AGENDA ITEM SUMMARY		ITEM NO:				
FLORENCE PLANNING COMMISSION		Meeting Date:	April 13, 2021	April 13, 2021		
		Department:	Community Dev.			
ITEM TITLE:	Appeal of Administrative Storage, LLC (Kingwood)	Design Review	AR 20 10 DR 03 Hee	ceta Self		

## **ACTION REQUESTED:**

On April 13, 2021, the Florence Planning Commission will hold a public hearing and possibly deliberate and take action on an appeal by the applicants of AR 20 10 DR 03, which was conditionally approved by staff on February 25, 2021. The applicants, Larry and Crystal Farnsworth, for Heceta Self Storage Corporation, ultimately seek to construct a phased 470-unit storage facility with an associated office building on multiple lots owned by the City of Florence and leased to the applicants and are appealing conditions related to their proposed stormwater design for an established vegetated area situated along the east boundary of the properties in question.

All lots associated with the proposed development are unaddressed, total approximately 4.5 acres, and are located on Assessor's Map 18-12-22-43, Tax Lots 00900, 00800, 00700, 00600, 00500, and 00400 and Assessor's Map 18-12-22-42, Tax Lots 00200 and 00100. They are also described as being Lots 4 through 10 and the southern half of lot 11 of the Industrial Park plat of the City of Florence and situated along the west side of Kingwood St., between the Oregon Coast Military Museum to the south and the Florence Public Works building to the north.

Conditions issued by the Planning staff under a Type II approval cannot be amended without an approved appeal by the Planning Commission. Therefore, all conditions from AR 20 10 DR 03 stand as written with exception to those related to the stormwater design in this appeal and are explained in this AIS. Staff will check future submitted plans to ensure that conditions were followed or are complete.

### APPEAL ITEM

Larry and Crystal Farnsworth are appealing the stormwater design requirement of a proposed vegetated filter strip measuring up to 14' in width and is to be located on the eastern side of the development. This filter strip area is referred to in the applicants' updated Stormwater Design Report (Attachment 4) as Region 7. Region 7 is illustrated in red on page 13 of the report in Map A.3 labeled "Watershed / Catchment Delineation Map (Post-Development)". The region consists of stormwater catchment from the office building, eastern half of three storage building roofs, the eastern drive aisle, and the proposed filter strip. The applicants desire to preserve the native vegetation in this filter strip area while the Best Management Practice within the Stormwater Design Manual (SDM) requires a constructed design which involves removing the vegetation and replacing with a specified soil blend and planting scheme. Attachment 4, in contradiction to the applicants'

desire to retain the vegetation, illustrates SW-160 of the SDM as the planned constructed design for the eastern proposed filter strip. Regardless, the applicants' engineer contends that leaving the native vegetation as-is will adequately handle stormwater needs. Furthermore, the applicants offer an alternative solution in order to retain this vegetation by proposing that the area be tested and outline their proposed process. If the tests fail, then the applicants would construct the project in accordance with the Stormwater Design Manual. This test proposal is explained in the following section.

Also of note is that the applicants state, in Attachment 1, that Planning staff concurs that the minimum requirement for landscape is met. In fact, staff will need an updated landscape plan as conditioned in AR 20 10 DR 03, Condition 17 in particular, to verify that this landscaping requirement will be met (Attachment 3:

"17. In order to ensure that the applicant will retain the minimum landscaping required for the development, the applicant shall provide a detailed Landscape Plan and irrigation plans for the existing native vegetation to remain and proposed new vegetation prior to the issuance of permits in accordance with FCC 10-23-3-2 D and 10-34-3-5 and 9-2-3-5. This shall be submitted under a Type 1 review process subject to the associated staff review fee."

### BACKGROUND STATEMENT

The Type II application for the above development was processed by staff in accordance with FCC 10-1-1-5 (as applicable) and 10-1-1-6-2, Sections A through D; which included ensuring completeness of the application, noticing for hearings, post-hearing, and procedural requirements as they related to processing the conditional administrative approval. This application was conditionally approved on February 25, 2021 and the applicant mailed a Notice of Decision for AR 20 10 DR 03 which included items that were conditionally approved.

Planning staff received a Petition to Appeal from the applicant as outlined in Florence City Code Title 10, Chapter 1, Section 10-1-1-7 (B), within the allotted 12 appeal day period after mailing the Notice of Decision (Attachment 1). The public hearing notice for this appeal was mailed to the applicants on March 29, 2021 as required by FCC 10-1-1-6-3 (B).

The applicants' updated Stormwater Management Report (Exhibit I, Attachment 4) was peer reviewed by Civil West Engineering, the City engineer of record, and Mike Miller, Public Works Director. Attachments 6 through 8 provide comments made by Civil West and Mike Miller. Therefore, stormwater-related Conditions 30 through 36 in the AR 20 10 DR 03 findings (Attachment 3) were derived from these peer review comments and criteria outlined in FCC Title 9, Chapter 5 and Florence Stormwater Design Manual.

The majority of the conditions for AR 20 10 DR 03 (Attachment 3) were agreed upon by the applicant (Attachment 2). Items related to these appeal proceedings are in reference to the design

of the vegetated filter strip bordering the east side of the development. The review of Stormwater criteria is discussed in Attachment 3, starting on page 43. As previously stated, stormwater design conditions for the administrative approval includes Conditions 30 through 36:

- **30.** The applicant's engineer discusses the use of both Rational and Prescriptive calculations in the two Stormwater Design Studies provided. The Rational Method is acceptable per the Public Works Director if onsite capacity calculations are provided. System capacity calculations shall be provided to demonstrate that any additional flow will not overwhelm the system. If not provided, then the prescribed methods in the City's Stormwater Design Manual and City Code (FCC Title 9) shall be followed.
- **31.** The northern filter strip includes piping which is not a feature of a filter strip in the SWDM. The piping proposed for the filter strips shall use a schematic standard for another BMP in the SWDM similar in function such as a swale. The nearest drain inlets to the north filter strip are 130 feet to the north and 170 feet to the south in Kingwood St. Any stormwater system Best Management Practices must be constructed per City approved detail. Two alternative solutions specifically for the north filter strip include: 1. The north vegetated filter strip shall be designed so that any anticipated overflow from a 25-year rain event may be allowed to utilize a bubble-up catch basin whereby anything over a 50 to 100-year storm event is conveyed to the existing gutter/curb on the east side of Kingwood St; <u>OR</u>, 2. Excess flow above a 25-year storm event shall be conveyed to a 6-inch pipe and penetrate the back of the curb inlet, providing that the correct fall for proper drainage is demonstrated.
- **32**. Appendix E in the Stormwater Management Study (Exhibit I) includes the necessary information pursuant to the above code; form drafts, an Operations and Maintenance Agreement, and an Operations and Maintenance Plan. Should these need amending as a result of conditions set out in these Findings, the applicant shall submit the amendments to the Public Works Director for approval.
- **33**. The Maintenance Agreement draft currently excludes the above 10-day period to complete corrections after noticing. Pursuant to FCC 9-5-4 B, prior to final building inspections the applicant shall provide the final Maintenance Agreement to include the following in their Maintenance Agreement: "...corrections shall be completed within ten (10) days after notice thereof."
- **34**. Include the Intensity Duration Frequency (IDF) curves in Appendix A of the applicant's Stormwater Management Report.
- **35**. The applicant shall have values tabulated in a single table within the Stormwater Management Report for ease of reference.
- **36.** Vegetated filter strips under the required minimum 10' widths shall be constructed so as to prevent inconsistency with other conditions in these Findings.

Although Condition 31 of the approval generally references the north vegetated filter strips; a statement included within the condition addresses all stormwater system design: "Any stormwater

system Best Management Practices must be constructed per City approved detail." This Condition is directly related to a Peer Review comment provided and shown in Item 4 of Attachment 7. Except as noted in FCC 9-5-1-8, FCC Title 9, Chapter 5 includes the stormwater regulations and adopts the 2008 City of Portland Stormwater Management Manual, the 2008 City of Portland Erosion and Sediment Control Manual, and the December 2010 City of Florence Stormwater Design Manual. This latter document contains the Best Management Practices implemented in stormwater systems construction. Condition 36 is the focus of the appeal; "Vegetated filter strips under the required minimum 10' widths shall be constructed so as to prevent inconsistency with other conditions in these Findings."

The applicants' engineer's intention for the east filter strip, (referred to as 'Region 7') is to receive all storm water from the office building, the eastern half of three storage buildings (Buildings AA, AE AH, pitched roof) and the eastern drive aisle, (Attachment 4, p. 6 and Appendix A-3). The conflict is the design, regardless of whether or not the area can treat all post-development runoff in that no additional stormwater exits the development. Item 4 in Attachment 7 states: *"Directing drainage to existing vegetated areas is not an approved method of treatment. Any filter strip BMPs must be constructed per City approved standard details."* The City does not provide for a stormwater filter strip BMP that includes existing native vegetation.

Although the applicants originally proposed vegetated filter strips on the east side of their development as discussed in Attachment 2, they state they were unaware that the construction requirements of these strips meant that removal of existing native vegetation was necessary. Applicants state that their engineer believes that leaving the native vegetation with its established root mat is an adequate treatment facility in itself and that they would replace any areas they would need to disturb for constructing fencing and driveways, for example, with the requisite filter strip rock, soils and plants. They otherwise propose to leave the vegetation as-is, which would measure up to 14' in width throughout parts of the swath, and to "test" its ability to treat stormwater after development of the storage units are in place rather than construct the filter strips as outlined in the Stormwater Design Manual.

In Attachment 2, the applicants propose three conditions for the testing: 1). a visual inspection of the site by an Airport Annex employee after every forecast or storm event of 1" or more rainfall; 2). keeping an inspection log of these activities and documenting the performance of the area where waters exceed 2" in depth and track areas of standing water and instances where waters reach or flow over the sidewalk along Kingwood St. 48 hours after a storm event; and, 3). Perform maintenance duties as described in their Operations and Maintenance Plan to correct or repair observed conditions. Applicants propose to regrade and replant if this system fails according to design specifications, and also to retain existing trees.

The central issue with the applicants' test proposal is that this methodology is not an approved design approach through Title 9, Chapter 5 nor the Stormwater Design Manual. FCC 9-5-7-1, however, does allow opportunity for a technical equivalency:

A. The City may grant a technical deviation from the requirements of this Code if there are

exceptional circumstances appliable to the project such that the provisions of the Code will result in unnecessary hardship and not fulfill the intent and objectives of the Code. The costs to comply with the requirements of this Code shall not be considered as justification for a technical equivalency.

B. To be approved, the proposed technical equivalency shall meet the following conditions:

1. The technical equivalency complies with the development conditions imposed on the project.

2. The granting of a technical equivalency will produce compensating or comparable results that are in the public interest.

3. The granting of a technical equivalency will meet the objectives of safety, function, appearance, environmental protection, and maintainability based on sound engineering judgement.

4. The City shall make findings supporting the determination of technical equivalency.

C. A written request for a technical equivalency shall be required and shall state the specific equivalency sought and the reasons, with supporting data, for their granting. The request shall include descriptions, drawings, calculations and any other information that is necessary to evaluate the proposed equivalency. A technical equivalency shall only be granted when the applicant can show that an unnecessary hardship exists that is unique to the project or the property.

The Stormwater Design Manual also allows an opportunity for a technical equivalency as evidenced on p. 10 of 49 which essentially provides the same verbiage as that above.

### **ROLES & RESPONSIBILITIES**

### PLANNING STAFF

Review and decisions for Type II administrative procedures are made by the City Planning Director or designee with an opportunity for appeal to the Planning Commission. Under appeal is a Type II administrative decision.

City of Florence Planning staff will be present throughout the public hearing and deliberations to assist the Planning Commission. Staff will advise the Planning Commission with regard to process, location of materials in the record, legal matters, and interpretation of land use code requirements.

Although staff will not be providing final recommendations for this appeal hearing, they will provide existing evidence based on their professional expertise and familiarity with the application and record of materials to date. Staff will also assist the Planning Commission in drafting the final decision on this appeal. (Notice of Decision).

### PLANNING COMMISSION

The Florence Planning Commission serves our community through two main roles. One role is to assist the City Council in legislative efforts to create or modify our community's policies related to

land use through recommending their decisions to the City Council. The second role is to serve as a 'quasi-judicial' body to make decisions on individual land use applications in the context of Florence City Code. In this appeals instance, the Planning Commission's decisions must decide whether to affirm, reverse, or modify the Administrative decision based on the approval criteria for the proposed development. This hearing involves listening to interested parties who wish to make arguments based on the existing record review of the appeal items. The basis of each appeal is limited to the issues raised during the review of the original applications by the Planning Commission, and set out in the appeal statement. No new issues or evidence is allowed per Florence City Code, Title 10, Chapter 1, Section 10-1-1-7 E.

The review of the initial action shall be confined to the issues raised upon appeal and be based on the record of the proceeding below, which shall include:

1. All materials, pleadings, memoranda, stipulations, and motions submitted by any party to the proceeding and received or considered as evidence.

- 2. All material submitted by the City staff with respect to the application.
- 3. The minutes of the hearing (if applicable).
- 4. The Findings on which the decision is based.
- 5. The notice of intent to appeal or the requests for review and the written petitions on appeal.
- 6. Argument by the parties or their legal representatives.

Following the hearing, the Planning Commission will discuss the testimony presented in the public hearing, written testimony provided to the Planning Commission and the records of the Administrative Type II original decisions. This portion of the process is referred to as deliberation. The purpose of the deliberation is to help the Planning Commission reach a decision on each appeal item; given the information in the record at the time of the Planning Commission's decision; whether staff, under the Type II Administrative review, correctly evaluated the application and make their decisions consistent with the Design Review criteria outlined in FCC Title 10, Chapters 3, 6 and 7, 20, and 34 through 37; and Title 11, Chapter 5, and the Florence Stormwater Design Manual, respectively.

### MAKING A DECISION

If the Planning Commission determines that the Administrative staff decisions related to the items under appeal should be affirmed, they can be adopted in their entirety without further need for findings. If the decision seeks to modify, such as to add or revise conditions of approval, or provide a response to legal issues raised by the appellants, staff seeks direction on those changes to support the Planning Commission decision. In the event of reversal (denial), The Planning Commission will need to provide further direction on clear findings, relying upon existing evidence in the record, to explain its basis on what Design Review criteria are not met. Staff is available as part of this process to facilitate whatever final decision is made, and prepared to help draft a final order that can affirm, modify, or reverse the Planning Commission's decision.

Affirm	
<ul> <li>Planning staff was correct</li> <li>Notice of Decision incorpo</li> </ul>	rates and adopts the Planning Commission decision.
Modify	<u> </u>
<ul> <li>Planning staff was mostly co</li> <li>Explain which areguement</li> <li>Explain how Planning staff</li> <li>Provide new condition/cor condition of approval</li> </ul>	rrect is more convincing was wrong ditions of approval, modification of approval, or remove a
Reverse	

- •Planning staff was incorrect
- •Explain how Planning staff misinterpreted the code, or misread evidene
- •Explain which areguement points to this error
- •Explain why a condition of approval cannot fix the error

ALTERNATIVES:	1. Affirm the Planning staff was correct, with action explained above.
	2. Modify Planning staff's decision, with the action explained above.
	3. Reverse Planning staff's decision, with the action explained above.
AIS PREPARED BY:	Roxanne Johnston, Senior Planner
ITEM'S ATTACHED:	Attachment 1: Notice of Intent to Appeal, dated 3/08/2021
	Attachment 2: Response to Conditions of Approval, dated 2/28/2021
	Attachment 3: Administrative Approval for AR 20 10 DR 03
	Attachment 4: Exhibit I – Updated Stormwater Management Report
	Attachment 5: Exhibit L – Trachte Plan

<u>Attachment 6</u>: Exhibit M – Public Works Stormwater Comments <u>Attachment 7</u>: Exhibit N – Public Works 2.12.21 Comments <u>Attachment 8</u>: Exhibit O – Public Works 2.25.21 Comments

# Attachment 1

March 8, 2021

RECEIVED City of Florence MAR 0 8 2021 By: DHH

By Email:

Roxanne Johnston Senior Planner City of Florence

Wendy Farley-Campbell Planning Director City of Florence

Mike Miller Director Public Works City of Florence

Greetings,

Thank you for your email response today to our request to use the existing vegetation along the eastern side of our Airport Annex project as our storm water filter strip. We understand that your view is that the purview or approval authority for this type of request rests with the Planning Commission and thereafter, if necessary, with the City Council. We have been referred to FCC 10.1.1.7.

This is our notice that we wish to Appeal to enable our request for this alternative means of storm water mitigation to be decided by the appropriate city authority. Our goal is to preserve the native vegetation and to mitigate our storm water in an equally effective manner as might otherwise be constructed.

We do assume that we have concurrence for all other Conditions of Approval and with clarification of other Findings of Fact.

For clarity, we believe that Planning concurs that our project is within our surveyed boundaries and is correctly shown on our civil improvement plans. We also believe that Planning concurs that we have the minimum required 15% of landscaping area and that will be maintained with revisions due to an anticipated Native Vegetation Preservation credit application. We believe that submission of our Landscape plans, as amended, will continue under Administrative review. We believe that Planning concurs on all conditions

listed that are no longer applicable due to the removal of the perforated pipe in the northern filter strip.

The Landscape Plans will be resubmitted for Administrative Review based on the decisions of the Planning Commission or City Council, as applicable.

If these correctly reflect our mutual understandings, then the only matter which needs review is the construction method for the eastern boundary vegetated filter strip.

If this is not the case, please advise us.

During our appeal hearing, we would like the opportunity to present our case in front of the Planning Commission and to have our Civil Engineer give testimony and to solicit the advice and counsel of the Public Works Director.

Respectfully,

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Larry and Crystal Farnsworth Heceta Self Storage Corporation



February 28, 2021

By Email:

Roxanne Johnston Senior Planner City of Florence

Wendy Farley-Campbell Planning Director City of Florence

Mike Miller Director Public Works City of Florence

Greetings,

Thank you for providing and preparing the approval packet for our Airport Annex project. It's clear that much time and effort have gone into its preparation. The Findings of Fact are very helpful to us and the Conditions of Approval are equally informative about areas we can address to increase our mutual understandings. The Conditions provide a helpful checklist for required actions before, during and after construction.

The Staff Report and Findings of Fact lists a few concerns in Section II, BACKGROUND/NARRATIVE, Paragraph 4, which we will address before we provide and ask for clarifications on the individual Conditions of Approval below.

In our September 10, 2020 letter, we described the following pervious areas of our site plan:

<u>Impervious vs. Pervious</u> – The total area of impervious surfaces on the site (including concrete and roofs) is 183,122 sq. ft. (4.20 acres). The total area of the site is 218,738 sq. ft. (5.02 acres). Given these quantities, the total area of impervious surfaces is equal to 83.7%. Per City of Florence Municipal Code 10-20-4, the site plan is compliant with the maximum lot coverage requirements.

We should have clarified additionally that <u>all</u> pervious surfaces are landscaped either with native vegetation that is preserved or with new plantings. We have

no pervious areas that are left bare or subtracted. Therefore, pursuant to 10-34-3-3, landscaped areas are equal to 16.3% of the entire site prior to any credit for native vegetation. We will wish to seek preservation credits pursuant to 10-34-2-4 and 10-34-3-4 B. We will meet (and maintain) at least a 15% requirement for landscaping. The primary reason for seeking a preservation credit is because we now understand the application of minimum tree and shrub counts without it. We assume that we will not need to add trees and plants along the long east side of our project where native vegetation is to be preserved. We also understand that all of the areas that our storm water filter strips and rain garden occupy do count towards our 15% percent of required area landscaping. It's for this reason that we believe that all of our pervious areas count towards landscaping requirements.

We will also use impermeable fabric wrap adjacent to all building foundations that are within 10 feet of any storm water filter strip. We will also comply with Condition 36, that any "Vegetated filters strips under the required minimum 10' widths shall be constructed so as to prevent inconsistency with other conditions in these Findings."

In the fourth paragraph of the Background Narrative it states, "...it is apparent that existing native vegetation will need removing in those areas proposed for retention, effectively eliminating their natural element and the minimum percentage of landscaping (15%) required for the project..."

Our east side filter strip design is to use the existing dense and mature native vegetation and root mat as our filter strip. Our civil engineer believes that what is growing there already is far better at mitigating both water and runoff substances than anything we might excavate and build in its place. We believe that we communicated this, but perhaps it escaped both of us until now that there is a standing requirement to "build" the filter strip after excavating away anything there prior to construction. We have always wanted to preserve as much of the Kingwood vegetation as possible right up to our future fence and driveways. We love that vegetation and admire it as a great feature of the Kingwood corridor. This was part of our presentation from the beginning, including during any discussions about how much of our business, buildings or fencing would be visible to pedestrians or drivers along Kingwood. We would still like to keep this entire area preserved with native vegetation and beautiful native rhododendrons.

Given this situation, we visited and discussed this with Mike Miller, Public Works Director on February 26th, and we wish to make this proposal:

We would like to use the native vegetation (which covers a 14'-wide area from our fence line) as our east side filter strip with the following conditions:

After construction is completed, this would be considered a test site for determining if this successfully works to mitigate the storm water that flows into this filter strip. During construction along our east driveway and fence line we would restore any areas disturbed by construction with appropriate filter strip rock, soils, and plants close to the fence line.

The criteria for this test could be that we will inspect the area after every forecast or actual storm event of 1" or greater rainfall to document the performance of on-site filter strips. This test would be done as follows:

- 1. Perform a visual inspection on both west and east sides of the filter strip, along the fence line and along the sidewalk on Kingwood, (to be completed by an employee of the Airport Annex.)
- 2. Keep a written inspection log with the date and time of the inspection, the amount of recorded rainfall, and other information as required by the Operations & Maintenance Agreement. Document apparent performance of filter strip based on observation of any areas where flowing surface waters exceed 2-inches in depth. 48-hours after the storm event, identify any areas with observable standing water. Document instances where surface waters originating on Airport Annex parcels reach and/or flow across the sidewalk along Kingwood.
- 3. Perform maintenance activities as described in the Operations and Maintenance Plan, to correct or repair observed issues.

If desired and as agreed upon previously in the Operations and Maintenance Agreement, Public Works employees may accompany our inspections or inspect separately at any time according to their own preferences. All inspection reports by us would be provided to Public Works upon request. As required by the Operations and Maintenance Plan, if areas are observed which fail to meet documented performance criteria, it shall be regraded and replanted according to design specifications. Established trees shall not be removed or harmed in this process.

We respectfully request approval of this method of storm water mitigation, as a test, pending results, in order to preserve as much of the native vegetation as possible.

Given these understandings, here are our responses to each of the Conditions of Approval:

- Condition 1: Concur.
- Condition 2: Concur.
- Condition 3: Concur.
- Condition 4: Concur.
- Condition 5: Concur.
- Condition 6: Concur: Our parking lot striping is 2 feet wide and will comply with FCC 10-3-9 B when constructed.
- Condition 7: Concur.
- Condition 8: Concur: Bicycle parking signage will be submitted for approval.
- Condition 9: Concur.
- Condition 10: Concur.

## Condition 11: Concur: Architectural requirements will be submitted for approval.

- Condition 12: Concur.
- Condition 13: Concur.
- Condition 14: Concur.
- Condition 15: Concur: The western fence height will be submitted.
- Condition 16: Clarification: We affirm that the Civil Improvement Plans submitted are entirely within the boundaries of the area surveyed and approved by Public Works for our project. Please see attached survey completed by Rob Ward. The agreement was to split Lot 11 by square footage into two equally sized areas. This was confirmed with the Public Works Director.
- Condition 17: Concur, with clarification: We will submit a more detailed Landscape Plan. We hope to work with staff to better understand and define areas where additional plantings are needed over the plans already submitted. We will ask for appropriate adjustments pursuant to a preservation credit for preserved native vegetation. The FCC Code sited is incorrect (FCC 10-23-3-2 D) and should be FCC 10-34-3-2 D. We concur with the Type 1 review and fee.
- Condition 18: Concur, with modifications per a revised Landscape Plan and preservation credits.
- Condition 19: Concur, with modifications per a revised Landscape Plan and preservation credits.
- Condition 20: Concur.
- Condition 21: Concur, with clarification to FCC 10-34-3-4 (A) 3.
- Condition 22: Concur.
- Condition 23: Concur.
- Condition 24: Concur.

- Condition 25: Clarification is needed. These are two different subjects mixed in this paragraph. Only the first sentence applies to our storm water rain garden at the south end of our site, to which we concur. The last two sentences no longer apply in as much as we have modified our plans to not use the airport swale. We have removed the perforated pipe leading to the airport swale in the northern boundary filter strip. It isn't needed to mitigate storm water.
- Condition 26: Concur.
- Condition 27: Concur.
- Condition 28: Concur.
- Condition 29: Concur.
- Condition 30: This paragraph needs a bit of clarification. Perhaps since we are no longer using the airport swale, the paragraph could be written as follows: "The applicant's engineer has discussed the use of the Rational Method and Prescriptive Approach in the Stormwater Design Studies provided. The Rational Method is acceptable per the Public Works Director. The storm water design capacity calculations for the plan have been provided in compliance with the Stormwater Design Manual, and to the satisfaction of the Public Works Director. The city owned storm water system capacity calculations were waived by the Public Works Director." We can concur with this revised language.
- Condition 31: Clarification: We have removed the piping from the northern filter strip as extraneous to the plan. No alternative methods of mitigation are necessary. The filter strip is designed to handle all tributary surface water. With revisions, we can concur.
- Condition 32: Concur.
- Condition 33: Concur.
- Condition 34: Concur.
- Condition 35: Concur.
- Condition 36: Clarification needed per our request to use native vegetation in our east filter strip.

Respectfully, Lang Jamant Turstal Face work

Larry and Crystal Farnsworth Heceta Self Storage Corporation

## Attachment 3

### STAFF REPORT & FINDINGS OF FACT FLORENCE COMMUNITY DEVELOPMENT DEPARTMENT Exhibit "A"



Date of Report: F	February 25, 2021	Planner:	Roxanne Johnston,	CFM
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Application: AR 20 10 DR 03 – Administrative Design Review

**Related Files:** AR 19 14 VEG 07 – Vegetation Clearing Permit

PC 20 30 DR 07 – Design Review for Barbed Wire Fencing and Unshielded Lighting

### I. PROPOSAL DESCRIPTION

- **Proposal:** A request for Design Review to construct, in phases, an office and a 470-unit self-storage facility on multiple lots within the Pacific View Business Park.
- Applicant: Heceta Self Storage Corporation Larry and Crystal Farnsworth

### Property Owner: The City of Florence

Location: Unaddressed

Assessor's Map 18-12-22-43, Tax Lots 00900, 00800, 00700, 00600, 00500, and 00400 and Assessor's Map 18-12-22-42, Tax Lots 00200 and 00100, being Lots 4 through 10 and the southern half of lot 11 of the Industrial Park plat of the City of Florence.

General Location: Between Kingwood Street and the Florence Airport, stretching from The Oregon Coast Military Museum (2145 Kingwood St.) to Florence Public Works (2675 Kingwood St.).

### Site Characteristics:

	Use(s)	Zoning	Comp. Plan Designation	Streets/TSP Classification
Site	Vacant	Limited Industrial	Business/Industrial Park	Kingwood/Collector
North	Florence Public Works	Limited Industrial	Business/Industrial Park	27th St./Collector
South	Oregon Coast Military Museum	Limited Industrial	Business/Industrial Park	Airport Way/Local
East	Siuslaw School District Bus Maintenance Yard, Alternative School, PeaceHealth Med. Group & Hospice Services	Pacific View Business Park / High Density Residential	Business/Industrial Park/Public	Kingwood St./Collector
West	Municipal Airport	Public Use Airport	Public	Airport Way/Local

### II. BACKGROUND/NARRATIVE

In March 2019, the Florence City Council adopted Ordinance No. 3, Series 2019, effectively rezoning the subject property and six other lots from Pacific View Business Park to Limited Industrial District. The Ordinance also amended the text of the Limited Industrial District zoning codes to include "storage" and "community service" as allowed uses. The zoning changes, which were requested by the applicant of this application, allowed the applicant to move forward with plans to develop a self-storage facility on the site. The 4.5-acre site is owned and leased by the City of Florence. It is currently heavily vegetated and includes a mix of trees and other native vegetation.

In December 2019, the applicant applied for a Vegetation Permit to clear portions of the property. The applicant requested that no time limitations be placed on the vegetation clearing work. Due to the incongruity between this request and ways in which Type II applications are generally handled at the Administrative Review level, the decision was referred to the Planning Commission. Thus, the application was conditionally approved by the Planning Commission on March 10, 2020 as under Resolution PC AR 19 14 VEG 07.

This Type II Design Review application approval process is the next step in the applicant's plan to develop the first phase of the storage facility. This first phase would include an approximately 600 square feet office building. The remainder of the 470-unit project is proposed to be completed in phases to take place over several years. Two design elements associated with this request include 54 external unshielded lighting units and the placement of barbed wire atop a chain link fence which will be placed on all sides of the property where necessary for security. These two design elements fall under the purview of the Planning Commission. A public hearing for these two items only was held on December 22, 2020 and were conditionally approved under Resolution PC 20 30 DR 07.

Although several conditions of approval have been placed on this proposed development, three central related concerns are evident and discussed in these Findings of Fact. One is the need for the applicant to verify that a minimum of 15% landscaping will be met (and maintained) and the other two are related to stormwater. First in order to design the stormwater facilities in accordance with the provided stormwater plan, it is apparent that existing native vegetation will need removing in those areas proposed for retention; effectively eliminating their natural element and the minimum percentage of landscaping (15%) required for the project outlined under Title 10, Chapter 34 of these Findings. Second are two items related to the filter strip design.

Unless impermeable fabric is planned in the stormwater vegetated filter strips, the site plan may need revised to include a 10' setback from these stormwater facilities adjacent to building foundations as set forth in page 22 of the City of Florence Stormwater Design Manual:

"Setbacks: Required setback from building foundations is 10 feet unless lined with impermeable fabric."

Lastly, the Stormwater Design Manual, (p. 32), states that filter strips shall be a minimum of 10 feet wide. Page 6 of Exhibit I reveals that two of these strips are proposed to be under this minimum at 7.5' wide on the west side, and 6' on the north side. Condition 36 addresses this topic.

### III. NOTICES & REFERRALS

<u>Notice</u>: On December 2, 2020, notice was mailed to surrounding property owners within 100 feet of the property, and a sign with notice copies posted on site.

At the time of this report, the City had received no public comments on the proposal.

**<u>Referrals</u>**: Referrals were sent to the City of Florence Public Works, Civil West Engineering, Federal Aviation Administration, and the Oregon Department of Aviation on December 2, 2020. (Note: the FAA and ODA were notified of the application because the subject properties are located in close proximity to the Airport Overlay Zone).

On December 4, 2020, Seth Thompson of the Oregon Department of Aviation submitted a letter acknowledging the notice and provided recommendations. These recommendations are as follows:

1. "Prior to issuance of any building permits, the applicant must file and receive a determination from the ODA as required by OAR 738-070-0060 on FAA Form 7460-1 Notice of Proposed Construction or Alteration to determine if any structures will pose an obstruction to aviation safety at the Florene Municipal Airport.

2 The height of new structures shall not penetrate FAA Part 77 Imaginary Surfaces, as determined by the ODA and the FAA.

3. Shields on any external building shall be designed as to not interfere with aircraft or airport operations Building and yard light details are reviewed to be submitted with building permits to include evidence of no glare-emitting light sources to aviation."

On December 8, 2020, the applicant submitted FAA form 7460-1 as requested and emailed staff a copy.

On December 23, 2020, the applicant supplied staff with the response to FAA Form 7460-1. The ODA determined that the structures exceeded the FCC standards, and advised the applicant that any changes would require submission of an additional FAA Form 7469-1 and review and that the current determination would expire 18 months after its effective date. OF the several mitigation recommendations listed in the form, only one was checked off: "We do not object with conditions to the construction described in this proposal. This determination does not constitute ODA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground."

On February 3rd and 12th, 2021, the Planning Department received referral comments on the proposed stormwater facilities from Florence Public Works Director, Mike Miller.

These comments are in regard to the applicant's revised Stormwater Management Report dated December 15, 2020.

On February 3rd, Mr. Miller states (Exhibit M):

- Include the Intensity Duration Frequency (IDF) curves in Appendix A.
- Have values tabulated in a single table as opposed to be scattered throughout the report.
- For documentation purposes, provide an analysis of the airport swale to demonstrate no impact from the proposed development.

On February 12th, Mr. Miller states (Exhibit N):

- The Rational Method is acceptable if on-site capacity calculations are provided. If they are not provided then the project must follow the prescribed methods in the Stormwater Management Design Manual and City Code.
- Downstream analysis of Kingwood St. overflow system capacity is waived.
- Proposed overflows to the Airport swale west of the project site needs analysis
  of drainage basin capacity. Overflow from less than a 100-year event is not
  acceptable.
- Directing drainage to existing vegetated areas is not an approved method of treatment and not supported by the provided stormwater management plan for the project site. Any BMPs used must be constructed per City approved standard detail.

### IV. APPLICABLE REVIEW CRITERIA

#### Florence City Code:

#### **Title 10: Zoning Regulations**

- Chapter 1: Zoning Administration, Sections 1-6-2,
- Chapter 3: Off-Street Parking and Loading, Sections 2 through 5 and 7 thru11
- Chapter 6: Design Review, Sections 3, 4, 5, and 8
- Chapter 7: Special Development Standards, Sections 6
- Chapter 20: Limited Industrial District, Sections 2, 4, & 5
- Chapter 34: Landscaping, Section 3
- Chapter 35: Access and Circulation, Sections 2-8, 2-9, 2-12 thru 2-14, and 3
- Chapter 36: Public Facilities, Sections 3 and 4
- Chapter 37: Lighting, Section 3 through 6

# Title 9: Stormwater Management Utility, User Fee System and Stormwater Management Requirements

Chapter 5: Stormwater Management, Sections 2 through 7

#### V. PROPOSED FINDINGS

Code criteria are listed in **bold**, with staff response beneath. Only applicable criteria have been listed.

### FLORENCE CITY CODE

### TITLE 10: CHAPTER 1: ZONING ADMINISTRATION:

10-1-1-6-2: TYPE II REVIEWS - ADMINISTRATIVE REVIEWS:

A. The Planning Director, or designated planning staff may make administrative decisions (limited land use). The Type II procedure is used when there are clear and objective approval criteria and applying City standards requires limited use of discretion.

B. Type II (Administrative) Decisions are based upon clear compliance with specific standards. Such decisions include, but are not limited to the following:

8. Type II Review is required for all new construction, expansions, change of use and remodels within the Limited Industrial District and Pacific View Business Park District, except certain changes may be approved as indicated under the ministerial process.

The applicant has proposed new construction of a 600 sq. ft. business office and a gated multi-unit self-storage facility comprised of nine buildings containing separate multiple storage units with mechanical maintenance areas. The storage structures are to be constructed of engineered metal. The proposed construction meets the criteria for an Administrative Review within the Limited Industrial zoning district. The applicant has applied for an Administrative Design Review, satisfying this code requirement.

D. Notice - Information:

1. Type II Decisions: The City will post a notice on the subject property and provide Notice of Application to owners of property within 100 feet of the entire contiguous site for which the application is made. The list of property owners will be compiled from the most recent property tax assessment roll.

Notice shall also be provided to the airport as required by ORS **a**. 227.175 and FCC 10-21-2-4 and any governmental agency that is entitled to notice under an intergovernmental agreement with the City or that is potentially affected by the proposal. For proposals located adjacent to a state roadway or where proposals are expected to have an impact on а state transportation facility, notice of the application shall be sent to the Oregon

2. **Property Owner Notice shall:** 

Department of Transportation.

a. Provide a 14 day period of submission of written comments prior to the decision;

b. List applicable criteria for the decision;

c. Set forth the street address or other easily understood geographical reference to the subject property;

d. State the place, date and time that comments are due, and the person to whom the comments should be addressed;

e. State that copies of all evidence relied upon by the applicant are available for review at no cost, and that copies can be obtained at a reasonable cost;

# f. Include the name and phone number of local government representative to contact and the telephone number where additional information may be obtained.

Notification of administrative review was mailed on December 2, 2020, to all property owners within 100 feet of the subject property, and notice posted on the property itself.

On December 2, 2020, notice was also sent to the administrator of the Florence Municipal Airport, the City of Florence Public Works Director Mike Miller; the Federal Aviation Administration; the Oregon Department of Aviation; and the City of Florence Building Department. The notification procedures meet the requirements of FCC 10-1-1-6-2.

The notice mailed to surrounding property owners within 100 feet as described above contained information regarding the nature of the application and uses proposed; applicable criteria applying to the issue; an easily understood geographical reference to the subject property; stated the place, date, and time that comments on the proposal were due; and stated that the application and criteria were available for inspection at no cost and would be provided at reasonable cost. The application was properly noticed and these criteria are met.

### CHAPTER 3: OFF STREET PARKING AND LOADING

10-3-2: GENERAL PROVISIONS:

A. The provision for and maintenance of off-street parking and loading spaces are continuing obligations of the property owners. 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.

B. At the time of new construction or enlargement or change in use of an existing structure within any district in the City, off-street parking spaces shall be provided as outlined in this Chapter, unless requirements are otherwise established by special review or City Council action. Additional parking spaces shall meet current code.

C. 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 required by this Chapter.

D. Required parking spaces shall be available for the parking of passenger automobiles of residents, customers, patrons and employees, and shall not be used for storage of materials of any type.

E. Ingress and egress for parking and loading shall not endanger or impede the flow of traffic.

# F. The required off-street parking for nonresidential uses shall not be used for loading and unloading operations during regular business hours.

The applicant is proposing 5 parking spaces; four of which are to be located within a parking lot accessible to the public. Per FCC 10-3-2 F, required parking spaces shall be maintained and shall not be eliminated, used for the storage of materials of any type, or used for loading or unloading operations during business hours, [Condition 4].

### TABLE 10-3-1, MINIMUM REQUIRED PARKING BY USE:

[...]

C. Commercial and Retail Trade Types:

Offices Call Centers, data centers, and other similar communications or internet businesses	1 space per 400 sq. ft. floor area
[]	[]
Self-Service Storage	None

The 20' x 30' business office building associated with the proposed mini-storage units is planned to contain approximately 600 square feet. The use table listed above demonstrates that a minimum of two (2) parking spaces are required. The applicant is proposing a total of 5 spaces, which will include curb stops.

No parking spaces are required for the storage units themselves. These criteria have been met.

10-3-5: Vehicle Parking – Minimum Accessible Parking:

A. Accessible parking shall be provided for all uses in accordance the standard I table 10-3-2; parking spaces used to meet the standards in Table 10-3-2 shall be counted toward meeting off-street parking requirement in Table 10-3-1;

B. Such parking shall be located in close proximity to building entrances and shall be designed to permit occupants of vehicles to reach the entrance on an unobstructed path or walkway;

C. Accessible spaces shall be grouped in pairs where possible;

D. Where covered parking is provided, covered accessible spaces shall be provided in the same ratio as covered non-accessible spaces.

E. Required accessible parking spaces shall be identified with signs and pavement markings identifying them as reserved for persons with disabilities; signs shall be posted directly in front of the parking space at a height of no less than 42 inches and no more than 72 inches above pavement level. Van spaces shall be specifically identified as such.

Table 10-3-2 Source:	2 - Minimum Number of ADA Standards for Ac	Accessible Parkin cessible Design 4.	ig Spaces 1.2(5)		
Total Number of Parking Spaces Provided (per lot)	Total Minimum Number of Accessible Parking Spaces (with 60" access aisle, or 96" aisle for vans*)	Van Accessible Parking Spaces with min. 96" wide access aisle	Accessible Parking Spaces with min. 60" wide access aisle		
1 to 25	Column A 1	1	0		
[]					
*vans and cars may share access aisles **one out of every 8 accessible spaces ***7 out of every 8 accessible parking spaces					

One of the five spaces provided is ADA accessible in accordance with Tables 10-3-1 and 10-3-2 and will be located near the front entrance to the proposed office building. Additionally, Sheet C2-1 in Exhibit D demonstrates that this space meets the minimum 96" access aisle width; a 96" wide access aisle is provided immediately adjacent to the ADA space. Furthermore, the applicant provided details of the required ADA parking sign and an ADA striping symbol on Sheet C5.2 of Exhibit D. This parking space is not planned to be covered. The criteria have been met.

10-3-8: PARKING AREA IMPROVEMENT STANDARDS: All public or private parking areas, loading areas and outdoor vehicle sales areas shall be improved according to the following: All required parking areas shall have a durable, dust free surfacing of asphaltic concrete, cement concrete, porous concrete, porous asphalt, permeable pavers such as turf, concrete, brick pavers or other materials approved by the City. Driveways aprons shall be paved for the first fifty feet (50') from the street.

[...]

C. All parking areas except those required in conjunction with a single-family, duet or duplex dwelling shall be graded so as not to drain storm water over public sidewalks. Parking lot surfacing shall not encroach upon a public right of way except where it abuts a concrete public sidewalk, or has been otherwise approved by the City.

The applicant proposes an asphalt-paved parking area with a paved driveway within the first 20 feet of an entrance from a public right-of-way.

Per FCC 10-3-8 C, the parking lot shall be graded as to not drain storm water over public sidewalks. The parking lot drainage systems shall be connected to vegetated stormwater features to infiltrate the stormwater rather than directing it to a storm sewer system to be conveyed off-site, [Condition 5].

# D. Parking spaces shall be located or screened so that headlights do not shine onto adjacent residential uses.

Proposed parking is internal to the project (no on-street parking proposed) with four spaces orienting north/south immediately north of the office building. The fifth space is on the west side of the office building. In both instances, the office building will function as required screening from lighting caused by vehicle headlights facing southward and eastward. For traffic travelling and parking after entering the facility's security gate on the north, a 6-foothigh opaque chain link fence topped with three strands of barbed wire (making the fencing 7 feet, in total) and 15' landscaping buffer (some of which will contain existing native vegetation) should serve to mitigate any possible glare internal to the storage units along Kingwood St. There are no residential uses or zoning districts directly adjacent to the development. This criterion has been met.

# F. No parking area shall extend into the public way except by agreement with the City.

Parking is proposed in excess of 20 feet internal to the project site to the public way off of Kingwood St. and is not planned to extend into the public way. The criterion is met.

### H. Lighting: Refer to Section 10-37 of this Title for requirements.

The applicant supplied a Lighting Plan. This Plan is examined under Section 10-37 of these Findings. One element of the Plan proposes exterior unshielded lighting attached under the eaves of the mini storage units. This proposal for unshielded lighting has been reviewed and a decision rendered by the Planning Commission at a public hearing on December 22, 2020, (reference PC 20 30 DR 07).

# J. Unless otherwise provided, required parking and loading spaces shall not be located in a required front or side yard.

FCC 10-20-4 D outlines the requirements of the front, rear and side yard setbacks in the Limited Industrial District. According to that code, unless setbacks have been established for widening roads "or other purposes," or if the property abuts a residential district (which it does not), then there is only one additional requirement relevant to this proposal which includes a three foot (3') minimum setback requirement if a building is not constructed on a property line. For the narrowest distance between a building and a lot line for the combined development, the most western (rear) property line abutting the airport is evidenced to exceed 10 feet to the nearest building (Exhibit K). Loading is not required for the 600 sq. ft. office. Loading in

the mini-storage areas are standard activities for the use that will occur in the lanes internal to the property and will not affect public rights of way. This criterion has been met.

K. Planning review is required for all parking lot construction or resurfacing.

L. A plan, drawn to a suitable scale, indicating how the off- street parking and loading requirements are to be met shall accompany an application for a building permit. The plan shall indicate in detail all of the following:

- 1. Individual parking and loading spaces. (Exhibit D, Sheet C2.1)
- 2. Circulation area. (Exhibit K, Trachte Plan)
- 3. Access to streets and property to be served. (Exhibit D, Sheet C0.3)
- 4. Curb cut dimensions. (Exhibit D, Sheet C2.1,)
- 5. Dimensions, continuity and substance of screening, if any. (Exhibit D, Sheets C4.1 thru C4.6 & C5.3)
- 6. Grading, drainage, surfacing and subgrading details. (Exhibit D, Sheet C3.3)
- 7. Obstacles, if any, to parking and traffic circulation in finished parking areas. N/A
- 8. Specifications for signs, bumper guards and curbs. (Exhibit D, Sheet C5.2)
- 9. Landscaping and lighting. (Exhibits F and G)

The applicant supplied material that demonstrates most of the above requirements. Although an interior circulation plan to the storage units beyond the parking lot have not been submitted nor an area designated as a specific loading zone, the aisles between the storage units have been dimensioned in Exhibit K. Further discussion involving the measurement of 25' at the most narrowest point is described below in 10-3-11 of this Title and Chapter.

10-3-9: PARKING STALL DESIGN AND MINIMUM DIMENSIONS: All off-street parking spaces [...] shall be improved to conform to City standards for surfacing, stormwater management, and striping [,,,]. Standard parking spaces shall conform to minimum dimensions specified in the following standards and Figures 10-3(1) and Table 10-3-5:

A. Motor vehicle parking spaces shall measure nine (9) feet and six (6) inches wide by nineteen (19) feet long.

B. Each space shall have double line striping with two feet (2') wide on center.

C. The width of any striping line used in an approved parking area shall be a minimum of 4" wide.

D. All parallel motor vehicle parking spaces shall measure eight (8) feet six (6) inches by twenty-two (22) feet;

E. Parking area layout shall conform to the dimensions in Figure 10-3(1), and Table 10-3-3, below;

F. Parking areas shall conform to Americans With Disabilities Act (ADA) standards for parking spaces (dimensions, van accessible parking spaces, etc.). Parking structure vertical clearance, van accessible parking spaces, should refer to Federal ADA guidelines.





		Tabl	e 10-3-3 - Pi	arking Area La	yout		
	Parking Angle <*	Stall Depth		Alsle Width		(Dr. N. Adab.	Curb
Space Dimensions in feet		Single (C)	Double (E)	One Way (D)	Two Way (D)	(B)	Length (F)
	30°	15.6	26.7	12	18	9.5	19.0
	45°	18.4	334	13	18	9.5	13.4
	60°	20	38.8	17	18	9.5	11.0
	70°	20.3	40.6	18	19	9.5	10.1
	80*	20	41.2	22	22	9.5	9.6
	90*	19	40.5	23	23	9.5	9.5

FIGURE 10-3 (1)

The applicant supplied plans throughout Exhibit D demonstrating that the majority of the listed criteria of this subsection have been met where applicable. Angled and parallel parking is not proposed. The proposed head-in parking stall widths measure 9.5' X 19', (from curb to end of parking stripes). Furthermore, the applicant supplied detailed measurements for the one ADA parking space designated as Van Accessible. The respective double line striping appears to measure nearly 2 feet wide; however, the exact dimensions were not indicated in the plans and shall be verified upon construction per FCC 10-3-9 B [Condition 6].

- 10-3-10: BICYCLE PARKING REQUIREMENTS: All new development that is subject to Site Design Review, shall provide bicycle parking, in conformance with the standards and subsections A-H, below.
- A. Minimum Size Space: Bicycle parking shall be on a two (2) feet by six (6) feet minimum.
- B. Minimum Required Bicycle Parking Spaces. Short term bicycle parking spaces shall be provided for all non-residential uses at a ratio of one bicycle space for every ten vehicle parking spaces. In calculating the number of required spaces, fractions shall be rounded up to the nearest whole number, with a minimum of two spaces.
- D. Location and Design. Bicycle parking should be no farther from the main building entrance than the distance to the closest vehicle space other than handicap parking, or fifty (50) feet, whichever is less and shall be easily accessible to bicyclists entering the property from the public street or multiuse path.
- E. Visibility and Security. Bicycle parking for customers and visitors of a use shall be visible from street sidewalks or building entrances, so that it provides sufficient security from theft and damage;
- F. Lighting. For security, bicycle parking shall be at least as well lit as vehicle parking. Refer to Section 10-37 of this Title for requirements.
- G. Reserved Areas. Areas set aside for bicycle parking shall be clearly marked and reserved for bicycle parking only.
- H. Hazards. Bicycle parking shall not impede or create a hazard to pedestrians. Parking areas shall be located so as to not conflict with vision clearance standards. If bicycle parking cannot be provided safely, the Design Review Board or Community Development Director may waive or modify the bicycle parking requirements.

The applicant provided plans for a bicycle rack. The planned proximity of the rack to the office entrance and parking lot appears to offer reasonable security and light coverage. Per Section 10-3-10 B, above, the minimum requirement shall be two (2) bicycle parking spaces. The bicycle parking plan is set forth in Exhibit D, Sheet C3.4, with installation drawings shown on Sheet C5.2. The placement of the bicycle rack is near to both the parking area and the front doorway leading into the office building and nearest to a gateway leading into the storage unit facility – meaning that this gateway is not intended as a public access point. The distance between the curb of the nearest parking space and the fence (whereupon the gate is located left of the bicycle rack) is approx. 12.5'. In keeping with FCC 10-3-10-H, the applicant shall demonstrate to the Community Development Department that a 5' unimpeded walkway is maintained between the 2'x 6' bicycle stalls and the raised parking curb prior to issuance of a Certificate of Occupancy, [Condition 7]. Signage for the bicycle parking has not been demonstrated. On-site signage indicating the bicycle parking area shall be required per FCC 10-3-10 G with signage plans submitted and approved prior to permitting, [Condition 8].

### 10-3-11: LOADING AREAS:

[...]

D. Number of Loading Spaces.

[...]

6. Non-residential and mixed-use buildings. Buildings where any floor area is in non-residential uses shall meet the following standards:

a. Less than 20,000 square feet total floor areas. No loading spaces required.

b. 20,000 to 50,000 square feet of total floor area: One (1) loading space.

c. More than 50,000 square feet of total floor area: Two (2) loading spaces.

The overall square footage proposal for the applicant's development exceeds 50,000 square feet. Phase 1 will contain 31,300 sq. ft; Phase 2 will contain 22,600 sq. ft; and Phase 3 will contain 28,600 sq. ft., (Exhibit K). FCC 10-2-13 defines a loading space as:

"An off street space or berth on the same lot with a main building or contiguous to a group of buildings, for the temporary parking of a commercial vehicle while loading or unloading merchandise or materials, and which has access on a street or alley, or other appropriate means of access"

The very nature of a proposed storage unit facility implies access to load and unload materials into the units via internal travel aisles measuring, at the narrowest, 25 feet in width, not including narrower areas in the most southern storage sites which dead-end. Even in the narrowest lane areas, adequate access to the intended storage units is sufficient and does not appear to affect the internal circulation of the development.

### TITLE 10: CHAPTER 6: DESIGN REVIEW

### 10-6-3: GENERAL APPLICABILITY:

- A. Planning Commission/ shall:
  - 1. Unless otherwise directed by the underlying zoning district, or subsection (B) below, review the following through a Type III process consistent with FCC 10-1-1-6-3 prior to issuance of a building permit:
    - a. New construction,
    - b. Alterations to the exterior of non-residential structures or additions involving twenty five percent (25%) or more of the floor area of a building; and
    - c. Changes of use from less intensive to greater intensive use not eligible for Type I or Type II review (see FCC 10-1-1-6-1 and 10-1-1-6-2).
  - [...]

- B. The Planning Director or designee shall:
  - 1. Unless otherwise directed by the underlying zoning district, review the following through a Type II process consistent with FCC 10-1-1-6-2 prior to Issuance of a building permit:
    - a. Construction or expansion of a residential or mixed-use building that includes residential uses, but not limited to: [...]
    - b. Alterations to the exterior of structures or additions involving twenty-five percent (25%) or more of the floor area of a residential building or mixed-use building including residential uses for any building not shown on the historic resources map of the Comprehensive Plan.
    - c. Changes of use from less intensive to greater intensive use not eligible for Type I review (see FCC 10-1-1-6-1).

[...]

C. The requirements of individual zoning districts shall prevail where the applicability of this chapter and individual zoning districts conflict.

FCC 10-1-1-6-2, which outlines the administration of Type II reviews, includes subsection A (8) that is specific to the Limited Industrial District:

8. Type II Review is required for all new construction, expansions, change of use and remodels within the Limited Industrial District and Pacific View Business Park District, except certain changes may be approved as indicated under the ministerial process.

Furthermore, FCC 10-20-2 outlines the requirements for the Limited Industrial (LI) District and lists the applicants proposed uses as permitted.

This section of the Design Review chapter, which indicates which type of review is applicable to which proposed use, does not include language specific to the applicant's proposed use; it also stipulates that the requirements of individual zoning districts shall prevail.

This application is thus being reviewed through the Type 2 process, with two design features (unshielded external lighting and barbed wire fencing) reviewed previously through a Type III process by the Planning Commission.

10-6-4: DRAWINGS TO BE APPROVED: No permit for a new use, structure or exterior alteration or enlargement of an existing use or structure that is subject to design review, as prescribed in this Title, shall be issued until the drawings required by this Chapter have been approved by the Planning Commission, Planning Director, or their designee.

The purpose of the Land Use application submittal by the applicant is to have the Planning Director's designee review the drawings under a Type II process in order to facilitate permitting and subsequent construction of the plans. This criterion has been met.

#### 10-6-5: GENERAL APPROVAL CRITERIA:

10-6-5-1: GENERAL CRITERIA FOR NONRESIDENTIAL DEVELOPMENT: Nonresidential projects shall meet the following criteria. The Planning Commission or Planning Commission or their designee may require any of the following conditions it deems necessary to secure the purpose and intent of this Chapter. The Commission or their designee shall consider the following criteria reviewing applications and may set conditions or standards which regulate and limit the following:

- A. Setbacks, yards, height, density and similar design features according to the underlying zoning district.
- B. Lot area, dimensions and percentage of coverage according to the underlying zoning district.

The Limited Industrial District does not require front, rear and side setbacks. Further review of the setbacks, yards, height, density, lot area, dimensions and percentage of coverage will be reviewed as part of FCC 10-20 later in this report.

C. Installation and maintenance of fences, walls, hedges, screens and landscaping according to standards set forth in FCC 10-34 Landscaping, and any requirements of the underlying zoning district.

Screening and landscaping will be addressed as part of review in Chapter 34: Landscaping, later in this report. Proposed barbed wire as a separate element to be installed atop opaque chain link fencing has been approved by the Planning Commission per Resolution PC 20 30 DR 07 on December 22, 2020 after a duly noticed public hearing. The proposed chain link fencing with the opaque cloth slats (green) meets the standards outlined in this section.

D. The location and design of access and egress points for vehicles and pedestrians, including access points along State highways according to standards set forth in FCC 10-35 Access and Circulation, and any requirements of the underlying zoning district.

The proposed location and design of access and egress points for vehicles and pedestrians are reviewed in these Findings of Facts under FCC 10-35 and include a total of three driveways off of Kingwood St. Two of the drives are proposed to be used under supervision of the applicant on an as-needed basis for situations where access for a large moving van is anticipated, for example.

### E. Noise, vibration, smoke, dust, odor, light intensity and electrical interference's.

Due to the nature of the proposed uses, these potential nuisances are unlikely. The applicant's lighting plan included fixtures that would create light intensity upward. This proposal was reviewed by the PC and conditioned to direct illumination downward. Per FCC 10-6-5 E, the applicant shall ensure that noise, vibration, smoke, dust, odor, intense lighting, and electrical interferences shall not exceed levels allowed by applicable nuisance codes, [Condition 9].

# F. Parking and outside display areas, dimensions, surfacing and on-site traffic circulation according to standards set forth in FCC 10-3 Parking and Loading.

The criteria of FCC 10-3: Off-Street Parking and Loading were reviewed earlier within these Findings.

# G. Architectural quality and aesthetic appearance, including compatibility with adjacent buildings.

The proposed storage units are of appropriate architectural quality and aesthetic appearance for this district and are proposed to be compatible with the many adjacent buildings near the development. Additional criteria are reviewed as part of the Limited Industrial District. The applicant did not submit comprehensive plans for the approximately 600 sq ft office building, but what was submitted indicates that the office will include aesthetic materials that include a stone or faux-stone bottom skirt that spans from the foundation to just above the bottom of the windows and wraps around the eastern and northern sections of the office (excluding the door); a covered entryway, stone or faux stone wrapped columns that hold up the entryway, and what appears to be lap siding. The entry porch will face north towards the parking lot, and the side of the office facing Kingwood St. appears to have three windows which break up the plane of the side. This side also hosts the stone skirt appearance (Exhibit E). The lack of information such as the materials, color scheme and dimensions for the office are conditioned below.

# H. Color, building materials and exterior appearance in accordance with the policies established by the City in the Downtown Implementation Plan, and in applicable zoning districts.

The proposed colors for the storage unit buildings are neutral and are the same as those located on the applicant's Highway 101 storage facility, according to the applicant (p. 5, Exhibit C). Proposed colors are Slate Grey for the storage building walls and Evergreen for the roof and roll-up doors. Where the doors are visible, they serve to break up the long horizontal plane of the storage units. Doors leading to maintenance rooms are proposed to be white. Images submitted by the applicant in Exhibit E.1. indicate that the Frieze board underneath the storage unit's eaves will also be painted Evergreen. The applicant has been conditioned in these Findings under FCC 10-6-8 C to provide the required Design Review information for the office building.

### I. Exterior lighting and security.

Lighting is addressed in the Findings and regulated by FCC 10-37. Proposed unshielded lighting and barbed wire strands atop opaque chain link fencing were reviewed separately and conditionally approved by the Planning Commission on December 22, 2020. These conditions may be found under Resolution PC 20 30 DR 07

### J. Public health, safety and general welfare.

The applicant has proposed a secured gated facility. Only employees and patrons of the facility will have interior access to the property. The general public will not be able to access the project internally without a gate code. To mitigate trespassers, the Planning Commission approved three strands of barbed wire fencing on top of the proposed 6' chain link fencing on December 22, 2020 per Resolution PC 20 30 DR 07. The chain link fencing will have green opaque cloth slats. The barbed wire will be mounted to angle inward into the subject properties. In total, the fencing will not exceed 8 feet in height. Additionally, landscaped buffering between Kingwood St. and the development will help mitigate any possible distractions of activities occurring within the development and keep the general public out of the development. This criterion is met.

# K. Provision of public facilities and infrastructure according to standards set forth in FCC 10-36 Public Facilities.

Review of the standards of FCC 10-36 will take place later within these Findings.

# L. Requiring a time period within which the proposed use or portions thereof shall be developed.

The proposed facility is planned over 3 phases projected to be completed over a ten-year period. There will be no time period within which the proposed use or portions thereof shall be developed other than the normal Design Review approval period.

#### M. Requiring bonds to insure performance of special conditions. (Ord. 625, 6-30-80)

No bonds will be required to ensure performance of special conditions.

# N. Such other conditions as are necessary to implement policies contained in the Florence Comprehensive Plan. (Ord. 680, 1-11-83)

No other conditions are necessary to implement policies contained within the Florence Comprehensive Plan.

#### 10-6-6-3: BUILDING FAÇADES:

A. Horizontal Design Elements: Multi-story commercial storefront buildings shall have a distinctive horizontal base; second floor; and eave, cornice and/or parapet line; creating visual interest and relief. Horizontal articulations shall be made with features such as awnings, overhanging eaves, symmetrical gable roofs, material changes, or applied facia detail. New buildings and exterior remodels shall generally follow the prominent horizontal lines existing on adjacent buildings at similar levels along the street frontage. Examples of such horizontal lines include but are not limited to: the base below a series of storefront windows; an existing awning or canopy line, or belt course between building stories; and/or an existing cornice or parapet line. Where existing adjacent buildings do not meet the City's current building design standards, a new building may establish new horizontal lines.

The north side of the proposed office measures 30 feet in total in its length. The east side measures 20 feet. The proposed single-story office building includes horizontal siding elements which are broken up by a skirting, or base, of masonry from the foundation to a point just above the bottom sills of the windows. The masonry shown in the elevation sketches will match the porch support columns. (Exhibit E). Materials and colors will be verified once the condition for the applicant to provide architectural and civil drawings and a materials list is submitted as conditioned above under FCC 10-6-5-1 H. There are three storage unit buildings oriented linearly along Kingwood St. Between them and Kingwood St. there is a 6' fabric slatted chain link fence, 14' of on-site vegetation in the form of filter strips and vegetated buffer, and street trees. The combination of these elements will screen the building walls.

Two of the three buildings have roll-up doors that break both the horizontal and vertical planes of these long buildings. The one building without garage doors is within 2.5' of the fencing.

B. Vertical Design Elements: Commercial storefront building faces shall have distinctive vertical lines of emphasis spaced at relatively even intervals. Vertical articulations may be made by material changes, variations in roof heights, applied facia, columns, bay windows, etc. The maximum spacing of vertical articulations on long, uninterrupted building elevations shall be not less than one break for every 30 to 40 feet.

Proposed vertical design windows on the office building include one window on the north side and three windows on the east side. There will also be an access office door on the north side under a porch. Both the north and east sides will be visible to traffic traversing Kingwood St. Therefore, the door and windows represent vertical design elements required by this section. Additionally, the porch roof varies in height from the main roof which will add visual interest. (Exhibit E). The storage buildings are discussed above. The criteria is met.

C. Articulation and Detailing: All building elevations that orient to a street or civic space must have breaks in the wall plane (articulation) of not less than one break for every 30 feet of building length or width, as applicable, as follows:

1. Plans shall incorporate design features such as varying rooflines, offsets, balconies, projections (e.g., overhangs, porches, or similar features), recessed or covered entrances, window reveals, or similar elements that break up otherwise long, uninterrupted elevations. Such elements shall occur at a minimum interval of 30-40 feet. In addition, each floor shall contain at least two elements meeting the following criteria:

- a. Recess (e.g., porch, courtyard, entrance balcony, or similar feature) that has a minimum depth of 4 feet;
- b. Extension (e.g., floor area, porch, entrance, balcony, overhang, or similar feature) that projects a minimum of 2 feet and runs horizontally for a minimum length of 4 feet; and/or
- c. Offsets or breaks in roof elevation of 2 feet or greater in height.
- d. A "break," for the purposes of this subsection, is a change in wall plane of not less than 24 inches in depth. Breaks may include, but are not limited to, an offset, recess, window reveal, pilaster, frieze, pediment, cornice, parapet, gable, dormer, eave, coursing, canopy, awning, column, building base, balcony, permanent awning or canopy, marquee, or similar architectural feature.

As mentioned previously, the north side of the office will measure 30 feet and the east side, 20. The applicant is proposing a gable roof covered porch for the office which faces north. This roof is positioned at a different elevation than the main hipped roof and adds an architectural break and offset. The site plan provided indicates that this porch will exceed a length of 4', and a depth of approximately 5'. The criteria are met for the office building. (Exhibits D & E).

The storage unit buildings shall either provide the elements listed in FCC 10-6-6-3 to comply with the criteria; or be fully screened from Kingwood St.; or provide denser, multi-story, landscaping, street furnishings, and/or sculpture elements in a manner to meet frequency of offset/break—so one or a combination of every 30-40 feet along Kingwood St. [Condition 10].

[....]

10-6-6-4: PERMITED VISIBLE BUILDING MATERIALS: Building materials which have the same or better performance may be substituted for the materials below provided that they have the same appearance as the listed materials.

[...]

G. Building and Site Material Colors: Color finishes on all building exteriors shall be approved by the City and be of a muted coastal Pacific Northwest palette. Reflective, luminescent, sparkling, primary, and "day-glow" colors and finishes are prohibited. The Planning Commission/Planning Commission or their designee may approve adjustments to the standards as part of a site Design Review approval.

The color palette for the storage unit buildings proposed by the applicant includes Slate Gray for the outer walls, Evergreen for the roofs, storage roll-up doors and Frieze boards, and two mechanical room doors which are proposed to be white (Exhibits C, p. 5 & E.1). No reflective, luminescent, sparkling, primary, and "day-glow" colors nor finishes are planned. These criteria have been met.

10-6-7: NON-RESIDENTIAL DESIGN REQUIREMENTS: In districts other than Mainstreet and Old Town, the architectural design requirements of this section shall apply to all commercial buildings.

A. All commercial buildings shall meet the standards of FCC 10-6-6-3 and 10-6-6-4-G above.

The proposed development is a 600 square foot office supporting self-storage units and the storage buildings themselves. As such, the office is considered a commercial use under "Commercial Use Categories" listed in FCC 10-2-14:

"[...] Office uses are characterized by activities conducted in an office setting and generally focusing on business, government, professional, medical or financial services."

Information regarding the proposed office is conditioned in this section, below.

10-6-8: DRAWING SUBMITTAL: In addition to information required by FCC 10-1-1-4, the owner or authorized agent shall submit the following drawings to the City for review:

- A. A site plan, drawn to scale, showing the proposed layout of structures and other improvements including, where appropriate, driveways, pedestrian walks, offstreet parking and off-street loading areas, landscaped areas, locations of entrances and exits, the direction of traffic flow into and out of off-street parking space and loading berth, and areas for turning and maneuvering vehicles. The site plan shall indicate how utility services and drainage are to be provided.
- B. A landscape plan, drawn to scale, in conformance with FCC 10-34-3-2.

The applicant submitted a Landscape Plan. Landscaping will be discussed in FCC 10-34.

C. Architectural drawings or sketches, drawn to scale, including floor plans in sufficient detail to permit computation of yard requirements and showing all elevations of the proposed structures as they will appear upon completion. All exterior surfacing materials and colors shall be specified.

The applicant shall submit a color scheme and exterior materials list, architectural plans and/or dimensioned Civil Plans for the office in accordance with FCC 10-6-5-1 and 10-6-8 C, [Condition 11].

D. Additional information may be required by the City if necessary to determine whether the purposes of this Chapter are being carried out or may authorize omission of any or all the drawings required by this Chapter if they are not necessary. The City shall specify the number of copies of each drawing to be submitted.

### TITLE 10: CHAPTER 7: SPECIAL DEVELOPMENT STANDARDS

10-7-2: IDENTIFICATION OF WETLANDS AND RIPARIAN AREAS AND POTENTIAL PROBLEM AREAS: At minimum, the following maps shall be used to identify wetlands and riparian areas and potential problem areas:

- A. "Hazards Map", Florence Comprehensive Plan Appendix 7.
- B. "Soils Map", Florence Comprehensive Plan Appendix 7.
- C. "Beaches and Dunes Overlay Zone." See Chapter 19 for overlay zone requirements. Where conflicts exist between that chapter and this one, the more restrictive requirements shall apply.
- D. 2013 City of Florence Significant Wetlands Map and 2013 City of Florence Significant Riparian Reaches Map in Appendix A of the 2013 Florence Area Wetlands and Riparian Inventory (2013 Inventory) and in the 2013 City of Florence Significant Wetlands and Riparian Corridors Plan (2013 Plan), in Comprehensive Plan Appendix 5.
- E. Other information contained in the plan or adopted by reference into the plan, or more detailed inventory data made available after adoption of the plan may also be used to identify potential problem areas. (Amended Ord. No. 10, Series 2009)

10-7-3: DEVELOPMENT STANDARDS FOR POTENTIAL PROBLEM AREAS: The following standards shall be applied to development in potential problem areas unless an approved Phase I Site Investigation Report or an on-site examination shows that the condition which was identified in the Comprehensive Plan or Overlay Zoning Map does not in fact exist on the subject property. These standards shall be applied in addition to any standards required in the Zoning Districts, Comprehensive Plan, and to any requirements shown to be necessary as a result of site investigation. Where conflicts or inconsistencies exist between these Development Standards, City Code, and the Comprehensive Plan, the strictest provisions shall apply unless stated otherwise. [...]

H. Yaquina Soils and Wet Areas (except significant wetlands and riparian areas identified in the 2013 Wetland and Riparian Inventory, as amended): In areas with seasonal standing water, construction of a drainage system and/or placement of fill material shall be required according to plans prepared by a registered engineer and approved by the City. (Amended Ord. 10, Series 2009)

The Soils Map illustrates the soils making up the subject property are Yaquina Loamy Fine Sand which can be unsuitable or conditionally suitable for development. A Phase 1 Site Investigation Report is required before development is permitted. The subject property is not identified as a hazard area within the *Hazards Map*, a wetland or riparian area on the 2013 *City of Florence Significant Wetlands Map* and 2013 *City of Florence Significant Riparian Reaches Map*, or within the *Beaches and Dunes Overlay Zone*. A Phase 1 Site Investigation Report was submitted by the applicant. The engineer responsible for the report found no conflicts with the development proposal and the property environs and its surroundings. The results confirmed the primary site soil consists of Yaquina loamy fine sand. Additionally, the results revealed that there was no need to complete a Phase 2 Site Investigation, (Exhibit J). The applicant proposes an on-site infiltration stormwater system to meet the drainage needs of the site and proposed development. Soil percolation is part of the analysis for stormwater plan design. The drainage plan has been peer reviewed and is discussed later in these Findings under Title 9.

### 10-7-6: SITE INVESTIGATION REPORTS (SIR):

- A. Areas identified in Section 2 and 3 above, are subject to the site investigation requirements as presented in "Beach and Dune Techniques: Site Investigation Reports by Wilbur Ternyik" from the Oregon Coastal Zone Management Association's Beaches and Dunes Handbook for the Oregon Coast (OCZMA Handbook), Appendix 18 of the Florence Comprehensive Plan as modified by the City of Florence. No development permit (such as building permit or land use permit) subject to the provisions of this Title may be issued except with affirmative findings that:
  - 1. Upon specific examination of the site utilizing a Phase I Site Investigation Report (the checklist from the OCZMA Handbook, as modified by the City of Florence), it is found that the condition identified on the "Hazards Map" or "Soils Map" or "Beaches and Dunes Overlay Zone" or other identified problem area does not exist on the subject property; or

### [...]

Site investigation requirements may be waived where specific standards adequate to eliminate the danger to health, safety and property, have been adopted by the City. This exception would apply to flood-prone areas, which are subject to requirements of the National Flood Insurance Program and other problem areas which may be adequately protected through provisions of Building Code.

#### 10-7-7: REVIEW AND USE OF SITE INVESTIGATION REPORTS

A. The Phase I Site Investigation Report shall be reviewed administratively through a Type II Review. If it is found that the condition identified on the "Hazards Map" or "Soils Map" or "Beaches and Dunes Overlay Zone" or other identified
problem area does not exist on the subject property; no Phase II report is required and the Site Investigation process is terminated. If hazards are found to exist, a Phase II report and a Conditional Use Permit shall be required.

If a Phase II Site Investigation Report is required, the Phase II conclusions shall be submitted for Planning Commission review.

The Phase I Site Investigation Report submitted by the applicant (Exhibit J), found that the conditions identified on the "Soils Map" (Yaquina loamy fine sand) may be adequately addressed through provisions of the Building and City Stormwater Codes, specifically requirements for sand stabilization in conformance with the Portland Erosion and Sedimentation Control Plan. The Site 1 Investigation Report submitted by the applicant indicates that no Phase II Site Investigation Report is required.

### TITLE 10: CHAPTER 20: LIMITED INDUSTRIAL DISTRICT

10-20-2: PERMITTED BUILDINGS AND USES: For the purpose of this Title, terms are defined in Title 10 Chapter 1 Section 5, "Land Use Category Definitions". If any permitted building or use has the potential to be hazardous, obnoxious, offensive or unsightly by reason of emission of odor, sound, vibration, radioactivity, electrical interference, flare, liquid or solid wastes, smoke or other air pollutants, said buildings or uses shall be required to obtain a conditional use permit issued by the Planning Commission subject to the procedures and conditions in Chapter 4 of this Title.

[...]

Commercial Uses:

Offices

[...]

Storage (household goods, business inventories, boats, RVs, including outdoor storage)

[...]

Other Uses:

Accessory buildings and uses normal and incidental to the buildings and uses permitted in this Section.

The applicant is proposing an office related to the self- storage units. The uses are allowed per this section and the criteria are met.

#### 10-20-4: LOT AND YARD PROVISIONS:

### A. Minimum Lot Area: The minimum lot area shall be seven thousand five hundred (7,500) square feet.

The most southern lot of the development is Lot 4. This lot contains 21,686 sq ft and has the least square footage of lot area of all the lots in the development; even compared to the south  $\frac{1}{2}$  of Lot 11 which is comprised of approximately 21,950.5 sq ft of area. The criterion is met.

#### B. Minimum Lot Dimensions: The minimum lot width shall be fifty feet (50').

Heceta Self Storage Corporation (Kingwood St.) AR 20 10 DR 03 The narrowest point of the development is the south half of Lot 11 and measures approximately 75 feet in width. This criterion is met.

# C. Maximum Lot Coverage: Up to eighty-five percent (85%) coverage by buildings and impervious surface, unless a preservation credit is achieved in accordance with FCC 10-34-2-4.

The overall development measures 5.02 acres (218,737.5 sq. ft). No preservation credit has been requested. Impervious surfaces, including concrete and roofs, are proposed to total 183,122 sq. ft. (4.20 acres). This calculates to be 83.7%, under the maximum coverage allowed. This criterion has been met.

#### D. Yard Regulations:

1. Front yards are not required except where setbacks have been established for road widening or other purposes.

- 2. Side and rear yards are not required except:
  - a. Where setbacks have been established for road widening or other purposes.
  - b. Where the commercial or industrial use abuts a residential district, see FCC 10-34-3-7-D.

### c. Where a building is not constructed on the property line, a three foot (3') minimum setback is required.

No road widening adjacent to the subject properties is proposed and no residential district abuts the development. All buildings are proposed to be located greater than 3' from a property line. The proposed development is in accordance with these regulations.

#### 10-20-5: SITE AND DEVELOPMENT PROVISIONS:

- A. Building and Structural Height Limitations:
  - 1. The maximum building height shall be thirty eight feet (38').

2. Towers, spires, chimneys, machinery penthouses, water tanks, radio aerials and similar structures and mechanical appurtenances shall not exceed sixty feet (60') in height, only if approved by the FAA and shall not be used for any commercial, residential or advertising purpose.

No structures on the property are proposed to exceed 38 feet and there are no proposals as outlined in subsection A 2., above.

### B. Fences, Hedges, Walls or Landscaping: Refer to 10-34 of this Title for general requirements. Landscaping and trees shall not obstruct the airport's approach path.

None of the features of the proposed development are expected to obstruct the airport's approach path. The development does not abut the runway nor its approaches.

#### C. Outdoor Storage: All outdoor storage shall be enclosed within a sightobscuring fence or wall.

No outdoor storage is proposed.

### D. Parking and Loading Space: Refer to Chapter 3 of this Title for specific parking requirements. (Ord. 625, 6-30-80; amd. Ord. 669, 5-17-82)

Parking and loading have been addressed earlier in these Findings.

### E. Vision Clearance: Refer to Section 10-1-4 and 10-35-2-13 of this Title for definition and requirements.

As proposed, the vision clearances for all three driveways will meet code criteria.

### F. Signs: Signs shall be in accordance with Title 4 Chapter 7 of this Code. (Ord. 4, 2011)

The applicant has submitted plans for signage which will be reviewed by the Building Department in accordance with the above code.

#### G. Access and Circulation: Refer to Section 10-35 of this Title for requirements.

#### H. Public Facilities: Refer to Section 10-36 of this Title for requirements.

The sidewalk and street trees stretch parallel to Kingwood St. and have already been installed. Although no public facilities have been proposed, erosion control measures apply and are addressed under 10-36-4 of these Findings.

# I. All trash receptacles shall be located inside structures or in a trash enclosure that is fully screened by a sight-obscuring fence or wall not less than 5' in height. Trash receptacle areas shall be kept clean. Trash shall not be allowed to blow about the site nor onto neighboring sites, nor shall any trash be stored in a manner to attract rodents.

Outdoor stationary trash receptacles are not proposed. The development will utilize rollout bins for office and maintenance uses that will be stored inside the building. According to the applicant, clientele of the storage units will be individually responsible for removing their trash off-site.

### J. Administrative Review: All permitted uses in the Limited Industrial District shall be subject to administrative review, Section 10-1-1-6 of this Title.

The development proposal is under administrative review with the exception of two elementsbarbed wire fencing and unshielded external lighting which have been conditionally approved by the Planning Commission under Resolution PC 20 30 DR 07.

### K. Airport Overlay Zone: Refer to Section 10-21-2 of this Title for specific requirements of the Public Use Airport Safety and Compatibility Overlay Zone.

The proposed development is City-leased property and runs parallel to the airport's runway. Future airplane hangars are planned between the subject properties, runway and runway protection zone (RPZ). Subject properties lie well outside 300' from the runway.

The FAA and the Oregon Department of Aviation (ODA) were notified of this development.

### L. Lighting: Refer to Section 10-37 of this Title for requirements.

### TITLE 10: CHAPTER 21: AIRPORT OVERLAY ZONE

### 10-21-2: PUBLIC USE AIRPORT SAFETY AND COMPATIBILITY OVERLAY ZONE

10-21-2-3: IMAGINARY SURFACE AND NOISE IMPACT BOUNDARY DELINEATION: The airport elevation, the airport noise impact boundary, and the location and dimensions of the runway, primary surface, runway protection zone, approach surface, horizontal surface, conical surface and transitional surface are delineated in the Florence Municipal Airport, Airport Master Plan Update Final Report, February 2010 and shall be made part of the Official Zoning Map. All lands, waters and airspace, or portions thereof, that are located within these boundaries or surfaces shall be subject to the requirements of this overlay zone.

The site is outside of the 2009 and 2014 airport noise impact boundary, as designated by the Airport Master Plan 2010 Update. The site is partially within the 2029 55 DNL noise level designated by the Airport Master Plan 2010 Update.

10-21-2-5: HEIGHT LIMITATIONS ON ALLOWED USES IN UNDERLYING ZONE. All uses permitted by the underlying zone shall comply with the height limitations in this Section. When height limitations of the underlying zone are more restrictive than those of this overlay zone, the underlying zone height limitations shall control.

The maximum height allowance in the site's Limited Industrial zoning district is 38', per FCC 10-20-5 A. Although dimensions for the office building have not been provided and are conditioned elsewhere in these Findings, the office is not expected to exceed this maximum height allowance.

A. Except as provided in subsections B and C of this Section, no structure or tree, plant or other object of natural growth shall penetrate an airport imaginary surface.

B. For areas within airport imaginary surfaces but outside the approach and transition surfaces, where the terrain is at higher elevations than the airport runway surfaces such that existing structures and permitted development penetrate or would penetrate the airport imaginary surfaces, a local government may authorize structures up to 35 feet in height above ground level.

The highest elevations at finished grade, as shown in Exhibit D, Sheet C3.4 are slightly under 57 feet at the south landscaped office area. The height of the office building is unknown and dimensions for the office have been conditioned elsewhere. The elevation of the end of the runway is 50.8'. The site nearest the end of Runway 15 is approximately 500 feet and outside of the approach and transition surfaces. The height of the tallest storage buildings are proposed to be 12' 08" (Building AF, shown in Exhibit K and described in Exhibit C) will be well below that of the existing vegetation currently on site, and no imaginary surfaces such as the Transitional Surface (7:1 = 120 feet at the closest property line) or the Horizontal Surface (150 feet) will be penetrated. This criterion is met.

10-21-2-7: LAND USE COMPATIBILITY REQUIREMENTS: Applications for zone changes and land use for properties within the boundaries of this overlay zone shall comply with the requirements of ORS 836 and this chapter as provided herein. Building permits shall also be required to conform to the requirements of this chapter.

A. Noise. The Noise Contour Map for the Florence Municipal Alrport is included in the Florence Municipal Airport, Airport Master Plan Update Final Report, February 2010 – Figure 8-1: Nolse Contours, which is incorporated herein, and which shall remain on file in the Florence Community Development Department. Within the airport noise impact boundaries, land uses shall be established consistent with the levels identified in OAR 660, Division 13, Exhibit 5. A declaration of anticipated noise levels shall be attached to any subdivision or partition approval or other land use approval or building permit affecting land within airport noise impact boundaries. In areas where the noise level is anticipated to be at or above 55 DNL, prior to Issuance of a building permit for construction of a noise sensitive land use (real property normally used for sleeping or as a school, church, hospital, public library or similar use), the permit applicant shall be required to demonstrate that a noise abatement strategy will be incorporated into the building design that will achieve an indoor noise level equal to or less than 55 DNL.

Western portions of the site lie inside the 2029 55 DNL Noise Contour; however, the proposed development is not a noise-sensitive land use. No noise abatement strategy will be required.

B. Outdoor Lighting. No industrial, commercial or recreational use shall project lighting directly onto an existing runway or taxiway or into existing airport approach surfaces except where necessary for safe and convenient air travel. Lighting for these uses shall be in accordance with FCC 10-37. No use shall reflect light towards airport approach surfaces, imitate airport lighting or impede the ability of pilots to distinguish between airport lighting and other lighting.

The applicant shall not allow any lighting to point or reflect towards airport approach surfaces, imitate airport lighting, or impede the ability of pilots to distinguish between airport lighting and other lighting, [Condition 12].

## C. Glare. No glare producing material, including but not limited to unpainted metal or reflective glass, shall be used on the exterior of structures located within an approach surface or on nearby lands where glare could impede a pilot's vision.

The applicant must ensure the combination of color and metal roofing materials do not produce glare. The applicant shall construct the buildings with a roof material/coatings which will not produce glare that could impede a pilot's vision pursuant to FCC 10-21-.2-7 C, [Condition 13].

D. Industrial Emissions. No new industrial, mining or similar use, or expansion of an existing industrial, mining or similar use, shall, as part of its regular operations, cause emissions of smoke, dust or steam that could obscure visibility within airport approach surfaces, except upon demonstration, supported by substantial evidence, that mitigation measures imposed as approval conditions will reduce the potential for safety risk or incompatibility with airport operations to an insignificant level. The review authority shall impose such conditions as necessary to ensure that the use does not obscure visibility.

The applicant has not proposed that the storage facility and related office will create any industrial emissions which obscure visibility within the airport approach surfaces. This criterion is met.

E. Communications Facilities and Electrical Interference. No use shall cause or create electrical Interference with navigational signals or radio communications

between an airport and aircraft. Proposals for the location of new or expanded radio, radiotelephone, and television transmission facilities and electrical transmission lines within this overlay zone shall be coordinated with the Department of Aviation and the FAA prior to approval. Approval of cellular and other telephone or radio communication towers on leased property located within airport imaginary surfaces shall be conditioned to require their removal within 90 days following the expiration of the lease agreement. A bond or other security may be required to ensure this result.

The applicant has not proposed development that falls under this code section.

10-21-2-11: AVIGATION EASEMENT: Within this overlay zone, the owners of properties that are the subjects of applications for land use or limited land use decisions, for building permits for new residential, commercial, industrial, institutional or recreational buildings or structures intended for inhabitation or occupancy by humans or animals, or for expansions of such buildings or structures by the lesser of 50% or 1000 square feet, shall, as a condition of obtaining such approval or permits, dedicate an avigation easement to the airport sponsor. The avigation easement shall be in a form acceptable to the airport sponsor and shall be signed and recorded in the deed records of the County. The avigation easement shall allow unobstructed passage for alrcraft and ensure safety and use of the airport for the public. Property owners or their representatives are responsible for providing the recorded instrument prior to issuance of building permits.

The applicant has leased the property from the City of Florence, owner of the property and operator of the Florence Municipal Airport. Lots 4 through 10 and southern half of Lot 11 are for permanent lease by the City and will not be sold. For the purposes of this review, an easement will not be required. Should these lots ever be sold an avigation easement will be required as a condition of the sale, [Condition 14].

#### TITLE 10: CHAPTER 34: LANDSCAPING

#### 10-34-3: LANDSCAPING

10-34-3-1: Applicability. Except for single-family and duplex dwelling uses, this Section shall apply to all new development as well as changes of use and expansions as described below, and shall apply in all districts except where superseded by specific zoning district requirements. These provisions shall be in addition to the provisions of FCC Title 9 Chapter 5 and where there are conflicts, the provisions of Title 9 Chapter 5 shall prevail.

A. For new developments, all landscaping shall meet current code requirements. (Ord. 4, 2011)

### [...]

The development proposed is new and shall be conditioned to meet current code requirements as applicable.

10-34-3-2: Landscaping Plan Required. A landscape plan is required. All landscape plans shall include the following information:

### A. The location and height of existing and proposed fences and walls, buffering or screening materials.

An existing chain link fence with barbed wire strands is in place along the western border with its footing abutting airport property. Sheets C3.1, C3.2, C3.4 in Exhibit D contains notes to protect the fence during grading. The applicant shall provide the height of the existing fencing along the western border of the property per FCC 10-34-3-2 A, [Condition 15]. The plans illustrate the proposed east and south side fencing being 2.5' outside the buildings or along drive aisles rather than along the property lines. On the north end of the site (southern half of Lot 11) a fence is proposed north of the filter strip. This northern filter strip is noted within this report to be located on the northern half of Lot 11, outside the site plan. The fence is therefore proposed outside the site as well. Sheet C2,1 indicates an encroachment of 6.06 feet. The applicant shall adjust and then implement the site plan and associated construction plans so that all improvements relied upon for this development are located on-site. Street trees are the exception, [Condition 16].

### B. The location of existing and proposed terraces, retaining walls, decks, patios, shelters, and play areas.

No existing items listed here are situated in the subject properties and none are proposed.

### C. The location, size, and species of the new proposed plant materials (at time of planting).

A Landscaping Plan has been provided for the east side of the south half of Lot 11 and the NE area of Lot 10 which is near the office. Around 67 shrubs are planned for this planting area. Also included are 8 trees which include pine, birch, vine maple, blue spruce and wax myrtle varieties and ground cover such as lithodora and heathers. Included in the Plan are the container size, in gallons, for each tree and plant. The applicant has been required to modify the Landscape Plan (below) where requirements of this Chapter are not met. Vegetated areas proposed to retain existing vegetation or replanted in accordance with the Stormwater Design Manual specifications will require inclusion on the landscape plan revision. Landscaping plans addressing existing native vegetation and its replacement have been conditioned below, under D of this section. The plans submitted indicate the location, size and species of new plant materials, as proposed for the office site area, which includes the entryway landscape beds internal to the project, (Exhibit F).

# D. The location(s) of areas where existing vegetation will be cleared and the location(s) of areas where existing vegetation will be preserved, delineated on a recent aerial photo or site plan drawn to scale.

The applicant proposes to retain vegetation along the eastern and western sides of the site and in no rain garden areas on Lot 4. The comments provided from peer review of the proposed stormwater design state that filter strips are to be constructed per the BMPs which will necessitate removal of the vegetation within the proposed filter strip area to accommodate correct soil blends and a liner if necessary, to meet setback limitations. This change could reflect a different treatment of plants located or to be replanted, once cleared, of the newer proposed stormwater facilities, such as the three vegetated filter strip areas and the rain garden on Lot 4. In order to ensure that the applicant will retain the minimum landscaping required for the development, the applicant shall provide a detailed Landscape Plan and irrigation plans for the existing native vegetation to remain and proposed new vegetation prior to the issuance of permits in accordance with FCC 10-23-3-2 D and 10-34-3-5 and 9-2-3-5. This shall be submitted under a Type 1 review process subject to the associated staff review fee, [Condition 17].

### E. Existing and proposed building and pavement outlines.

Although they are not labeled, the Landscape Plan includes the proposed building and pavement outlines for the office and parking area.

### F. Specifications for soil at time of planting, irrigation and anticipated planting schedule.

Sheet C 5.1 in Exhibit D details the design of the vegetated filter strips and rain garden which are intended to serve as stormwater management facilities. Included in the design are instructions for growing mediums to be used in those areas such as topsoil blended with sand, loam and compost, pea gravel and drain rock and how these will be implemented within the strips. Note 7 on this Sheet states that the plantings should be done 10 days within placement and grading of the growing medium. Irrigation is not shown for plantings in the proposed stormwater management facilities including the retention pond on Lot 4 and has been conditioned earlier in this Chapter. The stormwater management facilities are discussed in more details under Title 9 of these Findings. The Landscape Plan states a soil/compost blend will be used.

### G. Other information as deemed appropriate by the City Planning Official.

10-34-3-3: Landscape Area and Planting Standards. The minimum landscaping area is 15% of the lot area, unless specified otherwise in the applicable zoning district<sup>1</sup> for the proposed use. This required minimum landscaping area may be reduced if preservation credits are earned as specified in Section 10-34-2-4.

The Landscape Plan provides for approximately 2,097 sq. ft. of total area (0.0481 of an acre) which will be located on the S half of Lot 11 and the N 1/2 of Lot 10 adjacent to the office building and the main entrance to the development.

The Limited Industrial District refers to Chapter 34 for landscape provisions. No preservation credits have been requested and the applicant will retain a variable 15'- swath of natural native vegetated buffer from the most southern portion of the development (Lot 4) to the planned landscape area in Lot 10. Lot 4 will also contain a stormwater retention pond. Although the applicant states that a portion of the native vegetation will be removed for the construction of this rain garden facility, the applicant proposes to retain as many plants as possible surrounding the pond area to reduce replanting costs. The applicant has not yet submitted a landscape plan for this area outside the rain garden and therefore has been conditioned above in order to provide the minimum landscaping requirements of 15% post-buildout.

### A. Landscaping shall include planting and maintenance of the following:

### 1. One tree per 30 lineal feet as measured along all lot lines that are

<sup>&</sup>lt;sup>1</sup> Mainstreet District (FCC 10-27) and Old Town District, Area A and B (FCC 10-17A and 10-17B) require 10% of the gross lot area to be landscaped.

#### adjacent to a street.

The project site has 1130.45 feet of street frontage along Kingwood St. requiring 37 trees (1130.45/30=37). With exception to Lot 7, 19 street trees are established between the sidewalk and curb, along Kingwood St. and the subject properties, (Sheet CO.2 in Exhibit D). Sheet C0.3 illustrates 16 street trees remaining after the construction of driveway cuts. The Landscape Plan lists five new trees countable from Florence' Tree and Plant List (Pine and Birch). Some of the native vegetated buffer is to remain between the proposed fencing parallel to Kingwood and the sidewalk. Retained conifer trees within this buffer that are 5' in height can count towards the required tree count. Retained deciduous trees 1 <sup>3</sup>/<sub>4</sub>" inches in diameter 6" above grade can count towards the required tree count. A Landscape Plan shall be submitted for review and approval that includes a minimum of 16 additional trees with a total of 37 trees in or within 20' of Kingwood St. right-of-way, [Condition 18].

### 2. Six shrubs per 30 lineal feet as measured along all lot lines that are adjacent to a street.

The project site has 1130.45 feet of street frontage along Kingwood St. requiring 226 shrubs ((1130.45/30)6)=226). The Landscape Plan illustrates plantings in the southern half of Lot 11 and in the northern half of Lot 10 adjacent to Kingwood St. and the development's internal driveway. The plan includes 67 shrubs (includes 4 non-countable trees). The applicant plans to leave some vegetation between the fence and the property line. (Shrubs off-site do not count towards the required landscaping.) Without knowing exactly where existing plants are located and which will remain after development, it is impossible to know if this criterion is met. The applicant has proposed to appropriately prune existing trees and shrubbery as necessary and remove invasive species along the swath, (Exhibit C). A Landscape Plan shall be submitted for review and approval that includes a minimum of 159 additional shrubs on-site within 20' of the Kingwood St. property line, with a total of 226 total shrubs, [Condition 19].

- 3. Living plant materials shall cover a minimum of 70 percent of the required landscape area within 5 years of planting.
- 4. Except for preservation of existing significant vegetation, the required plant materials on-site shall be located in areas within the first 20 feet of any lot line that abuts a street. Exceptions may be granted where impracticable to meet this requirement or the intent is better served. Required trees may be located within the right-of-way and must comply with Section 10-34-4. Plant materials may be installed in any arrangement and do not need to be equally spaced nor linear in design. Plantings and maintenance shall comply with the vision clearance standards of FCC 10-35-2-13.

The application is not claiming vegetation preservation credit. The proposed landscape area and retention areas are sufficiently planted and dense to meet the 70% requirement. The planned landscape area at the entryway to the office off of Kingwood St. indicates that this visual clearance will be met. Two additional driveways are located in areas that already contain natural vegetation and as such, it will be the applicant's responsibility to demonstrate, as conditioned under FCC 10-34-3-2 that the minimum 15% landscaping requirement shall be met.

5. Pocket-planting<sup>2</sup> with a soil-compost blend around plants and trees shall be used to ensure healthy growth.

The Landscape Plan calls for plants to be installed in soil/compost and beds covered with 2-3" medium fir mulch. This criterion is met.

B. Noxious Weeds shall be removed during site development and the planting of invasive or noxious weeds is prohibited.

10-34-3-4: Landscape Materials. Permitted landscape materials include trees, shrubs, ground cover plants, non-plant ground covers, existing native vegetation, outdoor hardscape features and storm water features, as described below.

- A. Plant Selection. A combination of deciduous and evergreen trees, shrubs, and ground covers shall be used, consistent with the purpose of this Chapter. A suggested Tree and Plant List for the City of Florence and the Sunset Western Garden Book are available at City Hall. The selection of plant and tree species shall be based upon site conditions such as wind and sun exposure, space limitations, water availability, and drainage conditions. The use of indigenous plants is encouraged, and may be required where exposure, slope or soil conditions warrant.
  - 1. Ground Cover. Ground cover may consist of separate plants or mowed grass turf. Ground cover plant species shall meet the following minimum standards: plants from 4-inch pots shall be spaced a maximum of 18 inches measured on center, and 1-2 gallon size plants shall be spaced a maximum of 3 feet measured on center.
  - 2. Shrubs. Shrub plant species shall be planted from 3 gallon containers unless otherwise specified in the *Tree and Plant List for the City of Florence*.

The landscape plan includes seven Lithodora in one-gallon containers distributed across three pocket planting areas. These groundcover plants meet the minimum planting container sizes. This criterion is met.

The following shrubs as well as seven others are not shown in the Landscape Plan to be contained in the required 3-gallon containers, but rather 1 or 2-gallon containers: Barberry "Crimson Pygmy", Evergreen Huckleberry and Pieris "Mountain Fire". The *Tree and Plant List for the City of Florence* permits Azaleas to be 2 gallon and Heather to be 1 gallon, so those plantings my remain as proposed. Spirea need to be increased from 1 gallon to 2-gallon. Per FCC 10-34-3-4-A-2, the Landscape Plan shall be modified to ensure the shrubs will be planted from a minimum of 3-gallon containers unless a smaller size is permitted in the Tree and Plant List for the City of Florence. The Landscape Plan shall be implemented prior to issuance of a Certificate of Occupancy, [Condition 20].

<sup>&</sup>lt;sup>2</sup> Pocket-planting is used in conjunction with sandy soils by removing existing sand approximately twice the width and the same depth of the pot, and replacing it with a soil-compost blend.

3. Trees. Evergreen and deciduous tree species shall meet the following minimum standards: deciduous trees shall be a minimum of 1 ¼ inch caliper (diameter) measured 6 inches above grade, and evergreen trees shall be a minimum of 5 feet tall (Nursery Grade 5/6).

The Landscape Plan includes just container sizes for the trees. The Landscape Plan shall be modified to include the minimum height and caliper of trees as indicated in FCC 10-34-3-4 3, [Condition 21].

4. Non-plant Ground Covers. Bark dust, chips, aggregate, or other non-plant ground covers may be used. Non-plant ground cover located adjacent to pedestrian ways shall be confined to the material within the planting bed to avoid safety hazards by edging 4 inches above-grade or recessing from grade. Non-plant ground covers cannot be a substitute for ground cover plants.

The Landscape Plan for Lot 10 and the south half of Lot 11, respectively, in Exhibit F demonstrates a variety of trees and shrubs. Non-plant ground cover includes nine basalt boulders between the office entrance area and the sidewalk along Kingwood St. According to the Plan, the beds are to be covered with 2-3" medium Fir mulch.

B. Existing Native Vegetation. Preservation of existing native vegetation is encouraged and preservation credits in accordance with Section 10-34-2-4 may be used to meet the landscape requirements of this Chapter.

The applicant has not requested preservation credits for the existing native vegetation and will be removing much of the vegetation for development. Treatment of this vegetation has been conditioned above in these Findings.

C. Hardscape features, such as plazas, pathways, patios and other pedestrian amenities may count toward ten (10) percent of the required landscape area, except in the Old Town and Main Street districts where hardscape features may count toward 50 percent of the landscape area, provided that such features conform to the standards of those districts. Swimming pools, sports courts, decks and similar facilities may not be counted toward fulfilling the landscape requirement in any zone.

No hardscape features are proposed to count towards the required landscape area.

D. Storm Water Facilities. Storm water facilities, such as detention/retention ponds and swales shall be landscaped. Landscaped bio-swales are encouraged and shall count toward meeting the landscaping requirement of this section if they are designed and constructed in accordance with the standards specified in Title 9 Chapter 5, and approved by the Public Works Department. Storm water facilities shall be landscaped with water-tolerant, native plants.

The applicant submitted a Stormwater Management Report that calls for three vegetated planting strips: a 6' wide strip to the north in Lot 11, a 7.5' wide strip along the western boundary, and a variable 15' strip along the eastern boundary of the development. The Report

also includes a stormwater detention pond in Lot 4, which is the most southern lot in the development. This lot is currently heavily vegetated with native plants. Although the lot will experience development with the detention pond which will include grading, the applicant has been conditioned elsewhere to ensure the minimum 15% landscaping requirements are met, and that irrigation will be in place in accordance with FCC 10-34-3-5, below.

10-34-3-5: Irrigation. Permanent, underground irrigation is required for all landscaping, except existing native vegetation that is preserved in accordance with the specifications of Section 10-34-2-2 and new drought tolerant plants which must have temporary irrigation for plant establishment. All irrigation systems require an irrigation permit and shall be installed with a backflow prevention device per FCC 9-2-3-5.

The Landscape Plan lists installation of irrigation. However, plans have not yet been submitted indicating the detail of the irrigation design and locations and are conditioned in this Chapter.

[...]

10-34-3-7: Buffering and Screening. Buffering and screening are required under the conditions listed below. Walls, fences, and hedges shall comply with the vision clearance requirements and provide for pedestrian circulation, in accordance with FCC 10-35-2-13. (See Section 10-34-5 for standards specific to fences and walls.)

A. Parking/Maneuvering Area Adjacent to Streets and Drives. Where a parking or maneuvering area is adjacent and parallel to a street or driveway, a berm; an evergreen hedge; decorative wall (masonry or similar quality material) with openings; arcade; trellis; or similar partially opaque structure 3-4 feet in height shall be established between street and driveway or parking area. See also FCC 10-3-7-D for standards specific to parking lots adjacent to the street. The required screening shall have breaks or portals to allow visibility (natural surveillance) into the site and to allow pedestrian access to any adjoining walkways. Hedges used to comply with this standard shall be a minimum of 36 inches in height at maturity, and shall be of such species, number, and spacing to provide year round screening within five (5) years after planting. Vegetative ground cover is required on all surfaces between the wall/hedge and the street/driveway line.

The proposed Landscape Plan indicates that these standards will be met once plants have been established. The applicant has been conditioned elsewhere to provide irrigation plans that will ensure plant growth which should also facilitate screening.

B. Parking/Maneuvering Area Adjacent to Building. Where a parking or maneuvering area or driveway is adjacent to a building, the area shall be separated from the building by a curb and a raised walkway, plaza, or landscaped buffer not less than five (5) feet in width. Raised curbs, bollards, wheel stops, or other design features shall be used to protect pedestrians, landscaping, and buildings from being damaged by vehicles.

The applicant has submitted plans demonstrating that these features are included in the design. This includes raised curbs, wheel stops and some landscaping planting areas adjacent to the parking lot servicing the business office.

- C. Screening of Mechanical Equipment, Outdoor Storage, Service and Delivery Areas, and Other Screening When Required. All mechanical equipment, outdoor storage and manufacturing, and service and delivery areas shall be screened from view from all public streets and adjacent Residential districts. When these or other areas are required to be screened, such screening shall be provided by:
  - 1. a decorative wall (i.e., masonry or similar quality material),
  - 2. evergreen hedge,
  - 3. opaque or sight-obscuring fence complying with Section 10-34-5, or
  - 4. a similar feature providing an adequate screen.

No mechanical equipment is proposed that would be visible from Kingwood St.

D. Abutting Land Use Buffers. When a commercial, industrial, or other nonresidential use abuts a residential district or residential land use, a visual and noise buffer shall be established and maintained immediately adjacent to the residential property line, consistent with the standards listed in the table below. In no case shall the buffer strip be less than 15 feet in width unless reduced by the Planning Commission where a lesser distance will provide adequate buffering. The buffer strip may include existing vegetation, landscape plantings, evergreen hedge, berm, fence, and/or wall components. Fence and wall structures shall be not less than 6 feet and no more than 8 feet in height (see also Section 10-34-5). The landscaped buffer shall effectively screen at least 70 percent of the view between districts within five (5) years. Significant vegetation in these buffer strips maybe preserved in accordance with Section 10-34-2, and replanting of local native vegetation is encouraged.

Adjoining Land Use / Zoning	Landscaped Buffer and/or Fence or Wall
Abutting single family Zoning or use	15 foot buffer with 6' solid wood fence or block wall
	35 foot landscaped buffer
Abutting Duplex, triplex or townhouse zoning or use	15 foot buffer with 6' solid wood fence or block wall or 25 foot landscaped buffer
Abutting multiple family or condominiums	15 foot buffer with 6' solid wood fence or block wall or 15 foot landscaped buffer

The subject property does not abut a residential district or use.

#### TITLE 10: CHAPTER 35: ACCESS AND CIRCULATION

10-35-2-8: Access Standards: New development shall gain access primarily from local streets. Access onto arterials and collectors shall be evaluated based on access options, street classifications and the effects of new access on the function, operation and safety of surrounding streets and intersections and possible lower level street

alternatives. Where such access to higher level street classification is necessary, shared driveways may be required in conformance with FCC 10-35. If vehicle access off a lower-level street is possible, then the City may prohibit access to the higher-level street.

Vehicle access is proposed from Kingwood St., which is classified in the Florence Transportation System Plan as a 'Collector.' No expansion of a lower-level classification street with access to the development is proposed in the TSP. Abutting properties are developed and driveways are not located where sharing is feasible or practicable.

10-35-2-9: Site Circulation: New developments shall be required to provide a circulation system that accommodates expected traffic on the site. Pedestrian and bicycle connections on the site, including connections through large sites, and connections between sites (as applicable) and adjacent sidewalks, trails or paths, must conform to the provisions in Section 10-35-3.

The development proposes a parking lot situated in the northeastern area within Lot 10 which will serve the office building and a thru-way to a security gate what will allow main access into and out of the storage unit areas. Also included are 5' wide concrete sidewalks that will extend from the existing sidewalk in Kingwood St. to and around the office building. A connecting sidewalk system is not planned internal to the self-storage units because it is not open to the general public. However, private walkways are planned that will allow access for maintenance purposes in back of the storage units; namely the most eastern and western units.

10-35-2-12: Driveway Design: All openings onto a public right-of-way and driveways shall conform to the following:

- A. Driveway Approaches. Driveway approaches, including private alleys, shall be approved by the Public Work Director and designed and located with preference given to the lowest functional classification street. Consideration shall also be given to the characteristics of the property, including location, size and orientation of structures on site, number of driveways needed to accommodate anticipated traffic, location and spacing of adjacent or opposite driveways.
- B. Driveways. Driveways shall meet the following standards, subject to review and approval by the Public Works Director:
  - 2. Driveways shall have a minimum width of ten (10) feet, except where a driveway serves as a fire apparatus lane, in which case city-approved driveway surface of 12 feet minimum width shall be provided within an unrestricted, twenty (20) foot aisle, or as approved by the Fire Code Official.
  - 3. Where a driveway is to provide two-way traffic, the minimum width shall be 18 feet.
  - 5. The maximum allowable driveway grade is fifteen (15) percent, except that driveway grades exceeding fifteen (15) percent may be allowed, subject to review and approval by the Public Works Director and Fire Code Official, provided that the applicant has provided an engineered plan for the driveway. The plan shall be stamped by a registered

geotechnical engineer or civil engineer, and approved by the Public Works Director.

C. Driveway Apron Construction. Driveway aprons (when required) shall be constructed of concrete and shall be installed between the street right-of-way and the private drive, as shown in Figure 10-35(2). Driveway aprons shall conform to ADA requirements for sidewalks and walkways, which generally require a continuous unobstructed route of travel that is not less than three (3) feet in width, with a cross slope not exceeding two (2) percent, and providing for landing areas and ramps at intersections. Driveways are subject to review by the Public Works Director.

Three concrete driveways are proposed with this development. Details of these driveways are provided in Sheet C3.4 in Exhibit D. The most northern driveway serves as the main access point in and out of the facility and is 31' wide meeting the above width criterion. Two additional driveways are proposed for large truck access that will connect to Kingwood St., are gated and the applicant has reported that they will rarely be used. All driveway improvements are subject to review and approval by the Public Works Director per FCC 10-35-2-12, [Condition 22].

D. Fire access lanes with turnarounds shall be provided in conformance with the Fire code. Except as waived in writing by the Fire Code Official, a fire equipment access drive shall be provided for any portion of an exterior wall of the first story of a building that is located more than 150 feet from an existing public street or approved fire equipment access drive. The drive shall contain unobstructed aisle width of 20 feet and turn-around area for emergency vehicles. The fire lanes shall be marked as "No Stopping/No Parking." See figure 10-35(3) for examples of fire lane turn-rounds. For requirements related to cul-de-sacs or dead-end streets, refer to FCC 10-36.

Four fire hydrants have already been installed between the subject properties Kingwood St. The deepest lot in the proposed development is the south half of Lot 11, the northernmost lot. This lot line measures 293.20'. The most western storage unit group is proposed to be located near and along the western property boundary which places it outside of the 150' mark from Kingwood St. The applicant is conditioned under FCC 10-36-3-E, below, to consult with Siuslaw Valley Fire and Rescue in order to verify their requirements are met.

### 10-35-2-13: Vertical Clearances: Driveways, private streets, aisles, turn-around areas and ramps shall have a minimum vertical clearance of 13' 6" for their entire length and width.

Internal circulation of the development has been designed particularly for vehicular visibility and vehicular accessibility to the units, with the Idea of large trucks; sometimes moving vans, using the aisles to deliver and retrieve large items. At its narrowest and located NE of the most southern storage units, the access aisle measures 19.4 feet and is at a point where the aisle dead-ends. The remainder widths of the aisles measure anywhere from 24.4' (again, at a terminus to an aisle) up to 38' internal to the security gate.

10-35-2-14: Vision Clearance: No visual obstruction (e.g., sign, structure, solid fence, or shrub vegetation)shall block the area between two and one-half feet ( $2 \frac{1}{2}$ ) and eight (8) feet in height in "vision clearance areas" on streets, driveways, alleys, mid-block

lanes, or multi-use paths where no traffic control stop signor signal is provided, as shown in Figure 10-35(4). The following requirements shall apply in all zoning districts:

A. At the intersection of two (2) streets, minimum vision clearance shall be twenty feet (20').

This is not applicable to the proposed development.

B. At the intersection of an alley or driveway and a street, the minimum vision clearance shall be ten feet(10').

All three access driveways connecting to Kingwood St. indicate that the minimum vision clearance of 10' will be met, (Sheets C2.1 and C2.2, Exhibit D, which contain curve tables). No new landscaping nor structures are planned within these areas.

C. At the intersection of internal driveways, the minimum vision clearance shall be ten feet (10').

The sides of the minimum vision clearance triangle are the curb line or, where no curb exists, the edge of pavement. Vision clearance requirements may be modified by the Public Works Director upon finding that more or less sight distance is required (i.e., due to traffic speeds, roadway alignment, etc.). This standard does not apply to light standards, utility poles, trees trunks and similar objects. Refer to Section 10-2-13 of this Title for definition.

No obstructions to vertical clearance or vision clearance are proposed.

10-35-3: PEDESTRIAN ACCESS AND CIRCULATION: All new development shall be required to install sidewalks along the street frontage, unless the City has a planned street improvement, which would require a non-remonstrance agreement.

10-35-3-1: Sidewalk Requirements:

- A. Requirements: Sidewalks shall be newly constructed or brought up to current standards concurrently with development under any of the following conditions:
  - 1. Upon any new development of property.
  - 2. Upon any redevelopment of property that expands the building square footage by 25% or more.
  - 3. Upon any change of use that requires more than five additional parking spaces.

The development is required to comply with this Section because it is new. Public sidewalks along Kingwood St. measure approximately 5 feet in width and are compliant with current standards. Additionally, internal sidewalks in the upper NE area of the development (connecting to the office) will be compliant to current standards as indicated on Sheet C0.3 of Exhibit D. Furthermore, the same Exhibit indicates that the sidewalks will be re-designed for the three driveway entrances onto the development.

B. Exceptions: The Planning Commission may issue a permit allowing noncompliance with the provisions of subsection (A) of this section and obtain

instead a non-remonstrance agreement for future improvements when, in the Planning Commission's determination through a Type 3 process, the construction of a sidewalk is impractical for one or more of reasons 1 through 4 below. The Public Works Director may issue a permit allowing noncompliance with the provisions of subsection(A) of this section and obtain instead a nonremonstrance agreement for future improvements for reason 5 below:

- 1. Sidewalk grades have not and cannot be established for the property in question within a reasonable period of time.
- 2. Future installation of public utilities or street paving would, of necessity, cause severe damage to existing sidewalks.
- 3. Topography or contours make the construction of a sidewalk impractical.
- 4. Physical improvements are present along the existing street that prevents a reasonable installation within the right-of-way or adjacent property.
- 5. If the proposed development is in a residential zoning district and there are no sidewalks within 400 linear feet.

Sidewalks meeting current standards exist along Subject Property's street frontage; no additional sidewalk installation withing the public ROW nor improvement is required and any modification for tying in to existing sidewalks and installing driveways shall meet the requirements of this Title to include procuring the necessary public improvement permits for the portions of sidewalks within the public right of way. The City has no planned improvements to Kingwood that would warrant a non-remonstrance agreement with the applicant.

#### TITLE 10: CHAPTER 36: PUBLIC FACILITIES

#### 10-36-3: SANITARY SEWERS, WATER, STORMWATER, AND FIRE PROTECTION:

- A. Sewers, Water, and Stormwater Mains Required: Sanitary sewers, water mains, and stormwater drainage shall be installed to serve each new development and to connect developments to existing mains in accordance with the City's Wastewater Master Plan, Water System Master Plan, and Stormwater Master Plan, Florence Code Title 9 Chapters 2, 3 and 5, and the applicable construction specifications. When streets are required to be stubbed to the edge of the subdivision; stormwater, sewer and water system improvements shall also be stubbed to the edge of the subdivision for future development.
- B. Sewer, Water, and Stormwater Plan Approval: Development permits for stormwater drainage, sewer and water improvements shall not be issued until the Public Works Director or their designee has approved all stormwater, sanitary sewer and water plans in conformance with City standards, and Florence Code Title 9 Chapters 2, 3 and 5.
- C. Existing Watercourse: Where a proposed development is traversed by a watercourse, drainageway, channel, or stream, there shall be provided a storm water easement or drainage right-of-way conforming substantially to the lines of such watercourse and such further width as will be adequate for conveyance

### and maintenance to protect the public health and safety and consistency with the Stormwater Manual.

The proposed development does not contain an existing watercourse. The applicant supplied utility plans to the Public Works Department for review. Per FCC 10-36-3 A and B, utility plans shall receive final approval by the Public Works Department prior to issuance of building permits, [Condition 23].

D. Over-Sizing: The City may require as a condition of development approval that sewer, water, and/or storm drainage systems serving new development be sized to accommodate future development within the area as projected by the applicable Water, Sewer, and/or Storm Drainage Master Plan, and Florence Code Title 9 Chapter 1. The developer may be entitled to credit or reimbursement for over-sizing City master planned improvements.

Over-sizing of water and sewer utility lines is not expected with this development. With regard to storm drainage systems servicing this new development, the City's Public Work Director has waived a downstream analysis of the Kingwood St. overflow system capacity (Exhibit M). Furthermore, the applicant has been conditioned to provide a study of the Airport property swale abutting the western subject property boundary. Appendix A.3 of Exhibit I indicates a stormwater drain extends from the east to the west, terminating at the Airport swale; however, conveying stormwater to the swale is not proposed elsewhere in the study.

E. Fire Protection: All new development shall conform to the applicable provisions of the Oregon Fire Code. Developers shall provide verification of existing and proposed water service mains and hydrant flow supporting the development site. Fire flow analyses and plans for hydrants and water service mains shall be subject to review and approval by the Building Official or Fire Marshal.

Siuslaw Valley Fire and Rescue has not submitted comments after referrals were sent out. Prior to issuance of building permits the applicant shall consult with Siuslaw Valley Fire and Rescue to identify any improvements needed to the fire suppression and access needs for the buildings proposed within this project. All required improvements shall be made prior to receipt of the Certificate of Occupancy for the associated improvement, [Condition 24]

F. Inadequate Facilities: Development permits may be restricted by the City where a deficiency exists in the existing water, sewer or stormwater system that cannot be rectified by the development and that if not rectified will result in a threat to public health or safety, surcharging of existing mains, or violations of state or federal standards pertaining to operation of domestic water and sewerage treatment systems.

Sheet C0.2 does not indicate any existing infrastructure within the undeveloped properties. Existing public infrastructure is installed in the Kingwood St. ROW. An existing 8-inch sewer main is located in Kingwood St. near the most SE corner of Lot 11, which will be the point where the future office sewer line will tie into this public system. A 10-inch water main is located on the east side of Kingwood St. An 8-inch water line is connected to this main and is shown to run under Kingwood St., extending to a point approximately 10 feet south of the sewer line. Electric power lines and poles are located between the sidewalk and the west side of Kingwood St. Public stormwater facilities are also located in the Kingwood St. ROW; with the most southern to the property being a curb inlet SE of the most southern lot of the

development (Lot 4), Although additional inlets exist in Kingwood St., the development proposed to utilize this most southern inlet which flows into an 18-inch stormwater line. The applicant shall provide an evaluation of drainage basin capacity for any overflow to the Airport swale. Overflow from less than a 100-year storm event is not acceptable, [Condition 25].

10-36-4: EROSION CONTROL: in addition to standard City requirements for stormwater, erosion control and sand management, projects that disturb one (1) or more acres of land over a period of time, a National Pollution Discharge Elimination System (NPDES) Permit must be obtained from the Department of Environmental Quality prior to the issuance of a development permit or land use permit based on appropriate criteria.

Sheet C1.0 in Exhibit D lays out the project's erosion control plan. The City of Florence Stormwater Management Design Manual and state law dictate that projects disturbing over one acre require a NPES 1200C permit from the Oregon Department of Environmental Quality. This permit would normally be obtained along with building permits, but it is a required step for vegetation clearing when conducted on its own, which will occur before construction - the first phase of the storage facility alone would require clearing more than two acres. Prior to clearing of vegetation, the applicant shall demonstrate to the City that a DEQ 1200C permit has been obtained per FCC 10-36-4, [Condition 26].

#### TITLE 10: CHAPTER 37: LIGHTING

10-37-2: APPLICABILITY: Section 10-37 applies to installation of all lighting fixtures as of the effective date of this Ordinance, except as exempted by provision of this Ordinance. Devices include but are not limited to, lights for: buildings and structures, recreational areas, parking lot and maneuvering areas, landscape areas, streets and street signs, product display areas, building overhangs and open canopies, holiday celebrations, and construction lights.[...]

10-37-3: LIGHTING PLANS REQUIRED: All applications for building permits and land use planning review which include installation of exterior lighting fixtures, not exempted, shall include the number of luminaires, the number of lamps in each luminaire, a photometric report for each type of luminaire and a site plan with the photometric plan of the lumen output.

The applicant submitted a Lighting Plan and product pamphlet information that includes the criteria listed here (Exhibits G and H). The lighting plan includes the luminaire output and number of specific light fixtures: 54 stationary wall mount units with 25-watt luminaires, 36 downward adjustable wall mount units containing 50-watt luminaires, and 2 pole lamps with 75- watt luminaires.

### The City shall have the authority to request additional information in order to achieve the purposes of this Ordinance.

The applicant is required under Condition 4 of Resolution PC 20 30 DR 07 by the Planning Commission to "...ensure that lighting be extinguished at the end of business hours except as needed for safety in accordance with FCC 10-37-4 D and that the unshielded fixtures be mounted thirty degrees to ensure downward illumination thereby preventing up-lighting in accordance with FCC 10-37- 5 H." The latter part of this condition is a result of proposed lighting that was unshielded and would therefore illumination would be cast skyward if not modified.

#### 10-37-4: LIGHTING STANDARDS:

A. All exterior lighting fixtures subject to this code section must be designed as a full cut-off fixture or have a shielding method to direct light emissions downward below the horizontal plane onto the site and does not shine illumination or glare skyward or onto adjacent or nearby property.

The Planning Commission conditionally approved proposed lighting on 54 units (25-watt) that were unshielded, but conditioned those lights to meet the shielding requirements through adjustments in mounting angle, effectively denying the lighting as proposed Condition 4 of Resolution PC 20 30 DR 07 states:

"The applicant shall ensure that lighting be extinguished at the end of business hours except as needed for safety in accordance with FCC 10-37-4 D and that the unshielded fixtures be mounted thirty degrees to ensure downward illumination thereby preventing up-lighting in accordance with FCC 10-37-5 H." Similarly, any lighting not addressed by the Planning Commission, such as the thirty-six (36) 50W adjustable downlight units and the two 75W pole units, shall be positioned to ensure downward illumination in accordance with FCC 10-37-4-A, [Condition 27].

B. Parking areas shall have lighting to provide at least two (2) foot-candles of illumination at any point in the entire lot with a maximum of flve (5) foot-candles over parking spaces and walkways. The Design Review Board may decrease the minimum if the applicant can provide documentation that the overall parking lot has adequate lighting. The Design Review Board may increase the maximum on a case-by-case basis, with no greater than 7 foot-candles measured directly under the light fixture.

The manufacturer's product pamphlet indicates that the 2 proposed light poles will be made of 4"x 4" square galvanized steel gauge and would be not exceed 18 feet as indicated in the applicant's revised narrative (Exhibit C). The remaining external lighting will be mounted on exterior walls. There is an area on the plans within the parking area and adjoining sidewalk that does not indicate lighting on the plan. This area includes the ADA parking space. The applicant shall provide lighting for the entire parking lot containing at least two (2) foot-candles of illumination with a maximum of five (5) foot-candles in the parking area and walkway areas not indicated on the Lighting Plan per FCC 10-37-4 B, [Condition 28].

C. Lighting in or adjacent to residential zones or residential uses shall not exceed twenty feet in height as measured from the adjacent grade to the top of the light fixture. Heights in other zoning districts shall not exceed 25 feet unless the Design Review Board adopts findings that the higher light fixtures are necessary to achieve proper illumination levels.

The applicant has demonstrated in the Applicant Revised Narrative (Exhibit C) that no on-site lighting will exceed 25 feet. The tallest pole-mounted fixtures will be set at approximately 18 feet in height. This criterion has been met.

D. Main exterior lights for commercial, institutional, and industrial buildings, landscaping and parking lots shall be extinguished at end of business hours with a minimum lighting remaining for personal and building security and safety after hours.

- E. A thirty-day review period beginning with the first day in business using the new lighting system shall be required to evaluate and adjust illumination levels of lighting. The City may ask for lighting to be adjusted in this time period based on public comments or staff inspections.
- F. All externally lit commercial signs should shine from the top and point down toward the ground. Signs with uplighting must be shielded so that illumination is restricted to the sign face and glare is eliminated.

A monument sign is proposed to have external illumination. External light sources for the sign shall be directed and shielded to restrict illumination to the sign face and glare is eliminated in accordance with FCC 10-37-4 F, top mounting is preferred [Condition 29].

G. Lighting for roadway signs and pedestrian ways must be designed or have an opaque shielding method to direct light emissions downward and below the horizontal plane of the fixture in the permanently installed position.

No signage of the above nature is proposed.

#### TITLE 9, CHAPTER 5: STORMWATER MANAGEMENT

#### 9-5-2: DRAINAGE PLAN SUBMITTAL REQUIREMENTS:

#### 9-5-2-1: GENERAL:

A. A Drainage Plan is required for all development, except as provided in FCC 9-5-2-4. Submittal requirements are tailored to the size and impacts of the development. The submittal requirements are specified in the Stormwater Manual.

B. Onsite stormwater management facilities shall be required to prevent the postdevelopment runoff rates from a project site from exceeding the pre-development runoff rates from the site, based on a 2 through 25-year storm. Exemptions to this requirement may be approved by the City Manager or his/her designee if it is determined that a more effective solution is available and that downstream capacity will accommodate the increase in flow.

The applicant submitted a Stormwater Management Study dated June 11, 2020 and then submitted a revised plan dated December 15, 2020 by Aric L. Farnsworth, PE, RA, NCARB in accordance with this Title. Both studies have undergone peer review by Civil West Engineering and the Public Works Director. Post-development calculations were supplied by the applicant's engineer based on projected runoff rate for a 25-year storm event. Calculations for predevelopment (existing conditions) are also included in the study and assume that off-site groundwater and surface drainage from neighboring parcels will not interact with the proposed stormwater management facilities, (page.5, Exhibit I).

The applicant's engineer discusses the use of both Rational and Prescriptive calculations in the two Stormwater Design Studies provided. The Rational Method is acceptable per the Public Works Director if onsite capacity calculations are provided. System capacity calculations shall be provided to demonstrate that any additional flow will not overwhelm the system. If not provided, then the prescribed methods in the City's Stormwater Design Manual and City Code (FCC Title 9) shall be followed. [Condition 30].

### [...]

### 9-5-3: STORMWATER DESIGN CRITERIA:

#### 9-5-3-1: GENERAL:

A. The criteria in Section 9-5-3 shall be used in the design of public and private stormwater drainage and management systems. Stormwater management facilities shall be constructed in accordance with the Stormwater Manual: the 2008 Portland Stormwater Management Manual, as superseded by the December 2010 City of Florence Stormwater Design Manual; and the 2008 City of Portland Erosion and Sediment Control Manual.

The applicant's updated Stormwater Management Study reflects reference indicating the guidelines of the 2010 City of Florence Stormwater Manual in the development's overall stormwater design. The plan includes 3 vegetated infiltration filter strips: a 7.5' wide strip onsite along the west boundary of the project; a 6' wide strip north of the northernmost project boundary line, and a variable 14' strip (on-site) along the eastern boundary line. The Study also includes a rain garden to be located in Lot 4, the most southern lot of the development.

Page 13 of the applicant's updated Stormwater Management Study provides a colored graphic which breaks down stormwater areas into 7 regions and also depicts areas of pervious material such as those found in the rain garden, filter strips and landscaping. Each region is color-coded and provides a description of the correlating Runoff Management Method shown in a chart. For example, surface flow in Regions 1 through 3, which are located centrally within the development, are proposed to convey stormwater flow to catch basins, which are piped to the rain garden located in Lot 4. This rain garden is represented as 'Region 4,' which proposes infiltration. Any overflow from the rain garden would be conveyed by an underground pipe to the 18" stormwater drain just outside of the most SE corner of Lot 4 and in the Kingwood St. ROW as described on p. 8 in Exhibit I, under "ENGINEERING CONCLUSIONS". Regions 5 through 7 indicate that surface flow is conveyed to its nearest filter strip. These four systems (the 3 vegetated filter strips and the sole rain garden) are to be privately maintained in accordance with this Title.

In order to assess amendments required by the conditions regarding the applicant's Stormwater Management Report (Exhibit I), the Public Works Director requests the following conditions for the final approval process:

- Include the Intensity Duration Frequency (IDF) curves in Appendix A, of the applicant's Stormwater Management Report, [Condition 34].
- The applicant shall have values tabulated in a single table within the Stormwater Management Report for ease of reference, [Condition 35].
- Vegetated filter strips under the required minimum 10' widths shall be constructed so as to prevent inconsistency with other conditions in these Findings, [Condition 36].

The northern filter strip includes piping which is not a feature of a filter strip in the SWDM. The piping proposed for the filter strips shall use a schematic standard for another BMP in the SWDM similar in function such as a swale. The nearest drain inlets to the north filter strip are

130 feet to the north and 170 feet to the south in Kingwood St. Any stormwater system Best Management Practices must be constructed per City approved detail. Two alternative solutions specifically for the north filter strip include: 1. The north vegetated filter strip shall be designed so that any anticipated overflow from a 25-year rain event may be allowed to utilize a bubble-up catch basin whereby anything over a 50 to 100-year storm event is conveyed to the existing gutter/curb on the east side of Kingwood St; <u>OR</u>, 2. Excess flow above a 25-year storm event shall be conveyed to a 6-inch pipe and penetrate the back of the curb inlet, providing that the correct fall for proper drainage is demonstrated, [Condition 31].

#### 9-5-3-2: STORMWATER QUANTITY (FLOW CONTROL):

### A. A 25-year, return period storm shall be used for the design of all private and public stormwater drainage systems.

The applicant submitted a revised Stormwater Management Study dated December 15, 2020 by Aric L. Farnsworth, PE, RA, NCARB in accordance with this Title (Exhibit I). The study provides calculations for each of the four private stormwater treatment facilities based a 25-year storm event.

B. Onsite stormwater management facilities shall be required to prevent the postdevelopment runoff rates from a project site from exceeding the pre-development runoff rates from the site, based on a 2 through 25-year storm. Exemptions to this requirement may be approved by the City Manager or his/her designee if it is determined that a more effective solution is available and that downstream capacity will accommodate the increase in flow.

The applicant submitted a Stormwater Management Study (Exhibit I) in accordance with subsection A, above. Post-development calculations are provided in the study based on projected runoff rate for a 25-year storm event. The applicant did not request exemptions to the above requirement. Calculations for predevelopment (existing conditions) are included in the Stormwater Management Study and assume that off-site drainage will not interact with the proposed stormwater management facilities. Appendix A-3 of the study indicates a drainage pipe in place from the rain garden that would convey any runoff from the rain garden at the southerm-most lot within the development (Lot 4) to a curb inlet which then connects underground to an 18" stormwater drainage main in Kingwood St. It is unclear at what point the Kingwood inlet would accept stormwater overflow. Overflow for the north filter strip has been addressed in Condition 31.

C. Each new development project is responsible for mitigating its impacts on the stormwater system. This mitigation requirement can be satisfied through the use of any of the following techniques, subject to the other limitations identified by this Code:

1. Construction of onsite facilities to limit the flow rate of stormwater runoff leaving the development site, in accordance with the Stormwater Manual.

2. Enlargement or improvement of the down gradient conveyance system in accordance with the requirements of this Code and the City of Florence Stormwater Management Plan.

The proposed stormwater management techniques in the Stormwater Management Report call for three vegetated filter strips. The northern one will collect roof, parking lot and driveway drainage. The eastern one will collect roof and driveway drainage. The western one will mostly collect roof drainage. The southern rain garden will collect roof and driveway drainage through a system of piping. The applicant's Stormwater Management Study explains that the entire site serves as a single watershed and no additional post-development drainage is proposed to exit off-site. As previously discussed, any excess water from the filter strips would be conveyed to the rain garden in Lot 4. This system, in turn, includes an underground drainage pipe which would convey any overflow underground to a curb inlet which then delivers water to an 18" storm drain under Kingwood St. Adequacy of the Kingwood St. drainage system for collecting overflow from this site is unknown and the applicant has not provided research illustrating sufficient capacity. Nevertheless, the Public Works Director has waived a downstream analysis of the Kingwood St. overflow system capacity.

D. The development of any land requiring a Drainage Plan shall address onsite and offsite drainage concerns, both up gradient and down gradient (a minimum of 1/4-mile) of the project, including:

1. Modifications to the existing onsite stormwater drainage and management facilities and drainage patterns shall not restrict or redirect flows creating backwater or direct discharge onto off-site property to levels greater than the existing condition unless approved by the affected offsite property owners and the City. Proof of off-site property owners approval shall be provided by having the affected property owner(s) sign an easement identifying the location of the backwater storage or impoundment area. This area shall be clearly shown on the submitted Drainage Plan site sheet(s). The easement shall be in a form approved by the City and recorded with the Lane County Deeds and Records Office.

The applicant did not provide information on drainage either up or down-stream of this project. Civil West provided comments concerning the absence of the analysis. With exception to adding a stormwater conveyance pipe from the development's rain garden to the 18" stormwater main in Kingwood St. no modifications to an existing stormwater management facility are proposed. Additionally, no known drainage directs through this site from off-site sources., although the applicant has been conditioned to provide analysis of drainage basin capacity for overflow to the Airport swale located between the western subject property boundary and Airport Way with the instruction that the overflow analysis from less than a 100year storm event is not acceptable. The northern filter strip is off-site and has been conditioned to be moved onto the site.

# 2. Stormwater facilities shall be designed and constructed to accommodate all flows generated from the project property in accordance with the land use zoning as shown in the most recent approved City Code.

The applicant's Stormwater Management Study proposes that on-site facilities are designed and will be constructed in accordance to this subsection. This is interpreted to mean that the system will be designed, constructed and planted in accordance with the Stormwater Design Manual specifications for the type of facility proposed. The applicant has been conditioned where additional information is required. In these instances, it is possible that the Study (Exhibit I) will need revising to provide additional calculations or design elements in order to comply with FCC Title 9 and the City's Stormwater Design Manual.

### 3. Capacity of the downstream drainage system to determine if increases in peak flow rates resulting from the proposed development can be accommodated.

The applicant's stormwater report indicates that the development will not convey water flow to other properties with exception to excess overflow to the stormwater system located in Kingwood Street. The facilities, according to the study in Exhibit I, are designed to accommodate flow from the project property as required by this section. This study states that the site will only route water to downstream drainage systems during very large storms and only at rates less than or equal to the pre-development condition, meaning there will be no significant increase in peak flow rate to the public stormwater drainage system. Determining capacity of the Kingwood St. system has been waived.

E. The types of stormwater management controls presented in the Stormwater Manual are available for owners and developers to use in satisfying the predeveloped and post-development runoff requirement. More than one of these types of controls may be needed to satisfy the runoff requirement. In areas where the runoff requirement in Section 9-5-3-2-F are exempt or partially exempt, the Clty may require improvements to the down gradient conveyance system.

Florence Design Standards require that stormwater runoff from impervious surfaces be treated for rain events up to and including the 25-year water quality design storm, preferably by vegetated means. The proposed development plans to achieve this via three vegetated stormwater filter strips and a rain garden. The applicant's Stormwater Report indicates that the water quality design storm would be entirely managed by the proposed filter strips and this rain garden, and no untreated water would escape from the system. The applicant's engineer states in Exhibit I that the use of Manning's Equation, used to calculate the diameter of the on-site drainage pipes (in this instance), would indicate that a 3.5-inch orifice should be affixed to the discharge end of the on-site pipe network that conveys the treated stormwater underground to a curb inlet connected to a 15" stormwater drain. The application makes reference to both constructing the filter strips to SWDM specifications but also makes reference to retaining vegetation in the filter strip areas. The calculations in the stormwater plan are designed to assume one is using the system as specified in the BMPs. Using anything else guestions whether the capacity requirement will be satisfied. The project has been conditioned to build systems to City specifications. 9-5-3-3: STORMWATER QUALITY:

A. Stormwater management facilities to treat stormwater are required for certain types of projects. These water quality facilities shall be designed and constructed for all projects requiring a Drainage Plan and for other projects as required by this section. Stormwater management facilities required for development shall be designed, installed and maintained in accordance with the Stormwater Manual, which is based on achieving at least 70% removal of the Total Suspended Solids (TSS) from the flow entering the facility for the design storm specified in the Stormwater Manual.

### B. Water quality facilities shall be designed and constructed for all projects requiring a Drainage Plan.

The development is proposed to be contained within 5.2 acres with the southern lot of the development measuring one-half an acre. The applicant submitted a Stormwater Management Study that lays out the design of the proposed system describing both treatment methods: vegetated filter strips and a rain garden, discussed above.

### D. The water quality design storm shall be based on an intensity of 0.25 inches per hour, or 0.83 inches for a 24-hour SCS Type 1A rainfall return event.

Table 4.1 on page 20 of the City of Florence Stormwater Design Manual provides a SCS Type 1a hystograph in concert with the above code.

Appendix B in the applicant's Stormwater Management Study (Exhibit I) indicates that both pre- and post-development calculations were completed using the Rational method for the two types of treatment facilities (vegetated filter strips and the rain garden). These calculations were peer reviewed and any deficits have been noted or conditioned in these Findings of Facts.

- E. Water quality facilities must be designed to prevent damage to the facility for flows exceeding the water quality design storm and to ensure no re-suspension of pollutants, consistent with the Stormwater Manual.
- [...]

#### 9-5-4: MAINTENANCE RESPONSIBILITY:

Α. Private stormwater facilities must be maintained in accordance with the Operations and Maintenance Plan approved as part of the Drainage Plan. The Operations and Maintenance Agreement will be recorded with the Lane County Deeds and Records Office. The Stormwater Manual contains the Operations and Maintenance Agreement Form to be used. A log of all maintenance activity shall be kept by the owner and made available to the City upon request. The City may, at its option, inspect the facilities for compliance with the requirements. If a property owner fails to maintain their facilities, the City may issue a written notice specifying the required actions. If corrective actions are not completed in a timely manner, the City may pursue legal remedies to enforce the provisions of the Operations and Maintenance Plan. The City will only enter the property to perform the required corrections if the public's health and public property are in imminent danger. In this situation, reasonable attempts will be made to contact the property owner(s), but a written notice may not be required. The property owner(s) will be billed for City incurred expense.

Appendix E in the Stormwater Management Study (Exhibit I) includes the necessary information pursuant to the above code; form drafts, an Operations and Maintenance Agreement, and an Operations and Maintenance Plan. Should these need amending as a result of conditions set out in these Findings, the applicant shall submit the amendments to the Public Works Director for approval, [Condition 32].

B. The Maintenance Agreement shall provide that upon notification by the City of any violation, deficiency or failure to comply with the agreement or this Code, corrections shall be completed within ten (10) days after notice thereof. Thereafter the City may pursue legal action to enforce the provisions of the agreement. In an emergency situation, the City may provide for all necessary work to place the facility in proper working conditions. The persons specified as responsible for maintenance in the Maintenance Agreement shall be charged the costs of the work performed by the City or its agents.

The Maintenance Agreement draft currently excludes the above 10-day period to complete corrections after noticing. Pursuant to FCC 9-5-4 B, prior to final building inspections the applicant shall provide the final Maintenance Agreement to include the following in their Maintenance Agreement: "...corrections shall be completed within ten (10) days after notice thereof," [Condition 33].

### VI. CONDITIONS OF APPROVAL

The application, as presented, meets or can meet applicable City codes and requirements, provided that the following conditions of approval are met.

- 1. Approval shall be shown on:
  - "A" Findings of Fact
  - "B" Application AR 20 10 DR 03
  - "C" Applicant Revised and Initial Narratives
  - "D" Civil Plans Sheets C0.1 to C5.3
  - "E" Office Elevations and Floor Plan
  - "E.1" Colors at Storage Building Corners
  - "F" Landscape Plan for Office Site
  - "G" Lighting Plan Kingwood Revision
  - "H" Lighting Spec Sheets
  - "I" Updated Stormwater Management Study
  - "J" SIR Florence Signed
  - "K" Res. AR 19 14 VEG 07
  - "L" Trachte Plan Jan 2020
  - "M" P.W. 2-2-21 Comments on Stormwater Management Report
  - "N" P.W. 2-12-21 Condition for Stormwater Management Report
  - "O" P.W. 2-25-2021 Comments on Stormwater Management Report

Findings of Fact attached as Exhibit "A" are incorporated by reference and adopted in support of this decision. Any modifications to the approved plans or changes of use, except those changes relating to Building Codes, will require approval by the Community Development Director or Planning Commission/Design Review Board.

- 2. Regardless of the content of material presented for this Planning Commission, including application text and exhibits, staff reports, testimony and/or discussions, the applicant agrees to comply with all regulations and requirements of the Florence City Code which are current on this date, EXCEPT where variance or deviation from such regulations and requirements has been specifically approved by formal Planning Commission action as documented by the records of this decision and/or the associated Conditions of Approval. The applicant shall submit to the Community Development Department a signed "Agreement of Acceptance" of all conditions of approval prior to issuance of a building permit.
- 3. Upon encountering any cultural or historic resources during construction, the applicant shall immediately contact the State Historic Preservation Office and the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians. Construction shall cease immediately and shall not continue until permitted by either a SHPO or CTCLUSI representative
- 4. Per FCC 10-3-2 F, required parking spaces shall be maintained and shall not be eliminated, used for the storage of materials of any type, or used for loading or unloading operations during business hours.
- 5. Per FCC 10-3-8 C, the parking lot shall be graded as to not drain storm water over public sidewalks. The drainage systems shall be connected to vegetated stormwater features to infiltrate the stormwater rather than directing it to a storm sewer system to be conveyed off-site.
- 6. The respective double line striping appears to measure nearly 2 feet wide; however, the exact dimensions were not indicated in the plans and shall be verified upon construction per FCC 10-3-9 B.
- 7. In keeping with FCC 10-3-10H, the applicant shall demonstrate to the Community Development Department that a 5' unimpeded walkway is maintained between the 2'x 6' stalls and the raised parking curb prior to issuance of a Certificate of Occupancy.
- 8. On-site signage indicating the bicycle parking area shall be required per FCC 10-3-10 G with signage plans submitted and approved prior to permitting.
- **9.** Per FCC 10-6-5 E, the applicant shall ensure that noise, vibration, smoke, dust, odor, intense lighting, and electrical interferences shall not exceed levels allowed by applicable nuisance codes.
- 10. The storage unit buildings shall either provide the elements listed in FCC 10-6-6-3 to comply with the criteria; or be fully screened from Kingwood St.; or provide denser, multi-story, landscaping, street furnishings, and/or sculpture elements in a manner to meet frequency of offset/break—so one or a combination of every 30-40 feet along Kingwood St.

- **11.** The applicant shall submit a color scheme and exterior materials list, architectural plans and/or dimensioned Civil Plans for the office in accordance with FCC 10-6-5-1 and 10-6-8 C.
- **12.** The applicant shall not allow any lighting to point or reflect towards airport approach surfaces, imitate airport lighting, or impede the ability of pilots to distinguish between airport lighting and other lighting.
- **13.** The applicant shall construct the buildings with a roof material/coatings which will not produce glare that could impede a pilot's vision pursuant to FCC 10-21-.2-7 C.
- 14. The applicant has leased the property from the City of Florence, owner of the property and operator of the Florence Municipal Airport. Lots 4 through 10 and southern half of Lot 11 are for permanent lease by the City and will not be sold. For the purposes of this review, and easement will not be required. Should these lots ever be sold an avigation easement will be required as a condition of the sale.
- **15.** The applicant shall provide the height of the existing fencing along the western border of the property per FCC 10-34-3-2 A.
- 16. The plans illustrate the proposed east and south side fencing being 2.5' outside the buildings or along drive aisles rather than along the property lines. On the north end of the site (southern half of Lot 11) a fence is proposed north of the filter strip. This northern filter strip is noted within this report to be located on the northern half of Lot 11, outside the site plan. The fence is therefore proposed outside the site as well. Sheet C2,1 indicates an encroachment of 6.06 feet. The applicant shall adjust and then implement the site plan and associated construction plans so that all improvements relied upon for this development are located on-site. Street trees are the exception.
- 17. In order to ensure that the applicant will retain the minimum landscaping required for the development, the applicant shall provide a detailed Landscape Plan and irrigation plans for the existing native vegetation to remain and proposed new vegetation prior to the issuance of permits in accordance with FCC 10-23-3-2 D and 10-34-3-5 and 9-2-3-5. This shall be submitted under a Type 1 review process subject to the associated staff review fee.
- **18.** A Landscape Plan shall be submitted for review and approval that includes a minimum of 16 additional trees with a total of 37 trees in or within 20' of Kingwood St. right-of-way.
- **19.** A Landscape Plan shall be submitted for review and approval that includes a minimum of 159 additional shrubs on-site within 20' of the Kingwood St. property line, with a total of 226 total shrubs.
- 20. Per FCC 10-34-3-4-A-2, the Landscape Plan shall be modified to ensure the shrubs will be planted from a minimum of 3-gallon containers unless a smaller

size is permitted in the Tree and Plant List for the City of Florence. The Landscape Plan shall be implemented prior to issuance of a Certificate of Occupancy.

- **21.** The Landscape Plan includes just container sizes for the trees. The Landscape Plan shall be modified to include the minimum height and caliper of trees as indicated in FCC 10-34-3-4 3.
- **22.** All driveway improvements are subject to review and approval by the Public Works Director per FCC 10-35-2-12.
- **23.** Per FCC 10-36-3 A and B, utility plans shall receive final approval by the Public Works Department prior to issuance of building permits.
- 24. Prior to issuance of building permits the applicant shall consult with Siuslaw Valley Fire and Rescue to identify any improvements needed to the fire suppression and access needs for the buildings proposed within this project. All required improvements shall be made prior to receipt of the Certificate of Occupancy for the associated improvement.
- 25. Although additional inlets exist in Kingwood St., the development proposed to utilize this most southern inlet which flows into an 18-inch stormwater line. The applicant shall provide an evaluation of drainage basin capacity for any overflow to the Airport swale. Overflow from less than a 100-year storm event is not acceptable.
- **26.** Prior to clearing of vegetation, the applicant shall demonstrate to the City that a DEQ 1200C permit has been obtained per FCC 10-36-4.
- 27. Any lighting not addressed by the Planning Commission, such as the thirty-six (36) 50W adjustable downlight units and the two 75W pole units, shall be positioned to ensure downward illumination in accordance with FCC 10-37-4-A.
- 28. The applicant shall provide lighting for the entire parking lot containing at least two (2) foot-candles of illumination with a maximum of five (5) foot-candles in the parking area and walkway areas not indicated on the Lighting Plan per FCC 10-37-4 B.
- **29**. A monument sign is proposed to have external illumination. External light sources for the sign shall be directed and shielded to restrict illumination to the sign face and glare is eliminated in accordance with FCC 10-37-4 F, top mounting is preferred.
- 30. The applicant's engineer discusses the use of both Rational and Prescriptive calculations in the two Stormwater Design Studies provided. The Rational Method is acceptable per the Public Works Director if onsite capacity calculations are provided. System capacity calculations shall be provided to demonstrate that any additional flow will not overwhelm the system. If not

provided, then the prescribed methods in the City's Stormwater Design Manual and City Code (FCC Title 9) shall be followed.

- **31.** The northern filter strip includes piping which is not a feature of a filter strip in the SWDM. The piping proposed for the filter strips shall use a schematic standard for another BMP in the SWDM similar in function such as a swale. The nearest drain inlets to the north filter strip are 130 feet to the north and 170 feet to the south in Kingwood St. Any stormwater system Best Management Practices must be constructed per City approved detail. Two alternative solutions specifically for the north filter strip include: 1. The north vegetated filter strip shall be designed so that any anticipated overflow from a 25-year rain event may be allowed to utilize a bubble-up catch basin whereby anything over a 50 to 100-year storm event is conveyed to the existing gutter/curb on the east side of Kingwood St; <u>OR</u>. 2. Excess flow above a 25-year storm event shall be conveyed to a 6-inch pipe and penetrate the back of the curb inlet, providing that the correct fall for proper drainage is demonstrated.
- 32. Appendix E in the Stormwater Management Study (Exhibit I) includes the necessary information pursuant to the above code; form drafts, an Operations and Maintenance Agreement, and an Operations and Maintenance Plan. Should these need amending as a result of conditions set out in these Findings, the applicant shall submit the amendments to the Public Works Director for approval.
- 33. The Maintenance Agreement draft currently excludes the above 10-day period to complete corrections after noticing. Pursuant to FCC 9-5-4 B, prior to final building inspections the applicant shall provide the final Maintenance Agreement to include the following in their Maintenance Agreement: "...corrections shall be completed within ten (10) days after notice thereof."
- **34.** Include the Intensity Duration Frequency (IDF) curves in Appendix A of the applicant's Stormwater Management Report.
- **35.** The applicant shall have values tabulated in a single table within the Stormwater Management Report for ease of reference.
- **36.** Vegetated filter strips under the required minimum 10' widths shall be constructed so as to prevent inconsistency with other conditions in these Findings.

#### VII. EXHIBITS

"A"	Findings of Fact	
"B"	Application AR 20 10 DR 03	
"C"	Applicant Revised and Initial Narratives	
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	Management Report	

APPROVED BY THE COMMUNITY DEVELOPMENT DEPARTMENT, this 25<sup>nd</sup> day of February, 2021.

Roxanne Johnston, Senior Planner, CFM

### **Stormwater Management Report**

for

### Heceta Self Storage Airport Annex

Site Address:

2535 Kingwood Street Florence, Oregon 97439

**Prepared For:** 



Larry & Crystal Farnsworth, Owners 87632 North Hwy 101 Florence, OR 97439 541-997-9702 storage@hecetaselfstorage.com

**Prepared By:** 

Aric L. Farnsworth – PE, RA, NCARB 801-875-9805 <u>aricfarnsworth@gmail.com</u>

Submitted: December 15, 2020

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### **ENGINEER'S CERTIFICATION**

I hereby certify that this Stormwater Management Report for the Heceta Self Storage Airport Annex project has been prepared by me or under my supervision and meets minimum standards of the City of Florence and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.


#### **PROJECT OVERVIEW & DESCRIPTION**

The following narrative describes the methodology and results of the enclosed hydrological analysis for the Heceta Self Storage Airport Annex project, located at 2535 Kingwood St. in Florence, Oregon. The following parcels (listed by A.P.N. #) are included in the project:

- 1812224200200
- 1812224200100
- 1812224300900

- 1812224300800
  - 1812224300800
- 1812224300500
- 1812224300400

Together, these 7 ½ parcels account for 5.02 acres of land just south of the Florence Public Works facility, with frontage along the west side of Kingwood Street. The parcels are bordered on their west side by the Florence Municipal Airport.

1812224300600

The subject site is currently vacant land, although it is heavily vegetated with native bushes, trees, plants, and ground cover. Site topography is nearly flat, sloping downhill to the southwest at roughly 0.7%. Surface water on the site feeds the existing dense vegetation, with surplus waters being largely managed via groundwater infiltration. The entire subject site currently behaves as a single watershed and there are no documented wetlands present on the site.

Based on research and record drawings, it appears that there are existing public and private utilities present in the Kingwood Right-Of-Way including sanitary sewer, water, storm, underground power, and telecommunications. There is also an existing stormwater swale that flows to the south along the west property boundary. This swale is located off-site, on the airport property.

All included parcels fall within a Limited Industrial District (LI), whose characteristics and permissions are described in Title 10, Chapter 20 of the Florence Municipal Code. In that Chapter, "Storage (household goods, business inventories, boats, RVs, including outdoor storage)" is an expressly permitted use.

The proposed project is a self-storage facility which

consists of multiple metal-clad buildings constructed in rows with paved drive aisles between them. The proposal also includes a 600 square-foot stand-alone office building at the northeast end of the project as well as security fencing surrounding the entire project. Much of the subject parcels will be covered with impervious surfaces in this project, so a thorough and accurate hydrological design is of particular importance.



#### METHODOLOGY

#### **AUTHORITY & DESIGN PARAMETERS**

The Authority Having Jurisdiction (AHJ) over this project is the City of Florence. In the City's *Stormwater Design Manual, 2010 (SWDM),* the **Rational Method** is identified as an acceptable hydrologic analysis method for projects of this size and type (see City of Florence Municipal Code, Title 9, Chapter 5, Section 9-5-3-2, Part B). Calculations for this project are based on the *Oregon Department of Transportation Hydraulics Manual – Chapter 7*, which provides instructions for Rational Method analysis. Additional guidance for calculation methods and engineering judgement, particularly related to sizing mitigation works, was drawn from other regional design manual and industry handbooks.

The ODOT manual includes location-specific I-D-F curves (Intensity-Duration-Frequency), which are useful in determining peak flow in locations throughout Oregon. Specific equations, figures, tables, and procedures for the Rational Method are outlined in the manual (and attached calculations) and are not repeated here. Equations used for sizing vegetated filter strips are included, though they are readily available in industry literature.

The attached peak flow and detention volume calculations were completed based on the **25-year storm** event, as required by Florence SWDM, Section 3.3.1. The purpose of these calculations was to evaluate the hydrologic impact of the proposed improvements on the site versus the drainage conditions that currently exist on the site prior to its development. Onsite storm water management facilities are designed to prevent the post-development runoff rates from exceeding the pre-development runoff rates from the site, based on the design storm indicated above (City Code, 9-5-3-5, F). Thus, calculations were completed with two sets of variables to compare these two separate conditions.

The attached calculations assume that ground water and surface runoff in parcels adjacent to the project do not interact with the stormwater <u>within</u> the drainage basin, and that all runoff from the project site originates on the property.

#### PROPOSED STORMWATER MANAGEMENT TECHNIQUES (BMPs)

- Multiple Stormwater BMPs are proposed to manage stormwater runoff from the project site, including:
  - a rain garden (Florence Std. Dtl. SW-130),
  - vegetated filter strips (Florence Std. Dtl. SW-160), and;

Design for each of these BMPs was undertaken separately as each BMP will receive waters from a separate post-development tributary region (catchment). The analysis and design of each of these BMPs will be addressed later in this document.

Successful stormwater management is achieved when a design protects the quality and quantity of water in the aquifer, particularly when groundwater is the sole source of drinking water, as it is in Florence. Therefore, stormwater designs in Florence must address flow control, pollution reduction, and erosion control. The Florence SWDM states that "*To meet pollution reduction requirements a facility must be able to provide 70 percent total suspended solids removal from 90 percent of the average annual runoff.*" (pg. 8). As described

in this report, the presumptive and performance approaches were both utilized to evaluate the hydrologic response capability of the proposed BMPs and demonstrate that adequate flow control and pollution reduction have been achieved.

#### ANALYSIS

#### APPROACH

While the existing site acts as a single watershed, the proposed site is divided up into four separate catchments, and each of these is proposed to be managed by a separate and unique stormwater BMP. These divisions are summarized below:

 <u>Vegetated Filter Strips Tributary</u> – There are three storage buildings proposed along the eastern boundary of the project site. The position of the storage buildings relative to the property line leaves enough room for a two-lane drive aisle and an approximately 15-feet +/- wide strip of landscaping. All storm water that lands on the eastern half of these three buildings (Building AA, AE, AH, pitched roof) and the eastern drive aisle is designed to shed into the landscaping, which acts as a Vegetated Filter Strip, treating the water prior to its infiltration.

A long continuous storage building runs along the entire western boundary of the project. Storm water which lands on the west half of the roof of this building (pitched roof) will shed to the west where a 7.5-ft wide filter strip is proposed between the edge of concrete and the airport property boundary.

The northern-most catchment on the project site is designed to discharge surface water into a 6-ft wide filter strip located along the northern property boundary. Stormwater will enter the filter strip via surface sheet flow, receive biological filtration, then infiltrate into the ground. This northern filter strip is also equipped with an underdrain (perforated pipe wrapped in filter fabric, placed in a gravel bed below the growing medium). This underdrain will serve as an emergency overflow for the site, removing high ground water if ever experienced. (Note: high ground water has not been observed in this area).

Vegetated Filter Strips in this project were designed using the Performance Approach as authorized in Section 5.1 of the SWDM.

 <u>Rain Garden Tributary</u> – The remainder of project surface water is proposed to be managed via collection into a series of catch basins and underground piping which will convey the stormwater to the southern-most parcel where a rain garden will be constructed. The rain garden depicted in the civil improvement plans was sized using the Presumptive Approach, per Section 5.1 of SWDM.

A more detailed description of the hydrological analysis that was completed for each of these proposed facilities is provided below.

#### **VEGETATED FILTER STRIPS**

The Florence SWDM encourages designers to incorporate on-site infiltration facilities into site landscaping areas as much as possible (SWDM, 3.1). Doing so is a preferred alternative to piped collection systems because it keeps the water onsite, where it can be filtered, then infiltrated to recharge the aquifer. In the Heceta Self Storage Airport Annex project, the use of vegetated filter strips and on site detention basins (rain

garden) will help to protect the quantity and quality of water in the aquifer rather than collecting the runoff and conveying it away to ultimately discharge into the Siuslaw River.

As stated previously, these facilities were designed using the Performance Approach. The attached calculations show equations, variables, and justification for each parameter considered. The calculation method utilized is an industry standard approach for the design of these commonly-used facilities. Please note that the proposed filter strips entirely comply with the constraints identified in City of Florence Standard Detail SW-160 and the calculations demonstrate that the filter strips depicted in the civil improvement drawings meet or exceed the minimum dimensional criteria required for each specific catchment.

#### **RAIN GARDEN**

Runoff from the portion of the site whose runoff has not been proposed to be managed by filter strips is proposed to be mitigated by a rain garden located at the south end of the project. As shown in the calculations, the contributing area for this catchment is approximately 2.73 acres, and the post-developed rate of runoff is predicted to be 7.53 cfs. This quantity is significantly larger than the rate of runoff predicted to occur from the same region of the pre-developed site (0.22 cfs, pro-rated from 0.4 cfs on 5.02 acres). However, comparing predicted rates of runoff from two theoretical storms is limited in its utility due to the differing times of concentration (rainfall durations) utilized in each set of calculations.

The methodology used for sizing the rain garden is discussed in the Engineering Conclusions section of this document.

#### ENGINEERING CONCLUSIONS

While the Rational Method is useful in peak flow estimation, it carries certain limitations regarding the design and sizing of mitigation works. For example, the two analyses completed in these calculations demonstrate that there are significant differences in the hydrologic performance of the post-developed site as opposed to the pre-developed site (higher peak discharge and shorter response time), but these results are difficult to compare because the peak discharge estimates from each analysis apply to two different rainfall durations. The Rational Method has been appropriately applied to quantify these differences, but it has been supplemented with hydrographic (hyetographic) analysis to determine the volume of stormwater detention that is required in order to satisfy runoff attenuation requirements. Required detention volume has been calculated by an algorithm that allows maximum pre-development flow to occur at all times, with the difference between inflow and maximum allowable outflow being taken to storage. Storage volume is released such that the maximum outflow never exceeds the pre-development peak discharge.

Because the Rational method does not provide enough data points to inform a detailed hydrographic study, engineering judgement was used to estimate the recession time of each storm. Specifically, it was estimated that the recession time of each storm is 1.7 times that of the time to peak, making a triangular shape that roughly follows the shape that would be presented by an SCS Unit Hydrograph. It is assumed that the resultant hydrograph provides a conservative approximation of runoff quantities in excess of predevelopment flow rates, and thus the rain garden sizing calculations are also conservative.

#### **ON-SITE PIPING & DISCHARGE**

Using Manning's equation, calculations were also completed to determine the minimum required pipe diameter for the on-site stormwater mains that are proposed to convey collected waters to the rain garden, and then to an ultimate point of discharge in an existing stormwater curb inlet located on Kingwood Street. In order to limit discharge into the inlet to pre-development discharge rates, orifice calculations indicate that, given the elevation head present in the system, a 3.5-inch diameter orifice should be affixed to the discharge end of the on-site pipe network.

This narrative is accompanied by all above-referenced calculations as well as drawings, schematic maps, and other submittal requirements indicated by the AHJ, to illustrate and identify catchment areas, stormwater BMPs, and other information.

Respectfully,

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- A Site Maps
  - Pre-Developed Contour Map (Existing Site Plan)
  - Post-Developed Contour Map (Proposed Grading Plan)
  - Watershed/Catchment Delineation Map (Exhibit)

#### **B** - Calculations

- Summary Page
- Pre-Developed
- Post-Developed (Rain Garden Tributary)
  - Hydrographs
  - Detention Volume
- Pre-Developed (Filter Strip Tributaries)
- Post-Developed (Filter Strip Tributaries)
- Mitigations Facility Sizing (Filter Strips, Pipe Sizing)
- Orifice
- Tables
- C BMP Details
- D Web soil survey
- E Operations & Maintenance Agreement
- F Operations & Maintenance Plan

APPENDIX A

CONTOUR MAP (PRE-DEVELOPMENT) (See construction drawings for greater detail).









#### APPENDIX - A.2

CONTOUR MAP (POST-DEVELOPMENT) (See construction drawings for greater detail).



#### APPENDIX - A.3

WATERSHED / CATCHMENT DELINEATION MAP (POST-DEVELOPMENT)

Region	Runoff Management Method
REGION 1	Surface flow to catch basins, then pipe flow to rain garden in south parcel.
REGION 2	Surface flow to catch basins, then pipe flow to rain garden in south parcel.
REGION 3	Surface flow to catch basins, then pipe flow to rain garden in south parcel.
REGION 4	Infiltration and/or surface flow to rain garden.
REGION 5	Surface flow to north filter strip.
REGION 6	Surface flow to west filter strip.
REGION 7	Surface flow to east filter strip.
2	Diagonal hatch designates pervious material (rain garden, filter strip, landscaping, etc.)

**APPENDIX B** 

## HSS Site Drainage - Summary Hydrologic Analysis - Performance Approach

Flow Control	25 year, 24-hour event 5.06 inches
Water Quality	Water Quality, 24-hour event 0.83 inches
Design Method	Performance Approach
Design Manual	ODOT Hydraulics Manual - Chapter 7 Hydrology, Appendix A, F.
	City of Florence Stormwater Design Manual 2010
	TR-55 Urban Hydrology for Small Watersheds
Additional Resources	Cahill, Maria (June 2018). Vegetated Filter Strips: Low-impact development fact sheet. OSU Extension Catalog (Oregon State University).
	Technical Manual for Site Development and Construction Integrated Stormwater Management - September 2011
	Rogue Valley Storm Water Quality Design Manual, Part 4.4.3
	Georgia Stormwater Management Manual, Volume 2 (Technical Handbook), Part 4.2.5.2
	Maidment, David R. (1993). Handbook of Hydrology. McGraw-Hill.
	Lindeburg, Michael R., P.E (2015) Civil Engineering Reference Manual for the PE Exam, 15th Edition.
	Pennington, Mark (2012). The Rational Method - Frequenty Used, Often Misused, Water New Zealand Stormwater Conference 2012.
	M.G. Dosskey, M. J. Helmers, and D.E. Eisenhauer 2008 A Design Aid for Determining Width of Filter Strips, Journal of Soil and Water Conservation.
	Kuichling, E (1889). The Relation between the Rainfall and the Discharge of Sewers in Populous Places, <i>Transactions of the American Society of Civil Engineers</i> Vol. 20, January, p. 1-60
BMPs Utilized	Filter Strip, City of Florence Std. Detail SW-160
	Rain Garden, City of Florence Std. Detail SW-140

HSS S	ite Dra	inage -	Pre-Dev	/elope	d (Rain G	arde	en Tributary	)	
Rational	Method	Hydrolog	gic Analysis	S				, ,	
	Travel Distan Elevation (Hig Elevation (Lo	ice gh) w)	315 55.25 53.06 0.70%	ft					
	Total Area		218740.596	sf	(From AutoCAD)				
	Velocity Zone		5.022 0.22 3	acre ft/sec	(Figure 1, Appendi (IDF Curve, Appen	x F) ıdix A)			
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Equation 2	C =	[(C1 x A1) +	(C2 x A2) + (C	n x An)] ÷ A	Total				
Equation 3	T <sub>c</sub> =	$T_{osf} + T_{scf} + T_{scf}$	$T_{ocf} + T_{pf}$	T <sub>c</sub> =	Time of Concentra	tion (min	)		
Equation 4	T <sub>osf</sub> =	$\frac{0.93 * (L^{0.6} *}{(i^{0.4} * S^{0.3})}$	n <sup>0.6</sup> )	T <sub>osf</sub> =	Travel time for the (This is the only co	overland	I sheet flow segment (r	min) <i>he undeveloped site.)</i>	
Iteration #1	Assume Tc =	25	min.						
i = L = n = S =	1.55 315.0 0.4 0.70%	in/hr ft	(See Appendix (^ also see Tab	A, IDF Curv le 4.2 Florei	e) nce SWDesign	i = L = n = S =	Rainfall intensity (in/h Length of the overland Manning's Roughness Average slope of the	r) d sheet flow segment (ft) s coefficient (See Table 3) overland area (ft/ft)	
	T <sub>osf</sub> =	63.09	< Does not e	qual Assum	ed Tc				
Iteration #2	Assume Tc =	85	min.						
i = L = n = S =	0.73 315.0 0.4 0.70%	in/hr ft	(See Appendix	A, IDF Curv	e)				
	T <sub>osf</sub> =	85.26	<approximate< td=""><td>ely matches</td><td>Assumed Tc)</td><td></td><td></td><td></td><td></td></approximate<>	ely matches	Assumed Tc)				
Runoff (Q)									
	Design Storm: C <sub>f</sub> = C = i = A =	25 year ever 1.1 0.10 0.73 5.022	nt (Table 3) (Table 2) ac		In order to directly developed condition is hereunder prora- is mitigated by the	compare ons, the c ted to the on-site F	e rates of runoff from th calculated Q value for t e area of the post-deve Rain Garden at the sou	he pre-developed and posi the pre-developed site elopment catchment which uth end of the project.	<u>t-</u>
	Q =	0.40	cfs		<u>2.73</u> 5.02	=	0.219 cfs 0.40	5	2

Rational Method Hydrologic AnalysisEquation 10 = $C_r x C x I x A$ 0 = runoff in offs $C_i = runoff coefficient (dimensionless)I = runofficient (dimensionless)I = runofficient (dimensionless)$	HSS Site Drainage - Post-Developed (Rain Garden Tributary)										
Equation 1Q =C <sub>1</sub> x C x 1 x AQ =runoff coefficient (dimensionless) C =C =C =(C1 x A1) + (C2 x A2) + (Cn x An)] + A Test = drainage area (acres)C =(C1 x A1) + (C2 x A2) + (Cn x An)] + A Test =Equation 2C =[(C1 x A1) + (C2 x A2) + (Cn x An)] + A Test = Travel time for concentration (min)Equation 3T_c =T_{ref} + T_{eff} + T_{eff} + T_{eff} + T_{eff} =Equation 4T_{ceff} =1C =Equation 5T_{eff} =[2(UV)]/60T_{eff} =Equation 6V =(K/n) * R^2(23) * S^1(12)V =Velocity (determined by Manning's Equation)Time of Concentration (Shallow Concentrated Flow)""Time of Concentration (Shallow Concentrated Flow)"F"Time of Concentration (Pipe Flow)""Time of Concentration (Shallow Concentrated Flow)1C =80.3490.302.4502Blue1661.452.076680.3490.302.4502Blue1681.451.93233120.7850.403.2213Magenta1681.451.93233120.7850.403.2204Orange000"Value calculated using Manning's equationTime of ConcentrationThe figure 3.1481.410n =0.013(Manning's Requences)3Hagenta1681.451.93233120.7850.403.224O	Rationa	l Method	Hydrolog	gic Analy	sis						
Equation 2 C = [(C1 x A1) + (C2 x A2) + (Cn x An]] + A Total   Equation 3 T_c = T_ost + T_{sd} + T_{od} + T_{pl} T_c = Time of Concentration (min)   Equation 4 T_ost = L Tag = Travel time for shallow concentrated flow segment (min)   Equation 5 T_pr = [2(LV)]/60 Tp = Travel time for pipe flow segment (min)   Equation 6 V = (kin) * R^{1}(2) * S^{1}(1/2) V = Velocity (determined by Manning's Equation)   Time of Concentration (Shallow Concentrated Flow) "F" Time of Concentration (Pipe Flow) "R   Region # Color L (tt) V (ft/s)* Tscf (min) L (tt) D (in) A (st) R^{2/3} V (ft/s)* T   1 Color L (tt) V (ft/s)* Tscf (min) L (tt) D (in) A (st) R^{2/3} V (ft/s)* T   2 Blue 186 1.45 2.07 66 8 0.349 0.30 2.45 0   2 Blue 186 1.45 2.93 233 12 0.785 0.40 3.22 0   3 Magenta 168 1.45 <th< td=""><td>Equation 1</td><td>Q =</td><td>C<sub>f</sub> x C x I x A</td><td>A</td><td>Q = C<sub>f</sub> = C = I = A =</td><td>runoff in cf/s runoff coeffic runoff coeffic rainfall inten drainage are</td><td>cient (dimensior cient (dimensior sity (in/hr) ea (acres)</td><td>iless) iless)</td><td></td><td></td><td></td></th<>	Equation 1	Q =	C <sub>f</sub> x C x I x A	A	Q = C <sub>f</sub> = C = I = A =	runoff in cf/s runoff coeffic runoff coeffic rainfall inten drainage are	cient (dimensior cient (dimensior sity (in/hr) ea (acres)	iless) iless)			
Equation 3 $T_c = T_{oot} + T_{oot} + T_{oot} + T_{oot} + T_{oot} = T_c = Time of Concentration (min)Equation 4T_{oot} = \frac{L}{60^{\circ}V}T_{oot} = Travel time for shallow concentrated flow segment (min)Equation 5T_{pt} = [\Sigma(L/V)]/60T_{pt} = Travel time for pipe flow segment (min)Equation 6V = (k/n) * R^{4}(2/3) * S^{4}(1/2)V = Velocity (determined by Manning's Equation)Time of Concentration (Shallow Concentrated Flow)T_c^{err}Time of Concentration (Pipe Flow)Region #ColorL (ft)V (ft/s)^{2}Tscf (min)L (ft)D (in)A (sf)R^{\alpha}(2/3)V (ft/s)^{2}T1Cyan1801.452.076680.3490.302.4502Blue1861.452.146280.3490.302.4503Magenta1681.451.932.33120.7850.403.2214Orange00065120.7850.403.220*Value from TR-55 Figure 3-1 and/or ODOTHydraulics Manual Ch. 7 Appx. F, Figure 1*Value calculated using Manning's equationT_cL = Length of the pipe segment (ft)T_c = Tscf + TpfTc = Figure 3SequencesL = Length of the pipe segment (ft)T_c = 4.48Tc = Tscf + TpfRegion # Color Areas (sf) AcreageT_c = 4.48MinT_c = 4.48MinT_c = 3Magenta 40806.50.94AMagenta 40806.50.94ARegion #Color Areas (sf) AcreageT_c = 4.48Min$	Equation 2	C =	[(C1 x A1) +	(C2 x A2) +	. (Cn x An)] ÷ A	Total					
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Rainfall Intensity Region # Color Areas (sf) Acreage   Tc = 4.48 min 1 Cyan 43050.2 0.99   i = 3 in/hr (See Appx. A, IDF Curve, Zone 3) 2 Blue 20926.4 0.48   3 Magenta 40806.5 0.94 4 Black 14237.3 0.33   Runoff (Q)	Flow Path Se	equences 1F, 1P, 2P, 3 2F, 2P, 3P, 1 3F, 3P, Disc Tc = Tscf +	3P, Discharge Discharge harge Tpf		Tc 4.48 4.10 3.48	< Max	L = S = n = K = D = R =	Length of the 0.005 0.013 1.49 Varies D/4	e pipe segment (Pipe Slope - (Manning's Ro (Constant) (Pipe Diamete (Assumed full	(ft) assumed) bugh Coef. for er, ft) )	PVC pipe)
Runoff (Q)	Rainfall Inter Tc = i =	4.4{	3 min 3 in/hr	(See Appx. / Zone 3)	A, IDF Curve,		Region # 1 2 3 4	Color Cyan Blue Magenta Black	Areas (sf) 43050.2 20926.4 40806.5 14237.3	Acreage 0.99 0.48 0.94 0.33	
Design Storm: 25 year 24-hour event $C_f = 1.1$ (Table 3) $C = 0.84$ (Table 2) $i = 3$ $11978$ $A = 2.732$ $Q = 7.53$ cfs(This calculation considers only that area which is contributed to the rain garden.)	Runoff (Q)	Design Storm C <sub>f</sub> = C = i = A = Q =	: 25 year 24-h = 1.1 = 0.84 = 2.732 	our event (Table 3) (Table 2) cfs	(This calcula	tion considers	Are sf 11978 108927 5 only that area	ea acre 0.275 2.501 which is cont	Material Landscaping Paved/Roofs	C 0.25 0.9 ain garden.)	



# HSS Site Drainage - Detention Volume Rational Method Hydrologic Analysis

### Required Detention Volume

Time (min)	O(afa)	OK To	To Be	Valuma (afa)	1
rime (min)	Q (CIS)	Runoff (cfs)	Stored (cfs)	volume (cis)	
0.5	0.840	0.219	0.62	19	
1	1.681	0.219	1.46	88	
1.5	2.521	0.219	2.30	207	
2	3.362	0.219	3.14	377	
2.5	4.202	0.219	3.98	597	
3	5.043	0.219	4.82	868	
3.5	5.883	0.219	5.66	1189	
4	6.724	0.219	6.50	1561	
4.48	7.534	0.219	7.31	1967	
5	7.040	0.219	6.82	2046	
5.5	6.546	0.219	6.33	2088	
6	6.051	0.219	5.83	2099	< Max
6.5	5.557	0.219	5.34	2082	
7	5.062	0.219	4.84	2034	
7.5	4.568	0.219	4.35	1957	
8	4.074	0.219	3.85	1850	
8.5	3.579	0.219	3.36	1714	
9	3.085	0.219	2.87	1547	
9.5	2.591	0.219	2.37	1352	
10	2.096	0.219	1.88	1126	
10.5	1.602	0.219	1.38	871	
11	1.107	0.219	0.89	586	
11.5	0.613	0.219	0.39	272	
12.0	0.119	0.219	0	0	

# HSS Site Drainage - Mitigations Facility Sizing Rational Method Hydrologic Analysis

#### PLANTER

Q1	Pre-Developed Flow	0.22	cfs						
Q2	Post Developed Flow	7.53	cfs	Stor	age Vol	ume (req) =	2099.5	cf	
						Bottom	Wtr Srfc	Тор	٦
	Avg. Width (in water)	29.5	ft	Wid	th (ft)	25	34	40	
	Avg. Length (in water)	54.5	ft	Leng	gth (ft)	50	59	65	
	Depth of Water	1.5	ft				Surface Area	2600	sf
	Side Slope	3:1 (H:V)	ft						
	Freeboard	1	ft						
	Volume	2411.6	cf	>		2099.5	ΟΚΑΥ		

PIPE SIZE						*Demand			**Capacity
Region	A (acr)	i	Cf	С	Q (cfs)	Qtot (cfs)	S (%)	D (in)	Q (cfs)
1	0.99	3	1.1	0.84	2.73	2.73	0.5	12	2.977
1, 2	0.48	3	1.1	0.84	1.32	4.05	0.93	12	4.0602
1, 2, 3	0.94	3	1.1	0.84	2.58	6.63	0.76	15	6.6548
. <u></u>	*Calculated via Rational Method								
	**Calculated using Manning's equation								

# Orifice Discharge - Flow Attenuation Rational Method Hydrologic Analysis

d =

3.51

 $\mathbf{Q} = \operatorname{Cd} \mathbf{x} \operatorname{A} \mathbf{x} \sqrt{2gh}$ 

- Q = max. allowable runoff in cf/s
- Cd = Orifice coefficient
- A = Cross sectional area of orifice
- g = gravity constant, 32.2 ft/s^2
- h = total head above orifice (ft)

Q =	0.40	cfs
h =	1.5	ft
g =	32.2	ft/s^2
Cd =	0.61	CERM 15th Ed., pg. 17-17
A =	0.07	sf
d =	0.29	ft

in

Install orifice with 3.5" diameter hole

HSS S	ite Dra	inage -	- Pre-Dev	/elope	ed (Easterr	n Filt	ter Strip 7	<b>Fributary</b> )	
Rational	Method	Hydrolo	gic Analysis	S	•				
	Travel Distan Elevation (Hig Elevation (Lo Average Slop	ce gh) w)	315 55.25 53.06 0.70%	ft					
	Total Area		218740.596	sf	(From AutoCAD)				
	Velocity Zone		0.22 3	ft/sec	(Figure 1, ODOT A (IDF Curve, ODOT	ppendix Append	F) lix A)		
Equation 1	Q =	C <sub>f</sub> x C x I x <i>i</i>	4	Q = C <sub>f</sub> = C = I = A =	runoff in cf/s runoff coefficient (d runoff coefficient (d rainfall intensity (in/ drainage area (acre	imensio imensio /hr) es)	nless) nless)		
Equation 2	C =	[(C1 x A1) +	(C2 x A2) + (C	n x An)] ÷ A	A <sub>Total</sub>				
Equation 3	T <sub>c</sub> =	$T_{osf} + T_{scf} +$	$T_{ocf} + T_{pf}$	T <sub>c</sub> =	Time of Concentrat	ion (min	)		
Equation 4	T <sub>osf</sub> =	0.93 * (L <sup>0.6</sup> * (i <sup>0.4</sup> * S <sup>0.3</sup> )	n <sup>0.6</sup> )	T <sub>osf</sub> =	Travel time for the o ( <i>This is the only co</i> )	overland <i>ndition c</i>	I sheet flow segment of flow that occurs	ent (min) <i>on the undevelop</i>	ed site.)
Iteration #1	Assume Tc =	25	min.						
i = L = n = S =	1.55 315.0 0.4 0.70%	in/hr ft	(See Appendix / (^ also see Tabl	A, IDF Curv le 4.2 Flore	/e) nce SWDesign	i = L = n = S =	Rainfall intensity Length of the ove Manning's Rough Average slope of	(in/hr) erland sheet flow s nness coefficient ( f the overland area	segment (ft) See Table 3) a (ft/ft)
	T <sub>osf</sub> =	63.09	< Does not ea	qual Assum	ed Tc				
Iteration #2	Assume Tc =	85	min.						
i = L = n = S =	0.73 315.0 0.4 0.70%	in/hr ft	(See Appendix .	A, IDF Cur∖	re)				
	T <sub>osf</sub> =	85.26	<approximate< td=""><td>ely matches</td><td>Assumed Tc)</td><td></td><td></td><td></td><td></td></approximate<>	ely matches	Assumed Tc)				
Runoff (Q)									
<u>!</u>	Design Storm: C <sub>f</sub> = C = i = A =	25 year eve 1.1 0.10 0.73 5.022	nt (Table 3) (Table 2) ac		In order to directly o developed condition is hereunder prorat is mitigated by filter	compare ns, the c ted to the r strips a	e rates of runoff fro calculated Q value e area of the post- along the eastern	om the pre-develo, for the pre-develo development cato property boundar	ped and post- pped site hment which Y
	Q =	0.40	cfs	0.95 5.02	_ acre acre	=	0.077 0.40	cfs cfs	8

HSS S	HSS Site Drainage - Post-Developed (Eastern Filter Strip Tributary)									
Rational	Method	Hydrolog	ic Analy	sis						
Equation 1	Q =	C <sub>f</sub> x C x I x A		Q = C <sub>f</sub> = C = I = A =	runoff in cf/s runoff coeffic runoff coeffic rainfall intens drainage are	ient (dimensior ient (dimensior sity (in/hr) a (acres)	nless) nless)			
Equation 2	C =	[(C1 x A1) + (	C2 x A2) +	(Cn x An)] ÷ A	Total					
Equation 3	T <sub>c</sub> =	T <sub>osf</sub> + T <sub>scf</sub> + T	<sub>ocf</sub> + T <sub>pf</sub>	T <sub>c</sub> =	Time of Cond	centration (min)	)			
Equation 4	T <sub>osf</sub> =	L 60*V		T <sub>scf</sub> =	Travel time for	or shallow conc	entrated flow	v segment (min	)	
Equation 5	T <sub>pf</sub> =	[Σ(L/V)]/60		T <sub>pf</sub> =	Travel time for	or pipe flow seg	gment (min)			
Equation 6	V =	(k/n) * R^(2/3	) * S^(1/2)	V =	Velocity (dete	ermined by Mar	nning's Equa	tion)		
Time of Conc	centration (Sh	allow Concentr	ated Flow)	"F"	Time of Cond	centration (Pipe	e Flow)			"P"
Region #	Color	L (ft)	V (ft/s)*	Tscf (min)	L (ft)	D (in)	A (sf)	R^(2/3)	V (ft/s)*	Tpf
1	Red	35	1.45	0.40			0.000	0.00	0.00	#DIV/0!
2	Grey	15	1.45	0.17			0.000	0.00	0.00	#DIV/0!
3	-						0.000	0.00	0.00	#DIV/0!
4	Value from Hydraulics N	TR-55 Figure 3 Manual Ch. 7 A	8-1 and/or OD ppx. F, Figure	OT 9 1			*Value calcu	lated using Ma	nning's equatio	#DIV/0!
Flow Path Se	aquences 1F, 2F Tc = Tscf + T	Гpf		Tc 0.57	< Max	L = S = n = K = D = R =	Length of the 0.005 0.013 1.49 Varies D/4	e pipe segment (Pipe Slope - (Manning's Re (Constant) (Pipe Diamete (Assumed full	(ft) assumed) ough Coef. for er, ft) )	PVC pipe)
Rainfall Inten	sity							_		
Tc = i =	0.57	7 min 3 in/hr	(See Appx. A Zone 3)	A, IDF Curve,		Region # 1 2	Color Red Grey	Areas (sf) 27656.6001 13847.4	Acreage 0.63 0.32	
Runoff (Q)						Δr	ea			
	Design Storm C <sub>f</sub> = C = i = A =	: 25 year 24-ho 1.1 0.65 3 0.953	our event (Table 3) (Table 2)			sf 13847 27657 Total Area:	acre 0.318 0.635 0.953	Material oodland & For Paved/Roofs	C 0.15 0.9	
	Q =	2.04	cfs	(This calculai	tion considers	only that area	which is con	tributed to the	eastern filter s	strip.) 9

## HSS Site Drainage - Eastern Vegetated Filter Strip Sizing Performance Approach

To calculate the size of a filter strip, first calculate:

- the maximum discharge loading per foot of filter strip width (q),
- the minimum width (Wmin)
- the minimum length of the filter strip (Lf)

#### Allowable Discharge per Foot of Width

q = (0.023/n) x Y <sup>(5/3)</sup> x S <sup>(1/2)</sup>		where	Manning's Equation	
q = Y = S = n =	0.223 1 2.12 0.15	cfs/ft inches %	Allowable discharge per foot of width of Allowable depth of flow Slope of filter strip (per Grading Plan) Manning's "n" roughness coefficient	filter strip (ODOT Appendix B) (Table 1, ODOT Appendix F)

#### Minimum Width of Filter Strip

Wfmin = Qwq / q	where		
Wfmin =	9.15	ft	Minimum filter strip width perpendicular to flow
Qwq =	2.04	cfs	Peak Flow Rate
q =	0.223	cfs/ft	Discharge per foot of width of filter strip

#### Minimum Length of Filter Strip

Lf = $(\underline{Tt})^{1.25} x (\underline{P}_{2.24})^{0.625} x \underline{S}^{0.5}$ 3.34 x n		where	
Lf = Tt = P <sub>2-24</sub> = S = n =	142.37 10 5.06 2.12 0.15	]ft min in %	Length of filter strip parallel to flow Travel time through filter strip 2 yr, 24-hr rainfall depth (See Florence SWDM Table 4.1) Slope of filter strip Manning's "n" roughness coefficient

•	142	<b>&gt;</b>
	Minimum Filter Strip Size	9
Minimim Required DimensionsLength142ft9Width9	Provided Dimensions (per Drawing: Length848K848Width14.2	<u>s)</u> Okay Okay

HSS S	Site Dra	inage -	Pre-Dev	elope	ed (Wester	'n Fil	Iter Strip	Tributary)	
Rational	Method	Hydrolog	gic Analysis	5	•				
	Travel Distan Elevation (Hig Elevation (Lo Average Slop	ice gh) w) be	315 55.25 53.06 0.70%	ft					
	Total Area		218740.596	sf	(From AutoCAD)				
	Velocity Zone		0.22 3	ft/sec	(Figure 1, ODOT A (IDF Curve, ODOT	ppendix Append	i F) lix A)		
Equation 1	Q =	C <sub>f</sub> x C x I x <i>F</i>	A	Q = C <sub>f</sub> = C = I = A =	runoff in cf/s runoff coefficient (c runoff coefficient (c rainfall intensity (in drainage area (acro	dimensio dimensio /hr) es)	nless) nless)		
Equation 2	C =	[(C1 x A1) +	(C2 x A2) + (Cr	n x An)] ÷ .	A <sub>Total</sub>				
Equation 3	T <sub>c</sub> =	$T_{osf} + T_{scf} + T_{scf}$	T <sub>ocf</sub> + T <sub>pf</sub>	T <sub>c</sub> =	= Time of Concentra	tion (min	1)		
Equation 4	T <sub>osf</sub> =	0.93 * (L <sup>0.6</sup> * (i <sup>0.4</sup> * S <sup>0.3</sup> )	n <sup>0.6</sup> )	T <sub>osf</sub> =	Travel time for the (This is the only co	overlanc Indition d	d sheet flow segm of flow that occurs	nent (min) s on the undeveloped sit	ie.)
Iteration #1	Assume Tc =	25	min.						
i = L = n = S =	1.55 315.0 0.4 0.70%	in/hr ft	(See Appendix A (^ also see Table	A, IDF Cur e 4.2 Flore	ve) ence SWDesign	i = L = n = S =	Rainfall intensity Length of the ov Manning's Roug Average slope o	γ (in/hr) rerland sheet flow segme hness coefficient (See T f the overland area (ft/ft)	ent (ft) Fable 3) )
	T <sub>osf</sub> =	63.09	< Does not eq	ual Assum	ned Tc				
Iteration #2	Assume Tc =	85	min.						
i = L = n = S =	0.73 315.0 0.4 0.70%	in/hr ft	(See Appendix A	A, IDF Cur	ve)				
	T <sub>osf</sub> =	85.26	<approximate< td=""><td>ly matches</td><td>s Assumed Tc)</td><td></td><td></td><td></td><td></td></approximate<>	ly matches	s Assumed Tc)				
Runoff (Q)									
	Design Storm: C <sub>f</sub> = C = i = A =	25 year ever 1.1 0.10 0.73 5.022	nt (Table 3) (Table 2) ac		In order to directly developed conditio is hereunder prora is mitigated by filte	compare ons, the c ted to the r strips a	e rates of runoff fr calculated Q value e area of the posi along the westerr	rom the pre-developed a e for the pre-developed a t-development catchmen n property boundary	nd post- site nt which
	Q =	0.40	cfs	0.49 5.02	acre acre	=	0.040 0.40	cfs cfs	11

HSS S	HSS Site Drainage - Post-Developed (Western Filter Strip Tributary)									
Rational	Method	Hydrolog	ic Analy	sis					• /	
Equation 1	Q =	C <sub>f</sub> x C x I x A		Q = C <sub>f</sub> = C = I = A =	runoff in cf/s runoff coeffici runoff coeffici rainfall intens drainage area	ent (dimensior ent (dimensior ity (in/hr) a (acres)	nless) nless)			
Equation 2	C =	[(C1 x A1) + (	C2 x A2) +	(Cn x An)] ÷ A	Total					
Equation 3	T <sub>c</sub> =	T <sub>osf</sub> + T <sub>scf</sub> + T	<sub>ocf</sub> + T <sub>pf</sub>	T <sub>c</sub> =	Time of Conc	entration (min)	)			
Equation 4	T <sub>osf</sub> =	L 60*V		T <sub>scf</sub> =	Travel time fo	r shallow conc	entrated flow	v segment (min)	)	
Equation 5	T <sub>pf</sub> =	[Σ(L/V)]/60		T <sub>pf</sub> =	Travel time fo	or pipe flow seg	gment (min)			
Equation 6	V =	(k/n) * R^(2/3	V =	Velocity (dete	ermined by Mar	nning's Equa	tion)			
Time of Conc	centration (Sha	allow Concentr	ated Flow)	"F"	Time of Conc	entration (Pipe	e Flow)			"P"
Region #	Color	L (ft)	V (ft/s)*	Tscf (min)	L (ft)	D (in)	A (sf)	R^(2/3)	V (ft/s)*	Tpf
1	Yellow	15	1.45	0.17			0.000	0.00	0.00	#DIV/0!
2	Grey	7.5	1.45	0.09			0.000	0.00	0.00	#DIV/0!
3							0.000	0.00	0.00	#DIV/0!
4	*Value from <sup>-</sup> Hydraulics N	FR-55 Figure 3 Ianual Ch. 7 A	8-1 and/or OD ppx. F, Figure	OT 9 1			*Value calcu	lated using Ma	nning's equatio	#DIV/0!
Flow Path Se	equences 1F, 2F Tc = Tscf + 1	pf		Tc 0.26	< Max	L = S = N = K = D = R =	Length of the 0.005 0.013 1.49 Varies D/4	e pipe segment (Pipe Slope - (Manning's Ro (Constant) (Pipe Diamete (Assumed full	(ft) assumed) ough Coef. for er, ft) )	PVC pipe)
Rainfall Inten	sity									
Tc = i =	0.26 3	min in/hr	(See Appx. A Zone 3)	, IDF Curve,		Region # 1 2	Color Yellow Grey	Areas (sf) 13607.3348 7860.308	Acreage 0.31 0.18	
Runoff (Q)						Δr	22			
	Design Storm: C <sub>f</sub> = C = i = A =	25 year 24-ho 1.1 0.63 3 0.493	our event (Table 3) (Table 2)			sf 7860 13607 Total Area:	acre 0.180 0.312 0.493	Material oodland & For Paved/Roofs	C 0.15 0.9	
	Q =	1.02	cfs	(This calculai	tion considers	only that area	which is coni	tributed to the	western filter s	strip.) 12

### HSS Site Drainage - Western Vegetated Filter Strip Sizing Performance Approach

To calculate the size of a filter strip, first calculate:

- the maximum discharge loading per foot of filter strip width (q),
- the minimum width (Wmin)
- the minimum length of the filter strip (Lf)

#### Allowable Discharge per Foot of Width

q = (0.023/n) x Y <sup>(5/3)</sup> x S <sup>(1/2)</sup>		where	Manning's Equation	
q = Y = S = n =	0.364 1 10 0.2	cfs/ft inches %	Allowable discharge per foot of width of Allowable depth of flow Slope of filter strip (per Grading Plan) Manning's "n" roughness coefficient	filter strip (ODOT Appendix B) (Table 1, ODOT Appendix F)

#### Minimum Width of Filter Strip

Wfmin = Qwq / q	where		
Wfmin =	2.80	ft	Minimum filter strip width perpendicular to flow
Qwq =	1.02	cfs	Peak Flow Rate
q =	0.364	cfs/ft	Discharge per foot of width of filter strip

#### Minimum Length of Filter Strip

$Lf = (Tt)^{1.25} x (P_{2.24})^{0.625} x S^{0.5}$		where		
3.34 x n				
lf-	221 01	Tft	l enath of filter strin naralle	el to flow
	10	min	Travel time through filters	trin
11 =	10	111111	Traver time through litter s	aup
P <sub>2-24</sub> =	5.06	in	2 yr, 24-hr rainfall depth	(See Florence SWDM Table 4.1)
S =	10	%	Slope of filter strip	
n =	0.2		Manning's "n" roughness of	coefficient



HSS S	Site Dra	inage -	Pre-Dev	velope	ed (Northe	ern Fi	ilter Strip	) Tributa	ry)
Rational	Method	Hydrolo	gic Analysi	S	•				
	Travel Distan Elevation (Hig Elevation (Lo	ce gh) w)	315 55.25 53.06 0.70%	ft					
	Total Area		218740.596	sf	(From AutoCAD)				
	Velocity Zone		5.022 0.22 3	acre ft/sec	(Figure 1, Appen (IDF Curve, Appe	dix F) endix A)			
Equation 1	Q =	C <sub>f</sub> x C x I x <i>F</i>	A	Q = C <sub>f</sub> = C = I = A =	runoff in cf/s runoff coefficient runoff coefficient rainfall intensity ( drainage area (ad	(dimensio (dimensio in/hr) cres)	nless) nless)		
Equation 2	C =	[(C1 x A1) +	(C2 x A2) + (C	cn x An)] ÷ .	A <sub>Total</sub>				
Equation 3	T <sub>c</sub> =	$T_{osf} + T_{scf} + T_{scf}$	T <sub>ocf</sub> + T <sub>pf</sub>	T <sub>c</sub> =	= Time of Concentr	ration (min	ı)		
Equation 4	T <sub>osf</sub> =	0.93 * (L <sup>0.6</sup> * (i <sup>0.4</sup> * S <sup>0.3</sup> )	n <sup>0.6</sup> )	T <sub>osf</sub> =	Travel time for th (This is the only o	e overland condition d	d sheet flow segr	ment (min) rs on the undeve	loped site.)
Iteration #1	Assume Tc =	25	min.						
i = L = n = S =	1.55 315.0 0.4 0.70%	in/hr ft	(See Appendix (^ also see Tab	A, IDF Cur le 4.2 Flore	ve) ence SWDesign	i = L = n = S =	Rainfall intensit Length of the o' Manning's Roug Average slope	y (in/hr) verland sheet flo ghness coefficie of the overland a	ow segment (ft) nt (See Table 3) area (ft/ft)
	T <sub>osf</sub> =	63.09	< Does not e	qual Assum	ned Tc				
Iteration #2	Assume Tc =	85	min.						
i = L = n = S =	0.73 315.0 0.4 0.70%	in/hr ft	(See Appendix	A, IDF Cur	ve)				
	T <sub>osf</sub> =	85.26	<approximat< td=""><td>ely matches</td><td>s Assumed Tc)</td><td></td><td></td><td></td><td></td></approximat<>	ely matches	s Assumed Tc)				
Runoff (Q)									
	Design Storm: C <sub>f</sub> = C = i = A =	25 year ever 1.1 0.10 0.73 5.022	nt (Table 3) (Table 2) ac	0 70	In order to directi developed condit is hereunder prof is mitigated by Bi	ly compare tions, the c rated to the MPs along	e rates of runoff i calculated Q valu e area of the pos g the northern p	from the pre-dev le for the pre-de st-development o roperty boundar	veloped and post- veloped site catchment which y
	Q =	0.40		5.02	acre	-	0.40	CfS	1

# HSS Site Drainage - Post-Developed (Northern Filter Strip Tributary) Rational Method Hydrologic Analysis

Equation 1	Q =	C <sub>f</sub> xCxlx/	Ą	Q = Cr =	runoff in cf/s	eint (dimensior	nless)			
				C =	runoff coeffic	cient (dimensior	nless)			
				=	rainfall intens	sity (in/hr)	,			
				A =	drainage are	a (acres)				
Equation 2	T <sub>c</sub> =	$T_{osf}$ + $T_{scf}$ +	T <sub>ocf</sub> + T <sub>pf</sub>	T <sub>c</sub> =	Time of Con	centration (min)	)			
Equation 3	T <sub>osf</sub> =	L 60*V	_	T <sub>scf</sub> =	Travel time f	or shallow conc	centrated flow	segment (min	)	
Equation 4	T <sub>pf</sub> =	[Σ(L/V)]/60		T <sub>pf</sub> =	Travel time f	or pipe flow seg	gment (min)			
Equation 5	V -	(k/n) * R^(2)	3) * \$^(1/2)	V =	Velocity (det	ermined by Ma	nnina's Fauat	tion)		
	v –	(N/II) IX (2/	3) 3 (1/2)	v –			nining S Equal			
Time of Conc	ontration (Sh	allow Concen	trated Flow)	"E"	Time of Con	contration (Pinc				"D"
				I			- 1 IOW)			I
Region #	Color	L (ft)	V (ft/s)*	Tscf (min)	L (ft)	D (in)	A (sf)	R^(2/3)	V (ft/s)*	Tpf
1	Green	185	1.45	2.13						
	*Value from Hydraulics	TR-55 Figure Manual Ch. 7	3-1 and/or OI	DOT re 1			*Value calcul	ated using Ma	nning's equati	on
Flow Path Se	quences		<u>, , , , , , , , , , , , , , , , , , , </u>		1					
						L =	Length of the	pipe segment	t (ft)	
	ər, ər			2.13		5 - n =	0.005	(Manning's R	ough Coef. for	r PVC pipe)
						K =	1.49	(Constant)		
						D =	Varies	(Pipe Diamet	er, ft)	
						R =	D/4	(Assumed ful	1)	
Rainfall Inten	sity					Region #	Color	Areas (sf)	Acreage	]
Tc =	2.13	3 min				1	Green	34344.532	0.79	
i =	3	3 in/hr	(See Appx.	A, IDF Curve,		2	Drk Grey	1358.4	0.03	
			Zone 3)							
Bupoff (O)	(Value for I d	corresponds v	vith min Tc = 5	ō min)						
Runon (Q)						Ar	ea			1
[	Design Storm	: 25 year 24-l	nour event			sf	acre	Material	С	
	C <sub>f</sub> =	= 1.1 0.94	(Table 3)			1358	0.031	Douland & For	0.15	
	i=	0.04 3	(Table Z)			Total Area:	0.788	Faveu/Roois	0.9	
	A =	0.79								
	0 =	2,19	cfs	(This calcula	tion considers	only that area	which is cont	ributed to the	northern filter	strip.)
	_			1		<i>,</i> a.ou				15

## HSS Site Drainage - Northern Vegetated Filter Strip Sizing Performance Approach

To calculate the size of a filter strip, first calculate:

- the maximum discharge loading per foot of filter strip width (q),
- the minimum width (Wmin)
- the minimum length of the filter strip (Lf)

#### Allowable Discharge per Foot of Width

q = (0.023/n) x Y <sup>(5/3)</sup> x S <sup>(1/2)</sup>		where	Manning's Equation	
q = [ Y = S = n =	0.364 1 10 0.2	cfs/ft inches %	Allowable discharge per foot of width of Allowable depth of flow Slope of filter strip (per Grading Plan) Manning's "n" roughness coefficient	filter strip (ODOT Appendix B) (Table 1, ODOT Appendix F)

#### Minimum Width of Filter Strip

Wfmin = Qwq / q	where		
Wfmin =	6.01	ft	Minimum filter strip width perpendicular to flow
Qwq =	2.19	cfs	Peak Flow Rate
q =	0.364	cfs/ft	Discharge per foot of width of filter strip

#### Minimum Length of Filter Strip

$Lf = (Tt)^{1.25} x (P_{2-24})^{0.625} x S^{0.5}$	5	where	
3.34 x n			
Lf = [ Tt = P <sub>2-24</sub> = S = n =	231.91 10 5.06 10 0.2	]ft min in %	Length of filter strip parallel to flow Travel time through filter strip 2 yr, 24-hr rainfall depth (See Florence SWDM Table 4.1) Slope of filter strip Manning's "n" roughness coefficient

•		232			<u>→</u> ,
Minimum Filter Strip Size					
Minimim Required DimeLength232Width6	nsions ft ft	<u>Provided Din</u> Length Width	nensions (per 1052 f 7.5 f	<b>Drawings)</b> it it	OKAY OKAY

## <u>Tables</u>

Type of Cover	Flat	Rolling (2%-10%)	Hilly (Over 10%)
Pavement & Roofs	0.9	0.9	0.9
Earth shoulders	0.5	0.5	0.5
Drives & Walks	0.75	0.8	0.85
Gravel Pavement	0.85	0.85	0.85
City Business Areas	0.8	0.85	0.85
Apartment Dwelling Areas	0.5	0.6	0.7
Light Residential: 1 to 3 units/acre	0.35	0.4	0.45
Normal Residential: 3 to 6 units/acre	0.5	0.55	0.6
Dense Residential: 6 to 15 units/acre	0.7	0.75	0.8
Lawns	0.17	0.22	0.35
Grass Shoulders	0.25	0.25	0.25
Side Slopes, Earth	0.6	0.6	0.6
Side Slopes, Turf	0.3	0.3	0.3
Median Areas, Turf	0.25	0.3	0.3
Cultivated Land, Clay & Loam	0.5	0.55	0.6
Cultivated Land, Sand & Gravel	0.25	0.3	0.35
Industrial Areas, Light	0.5	0.7	0.8
Industrial Areas, Heavy	0.6	0.8	0.9
Parks & Cemeteries	0.1	0.15	0.25
Playgrounds	0.2	0.25	0.3
Woodland & Forests	0.1	0.15	0.2
Meadows & Pasture Land	0.25	0.3	0.35
Unimproved Areas	0.1	0.2	0.3

\*"C" - Table 1, Appendix F (ODOT Hydraulics Manual)

Recurrence Interval	Runoff Coefficient Adjustment Factor		
10 years or less	1		
25 years	1.1		
50 years	1.2		
100 years	1.25		

\*Table 2, Appendix F (ODOT Hydraulics Manual)

	-	
Location	Roughness	
Location	Coefficient	
Pavement & Roofs	0.014	
City Business Areas	0.014	
Graveled Surfaces	0.02	
Apartment Dwelling Areas	0.05	
Industrial Areas	0.05	
Urban Residential Areas (> 6 units/acre)	0.08	
Meadows, Pastures & Range Land	0.15	
Rural Residential Areas (> 6 units/acre)	0.24	
Playgrounds, Light Turf	0.24	
Parks & Cemeteries, Heavy Turf	0.4	
Woodland & Forests	0.4	
*"n" - Table 3, Appendix F (ODOT Hydraulics Manual)		

**APPENDIX C** 



Filter Strip

SW-160

DATE: 11-30-10



- Provide protection from all vehicle traffic, equipment staging, and foot traffic in proposed infiltration areas prior to, during, and after construction.
- 2. Dimensions:
  - a. Width of basin: 9' minimum.
  - b. Depth of basin (from top of growing medium to overflow elevation); Simplified: 12", Presumptive: 9"-18".
  - c. Flat bottom width: 2' min.
  - d. Side slopes of basin: 3:1 maximum.

3. Setbacks (from midpoint of facility):

- a. Infiltration basins must be 10' from foundations and 5' from property lines.
- b. Flow-through swales must be lined with connection to approved discharge point according to SWDM Section 2.1.
- 4. Overflow:
  - a. Overflow required for Simplified Approach.
  - b. Inlet elevation must allow for 2" of freeboard, minimum.
  - c. Protect from debris and sediment with strainer or grate.

989 Spruce Street Florence, OR 97439 Phone: 541-997-4106

DATE: 11-30-10

5. Piping: shall be ABS Sch.40, cast iron, or PVC Sch.40. 3" pipe required for up to 1,500 sq ft of impervious area, otherwise 4" min. Piping must have 1% grade and follow the Uniform Plumbing Code.

6. Drain rock:

a. None required for infiltration basin b. Size for flow-through basin: ¾" washed

- 7. Separation between drain rock and growing medium: Use filter fabric (see SWDM Exhibit 2-5).
- 8. Growing medium:
  - a 18" minimum
    - b. See Appendix B for specification.
- Vegetation: Follow landscape plans otherwise refer to plant list in SWDM Appendix G. Minimum container size is 1 gallon. # of plantings per 100sf of facility area):
  - a. Zone A (wet): 115 herbaceous plants OR 100 herbaceous plants and 4 shrubs
  - b. Zone B (moderate to dry): 1 tree AND 3 large shrubs AND 4 medium to small shrubs.

The delineation between Zone A and B shall be either at the outlet elevation or the check dam elevation, whichever is lowest.

- 10. Install washed pea gravel or river rock to transition from inlets and splash pad to growing medium.
- 11. Inspections: Call City of Florence Public Works (541) 997-4106 to schedule appropriate inspections.

#### - DRAWING NOT TO SCALE -

#### STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

CITY OF FLORENCE - Simplified / Presumptive Design Approach - PUBLIC WORKS DEPARTMENT

NUMBER

CT OF BIODODENDER
FLORENCE · · OREGON · · 1893

### Rain Garden

SW-140

APPENDIX D



United States Department of Agriculture

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 Lane County Area, Oregon



## Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/? cid=nrcs142p2\_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# **How Soil Surveys Are Made**

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



	MAP L	EGEND		MAP INFORMATION					
Area of In	terest (AOI)	300	Spoil Area	The soil surveys that comprise your AOI were mapped at					
	Area of Interest (AOI)	۵	Stony Spot	1.20,000.					
Soils	Call Mar Link Dahmara	0	Very Stony Spot	Warning: Soil Map may not be valid at this scale.					
		Ŷ	Wet Spot	······································					
~		Δ	Other	Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil					
	Soil Map Unit Points		Special Line Features	line placement. The maps do not show the small areas of					
Special	Point Features	Water Fea	itures	contrasting soils that could have been shown at a more detailed scale					
9	Borrow Pit	$\sim$	Streams and Canals						
8		Transport	ation	Please rely on the bar scale on each map sheet for map					
英	Clay Spot	+++	Rails	measurements.					
<b>\$</b>	Closed Depression	~	Interstate Highways	Source of Map: Natural Resources Conservation Service					
X	Gravel Pit	~	US Routes	Web Soil Survey URL:					
00	Gravelly Spot	$\sim$	Major Roads	Coordinate System: Web Mercator (EPSG:3857)					
0	Landfill	~	Local Roads	Maps from the Web Soil Survey are based on the Web Mercator					
Α.	Lava Flow	Backgrou	nd	projection, which preserves direction and shape but distorts					
عليه	Marsh or swamp	Carlo and	Aerial Photography	Albers equal-area conic projection, should be used if more					
穷	Mine or Quarry			accurate calculations of distance or area are required.					
0	Miscellaneous Water			This product is generated from the USDA-NRCS certified data as					
0	Perennial Water			of the version date(s) listed below.					
$\sim$	Rock Outcrop			Soil Survey Area: Lane County Area. Oregon					
+	Saline Spot			Survey Area Data: Version 16, Sep 10, 2019					
÷.	Sandy Spot			Soil man units are labeled (as space allows) for man scales					
-	Severely Eroded Spot			1:50,000 or larger.					
6	Sinkhole			Data(a) aprial images were photographed. Aug 27, 2007 - San					
2	Slide or Slip			15, 2016					
₽ R	Sodic Spot			The endersheets on all solves and the last of the solution of					
jej	·			compiled and digitized probably differs from the soil lines were 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		
140	Yaquina loamy fine sand	5.1	100.0%		
Totals for Area of Interest		5.1	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 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.

### Lane County Area, Oregon

#### 140—Yaquina loamy fine sand

#### **Map Unit Setting**

National map unit symbol: 2359 Elevation: 20 to 130 feet Mean annual precipitation: 70 to 80 inches Mean annual air temperature: 50 to 52 degrees F Frost-free period: 180 to 210 days Farmland classification: Farmland of statewide importance

#### **Map Unit Composition**

Yaquina and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Yaquina**

#### Setting

Landform: Dune slacks Down-slope shape: Linear Across-slope shape: Linear Parent material: Eolian sand of mixed origin

#### **Typical profile**

*Oi - 0 to 1 inches:* slightly decomposed plant material *H1 - 1 to 9 inches:* loamy fine sand *H2 - 9 to 30 inches:* fine sand *H3 - 30 to 60 inches:* fine sand

#### **Properties and qualities**

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 24 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Low (about 4.3 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4w Hydrologic Soil Group: A/D Forage suitability group: Somewhat Poorly Drained (G004AY017OR) Hydric soil rating: Yes

# Soil Information for All Uses

## **Soil Reports**

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

### **Building Site Development**

This folder contains a collection of tabular reports that present soil interpretations related to building site development. The reports (tables) include all selected map units and components for each map unit, limiting features and interpretive ratings. Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

### **Dwellings and Small Commercial Buildings**

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally

cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Dwellings* are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

*Small commercial buildings* are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

### Report—Dwellings and Small Commercial Buildings

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Dwellings and Small Commercial Buildings–Lane County Area, Oregon												
Map symbol and soil	Pct. of	Dwellings without bas	ements	Dwellings with base	ments	Small commercial buildings						
name	unit	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value					
140—Yaquina loamy fine sand												
Yaquina	85	Very limited		Very limited		Very limited						
		Ponding	1.00	Ponding	1.00	Ponding	1.00					
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00					

### **Soil Physical Properties**

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

### **Physical Soil Properties**

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

*Sand* as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

*Silt* as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is

given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

*Clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

*Moist bulk density* is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

*Linear extensibility* refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause

damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

*Erosion factors* are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

*Erosion factor Kw* indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

*Erosion factor Kf* indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

*Erosion factor T* is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Wind erodibility groups* are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

*Wind erodibility index* is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

	Physical Soil Properties–Lane County Area, Oregon														
Map symbol and soil name	Depth	Depth	Sand	Silt	Clay	Moist bulk	Saturated hydraulic	Available water	Linear extensibility	Organic matter	Erosion factors			Wind erodibility	Wind erodibility
					density	conductivity	сарасну			Kw	Kf	т	group	index	
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct						
140—Yaquina loamy fine sand															
Yaquina	0-1	-35-	-50-	0-15- 25	0.10-0.20- 0.30	42.00-373.00-7 05.00	0.30-0.45-0.6 0	—	60.0-75.0- 90.0			5	2	134	
	1-9	-80-	-17-	1- 3- 5	1.30-1.45- 1.60	14.00-28.00-42. 00	0.08-0.09-0.1 0	0.0- 1.5- 2.9	2.0- 3.5- 5.0	.17	.17				
	9-30	-98-	- 1-	1- 2- 2	1.30-1.45- 1.60	14.00-28.00-42. 00	0.05-0.06-0.0 7	0.0- 1.5- 2.9	0.5- 0.8- 1.0	.15	.15				
	30-60	-98-	- 1-	1- 2- 2	1.30-1.45- 1.60	42.00-92.00-14 1.00	0.05-0.06-0.0 7	0.0- 1.5- 2.9	0.0- 0.3- 0.5	.02	.02				

Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

### **Engineering Properties**

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

*Hydrologic soil group* is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http:// directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

*Group A*. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

*Group B.* Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

*Group C.* Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

*Group D.* Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." *Classification* of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Percentage of rock fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

*Liquid limit* and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

#### References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Absence of an entry indicates that the data were not estimated. The asterisk '\*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/ OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

	Engineering Properties–Lane County Area, Oregon													
Map unit symbol and	Pct. of	Hydrolo	Depth	USDA texture	Classi	fication	Pct Fragments		Percentage passing sieve number—				Liquid	Plasticit
son name	unit	group			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		y index
			In				L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H
140—Yaquina loamy fine sand														
Yaquina	85	A/D	0-1	Slightly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	60-75-1 00	50-65- 90		_
			1-9	Loamy fine sand	SM	A-2	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	75-78- 80	15-20- 25	0-7 -14	NP
			9-30	Fine sand, sand	SM, SP, SP-SM	A-2, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	75-78- 80	0- 8- 15	0-7 -14	NP
			30-60	Fine sand, sand	SM, SP, SP-SM	A-2, A-3	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	75-78- 80	0- 8- 15	0-7 -14	NP

# References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

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Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/ nrcs/detail/national/soils/?cid=nrcs142p2\_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\_053580

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United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ home/?cid=nrcs142p2 053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/ detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/? cid=nrcs142p2\_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE\_DOCUMENTS/nrcs142p2\_052290.pdf

APPENDIX E

After Recording Return to: Name: Address:

Place Recording Label Here

### **APPENDIX A.4** Form O&M: Operations and Maintenance Plan

Permit Application No	
ssee Owner Name: Heceta Self Storage Corporation	
Phone: (area code required) 541-997-9702	
Mailing Address: (return address for records) P.O. Box 118	
City/State/Zip:Florence, OR 97439	
Site Address: 2535 Kingwood Street	
City/State/Zip: Florence, OR 97439	
Florence, OR 97439	
<b>1 Responsible Party for Maintenance</b> ( <i>check one</i> ) Homeowner association Property Owner X Other ( <i>describe</i> )	
Lessee - Heceta Self Storage Corporation	
2 Contact Information for Responsible Party(ies) if Other than Owner	
Daytime Phone: ( <i>area code required</i> ) 541-999-1979 - 541-999-4085 Emergency/After Hours Phone: Contact Name and Address:	
Larry & Crystal Farnsworth, 87839 Ternyik Ct, Florence, OR 97439	

**Instructions** 

Simplified Sizing Approach: Attach O&M Specifications from the Florence Stormwater Design Manual Appendix H.

**Presumptive and Performance Sizing Approach:** Attach the site-specific O&M Plan (See Stormwater Design Manual Section 6).

#### 3 Site Plan

Show all facility locations in relation to labeled streets, buildings, or other permanent features on the site. Also show the sources of runoff entering the facility, and the final onsite/offsite discharge point. *Please complete the table below* 

Maintaining the stormwater management facility on this site plan is a required condition of building permit approval for the identified property. The property owner is required to operate and maintain this facility in accordance with the O&M specifications or plan on file with the City of Florence. That requirement is binding on all current and future

owners of the property. Failure to comply with the O&M specifications or plan may result in enforcement action, including penalties. The O&M specifications or plan may be modified by written consent of new owners and written approval by re-filing with the Community Development Department.

#### Complete and recorded O&M Forms shall be submitted to:

Community Development Department, 250 Highway 101, Florence, OR, 97439 Office hours are 8 - 5, Monday through Friday. Call 541-997-3436 for assistance.

.....

Required Site Plan (insert here or attach separate sheet)

🗴 I Have Attached a Site Plan

Please complete this table

Facility Type	Size (sf)	Drainage is from:	Impervious Area Treated (sf)	Discharge Point	
Rain Garden					
Swale		See hydrolog	ic calculations atta	ched to	
Filter Strip		this report.			

**BY SIGNING BELOW** filer accepts and agrees to the terms and conditions contained in this O&M Form and in any document executed by filer and recorded with it. To be signed in the presence of a notary.

Filer signature

#### INDIVIDUAL Acknowledgement STATE of OREGON county of:

This instrument was acknowledged before me on:

By:

Notary Signature:

## **CORPORATE** Acknowledgement STATE of OREGON county of:

This instrument was acknowledged before me on:

By:

As (title):

Of (corporation):

Notary Signature:

My Commission Expires: \_\_\_\_\_

## Page 1of 3

#### (SAMPLE) STORMWATER MANAGEMENT FACILITY CITY OF FLORENCE, OREGON OPERATION & MAINTENANCE AGREEMENT

Sediment and other pollutants that degrade water quality will accumulate in urban stormwater facilities. The operation and maintenance of stormwater management facilities including the implementation of pollution reduction facilities is essential to the protection of the city's water quality. Removal of accumulated pollutants and sediment is important for proper operation. All property owners are expected to conduct business in a manner that promotes resource protection. This agreement contains specific provisions with respect to city maintenance of private stormwater management facilities and use of pollution reduction facilities.

Property Address: 2535 Kingwood Street, Florence, OR 97439

Legal description: See APN#'s listed in Hydrology Report

Note: Heceta Self Storage Corporation is the Lessee of the parcels on which the proposed project is built, but the Owners of the planned improvements.

Whereas, <u>Heceta Self Storage</u>, herein referred to as Owner, has constructed improvements, including but not limited to buildings, pavement, and stormwater management facilities on the property described above. In order to further the goals of the City of Florence to ensure the protection and enhancement of water quality, the City of Florence and Owner hereby enter into this Agreement. The responsibilities of each party to this Agreement are identified below.

Recitals

- 1. Owner owns the above described property within the City of Florence, Lane County, Oregon.
- 2. Owner owns and operates stormwater management facilities approved and permitted as required by land use permit \_\_\_\_\_.
- 3. Owner has requested the city to provide the functional maintenance of the facility.
- 4. City approved construction plans dedicating the drainage system conveying the runoff from the residential properties to the stormwater facility as a public drainage system are on file.
- 5. Access routes for maintenance have been located within a dedicated public easement on private or commonly held property, within the public right-of-way or on city owned property.
- 6. Sufficient easement area, right-of-way width or property have been provided to accommodate the construction and maintenance of all existing and proposed utilities and public infrastructure.

Owner shall:

- 1. Implement the stormwater management plan included herein as Attachment "A". (Stormwater disposal and pollution reduction construction details, and source control protection, etc.)
- 2. Implement the stormwater maintenance plan included herein as Attachment "B". (Owner responsibilities such as vegetation control, debris pickup, etc.)
- 3. Inspect the facilities monthly and after significant storm events to determine if maintenance activity is warranted.
- 5. Submit an annual report to the City of Florence regarding implementation programs referenced in (1) and (2) above. The report must be submitted on or before June 30 of each calendar year after execution of this agreement. At a minimum, the following items shall be included in the report:
  - a. Name, address, and telephone number of the businesses, persons, or firms responsible for maintenance plan implementation, and the persons completing the report.

- b. Time period covered by the report.
- c. A chronological summary of activities conducted to implement the program and plan referenced in (1) and (2) above. A photocopy of the applicable sections of the logbook with any additional explanations needed shall suffice. For any activities conducted by paid parties, include a copy of the invoice for services.
- d. Any outline planned activities for the upcoming year.
- 6. Allow the City of Florence staff to inspect stormwater management facilities at the above referenced site.

City of Florence shall:

- 1. Execute the following periodic major maintenance on the subdivision's pollution reduction facilities: sediment removal from facilities, resetting orifice sizes and elevations, and adding baffles.
- 2. Maintain all stormwater management facility elements within the public rights of way and dedicated easements, such as catch basins, weirs, oil-water separators, and pipes.
- 3. Provide technical assistance to the Owner in support of its operation and maintenance activities conducted pursuant to its maintenance and source control programs. Said assistance shall be provided upon request and as the City of Florence's time and resources permit.
- 4. Review the annual report and conduct a minimum of one (1) site visit per year to discuss performance and problems with the stormwater management facilities.
- 5. Review the agreement with the Owner and modify it as necessary at least once every three (3) years.

#### Remedies:

- If the City of Florence determines that maintenance that maintenance or repair work is required to be done to the stormwater management facilities located in the subdivision, the City of Florence shall give the Owner notice of the specific maintenance and/or repair required. The City of Florence shall set a reasonable time in which such work is to be completed the persons who were given notice. If the above required maintenance and/or repair is not completed within the time set by the City of Florence, written notice will be sent to the Owner stating the City of Florence's intention to perform such maintenance and bill the Owner for all incurred expenses.
- 2. If, at any time, the City of Florence determines that the existing facility creates any imminent threat to public health, safety, or welfare, the City of Florence may take immediate measures to remedy said threat. No notice to the persons listed in Remedies (1), above shall be required under such circumstances. All other

Owner responsibilities shall remain in effect.

- 1. The Owner shall grant unrestricted authority to the City of Florence for access to any and all stormwater management facilities for the purpose of performing maintenance or repair as may become necessary under Remedies (1) and/or (2).
- 2. The Owner shall assume responsibility for the cost of maintenance and repairs to the stormwater management facilities, except for those maintenance actions explicitly assumed by the City of Florence in the preceding section. Such responsibility shall include reimbursement to the City of Florence within 90 days of the receipt of the invoice for any such work performed. Overdue payments will require payment of interest at the current legal rate for liquidated judgments. If legal action ensues, any costs or fees incurred by the City of Florence will be borne by the parties responsible for said reimbursements. This Agreement is intended to protect the value and desirability of the real property described above and to benefit all the citizens of the City of Florence. It shall run with the land and be binding on all parties having or acquiring any right, title, or interest or any part thereof, of real property in the subdivision. They shall inure to the benefit of each present or future successor in interest of said property or any part thereof or interest therein, and to the benefit of all citizens of the City of Florence.

This instrument is intended to be binding upon the parties hereto, their heirs, successors and assignees.

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In Witness whereof, the undersigned has executed this ins ,20	trument on this day of
OWNER(s):	
Signature	
(print name)	
STATE OF OREGON, County of Lane, ss:	
This instrument was acknowledged before me this	day of, owner(s) of the above described premises.
	Notary Public for Oregon
	My commission expires
MANAGER, CITY OF FLORENCE In Witness whereof, the undersigned agent of the City of F acknowledged the said instrument to be free and voluntary act and deed of 20 for the purposes herein mentioned and on oath star	Florence has executed this instrument and on this day of, tes he is authorized to execute said instrument.
City Manager	
STATE OF OREGON, County of Lane, ss: This instrument was acknowledged before me this, 20, by,	day of, owner(s) of the above described premises.
	Notary Public for Oregon
	My commission expires

**APPENDIX F** 

#### Vegetated Filter Strips

#### **Operations & Maintenance Plan**

**Vegetated filter strips** are gently sloped vegetated areas that stormwater runoff is directed to flow and filter through. Stormwater enters the filter as sheet flow from an impervious surface or is converted to sheet flow using a flow spreader. Flow control is achieved using the relatively large surface area and check dams. Pollutants are removed through infiltration and sedimentation. The vegetative filter should drain within 48 hours of storm event. All facility components and vegetation shall be inspected for proper operations and structural stability. These inspections shall occur, at a minimum, quarterly for the first 2 years from the date of installation, 2 times per year thereafter, and within 48 hours after each major storm event. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Flow Spreader shall allow runoff to enter the vegetative filter as predominantly sheet flow.

- Source of erosion damage shall be identified and controlled when native soil is exposed or erosion channels are forming.
- Sediment build-up near or exceeding 2" in depth shall be removed.
- Filter Inlet shall assure unrestricted stormwater flow to the vegetative filter.
  - Sources of erosion shall be identified and controlled when native soil is exposed or erosion channels are present.
  - Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation.
  - Inlet shall be cleared when conveyance capacity is plugged.
  - Rock splash pads shall be replenished to prevent erosion.

Filter Media shall allow stormwater to percolate uniformly through the vegetative filter.

- If the vegetative filter does not drain within 48 hours, it shall be regraded and replanted according to design specifications. Established trees shall not be removed or harmed in this process.
- Debris in quantities more than 2" deep or sufficient to inhibit operation shall be removed routinely (e.g., no less than quarterly), or upon discovery.

**Check Dams** shall direct and control flow.

- Causes for altered water flow and channelization shall be identified, and obstructions cleared upon discovery.
- Cracks, rot, and structural damage shall be repaired.

Filter Outlet shall allow water to exit the vegetative filter as sheet flow, unless a collection drainpipe is used.

- Sources of erosion damage shall be identified and controlled when native soil is exposed or erosion channels are deeper than 2 inches.
- Outlet shall be cleared when 50% of the conveyance capacity is plugged. Sources of sediment and debris shall be identified and corrected.

**Vegetation** shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion.

- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance and prohibited vegetation from the Eugene Plant List (such as blackberries and English Ivy) shall be removed when discovered. Invasive vegetation contributing up to 25% of vegetation of all species shall be removed and replaced.
- Dead vegetation shall be removed to maintain less than 10% of area coverage or when vegetative filter function is impaired. Vegetation shall be replaced immediately to control erosion where soils are exposed and within 3 months to maintain cover density.

**Debris and Litter** shall be removed to ensure stormwater conveyance and to prevent clogging of inlet drains and interference with plant growth.

**Spill Prevention** measures shall be exercised when handling substances that contaminate stormwater. Releases of pollutants shall be corrected as soon as identified.

#### Vegetated Filter Strips

#### **Operations & Maintenance Plan**

**Training and/or written guidance information** for operating and maintaining vegetated filters shall be provided to all property owners and tenants. A copy of the O&M Plan shall be provided to all property owners and tenants.

Access to the vegetative filter shall be safe and efficient. Egress and ingress routes shall be maintained to design standards.

Obstacles preventing maintenance personnel and/or equipment access to the facility shall be removed. Gravel or ground cover shall be added if erosion occurs, e.g., due to vehicular or pedestrian traffic.

**Insects & Rodents** shall not be harbored in the vegetated filter. Pest control measures shall be taken when insects/rodents are found to be present.

- If a complaint is received or an inspection reveals that a stormwater facility is significantly infested with mosquitoes or other vectors, the property owner/owners or their designee may be required to eliminate the infestation at the City inspector's discretion. Control of the infestation shall be attempted by using first non-chemical methods and secondly, only those chemical methods specifically approved by the City's inspector. Acceptable methods include but are not limited to the following:
  - iii) Installation of predacious bird or bat nesting boxes.
  - iv) Alterations of pond water levels approximately every four days in order to disrupt mosquito larval development cycles.
  - v) Stocking ponds and other permanent water facilities with fish or other predatory species.
  - vi) If non-chemical methods have proved unsuccessful, contact the City inspector prior to use of chemical methods such as the mosquito larvicides Bacillus thurengensis var. israeliensis or other approved larvacides. These materials may only be used with City inspector approval if evidence can be provided that these materials will not migrate off-site or enter the public stormwater system. Chemical larvicides shall be applied by a licensed individual or contractor.
- Holes in the ground located in and around the vegetated filter shall be filled.

#### Rain Gardens

#### **Operations & Maintenance Plan**

A vegetated Infiltration Basin is a vegetated depression created by excavation, berms, or small dams to
provide for short-term ponding of surface water until it percolates into the soil. The basin shall infiltrate
stormwater within 24 hours. All facility components and vegetation shall be inspected for proper operations
and structural stability, at a minimum, quarterly for the first 2 years from the date of installation, 2 times per
year thereafter, and within 48 hours after each major storm event. The facility owner must keep a log,
recording all inspection dates, observations, and maintenance activities. The following items shall be inspected
and maintained as stated:

Basin Inlet shall assure unrestricted stormwater flow to the vegetated basin.

- Sources of erosion shall be identified and controlled when native soil is exposed or erosion channels are present.
- Inlet shall be cleared when conveyance capacity is plugged.
- Rock splash pads shall be replenished to prevent erosion.
- Embankment, Dikes, Berms & Side Slopes retain water in the infiltration basin.
  - Structural deficiencies shall be corrected upon discovery:
  - Slopes shall be stabilized using appropriate erosion control measures when soil is exposed/ flow channels are forming.
  - Sources of erosion damage shall be identified and controlled.

**Overflow or Emergency Spillway** conveys flow exceeding reservoir capacity to an approved stormwater receiving system.

- Overflow shall be cleared when 25% of the conveyance capacity is plugged.
- Sources of erosion damage shall be identified and controlled when soil is exposed.
- Rocks or other armament shall be replaced when only one layer of rock exists.

**Filter Media** shall allow stormwater to percolate uniformly through the infiltration basin. If water remains 36-48 hours after storm, sources of possible clogging shall be identified and corrected.

• Basin shall be raked and, if necessary, soil shall be excavated, and cleaned or replaced.

**Sediment/ Basin Debris Management** shall prevent loss of infiltration basin volume caused by sedimentation. Gauges located at the opposite ends of the basin shall be maintained to monitor sedimentation.

• Sediment and debris exceeding 4" in depth shall be removed every 2-5 years or sooner if performance is affected.

**Debris and Litter** shall be removed to ensure stormwater infiltration and to prevent clogging of overflow drains and interference with plant growth.

• Restricted sources of sediment and debris, such as discarded lawn clippings, shall be identified and prevented.

**Vegetation** shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion.

- Mulch shall be replenished as needed to ensure healthy plant growth.
- Vegetation, large shrubs or trees that limit access or interfere with basin operation shall be pruned or removed.
- Grass shall be mowed to 4"-9" high and grass clippings shall be removed no less than 2 times per year.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the Eugene Plant List (such as blackberries or English Ivy) shall be removed when discovered. Invasive vegetation contributing up to 25% of vegetation of all species shall be removed.
- Dead vegetation shall be removed to maintain less than 10% of area coverage or when infiltration basin function is impaired. Vegetation shall be replaced within 3 months, or immediately if required to control erosion.

**Spill Prevention** measures shall be exercised when handling substances that contaminate stormwater. Releases of pollutants shall be corrected as soon as identified.

#### Rain Gardens

#### **Operations & Maintenance Plan**

**Training and/or written guidance information** for operating and maintaining vegetated infiltration basins shall be provided to all property owners and tenants. A copy of the O&M Plan shall be provided to all property owners and tenants.

Access to the infiltration basin shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the infiltration basin shall be removed.
- Gravel or ground cover shall be added if erosion occurs, e.g., due to vehicular or pedestrian traffic.

**Insects & Rodents** shall not be harbored in the infiltration basin. Pest control measures shall be taken when insects/rodents are found to be present.

- If a complaint is received or an inspection reveals that a stormwater facility is significantly infested with mosquitoes or other vectors, the property owner/owners or their designee may be required to eliminate the infestation at the City inspector's discretion. Control of the infestation shall be attempted by using first non-chemical methods and secondly, only those chemical methods specifically approved by the City's inspector. Acceptable methods include but are not limited to the following:
  - i) Installation of predacious bird or bat nesting boxes.
  - ii) Alterations of pond water levels approximately every four days in order to disrupt mosquito larval development cycles.
  - iii) Stocking ponds and other permanent water facilities with fish or other predatory species.
  - iv) If non-chemical methods have proved unsuccessful, contact the City inspector prior to use of chemical methods such as the mosquito larvicides Bacillus thurengensis var. israeliensis or other approved larvacides. These materials may only be used with City inspector approval if evidence can be provided that these materials will not migrate off-site or enter the public stormwater system. Chemical larvicides shall be applied by a licensed individual or contractor.
- Holes in the ground located in and around the infiltration basin shall be filled.

#### If used at this site, the following will be applicable:

Fences shall be maintained to preserve their functionality and appearance.

- Collapsed fences shall be restored to an upright position.
- Jagged edges and damaged fences shall be repaired or replaced.

#### Swales (Vegetated, Grassy, and Street) Operations & Maintenance Plan

- Obstacles preventing maintenance personnel and/or equipment access to the swale shall be removed.
- Gravel or ground cover shall be added if erosion occurs, e.g., due to vehicular or pedestrian traffic.

**Insects & Rodents** shall not be harbored in the swale. Pest control measures shall be taken when insects/rodents are found to be present.

- If a complaint is received or an inspection reveals that a stormwater facility is significantly infested with mosquitoes or other vectors, the property owner/owners or their designee may be required to eliminate the infestation at the City inspector's discretion. Control of the infestation shall be attempted by using first non-chemical methods and secondly, only those chemical methods specifically approved by the City's inspector. Acceptable methods include but are not limited to the following:
  - i) Installation of predacious bird or bat nesting boxes.
  - ii) Alterations of pond water levels approximately every four days in order to disrupt mosquito larval development cycles.
  - iii) Stocking ponds and other permanent water facilities with fish or other predatory species.
  - iv) If non-chemical methods have proved unsuccessful, contact the City inspector prior to use of chemical methods such as the mosquito larvicides Bacillus thurengensis var. israeliensis or other approved larvacides. These materials may only be used with City inspector approval if evidence can be provided that these materials will not migrate off-site or enter the public stormwater system. Chemical larvicides shall be applied by a licensed individual or contractor.
- Holes in the ground located in and around the swale shall be filled.

If used at this site, the following will be applicable:

Check Dams shall control and distribute flow.

- Causes for altered water flow shall be identified, and obstructions cleared upon discovery.
- Causes for channelization shall be identified and repaired.



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## Attachment 6

# Memorandum



To: Roxanne Johnston, Senior Planner

From: Mike Miller, Public Works Director MM

Date: February 2, 2021

**Re:** Stormwater Management Plan for Heceta Self Storage Airport Annex

I have requested Civil West Engineering Services, Inc. complete a follow up review of the stormwater management report for Heceta Self Storage Airport Annex development as prepared by Aric Farnsworth, PE. This follow-up review was anticipated to ensure that the requested changes and suggestions were completed.

In reviewing Aric Farnsworth's updated stormwater management report along with his response dated November 4, 2020, and the report from Civil West, it appears that there is a personality conflict between Mr. Farnsworth and that of the engineer's at Civil West. However, I believe we have a path forward.

The stormwater management report dated December 15, 2020 is well put together and the design itself appears sound. With that said, Mr. Farnsworth has elected to explain his rationale for deviating from the requirements of the City's Stormwater Management Design Manual in lieu of addressing the specific comments that Civil West Engineering Services provided. While I respect Mr. Farnsworth's experience on City projects, we do need to treat this project just like any other proposed development project.

In order to resolve the disagreement between the two professional engineers, I propose the following items to be made a part of the stormwater management report for Heceta Self Storage Airport Annex:

- Include the IDF curves in Appendix A.
- Have values tabulated in a single table as opposed to being scattered throughout the report.
- For documentation purposes, provide an analysis of the airport swale to demonstrate no impact from the proposed development.

Regarding the emergency overflow from the southern rain garden into the City stormwater system in Kingwood Street, based on our experience with the stormwater facilities at the Public Works Operations Center emergency overflow water should not enter the City system. Therefore, there is no anticipated impacts to the City system.

Once these three items are satisfied, the City will be able to approve the stormwater management plan for the development.

## Attachment 7

- I. Retioned Method is ecceptuble if on-site capacity calculations are provided. IF not provided then follow prescribed methods in SWDM and City Code.
- 2. Downstream analysis of Kingwood St. overflow system capacity is waived.

3. Overflow to Airport Swele Needs ENELYSIS of drainage basin Capacity. Overflow from less than a 100° year event is Not acceptable.

4. Directing drzinzge to existing vegetited zrees is not an approved method of treatment. Any filter strip BMPs must be constructed per City approved standard detail.
Attachment 8

## **Roxanne Johnston**

From:	Mike Miller
Sent:	Monday, February 22, 2021 2:16 PM
То:	Roxanne Johnston; Wendy Farley-Campbell
Subject:	RE: Farnsworth final edits

Hi Roxanne,

On Condition #30, maybe tweaking it a bit to state that we will need the system capacity calculations to show that the additional flow will not overwhelm the system(s).

Condition #31 – how about if we said that anything over the 25 year design storm, may be allowed to utilize a bubble up catch basin so that the overflow from a 50 or 100 year storm event is conveyed to the existing curb/gutter in Kingwood. Looking at our system map, the nearest curb inlet is approximately 130 feet to the north or 170 feet to the south. Now that I say that, it makes total sense to convey the their excess flow above the 25 year storm event in a 6-inch pipe and penetrate the back of the curb inlet. We're not talking much of a drainage system and they could easily trench with a ditchwitch or a small backhoe. They just need to have the correct fall for positive drainage. If they push back I'm OK with the bubble up catch basin (or we can just go with the bubble up catch basin and cut our losses).

Other than that I think it looks good. I did talk with Sean at Civil West. We have less issue with the filter strip widths and offsets than the fact that they aren't actually planning on even installing them per the detail that they cite. The main objective is to construct the filter strips properly and showing that runoff won't make its way onto Kingwood or the airport swale under typical storm conditions.

Thank you,

Mike

From: Roxanne Johnston <Roxanne.Johnston@ci.florence.or.us>
Sent: Monday, February 22, 2021 11:44 AM
To: Mike Miller <mike.miller@ci.florence.or.us>; Wendy Farley-Campbell <wendy.farleycampbell@ci.florence.or.us>
Subject: Farnsworth final edits

Thank you for meeting with me, both of you!

Stormwater starts on p. 43, and Conditions 30-33 are the target here. The new part added today is noted in aqua for Condition 31. 😳 I attached Aric's report for ease of reference, just in case. The attached draft conditions may be overkill.

Thank you both again, so very much.

R

Roxanne M. Johnston, CFM Senior Planner | City of Florence O: 541.997.8237 Roxanne.Johnston@ci.florence.or.us 250 Highway 101, Florence, OR 97439 Follow Us! <u>City Website</u> | <u>Vimeo</u> | <u>Facebook</u> | <u>Twitter</u>