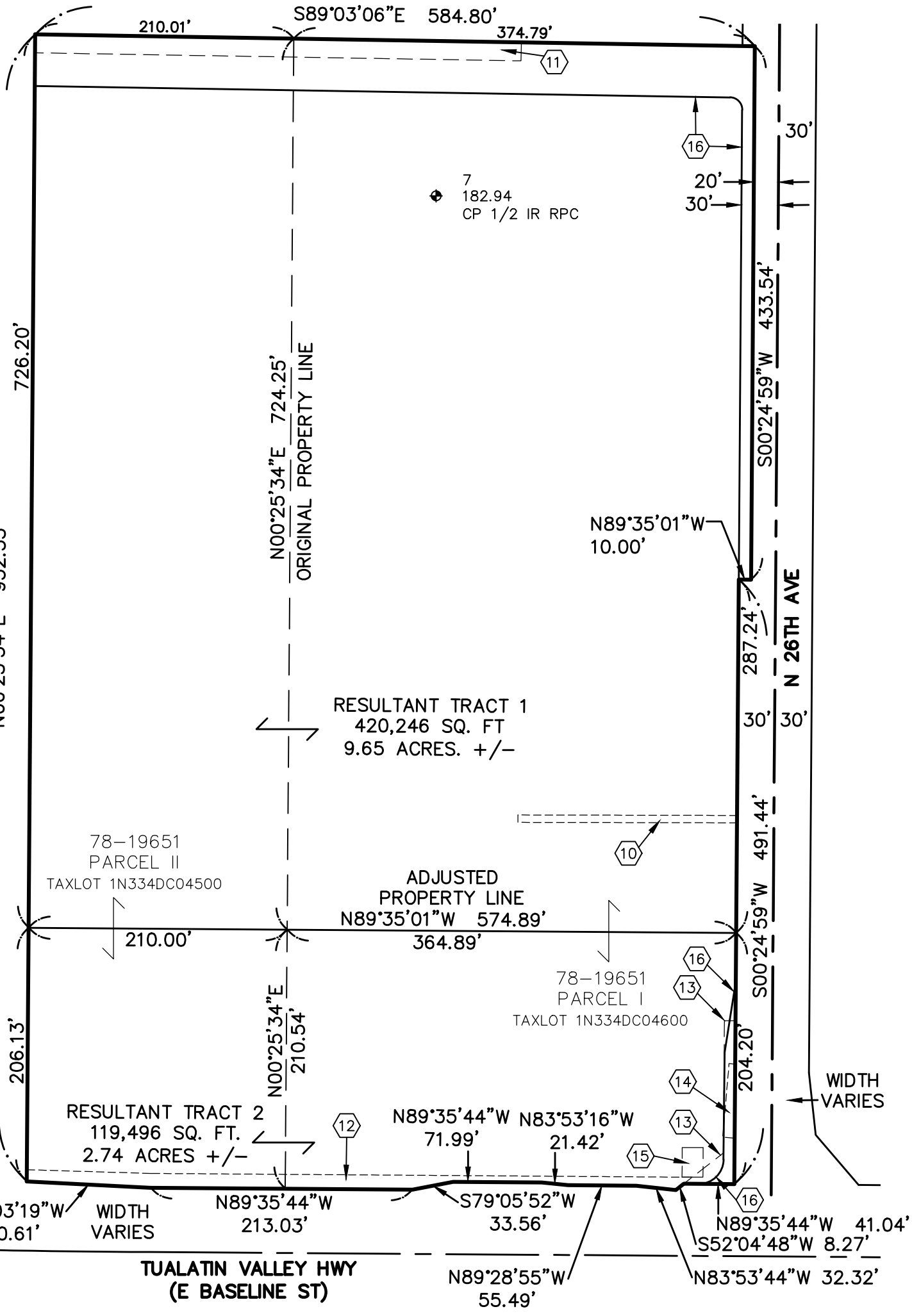
EXISTING CONDITIONS PLAN
85 N 26TH AVE
CORNELIUS,OREGON

SHEET NO. 1 OF 4
JOB NO. FPC-02

S:\FPC (Fore Property Company)\FPC-02 (Cornelius ALTA)\FPC-02-DWGS\C3D\ FPC-02-TOPO-SUR.dwg

PROPOSED PROPERTY LINE ADJUSTMENT EXHIBIT

LOCATED IN THE SOUTHWEST ONE-QUARTER OF THE SOUTHEAST ONE-QUARTER OF SECTION 34, TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON



SCALE
1" = 100'

10 6' PGE EASEMENT
DOC. NO. 85-004781

11 15' CITY STORM DRAINAGE
DOC. NO. 95-065296

12 PUBLIC UTILITY EASEMENT
DOC. NO. 2002-084971

13 RIGHT-OF-WAY EASEMENT
DOC. NO. 2002-084972

14 PGE POWER EASEMENT
DOC. NO. 2014-052827

15 CORNELIUS CINEMAS
SIGN EASEMENT
DOC. NO. 2015-069158

16 PROPOSED RIGHT-OF-WAY
BY SEPARATE DOCUMENT

PROPOSAL

ADJUST PROPERTY LINES
BETWEEN TAX LOT 4500 AND
4600

OWNERS OF LOTS INCLUDED ON
THIS PROPERTY LINE
ADJUSTMENT:

TAX LOT 1N334DC04500

HANEY INDUSTRIAL
PROPERTIES INC
901 NE GLISAN ST STE 200
PORTLAND, OR 97232

ZONING: GMU
ACREAGE: 4.51 ACRES
SEWAGE: CWS
WATER: ???

TAX LOT 1N334DC04600

HANEY INDUSTRIAL
PROPERTIES INC
901 NE GLISAN ST STE 200
PORTLAND, OR 97232

ZONING: GMU
ACREAGE: 7.88 ACRES
SEWAGE: CWS
WATER: ???

CALCULATED AREAS:

TAX LOT	BEFORE ADJUSTMENT	AFTER ADJUSTMENT
4500	4.51 ACRES	9.65 ACRES
4600	7.88 ACRES	2.74 ACRES

SEE ATTACHED LEGAL DESCRIPTION

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