SHELDON PLANNING

INDEX

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OVERVIEW

This application is for the subdivision of approximately 11 acres near Airport Heights, into 13 lots, and the development of a private road and utilities to serve those resultant lots. Separate from this application: the applicant intends to develop each lot individually, for single-family residential use.

The Subject Property is located on the line between the City of Coos Bay and City of North Bend. The applicant has arranged with the City of North Bend for (a) access off of their Right of Way (Connecticut Avenue), and (b) connection to their stormwater and wastewater systems, located near the intersection of Connecticut and Roosevelt. This agreement is attached as Attachment 10 North Bend Utilities and Access Agreement. Note that this agreement was the result of prior discussions between the applicant, City of Coos Bay, and City of North Bend, regarding service options for the development. Alternatives were discussed, and the proposal included in this application was determined by all parties to be the best option given the City boundaries, topography, and existing surrounding development.

This application includes a proposal to vacate the northernmost 50x160 foot section of the City of Coos Bay's Maxwell Street. This section of Maxwell is currently unimproved. The only properties served by this section of Maxwell are Subject Property. Because Subject Property will be accessed via the new connection at Connecticut Avenue, this section of Maxwell Street will no longer be of potential use as a right of way.

SUBDIVISION APPLICATION

Procedures: 17.130.050 Review for Technically Complete Status

(2) Standards for Technical Completeness. An application is technically complete if it includes the information required by the CBDC section(s) that apply to the application in question. If the CBDC does not list the information a given application is required to contain, then such an application is technically complete if it includes three hard copies and one electronic copy of the following information:

(a) A completed city land use application form;

Attachment 1 Land Use Application

(b) Required application fee;

(c) A copy of the pre-application conference summary, if the application was subject to pre-application review, which shall include all information required by the director to address issues, comments and concerns in the summary;

Attachment 2 Pre-Application Conference Summary

(d) The name, email address, mailing address, and telephone number of the owner(s) and official contact regarding the application;

Applicant/Owner's Representative:
Hailey Sheldon
Sheldon Planning LLC
444 N 4th Street
Coos Bay OR 97420
(541) 968-4686
hailey@sheldonplanning.com

Owner:
Red Moon Development & Construction Inc.
6589 S Kings Ranch Rd
Ste 103J, Box 6
Gold Canyon AZ 85118
bwoodruff01@gmail.com
cc: redmoonaz@aol.com

(e) Written authorization to file the application signed by the owner of the property that is the subject of the application, if the applicant is not the same as the owner as listed by the Coos County assessor;

Attachment 3 Agent Authorization

(f) Proof of ownership document, such as copies of deeds and/or a policy or satisfactory commitment for title insurance;

Attachment 4 Deeds

(g) A written description of how the application complies, or with conditions can comply, with each applicable CBCP, CBDC, and other city policy and regulation approval criterion applicable to the application. Basic facts and other substantial evidence supporting the description must also be included in the application;

Included in the findings of this written report.

(h) Applications necessarily associated with the proposal, such as applications for variances as specified in Chapter 17.372 CBDC or for modifications to the road standards that are required to approve the proposal;

Attachment 1 Land Use Application

Attachment 5 Right of Way Vacation Application

No variances or modifications to standards are proposed.

(i) A legal description of the site;

Included in Attachment 4 Deeds.

(j) A preliminary site plan at a scale of no more than one inch equals 200 feet, with north arrow, date, and graphic scale;

N/A – see findings in this report related to CMC 17.365 Site Plan Review.

(k) A floor plan at a one-quarter- or one-eighth-inch scale;

N/A

(l) Elevations of all sides of the proposed structure at a one-quarter- or one-eighth-inch scale;

N/A

(m) Existing and proposed lots, tracts, easements, rights-of-way and structures on the site, and existing lots, tracts, easements, rights-of-way and structures abutting the site; provided, information about off-site structures and other features may be approximate if such information is not in the public record. The applicant shall provide three copies of the plan of a size no smaller than 11 inches by 17 inches;

Attachment 6 Sheet C-1 Existing Conditions

(n) Proposed easements or dedications to the city or other agency, if applicable;

Attachment 7 Stormwater Easement

Attachment 8 Connecticut Access Easement

No dedications to the city or other agency are proposed

(o) Preliminary grading, erosion control and drainage plans may be required depending upon the application and if required shall be consistent with applicable provisions of this or other applicable city documents;

Attachment 6 Sheets C-4 Horizontal Control Plan and C-5 Grading & Drainage Plan

(p) Information about proposed utilities, including water and sanitary waste.

Attachment 6 Sheets C-8 Utility Plan Water, C-6 Utility Plan Stormwater, C-11 Utility Plan Electric, C-12 Utility Plan Sewer, and C-15 Utility Plan Gas

Attachment 10 City of North Bend Agreement to Serve Utilities and Access via Connecticut Ave

Subdivisions: 17.367.030 Preliminary Plat Application Contents

See Attachment 13 Preliminary Plat Map.

An applicant for a preliminary partition shall submit the requisite fee, a completed application review form provided for that purpose by the city, and three paper copies and one electronic copy of the following information:

(1) Written authorization to file the application signed by the owner of the property that is the subject of the application, if the applicant is not the same as the owner as listed by the Coos County assessor.

Attachment 3 Agent Authorization

(2) Proof of ownership document, such as copies of deeds and/or a policy or satisfactory commitment for title insurance.

(3) A legal description of the property proposed to be divided.

Attachment 4 Deeds

(4) A copy of the pre-application conference summary, if the application was subject to pre-application review, and all information required to address issues, comments and concerns in the summary.

Attachment 2 Pre-Application Conference Summary

(5) A written description of how the proposed preliminary plat does or can comply with each applicable approval criterion for the preliminary plat, and basic facts and other substantial evidence that supports the description.

Included in the findings of this written report.

(6) Applications necessarily associated with the preliminary plat, such as applications for exceptions, adjustments or variances to dimensional requirements of the base or overlay zones or for modifications to the adopted Coos Bay road standards that are required to approve the preliminary plat application as proposed.

Attachment 1 Land Use Application

Attachment 5 Right of Way Vacation Application

No variances or modifications to standards are proposed.

(7) Evidence that potable water will be provided to each lot from a public water system, and that each lot will be connected to public sewer.

Attachment 9 Coos Bay North Bend Water Board Service Available Letter

(8) A plan showing proposed phasing if the applicant proposes to develop the subdivision in phases.

No phases are proposed.

Subdivisions: 17.367.040 Approval Criteria for a Preliminary Plat

(1) The review authority shall approve a preliminary plat if he or she finds:

(a) The applicant has sustained the burden of proving that the application complies with the applicable provisions of this title;

(b) The application will comply with all applicable regulations by satisfying all adopted conditions of approval; or that necessary adjustments, exceptions, modifications or variations have been approved or are required to be approved before the final partition is approved; and

(c) The subdivision makes appropriate provision for potable water supplies and for disposal of sanitary wastes.

See Attachment 6 for water, sanitary sewer, stormwater, electric, gas, access, grading, and erosion control plans.

See Attachment 10 for the City of North Bend utilities and access service agreement.

The applicant's utilities plan is as follows:

Sanitary Sewer: install a private sanitary main and laterals to serve lots 1 through 13. The main will run under the private drive, and connect to an existing City of North Bend manhole on Roosevelt and Connecticut. The applicant has received permission from the City of North Bend to establish this connection (Attachment 10).

Water: install new service lines to lots 1 through 13, with a single connection at the existing 8-inch main at the intersection of Roosevelt and Connecticut. The applicant has received permission from the Coos Bay North Bend Water Board, pending approval by the Coos Bay Fire Department (Attachment 9 CBNB Water Board Service Available Letter).

Stormwater: install a private stormwater system, with an overflow connection to an existing City of North Bend stormwater line, which runs north-south through the adjacent Airport property. The applicant has received a 15-foot easement from the Airport for the maintenance of that connection (Attachment 7 Stormwater Easement), and permission from the City of North Bend to connect (Attachment 10).

(2) If phases are proposed, the subdivision shall comply with the following: […]

No phases are proposed. The applicant is proposing to subdivide the lots, install the utilities described above, construct the street access, and then develop or sell each lot individually (meeting the applicable requirements of the CBMC at the time of development).

(3) Flag lots[1] are discouraged. When allowed, flag lots shall comply with the following standards:

(a) The flag pole shall provide an all-weather surface with an unobstructed vertical clearance of at least 13 feet six inches. The improved surface shall be at least 20 feet wide and be marked and signed as a fire lane.

(b) The pole portion of the flag lot does not count toward the minimum lot size.

(c) If the length of the flagpole is more than 150 feet, the applicant shall provide a turn-around at the end of the driveway in conformance with the current adopted edition of the International Fire Code, and

[1] Lot, flag – A lot the developable portion of which is located behind another lot that has normal street frontage. A flag lot includes a strip of land that goes out to the public right-of-way street for public access. As shown on the Lot, Flag Exhibit below, there are two distinct parts to a flag lot: the flag which comprises the actual building site located behind another lot, and the pole which provides access from the street to the flag. A flag lot generally results from the division of a large lot that does not have sufficient width for division into two lots that would both have normal frontage onto the street. Creation of a flag lot is subject to additional standards in this code.

structures on the lot shall incorporate a fire-hazard warning, including a hard-wired, back-up smoke detector, and a sprinkler system.

(d) Where flag lots are not provided but access easements across abutting properties to public or private rights-of-way are provided, the applicable city engineering standards shall apply.

A single flag lot is proposed: lot 9.

The proposed preliminary subdivision plat does not contain any elements that would hinder the future owner's ability to meet these standards.

The proposed flag is 20 feet wide and 65.37 feet long.

The driveway and any vertical elements over the driveway will be installed at the time the individual lot is developed.

Low Density Residential Districts (LDR-6, LDR-8.5) and Overlay Zone LDR-6: 17.220.020 Land Uses

[…]

Table 17.220.020	
Residential Uses	LDR-6 Overlay
Single-family detached dwelling units, including manufactured homes which are subject to special siting standards	P/Type 1

Although not the subject of this application, the applicant is proposing the future development of single-family homes on Subject Property.

Low Density Residential Districts (LDR-6, LDR-8.5) and Overlay Zone LDR-6: 17.220.030 Development Standards and Criteria

[…]

Table 17.220.030		
	Table 17.230.030 Standards for LDR-6 Overlay Zone	**Proposed Development**
Minimum lot size	3,500 s.f.	**All proposed lots exceed 3,500 s.f.**
Maximum lot size	NA	**-**
Minimum lot width	40'	**No proposed lot width[2] is less than 40 feet. Lot 9 is a flag lot; the pole portion of a flag lot does not**

[2] 17.150.020 Definitions. Lot width – The average (mean) horizontal distance measured between the side lot lines, ordinarily measured parallel to the front lot line.

		count toward the minimum lot size.[3]
Minimum lot depth[4]	80'	**All proposed lot depths exceed 80'**
Lots for drainage facilities, parks, open space, wetlands and buffers, utilities	No minimum or maximum.	**N/A**
Building height	35' from lowest finished grade to highest point on the roof ridge.	**These standards will be met at the time of individual lot development. The preliminary subdivision plat does not conflict with these standards.**
Lot coverage	65%	
Landscaping	20% of net lot area.	
Front yard setback to enclosed or semi-enclosed living area (including porches)	10' from property line.	
Garage or carport setback	20' from property line. The setback may be reduced to 10' from a street or 5' from an alley if the entrance to the garage or carport is perpendicular to the street frontage and all of the required parking can be accommodated on private property.	
Minimum side yard – interior lot	As per the International Building Code	
Minimum rear yard	As per the International Building Code	
Minimum side yard – street side corner lot	20% of lot width but no less than 7' nor more than 20'.	
Setback to Coos Bay Estuary	As specified in the Coos Bay Estuary plan.	**N/A**
Setbacks for accessory buildings no greater than 120 s.f. or 8' in height at its highest point above site grade	Rear or side yards – as per the International Building Code. Front yard – building may be no closer than 20' from the front property line nor cause visual obstruction at driveways or intersections.	**N/A**
Parking	See Chapter 17.330 CBDC.	**See findings related to 17.330 below.**

[3] 17.367.040(b). The pole portion of the flag lot does not count toward the minimum lot size.
[4] 17.150.020 Definitions. Lot depth – The horizontal distance between the midpoint of the front lot line and opposite lot line, usually the rear lot line. In the case of a corner lot, the depth shall be the length of the street side lot line.

Off-Street Parking and Loading Requirements: 17.330.010 Off-Street Parking Requirements

[…]

Table 17.330.010(A) – Off-Street Parking Requirements	
Residential	Minimum Number of Parking Spaces
Single or duplex	2 spaces per dwelling unit

No elements of the proposed preliminary subdivision plat, utilities, or access plan would hinder the future developer's ability to provide two off-street parking spaces per unit.

Off-Street Parking and Loading Requirements: 17.330.030 Parking Design Standards

(1) Size of Parking Space. Each off-street parking space shall not be less than nine feet by 18 feet. Up to 25 percent of all required parking spaces can be used for compact vehicles. These compact spaces shall not be less than eight feet by 16 feet. Each space shall be provided with adequate ingress and egress.

(2) Location. Off-street parking facilities shall be located on site to the extent feasible. Off-site parking shall be no further than 300 feet from the site, measured from the nearest point of the parking facility to the nearest point of the nearest building that the facility is required to serve. Off-site parking shall be primarily employee parking.

(3) Materials, Design, and Lighting.

(a) Off-street parking facilities shall be surfaced with a durable and dustless surface, shall be graded and drained so as to dispose of surface water to the satisfaction of the public works department and shall be maintained in good condition, free of weeds, dust, trash, and debris.

(b) Except for a single-family or duplex dwelling, groups of more than two parking spaces per lot must:

(i) Provide aisles or turnaround areas so that all vehicles may enter the street in a forward manner; and

(ii) Serve a driveway designed and constructed to facilitate the flow of traffic on and off the site, with due regard to pedestrian and vehicle safety, and shall be clearly and permanently marked and defined. In no case shall two-way and one-way driveways be less than 20 feet and 12 feet, respectively, and arranged so as not to use any part of adjoining public sidewalks, street, or alley rights-of-way, except for ingress and egress.

[…]

(4) All uses, except for single-family dwellings and duplexes, required to provide off-street vehicle parking shall provide bicycle parking consistent with the standards in Table 17.330.030.

At the time of construction, the off-street parking on each lot will be constructed to meet the standards listed in 17.330.030, above.

No elements of the proposed preliminary subdivision plat, utilities, or access plan would hinder the adherence to these parking standards.

The proposed 50' private drive provides space for vehicles to back up out of driveways and enter Connecticut Avenue in a forward manner.

Supplementary Development Standards: 17.335.020 Height of Fences And Hedges, 17.335.030 Solid Waste, 17.335.040 Lighting, 17.335.050 Noise, and 17.335.060 Landscaping

17.335.020 Height Of Fences And Hedges

(1) Fences, walls and hedges not greater than eight feet in height shall be permitted on or within all property lines which are not within any vision clearance area. For any fence greater than eight feet in height a setback from the property line of one foot shall be provided for each additional foot or fraction of a foot.

[…]

17.335.030 Solid Waste

If refuse containers are used by more than one unit for temporary storage of solid wastes, the container(s) shall be screened from view from off site by a sight-obscuring fence and/or evergreen landscaping and the area kept clean of all litter.

17.335.040 Lighting

(1) Street lighting shall be a required component of all residential, commercial and industrial developments within the city of Coos Bay. Lighting plans shall be a required component of complete preliminary subdivision, partition and site plan applications. All lighting plans shall be approved by the director.

(2) Lighting, including permitted illuminated signs, shall be designed and arranged so as to not:

(a) Reflect or cast glare into any residential zone;

(b) Rotate, glitter, or flash; or

(c) Conflict with the readability of traffic signs and control signals.

(3) Lighting on any site shall not cause more than one foot-candle measured at any property line.

17.335.050 Noise

All development shall comply with the noise standards established in the city.

17.335.060 Landscaping

The following standards apply to landscaping and screening on private property required pursuant to this title. The city's public works department shall review and authorize landscaping and screening within public rights-of-way.

(1) At a minimum, 15 percent of each new commercial or industrial zoned lot or development must be landscaped to the standards within this chapter.

(2) Applicants are encouraged to provide flexible landscaping design that takes advantage of natural features and addresses the use and function of the proposed development. Landscaping choices should consider the aesthetic qualities of the existing site and provide attractive variety in tree and shrub species, texture, color, height and density.

(3) Existing vegetation may fulfill landscaping and screening requirements of this chapter if the existing landscaping provides at least an equivalent level of screening as the standard required for the development in question.

(4) As a condition of approval for a conditional use or PUD, the city may require an applicant to provide landscaping and screening that differs from the standards in this section where necessary to comply with the other applicable approval standards for the use or development.

(5) Landscaped areas required for stormwater management purposes may be used to satisfy the landscaping area requirements of this chapter, even though those areas may be inundated by surface water. Required stormwater management facilities are not classified as areas inundated by water.

(6) Required landscaping and screening shall be located on the perimeter of a lot or parcel. Required landscaping and screening shall not be located on a public right-of-way or private street easement, unless authorized by the city's public works department.

(7) Parking and loading areas shall be landscaped as follows:

(a) A minimum five-foot-wide landscaped strip shall be provided where vehicle parking or loading adjoins a public road right-of-way.

(b) Parking areas that contain at least seven spaces are required to provide landscaping islands throughout the development. A landscape island shall contain at least 25 square feet, shall be at least four feet wide, and shall prevent vehicles from damaging trees by using a wheel stop or curb.

(8) The applicant shall install required landscaping and screening consistent with the approved site plan or development, or an approved modification thereto, before the city issues an occupancy permit or final inspection for the development in question; provided, the city may defer installation of plant materials for up to six months after the city issues an occupancy permit or final inspection for the development in question if doing so increases the likely survival of plants.

(9) All required ground cover plants and shrubs must be of sufficient size and number to meet the required standards within three years of planting. Mulch (as a ground cover) must be confined to areas underneath plants and is not a substitute for living ground cover plants, lawn or approved flowers.

(10) Shrubs shall be supplied in a minimum of two-gallon containers or equivalent burlap balls, with a minimum spread of three inches. Reduction in the minimum size may be permitted if certified by a registered landscape architect that the reduction shall not diminish the intended effect or the likelihood the plants will survive.

(11) Trees shall be measured from the ground level at final planting to the top of the tree.

(a) Trees required for parking and loading areas shall be a minimum caliper of two inches and a minimum height of 10 feet at the time of planting.

(b) Required deciduous trees (other than street trees) shall be fully branched, have a minimum caliper of one and one-half inches and a minimum height of eight feet at the time of planting.

(c) Required evergreen trees (other than street trees) shall be fully branched and a minimum of six feet high at the time of planting.

(d) The review authority may reduce the minimum size of trees (other than street trees) if the applicant submits a written statement by a landscape architect registered in Oregon or expert in the growing of the tree(s) in question certifies that the reduction in size at planting will not decrease the likelihood the trees will survive.

(12) Landscape materials should be selected and sited to produce a hardy and drought-resistant landscape area. Selection should include consideration of soil type and depth, the amount of maintenance required, spacing, exposure to sun and wind, the slope and contours of the site, compatibility with existing native vegetation preserved on the site, water conservation where needed, and the impact of landscaping on

visibility of the site for purposes of public safety and surveillance. Landscaping materials shall be selected in accordance with a list of plant materials adopted by reference as the Sunset Western Garden Book.

(13) The applicant shall demonstrate and comply with the following:

(a) Plant materials shall be installed to current nursery industry standards.

(b) Plant materials shall be properly supported to ensure survival. Support devices such as guy wires or stakes shall not interfere with vehicular or pedestrian movement.

(c) Existing trees and plant materials to be retained shall be protected during construction, such as by use of chain-link or other sturdy fence placed at the drip-line of trees to be retained. Grading, topsoil storage, construction material storage, vehicles and equipment shall not be allowed within the drip-line of trees to be retained.

(14) Maintenance of landscaped areas is the ongoing responsibility of the property owner. Required landscaping must be continuously maintained in a healthy manner. Plants that die must be replaced with in-kind materials unless otherwise authorized by the review authority. Vegetation shall be controlled by pruning, trimming or otherwise so that it will not interfere with the maintenance or repair of any public utility, restrict pedestrian or vehicular access, or obstruct sight distance at intersections.

(15) Irrigation. The intent of this standard is to ensure that plants will survive the critical establishment period when they are most vulnerable due to lack of watering. All required landscaped areas must comply with one of the following:

(a) A permanent built-in irrigation system with an automatic controller will serve the landscape area in question, and the system will be installed and operational before the city grants an occupancy permit or final inspection for the development in question; or

(b) A temporary irrigation system will be acceptable, provided the applicant must submit a statement from a landscape architect registered in Oregon or expert in the growing of the vegetation in question which certifies that the proposed temporary irrigation system will provide sufficient water to ensure that the plant materials to be planted will survive installation and, once established, will survive without watering other than natural rainfall; or

(c) A permanent or temporary irrigation system will not serve the landscape area in question; provided the applicant submits the following:

(i) A statement from a landscape architect registered in Oregon or expert in the growing of the vegetation in question certifying that the materials to be planted will survive without watering other than natural rainfall; and

(ii) A plan for monitoring the survival of required vegetation on the approved site plan for at least one year and for detection and replacement of required vegetation that does not survive with like-kind material or other material approved by the city.

The applicant is proposing no shared fencing, trash receptacles, lighting, or landscaping at this time.

Each individual lot will be landscaped and lighted at the time of development.

Site Plan Review: 17.365.030 Exemptions

The following are exempt from the site plan review:

(1) Residential proposals creating less than 10 new units in any zone;

(2) Modifications to the interior of an existing structure that does not change the use or the intensity of a use;

(3) Subdivisions or partitions;

(4) The installation or replacement of underground utilities; and

(5) Other development the director determines to be exempt because it does not result in an appreciable increase in land use activity and intensity and does not create an additional significant adverse impact.

This application is exempt from Site Plan Review per 17.365.030 sections (3) and (4) above.

The preliminary subdivision plat, utility plan, and access plan provide a foundation for the future development of single-family homes which match the character of the surrounding Airport Heights neighborhood.

ENGINEERING STANDARDS + SITE DEVELOPMENT PERMIT APPLICATION

Transportation Facilities: 18.15.020 Privately Maintained Streets

The city will not construct or add to its existing inventory of city maintained streets or access roads unless they meet all standards provided in CBMC 18.15.010. However, in cases where public street standards cannot be met, the developer may elect, with concurrence by public works, to construct a privately maintained access road to serve an infill development. Said privately maintained access road shall be constructed on private property.

Privately maintained streets and access roads may be developed exclusively within private property and the following conditions shall apply:

(1) The maximum number of dwelling units potentially served by the access road shall be three. Streets having the potential to serve more than three dwelling units must meet the requirements in CBMC 18.15.010.

(2) Sidewalks are not required.

(3) The street or access road surface must be constructed of an all-weather surface, as approved by public works and the city fire code official.

(4) The first 25 feet linear feet of the intersection/access point to the city street shall be paved.

(5) Any new development on a private street shall have a fire suppression system approved by the city fire code official.

(6) The traveled way of a private road shall be designated as a fire lane under the Oregon Fire Code. Private streets must have a minimum of 20 feet unobstructed width with 14 feet of vertical clearance.

(7) With the approval of the city fire code official, the travel surface of the access road may be reduced to 16 feet if two or three dwelling units will be served, or 14 feet if only one dwelling unit will be served. The total length of any access road with a reduced pavement width must be 400 feet or less. Access roads in excess of 400 feet must have a paved surface at least 20 feet wide.

(8) A standard turnaround shall be required at any dead end. (See CBMC 18.15.010(9).)

(9) A maximum profile grade of 12 percent is allowed.

(10) All runoff from new access roads must be controlled and directed to appropriate storm drains, or existing natural drainage channels. Connection to a natural drainage requires public works approval.

(11) Construction of privately maintained improvements within existing public rights-of-way must not obstruct or reduce access to existing homes.

(12) The developer shall arrange for future maintenance and repair of the access road, through a recorded road maintenance agreement or other legal mechanism to ensure perpetual maintenance. The maintenance agreement shall be binding upon all subsequent property owners and shall clearly specify that the city may remove any road improvements as needed to construct, repair or maintain city utilities in the right-of-way or easements. Restoration or repair of any roadway damage caused by city utility work will be the responsibility of the parties to the maintenance agreement.

(13) Street improvements constructed in the public right-of-way shall be positioned to allow for future widening, if additional development is anticipated.

(14) Developers shall install their own signs in accordance with the MUTCD and city standards, including a street identification sign at all intersections. Public works approval is required when installing signs at intersections with public roads. Once installed, the city will assume maintenance responsibility for traffic control signs and devices and street name signs located at the intersection with a city street. The city will not furnish, install or maintain other signs for private streets.

The applicant is proposing to serve 13 dwelling units with a private drive. This private drive will connect to a proposed extension of the City of North Bend's Connecticut Avenue, off Roosevelt Street. See Attachment 6 Sheets C-17 Unnamed Drive Plan and Profile and C-16 Access Road Plan and Profile. (Note: The "Access Road" refers to the public Connecticut Avenue section; the "Unnamed Drive" is the section on private property. The plans were put on separate sheets for City of North Bend's review.)

Per 18.15.020(1), above, the private drive section will meet the requirements of 18.15.010, below, for a 36' Neighborhood Residential street.

The applicant will arrange for future maintenance and repair of the private drive, through a recorded road maintenance agreement or other legal mechanism to ensure perpetual maintenance.

18.15.010 City Streets

(1) Street Classifications. The city has adopted the following functional classification of streets based on the context of the surrounding land use:

(a) Principal arterial (state highway under ODOT jurisdiction);

(b) Arterial street;

(c) Collector street;

(d) Neighborhood route;

(e) Local street.

Refer to the city's transportation system plan (TSP) for a map showing the city's functional classification street designations.

Public works will determine the classification of any new streets which are not indicated in the TSP prior to design.

The proposed area for the private drive is (1) not platted and (2) not classified in the TSP.

[…]

Table 3-1. Lane Widths and Configuration in the Vehicular Zone

Type of Street	Min RoW Width	Vehicle Travel Lane	Median or Center Turn Lane	On-Street Parking	Bike Lane (a)	Sidewalk Curb (b)	Max Grade
36' Neighborhood Residential	50'	10'	–	2 @ 8'	–	2 @ 5'	16%

The proposed private drive meets the standards listed in Table 3-1, for a 36' Neighborhood Residential street. See Attachment 6 Sheet C-17 Unnamed Drive Plan and Profile. The

applicant is proposing a 50' right of way, with 5' of sidewalk and 8' of on-street parking on each side.

[CBMC] Oregon Fire Code: 15.35.050 (9) D-103.4 Dead Ends

(9) D-103.4 Dead Ends. Any dead-end fire apparatus access roads greater than 150 feet in length shall be provided with a circular turn-around with a minimum radius of 45 feet, subject to the following exceptions:

(a) The Fire Marshal and the Coos Bay Fire Department may approve a 20 ft. x 120 ft. hammer-head turn-around, upon a showing by the applicant that terrain, lot configuration, or pre-existing development makes a circular turn-around impractical.

(b) An automatic fire sprinkler system may be provided in lieu of a turn-around, subject to prior approval by the Coos Bay Fire Department.

(10) Section 902.2.2.6 Grade. The gradient for fire apparatus access roads shall not exceed 10 percent without prior approval of the Coos Bay Fire Department.

The applicant is proposing a 20x120 foot hammer head turn around, as shown on Attachment 6 Sheet C-17 Unnamed Drive Plan and Profile.

Sanitary Sewers: 18.20.050 Sanitary Sewer Connections

In accordance with the Coos Bay Municipal Code, each residential, commercial or industrial building is required to have a separate connection to the public sanitary sewer. Exceptions are allowed per CBMC 13.15.170.

(1) Connection of Sanitary Sewer Laterals. Connection of sanitary sewer laterals to the public sanitary sewer main must conform to the standard details. The cost of new lateral connections or extensions is the responsibility of the property owner.

No connections to the City of Coos Bay sanitary sewer system are proposed.

Stormwater Management Systems: 18.25.040 Permanent Stormwater Management Systems

(1) Flow Calculations and Sizing Methodology. Runoff calculations and pipe sizing performed by a registered engineer are required, and should be based on anticipated build-out. All future anticipated impervious surfaces in the development such as streets, walkways, driveways, roofs, patios, etc., should be accommodated when designing stormwater improvements.

Hydrologic calculations for drainage basins/watersheds less than 200 acres shall utilize the rational method. Hydrologic calculations for drainage basins/watersheds greater than 200 acres shall utilize the unit hydrograph method. Storm drain design shall utilize a 25-year, 24-hour duration return interval. Design for storm drain improvements for state highways (improvements associated with state highways must have ODOT approvals) or arterial roads shall utilize the 50-year, 24-hour duration return interval. In cases where roadway overtopping is likely, a 100-year, 24-hour return interval shall be utilized for design. Refer to the city of Coos Bay stormwater master plan and the ODOT Hydraulics Manual for calculating peak flows utilizing the rational method and unit hydrograph method. Selection of methodology is at the

discretion of the design engineer. Calculations should be confirmed using a second analysis method, also selected at the discretion of the designer.

(2) Inlets, Catch Basins and Stormwater Pretreatment. Inlets and catch basins in the public right-of-way shall be constructed per standard details. Inlets and catch basins on private property shall comply with plumbing code requirements.

Pretreatment of stormwater destined for conveyance in a public storm drain system is recommended. Pretreatment may be accomplished through the use of biofiltration swales, catch basin inserts, or other methods approved by public works which are designed to remove oil and grease, trash, debris, sediment, and other pollutants associated with development. Any catch basin inserts proposed for use on public facilities or located within public right-of-way will require approval of public works.

(3) Storm Drain Manholes. Manhole design shall conform to the following:

(a) Storm drain manholes shall be provided at least every 500 feet, at each change in pipe grade or alignment, and at each junction of two or more lines. Manhole lids shall have a minimum of six inches of clearance from the edge of curbs and shall not be in wheel paths of the traveled way.

(b) All manholes shall be a minimum of 48 inches in diameter.

(c) Inside drop and water quality manholes shall be at least 60 inches in diameter with at least 42 inches of clear space.

(d) Storm drain manholes shall meet the requirements of standard details in Chapter 18.35 CMC. Channelization is required in storm drain manholes.

(4) Storm Drain Pipes. The city allows the use of the following materials for storm drain piping:

(a) Pipe meeting ASTM D3034 SDR 35 specifications.

(b) High-density polyethylene (HDPE) pipe with fused joints. Joints shall be de-beaded.

(c) Dual wall corrugated HDPE pipe with smooth interior wall (for example, ADS N-12 piping for diameters of 24 inches and less; and ADS SaniTite for diameters of 30 inches and larger).

Storm drain piping shall otherwise meet the requirements of CBMC 18.20.020, except that the minimum storm drain pipe size shall be eight inches.

Green locate wire and tracer tape shall be installed as shown in standard details.

(5) Connection of Private Drains to the Public Storm Drain. Private drains may be connected directly to the public stormwater system, if approved by public works. Public storm drain pipes six-inch diameter and larger shall be connected at a nearby manhole or catch basin rather than directly to public stormwater pipelines. All connection points shall be approved by public works.

For private developments adjacent to residential streets, small private drains for individual lots may be piped under the sidewalk and through the curb, for discharge to the street gutter; provided, that there is two inches of freeboard from the water surface elevation (25-year, 24-hour storm event) to the top of curb and eight feet of the traveled way is dry. For highways and arterials, drainage under the sidewalk will be allowed on a case-by-case basis. Owner is responsible for any damage that occurs to sidewalk as a result of the drain. Gutter discharge points shall be approved by public works. Discharge points cannot adversely impact adjacent neighbors or cause flooding/ponding within the public right-of-way. The owner may be required to employ low impact development devices to capture runoff and reduce the volume and duration of runoff that enters into the gutter as a result of the private development. Public works may

require connection to the public stormwater system where gutter discharge has the potential for detrimental effects.

(6) Retention and Detention Facilities. Proposed improvements cannot adversely impact downstream drainages. If there are adverse impacts, the downstream system shall be mitigated or the increase in volume and durations on site shall be mitigated.

(a) Detention Flow Control Structures. Structural detention facilities such as tanks, vaults and oversized pipes shall be designed to prevent surcharge of downstream piping systems during storm events.

(i) The following criteria apply to detention basins:

(A) When required, on-site stormwater detention facilities shall be designed to capture runoff so the post-development runoff rates from the site do not exceed the predevelopment conditions, based upon a two-year through 25-year, 24-hour return storm. Volume and duration of predevelopment conditions will be considered.

(B) Detention basin shall have an emergency spillway designed to pass the 100-year storm event.

(C) In soils where groundwater may induce flotation and buoyancy, measures shall be taken to counteract these forces with concrete ballast, earth backfill, concrete anchors, or other counteractive measures. Calculations demonstrating stability shall be submitted to public works.

(ii) Flow control structures must be approved by public works and must meet the following design criteria:

(A) Refer to the ODOT Hydraulics Manual for orifice and weir flow control equations.

(B) Weir must be accessible (e.g., for backhoe, dump truck, and personnel) for maintenance.

(C) The control structure shall be designed to pass the 100-year storm event as overflow (emergency spillway), without causing flooding of the contributing drainage area.

(7) Operation and Maintenance Plans. A plan outlining the scope of activities, schedule and responsible parties for periodic inspection and maintenance of permanent stormwater facilities shall be prepared and included with the construction submittal. This plan shall cover vegetation management, structural repairs, sediment removal and other activities necessary for the continued long-term function of the stormwater facilities.

See Attachment 6 Sheets C-5 Grading & Drainage Plan, C-6 Utility Plan-Storm, C-7 Wet Pond Section, and Attachment 12 Storm Drainage Mitigation Design Report.

The proposed storm drainage system is designed to meet City of Coos Bay water quality standards.

The overflow is proposed to connect to the City of North Bend storm drain, as depicted in Attachment 6 Sheet C-6 Utility Plan-Storm.

Site Grading and Erosion Control: 18.30.020 Site Development Permits, 18.30.030 Grading and Fill Requirements, and 18.30.040 Other Requirements

18.30.020 Site Development Permits

(1)(a) Site development permit is required for all proposed grading (excavation or fill) activity within the city of Coos Bay, including but not limited to lot leveling, slope grading, site drainage, retaining wall excavation and fill, and other grading activities associated with site development.

(b) Site development permits are not required for sites on which excavation is limited to footing or foundation excavations and utility trenches. These items shall be covered under the building permit. This does not exempt these activities from installing the appropriate temporary sediment and erosion control measures during the construction activity.

(c) Site development permits, when required, shall be obtained from the city of Coos Bay public works department. The permit application form is available on the city's website or from the public works department.

(d) A bond shall be required to ensure that the work is done to city standards. The bond will be forfeited if the work is not inspected and approved by public works.

(2) Grading Plan.

(a) Each application for a site development permit shall be accompanied by a plan which clearly shows the nature and extent of the work proposed.

(b) A geological study prepared by an Oregon licensed geotechnical engineer or (depending upon the nature of the project) a certified engineering geologist is required to be submitted to and approved by public works prior to grading and/or proposed new development on slopes exceeding 25 percent. The study shall address overall slope stability, before, during, and after disturbance and/or development. Geological recommendations shall include methods for maintaining slope stability and managing stormwater during construction. All geological recommendations shall be incorporated in the applicant or developer's grading permit application, and approved by the engineer upon completion of construction. It is the responsibility of the owner to obtain all other necessary regulatory permits.

(c) Grading plans as described herein are intended for proposed grading, excavation, or fill projects on existing platted parcels within the city of Coos Bay. Grading plans for land division projects shall be included with plans submitted for development review as specified in Chapter 18.10 CBMC, General Requirements.

(d) The following items shall be included on each proposed grading plan:

(i) Name of the property owner and the person or firm that prepared the plan.

(ii) Site address and map parcel number.

(iii) Property lines and any easements on or across the property.

(iv) Limits of clearing.

(v) Extents of proposed grading, including depth of cut and fill.

(vi) Location of all existing and proposed buildings or structures and location of any buildings or structures within 15 feet of the proposed grading.

(vii) Location of any existing or proposed retaining walls (label wall height).

(viii) Location of any existing or proposed drainage courses or piping.

(ix) Configuration of all proposed cut and fill slopes (i.e., 2H:1V).

(x) Existing and proposed topography with two-foot contour intervals. [Ord. 479 § 1 (EDS § 6.2), 2016].

18.30.030 Grading and Fill Requirements

(1) Fill slopes shall not exceed two feet horizontal to one foot vertical (2:1) unless approved by a qualified Oregon licensed geotechnical engineer or (depending upon the nature of the project) a certified

engineering geologist. The toe of fill slopes shall be set back from property boundaries at least one-half the height of the fill with a minimum of two feet and a maximum of 20 feet. Where a fill slope is to be located near the property boundary, precautions shall be taken to protect the adjoining property from damage as a result of such grading. These precautions may include but are not limited to:

(a) Additional setbacks.

(b) Provision for retaining or slough walls.

(c) Mechanical or chemical treatment of the fill slope surface to minimize erosion.

(d) Provisions for the control of runoff.

(2) Cut slopes shall be no steeper than two feet horizontal to one foot vertical (2:1) unless a geological study prepared by an Oregon licensed geotechnical engineer or (depending upon the nature of the project) a certified engineering geologist is submitted which justifies that a steeper slope can be safely constructed and will not create a hazard to adjoining public or private property. The top of cut slopes shall not be made nearer to a site boundary line than one-fifth the height of cut, with a minimum of two feet and a maximum of 10 feet.

(3) Surface vegetation and topsoil must be grubbed to a depth of at least six inches prior to placement of fill material. All existing vegetation must be removed from areas designated to receive fill prior to placement.

(4) Fill material shall be free of all rubbish, organic material, and other deleterious substances which could be detrimental to the stability of the fill.

(5) Fill shall be compacted to at least 90 percent of maximum density as determined by the ASTM D1557 (Modified Proctor) test method. Fill material shall be placed in lifts not exceeding 12 inches compacted depth.

(6) A report prepared by an Oregon licensed geotechnical engineer, or (depending upon the nature of the project) a certified engineering geologist is required when fills in excess of 12 inches are planned within future building areas. The specified fill material shall be placed and compacted in accordance with the recommendations of the report. Any required testing shall be as recommended in the report.

(7) Disturbed areas not scheduled for construction of buildings or other improvements shall be stabilized with permanent erosion control to prevent erosion once grading is complete. Stabilization shall be completed within 30 days of the date all grading is finished. Temporary stabilization measures may also be required prior to completion of the project if the city determines it is necessary due to windblown dust or erosion at the site. [Ord. 479 § 1 (EDS § 6.3), 2016].

18.30.040 Other Requirements

(1) For sites located partially or entirely within a special flood hazard area as identified on the FEMA Flood Insurance Rate Maps, the project must meet the requirements of Chapter 17.318 CBDC, Flood Damage Prevention. An engineering evaluation to determine the impact of fill on floodwater elevation may be required.

(2) A biological evaluation may also be required to determine impact to endangered species and/or their habitat.

(3) The disturbance of one or more acres requires application for a National Pollutant Discharge Elimination System (NPDES) General Permit 1200-C as administered by the Oregon Department of Environmental Quality (DEQ). The application form is available online or can be obtained from the local

DEQ office. Issuance of a site development permit from the city of Coos Bay does not meet or negate the requirement to obtain an NPDES General Permit 1200-C.

(4) Excavations exceeding 5,000 cubic yards within a 12-month period require an operating permit from the Oregon Department of Geology and Mineral Industries (DOGAMI). Application forms are available online or by contacting DOGAMI at (971) 673-1555.

(5) If the proposed grading includes import or export of materials, a heavy hauling permit may be required by the city of Coos Bay. Heavy hauling permits require bonding to insure against damage to existing infrastructure within the right-of-way (see Chapter 12.05 CBMC). The amount of bonding required is based on the volume of import/export and will be determined by public works. [Ord. 479 § 1 (EDS § 6.4), 2016].

See Attachment 6 Sheets ESC 1 and 2 Erosion and Sediment Control Plans, and the soils report in Attachment 12 Storm Drainage Mitigation Design Report, for the applicant's proposed erosion and sediment control plan.

The applicant will obtain a NPDES General Permit 1200-C.

If required, the applicant will also submit a Public Works Permit (site development permit) application to the City of Coos Bay prior to site development, meeting the requirements of 18.30.020 through 10.30.040, above. Should this be required, the applicant proposes to submit the same details which are proposed in this application and the accompanying plan set to Public Works.

PUBLIC RIGHT OF WAY VACATION APPLICATION

Public Right of Way Vacation: 12.45.030 Individual ROW Vacation Request

An individual may request a ROW vacation for council action subject to the requirements of this chapter by submitting the following to the public works/community development director (director) or his/her designee as a part of the pre-application meeting as noted in CBMC 12.45.040:

(1) A city ROW application form.

(2) At the discretion of the director, a legal description may be required.

(3) A notarized statement of the individual requesting the vacation that owners of the "real property affected nearby" as defined by state statute have been notified of the pending request before the city. This statement will include a copy of the names and addresses of the owners of real property affected thereby. For the purposes of this section, "real property affected thereby" shall be the land lying on either side of the street or portion thereof proposed to be vacated and extending laterally to the next street that serves as a parallel street, but in any case not to exceed 200 feet, and the land for a like lateral distance on either side of the street for 400 feet along its course beyond each terminus of the part proposed to be vacated. Where a street is proposed to be vacated to its termini, the land embraced in an extension of the street for a distance of 400 feet beyond each terminus shall also be counted.

(4) A map of the ground proposed to be vacated, the purpose and justification for the vacation, and if applicable, a plat showing the proposed manner of replatting or rededication.

(5) Any fees required by the city to process the ROW vacation request. The city recorder shall obtain from the individuals requesting council action on a ROW vacation a sum sufficient to cover the cost of publication, posting and other anticipated expenses. The city recorder shall hold the sum so obtained until the actual cost has been ascertained, when the amount of the cost shall be paid into the city treasury and any surplus refunded to the individual requesting the ROW vacation.

See Attachment 5 Right of Way Vacation Application.

Public Right of Way Vacation: 12.45.010 General

(1) The city may find it appropriate and necessary to vacate a public right-of-way (ROW) (street, court, alley, plat, or other public place) when the public interest will not be prejudiced by the proposed vacation. Example of an instance where the public interest would be prejudiced includes but is not limited to a situation where the vacation would adversely affect public access or hinder efficient development. Vacation may be found to be appropriate and necessary for municipal purposes or to promote public welfare.

(2) No public right-of-way (ROW) may be vacated without the consent of the owners of the abutting property if the vacation will substantially affect the access or market value of such property, unless the city governing body provides for paying damages. If the ROW vacation was requested by an individual as defined in subsection (6) of this section, provision for paying such damages shall be funded by the individual requesting the ROW vacation for a local assessment to be managed by the city but funded by the individual.

[…]

See Attachment 5 Right of Way Vacation Application. The applicant is submitting this application concurrently with their application for preliminary subdivision plat approval.

The applicant is proposing to vacate the northmost 50x160 foot section of Maxwell Street (as shown on the map in Attachment 5); this street section is currently undeveloped.

The justification for this vacation is as follows: the only properties served by this section of maxwell are Subject Property. Because Subject Property will be accessed via the new connection at Connecticut Avenue, this section of Maxwell Street will no longer be of potential use as a right of way.

Parcel 210: Mag 7 Enterprises, LLC: established access via Roosevelt Street

Parcel 209: Newsum, John & Lisa L.: established access via Roosevelt Street

Parcel 4000: proposed as part of this subdivision application. Access off of newly constructed Unnamed Private Drive.

CITY OF COOS BAY
Public Works & Community Development Department
500 Central Avenue, Coos Bay, Oregon 97420
Phone 541-269-8918 Fax 541-269-8916

Permit No. **187-** _____

Date Received: _____

LAND USE APPLICATION

[1]**Type of Review** (Please check all that apply):

- ☐ Annexation – *Type IV*
- ☐ Appeal and Review – *Type III*
- ☐ Architectural Design Review - *Type III*
- ☐ Accessory Dwelling Unit – *Type II*
- ☐ Conditional Use – *Type III*
- ☐ Cultural Resources – *Type III*
- ☐ Estuarine Use/Activities – *Type Varies*
- ☐ Home Occupation/Non-Retail Sales – *Type I*
- ☐ Home Occupation/Retail Sales – *Type III*
- ☐ Legislative/Text Amendment – *Type IV*
- ☐ Lot Line Adjustment – *Type I or Type III*
- ☐ Partition – *Type II*
- ☐ Planned Unit Development – *Type II or Type III*
- ☐ Site Plan Review – *Type Varies*
- ☐ Subdivision – *Type III*
- ☐ Temporary Use – *Type I*
- ☐ Vacation Rental – *Type II*
- ☐ Variance – *Type Varies*
- ☐ Zone Change – *Type IV*
- ☐ Other_____

1. Near: West of Intersection of Roosevelt St & Connecticut Ave — 25S13W08/200 & 25S13W17AA/4000 (Acct #s 331150 & 311300)
   Site Location/Address — Assessor's Map No./Tax Lot(s)

   LDR-6 Overlay — Approx. 11 Acres
   Zoning — Total Land Area

2. Red Moon Development & Construction Inc — 6589 S Kings Ranch Rd, Ste 103J, Box 6, Gold Canyon AZ 85118
   Applicant/Owner Name — Address

   bwoodruff01@gmail.com; cc: redmoonaz@aol.com
   Phone — Email

3. Hailey Sheldon — 444 N 4th Street, Coos Bay OR 97420
   Applicant's Representative Name — Address

   (541) 968-4686 — hailey@sheldonplanning.com
   Phone — Email

4. Detailed Description of Proposal; attach additional sheets as necessary:

See attached.

You must also provide:

- Evidence of ownership or written statement from the owner that you are authorized to represent him/her.
- Copy of the deed for the subject property.
- Description that addresses the Decision Criteria or Goals/Standards (can be provided by City staff) outlined in the Coos Bay Municipal Code chapter(s) related to your request.
- Additional information, including but not limited to: date construction is expected to begin; estimated completion date of the total project and of individual segments; and anticipated future development.
- Type II and Type IV applications require: **three (3) complete single-sided hard-copy sets** of application and submitted documents and a digital file with all application materials; text sections of the application must be in Word format. Additional hard-copy sets may be required.
- Type III applications require: **ten (10) complete single-sided hard-copy sets** of application and submitted documents; text sections of the application must be in Word format. Additional hard-copy sets may be required.
- Fees related to application as required by the City. This information can be provided by City staff.

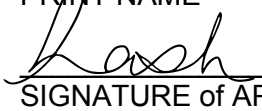
[1] ***Pre-Application and Appeal applications require a different application form, inquire of staff***

ATTACHMENT 1

I hereby certify that I have read and examined this application and know the same to be true and correct. I am the property owner of the site subject to this application. I hereby authorize the filing of this application. Acceptance of this application does not infer a complete submittal. I certify that the information and exhibits herewith submitted are true and correct. I understand that the processing of this application, and the filing fee paid, in no way obligates the City or its representatives to grant or otherwise authorize my request. I agree to pay the fees required for the land use permits associated with this application and any additional expenses for professional services incurred by the City in processing this application should such services be required due to staffing limitations. I also guarantee City access onto and through the project site for purposes of processing this application.

SIGNATURE of APPLICANT/OWNER — DATE

PRINT NAME



SIGNATURE of APPLICANT'S REPRESENTATIVE — 09/11/2020 DATE

Hailey Sheldon

PRINT NAME

CITY OF COOS BAY
Community Development Department

500 Central Avenue Coos Bay, OR 97420

541.269.8918
www.coosbay.org

PRE-APPLICATION CONFERNCE NOTES

July 30, 2020

APPLICATION #: 187-20-000032-PLNG

SUBJECT PROPERTY: Maxwell Road (25-13-08-200)
Project Name: The Bluffs

TYPE OF REQUEST: **Proposed Subdivision**
Proposed 13 single family residences, with proposed sanitary sewer, drainage and access through City of North Bend. Nearest utilities are located at intersection of Roosevelt and Connecticut in City of North Bend. Low impact Development (LID) and Best Management Practices (BMP) will be utilized to mitigate water quality runoff and provide effective temporary/permanent Erosion and Sediment Control. Vegetated detention swales with check dams for treatment and controlled outflow. Proposal includes Public or Private roadway development, utility extension, approximately 8,300 CY of cut and 11,300 CY of fill, for a net balance of approximately 3,000 CY fill for this single-family development.

ATTENDEES: **City Staff:** Debbie Erler and Jessica Spann.
Carolyn Johnson (Via Microsoft Teams)
Applicant Representatives: Justin Wilson and Dan Kyleberg

DATE: Monday, July 27, 2020 at 2:00 Via Microsoft Teams and in Person at the Coos Bay City Hall conference room.

All Coos Bay code chapters referenced in this report are available on the City's website at https://www.codepublishing.com/OR/CoosBay/

APPLICANT UPDATES/CLARIFICATIONS: The applicant's representatives provided the following additional information/clarifications at the time of the conference:

- They intent is to development a gated single-family dwelling community, with private roads and utilities. The lots will be developed by the owner/contractor one at a time, to allow flexibility adjust with the market.
- They are preparing a possible alternate subdivision design that would replace the proposed Cul-de-sac with a hammerhead turn-a-round.
- There may be single-family dwelling in excess of 3,500 square feet (including the attached garages).

ATTACHMENT 2

- They would like to construct rolled curbs.
- They propose pressure sanitary sewer for each property, connecting to the City of North Bend's sanitary and storm drain system.
- They intend to access gain access from easements and platted streets in the City of North Bend.
- They would like to propose the vacation of Maxwell Road abutting their property at Tax Lot #400.
- The proposed retaining walls will range in height from 4-feet to about 10-feet (Lots 1 & 2).
- They plan to submit the complete application by the end of August.
- Before submitting the application, the applicants will participate in a joint meeting with the City of Coos Bay and North Bend to help determine order of application's and approvals.

1. TYPE OF APPLICATION AND/OR APPLICABLE DEVELOPMENT CODE STANDARDS

The applicant must address all the applicable development standards and applicable criteria found in the Coos Bay Municipal Code; These include, but may not be limited to the following:

- Building and Fire Code (CBMC Title 15)
- Engineering Design Standards (CBMC Title 18), including 18.15.010 City street and private standards.
- Procedures (CBMC 17.130)
- Low-Density Residential (LDR-6 Overlay), including the Property development requirements (CBMC 17.220)
- Accessory Dwelling Units (CBMC 17.312)
- Off-Street Parking and Loading Requirements (CBMC 17.330)
- Public Right of Ways – Streets, Sidewalks & Public Places (CBMC Title 12)
- Public Utilities and Service (CBMC Title 13)
- Site Plan Review CBMC Chapter 17.365, including criteria for site plan approval.
- Supplementary Development Standards (CBMC 17.335)
- Zero Lot Line Development (CBMC 17.340)
- Planned Unit Development (CBMC 17.362)
- Subdivisions (CBMC 17.367)
- Variance (CBMC 17.372)

2. PROCESS SUMMARY/ TIME FRAME FOR REVIEW PROCESS

The applicant will submit land use application for a Type III "Subdivision" before the Planning Commission. The standards noted in this checklist are those which staff believes may be applicable to your proposal. Additional standards/applications may also be determined applicable at the time of a development submittal. The burden is upon the applicant to review all applicable City documents and address all the relevant standards.

Review Process:

- Pre-application conference (completed).
- Application submittal.
- Staff review for completeness (allowed up to 30 days).
- If the application is determined to be incomplete, the applicant will have 180 days from the date of incomplete letter to submit additional information. If complete, the review shall not exceed 120-days for a final decision, including appeals to the City Council. Appeals to LUBA fall outside the 120-day review process.
- When application is determined to be technically complete, the applicant is vested.
- The hearing date is set before the Planning Commission.
- Public notices are mailed twenty (20) days prior to the hearing date.

- Staff report is prepared and made available to the applicant at least seven (7) days before the date of the Planning Commission public hearing for approval or denial based upon the staff recommendation and the criteria found in the CBMC.
- A Final Order is provided within seven (7) days of the decision.
- A mandatory 15-day appeal period follows the Final Order and if no appeal is filed the decision becomes final.
- Coos Bay City Council must approve any public improvement prior to the subdivision plat being recorded.

3. DOCUMENTATION REQUIRED FOR A COMPLETE APPLICATION

The required land use application form is attached. Use one application for all review types. Mark each check-box that apply.

One copy of the proof of ownership and authorization by the owner allowing the given representative to act as the owner's agent in the land use and/or development process (if applicable).

The following items are required to be submitted in ten collated sets in addition to one digital copy:

- Application form signed by the owner or applicant.,
- Subdivision plans/Details (CBMC 17.367). This includes the following:

(1) Written authorization to file the application signed by the owner of the property that is the subject of the application, if the applicant is not the same as the owner as listed by the Coos County assessor.
(2) Proof of ownership document, such as copies of deeds and/or a policy or satisfactory commitment for title insurance.
(3) A legal description of the property proposed to be divided.
(4) A copy of the pre-application conference summary, if the application was subject to pre-application review, and all information required to address issues, comments and concerns in the summary.
(5) A written description of how the proposed preliminary plat does or can comply with each applicable approval criterion for the preliminary plat, and basic facts and other substantial evidence that supports the description (Example provided to applicant's representative).
(6) Applications necessarily associated with the preliminary plat, such as applications for exceptions, adjustments or variances to dimensional requirements of the base or overlay zones or for modifications to the adopted Coos Bay road standards that are required to approve the preliminary plat application as proposed.
(7) Evidence that potable water will be provided to each lot from a public water system, and that each lot will be connected to public sewer.
(8) A plan showing proposed phasing if the applicant proposes to develop the subdivision in phases. Reports such as drainage and traffic impact analysis, if required.

4. LAND USE APPLICATION FEES*

Subdivision	$1,956 + $27 per lot
Variance (to maximum lot size)	$280
Noticing/Mailing	$100
Technology Fee	5 percent of total fees
Review from outside professional (if needed)	As authorized/billed

*Note: Please verify the required fees prior to application submittal.

5. CONFERENCE NOTES/COMMENTS

The following are items that were submitted by department or agencies or were discussed during the conference or are items that may apply to the proposed development. Comments provided below are based on preliminary information provided by applicant and/or applicant's representative. Comments are subject to change as City staff is presented with more detailed information.

City of North Bend

- Comments received July 13, 2020 from Ralph Dunham, City of North Bend, Director of Public Works (541-756-8586 or rdunham@northbendcity.org).

  The applicant proposes to connect to City of North Bend street system, sanitary sewer system & likely storm drainage system. It is likely all utilities will be routed off the end of Roosevelt, on to the proposed Connecticut Ave. extension to access the property. The City of North Bend has reviewed the ability to connect, and has authorized connection contingent upon meeting City of North Bend development standards for the utilities and street improvements which are within our City limits. Attached are City council meeting agenda item and approval documentation (approval to connect and to open the right of way based upon City Standards). Note the approval includes an $1,100/year street maintenance fee (total for all units as Coos Bay will be collecting State & Federal gas tax funds for the development – with 90% or more of the street use being in North Bend), along with paying normal City connection fees and user fees on storm & sanitary sewer services.

  Applicable sections of the City of North Bend Code are provided below for review related to design and operation are as follows:

  10.12 Transportation Facilities & Improvements (specifically 12.12.120-160)
  https://northbendor.municipal.codes/NBCC/10.12.120.

  12.16 related to street grade requirements.
  https://northbendor.municipal.codes/NBCC/12.16.010

  Article IV. Streets
  • 10.12.120 General.
  • 10.12.130 Minimum right-of-way and roadway widths.

  Article V. Pedestrian Access and Circulation
  • 10.12.140 Pedestrian pathways.

  Article VI. Improvements
  • 10.12.150 Improvement standards.
  • 10.12.160 Improvement requirements.

  Street acceptance guidelines (https://northbendor.municipal.codes/NBCC/17.16.010), Street improvement guidelines (https://northbendor.municipal.codes/NBCC/17.28.010)

  Any sanitary sewer public improvement will be required to be submitted and approved by DEQ, Water main extension by CB-NB Water Board and shall comply with the applicable sections of Title 13 of the NBMC.

<u>Note a couple of possible issues</u>. First, The City of North Bend has the capacity to connect to our storm system which parallels the property on the east side of the subject property. It is however on Airport property which we have an easement for the main – and is located approximately 30 feet east of the subject property east line. Any connection to the system outside of the Connecticut St. right of way (high side in elevation) would require an easement from the Airport District.

No detention would be required if connected to the City of North Bend system, however the City of Coos Bay will require water quality improvements.

A street light may be required depending upon existing spacing (one exists at Chinook & Roosevelt) however maximum spacing is 250 feet and it will be close – although would likely make more sense at the intersection of Connecticut and Roosevelt.

The City of North Bend will not require a traffic study, as the proposal only generates roughly 138 trips per day.

- Comments received July 16, 2020 from Chelsea Schnabel, City of North Bend, City Planner (541-756-8535 or cschanbel@northbendcity.org).

  The subject property is immediately adjacent City of North Bend city limits, land zoned for single-family dwelling use (R-7) and for airport uses including residential uses when outside of a noise impact area (A-Z). That portion of the A-Z zoned parcel immediately adjacent to the North of what is now unimproved Connecticut Avenue could be developed with low or high-intensity residential use.

  Connecticut Avenue and Roosevelt Street are both currently classified in the City's adopted TSP as local streets.

  There is an existing off-street path (part of our adopted Parks & Rec Master Plan) located immediately adjacent the site on the Airport property that connects the Airport Heights neighborhood to the Empire Lakes area.

<u>Engineering</u>

Updated Engineering comments received July 30, 2020 from Jessica Spann, (541.269.8918) as follows:

Project comments are preliminary based on information provided with the Land Use Pre-Application. All comments provided by the preparer should not be construed as a final finding. Final findings of the engineering staff shall be provided during the Land Use Process.

<u>Site Development (Grading/Cut/Fill)</u> Project narrative states that approximately 8,300 CY of cut and 11,300 CY of fill, for a net balance of approximately 3,000 CY fill for this single-family development. Based on the project narrative a grading permit will be required. The submission of the grading permit can run concurrently with your Land Use application; however, you do so at your own risk. It will be the applicant's responsibility to comply with Coos Bay Municipal Code (CBMC) 18.30 Site Grading and Erosion Control for cut and fill requirements.

1. *Cut slopes shall be no steeper than two feet horizontal to one-foot vertical (2:1) unless a geological study prepared by an Oregon licensed geotechnical engineer or (depending upon the nature of the project) a certified engineering geologist is submitted which justifies that a steeper slope can be safely constructed and will not create a hazard to adjoining public or private property. The top of cut slopes shall not be made nearer to a site boundary line than one-fifth the height of cut, with a minimum of two feet and a maximum of 10 feet. Based on site plan it does not appear that setbacks comply with this requirement. Applicant shall confirm whether or not cut slopes exceed 2:1.*

   The top of cut slopes shall not be made nearer to a site boundary line than one-fifth the height of cut, with a minimum of two feet and a maximum of 10 feet. Based on site plan it does not appear that setbacks comply with this requirement. Applicant shall confirm whether or not cut slopes exceed 2:1.

2. Fill slopes shall not exceed two feet horizontal to one-foot vertical (2:1) unless approved by a qualified Oregon licensed geotechnical engineer or (depending upon the nature of the project) a certified engineering geologist. The toe of fill slopes shall be setback from exterior property boundaries at least one-half the height of the fill with a minimum of two (2) feet and a maximum of 20 feet. Where a fill slope is to be located near the property boundary, precautions shall be taken to protect the adjoining property from damage as a result of such grading. These precautions may include but are not limited to:

   a. Additional setbacks.
   b. Provision for retaining or slough walls.
   c. Mechanical or chemical treatment of the fill slope surface to minimize erosion.
   d. Provisions for the control of runoff

3. *On the provided conceptual lot layout it appears the majority of the proposed work is to excavate (cut) the existing ground; however, <u>If applicant is proposing to fill in excess of 12" then</u>: A report prepared by an Oregon licensed geotechnical engineer, or (depending upon the nature of the project) a certified engineering geologist is required when fills in excess of 12 inches are planned within future building areas. The specified fill material shall be placed and compacted in accordance with the recommendations of the report. Any required testing shall be as recommended in the report*

Based on topography at the southern portion it appears that there is significant cut and there may need to be in place a retaining wall. Retaining walls may be required to be engineered, and calculations provided to support the design and installation thereof. Once more information such as location, height etc. can be provided, a determination on whether or not it is a permitted structure can be provided. However, if permits are required and thus engineering this will not be required at the Land Use phase.

<u>Drainage</u> During the pre-application meeting it was stated that the vegetated detention swales with check dams for water quality treatment and controlled outflow will be changing. Once more information can be provided Engineering will provide further comments.

CBMC 18.25 Stormwater Management Systems states that all projects disturbing 1,000 square feet or more shall incorporate permanent storm water management controls. Overall, the construction will be increasing the impervious area and site must maintain historic drainage conditions. Project will be required to submit a stormwater analysis for review and approval prior to issuance of Building Permits. Site must mitigate for any adverse impacts, and post project flows shall not exceed pre-project levels. Drainage from the site cannot adversely impact adjacent property's, right of ways or downstream systems.

The permanent storm water management controls must be installed onsite and maintained into perpetuity. Applicant must submit for review and approval an inspection and maintenance procedure manual for the permanent water quality features prior to Building Permit issuance. Once approved, these procedures will be recorded with a Declaration. The City will prepare the Declaration and the owner will be responsible for recording fees.

Sanitary Sewer Project narrative states the proposed sanitary sewer shall be connected to the City of North Bend's system. The applicant will be responsible to obtain the necessary approvals/permits from the City of North Bend for connecting to their system.

In the pre-application meeting it was discussed that all sanitary sewer utilities will be private. It was determined that a sanitary sewer permit through the City would not be required for the connection of private laterals to the private sanitary sewer system.

In the event that the applicant decides to connect to the City of Coos Bay sanitary sewer system the applicant will be required to provided additional information for further evaluation. In CBMC 18.20 Sanitary Sewers provides information for the design of public sanitary sewers. The following sanitary sewer design standards have been developed with the goals of proper sizing for current and future flows, correct installation for long life, ease of access for maintenance and repair while taking into account construction cost.

Private sanitary sewers constructed on private property must be designed according to the Oregon Plumbing Specialty Code.

Storm Sewer Project narrative does not reference any new storm drain connections associated with this project. Submitted conceptual lot layout does not portray any storm water improvements. If project does intend to add any new storm sewer infrastructure, this clarification must be submitted along with information as to how this discharge will not affect adjacent properties and/or right of ways with the Land Use Application.

The conceptual lot layout did not show outfall locations. Drainage from the site cannot adversely impact adjacent property's, right of ways or downstream systems. Once more information can be provided Engineering with provide further comments.

Transportation Project narrative states that 13 single family residences are being proposed. Chapter 18.40 Traffic Impact Analysis Requirements: Applicants for development and redevelopment projects expected to create 20 or more residential units (e.g., single family residential lots, apartment/condo units) or 20,000 square feet or more of commercial/industrial space shall evaluate the project's transportation system impacts in a transportation impact analysis (TIA). Therefore, a Traffic Impact Analysis will not be required

Road access Based on the pre-application meeting the applicant stated that the road would be Private. It was discussed to have rolled curbs versus City standard curbs. In the Coos Bay Municipal Codes Chapter 18.10.060 design exceptions it states the following: "A documented design exception is required for any design or construction deviation from the City design standards. Exceptions may be granted by public works upon evidence that such adjustments are in the public interest. Requirements for safety, function, fire protection, transit needs, appearance and maintainability based upon sound engineering and technical judgment must be fully met."

The City will not construct or add to its existing inventory of city-maintained streets or access roads unless they meet all standards provided in CBMC 18.15.010. However, in cases where public street standards cannot be met, the developer may elect, with concurrence by public works, to construct a privately maintained access road to serve an infill development. Said privately maintained access road shall be constructed on private property.

Privately maintained streets and access roads may be developed exclusively within private property and the following conditions shall apply: 1) The maximum number of dwelling units potentially served by the access road shall be three. Streets having the potential to serve more than three dwelling units must meet the requirements in CBMC 18.15.010 and the City of Coos Bay Transportation System Plan.

The applicant must adhere to the: "City of Coos Bay Transportation System Plan" prepared for the City of Coos Bay by DKS Associates, and adopted in January 2004 & CBMC 18.15 Transportation Facilities. However, work has been underway to update the City's TSP from 2004. A draft 2020 TSP document has been prepared and goes to council August 18th. It will then be adopted sometime in August or September. Depending on when your Land Use applications are deemed technically complete will depend on which TSP you are required to adhere to.

Demolition: There are no buildings currently on the property therefore, project does not need a demolition permit.

Offsite Improvements Project narrative states access through the City of North Bend. Permissions to perform the offsite work for properties (tax lot 400) not owned by the applicant must be obtained prior to Building Permit issuance. It is the applicant's responsibility to obtain all approvals from the City of North Bend prior to submitting building permits.

The following permits, permissions and information are not required at the time of the Land Use Application but will be required when building permits are submitted:

- *A right of way use permit will be required for all work in the City right of way (Maxwell Road).*
- *The applicant is responsible to obtain all necessary permissions to construct the 13 single family residences on subject property (Tax Lot 100) and to construct on adjacent Tax Lot 400, as marked in the plans.*
- *The easement for purposes of ingress and egress, street improvements, curbs, all underground and overhead utilities that was provided with the pre-application does not appear to transfer to a new owner of the property. This will need to be further vetted out providing documentation that this does transfer to the new owner. In the event this does not transfer to the new property owner it is the applicant's responsibility to acquire appropriate easements for purposes of ingress and egress on affected lots.*

- *It does not appear that there are any trees that will be removed from the right of way (Maxwell Road). If trees in the right of way are to be removed a Tree Removal request is required and will be processed through the tree board.*
- *In the pre-application meeting it was discussed a potential vacation of Maxwell. The applicant with be required to go through the vacation process.*

COORDINATION WITH OTHER AGENCIES

- Applicant will be responsible to obtain plumbing and electrical permits through the state.
- Applicant will be responsible to obtain utility approvals from the appropriate utility (Coos Bay North Bend Water Board, NW Natural, Pacific Power, etc.)
- Applicant is responsible to obtain all required regulatory approvals from the appropriate entity including but not limited to Department of Environmental Quality, Army Corps of Engineers, Fish and Wildlife, State Historic Preservation Office, Department of State Lands, local tribes, etc.

GENERAL NOTE The North arrow on the conceptual lot layout appears to be incorrect.

Building Codes

Comments received on July 15, 2020 from Building Official Mike Smith (541.269.8918) indicated the following:

- Site work for permanent cut and/or fill slopes shall not be steeper than one-unit vertical in two-units horizontal. (50% slope) *Note: Deviation from this requirement may be permitted only upon presentation of an approved soil investigation report. (OSSC 3304 & 1803).
- Excavation, grading and fill soils supporting footings, foundations or surcharges shall be designed, installed and tested per ORSC R401.2 & R403, and OSSC 1804, 3304 & 1705.6. (Geo-technical report, along with compaction tests.)
- Provide and maintain approved erosion control measures.

Fire Protection and Access

Comments received July 27, 2020 from Fire Chief Mark Anderson (541.269.1191) indicated the following: *All references are from the 2019 Oregon Fire Code:*

- *Gated access must provide fire department access. Oregon Fire Code D103.5 items 1-8 addresses access gates. The best, and most common practice would be to install with the key pad (for the occupants) a Knox key override. Knox is a private company that provides locking systems with a single key for the local fire department use. It allows us to not need a special code or keep dozens of keys to different locations. Of note, per OFC, a single gate shall have an opening width of not less than 20 feet or, if the roadway is split into an entrance and exit with a gate for each, the gate width shall be at least 12 feet.*
- *The proposed access road width of 28 feet is acceptable. (Table D103.4)*
- *The access road is not to exceed 10 percent grade. (Appendix D103.2)*
- *The road surface must be paved with asphalt or concrete to provide an all-weather surface and constructed to support a load of 75,000 lbs. (Appendix D102.1)*
- *The cul-de-sac must have a minimum diameter of 96 feet. (Table D103.4)*
- *Hammerhead dimensions are also covered in OFC Appendix D. The sides of the hammerhead are to be 120 feet in total length (60 feet per side from center). The hammerhead must comply with the design (width and construction) as previously identified in the roadway standard.*

- *A hydrant able to produce at least 1000 gallons per minute (provided structures are less than 3600 square feet) must be installed within 250 feet of each building lot. (Table B105.1 and Table C102.1). If structures exceed 3600 square feet, the required fire flow increases. Up to 4,800 square feet would require 1,750 gallons per minute. If the structure is equipped with an automatic fire sprinkler system meeting NFPA 14R or 14D, the flow requirement stays at 1000 GPM regardless of the size of the structure.*

Operations

Operations will review the possibility of vacating the portion of Maxwell Road abutting the applicant's property at Tax Lot #400. Upon consideration staff will advise the applicant, and they can decide if they wish to proceed. At that time staff will provide the application and related information on the process and application fees.

Planning

While not required, planning staff encourage applicant examination of the City's Accessory Dwelling unit, Zero Lot Line Development and Planned Unit Development regulations. These regulatory tools provide layout, design and composition options for the proposed subdivision. These regulatory tools can be beneficial in doubling housing potential and affording creative and functional subdivision design. A hard copy of each is attached. Planning Staff is available to discuss in further detail.

- The proposed 13 lot subdivision indicates a proposed flag lot, which must meet the following standard.

17.367.040 Approval criteria for a preliminary plat.

(3) Flag lots are discouraged. When allowed, flag lots shall comply with the following standards:

(a) The flag pole shall provide an all-weather surface with an unobstructed vertical clearance of at least 13 feet six inches. The improved surface shall be at least 20 feet wide and be marked and signed as a fire lane.

(b) The pole portion of the flag lot does not count toward the minimum lot size.

(c) If the length of the flagpole is more than 150 feet, the applicant shall provide a turn-around at the end of the driveway in conformance with the current adopted edition of the International Fire Code, and structures on the lot shall incorporate a fire-hazard warning, including a hard-wired, back-up smoke detector, and a sprinkler system.

(d) Where flag lots are not provided but access easements across abutting properties to public or private rights-of-way are provided, the applicable city engineering standards shall apply.

Lot, flag – A lot the developable portion of which is located behind another lot that has normal street frontage. A flag lot includes a strip of land that goes out to the public right-of-way street for public access. As shown on the Lot, Flag Exhibit below, there are two distinct parts to a flag lot: the flag which comprises the actual building site located behind another lot, and the pole which provides access from the street to the flag. A flag lot generally results from the division of a large lot that does not have sufficient width for division into two lots that would both have normal frontage onto the street. Creation of a flag lot is subject to additional standards in this code.

- *As noted in CBMC Subdivisions (CBMC 17.367.060) Any construction proposed prior to final plat approval, required bonding as follows:*

  (1) In lieu of the completion of any required public improvements prior to approval of a final plat, the city may accept a bond, in an amount of at least 125 percent of the estimated cost of construction of the public improvements in question, as certified by a professional engineer and accepted by the public works and community development director, or their designee, and with surety and conditions satisfactory to the engineer, or other secure method as the engineer may require, providing for and securing to the city the actual construction and installation of such improvements within a period specified by the engineer, and specified in the bond or other agreement; and to be enforced by the engineer by appropriate legal and equitable remedies.

  (2) Construction shall not start prior to the public works department signing and approving both the construction plans and the final plat survey computations; except that rough grading operations may proceed before the plans are approved by the engineer under the following conditions:

  (a) The grading plan is submitted separately, along with an application for the grading permit.
  (b) The grading plan is in conformance with the approved preliminary plat.
  (c) The grading plan, if applicable, will not be in substantial conflict with the street profiles and drainage structure plans.
  (d) The grading permit, if applicable, is issued.

Coordination outside agencies

Applicant is responsible to obtain plumbing and electrical permits through the state. Applicant will be responsible to obtain utility approvals from the appropriate utility (Coos Bay North Bend Water Board, NW Natural, Pacific Power, etc.).

- Comments on July 23, 2020 via email, from Matt Whitty, Engineering Manager, Coos Bay-North Bend Water Board (541.267.3128 Ext 232 or email at matt_whitt@cbnbh2o.com)

  The applicant's engineer has contacted the Water Board. They were informed that water is available for the proposed development and to make a determination on line sizing and connection to the Waterboard system, they need a fire flow requirement from Chief Anderson for the large residential structures proposed for the development.

- Pacific Power, indicated if the site owner is requesting that Pacific Power give input/comment on this proposed rebuild, please have their designer/engineering group or site owner call our business center to get a request started with Pacific Power (Ph.# 888-221-7070).

  The applicant will be contacted after they have called in a request through our business center. Also, their designer can utilize our online ESR manual, available at: *http:www.pacifipower.net/esr*.

- Applicant is responsible to obtain all required regulatory approvals from the appropriate entity including but not limited to Department of Environmental Quality, Army Corps of Engineers, Fish and Wildlife, Department of State Lands, local tribes, ODOT, etc.

- Comments received via email on July 9, 2020 from Micah Horowitz, AICP ODOT Region 3 | Senior Transportation Planner.

  The proposal is about a mile from the nearest ODOT managed roadway and should not significantly affect our facilities.

- State permits include plumbing and electrical. State Building Codes Office is located at 1155 S 5th Street, Coos Bay (DMV building) #541-266-1098.

General Standards

- Noise: The noise level shall not exceed permitted levels measured at the appropriate measuring points established by the Oregon Department of Environmental Quality. If there is doubt that the proposed use will violate these standards or if a valid compliant has been registered about the level of noise, the owner or agent may be required to how written compliance with state regulations. Construction noise is also regulated by CBMC Chapter 9.20 Unreasonable noise.

- Byproducts: There shall be no emissions, odor, gas, mist, vapor, pollen, soot, carbon, acid, smoke, fume, dust, particulate matter, or other air, water, or land pollution which exceeds permitted levels of local, state, or federal regulations. If there is doubt that the proposed use will violate these standards or if a valid complaint has been registered about possible pollution, the owner or agent may be required to show written compliance with state regulations.

If there are questions, please do not hesitate to contact me.

Respectfully submitted,

Debbie Erler, Planner II
City of Coos Bay
Community Development
Ph. 541-269-1181 Ext 2259

Red Moon
DEVELOPMENT & CONSTRUCTION

September 11, 2020

To whom it may concern:

Hailey Sheldon with Sheldon Planning has authorization to file applications on behalf of Red Moon Development & Construction Inc.

Thank you,

Brad Woodruff
President

6589 S Kings Ranch Road #103J Box 6
Gold Canyon, AZ 85118
Phone 480-947-9253 * Fax 480-947-0774
Email redmoonaz@aol.com

ATTACHMENT 3

RECORDING REQUESTED BY:

TICOR TITLE Company of Oregon

300 W Anderson, PO Box 1075
Coos Bay, OR 97420

Coos County, Oregon	**2019-11613**
$91.00 **Pgs=2**	**12/20/2019 10:00 AM**
eRecorded by: TICOR TITLE COOS BAY	
Debbie Heller, CCC, Coos County Clerk	

AFTER RECORDING RETURN TO:
Order No.: 360619027710-DM
Red Moon Development & Construction Inc.
6589 South Kings Ranch Road, Suite 103J, Box 6
Gold Canyon, AZ 85118

SEND TAX STATEMENTS TO:
Red Moon Development & Construction Inc.
6589 South Kings Ranch Road, Suite 103J, Box 6
Gold Canyon, AZ 85118

APN: 311300
Map: 25-13-8 TL 200

SPACE ABOVE THIS LINE FOR RECORDER'S USE

STATUTORY WARRANTY DEED

Jeffrey Marineau and Steven Plinski, Grantor, conveys and warrants to **Red Moon Development & Construction Inc.**, Grantee, the following described real property, free and clear of encumbrances except as specifically set forth below, situated in the County of Coos, State of Oregon:

Government Lot 4 of Section 8, Township 25 South, Range 13 West of the Willamette Meridian, Coos County, Oregon, TOGETHER WITH the tidelands fronting and abutting thereon.

THE TRUE AND ACTUAL CONSIDERATION FOR THIS CONVEYANCE IS SEVEN HUNDRED THOUSAND AND NO/100 DOLLARS **($700,000.00)**. (See ORS 93.030).

Subject to:

Any adverse claim based upon the assertion that:

a) Said Land or any part thereof is now or at any time has been below the highest of the high watermarks of Coos Bay, in the event the boundary of said Coos Bay has been artificially raised or is now or at any time has been below the high watermark, if said Coos Bay is in its natural state.

b) Some portion of said Land has been created by artificial means or has accreted to such portion so created.

c) Some portion of said Land has been brought within the boundaries thereof by an avulsive movement of Coos Bay, or has been formed by accretion to any such portion.

The rights of the public and governmental bodies for fishing, navigation and commerce in and to any portion of the Land herein described, lying below the high water line of the Coos Bay.

The right, title and interest of the State of Oregon in and to any portion lying below the high water line of Coos Bay.

Terms, provisions and conditions, including, but not limited to, maintenance provisions, and a covenant to share the costs of maintenance, contained in Deed

Recording Date: August 26, 1938
Recording No.: Book 132, Page 192

Easement(s) and rights incidental thereto, as granted in a document:

Granted to: Coos County Airport District
Recording Date: July 30, 2013
Recording No: 2013-7500

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

ATTACHMENT 4

STATUTORY WARRANTY DEED
(continued)

IN WITNESS WHEREOF, the undersigned have executed this document on the date(s) set forth below.

Dated: 12/19/2019

Jeffrey Marineau

Steven Plinski

State of Oregon
County of Coos

This instrument was acknowledged before me on 12-19-19 by Jeffrey Marineau.

Notary Public - State of Oregon

My Commission Expires: 9-18-22

OFFICIAL STAMP
DENISE ALTHEA MATESKI
NOTARY PUBLIC-OREGON
COMMISSION NO. 979336
MY COMMISSION EXPIRES SEPTEMBER 18, 2022

State of Oregon
County of Coos

This instrument was acknowledged before me on 12-19-19 by Steven Plinski.

Notary Public - State of Oregon

My Commission Expires: 9-18-22

OFFICIAL STAMP
DENISE ALTHEA MATESKI
NOTARY PUBLIC-OREGON
COMMISSION NO. 979336
MY COMMISSION EXPIRES SEPTEMBER 18, 2022

RECORDING REQUESTED BY:
TICOR TITLE™ Company of Oregon

300 Anderson Ave
Coos Bay, OR 97420

Coos County, Oregon	**2020-05641**
$86.00 **Pgs=1**	**06/16/2020 11:50 AM**
eRecorded by: TICOR TITLE COOS BAY	
Debbie Heller, CCC, Coos County Clerk	

AFTER RECORDING RETURN TO:
Order No.: 360620031233-DM
Red Moon Development & Construction Inc.
6589 South Kings Ranch road, Suite 103J, Box 6
Gold Canyon, AZ 85118

SEND TAX STATEMENTS TO:
Red Moon Development & Construction Inc.
6589 South Kings Ranch road, Suite 103J, Box 6
Gold Canyon, AZ 85118

APN: 331150
Map: 25-13-17AA TL4000

SPACE ABOVE THIS LINE FOR RECORDER'S USE

STATUTORY WARRANTY DEED

Yesi Guirado, Grantor, conveys and warrants to **Red Moon Development & Construction Inc.**, Grantee, the following described real property, free and clear of encumbrances except as specifically set forth below, situated in the County of Coos, State of Oregon:

A tract of land located within the Northeast quarter of the Northeast quarter of Section 17, Township 25 South, Range 13 West of the Willamette Meridian, Coos County, Oregon and being more particularly described as follows:

Beginning at the Northeast corner of Section 17, Township 25 South, Range 13 West of the Willamette Meridian, Coos County, Oregon; thence South 89° 19' West along the North line of Section 17 a distance of 50 feet to the True Point of Beginning; thence continuing along the North line of Section 17 South 89° 19' West a distance of 239.12 feet; thence South 34° 33' West a distance of 36.73 feet; thence North 89° 19' East a distance of 190.69 feet; thence South 1° 25' East a distance of 230.81 feet to the North right of way line of Maxwell Road; thence Northeasterly along said right of way, through a curve to the left having a radius of 266.50 feet, for an arc distance of 153.40 feet; thence continuing along said right of way North 1° 34' West a distance of 128.33 feet to the True Point of Beginning.

THE TRUE AND ACTUAL CONSIDERATION FOR THIS CONVEYANCE IS THIRTY-FIVE THOUSAND AND NO/100 DOLLARS **($35,000.00)**. (See ORS 93.030).

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

IN WITNESS WHEREOF, the undersigned have executed this document on the date(s) set forth below.

Dated: 6-9-2020

Yesi Guirado

State of Oregon
County of Coos

This instrument was acknowledged before me on June 9, 2020 by Yesi Guirado.

Notary Public - State of Oregon

My Commission Expires: 4.11.22

OFFICIAL STAMP
SANDI L BROWN
NOTARY PUBLIC - OREGON
COMMISSION NO. 973685
MY COMMISSION EXPIRES APRIL 11, 2022

CITY OF COOS BAY
Public Works & Community Development Department
500 Central Avenue, Coos Bay, Oregon 97420
Phone 541-269-8918 Fax 541-269-8916

Permit No. _____-PW

Date Received: _____

RIGHT OF WAY VACATION APPLICATION

Applicant/Owner Name: (please print)	Applicant: Hailey Sheldon	Owner: Red Moon Devmpt.	Phone: (541) 968-4686
Address:	Sheldon Planning LLC 444 N. 4th Street	6589 S Kings Ranch Rd Ste 103J, Box 6	Email: hailey@sheldonplanning.com cc: bwoodruff01@gmail.com
City State ZIP:	Coos Bay OR 97420	Gold Canyon AZ 85118	redmoonaz@aol.com

Proposed Vacation Area/Address: Maxwell Street ROW (see attached map)

Purpose Statement:

The purpose for which the RIGHT OF WAY vacation is proposed:

See attached.

Application Requirements:

1. **Preapplication meeting**

An in-person pre-application meeting is required to submit a right of way vacation application. A base fee of $954, plus a 5% technology fee, and the information in section 2 of this form is required. Additional fees may be required based on RIGHT OF WAY impacts. You will meet with the Public Works Operations Administrator or his designee to review the application for completeness. Only complete applications will be accepted.

2. **Submittal requirements with the Right of Way Vacation Application**

a) A written summary of the purpose and justification for the vacation.

b) A map of the ground proposed to be vacated, and if applicable, a plat showing the proposed manner of re-platting or rededication. (Map can be provided by the City)

c) A notarized statement of the Applicant that owners of the "real property affected thereby," as defined below, have been notified of the pending request before the City. Attached to this statement shall be a copy of the notice provided and a list of the property owners notified, which includes their name(s), mailing address, situs address, and map and tax lot number of the real property affected. ORS 271.080 defines real property affected thereby as "land lying on either side of the street or portion of land proposed to be vacated and extending laterally to the next street that serves as a parallel street, but in any case not to exceed 200 feet, and the land for a like lateral distance on either side of the street for 400 feet along its course beyond each terminus of the part proposed to be vacated. Where a street is proposed to be vacated to its termini, the land embraced in an extension of the street for a distance of 400 feet beyond each terminus shall also be counted." (See attached sample)

d) Written consent of abutting property owners and two-thirds of the property owners affected thereby (if required). (See attached samples)

e) A legal description for each affected property (if required).

f) A metes and bounds survey of the area to be vacated (if required, the cost will be at the Applicant's expense).

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Coos Bay Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

The undersigned acknowledges and agrees that submittal of this application does not constitute approval of the request and further understands the application is subject to review and approval under CBMC Chapter 12.45.

Applicant's signature	Date	Owner's signature ***(required)***	Date
	09/11/2020		

ATTACHMENT 5

Disclaimer:
This document is produced using a Geographic Information System (GIS). The data contained herein is intended to be a graphical representation only and is by no means an official survey or legal interpretation thereof. The City of Coos Bay provides this data in good faith and makes no warranties, guarantees or representations of any kind, either expressed or implied, as to the content, accuracy, completeness or reliability of this data.

Image Date: 3/6/2018

Date: 5/20/2020

N
W E
S

1 inch = 160 feet

Proposed Vacation Area

NE1/4 NE1/4 SEC. 17 T25S R13W W.M.
COOS COUNTY
1" = 100'

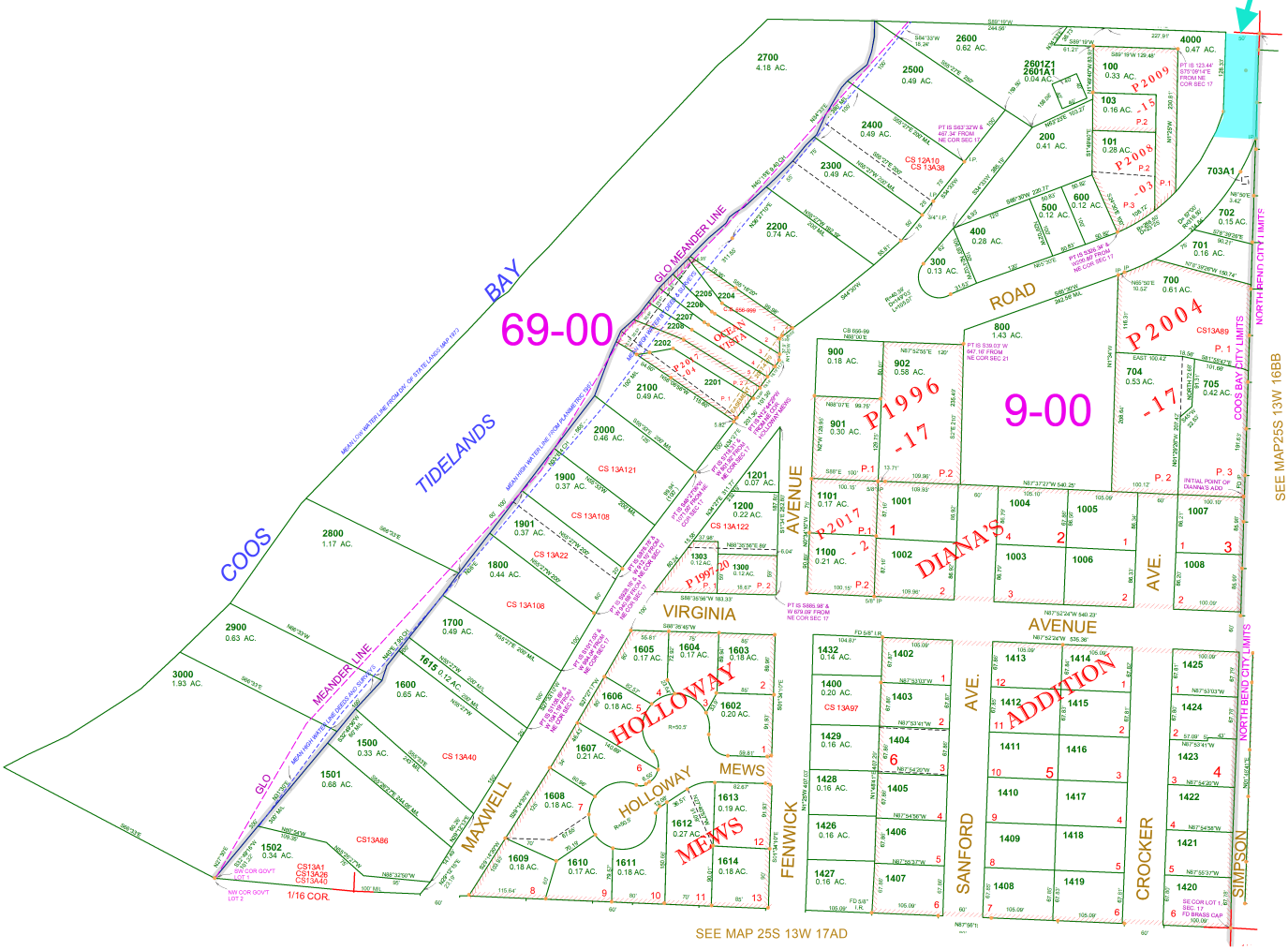
MAP ADJUSTED TO FIT PAPER
NOT TO SCALE

THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSE ONLY

25S 13W 17AA
COOS BAY

CANCELLED NO.

1000	301
1401	302
1430	1601
1431	703L
1433	706
1202	1617
2101	2203
	102



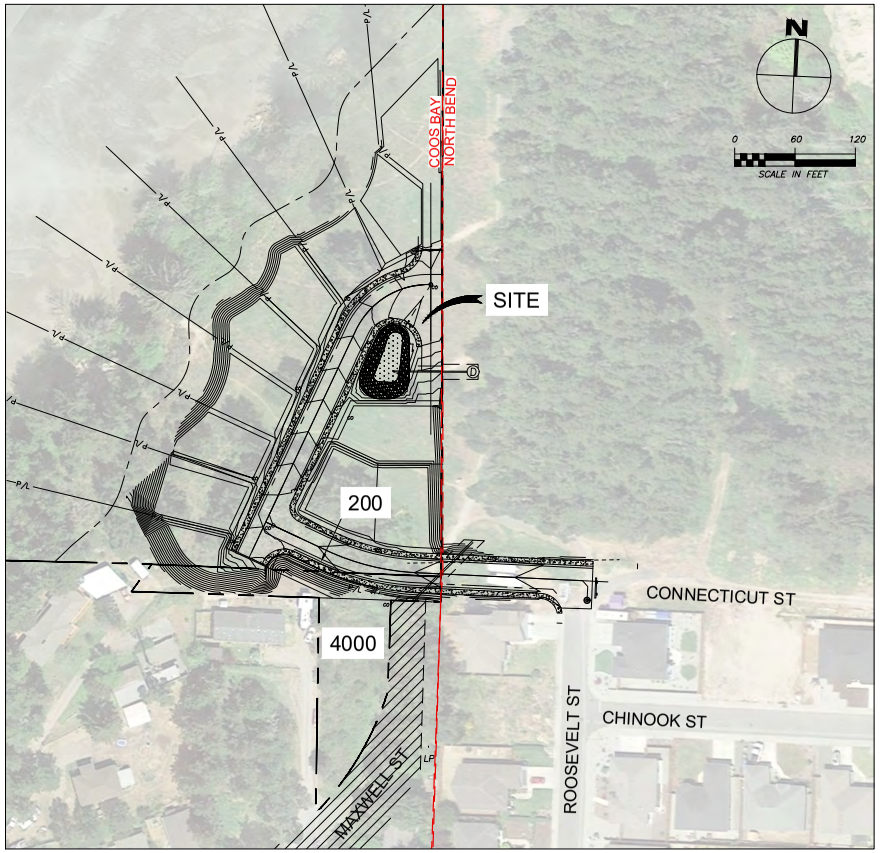
01-15-2019

25S 13W 17AA
COOS BAY

ATTACHMENT 6

BLUFFS SUBDIVISION PROJECT

PARCEL #25S13W08-200 & 25S13W17-4000



PROJECT MAP
NOT TO SCALE

LEGEND :

EXISTING

- SEWER MANHOLE
- STORM MANHOLE
- GAS VALVE
- POLE WITH STREET LIGHT
- STREET LIGHT
- ELECTRICAL MANHOLE
- ELECTRICAL VAULT
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- UTILITY VALVE
- FIRE HYDRANT
- WM — WATER METER
- WATER VALVE
- CE — CONSTRUCTION EASEMENT
- E — E — ELECTRICAL UNDER GROUND
- G — G — GAS LINE
- XXX — MAJOR CONTOUR LINE
- XXX — MINOR CONTOUR LINE
- OH — OH — OVERHEAD LINE
- P/L — PROPERTY LINE
- R/W — RIGHT-OF-WAY
- SAN — SANITARY SEWER MAIN
- STM — STORM SEWER MAIN
- TEL — TELEPHONE LINE
- TOE — TOE OF SLOPE
- TOP — TOP OF SLOPE
- W — W — WATER LINE
- GRAVEL
- CONCRETE
- AC PAVEMENT

PROPOSED

- CLEANOUT
- INLET
- FIELD INLET
- SEWER MANHOLE
- STORM MANHOLE
- COMBINED SEWER MAIN
- CONDUIT
- CE — CONSTRUCTION EASEMENT
- CURB
- EZ — EXCLUSION ZONE FENCE
- X — X — FENCE
- XXX — MAJOR CONTOUR LINE
- XXX — MINOR CONTOUR LINE
- PDL — PERMANENT DISTURBANCE LIMITS
- TDL — TDL — TEMPORARY DISTURBANCE LIMITS
- RETAINING WALL
- PROJECT SITE BOUNDARY
- PRIVATE SEWER LATERAL
- PRIVATE SEWER MAIN
- P/L — PROPERTY LINE
- R/W — RIGHT-OF-WAY
- SANITARY SEWER MAIN
- SEWER SERVICE LATERAL
- SILT FENCE
- STORM DITCH
- STORM SEWER MAIN
- W — W — WATER MAIN
- MATTING

PROJECT SITE

COOS BAY, OREGON
VICINITY MAP
NOT TO SCALE

SHEET LIST TABLE

NO.	SHEET TITLE
C-2	EROSION & SEDIMENT CONTROL
G-1	COVER
G-2	SPECIFICATIONS
C-1	EXISTING CONDITIONS
C-3	OVERALL IMPROVEMENT PLAN
C-4	HORIZONTAL CONTROL PLAN
C-5	GRADING & DRAINAGE PLAN
C-6	UTILITY PLAN - STORM
C-7	WET POND SECTION
C-8	UTILITY PLAN - WATER
C-9	ACCESS ROAD WATER P&P
C-10	UNNAMED ROAD WATER P&P
C-11	UTILITY PLAN - ELECTRIC
C-12	UTILITY PLAN -PRIVATE SEWER
C-13	ACCESS ROAD SANITARY P&P
C-14	UNNAMED ROAD SANITARY P&P
C-15	UTILITY PLAN - GAS
C-16	ACCESS ROAD PLAN & PROFILE
C-17	UNNAMED DRIVE PLAN & PROFILE
C-18	SITE SECTIONS
D-1	DETAILS
D-2	DETAILS
D-3	DETAILS
D-4	DETAILS
D-5	DETAILS
D-6	DETAILS

Oregon 811
UTILITY NOTIFICATION CENTER

CALL THE STATEWIDE UTILITIES LOCATING SERVICE AT:
800-332-2344 (811) WITH YOUR SCHEDULE AT LEAST
TWO DAYS PRIOR TO BEGINNING WORK.

ENGINEERING FIRM:
JCW ENGINEERING
CONTACT: JUSTIN C. WILSON, P.E.
COOS BAY, OR 97420
JCWILSONENGINEERING@GMAIL.COM
PHONE: 208-553-6742

DEVELOPER:
RED MOON DEVELOPMENT & CONSTRUCTION, INC
CONTACT: BRAD WOODRUFF
6589 S KINGS RANCH RD #103 J BOX 6
GOLD CANYON, AZ 85118-2933
BWOODRUFF01@GMAIL.COM
(602)796-1800

COVER
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

JC WILSON ENGINEERING & CONSULTING, LLC
PO BOX 162
NORTH BEND, OR 97459
WWW.JCWILSONENGINEERING.COM
P: (208) 553-6742

C:\Users\Dawn Reed\Projects\JCW\2005-NB-BLUFFS\DWG\2005-BLUFF-GEN.dwg

SYM.	REVISION	DATE

DATE: 10-2020
SCALE: AS SHOWN
DESIGNED BY: DSR
DRAWN BY: DSR
CHECKED: JCW
REVIEW: CITY

REGISTERED PROFESSIONAL ENGINEER
OREGON
JUSTIN C. WILSON
EXPIRES: 06/30/22

SHEET:
G-1

SPECIFICATIONS:

GENERAL
1. ALL WORK SHALL CONFORM TO CURRENT OREGON BUILDING CODE, CITY OF COOS BAY & NORTH BEND STANDARDS FOR CONSTRUCTION, OR OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION AS APPLICABLE.
2. ALL WORK WITHIN THE RIGHT-OF-WAY SHALL COMPLY WITH THE OREGON TRAFFIC CONTROL HANDBOOK LATEST EDITION.
3. ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH EXISTING CONDITIONS IN THE FIELD BEFORE BEGINNING CONSTRUCTION. EXISTING UNDERGROUND UTILITIES WITHIN THE LIMITS OF EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING, PROVIDED SUCH IS PERMITTED BY LOCAL PUBLIC AUTHORITIES WITH JURISDICTION, BEFORE BEGINNING CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES.
4. THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
5. THE CONTRACTOR SHALL PROVIDE TRENCH SHORING FOR ANY TRENCH REQUIRING WORKER PROTECTION AND IN ACCORDANCE WITH OSHA.
6. CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, GENERAL CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY.
7. ALL WORK AND EQUIPMENT SHALL COMPLY WITH OSHA SAFETY REQUIREMENTS. THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY, AND NOT BE LIMITED TO NORMAL WORKING HOURS. CONTRACTOR FURTHER AGREES TO HOLD HARMLESS, INDEMNIFY AND DEFEND THE OWNER, THE ENGINEER AND HIS/HER AGENTS.
8. THE CONTRACTOR SHALL INDEPENDENTLY REVIEW GROUND, TOPOGRAPHY, AND CONDITIONS THROUGHOUT THE SITE, AND ASSUME THE RISK OF COMPLETING THE WORK SET OUT ON THESE PLANS, REGARDLESS OF ROCK, WATER TABLE OR OTHER CONDITIONS WHICH MAY BE ENCOUNTERED IN THE COURSE OF THE WORK.
9. ANY DISCREPANCY DISCOVERED BY THE CONTRACTOR IN THESE PLANS, OR ANY FIELD CONDITIONS DISCOVERED BY THE CONTRACTOR THAT MAY DELAY OR OBSTRUCT THE PROPER COMPLETION OF THE WORK SHOWN HEREIN SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND THE ENGINEER IMMEDIATELY UPON DISCOVERY. SAID NOTIFICATION SHALL BE IN WRITING.
10. ALL UNDERGROUND IMPROVEMENTS SHALL BE INSTALLED TESTED AND APPROVED PRIOR TO PAVING.
11. GRADING AND CONSTRUCTION CONTRACTORS SHALL STOP WORK AND NOTIFY THE OWNER AND THE ENGINEER IF CULTURAL RESOURCES ARE DISCOVERED DURING CONSTRUCTION (CONSULTANT TO AOR (680) .
12. THE CONTRACTOR SHALL GIVE THE INSPECTOR 48 HOURS ADVANCE NOTICE OF ANY CONSTRUCTION OR REQUIRED TESTING.
13. SHOULD THE CONTRACTOR OR ANY OF HIS AGENTS OR EMPLOYEES ENCOUNTER OR DISCOVER MATERIALS WHICH APPEAR TO BE HAZARDOUS DURING THE PERFORMANCE OF THE WORK, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY AND SHALL NOT RESUME WORK IN THE AFFECTED AREA UNTIL THE ENGINEER HAS INSPECTED THE LOCATION AND MATERIALS IN QUESTION. SHOULD IT BE NECESSARY TO UNDERTAKE REMEDIATION, THE ENGINEER WILL GIVE WRITTEN NOTICE TO SUSPEND WORK IN THE AFFECTED AREA UNTIL THE PROPER COURSE OF ACTION HAS BEEN DETERMINED. OPERATIONS IN THE AFFECTED AREA SHALL BE RESUMED ONLY UPON WRITTEN NOTICE BY THE ENGINEER.
14. ALL SITE GRADING WILL BE INSPECTED BY THE ENGINEER. COMPACTION TESTING WILL BE CONDUCTED AFTER SUFFICIENT DENSITIES HAVE BEEN ACHIEVED IN THE CONTRACTOR'S OPINION. THE CONTRACTOR SHALL MAKE ALL REQUESTS FOR MATERIALS TESTING AT LEAST 48 HOURS IN ADVANCE. ANY SOILS THAT FAIL TO MEET THE REQUIRED COMPACTION LEVELS SHALL BE REMOVED, AND RECOMPACTED. ALL COSTS ASSOCIATED WITH ACHIEVING COMPACTION STANDARDS SHALL BE INCLUDED IN THE CONTRACTOR'S ORIGINAL BID.
15. THE TOPSOIL SHALL BE REMOVED FROM CUT AND FILL AREAS AND SHALL NOT BE USED FOR ENGINEERED FILL. TOPSOIL SHALL BE STOCKPILED SEPARATELY AND UTILIZED IN LANDSCAPED AREAS.
16. NO CHANGES OR MODIFICATIONS SHALL BE MADE TO THESE PLANS WITHOUT WRITTEN APPROVAL BY THE ENGINEER.
17. THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED FOR INSTALLATION IN THE SPACE PROVIDED. THEY DO NOT SHOW EVERY DIMENSION, COMPONENT PIECE, SECTION, JOINT OR FITTING REQUIRED TO COMPLETE THE PROJECT.

GRANULAR MATERIALS:
1. FURNISH THE FOLLOWING MATERIALS FOR FILL OR BACKFILL WHERE SHOWN OR REQUIRED:
   - I. CLASS A BACKFILL: USE SELECT NATIVE OR COMMON MATERIAL THAT, IN THE OPINION OF THE ENGINEER, MEETS THE CHARACTERISTICS REQUIRED FOR THE SPECIFIC SURFACE LOADING OR OTHER CRITERIA OF THE BACKFILL ZONE. NATIVE MATERIAL SHALL BE FREE FROM ORGANIC OR OTHER DELETERIOUS MATERIAL, AND FREE FROM ROCK LARGER THAN 3 INCHES. IF STOCKPILED MATERIAL BECOMES SATURATED OR UNSUITABLE, CLASS B, C OR D BACKFILL SHALL BE USED.
   - II. CLASS B BASEROCK OR BACKFILL: 3/4-INCH DENSE-GRADED AGGREGATE MEETING ODOT SECTION 02630.10.
   - III. CLASS C BACKFILL: USE CLEAN SAND WITH NO PARTICLE SIZE LARGER THAN 1/4-INCH.
   - IV. CLASS D BACKFILL: USE PIT RUN OR BAR RUN MATERIAL, WELL GRADED FROM COARSE TO FINE. THE MAXIMUM DIMENSION SHALL BE 3-INCHES.
   - V. CLASS E BACKFILL: USE CONTROLLED LOW-STRENGTH MATERIAL (CLSM) CONFORMING TO ODOT SECTION 00442. SLURRY SHALL CONSIST OF A HIGHLY FLOWABLE LEAN CONCRETE MIX; MIXTURE OF PORTLAND CEMENT, FLY ASH, FINE AGGREGATES, WATER AND ADMIXTURES AS REQUIRED FOR A MIXTURE THAT RESULTS IN A HARDENED, DENSE, NON-SETTLING, HAND EXCAVATABLE FILL.

EROSION CONTROL:
SEE NOTES SHEET C-2.

DEMOLITION:
1. OFFSITE UTILITIES TO BE ABANDONED IN PLACE OR ABANDONED BY THE ASSOCIATED UTILITY PROVIDER (SEE NOTES ON PLANS).
2. REMOVE EXISTING FOUNDATIONS, UTILITIES, BURIED STRUCTURES, PAVEMENTS ETC., THROUGHOUT THE SITE, AND FILL ALL VOIDS WITH STRUCTURAL FILL.
3. MATERIALS GENERATED DURING DEMOLITION SHOULD BE TRANSPORTED OFF SITE OR STOCKPILED IN AREAS DESIGNATED BY THE OWNERS REPRESENTATIVE.
4. IF MATERIALS CONTAINING ASBESTOS OR OTHER HAZARDOUS MATERIALS ARE ENCOUNTERED ON THIS PROJECT. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR PROPER IDENTIFICATION OF MATERIALS, SAFE HANDLING, AND PROPER DISPOSAL. ALL APPLICABLE FEDERAL, STATE AND LOCAL RULES, LAWS AND GUIDELINES MUST BE STRICTLY ADHERED TO OVER THE COURSE OF CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE PAYMENT FOR PERMITS, FEES, INSPECTIONS, ETC. WITH APPROPRIATE REGULATORY AGENCIES. CONTRACTOR TO PROVIDE SAFE TRANSPORT TO DISPOSAL FACILITIES.

EARTHWORK:
1. REFER TO THE GEOTECHNICAL ENGINEERING REPORT FOR GENERAL GUIDELINES ON SITE PREPARATION, EXCAVATION, ENGINEERED FILL, AND OTHER GENERAL RECOMMENDATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONFIRM EXISTING GROUND ELEVATIONS, OVERALL TOPOGRAPHY, AND GENERAL SITE CONDITIONS PRIOR TO THE START OF CONSTRUCTION.
3. COMPACTION REQUIREMENTS AS SPECIFIED WILL BE BY PERCENT OF THE MAXIMUM DRY DENSITY (MDD) AND AS DETERMINED PER ASTM D 1557/D6938.
4. PLACE FILL MATERIALS, BASEROCK AND TRENCH BACKFILL MATERIAL IN LOOSE LIFTS OF NOT MORE THAN 8 INCHES FOR MATERIAL COMPACTED BY HEAVY EQUIPMENT, AND NOT MORE THAN 4 INCHES FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS.
5. THE GROUND SURFACE IN AREAS TO RECEIVE FILL SHALL BE PREPARED AS FOLLOWS:
   - A. ALL ORGANIC MATERIAL AND TOPSOIL SHALL BE REMOVED.
   - B. ON SLOPES GREATER THAN 1V:4H, HORIZONTAL BENCHES SHALL BE CUT INTO THE SOIL TO PROVIDE A LEVEL-BEARING SURFACE FOR THE FILL MATERIAL. THE MINIMUM WIDTH OF THE BENCHES SHALL BE FOUR FEET.
   - C. COMPACT SUBGRADE TO 95% MDD.
6. ALL IMPROVEMENTS SHALL BE GRADED TO DRAIN TO THE APPROVED DRAINAGE COURSE AT A UNIFORM SLOPE OF 2% MINIMUM UNLESS OTHERWISE NOTED.
7. NO CUT OR FILL SLOPES SHALL EXCEED THE SLOPE RATIO OF 2H:1V, UNLESS OTHERWISE NOTED.
8. TOPSOIL SHALL BE REMOVED FROM ALL CUT AND FILL AREAS AND SHALL NOT BE USED FOR ENGINEERED FILL.
9. FILL MATERIALS SHALL BE CLASS B BASEROCK OR OTHER UNIFORMLY GRADED GRANULAR MATERIAL APPROVED BY THE ENGINEER.
10. FILL MATERIALS SHALL BE MECHANICALLY COMPACTED. JETTING WILL NOT BE ALLOWED.
11. CARE SHALL BE TAKEN NOT TO CRUSH THE PIPE OR OTHER COMPONENTS WITH COMPACTION EQUIPMENT.
12. ENGINEER SHALL INSPECT AND APPROVE FOOTING EXCAVATIONS PRIOR TO PLACEMENT OF FORMS AND REBAR.

TESTING AND INSPECTION:
1. ALL SITE GRADING, SUBGRADE, AND BACKFILLING WILL BE INSPECTED BY THE ENGINEER. CONTRACTOR TO PROVIDE 48 HOUR NOTICE IN ADVANCE OF REQUIRED INSPECTION. FAILURE TO GIVE ADEQUATE NOTICE MAY RESULT IN TESTING DELAYS WHICH WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. THE CONTRACTOR SHALL PROVIDE AND FACILITATE ALL TESTING BY A THIRD PARTY AS REQUIRED BY THESE PLANS AND/OR AS REQUESTED BY THE ENGINEER. THE ENGINEER WILL BE PERMITTED TO REQUEST AND RECEIVE TESTING RESULTS AT ANY FILL OR BACKFILL LOCATION OR ELEVATION DURING THE CONSTRUCTION PROCESS.
3. THE CONTRACTOR SHALL SCHEDULE TESTING WHEN IN HIS OPINION SUFFICIENT DENSITIES HAVE BEEN ACHIEVED.
4. TRENCHES SHALL BE TESTED EVERY 50- FEET AND FOR EACH THREE (3) FEET OF LIFT. TESTS SHALL BE AT RANDOM LOCATIONS, OR LOCATIONS SELECTED BY THE ENGINEER, AND WITH A MINIMUM OF TWO TESTS PER ANY LENGTH OF TRENCH.
5. FILL UNDER BUILDING STRUCTURES: PROVIDE TWO (2) COMPACTION TESTS ON SUBGRADE AND TWO (2) TESTS FOR EACH 12-INCHES OF FILL, DEPENDING ON PERFORMANCE OF BACKFILL MATERIAL.
6. BASEROCK UNDER CONCRETE SLABS SHALL BE TESTED FOR EACH 10,000 SF.
7. A FAILING COMPACTION TEST INDICATES THAT THE REQUIRED COMPACTION STANDARDS HAVE NOT BEEN ACHIEVED. ANY FILL MATERIAL OR PORTION OF FILL MATERIAL THAT DOES NOT MEET THE SPECIFIED REQUIREMENTS SHALL BE RECOMPACTED UNTIL THE REQUIREMENTS ARE SATISFIED, OR REMOVED AND REPLACED AT NO ADDITIONAL COST TO THE OWNER. COSTS ASSOCIATED WITH RETESTING PREVIOUSLY FAILED AREAS SHALL BE PAID BY OWNER AND BACK-CHARGED TO THE CONTRACTOR.
8. ALL COSTS ASSOCIATED WITH ACHIEVING COMPACTION STANDARDS SHALL BE BORNE BY THE CONTRACTOR.

PAVING:
1. ASPHALT CONCRETE SHALL BE ½" DENSE, LEVEL 2 ACP AND SHALL CONFORM TO SECTION 00744 OF THE OREGON STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION 2015 OR THE LATEST EDITION.
2. TACK COAT TO CONFORM TO ASTM D-977 FOR "EMULSIFIED ASPHALT," RVS-1 OR RS-2 GRADE OR APPROVED EQUAL.
3. ASPHALT CONCRETE MATERIAL SHALL BE PLACED TO THE MINIMUM THICKNESS REQUIRED ON THE PLANS.
4. WHERE NEW PAVING MEETS EXISTING PAVEMENT, EXISTING PAVEMENT

PAVING CONT:
5. SHALL BE SAWCUT, PLACE NEW PAVEMENT AND BASE TO SECTION SHOWN ON THE PLANS OR MATCH EXISTING THICKNESS WHICHEVER IS GREATER.
6. APPLY TACK COAT TO CONTACT SURFACES OF CURBS, GUTTERS AND EXISTING PAVEMENT.
7. SEE STRUCTURAL SHEETS FOR CONCRETE WITHIN THE BUILDING.
8. COMPACT PAVEMENT BY ROLLING TO A MINIMUM OF 90% OF MAXIMUM DENSITY. DO NOT DISPLACE OR EXTRUDE PAVEMENT FROM POSITION. HAND COMPACT IN AREAS INACCESSIBLE TO MECHANICAL ROLLING EQUIPMENT. PERFORM ROLLING WITH CONSECUTIVE PASSES TO ACHIEVE SMOOTH FINISH WITHOUT ROLLER MARKS.
9. AGGREGATE BASE MATERIAL SHALL BE AS SPECIFIED ABOVE AND COMPACTED TO 95% MDD PER ASTM D1557/D6938.
10. COMPACT SUBGRADE TO 95% MDD PER ASTM D1557/D6938.

SITE WORK CONCRETE:
1. SEE STRUCTURAL SHEETS FOR CONCRETE WITHIN THE BUILDING FOOTPRINT.
2. ALL CONCRETE CONSTRUCTION SHALL CONFORM WITH THE MINIMUM STANDARDS SET FORTH IN OREGON STANDARD SPECIFICATION SECTION 00440 COMMERCIAL GRADE CONCRETE LATEST EDITION.
3. MIX DESIGNS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONCRETE PLACEMENT.
4. UNLESS OTHERWISE STATED, CONCRETE SHALL MEET THE FOLLOWING CRITERIA:
   - A. CURBS, SIDEWALKS, THRUST BLOCKS, MISCELLANEOUS STRUCTURES, MINIMUM 28-DAY COMPRESSIVE STRENGTH = 3,000 PSI
   - B. RETAINING WALLS, MINIMUM 28-DAY COMPRESSIVE STRENGTH = 4,500 PSI
   - C. MAXIMUM AGGREGATE SIZE = 3/4"
   - D. SLUMP = 4"±1"
5. REINFORCING SHALL BE DEFORMED BAR, INTERMEDIATE GRADE STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A 615, GRADE 60, PLACED IN ACCORDANCE WITH THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI) "MANUAL OF STANDARD PRACTICE."
6. SURFACE OF ALL CONCRETE FLATWORK SHALL BE IN ACCORDANCE WITH OREGON BUILDING CODE (OBC) REQUIREMENTS FOR ACCESSIBLE ROUTES.
7. FINISH CURB AND SIDEWALK SURFACES WITH LIGHT BROOM FINISH.
8. FINISH VERTICAL WALLS WITH CLASS 2 SURFACE FINISH (GROUND, FLOATED AND COATED). APPLY PENETRATING CONCRETE STAIN OR SEALER FROM THE OREGON QUALIFIED PRODUCTS LIST (QPL). APPLY SHERWIN WILLIAMS ANTI-GRAFFITE COATING OVER ALL VERTICAL WALL SURFACES.
9. ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCING DOWELS, BOLTS, ANCHORS, PIPES AND SLEEVES SHALL BE SECURELY POSITIONED IN FORMS BEFORE PLACEMENT OF CONCRETE.
10. WALKWAYS SHALL MEET THE ACCESSIBILITY REQUIREMENTS PROVIDED IN THE OBC. LONGITUDINAL SLOPES OF WALKWAYS SHALL NOT EXCEED 8%, MAXIMUM DISTANCE BETWEEN LANDINGS IS 30-FEET. CROSS SLOPES OF WALKWAYS SHALL NOT EXCEED 2%. LANDINGS SHALL NOT EXCEED 2% SLOPE IN ANY DIRECTION, AND SHALL BE 4-FEET BY 4-FEET MINIMUM.

SANITARY SEWER SERVICE:
1. THE CONTRACTOR SHALL INSTALL ALL SANITARY SEWER SERVICE IMPROVEMENTS TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. ALL MATERIALS SHALL BE FROM NEW STOCK AND DELIVERED IN NEW CONDITIONS.
3. ALL SEWER PIPE AND FITTINGS SHALL BE FACTORY MANUFACTURED AND CONFORM TO ASTM D3034 WITH GASKETED JOINTS.
4. CONNECT TO THE CITY MANHOLE PER MANHOLE CONNECTION DETAIL.
5. PIPE ENDS SHALL BE CAREFULLY CLEANED BEFORE PIPE IS JOINED. INTERIOR OF PIPE SHALL BE KEPT FREE OF DIRT AND DEBRIS.
6. INSTALL NO. 12 COPPER WIRE ALONG TOP OF PIPE. WIRE SHALL EXTEND TO SURFACE AT ALL MANHOLES AND CLEANOUTS.
7. INSTALL PIPE ACCORDING TO THE TRENCH DETAIL. TESTING SHALL BE IN ACCORDANCE WITH THE CITY OF NORTH BEND STANDARDS AND SPECIFICATIONS AND THE UNIFORM BUILDING CODE.

WATER SERVICE:
1. COORDINATE WATER SERVICE INSTALLATION WITH THE CITY. COOS BAY NORTH BEND WATER BOARD TO INSTALL SERVICE FROM MAINLINE TO METER OR PROPERTY LINE. CONTRACTOR TO INSTALL WATER LINES AND PREMISE ISOLATION VALVES FROM PROPERTY LINE TO BUILDING AS SHOWN ON PLANS.
2. WATER SERVICE FROM METER TO BUILDING CONNECTION TO BE 2" SCHEDULE 80 COPPER INSTALLED PER OHA OR APWA GUIDLINES FOR TESTING NEW EXTENSIONS. WATER SERVICE LINE SHALL BE TESTED AND DISINFECTED IN ACCORDANCE WITH THE UNIFORM BUILDING CODE.
3. FOLLOWING SUCCESSFUL DISINFECTION, ALL TREATED WATER SHALL BE THOROUGHLY FLUSHED FROM THE PIPELINE UNTIL THE REPLACEMENT WATER HAS BEEN TESTED AND PROVEN BOTH CHEMICALLY AND BIOLOGICALLY EQUAL TO THE TREATED WATER AT THE POINT OF SUPPLY. DISINFECTION SHALL BE REPEATED IF NECESSARY AT NO ADDITIONAL COST TO THE OWNER.
4. INSTALL NO. 12 COPPER WIRE ALONG TOP OF PIPE AND DETECTABLE WARNING TAPE ON TOP OF SUBGRADE OVER PIPE. WIRE SHALL EXTEND TO SURFACE AT ALL VALVES, METERS AND WALL PENETRATION POINTS.

FIRE WATER SERVICE:
1. COORDINATE WATER SERVICE INSTALLATION WITH CITY. CBNB WATER BOARD TO INSTALL SERVICE FROM MAINLINE TO METER OR PROPERTY LINE. CONTRACTOR TO INSTALL WATER LINES AND PREMISE ISOLATION VALVES FROM PROPERTY LINE TO BUILDING AS SHOWN ON PLANS.
2. WATER SERVICE LINE SHALL BE TESTED WITH ACCORDANCE WITH THE UNIFORM BUILDING CODE.
3. INSTALL DETECTABLE WARNING TAPE ON TOP OF SUBGRADE OVER PI

STORM DRAIN:
1. THE CONTRACTOR SHALL INSTALL ALL STORM DRAIN IMPROVEMENTS TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. ALL MATERIALS SHALL BE FROM NEW STOCK AND DELIVERED IN NEW CONDITIONS.
3. ALL STORM DRAIN PIPE AND FITTINGS SHALL BE FACTORY MANUFACTURED AND CONFORM TO ASTM D3034 WITH GASKETED JOINTS. PROVIDE C900 GASKETED JOINT PIPE AND DUCTILE IRON FITTINGS WHERE LESS THAN 36-INCHES OF COVER IS PROVIDED.
4. PIPE ENDS SHALL BE CAREFULLY CLEANED BEFORE PIPE IS JOINED. INTERIOR OF PIPE SHALL BE KEPT FREE OF DIRT AND DEBRIS.
5. INSTALL NO. 12 COPPER WIRE ALONG TOP OF PIPE. WIRE SHALL EXTEND TO SURFACE AT ALL MANHOLES AND CLEANOUTS, AND SHALL TIE TO TRACER WIRE ALONG EXISTING STORM DRAIN SEWER PIPING.
6. INSTALL PIPE ACCORDING TO THE TRENCH DETAIL. TESTING SHALL BE IN ACCORDANCE WITH THE CITY OF COOS BAY STANDARDS AND SPECIFICATIONS AND THE UNIFORM BUILDING CODE.
7. INSTALL CLEANOUTS AND VALVE BOX COVERS WHERE SHOWN ON PLANS, AND AS SHOWN IN DETAILS. ROOF DRAINS SHALL BE INSTALLED WITH CLEANOUTS FOR EVERY 120 DEGREES OF BEND.

LANDSCAPING:
1. PLANTINGS TO BE INSTALLED PER THE NURSERY RECOMMENDATIONS FOR EACH PLANT. PROVIDE REQUIRED AMENDMENT, ORGANIC FERTILIZER AND WATER OF GENEROUS QUANTITIES PER RECOMMENDATION FOR EACH PLANT. PLANTING HOLE SHALL BE SCARIFIED TO A MINIMUM OF FOUR INCHES DEEP AND MIXED WITH AN EQUAL AMOUNT OF THE AMENDED SOIL MIX TO CREATE A 50:50 SOIL TEXTURAL TRANSITION ZONE BETWEEN NATIVE AND PLANTING SOIL.
2. AMENDED PLANTING SOIL TO CONSIST OF AN APPROXIMATE 50:50 BLEND OF FINISHED COMPOST AND LOAMY TOPSOIL, OR A BLEND APPROVED BY THE ENGINEER, WITH ADDITIONAL AMENDMENTS INCLUDING FINE-FLOUR DOLOMITE LIME APPLIED AT A RATE OF 50 POUNDS PER 1,000 SF, GYPSUM APPLIED AT A RATE OF 20 POUNDS PER 1,000 SF AND AZOMITE (OR GLACIAL ROCK DUST) APPLIED AT A RATE OF 25 POUNDS PER 1,000 SF. ORGAINIC FERTILIZER TO BE NATURAL ORGANIC MATERIALS WITH AN EQUIVALENT STRENGTH OF 4-3-2 AT A RATE OF 100 POUNDS PER 1,000 SF (APPROV3ED BY THE ENGINEER). ALL AMENDMENTS AND FERTILIZER TO BE THOROUGHLY INCORPORATED INTO PLANTING SOIL PRIOR TO INSTALLATION.
3. COVER ALL LANDSCAPED AREAS WITH MINIMUM 2-INCHES OF ROUNDED RIVER ROCK GENERALLY 3-INCH TO 1/2-INCH, OVER GEOTEXTILE WEED BARRIER.
4. PLACE TREE STAKES PARALLEL WITH THE PREVAILING WINDS AND DRIVE VERTICALLY INTO THE GROUND AT LEAST 12 INCHES BELOW THE PLANTING HOLE DEPTH, OR AS SHOWN. DO NOT DRIVE STAKES THROUGH THE ROOT BALL.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE SURVIVAL OF ALL PLANT MATERIAL UNTIL THE END OF A PLANT ESTABLISHMENT PERIOD OF 1 CALENDAR YEAR. THE PLANT ESTABLISHMENT PERIOD WILL BEGIN WHEN ALL THE ORIGINAL PLANTING IS COMPLETE. THE ORIGINAL PLANTING IS CONSIDERED COMPLETE WHEN ALL THE PLANT MATERIAL HAS BEEN INSTALLED TO THE SATISFACTION OF THE ENGINEER.
6. DURING THE PLANT ESTABLISHMENT PERIOD, MAINTAIN PLANTS IN A VIGOROUS GROWING CONDITION BY REGULARLY DOING THE FOLLOWING:
   - WATERING AND FERTILIZING SUFFICIENTLY TO PROMOTE GROWTH.
   - WEEDING, CULTIVATING, PRUNING, AND REPAIRING.
   - ADJUSTING TREE STAKES AND GUYS.
   - CONTROLLING WEEDS BEFORE THEY SEED ACCORDING TO 01040.48.
   - CONTROLLING PESTS AND NOXIOUS WEEDS BEFORE THE REPRODUCTIVE CYCLE.
   - REMOVING DEAD, DISEASED OR NON-VIGOROUS PLANTS.
   - REPLACING MISSING PLANTS.
   - RE-MULCHING OF PLANT BED AREAS.
7. CONTRACTOR TO SUBMIT PLANS FOR ANY REQUIRED IRRIGATION INCLUDING CONNECTION POINT, PREMISE ISOLATION, AUTOMATIC CONTROLS, ETCETERA.
8. RAIN GARDENS TO BE CONSTRUCTED WITH 18 INCHES OF BLENDED SOIL TOPPED WITH GEOTEXTILE AND 4-INCHES OF ROCK AS ABOVE. BLENDED SOIL TO CONSIST OF EQUAL PARTS FINISHED COMPOST AND 2 PARTS SAND. ADDITIONAL AMENDMENTS SHALL INCLUDE FINE-FLOUR DOLOMITE LIME APPLIED AT A RATE OF 30 POUNDS PER 1,000 SF, GYPSUM APPLIED AT A RATE OF 40 POUNDS PER 1,000 SF AND AZOMITE (OR GLACIAL ROCK DUST) APPLIED AT A RATE OF 25 POUNDS PER 1,000 SF. ALL AMENDMENTS TO BE THOROUGHLY INCORPORATED PRIOR TO PLANTING.
9. ALL IMPORTED SOIL MATERIALS MUST BE FREE FROM DELETERIOUS SUBSTANCES SUCH AS LITTER, REFUSE, TOXIC WASTE, STONES LARGER THAN 3/4 INCH IN SIZE, STIFF CLAY, BRUSH, STICKS, GRASSES, ROOTS, WEEDS, AND OTHER MATERIALS DETRIMENTAL TO PLANT, ANIMAL AND HUMAN HEALTH. COMPOST AMENDMENTS SHALL BE NITROGEN-STABILIZED, WELL-DECOMPOSED COMPOST OR UNBLEACHED, MANURE CONTAINING NOT MORE THAN 25% BY VOLUME STRAW, SAWDUST OR OTHER BEDDING MATERIALS AND SHALL BE FREE OF THE DELETERIOUS SUBSTANCES LISTED ABOVE.
10. PRIOR TO PLACEMENT OF RAINGARDEN SOIL MIX (AFTER EXCAVATION OF RAIN GARDEN), NATIVE SOIL TO BE SCARIFIED TO A MINIMUM OF FOUR INCHES DEEP AND MIXED WITH AN EQUAL AMOUNT OF THE SAND/COMPOST/TOPSOIL MIX TO CREATE A 50:50 SOIL TEXTURAL TRANSITION ZONE BETWEEN NATIVE AND ENGINEERED SOIL.
11. FOLLOWING LANDSCAPE INSTALLATION AND INITIAL IRRIGATION, APPLY MICROBE LIFE'S PLUS-C AT LABELED RATE OF 2 OUNCES PER FIVE GALLONS OF WATER AND THOROUGHLY SATURATE THE ROOT BALL OF ALL PLANTS DURING THE SECOND AND THIRD IRRIGATION EVENTS, APPROXIMATELY FIVE DAYS APART. IF PLUS-C CANNOT BE RUN THROUGH IRRIGATION SYSTEM, SHUT THE SYSTEM OFF AND TANK-APPLY DURING THESE ESTABLISHMENT EVENTS.

TO BE APPROVED BY CITY OF NORTH BEND

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SYM	REVISION	DATE

DATE: 10-2020
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DRAWN BY: DSR
CHECKED: JCW
REVIEW: CITY

SPECIFICATIONS
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

JC WILSON
ENGINEERING &
CONSULTING, LLC
PO BOX 182
NORTH BEND, OR 97459
WWW.JCWILSONENGINEERING.COM
PH: (458) 550-6742

REGISTERED PROFESSIONAL ENGINEER
OREGON
SEPTEMBER 17, 2008
JUSTIN C. WILSON
EXPIRES 06/30/22

SHEET:
G-2

EXISTING CONDITIONS

TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS. TO DETERMINE THE BEST SOLUTIONS FOR MINIMIZING EARTHWORK, THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY.
2. PROPOSED SURFACE CONTOURS AND ELEVATIONS WERE GENERATED OFF OF TOPOGRAPHIC ELEVATIONS AS DESCRIBED ABOVE IN NOTE #1.

N

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SCALE IN FEET

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SYM.	REVISION	DATE

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 15, 2005
KRISTIN C. WILSON
EXPIRES: 06/30/21

SHEET: C-1

DATE: 10-2020	
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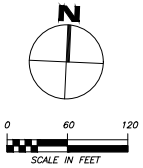
EXISTING CONDITIONS
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

OVERALL IMPROVEMENT PLAN



TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
2. PROPOSED SURFACE, CONTOURS, AND ELEVATIONS WERE GENERATED OFF OF TOPOGRAPHIC ELEVATIONS AS DESCRIBED ABOVE IN NOTE #1.

OVERALL IMPROVEMENT PLAN
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

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REGISTERED PROFESSIONAL ENGINEER
OREGON
JUSTIN C. WILSON
EXPIRES: 06/30/22

SHEET:
C-3

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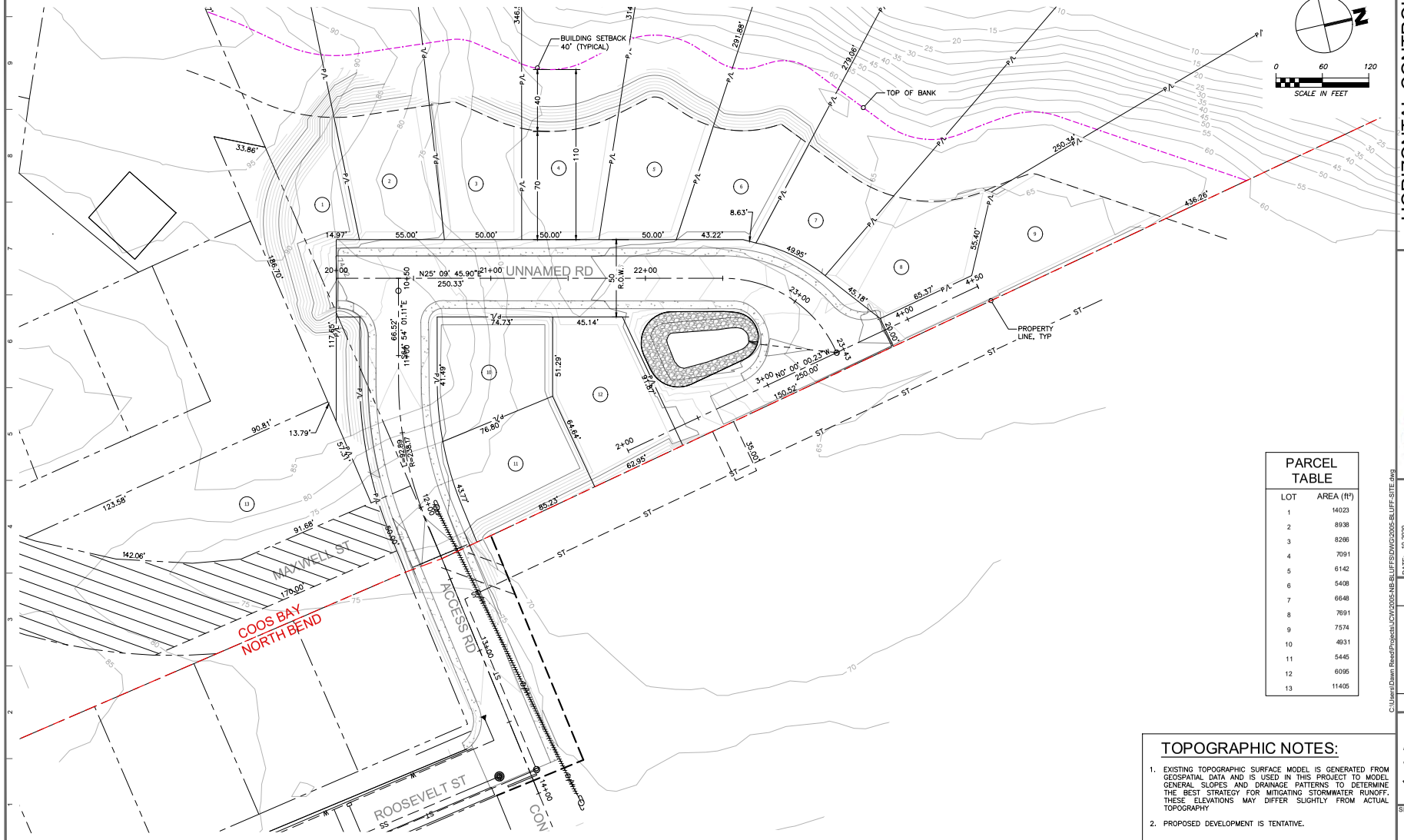
HORIZONTAL CONTROL PLAN
PARCEL #25S13W08-200 & 25S13W17-4000



PARCEL TABLE	
LOT	AREA (ft²)
1	14023
2	8938
3	8266
4	7091
5	6142
6	5408
7	6648
8	7691
9	7574
10	4931
11	5445
12	6095
13	11405

TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
2. PROPOSED DEVELOPMENT IS TENTATIVE.

HORIZONTAL CONTROL PLAN
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

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REGISTERED PROFESSIONAL ENGINEER
OREGON
SEPTEMBER 13, 2005
ERIN C. WILSON
EXPIRES: 06/30/22

SHEET:
C-4

GRADING & DRAINAGE PLAN

TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
2. PROPOSED SURFACE CONTOURS AND ELEVATIONS WERE GENERATED OFF OF TOPOGRAPHIC ELEVATIONS AS DESCRIBED ABOVE IN NOTE #1.

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REGISTERED PROFESSIONAL ENGINEER
OREGON
JUSTIN C. WILSON
EXPIRES: 06/30/21

SHEET: C-5

GRADING & DRAINAGE PLAN
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

UTILITY PLAN - STORM

UTILITY PLAN - STORM
RED MOON DEVELOPMENT
COOS BAY, OREGON
BLUFFS SUBDIVISION

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REGISTERED PROFESSIONAL ENGINEER
OREGON
JEFFREY C. WILSON
EXPIRES: 06/30/21

SHEET: C-6

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WET POND SECTION

POND SECTION PROFILE
SCALE: 20H 5V

WET POND SECTION
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

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REGISTERED PROFESSIONAL ENGINEER
OREGON
JEFFREY C. WILSON
EXPIRES: 06/30/21

SHEET: C-7

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UTILITY PLAN - WATER

UTILITY PLAN - WATER
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

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REGISTERED PROFESSIONAL ENGINEER
OREGON
JUSTIN C. WILSON
EXPIRES: 06/30/21

SHEET: C-8

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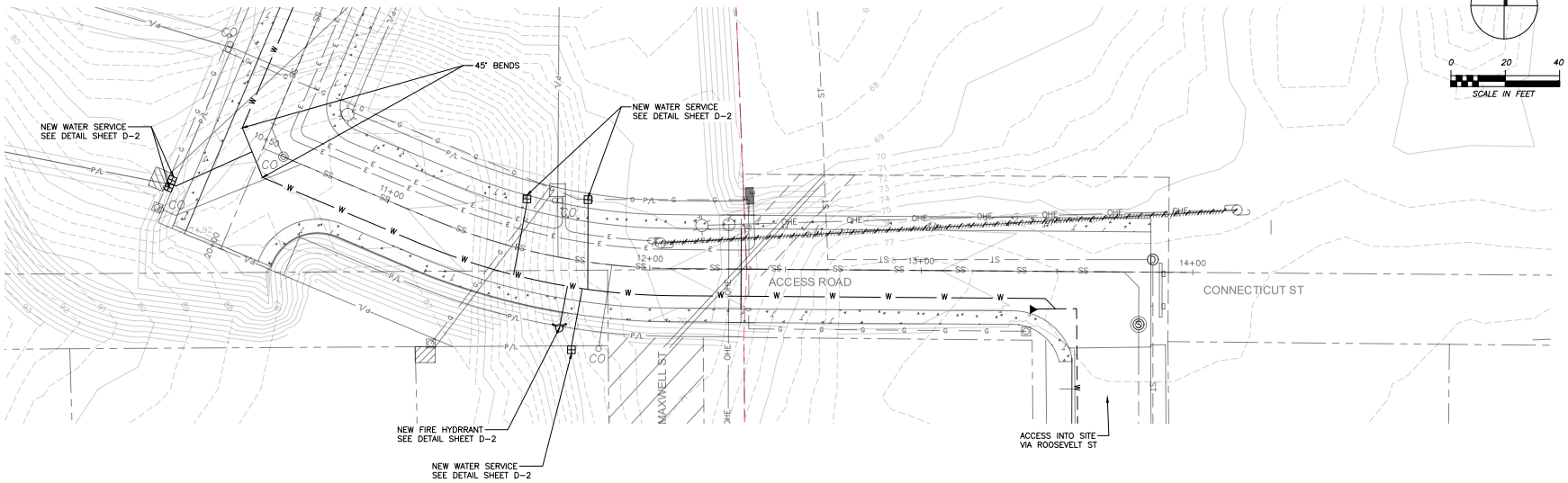
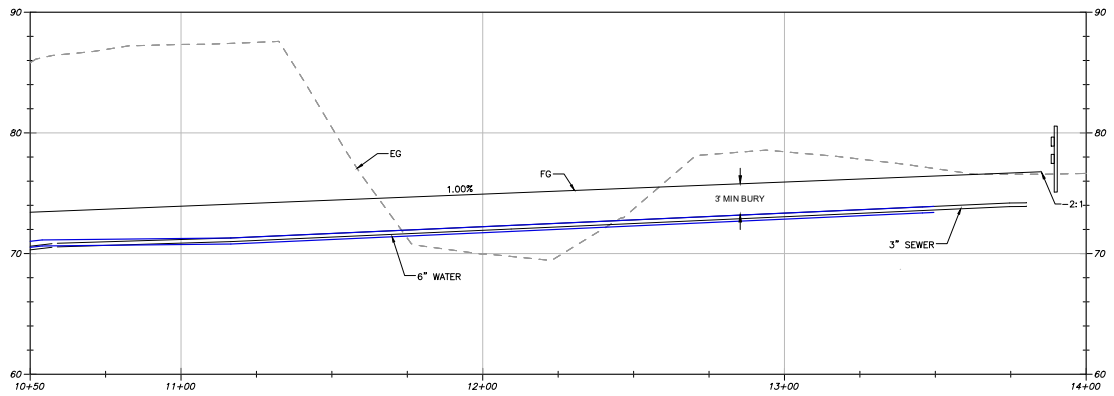
ACCESS ROAD WATER P&P





ACCESS ROAD PROFILE
SCALE: 20H 5V

TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
2. PROPOSED SURFACE, CONTOURS, AND ELEVATIONS WERE GENERATED OFF OF TOPOGRAPHIC ELEVATIONS AS DESCRIBED ABOVE IN NOTE #1.

ACCESS ROAD WATER P&P
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

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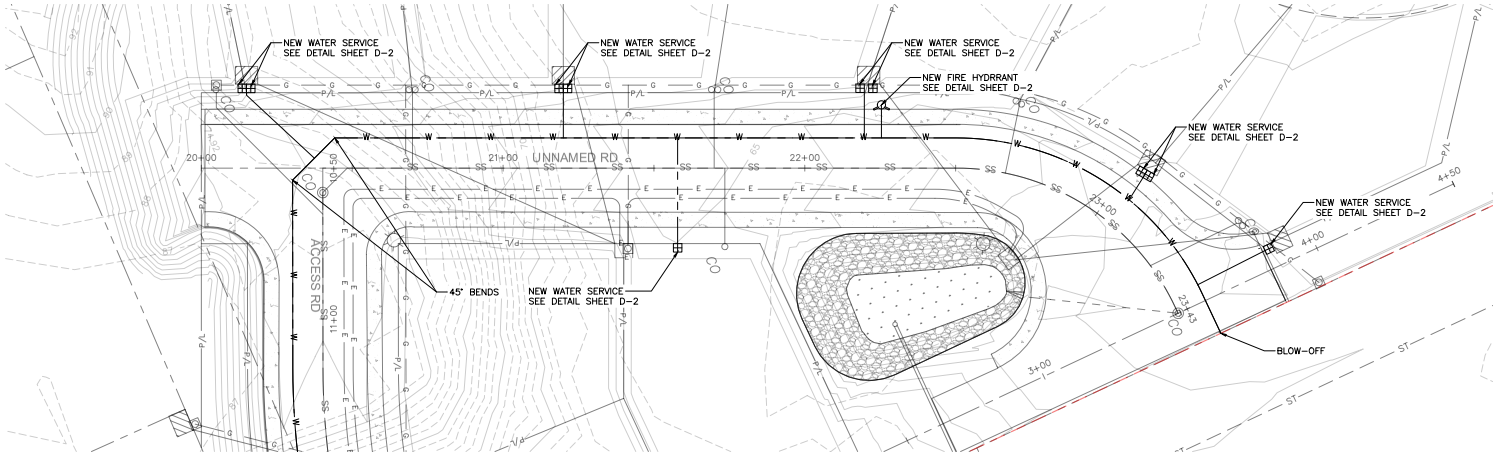
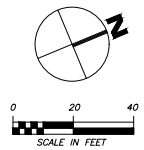
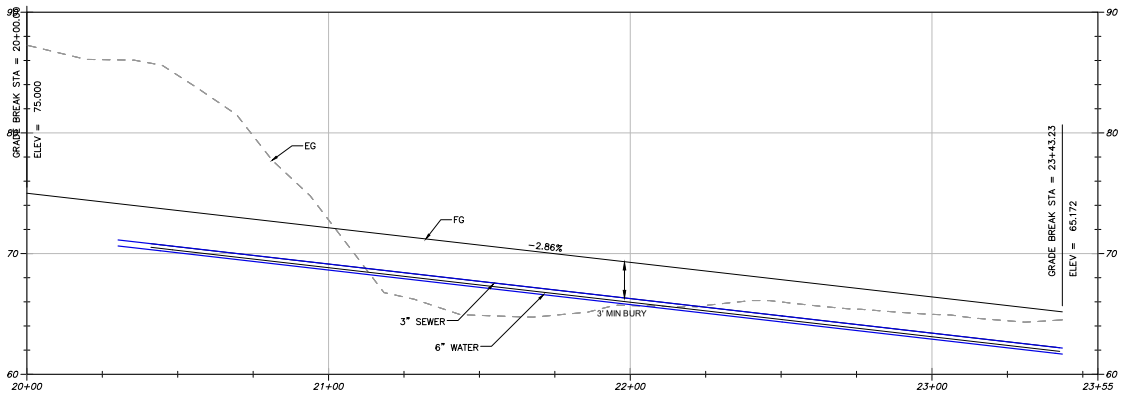
REGISTERED PROFESSIONAL ENGINEER
91637PE
OREGON
SEPTEMBER 13, 2005
EXPIRES: 06/30/22

SHEET:
C-9

UNNAMED ROAD WATER P&P







UNNAMED ROAD PROFILE
SCALE: 20H 5V

TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
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UNNAMED ROAD WATER P&P
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

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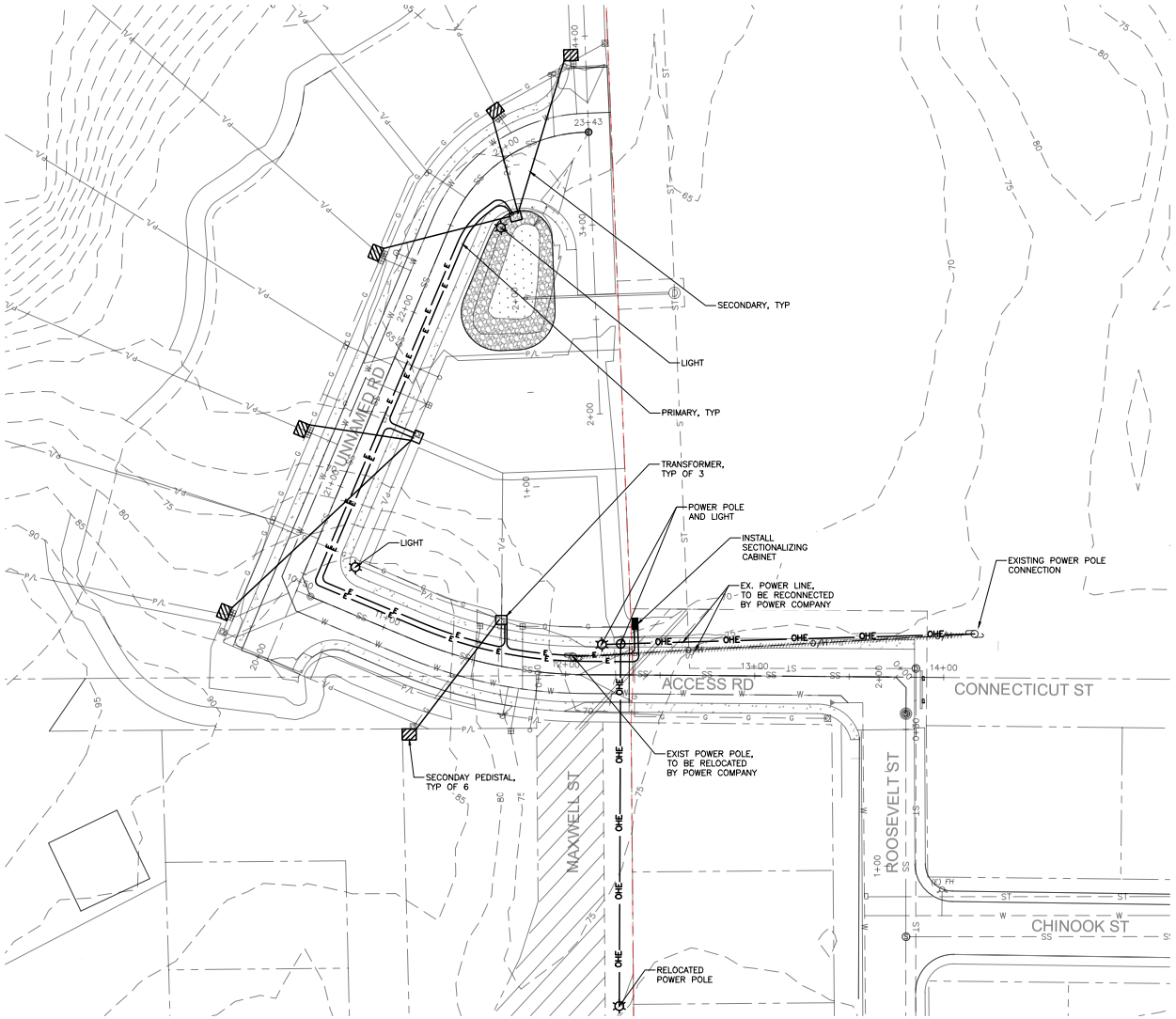
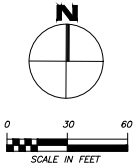
REGISTERED PROFESSIONAL ENGINEER
91637PE
OREGON
SEPTEMBER 13, 2005
JUSTIN C. WILSON
EXPIRES: 06/30/22

SHEET:
C-10

UTILITY PLAN - ELECTRIC





NOTES:

- ALL PRIMARY SWEEPS ARE REQUIRED TO BE FIBERGLASS.
- ALL CONDUIT TO BE 3" WITH NO MORE THAN 3-90'S.
- SWEEPS TO BE NO LESS THAN 36".
- CONDUIT MUST BE 36" DEEP TO TOP OF CONDUIT FROM FINAL GRADE.

LEGEND

SECTIONALIZING CABINET
TRANSFORMER
PRIMARY — E —
SECONDARY PEDESTAL
SECONDARY
LIGHT

UTILITY PLAN - ELECTRIC
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

JC WILSON ENGINEERING & CONSULTING, LLC
P.O. BOX 1645
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REGISTERED PROFESSIONAL ENGINEER
OREGON
SEPTEMBER 13, 2006
JUSTIN C. WILSON
EXPIRES 06/30/22

SHEET:
C-11

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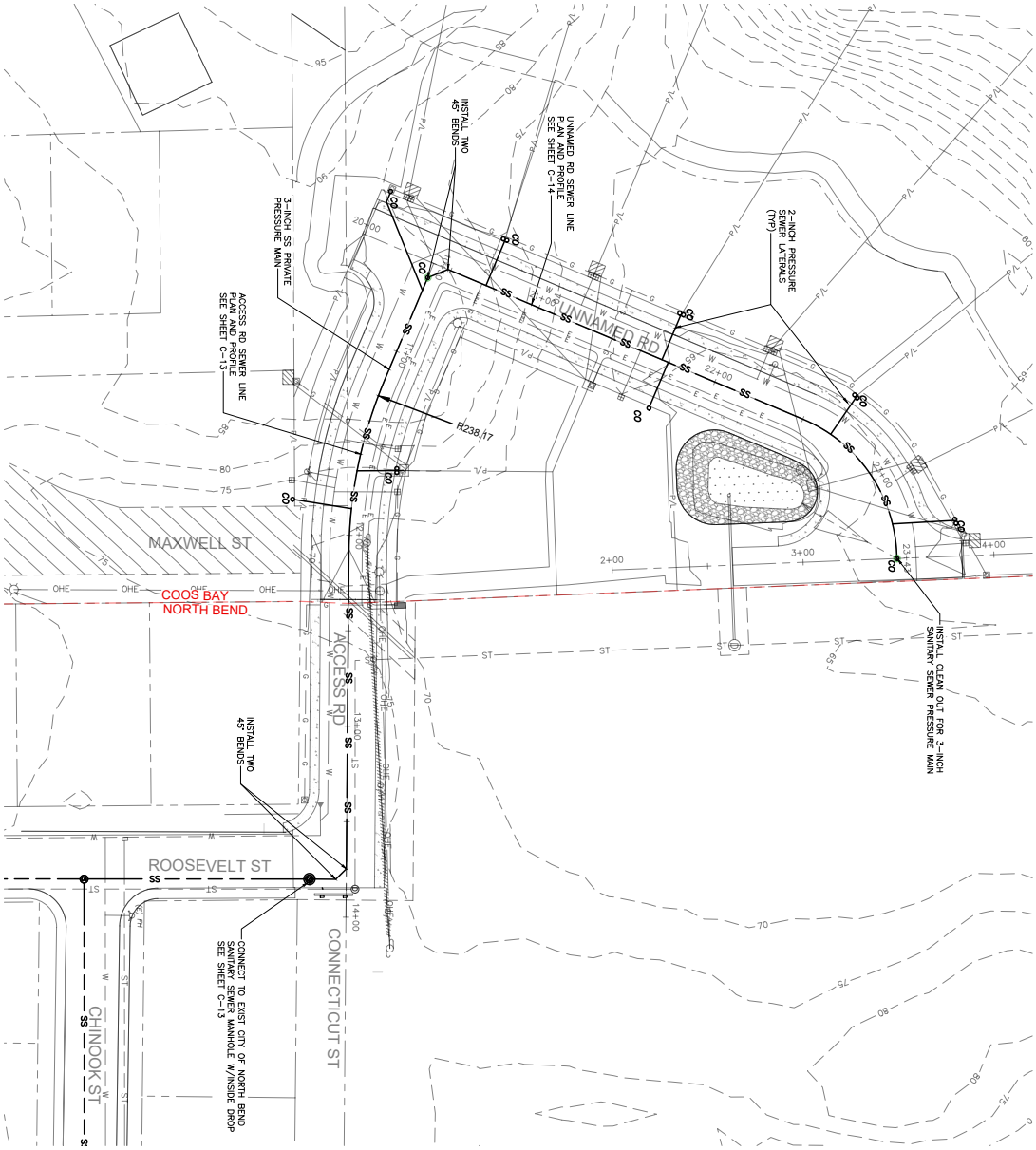
UTILITY PLAN -PRIVATE SEWER



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SHEET: C-12

SYM.	REVISION	DATE

DATE: 10-2020
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JC WILSON ENGINEERING & CONSULTING, LLC
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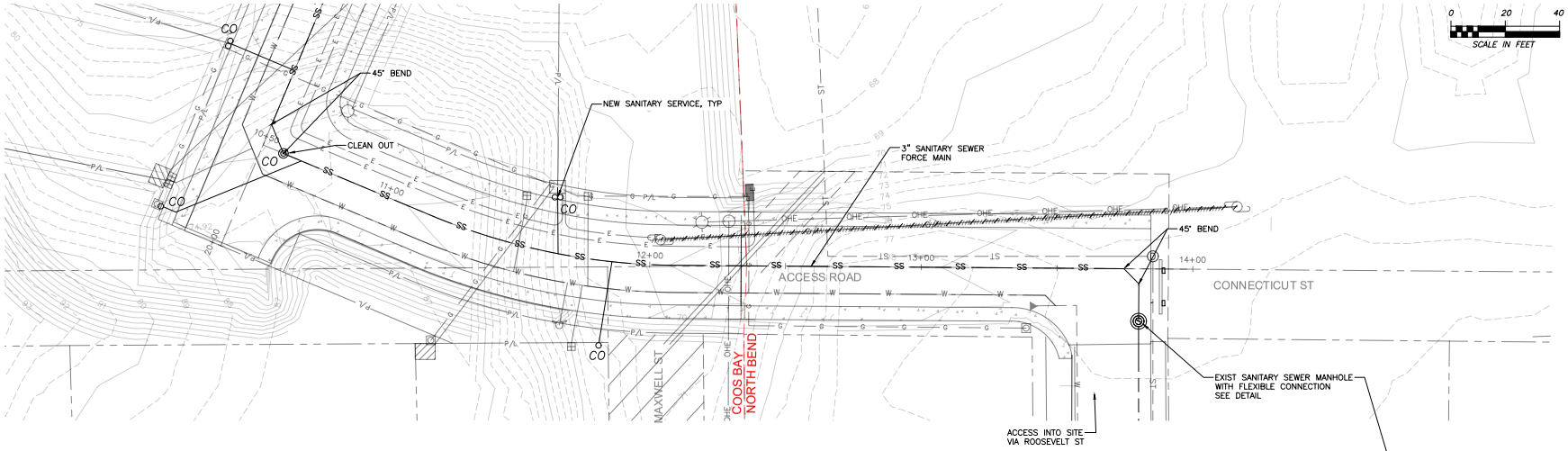
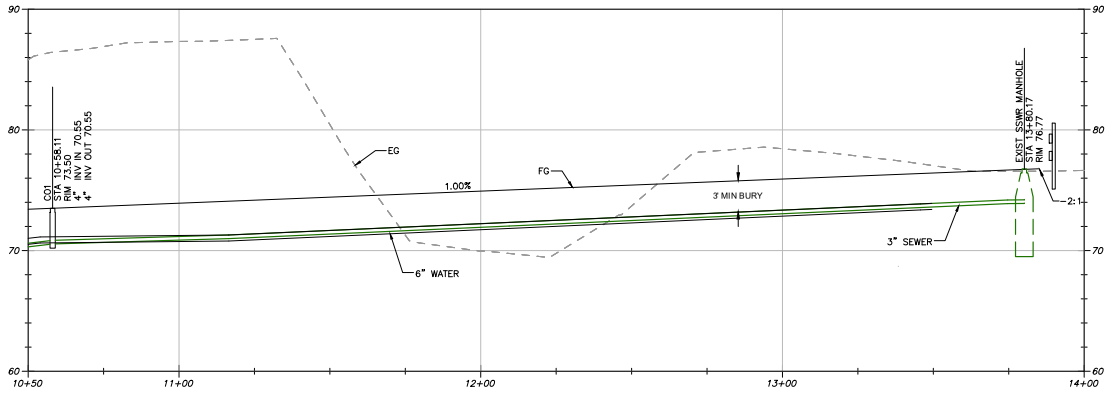
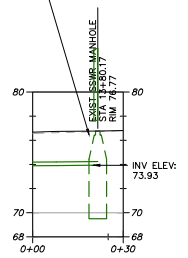
UTILITY PLAN -PRIVATE SEWER
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

ACCESS ROAD SANITARY P&P





ACCESS ROAD PROFILE
SCALE: 20H 5V



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SCALE: 20H 5V

TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
2. PROPOSED SURFACE, CONTOURS, AND ELEVATIONS WERE GENERATED OFF OF TOPOGRAPHIC ELEVATIONS AS DESCRIBED ABOVE IN NOTE #1.

ACCESS ROAD SANITARY P&P
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

JC WILSON ENGINEERING & CONSULTING, LLC
PO BOX 1135
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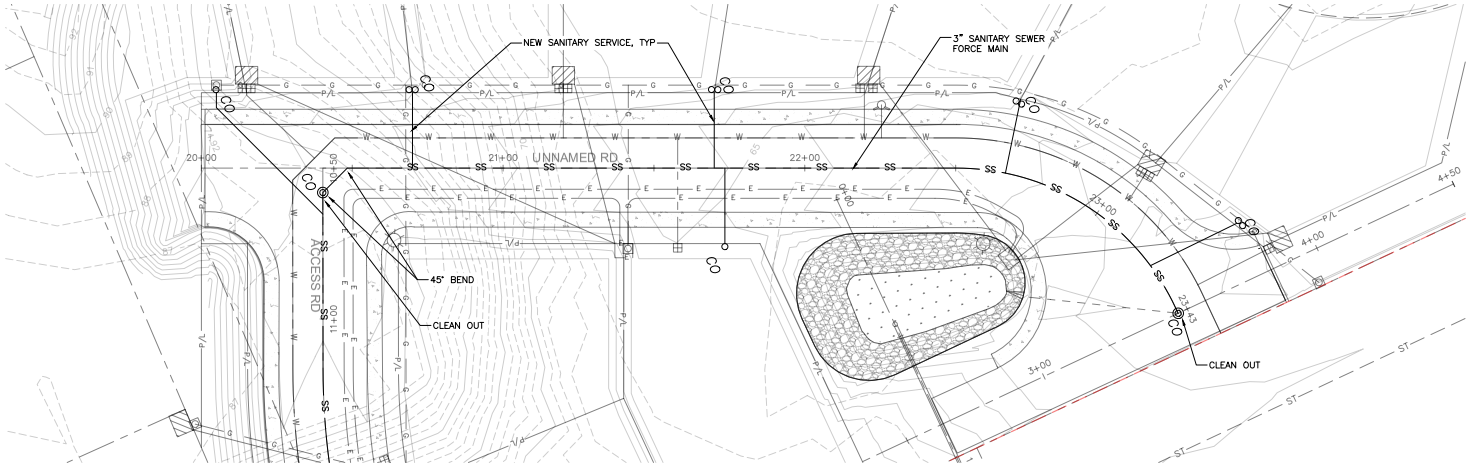
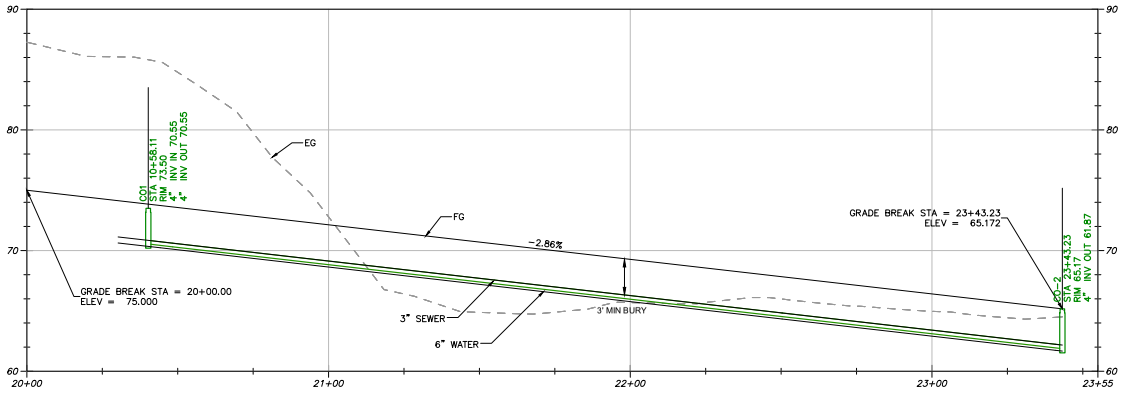
REGISTERED PROFESSIONAL ENGINEER 91637PE OREGON SEPTEMBER 13, 2005 ERIN C. WILSON EXPIRES: 06/30/22

SHEET: C-13

UNNAMED ROAD SANITARY P&P





UNNAMED ROAD PROFILE
SCALE: 20H 5V

TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
2. PROPOSED SURFACE, CONTOURS, AND ELEVATIONS WERE GENERATED OFF OF TOPOGRAPHIC ELEVATIONS AS DESCRIBED ABOVE IN NOTE #1.

UNNAMED ROAD SANITARY P&P
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

JC WILSON ENGINEERING & CONSULTING, LLC
PO BOX 445
NORTH BEND, OR 97459
WWW.JCWILSONENGINEERING.COM
P: (208) 553-6742

DATE: 10-2020
SCALE: AS SHOWN
DESIGNED BY: DSR
DRAWN BY: DSR
CHECKED: JCW
REVIEW: CITY

SYM.	REVISION	DATE

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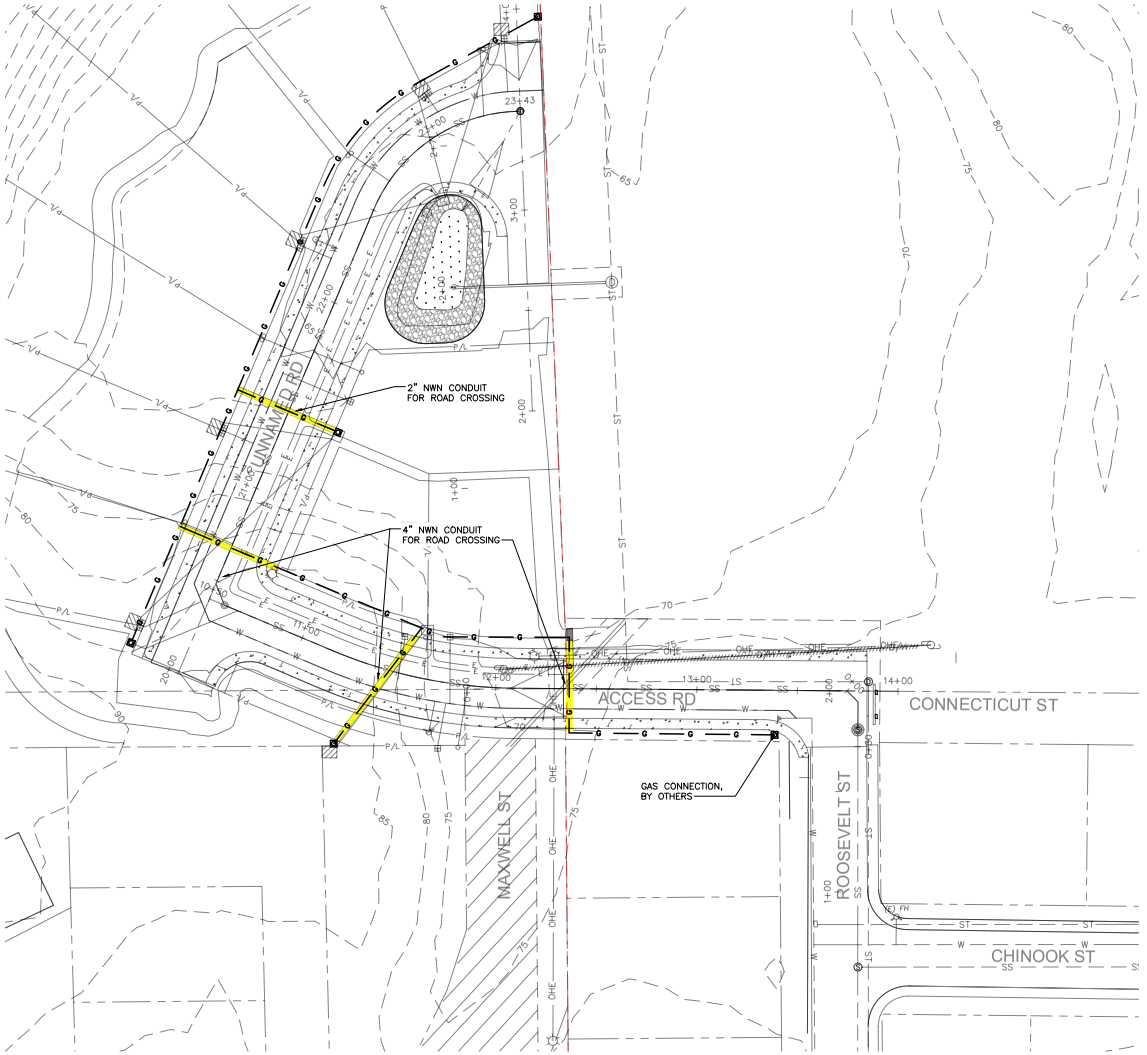
REGISTERED PROFESSIONAL ENGINEER
91637PE
OREGON
SEPTEMBER 13, 2005
JUSTIN C. WILSON
EXPIRES: 06/30/22

SHEET:
C-14

UTILITY PLAN - GAS



N

0 30 60
SCALE IN FEET

NOTES:

- INSTALL APPROX 875-FT OF MAIN
- TIE-IN FEE
- 13 LOTS
- PLAT 2-3233-129

INSPECTOR: ELDON COOPER 541-294-7269 FOR THE TRENCH INSPECTION ON ONSITE PRE-CON

LEGEND

NORTHWEST NATURAL GAS CO NWN

CONDUIT, SEE SIZE ON PLANS

CONDUIT ROAD CROSSING

PEDESTAL

UTILITY PLAN - GAS
BLUFFS SUBDIVISION
COOS BAY, OREGON
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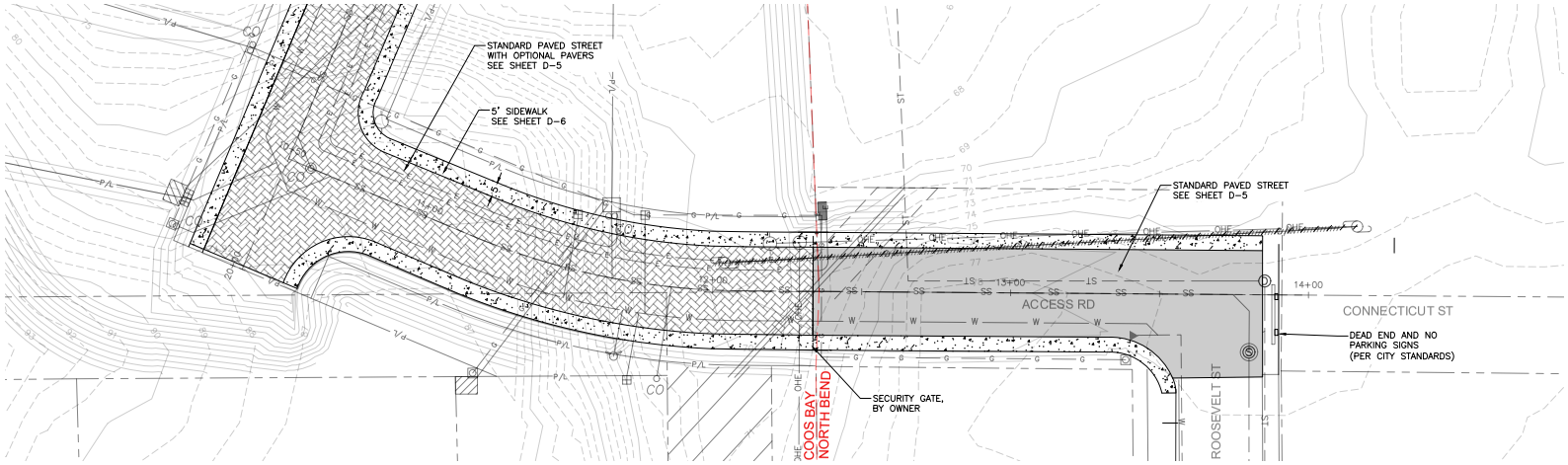
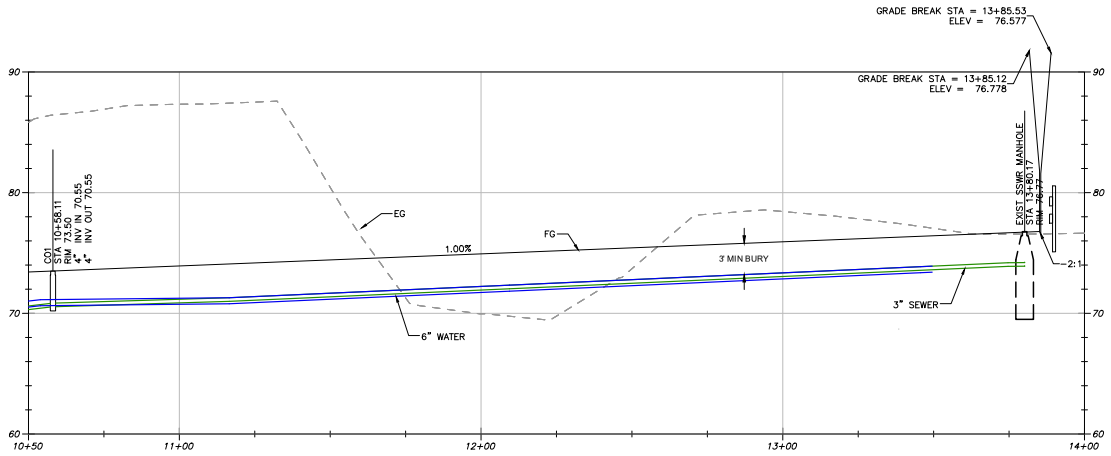
REVIEW: CITY

REGISTERED PROFESSIONAL ENGINEER
OREGON
JUSTIN C. WILSON
EXPIRES 06/30/22

SHEET:
C-15

ACCESS ROAD PLAN & PROFILE





ACCESS ROAD PROFILE
SCALE: 20H 5V

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N

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SCALE IN FEET

ACCESS ROAD PLAN & PROFILE
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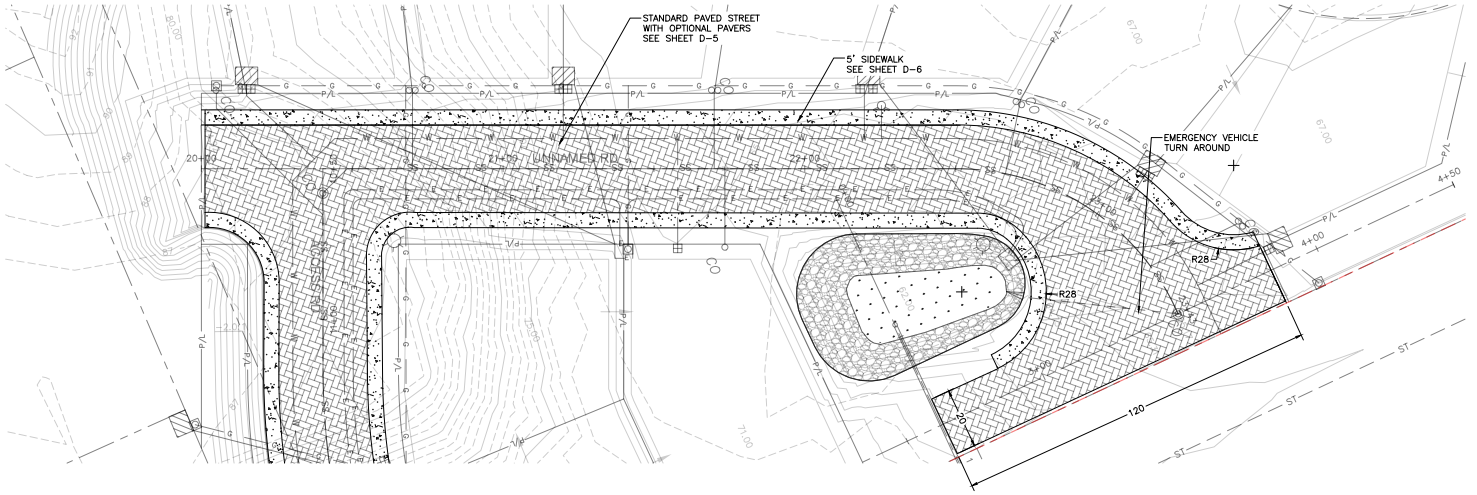
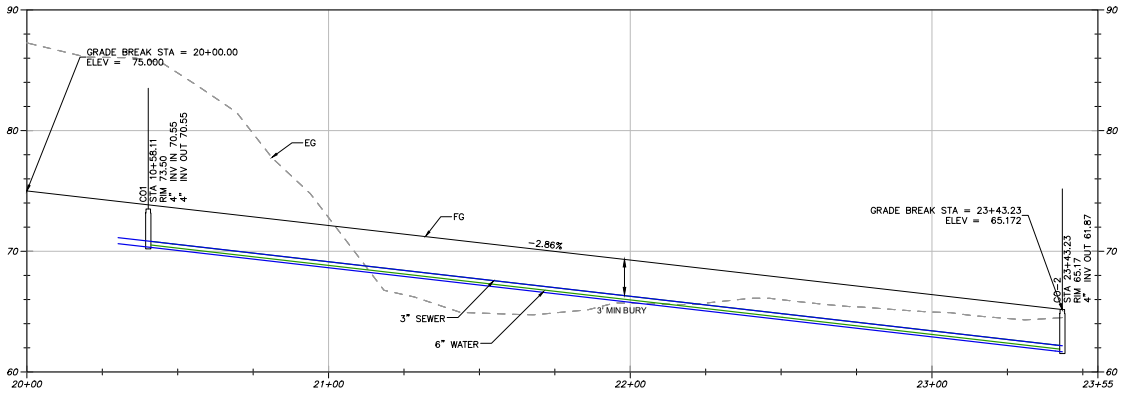
REVIEW: CITY

REGISTERED PROFESSIONAL ENGINEER
91637PE
OREGON
SEPTEMBER 13, 2006
EVELYN C. WILSON
EXPIRES: 06/30/22

SHEET:
C-16

UNNAMED DRIVE PLAN & PROFILE





UNNAMED ROAD PROFILE
SCALE: 20H 5V

TOPOGRAPHIC NOTES:

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UNNAMED DRIVE PLAN & PROFILE
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

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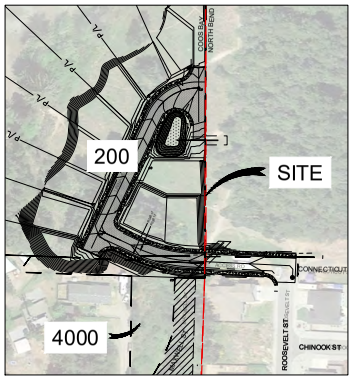
REGISTERED PROFESSIONAL ENGINEER
91637PE
OREGON
SEPTEMBER 13, 2005
EXPIRES: 06/30/22
DUSTIN C. WILSON

SHEET:
C-17

EROSION & SEDIMENT CONTROL PLAN



SITE MAP
NTS

PROJECT SITE

VICINITY MAP
NTS

LOCATION:

COOS COUNTY, OREGON
LATITUDE 43.243645
LONGITUDE 124.153398

DESCRIPTION:

25S13W08-200 & 25S13W17-4000
COOS COUNTY, OREGON

ATTENTION EXCAVATORS:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6699.

SPECIAL EROSION CONTROL NOTES:

1. MINIMIZE ENVIRONMENTAL DISTURBANCE BY ALLOWING FLEXIBILITY OF CORE LOCATIONS. A MINOR RELOCATION OF A CORE LOCATION MAY PRODUCE A SIGNIFICANT REDUCTION IN DISTURBANCE.
2. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE DISCHARGED OVER AN UNDISTURBED, PREFERABLY VEGETATED AREA, AND THROUGH A SEDIMENT CONTROL BMP (I.E. FILTER BAG)
3. ALL EXPOSED SOILS MUST BE COVERED DURING THE WET WEATHER PERIOD, OCT 01 – MAY 31.

DEVELOPER

RED MOON DEVELOPMENT & CONSTRUCTION
CONTACT: BRAD WOODRUFF
6589 S KINGS RANCH RD #103 J BOX 6
GOLD CANYON, AZ 85118-2933
BWOODRUFF01@GMAIL.COM
(602)796-1800

ENGINEERING FIRM:

JCW ENGINEERING
CONTACT: JUSTIN C. WILSON, P.E.
COOS BAY, OR 97420
JCWILSONENGINEERING@GMAIL.COM
PHONE: 208-553-6742

NARRATIVE DESCRIPTIONS:

EXISTING SITE CONDITIONS

UNDEVELOPED

DEVELOPED CONDITIONS:

RESIDENTIAL DEVELOPMENT.
COOS BAY PROTECTED FROM TURBIDITY RUNOFF.

ESTIMATED ACTIVITY TIME TABLE:

- CLEARING – OCTOBER 2020
- GRADING – OCTOBER 2020
- IMPROVEMENTS – SEPTEMBER 2021
- STABILIZATION – SEPTEMBER/OCTOBER 2021

TOTAL SITE AREA = X
TOTAL DISTURBED AREA = X ACRE

SITE SOIL CLASSIFICATION:

X

RECEIVING WATER BODIES:

COOS BAY

LOCAL-AGENCY-SPECIFIC NOTES

1. IF VEGETATIVE SEED MIXES ARE SPECIFIED, SEEDING MUST TAKE PLACE NO LATER THAN SEPT. 1; THE TYPE AND PERCENTAGE OF SEED IN THE MIX MUST BE IDENTIFIED ON THE PLANS.
2. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE DISCHARGED OVER AN UNDISTURBED, PREFERABLY VEGETATED AREA, AND THROUGH A SEDIMENT CONTROL BMP (I.E. FILTER BAG)
3. ALL EXPOSED SOILS MUST BE COVERED DURING THE WET WEATHER PERIOD, OCT 01 – MAY 31.

INSPECTION FREQUENCY

	SITE CONDITION	MIN. FREQUENCY
1	ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING FROM SNOWMELT IS OCCURRING AT LEAST ONCE EVERY TWO (2) WEEKS REGARDLESS OF WHETHER STORMWATER RUNOFF IS OCCURRING
2	PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES ARE IN WORKING ORDER, ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3	INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS	ONCE EVERY TWO (2) WEEKS
4	PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION.
5	PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS	MONTHLY. RESUME MONITORING IMMEDIATELY UPON MELT, OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY.

STANDARD ESC PLAN DRAWING NOTES:

1. HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS. (SCHEDULE A.8.C.i.(3))
2. ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS. (SCHEDULE A.12.B AND SCHEDULE B.1)
3. INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS. (SCHEDULE B.1.C AND B.2)
4. RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, THE ABOVE RECORDS MUST BE RETAINED BY THE PERMIT REGISTRANT, BUT DO NOT NEED TO BE AT THE CONSTRUCTION SITE. (SCHEDULE B.2.C)
5. ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT. (SCHEDULE A.8.A)
6. THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS. (SCHEDULE A.12.C.i)
7. SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT WITHIN 10 DAYS. (SCHEDULE A.12.C.iv AND v)
8. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION. (SCHEDULE A.7.A.iii)
9. IDENTIFY, MARK, AND PROTECT (BY CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G. WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. (SCHEDULE A.8.C.(1) AND (2))
10. PRESERVE EXISTING BEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED. (SCHEDULE A.7.A.v)
11. MAINTAIN AND DELINEATE ANY EXISTING NATURAL BUFFER WITHIN THE 50-FEET OF WATERS OF THE STATE. (SCHEDULE A.7.B.i AND (2(A)(B))
12. INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET PROTECTION AS WELL AS ALL SEDIMENT BASINS, TRAPS, AND BARRIERS PRIOR TO LAND DISTURBANCE. (SCHEDULE A.8.C.i(5))
13. CONTROL BOTH PEAK FLOW RATES AND TOTAL STORM WATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND DOWNSTREAM CHANNELS AND STREAMBANKS. (SCHEDULE A.7.C)
14. CONTROL SEDIMENT AS NEEDED ALONG THE SITE PERIMETER AND AT ALL OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION, BOTH INTERNALLY AND AT THE SITE BOUNDARY. (SCHEDULE A.7.D.i)
15. ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK. (SCHEDULE A.8.C.i(6))
16. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES. TEMPORARY OR PERMANENT STABILIZATIONS MEASURES ARE NOT REQUIRED FOR AREAS THAT ARE INTENDED TO BE LEFT UNVEGETATED, SUCH AS DIRT ACCESS ROADS OR UTILITY POLE PADS. (SCHEDULE A.8.C.ii(3))
17. ESTABLISH MATERIAL AND WASTE STORAGE AREAS AND OTHER NON-STORMWATER CONTROLS. (SCHEDULE A.8.C.i(7))
18. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS: CONSTRUCTION ENTRANCE, GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. (SCHEDULE A.7.D.ii AND A.8.C.i(4))
19. WHEN TRUCK SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SCHEDULE A.7.D.ii(5))
20. CONTROL PROHIBITED DISCHARGES FROM LEAVING THE CONSTRUCTION SITE, I.E. CONCRETE WASH-OUT, WASTEWATER FROM CLEANOUT OF STUCCO, PAINT AND CURING COMPOUNDS. (SCHEDULE A.6)
21. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, FERTILIZER, PESTICIDES AND HERBICIDES, PAINTS, SOLVENTS, CURING COMPOUNDS AND ADHESIVES FROM CONSTRUCTION OPERATIONS. (SCHEDULE A.7.E.i(2))
22. IMPLEMENT THE FOLLOWING BMPS WHEN APPLICABLE; WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. (SCHEDULE A.7.E.iii)
23. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOILS. (SCHEDULE A.7.A.iv)
24. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE. (SCHEDULE A.9.B.iii)
25. IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS. (SCHEDULE A.9.D)
26. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR. (SCHEDULE A.7.B)
27. AS NEEDED BASED ON WEATHER CONDITIONS, AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPS MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. (SCHEDULE A.7.E.ii(2))
28. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND BARE GROUND ACTIVITIES DURING WET WEATHER. (SCHEDULE A.7.A.i)
29. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL. (SCHEDULE A.9.C.i)
30. OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT AND BEFORE BMP REMOVAL. (SCHEDULE A.9.C.i)
31. CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND AT COMPLETION OF PROJECT. (SCHEDULE A.9.C.ii AND iv)
32. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN-UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME. (SCHEDULE A.9.B.i)
33. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASE SEDIMENTS. (SCHEDULE A.9.B.ii)
34. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYERS, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE. (SCHEDULE A.7.F.i)
35. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SCHEDULE A.7.F.ii)
36. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREA IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED, ALL TEMPORARY EROSION CONTROLS AND RETAINED SOILS MUST BE REMOVED AND DISPOSED OF PROPERLY, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. (SCHEDULE A.8.C.iii(1) AND D.3.C.ii AND iii)

THE PERMITEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN.

BMP MATRIX FOR CONSTRUCTION PHASES:

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMPS

	CLEARING	MASS GRAD.	UTILITY INSTALL.	STREET CONSTR.	FINAL STABIL.	WET WEATHER (OCT 1 – MAY 31)
EROSION PREVENTION						
PRESERVE NATURAL VEGETATION	**X	X	X	X	X	X
GROUND COVER					X	X
HYDRAULIC APPLICATIONS					X	
PLASTIC SHEETING						X
MATTING					X	X
DUST CONTROL	X	X	X	X	X	X
TEMPORARY/PERMANENT SEEDING		X	X	X	X	X
BUFFER ZONE	**X	X	X	X	X	X
OTHER:						
SEDIMENT CONTROL						
SEDIMENT FENCE (PERIMETER)	**X	X	X	X	X	X
SEDIMENT FENCE (INTERIOR)			X	X	X	X
STRAW WATTLES			X	X	X	X
FILTER BERM	X	X	X	X	X	X
INLET PROTECTION	**X	X	X	X	X	X
DEWATERING						
SEDIMENT TRAP	X	X	X	X	X	
NATURAL BUFFER ENCROACHMENT	**X	**X	**X	**X	**X	X
OTHER:						
RUN OFF CONTROL						
CONSTRUCTION ENTRANCE	**X	X	X	X	X	
PIPE SLOPE DRAIN	X	X	X			
OUTLET PROTECTION	X	X	X	X	X	
SURFACE ROUGHENING					X	
CHECK DAMS	X	X	X	X	X	X
OTHER:						
POLLUTION PREVENTION:						
PROPER SIGNAGE	X	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X	X	X
SPILL KIT ON-SITE	X	X	X	X	X	X
CONCRETE WASHOUT AREA	X	X	X	X	X	X
OTHER:						

** SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY

RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ'S GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMP's WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

INITIAL

PERMITEE'S SITE INSPECTOR:

INSPECTOR: JUSTIN WILSON PE

E-MAIL: jwilson@shn-engr.com

DESCRIPTION OF EXPERIENCE:
PAST WADOE CERTIFIED EROSION AND SEDIMENT CONTROL LEAD (CESCL) #459 AND #EF04231323 AND CURRENTLY ACCEPTED APPLICANT FOR CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENTATION CONTROL (CPESC) CPESC #TBD

SHEET INDEX

ESC-COVER
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

JC WILSON ENGINEERING & CONSULTING, LLC
PO BOX 182
NORTH BEND, OR 97459
WWW.JCWILSONENGINEERING.COM
P: (208) 553-6742

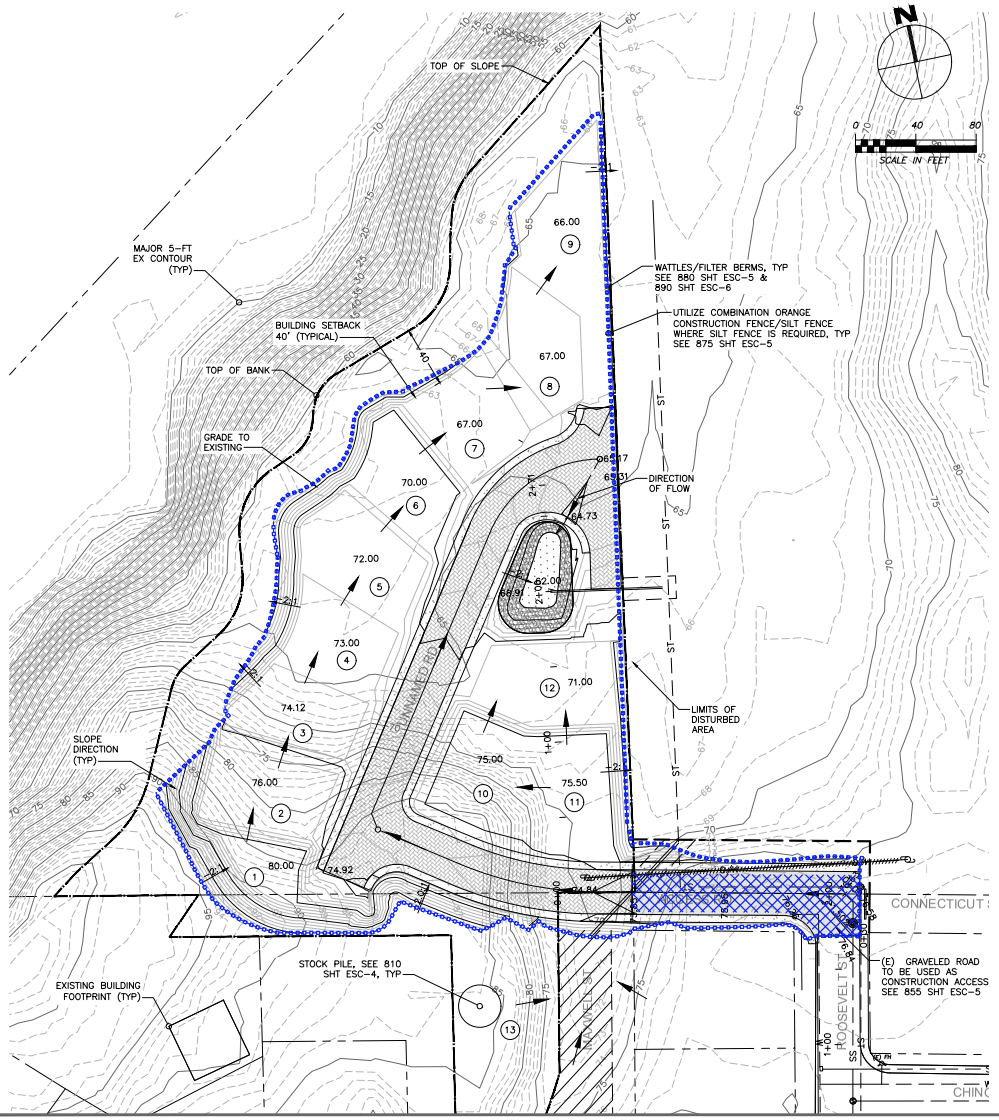
SYM	REVISION	DATE

DATE: 10-2020
SCALE: AS SHOWN
DESIGNED BY: DSR
DRAWN BY: DSR
CHECKED: JCW
REVIEW: CITY

C:\Users\Dawn Reed\Projects\JCW\2005-NB-BLUFFS\DWG\2005-BLUFF-GEN.dwg

SHEET:
ESC-1

EROSION & SEDIMENT CONTROL



PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES:

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.
3. SENSITIVE RESOURCES INCLUDING, BUT NOT LIMITED TO, TREES, WETLANDS, AND RIPARIAN PROTECTION AREAS SHALL BE CLEARLY DELINEATED WITH ORANGE CONSTRUCTION FENCING OR CHAIN LINK FENCING IN A MANNER THAT IS CLEARLY VISIBLE TO ANYONE IN THE AREA. NO ACTIVITIES ARE PERMITTED TO OCCUR BEYOND THE CONSTRUCTION BARRIER.
4. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING, AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
5. RUN-ON AND RUN-OFF CONTROLS SHALL BE IN PLACE AND FUNCTIONING PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES. RUN-ON AND RUN-OFF CONTROL MEASURES INCLUDE: SLOPE DRAINS (WITH OUTLET PROTECTION), CHECK DAMS, SURFACE ROUGHENING, AND BANK STABILIZATION.

EROSION AND SEDIMENT CONSTRUCTION NOTES:

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED:
   A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX.
   B. SEED MIX CHOSEN FOR PERMANENT SEEDING SHOULD BE COMPROMISED OF NATIVE, PERENNIAL SPECIES DUE TO RIPARIAN PROXIMITY.
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE COVERING OF EXPOSED SOIL WITH APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.

EROSION AND SEDIMENT CONTROL BMP IMPLEMENTATION:

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.
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Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Earthwork	1.000	1.000	99703.65 Sq. Ft.	8263.09 Cu. Yd.	11319.38 Cu. Yd.	3056.29 Cu. Yd.<Fill>
Totals			99703.65 Sq. Ft.	8263.09 Cu. Yd.	11319.38 Cu. Yd.	3056.29 Cu. Yd.<Fill>

EROSION & SEDIMENT CONTROL
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

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SYM.	REVISION	DATE

DATE: 10-2020
SCALE: AS SHOWN
DESIGNED BY: DSR
DRAWN BY: DSR
CHECKED: JCW
REVIEW: CITY

SHEET:
ESC-2

SHELDON PLANNING

September 14, 2020

City of Coos Bay
Planning Dept.
500 Central Avenue
Coos Bay, OR 97420
cc: derler@coosbay.org

Re: Placeholder for Stormwater Easement

To Whom It May Concern:

The applicant has received confirmation from the North Bend Airport that they will allow a 15' foot easement for maintenance of the applicant's proposed stormwater overflow.

This easement paperwork will be submitted to the City of Coos Bay and the City of North Bend when it has been completed.

Thank you,

Hailey Sheldon

ATTACHMENT 7

EASEMENT

RECORDED BY
FIRST AMERICAN TITLE
13-045

Jeff Marineau and Steve Plinski
510 Highland Avenue
Coos Bay, Oregon 97420
First Party

Coos County Airport District
1100 Airport Lane
North Bend, Oregon 97459
Second Party

After recording return to:

Jeff Marineau
510 Highland Avenue
Coos Bay, Oregon 97420

THIS AGREEMENT is made and entered into this 19th day of July, 2013 by and between Jeff Marineau and Steve Plinski, hereinafter called first party and Coos County Airport District, hereinafter called second party, WITNESSETH:

WHEREAS, First party is the record owner of the following described real property in Coos County, Oregon:

Government Lot 4 and the tidelands fronting thereon, in Section 8, Township 25 South, Range 13 West of the Willamette Meridian, Coos County, Oregon APN 3113.00

And the second party is the record owner of the following described real property in Coos County, Oregon:

A parcel of land located in the Southwest corner of Government Lot 5 of Section 9 of Township 25 South, Range 13 West of the Willamette Meridian and also known as a portion of Map and Tax Lot 25S-13W-09-100.

And the two parcels of real estate adjoin one another and the two parties desire to grant to each other an easement and right to use a roadway for ingress and egress purposes to be constructed along and upon a portion of each parcel for the benefit of both parties.

Said easement shall allow the first party to construct said easement for purposes of ingress and egress to the first party's property including but not limited to an easement for street improvements, curbs, all underground and overhead utilities all to be done at the first party's sole cost and expense.

NOW, THEREFORE, in consideration of each party's granting to the other an easement hereinafter described, and other valuable consideration paid to each other, the receipt of which is hereby acknowledged:

Second party conveys to first party a perpetual easement for the purposes as is set forth herein, along and upon that portion of the second party's property described as follows:

OS COUNTY CLERK, OREGON
RRI L. TURI, CCC, COUNTY CLERK
TOL $51.00
07/30/2013 02:31:45PM
PAGE 1 OF 3

ATTACHMENT 8

Beginning at a brass cap at the corner of sections 8,9,16, and 17, Township 25 South, Range 13 West, Willamette Meridian, Coos county, Oregon, thence S87°07'02"E along the line between Sections 9 and 16 a distance of 156.02 feet to a point; thence N1°48'11"E a distance of 35.00 feet to a point; thence N87°07'02"W a distance of 156.00 feet, more or less, to the line between Sections 8 and 9; thence South along said line a distance of 35.00 feet to the point of beginning.

Each party may use the whole easement in common with the other party, including that portion thereof situated on the property of the other party for ingress and egress and for the purposes as is set forth herein.

The cost of all maintenance and costs of all improvements shall be the responsibility of the first party; until such time that the city of North Bend takes control of these improvements for purposes of public use.

The parties acknowledge that it is the desire of the first party to develop or have their assigns develop the property for a residential or other form of development and that this agreement is binding upon the heirs, successors and assigns.

IN WITNESS WHEREOF, the parties have executed this instrument on the date stated above.

Jeff Marineau

STATE OF OREGON, County of Coos.
This instrument was acknowledged before me on the 19th day of July, 2013

by Debra L Wallace.

Notary Public for Oregon
My commission expires: 12/22/2013

OFFICIAL SEAL
DEBRA L WALLACE
NOTARY PUBLIC-OREGON
COMMISSION NO. 445312
MY COMMISSION EXPIRES DECEMBER 22, 2013

Steve Plinski

STATE OF OREGON, County of Coos.
This instrument was acknowledged before me on the 19th day of July, 2013

by Debra L Wallace.

Notary Public for Oregon
My commission expires: 12/22/2013

OFFICIAL SEAL
DEBRA L WALLACE
NOTARY PUBLIC-OREGON
COMMISSION NO. 445312
MY COMMISSION EXPIRES DECEMBER 22, 2013

COOS COUNTY CLERK, OREGON
TERRI L. TURI, CCC, COUNTY CLERK
TOTAL $51.00

07/30/2013 02:31:45PM
PAGE 2 OF 3

Theresa Cook

Theresa Cook, Executive Director

STATE OF OREGON, County of Coos.

This instrument was acknowledged before me on the 25th day of July, 2013

by Theresa Cook.

Notary Public for Oregon
My commission expires: February 2, 2017

OFFICIAL SEAL
ANDREW E COMBS
NOTARY PUBLIC-OREGON
COMMISSION NO. 474950
MY COMMISSION EXPIRES FEBRUARY 02, 2017

~~Joe Benetti, Chairman~~ of the Board
John Briggs, Vice Chairman

STATE OF OREGON, County of Coos.

This instrument was acknowledged before me on the 25th day of July, 2013

by John Briggs.

Notary Public for Oregon
My commission expires: February 2, 2017

OFFICIAL SEAL
ANDREW E COMBS
NOTARY PUBLIC-OREGON
COMMISSION NO. 474950
MY COMMISSION EXPIRES FEBRUARY 02, 2017

OFFICIAL SEAL
ANDREW E COMBS
NOTARY PUBLIC-OREGON
COMMISSION NO. 474950
MY COMMISSION EXPIRES FEBRUARY 02, 2017

COOS COUNTY CLERK, OREGON
TERRI L. TURI, CCC, COUNTY CLERK
TOTAL $51.00

07/30/2013 02:31:45PM
PAGE 3 OF 3

COOS BAY • NORTH BEND
WATER BOARD

2305 Ocean Boulevard
P. O. Box 539, Coos Bay, Oregon 97420-0108
Telephone: (541)267-3128 Fax: (541)269-5370

Ivan Thomas, General Manager

August 12, 2020

Justin C. Wilson, P.E.
JC Wilson Engineering & Consulting, LLC
P.O. Box 162
North Bend, OR 97459

SUBJECT: Water Service for The Bluffs subdivision

Dear Eric:

This letter is to advise you that Coos Bay-North Bend Water Board has adequate supply and pressure to serve the proposed The Bluffs subdivision in Coos Bay, Oregon. The new service lines can be connected to the existing 8-inch diameter main at the intersection of Roosevelt and Connecticut Avenue in North Bend, and the 6-inch diameter main on Maxwell Road in Coos Bay.

Connecting at both available locations would maximize fire flow to the subdivision. Connection at both locations is not a requirement unless your design shows that fire flows will be insufficient to afford the level of protection required by the Coos Bay Fire Department.

Please let me know if you have any questions.

Sincerely,

Matt Whitty, PE, PLS
Engineering Manager

ATTACHMENT 9

CITY OF NORTH BEND
CITY COUNCIL AGENDA ACTION SHEET

Date : June 23, 2020 **Agenda Number : 7**

Agenda Title : **Agreement to serve with Utilities, and allow opening (full improvements) of 156 feet of Connecticut Ave. in North Bend.**

Presented By : **Ralph Dunham- Public Works Director.**

Explanation :

In summer of 2019 City staff was approached by a prospective buyer of TL 200 T25S R13W S8 which is the property west of the airport in the City of Coos Bay (old Navy Trap Range) north and west of the westerly end of Connecticut St. The purchaser advised he was looking at sanitary sewer services options, along with access to the property. Currently Connecticut Ave. in unimproved from the end of Roosevelt Ave., west to Coos Bay City Limits. The parcel is currently accessed over an existing gated gravel road in Connecticut Ave. right of way approximately 120 feet in length, or through Maxwell Ln in Coos Bay through a gated gravel road approximately 870 feet in length. The site elevation is such that sanitary sewer would require pumping to either City, North Bend system approximately half the distance from the property, and similar features with all other utilities. Brad Woodruff of Red Moon Development therefore during his due diligence in purchasing the property contacted staff to see if, and with what requirements if known, the property could be served through connection to the City of North Bend. Mr. Woodruff was told at that time that it would require City Council approval, and development would be required to meet City Standards, however with Council approval, and after I conducted preliminary investigation into capacity issues (none found at that time), with agreement from the City of Coos Bay he could conceivably connect utilities and street improvements to the City of North Bend. Coos Bay staff indicated they had no issues

ATTACHMENT 10

either way he chose to connect. Mr. Woodruff subsequently purchased the property.

Mr. Woodruff submitted a letter last week requesting connection to the City of North Bend utilities, and approval to submit plans for improving Connecticut Ave. to access his property. Mr. Woodruff's intended development now is a 14-unit residential subdivision development (see attached preliminary plan). The obvious reason for this request is the extent of development required – North Bend is developed much closer to the property. Terence discussed possible annexation with Mr. Craddock, City of Coos Bay, however Coos Bay is not interested in giving up the tax income.

I have reviewed this preliminary proposal in relation to potential impacts to the City of North Bend. Utility services provided by the City of North Bend are sanitary sewer and storm water. We have a 24" storm line directly adjacent to the property (approx. 15' east on airport property) and a sanitary sewer pump station located 120 feet east of the property which was originally constructed by Mag 7 Enterprises (Sea Breeze Subdivision), and was designed to serve their 60 lot subdivision, Benny Hempstead's 11 lot subdivision, and included 20 dwellings on Wayne Shrunk's property south of Palm Island (Benny's subdivision), which all 3 provided proportionate funding for the pump station in 2006 (91 dwelling units). To date, 56 lots are developed, and the pump station is running at less than half capacity (theoretical capacity is 150-170 units). The capacity of the pump station as well as the collection system and treatment plant allow for this additional connection. Our agreement with Coos Bay indicates who ever supplies service collects fees, and is responsible for maintenance of the utility. Initial connection fees for 15 units would be $9,600 and annual sewer fees over $5,400/year. I assume we could collect our storm water fees also – as we are serving the property and could make it a condition of approval (approx. $800/year).

Coos Bay would receive the property taxes from this project, as well as franchise fees and gas tax revenues, supply police and fire protection. The portion of Connecticut Ave. improved would be ours to maintain. Based upon a pavement replacement plan every 20 years, minor maintenance of curb etc. Current pavement costs and miscellaneous maintenance for the short extension of Connecticut Ave. would be

approximately $20,000 every 20 years (bid cost on Sherman is $3.75/sf for removal & replacement). A sinking fund value (3% inflation, 5% earnings rate) would require an annual payment of $823.20 per year for the maintenance cost associated with this street. We should add however a minimum of $300/year for annual maintenance activities associated with owning a street. Traffic generated from this development will obviously be utilizing North Bend streets, however other than additional use of Roosevelt Ave., would likely be using our streets anyway. Estimated daily volume of traffic is 148 vehicles per day, less than the 500 vpd which triggers a traffic study in our ordinance.

Assuming appropriate user fees (sewer and drainage) are charged, no initial cost to the City (developer funds all improvements) and a condition of the development paying an annual street maintenance fee of approximately $1,100/year, I see no issues with authorizing the opening of Connecticut Ave. and providing utility service to this property.

Fiscal Impact : Current value $6,200 per year in utility fees, and $1,100 per year in street maintenance fees.

Staff Recommendation: To allow Red Moon Development to open City of North Bend right of way to City standards and connect to City of North Bend Utilities based upon the condition of a street maintenance fee and storm user fees be paid to the City of North Bend (sanitary sewer is already addressed in our IGA with the City of Coos Bay).

Council Action: Connecticut Ave. Improvements & Connection.

_____ Passed _____ Tabled _____ Failed

PLANNING FOR COMMUNITY AND ECOSYSTEM RESILIENCE ON THE OREGON COAST

The Oregon Coastal Management Program sought the City's support for a National Fish and Wildlife project titled "Planning for Community and Ecosystem Resilience on the Oregon Coast. Public Works Director Ralph Dunham explained that the project would leverage existing efforts and partnerships in coastal zone land use planning to draft Estuarine Resilience Action Plans.

He mentioned that The City already supports similar efforts, having adopted the Coos Bay Estuary Management Plan along with special estuary, floodplain, and tsunami hazard overlays and land use regulations. This project would expand upon those efforts but is not something that they necessarily should do and they do not need our support to go through with the grant but being a cosigner would allow the City to potentially shape rules and regulations

Councilors Graham and Erberle expressed their concerns about such a partnership as information from other meetings had led them to understand it could add another level of bureaucracy to doing anything in the coastal zone.

Item died for lack of a motion.

AGREEMENT TO SERVE WITH UTILITIES, AND ALLOW OPENING (FULL IMPROVEMENTS) OF 156 FEET OF CONNECTICUT AVE. IN NORTH BEND.

Public Works Director Dunham received a request to open 156 ft of Connecticut off the end of Roosevelt and the connection of sewer utilities from the City of North Bend. He explained this was the first step in a project for Red Moon Development to develop up to 15 single family units. The development would still need to go through Planning Commission and the development process.

Councilor Mike Erberle recused himself. Councilor Larry Garboden moved, and Jessica Engelke seconded, to agree to serve with utilities and allow opening of 156 feet of Connecticut Ave. The motion carried unanimously.

AUTHORIZATION TO AWARD MADRONA ST. #1 PAVING & UTILITY REHABILITATION PROJECT

Public Works Director Dunham explained that all bids were complete. Bids received ranged from $478,828 -$491,950 with the apparent low bidder being Laskey Clifton Inc. Work was stipulated to be completed prior to Oct. 15, 2020. In review of the bids, the only anomaly noted was the site restoration bid item ($1) by Laskey Clifton Inc., all other items appeared reasonable. He noted that while cleanup & site restoration is at the end of the project, we also would be holding approximately $24,000 in retainage at that time to insure site is properly restored. The project would be $478,828.40 split amongst funds 02-0079841, 12-00-79840, and 14-00-79870 based upon the bid schedule items split. Public

From: **Ralph Dunham** rdunham@northbendcity.org
Subject: RE: Next Steps: Bluffs Subdivision
Date: September 23, 2020 at 3:27 PM
To: Hailey Sheldon hailey@sheldonplanning.com, Derek Windham emap@northbendcity.org
Cc: Dan Kyelberg mdkconst12@hotmail.com

RD

Hailey:

Steps are as follows:

Submit with a right of way use application the street design for Connecticut, including drainage plan for the public portion of the street, and any utilities to be located within the public street, including details for any required signage, ADAAG accessibility, etc.

Submit with DEQ approval the sanitary sewer design, connection details to our system, and clearly demarking the publicly maintained portion.

Submit connection details to our storm sewer for the drainage line from the subdivision.

Submit specifications for construction related to any of the public improvements.

Next we review, comment, require modifications as necessary, and approve for construction.

You then build these facilities, with required documentation and city inspection as necessary.

You then submit record drawings of the constructed facilities, any O & M information necessary and the City does a final inspection.

You then complete any items noted as deficient, and City staff forward to City Council with a recommendation for acceptance (or not if improperly constructed) for maintenance. At that point you are complete.

Ralph Dunham, PE, PLS, CWRE
Director of Public Works
P.O. Box B, North Bend OR, 97459
(541) 756-8586
rdunham@northbendcity.org

From: Hailey Sheldon <hailey@sheldonplanning.com>
Sent: Wednesday, September 23, 2020 12:59 PM
To: Ralph Dunham <rdunham@northbendcity.org>; Derek Windham <emap@northbendcity.org>
Cc: Dan Kyelberg <mdkconst12@hotmail.com>
Subject: Next Steps: Bluffs Subdivision

Ralph and Derek: please let me know what additional steps Red Moon Development must complete in order to do the work they have proposed in the Connecticut ROW, to serve the Bluffs subdivision. I've attached the June 23rd agreement from the North Bend

City Council, to serve the proposed development w/ utilities and allow the improvement of 156 feet of Connecticut Ave. We've submitted our application for subdivision, site development, and the vacation of Maxwell Street to the City of Coos Bay; that application is here.

Let me know what's next with North Bend.

Thanks for your help.

Best,

hs

Hailey Sheldon
Sheldon Planning
444 N 4th Street l Coos Bay Oregon
(541) 968-4686 l hailey@sheldonplanning.com

Disclaimer:
This document is produced using a Geographic Information System (GIS). The data contained herein is intended to be a graphical representation only and is by no means an official survey or legal interpretation thereof. The City of Coos Bay provides this data in good faith and makes no warranties, guarantees or representations of any kind, either expressed or implied, as to the content, accuracy, completeness or reliability of this data.

Image Date: 3/6/2018

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W E
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Date: 5/20/2020

ATTACHMENT 11

JCW

JC Wilson Engineering & Consulting, LLC

Innovative - Practical - Strategic

LETTER

DATE: AUGUST 27, 2020

Reference: 2005

Red Moon Development & Construction, Inc
Attn: Brad Woodruff
6517 S Kings Ranch Rd.
Apache Junction, AZ 85118

Subject: Storm Drainage Mitigation Design – Bluffs Subdivision

Dear Brad:

JCW has completed drainage design calculations for proposed Bioretention LID facility proposed for this subdivision development. In this report package, JCW has completed design with SBUH analysis for all impervious area that will be placed on this site. Analysis was performed for asphalt surface for worst case option, though you do intend to utilize pavers that will greatly reduce peak flows.

Drainage design must meet City of Coos Bay water quality standards, and North Bend City Engineer did not feel water quantity from larger storm overflows would be an issue to drain into existing 24-in storm main to outfall. Water quantities from larger storms was not of great concern because of projects close proximity to the Bay, time of concentration flow characteristics.

The water quality storm for ½ 2-yr 24-hr storm will be completely infiltrated in the proposed LID Bio-retention facility, with no flows draining to City of North Bend System. The 25-yr 24-hr storm will overflow approximately 1.41-cfs to City system, and the 100-yr 24-hr storm will overflow 1.71-cfs to the City system. The City's 24" storm main is calculated to have a capacity of 22.34-cfs at a conservative slope of 0.5% grade.

Please feel free to contact me at 208-553-6742 if you have any questions.

Respectfully submitted,

JC Wilson Engineering & Consulting, LLC

Justin C. Wilson, PE
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
91633PE
8/27/20
OREGON
SEPT. 13, 2016
JUSTIN C. WILSON
EXPIRES: 6/2022

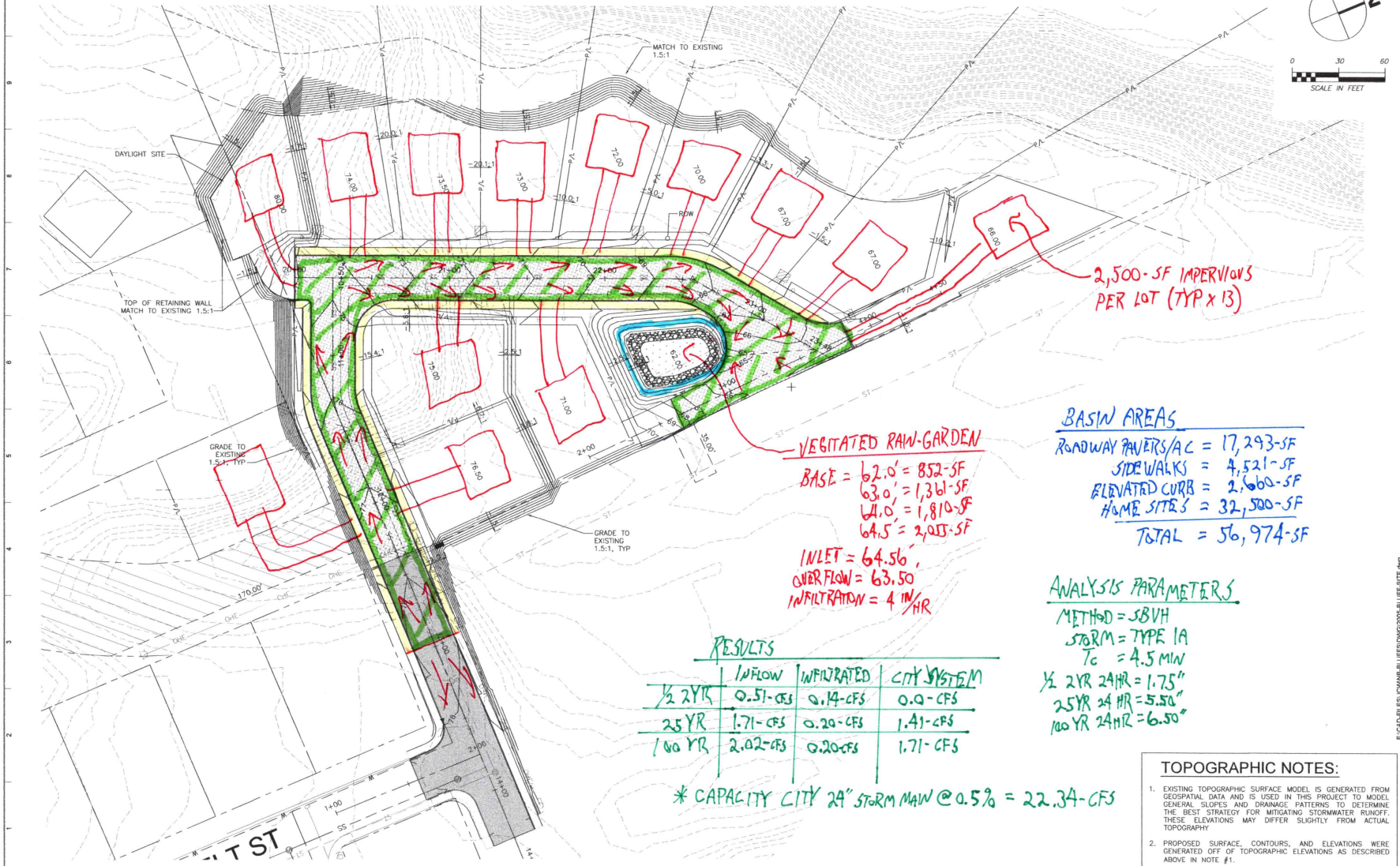
JCW:jcw

Attachments:
1. Drainage Design & Onsite Basin Map
2. Hydrologic Calculations & O&M Guide
3. USDA Soil Report

ATTACHMENT 12

Drainage Design & Onsite Basin Map 1

GRADING & DRAINAGE PLAN



	INFLOW	INFILTRATED	CITY SYSTEM
½ 2YR	0.51-CFS	0.14-CFS	0.0-CFS
25 YR	1.71-CFS	0.20-CFS	1.41-CFS
100 YR	2.02-CFS	0.20-CFS	1.71-CFS

TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
2. PROPOSED SURFACE, CONTOURS, AND ELEVATIONS WERE GENERATED OFF OF TOPOGRAPHIC ELEVATIONS AS DESCRIBED ABOVE IN NOTE #1.

GRADING & DRAINAGE PLAN
BLUFFS SUBDIVISION
NORTH BEND, OREGON
RED MOON DEVELOPMENT

JC WILSON ENGINEERING & CONSULTING, LLC
PO BOX 182
NORTH BEND, OR 97459
WWW.JOHNWILSONENGINEERING.COM
P: (541) 515-8762

SYM.	REVISION	DATE

DATE: 07-2020
SCALE: AS SHOWN
DESIGNED BY: DSR
DRAWN BY: DSR
CHECKED: JCW
REVIEW: CITY

E:\CAD-FILES\CIVIL\BLUFFS\DWG\2005-BLUFF-SITE.dwg

SHEET: C-4

Hydrologic Calculations & O&M Guide 2

Summary for Subcatchment 2S: QUALITY

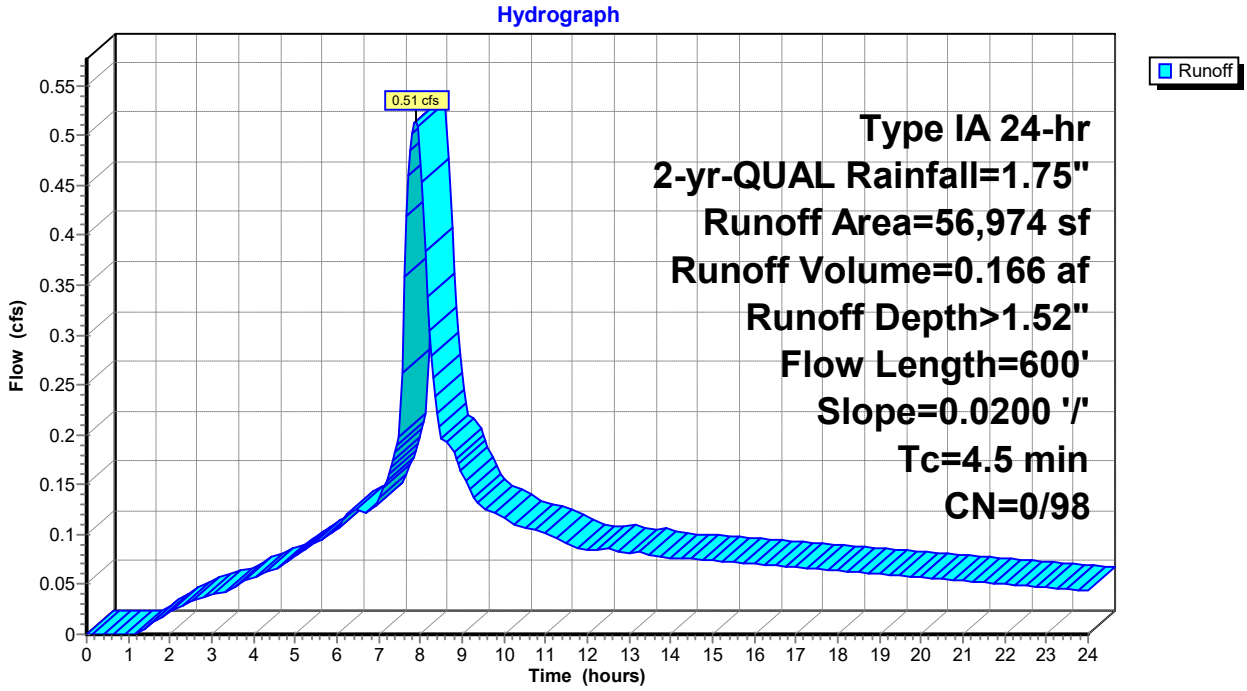
Runoff = 0.51 cfs @ 7.90 hrs, Volume= 0.166 af, Depth> 1.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr-QUAL Rainfall=1.75"

	Area (sf)	CN	Description
*	17,293	98	Paved roads w/curbs & sewers, HSG A
	32,500	98	Roofs, HSG C
	2,660	98	Paved roads w/curbs & sewers, HSG A
	4,521	98	Paved parking, HSG A
	56,974	98	Weighted Average
	56,974	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	300	0.0200	1.79		**Sheet Flow, IMPERV** Smooth surfaces n= 0.011 P2= 3.50"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	600	Total			

Subcatchment 2S: QUALITY



Hydrograph for Subcatchment 2S: QUALITY

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	**0.00**	0.00	0.00
0.50	0.02	0.00	0.00	0.00
1.00	0.03	0.00	0.00	0.00
1.50	0.06	0.00	0.00	0.01
2.00	0.09	0.00	0.01	0.02
2.50	0.12	0.00	0.02	0.03
3.00	0.14	0.00	0.03	0.04
3.50	0.17	0.00	0.05	0.05
4.00	0.20	0.00	0.07	0.06
4.50	0.24	0.00	0.10	0.07
5.00	0.27	0.00	0.12	0.08
5.50	0.32	0.00	0.16	0.09
6.00	0.36	0.00	0.20	0.11
6.50	0.41	0.00	0.24	0.13
7.00	0.47	0.00	0.29	0.14
7.50	0.54	0.00	0.36	**0.20**
8.00	0.74	0.00	0.54	**0.50**
8.50	0.84	0.00	0.64	0.20
9.00	0.91	0.00	0.70	0.16
9.50	0.96	0.00	0.75	0.13
10.00	1.01	0.00	0.80	0.12
10.50	1.05	0.00	0.84	0.11
11.00	1.09	0.00	0.88	0.10
11.50	1.13	0.00	0.92	0.09
12.00	1.16	0.00	0.95	0.08
12.50	1.20	0.00	0.98	0.09
13.00	1.23	0.00	1.01	0.08
13.50	1.26	0.00	1.04	0.08
14.00	1.29	0.00	1.07	0.08
14.50	1.32	0.00	1.10	0.08
15.00	1.35	0.00	1.13	0.07
15.50	1.37	0.00	1.16	0.07
16.00	1.40	0.00	1.18	0.07
16.50	1.43	0.00	1.21	0.07
17.00	1.45	0.00	1.24	0.07
17.50	1.48	0.00	1.26	0.07
18.00	1.50	0.00	1.28	0.06
18.50	1.53	0.00	1.31	0.06
19.00	1.55	0.00	1.33	0.06
19.50	1.58	0.00	1.35	0.06
20.00	1.60	0.00	1.38	0.06
20.50	1.62	0.00	1.40	0.06
21.00	1.64	0.00	1.42	0.05
21.50	1.66	0.00	1.44	0.05
22.00	1.68	0.00	1.46	0.05
22.50	1.70	0.00	1.48	0.05
23.00	1.72	0.00	1.49	0.05
23.50	1.73	0.00	1.51	0.04
24.00	**1.75**	0.00	**1.53**	0.04

Summary for Pond 3P: (new Pond)

Inflow Area = 1.308 ac,100.00% Impervious, Inflow Depth > 1.52" for 2-yr-QUAL event
Inflow = 0.51 cfs @ 7.90 hrs, Volume= 0.166 af
Outflow = 0.14 cfs @ 9.22 hrs, Volume= 0.166 af, Atten= 73%, Lag= 79.4 min
Discarded = 0.14 cfs @ 9.22 hrs, Volume= 0.166 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 63.13' @ 9.22 hrs Surf.Area= 1,422 sf Storage= 1,294 cf

Plug-Flow detention time= 75.6 min calculated for 0.166 af (100% of inflow)
Center-of-Mass det. time= 74.3 min (759.4 - 685.1)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	3,658 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

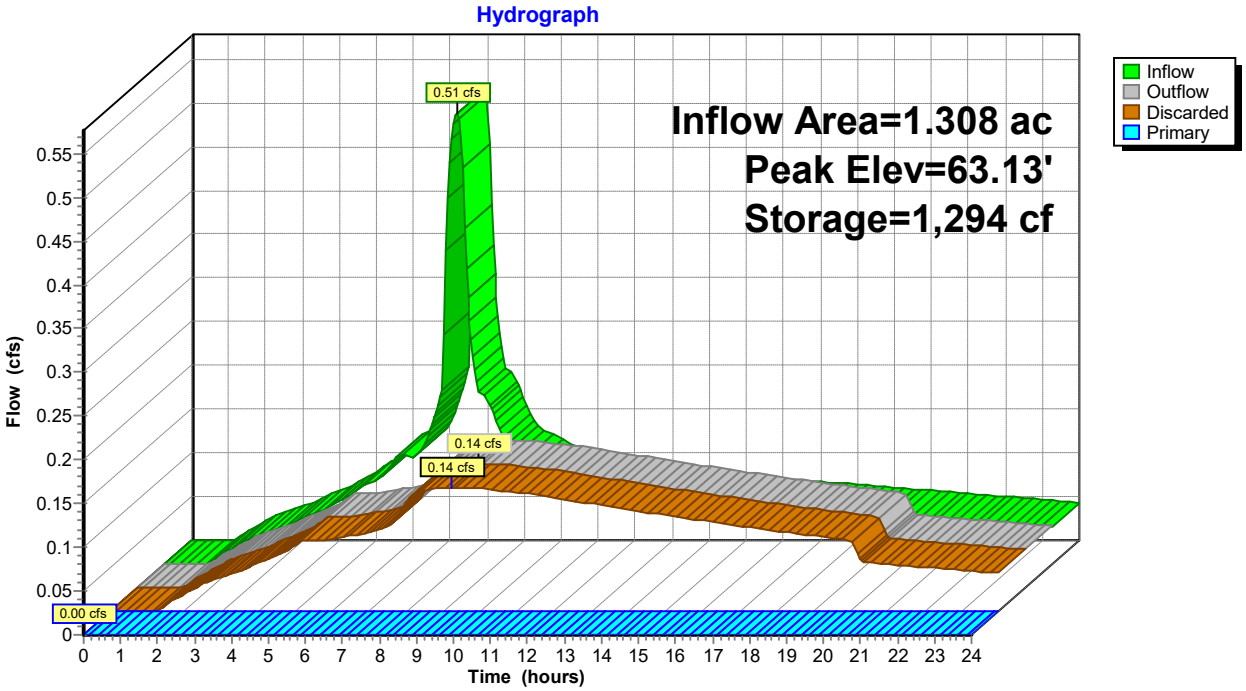
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.00	852	0	0
63.00	1,361	1,107	1,107
64.00	1,810	1,586	2,692
64.50	2,055	966	3,658

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**4.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.00'
#2	Primary	63.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.14 cfs @ 9.22 hrs HW=63.13' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: (new Pond)



Hydrograph for Pond 3P: (new Pond)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	62.00	0.00	0.00	**0.00**
0.50	0.00	0	62.00	0.00	0.00	0.00
1.00	0.00	0	62.00	0.00	0.00	0.00
1.50	0.01	2	62.00	0.01	0.01	0.00
2.00	0.02	5	62.01	0.02	0.02	0.00
2.50	0.03	8	62.01	0.03	0.03	0.00
3.00	0.04	10	62.01	0.04	0.04	0.00
3.50	0.05	12	62.01	0.05	0.05	0.00
4.00	0.06	15	62.02	0.06	0.06	0.00
4.50	0.07	17	62.02	0.06	0.06	0.00
5.00	0.08	20	62.02	0.08	0.08	0.00
5.50	0.09	31	62.04	0.08	0.08	0.00
6.00	0.11	60	62.07	0.08	0.08	0.00
6.50	0.13	122	62.14	0.09	0.09	0.00
7.00	0.14	188	62.21	0.09	0.09	0.00
7.50	**0.20**	314	62.33	0.10	0.10	0.00
8.00	**0.50**	903	62.85	0.13	0.13	0.00
8.50	0.20	1,207	63.07	0.14	0.14	0.00
9.00	0.16	**1,287**	**63.13**	**0.14**	**0.14**	0.00
9.50	0.13	**1,285**	**63.13**	**0.14**	**0.14**	0.00
10.00	0.12	1,253	63.11	0.14	0.14	0.00
10.50	0.11	1,200	63.07	0.14	0.14	0.00
11.00	0.10	1,141	63.03	0.14	0.14	0.00
11.50	0.09	1,072	62.97	0.13	0.13	0.00
12.00	0.08	993	62.91	0.13	0.13	0.00
12.50	0.09	915	62.86	0.13	0.13	0.00
13.00	0.08	840	62.80	0.12	0.12	0.00
13.50	0.08	769	62.74	0.12	0.12	0.00
14.00	0.08	696	62.68	0.12	0.12	0.00
14.50	0.08	627	62.62	0.11	0.11	0.00
15.00	0.07	561	62.56	0.11	0.11	0.00
15.50	0.07	498	62.51	0.11	0.11	0.00
16.00	0.07	437	62.45	0.10	0.10	0.00
16.50	0.07	379	62.40	0.10	0.10	0.00
17.00	0.07	323	62.34	0.10	0.10	0.00
17.50	0.07	270	62.29	0.09	0.09	0.00
18.00	0.06	218	62.24	0.09	0.09	0.00
18.50	0.06	169	62.19	0.09	0.09	0.00
19.00	0.06	121	62.14	0.09	0.09	0.00
19.50	0.06	76	62.09	0.08	0.08	0.00
20.00	0.06	32	62.04	0.08	0.08	0.00
20.50	0.06	15	62.02	0.06	0.06	0.00
21.00	0.05	14	62.02	0.05	0.05	0.00
21.50	0.05	14	62.02	0.05	0.05	0.00
22.00	0.05	13	62.02	0.05	0.05	0.00
22.50	0.05	13	62.02	0.05	0.05	0.00
23.00	0.05	13	62.01	0.05	0.05	0.00
23.50	0.04	12	62.01	0.05	0.05	0.00
24.00	0.04	12	62.01	0.04	0.04	0.00

Summary for Subcatchment 2S: QUALITY

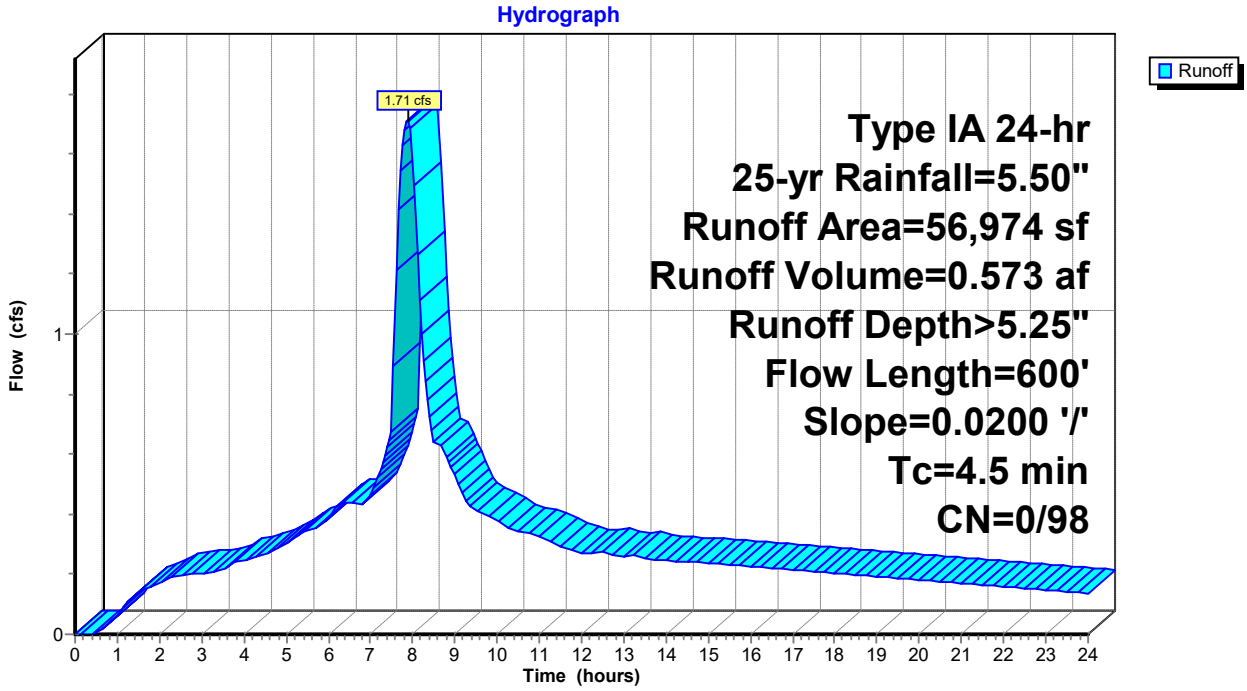
Runoff = 1.71 cfs @ 7.88 hrs, Volume= 0.573 af, Depth> 5.25"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	17,293	98	Paved roads w/curbs & sewers, HSG A
	32,500	98	Roofs, HSG C
	2,660	98	Paved roads w/curbs & sewers, HSG A
	4,521	98	Paved parking, HSG A
	56,974	98	Weighted Average
	56,974	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	300	0.0200	1.79		**Sheet Flow, IMPERV** Smooth surfaces n= 0.011 P2= 3.50"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	600	Total			

Subcatchment 2S: QUALITY



Hydrograph for Subcatchment 2S: QUALITY

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	**0.00**	0.00	0.00
0.50	0.05	0.00	0.00	0.01
1.00	0.11	0.00	0.02	0.06
1.50	0.19	0.00	0.06	0.14
2.00	0.28	0.00	0.13	0.17
2.50	0.36	0.00	0.20	0.20
3.00	0.45	0.00	0.27	0.20
3.50	0.54	0.00	0.35	0.22
4.00	0.64	0.00	0.45	0.25
4.50	0.74	0.00	0.54	0.27
5.00	0.86	0.00	0.65	0.30
5.50	0.99	0.00	0.78	0.35
6.00	1.13	0.00	0.92	0.38
6.50	1.30	0.00	1.09	0.45
7.00	1.47	0.00	1.25	0.47
7.50	1.71	0.00	1.48	**0.67**
8.00	2.34	0.00	2.11	**1.65**
8.50	2.64	0.00	2.41	0.64
9.00	2.86	0.00	2.63	0.52
9.50	3.02	0.00	2.79	0.41
10.00	3.17	0.00	2.94	0.38
10.50	3.31	0.00	3.07	0.34
11.00	3.43	0.00	3.20	0.32
11.50	3.55	0.00	3.31	0.30
12.00	3.65	0.00	3.42	0.27
12.50	3.76	0.00	3.52	0.28
13.00	3.86	0.00	3.62	0.26
13.50	3.95	0.00	3.72	0.25
14.00	4.05	0.00	3.81	0.24
14.50	4.14	0.00	3.91	0.24
15.00	4.23	0.00	4.00	0.24
15.50	4.32	0.00	4.08	0.23
16.00	4.41	0.00	4.17	0.23
16.50	4.49	0.00	4.25	0.22
17.00	4.57	0.00	4.34	0.21
17.50	4.65	0.00	4.42	0.21
18.00	4.73	0.00	4.49	0.20
18.50	4.80	0.00	4.57	0.20
19.00	4.88	0.00	4.64	0.19
19.50	4.95	0.00	4.71	0.19
20.00	5.02	0.00	4.78	0.18
20.50	5.09	0.00	4.85	0.18
21.00	5.15	0.00	4.92	0.17
21.50	5.22	0.00	4.98	0.16
22.00	5.28	0.00	5.04	0.16
22.50	5.34	0.00	5.10	0.15
23.00	5.39	0.00	5.16	0.15
23.50	5.45	0.00	5.21	0.14
24.00	**5.50**	0.00	**5.26**	0.14

Summary for Pond 3P: (new Pond)

Inflow Area = 1.308 ac,100.00% Impervious, Inflow Depth > 5.25" for 25-yr event
Inflow = 1.71 cfs @ 7.88 hrs, Volume= 0.573 af
Outflow = 1.61 cfs @ 8.01 hrs, Volume= 0.532 af, Atten= 6%, Lag= 7.6 min
Discarded = 0.20 cfs @ 8.01 hrs, Volume= 0.302 af
Primary = 1.41 cfs @ 8.01 hrs, Volume= 0.230 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 64.13' @ 8.01 hrs Surf.Area= 1,874 sf Storage= 2,934 cf

Plug-Flow detention time= 100.3 min calculated for 0.530 af (93% of inflow)
Center-of-Mass det. time= 47.1 min (699.5 - 652.4)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	3,658 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

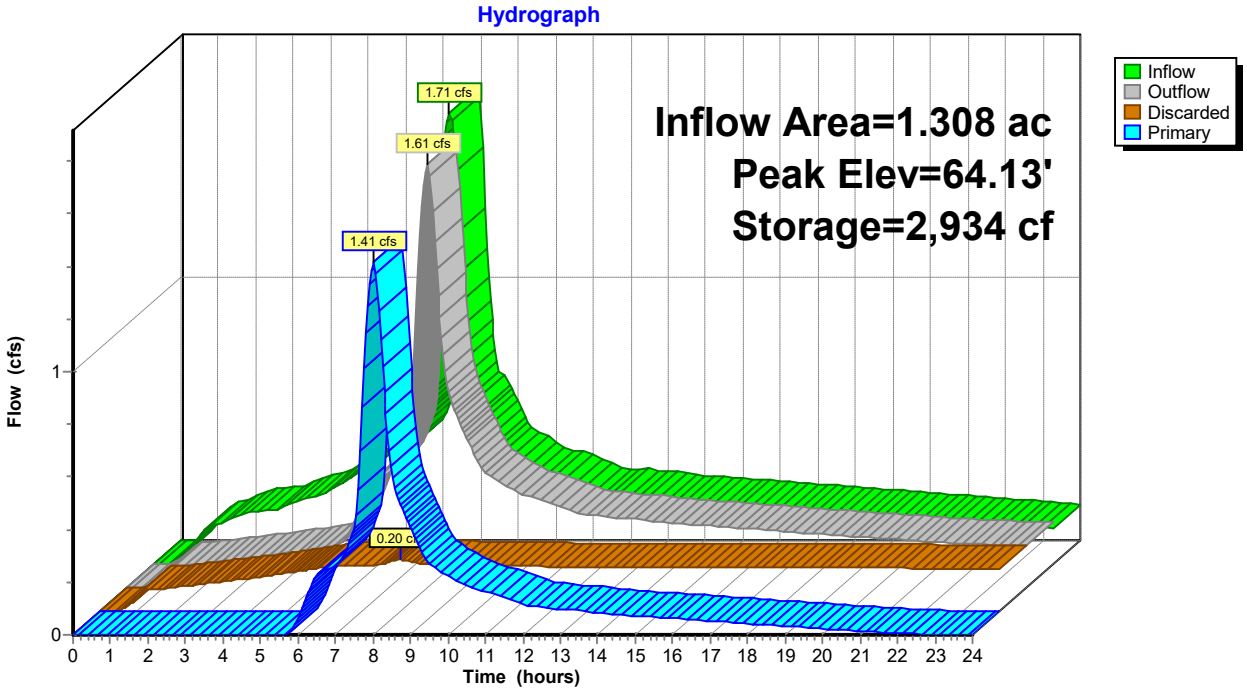
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.00	852	0	0
63.00	1,361	1,107	1,107
64.00	1,810	1,586	2,692
64.50	2,055	966	3,658

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**4.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.00'
#2	Primary	63.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.20 cfs @ 8.01 hrs HW=64.13' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=1.41 cfs @ 8.01 hrs HW=64.13' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 1.41 cfs @ 2.70 fps)

Pond 3P: (new Pond)



Hydrograph for Pond 3P: (new Pond)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	62.00	0.00	0.00	0.00
0.50	0.01	1	62.00	0.00	0.00	0.00
1.00	0.06	14	62.02	0.05	0.05	0.00
1.50	0.14	71	62.08	0.08	0.08	0.00
2.00	0.17	194	62.21	0.09	0.09	0.00
2.50	0.20	356	62.38	0.10	0.10	0.00
3.00	0.20	530	62.54	0.11	0.11	0.00
3.50	0.22	701	62.68	0.12	0.12	0.00
4.00	0.25	906	62.85	0.13	0.13	0.00
4.50	0.27	1,132	63.02	0.14	0.14	0.00
5.00	0.30	1,391	63.20	0.15	0.15	0.00
5.50	0.35	1,709	63.41	0.16	0.16	0.00
6.00	0.38	2,038	63.62	0.23	0.17	0.06
6.50	0.45	2,223	63.73	0.40	0.17	0.23
7.00	0.47	2,255	63.75	0.44	0.17	0.26
7.50	**0.67**	2,366	63.82	0.58	0.18	0.41
8.00	**1.65**	**2,933**	**64.13**	**1.61**	**0.20**	**1.41**
8.50	0.64	2,518	63.90	0.82	0.18	0.64
9.00	0.52	2,368	63.82	0.59	0.18	0.41
9.50	0.41	2,265	63.76	0.45	0.17	0.28
10.00	0.38	2,221	63.73	0.40	0.17	0.22
10.50	0.34	2,183	63.71	0.36	0.17	0.18
11.00	0.32	2,164	63.70	0.34	0.17	0.17
11.50	0.30	2,137	63.68	0.31	0.17	0.14
12.00	0.27	2,106	63.66	0.28	0.17	0.11
12.50	0.28	2,098	63.66	0.28	0.17	0.11
13.00	0.26	2,085	63.65	0.27	0.17	0.10
13.50	0.25	2,080	63.65	0.26	0.17	0.09
14.00	0.24	2,065	63.64	0.25	0.17	0.08
14.50	0.24	2,058	63.63	0.25	0.17	0.08
15.00	0.24	2,051	63.63	0.24	0.17	0.07
15.50	0.23	2,044	63.62	0.23	0.17	0.07
16.00	0.23	2,036	63.62	0.23	0.17	0.06
16.50	0.22	2,027	63.61	0.22	0.17	0.06
17.00	0.21	2,018	63.61	0.22	0.17	0.05
17.50	0.21	2,009	63.60	0.21	0.17	0.05
18.00	0.20	2,001	63.60	0.21	0.17	0.04
18.50	0.20	1,991	63.59	0.20	0.17	0.04
19.00	0.19	1,980	63.59	0.20	0.17	0.03
19.50	0.19	1,969	63.58	0.19	0.17	0.03
20.00	0.18	1,958	63.57	0.19	0.16	0.02
20.50	0.18	1,946	63.56	0.18	0.16	0.02
21.00	0.17	1,932	63.56	0.18	0.16	0.01
21.50	0.16	1,918	63.55	0.17	0.16	0.01
22.00	0.16	1,901	63.54	0.17	0.16	0.01
22.50	0.15	1,882	63.52	0.16	0.16	0.00
23.00	0.15	1,859	63.51	0.16	0.16	0.00
23.50	0.14	1,831	63.49	0.16	0.16	0.00
24.00	0.14	1,795	63.47	0.16	0.16	0.00

Summary for Subcatchment 2S: QUALITY

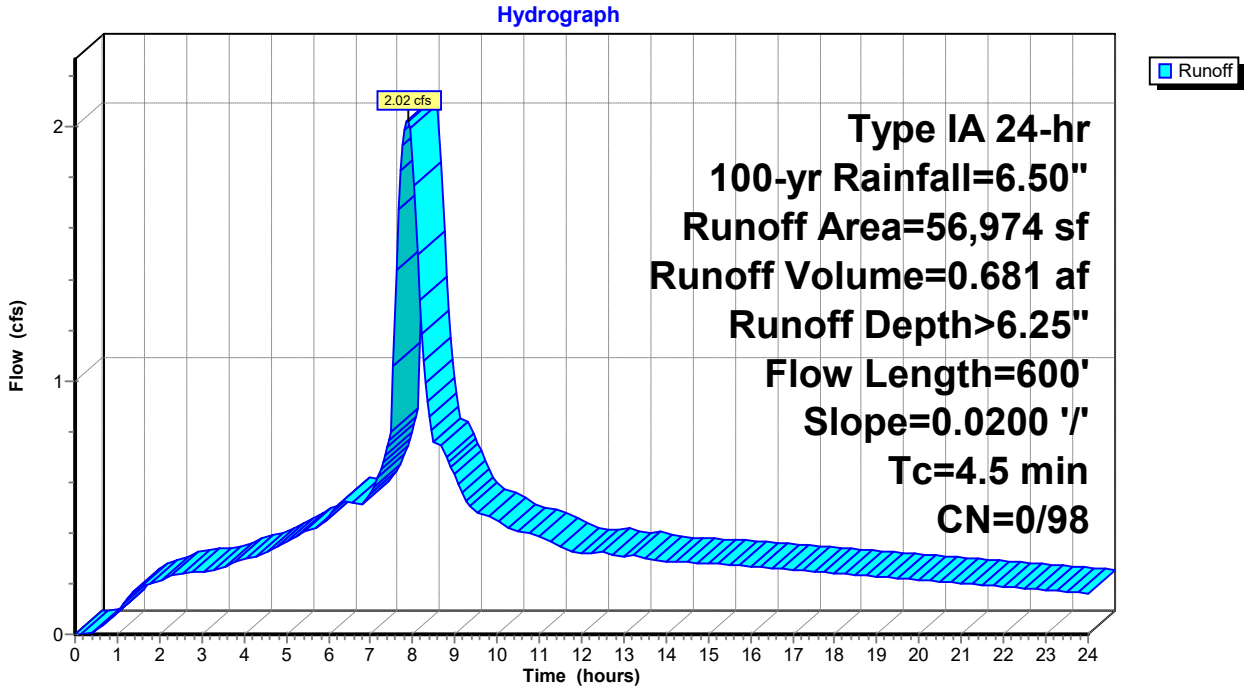
Runoff = 2.02 cfs @ 7.88 hrs, Volume= 0.681 af, Depth> 6.25"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=6.50"

	Area (sf)	CN	Description
*	17,293	98	Paved roads w/curbs & sewers, HSG A
	32,500	98	Roofs, HSG C
	2,660	98	Paved roads w/curbs & sewers, HSG A
	4,521	98	Paved parking, HSG A
	56,974	98	Weighted Average
	56,974	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	300	0.0200	1.79		**Sheet Flow, IMPERV** Smooth surfaces n= 0.011 P2= 3.50"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	600	Total			

Subcatchment 2S: QUALITY



Hydrograph for Subcatchment 2S: QUALITY

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	**0.00**	0.00	0.00
0.50	0.06	0.00	0.00	0.02
1.00	0.13	0.00	0.03	0.09
1.50	0.23	0.00	0.09	0.19
2.00	0.33	0.00	0.17	0.21
2.50	0.43	0.00	0.25	0.24
3.00	0.53	0.00	0.35	0.25
3.50	0.64	0.00	0.44	0.26
4.00	0.75	0.00	0.55	0.30
4.50	0.88	0.00	0.67	0.32
5.00	1.01	0.00	0.80	0.36
5.50	1.17	0.00	0.96	0.41
6.00	1.34	0.00	1.12	0.46
6.50	1.54	0.00	1.32	0.53
7.00	1.74	0.00	1.52	0.56
7.50	2.02	0.00	1.79	**0.80**
8.00	2.76	0.00	2.53	**1.96**
8.50	3.12	0.00	2.89	0.76
9.00	3.38	0.00	3.15	0.62
9.50	3.57	0.00	3.34	0.48
10.00	3.75	0.00	3.52	0.45
10.50	3.91	0.00	3.67	0.40
11.00	4.06	0.00	3.82	0.38
11.50	4.19	0.00	3.96	0.35
12.00	4.32	0.00	4.08	0.32
12.50	4.44	0.00	4.20	0.33
13.00	4.56	0.00	4.32	0.31
13.50	4.67	0.00	4.44	0.30
14.00	4.78	0.00	4.55	0.29
14.50	4.89	0.00	4.66	0.29
15.00	5.00	0.00	4.76	0.28
15.50	5.10	0.00	4.87	0.27
16.00	5.21	0.00	4.97	0.27
16.50	5.31	0.00	5.07	0.26
17.00	5.40	0.00	5.17	0.25
17.50	5.50	0.00	5.26	0.25
18.00	5.59	0.00	5.35	0.24
18.50	5.68	0.00	5.44	0.23
19.00	5.77	0.00	5.53	0.23
19.50	5.85	0.00	5.61	0.22
20.00	5.93	0.00	5.69	0.21
20.50	6.01	0.00	5.77	0.21
21.00	6.09	0.00	5.85	0.20
21.50	6.16	0.00	5.93	0.19
22.00	6.24	0.00	6.00	0.19
22.50	6.31	0.00	6.07	0.18
23.00	6.37	0.00	6.13	0.18
23.50	6.44	0.00	6.20	0.17
24.00	**6.50**	0.00	**6.26**	0.16

Summary for Pond 3P: (new Pond)

Inflow Area = 1.308 ac,100.00% Impervious, Inflow Depth > 6.25" for 100-yr event
Inflow = 2.02 cfs @ 7.88 hrs, Volume= 0.681 af
Outflow = 1.91 cfs @ 8.01 hrs, Volume= 0.638 af, Atten= 6%, Lag= 7.5 min
Discarded = 0.20 cfs @ 8.01 hrs, Volume= 0.310 af
Primary = 1.71 cfs @ 8.01 hrs, Volume= 0.327 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 64.21' @ 8.01 hrs Surf.Area= 1,913 sf Storage= 3,083 cf

Plug-Flow detention time= 89.6 min calculated for 0.638 af (94% of inflow)
Center-of-Mass det. time= 41.4 min (690.9 - 649.5)

Volume	Invert	Avail.Storage	Storage Description
#1	62.00'	3,658 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

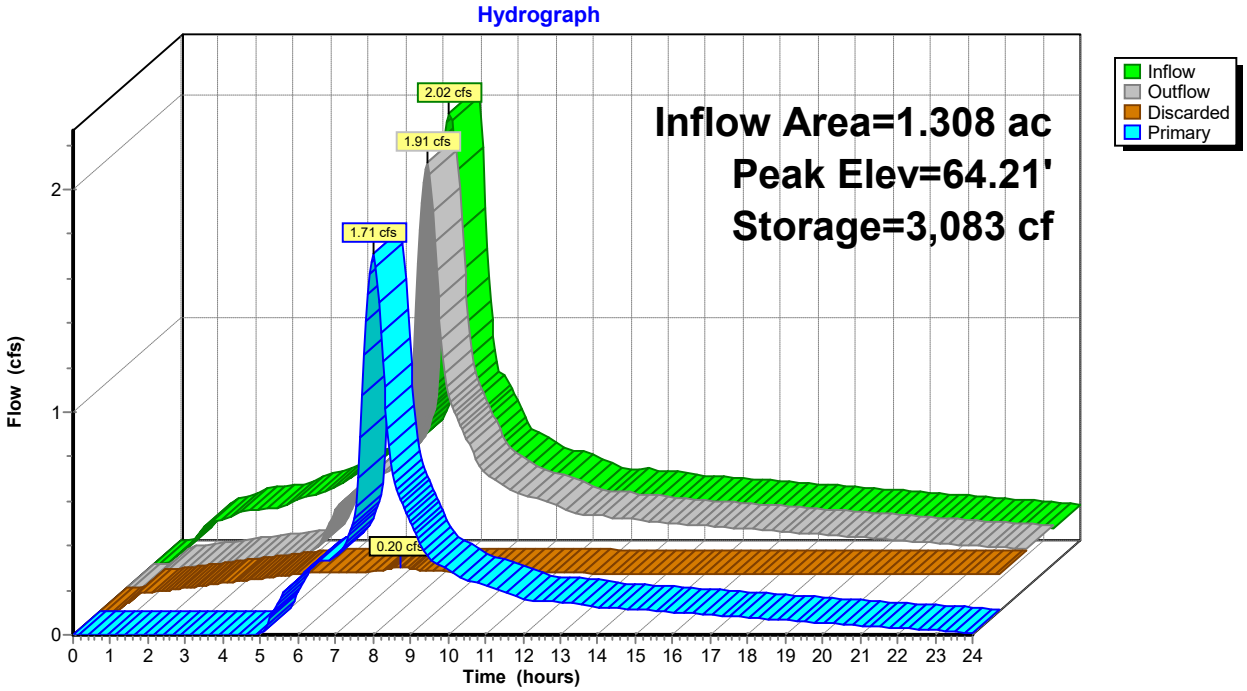
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.00	852	0	0
63.00	1,361	1,107	1,107
64.00	1,810	1,586	2,692
64.50	2,055	966	3,658

Device	Routing	Invert	Outlet Devices
#1	Discarded	62.00'	**4.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.00'
#2	Primary	63.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.20 cfs @ 8.01 hrs HW=64.21' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=1.71 cfs @ 8.01 hrs HW=64.21' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 1.71 cfs @ 2.87 fps)

Pond 3P: (new Pond)



Hydrograph for Pond 3P: (new Pond)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	62.00	0.00	0.00	0.00
0.50	0.02	3	62.00	0.01	0.01	0.00
1.00	0.09	20	62.02	0.07	0.07	0.00
1.50	0.19	130	62.15	0.09	0.09	0.00
2.00	0.21	319	62.34	0.10	0.10	0.00
2.50	0.24	545	62.55	0.11	0.11	0.00
3.00	0.25	780	62.75	0.12	0.12	0.00
3.50	0.26	1,007	62.93	0.13	0.13	0.00
4.00	0.30	1,273	63.12	0.14	0.14	0.00
4.50	0.32	1,564	63.32	0.15	0.15	0.00
5.00	0.36	1,892	63.53	0.17	0.16	0.00
5.50	0.41	2,156	63.69	0.33	0.17	0.16
6.00	0.46	2,241	63.74	0.42	0.17	0.25
6.50	0.53	2,312	63.78	0.51	0.18	0.33
7.00	0.56	2,323	63.79	0.53	0.18	0.35
7.50	**0.80**	2,443	63.86	0.70	0.18	0.52
8.00	**1.96**	**3,083**	**64.21**	**1.91**	**0.20**	**1.71**
8.50	0.76	2,599	63.95	0.96	0.19	0.78
9.00	0.62	2,436	63.86	0.69	0.18	0.51
9.50	0.48	2,325	63.79	0.53	0.18	0.35
10.00	0.45	2,279	63.77	0.47	0.18	0.29
10.50	0.40	2,239	63.74	0.42	0.17	0.24
11.00	0.38	2,220	63.73	0.40	0.17	0.22
11.50	0.35	2,192	63.71	0.37	0.17	0.19
12.00	0.32	2,160	63.69	0.33	0.17	0.16
12.50	0.33	2,153	63.69	0.33	0.17	0.15
13.00	0.31	2,139	63.68	0.31	0.17	0.14
13.50	0.30	2,135	63.68	0.31	0.17	0.14
14.00	0.29	2,120	63.67	0.30	0.17	0.13
14.50	0.29	2,113	63.67	0.29	0.17	0.12
15.00	0.28	2,106	63.66	0.28	0.17	0.11
15.50	0.27	2,099	63.66	0.28	0.17	0.11
16.00	0.27	2,091	63.65	0.27	0.17	0.10
16.50	0.26	2,083	63.65	0.26	0.17	0.10
17.00	0.25	2,075	63.64	0.26	0.17	0.09
17.50	0.25	2,066	63.64	0.25	0.17	0.08
18.00	0.24	2,058	63.63	0.25	0.17	0.08
18.50	0.23	2,049	63.63	0.24	0.17	0.07
19.00	0.23	2,040	63.62	0.23	0.17	0.07
19.50	0.22	2,030	63.62	0.23	0.17	0.06
20.00	0.21	2,020	63.61	0.22	0.17	0.05
20.50	0.21	2,009	63.60	0.21	0.17	0.05
21.00	0.20	1,999	63.60	0.21	0.17	0.04
21.50	0.19	1,987	63.59	0.20	0.17	0.04
22.00	0.19	1,974	63.58	0.20	0.17	0.03
22.50	0.18	1,962	63.57	0.19	0.16	0.02
23.00	0.18	1,947	63.57	0.18	0.16	0.02
23.50	0.17	1,932	63.56	0.18	0.16	0.01
24.00	0.16	1,915	63.54	0.17	0.16	0.01

Manning Formula Uniform Pipe Flow at Given Slope and Depth

Check out our spreadsheet version of this calculator [Download Spreadsheet](#) [Open Google Sheets version](#) [View All Spreadsheets](#)

Bluffs Subdivision

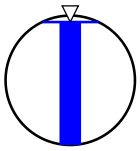
NB 24-in Storm Main - 0.5% slope

Inputs

Pipe diameter, d_0	2	ft
Manning roughness, n	0.01	
Pressure slope (possibly ? equal to pipe slope), S_0	0.005	rise/run
Percent of (or ratio to) full depth (100% or 1 if flowing full)	0.95	fraction

Results

Flow, Q	22.3434	cfs
Velocity, v	7.2477	ft/sec
Velocity head, h_v	0.8164	ft H2O
Flow area	3.0830	ft^2
Wetted perimeter	5.3811	ft
Hydraulic radius	0.5729	ft
Top width, T	0.8718	ft
Froude number, F	0.68	
Shear stress (tractive force), tau	0.1788	psf



Bioretention Facilities

Bioretention facilities are engineered facilities that store and treat stormwater by filtering it through a specified soil profile. Water that enters the facility ponds in an earthen depression or other basin (e.g., concrete planter) before it infiltrates into the underlying bioretention soil. Stormwater that exceeds the surface storage capacity overflows to an adjacent drainage system. Treated water is either infiltrated into the underlying native soil or collected by an underdrain and discharged. Bioretention facilities are considered Stormwater Treatment and Flow Control BMPs/Facilities when used to help meet Minimum Requirements #6 (treatment), #7 (flow control), or both.

Key Maintenance Considerations

The main components of bioretention facilities are listed below with descriptions of their function and key maintenance considerations.

- **Inlet**: Stormwater can flow into a bioretention facility in a number of ways including: dispersed flow across vegetated areas, sheet flow across impervious areas, or concentrated flow through curb cuts and/or piped flow inlets. Inlets must be maintained to be unobstructed to ensure that stormwater enters the facility as designed. Erosion control measures must also be maintained in areas of concentrated flows (e.g., pipes inlets or narrow curb cuts).
- **Facility footprint**: The facility footprint is typically an earthen depression or another type of basin (e.g., concrete planter box) that provides surface storage for stormwater before it infiltrates into the underlying bioretention soil. If the facility is located on a slope, low permeability check dams may be included (oriented perpendicular to the slope) to encourage ponding. Key maintenance considerations for the facility footprint include the following:
    - The integrity of earthen berms and basin walls must be maintained, soil areas must be protected from erosion, and accumulated sediment must be removed.
    - Bioretention facilities are designed to infiltrate all ponded water within a 24- to 48-hour "drawdown" time after the end of a storm. This allows the soil to dry out periodically in order to restore the hydraulic capacity of the system and prevent conditions supportive of mosquito breeding. Slower drawdown times may indicate that the underdrain (if present) is plugged or the bioretention soil is overly compacted, clogged, or does not meet design specifications. Corrective maintenance may include clearing underdrain obstructions or partial or complete replacement of bioretention soil to restore bioretention facility function.
- **Bioretention soil**: Infiltration of stormwater through the engineered bioretention soil mix provides water quality treatment. All maintenance activities must be performed in a manner to prevent compaction of the bioretention soil.
- **Mulch**: The bioretention soil is covered by a layer of mulch, comprised of arborist wood chips, compost, and/or rocks. Mulch reduces weed establishment. Organic

mulches regulate soil temperatures and moisture, and add organic matter to soil. The mulch layer must be supplemented regularly.

- **Vegetation**: Bioretention systems rely on vegetation (i.e., grasses, shrubs, and sometimes trees) to intercept, uptake, and evapotranspire stormwater. In addition, plant roots improve soil structure and increase infiltration capacity. Regular maintenance activities associated with vegetation include weeding and pruning. Plants also require irrigation during the first 2 to 3 years of establishment and during extended dry periods.
- **Overflow**: Flows exceeding the capacity of the facility are discharged via an overflow structure (e.g., pipe, curb cut, earthen channel). It is important to maintain clear outlet pipes and overflow structures to ensure that stormwater can be safely conveyed to a designated discharge point (e.g., storm drain system).
- **Underdrains (optional)**: Underdrains are optional components of a bioretention facility that may be included in bioretention systems where, for example, infiltration to underlying soil is not prudent or feasible. Underdrains are installed under the bioretention soil layer to collect and convey treated water. An underdrain system can be comprised of perforated or slotted pipe, wrapped in an aggregate blanket. It is important to maintain clear drains so that water moves through system as designed. Maintenance may include occasional cleaning to remove plant roots or debris. If underdrains are equipped with a flow restrictor (e.g., orifice) to attenuate flows, the orifice must be inspected and cleaned regularly.

Nutrient sensitivity of the receiving water is also an important maintenance consideration, particularly in watersheds draining to phosphorous limited water bodies. The addition of excess fertilizers to the system and/or systems operating in bypass, can increase the potential for export of phosphorous found in bioretention soil or compost and increase nutrient loads to downstream receiving waters.

Key Operations to Preserve Facility Function

For a bioretention system to function properly, stormwater must infiltrate freely through the bioretention soil. The soil infiltration rate can be reduced if the soil is subject to compaction (e.g., foot and vehicle traffic loads). To limit the likelihood of corrective maintenance (e.g., bioretention soil replacement), the facility footprint area should be protected from external loads. Because the risk of compaction is higher when soils are saturated, any type of loading in the bioretention facility (including foot traffic) should be avoided during wet conditions.

Signage can also be used to identify the vegetated area as a stormwater BMP and inform maintenance crews and the general public about protecting the facility's function.

Maintenance Standards and Procedures

Table 3 provides the recommended maintenance frequencies, standards, and procedures for bioretention facility components. The level of routine maintenance required and the frequency of corrective maintenance actions may increase for facilities subject to high sediment loads from the contributing drainage area.

Table 3. Maintenance Standards and Procedures for Bioretention Facilities.

Component	Recommended Frequency [a]		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Facility Footprint				
Earthen side slopes and berms	B, S		Erosion (gullies/ rills) greater than 2 inches deep around inlets, outlet, and alongside slopes	• Eliminate cause of erosion and stabilize damaged area (regrade, rock, vegetation, erosion control matting) • For deep channels or cuts (over 3 inches in ponding depth), temporary erosion control measures should be put in place until permanent repairs can be made. • Properly designed, constructed and established facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems persist, the following should be reassessed: (1) flow volumes from contributing areas and bioretention facility sizing; (2) flow velocities and gradients within the facility; and (3) flow dissipation and erosion protection strategies at the facility inlet.
	A		Erosion of sides causes slope to become a hazard	Take actions to eliminate the hazard and stabilize slopes
	A, S		Settlement greater than 3 inches (relative to undisturbed sections of berm)	Restore to design height
	A, S		Downstream face of berm wet, seeps or leaks evident	Plug any holes and compact berm (may require consultation with engineer, particularly for larger berms)
	A		Any evidence of rodent holes or water piping in berm	• Eradicate rodents (see "Pest control") • Fill holes and compact (may require consultation with engineer, particularly for larger berms)
Concrete sidewalls	A		Cracks or failure of concrete sidewalls	• Repair/ seal cracks • Replace if repair is insufficient
Rockery sidewalls	A		Rockery side walls are insecure	Stabilize rockery sidewalls (may require consultation with engineer, particularly for walls 4 feet or greater in height)
Facility area		All maintenance visits (at least biannually)	Trash and debris present	Clean out trash and debris
Facility bottom area	A, S		Accumulated sediment to extent that infiltration rate is reduced (see "Ponded water") or surface storage capacity significantly impacted	• Remove excess sediment • Replace any vegetation damaged or destroyed by sediment accumulation and removal • Mulch newly planted vegetation • Identify and control the sediment source (if feasible) • If accumulated sediment is recurrent, consider adding presettlement or installing berms to create a forebay at the inlet
		During/after fall leaf drop	Accumulated leaves in facility	Remove leaves if there is a risk to clogging outlet structure or water flow is impeded
Low permeability check dams and weirs	A, S		Sediment, vegetation, or debris accumulated at or blocking (or having the potential to block) check dam, flow control weir or orifice	Clear the blockage
	A, S		Erosion and/or undercutting present	Repair and take preventative measures to prevent future erosion and/or undercutting
	A		Grade board or top of weir damaged or not level	Restore to level position

[a] Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least one visit should occur during the wet season (for debris/clog related maintenance, this inspection/maintenance visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

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Table 3 (continued). Maintenance Standards and Procedures for Bioretention Facilities.

Component	Recommended Frequency [a]		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Facility Footprint (cont'd)				
Ponded water	B, S		Excessive ponding water: Water overflows during storms smaller than the design event or ponded water remains in the basin 48 hours or longer after the end of a storm.	Determine cause and resolve in the following order: 1) Confirm leaf or debris buildup in the bottom of the facility is not impeding infiltration. If necessary, remove leaf litter/debris. 2) Ensure that underdrain (if present) is not clogged. If necessary, clear underdrain. 3) Check for other water inputs (e.g., groundwater, illicit connections). 4) Verify that the facility is sized appropriately for the contributing area. Confirm that the contributing area has not increased. If steps #1-4 do not solve the problem, the bioretention soil is likely clogged by sediment accumulation at the surface or has become overly compacted. Dig a small hole to observe soil profile and identify compaction depth or clogging front to help determine the soil depth to be removed or otherwise rehabilitated (e.g., tilled). Consultation with an engineer is recommended.
Bioretention soil media	As needed		Bioretention soil media protection is needed when performing maintenance requiring entrance into the facility footprint	• Minimize all loading in the facility footprint (foot traffic and other loads) to the degree feasible in order to prevent compaction of bioretention soils. • Never drive equipment or apply heavy loads in facility footprint. • Because the risk of compaction is higher during saturated soil conditions, any type of loading in the cell (including foot traffic) should be minimized during wet conditions. • Consider measures to distribute loading if heavy foot traffic is required or equipment must be placed in facility. As an example, boards may be placed across soil to distribute loads and minimize compaction. • If compaction occurs, soil must be loosened or otherwise rehabilitated to original design state.
Inlets/Outlets/Pipes				
Splash block inlet	A		Water is not being directed properly to the facility and away from the inlet structure	Reconfigure/ repair blocks to direct water to facility and away from structure
Curb cut inlet/outlet	M during the wet season and before severe storm is forecasted	Weekly during fall leaf drop	Accumulated leaves at curb cuts	Clear leaves (particularly important for key inlets and low points along long, linear facilities)
Pipe inlet/outlet	A		Pipe is damaged	Repair/ replace
	W		Pipe is clogged	Remove roots or debris
	A, S		Sediment, debris, trash, or mulch reducing capacity of inlet/outlet	• Clear the blockage • Identify the source of the blockage and take actions to prevent future blockages
		Weekly during fall leaf drop	Accumulated leaves at inlets/outlets	Clear leaves (particularly important for key inlets and low points along long, linear facilities)
		A	Maintain access for inspections	• Clear vegetation (transplant vegetation when possible) within 1 foot of inlets and outlets, maintain access pathways • Consultation with a landscape architect is recommended for removal, transplant, or substitution of plants
Erosion control at inlet	A		Concentrated flows are causing erosion	Maintain a cover of rock or cobbles or other erosion protection measure (e.g., matting) to protect the ground where concentrated water enters the facility (e.g., a pipe, curb cut or swale)

[a] Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least one visit should occur during the wet season (for debris/clog related maintenance, this inspection/maintenance visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

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Table 3 (continued). Maintenance Standards and Procedures for Bioretention Facilities.

Component	Recommended Frequency [a]		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Inlets/Outlets/Pipes (cont'd)				
Trash rack	S		Trash or other debris present on trash rack	Remove/dispose
	A		Bar screen damaged or missing	Repair/replace
Overflow	A, S		Capacity reduced by sediment or debris	Remove sediment or debris/dispose
Underdrain pipe	Clean pipe as needed	Clean orifice at least biannually (may need more frequent cleaning during wet season)	• Plant roots, sediment or debris reducing capacity of underdrain • Prolonged surface ponding (see "Ponded water")	• Jet clean or rotary cut debris/roots from underdrain(s) • If underdrains are equipped with a flow restrictor (e.g., orifice) to attenuate flows, the orifice must be cleaned regularly.
Vegetation				
Facility bottom area and upland slope vegetation	Fall and Spring		Vegetation survival rate falls below 75% within first two years of establishment (unless project O&M manual or record drawing stipulates more or less than 75% survival rate).	• Determine cause of poor vegetation growth and correct condition • Replant as necessary to obtain 75% survival rate or greater. Refer to original planting plan, or approved jurisdictional species list for appropriate plant replacements (See Appendix 3 - Bioretention Plant List, in the LID Technical Guidance Manual for Puget Sound). • Confirm that plant selection is appropriate for site growing conditions • Consultation with a landscape architect is recommended for removal, transplant, or substitution of plants
Vegetation (general)	As needed		Presence of diseased plants and plant material	• Remove any diseased plants or plant parts and dispose of in an approved location (e.g., commercial landfill) to avoid risk of spreading the disease to other plants • Disinfect gardening tools after pruning to prevent the spread of disease • See Pacific Northwest Plant Disease Management Handbook for information on disease recognition and for additional resources • Replant as necessary according to recommendations provided for "facility bottom area and upland slope vegetation".
Trees and shrubs		All pruning seasons (timing varies by species)	Pruning as needed	• Prune trees and shrubs in a manner appropriate for each species. Pruning should be performed by landscape professionals familiar with proper pruning techniques • All pruning of mature trees should be performed by or under the direct guidance of an ISA certified arborist
	A		Large trees and shrubs interfere with operation of the facility or access for maintenance	• Prune trees and shrubs using most current ANSI A300 standards and ISA BMPs. • Remove trees and shrubs, if necessary.
	Fall and Spring		Standing dead vegetation is present	• Remove standing dead vegetation • Replace dead vegetation within 30 days of reported dead and dying plants (as practical depending on weather/planting season) • If vegetation replacement is not feasible within 30 days, and absence of vegetation may result in erosion problems, temporary erosion control measures should be put in place immediately. • Determine cause of dead vegetation and address issue, if possible • If specific plants have a high mortality rate, assess the cause and replace with appropriate species. Consultation with a landscape architect is recommended.
	Fall and Spring		Planting beneath mature trees	• When working around and below mature trees, follow the most current ANSI A300 standards and ISA BMPs to the extent practicable (e.g., take care to minimize any damage to tree roots and avoid compaction of soil). • Planting of small shrubs or groundcovers beneath mature trees may be desirable in some cases; such plantings should use mainly plants that come as bulbs, bare root or in 4-inch pots; plants should be in no larger than 1-gallon containers.

[a] Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least one visit should occur during the wet season (for debris/clog related maintenance, this inspection/maintenance visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

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Table 3 (continued). Maintenance Standards and Procedures for Bioretention Facilities.

Component	Recommended Frequency [a]		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Vegetation (cont'd)				
Trees and shrubs (cont'd)	Fall and Spring		Planting beneath mature trees	• When working around and below mature trees, follow the most current ANSI A300 standards and ISA BMPs to the extent practicable (e.g., take care to minimize any damage to tree roots and avoid compaction of soil). • Planting of small shrubs or groundcovers beneath mature trees may be desirable in some cases; such plantings should use mainly plants that come as bulbs, bare root or in 4-inch pots; plants should be in no larger than 1-gallon containers.
	Fall and Spring		Presence of or need for stakes and guys (tree growth, maturation, and support needs)	• Verify location of facility liners and underdrain (if any) prior to stake installation in order to prevent liner puncture or pipe damage • Monitor tree support systems: Repair and adjust as needed to provide support and prevent damage to tree. • Remove tree supports (stakes, guys, etc.) after one growing season or maximum of 1 year. • Backfill stake holes after removal.
Trees and shrubs adjacent to vehicle travel areas (or areas where visibility needs to be maintained)	A		Vegetation causes some visibility (line of sight) or driver safety issues	• Maintain appropriate height for sight clearance • When continued, regular pruning (more than one time/ growing season) is required to maintain visual sight lines for safety or clearance along a walk or drive, consider relocating the plant to a more appropriate location. • Remove or transplant if continual safety hazard • Consultation with a landscape architect is recommended for removal, transplant, or substitution of plants
Flowering plants		A	Dead or spent flowers present	Remove spent flowers (deadhead)
Perennials		Fall	Spent plants	Cut back dying or dead and fallen foliage and stems
Emergent vegetation		Spring	Vegetation compromises conveyance	• Hand rake sedges and rushes with a small rake or fingers to remove dead foliage before new growth emerges in spring or earlier only if the foliage is blocking water flow (sedges and rushes do not respond well to pruning)
Ornamental grasses (perennial)		Winter and Spring	Dead material from previous year's growing cycle or dead collapsed foliage	• Leave dry foliage for winter interest • Hand rake with a small rake or fingers to remove dead foliage back to within several inches from the soil before new growth emerges in spring or earlier if the foliage collapses and is blocking water flow
Ornamental grasses (evergreen)		Fall and Spring	Dead growth present in spring	• Hand rake with a small rake or fingers to remove dead growth before new growth emerges in spring • Clean, rake, and comb grasses when they become too tall • Cut back to ground or thin every 2-3 years as needed
Noxious weeds		M (March – October, preceding seed dispersal)	Listed noxious vegetation is present (refer to current county noxious weed list)	• By law, class A & B noxious weeds must be removed, bagged and disposed as garbage immediately • Reasonable attempts must be made to remove and dispose of class C noxious weeds • It is strongly encouraged that herbicides and pesticides not be used in order to protect water quality; use of herbicides and pesticides may be prohibited in some jurisdictions • Apply mulch after weed removal (see "Mulch")

[a] Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least one visit should occur during the wet season (for debris/clog related maintenance, this inspection/maintenance visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

IPM – Integrated Pest Management

ISA – International Society of Arboriculture

Table 3 (continued). Maintenance Standards and Procedures for Bioretention Facilities.

Component	Recommended Frequency [a]		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Vegetation (cont'd)				
Weeds		M (March – October, preceding seed dispersal)	Weeds are present	• Remove weeds with their roots manually with pincer-type weeding tools, flame weeders, or hot water weeders as appropriate • Follow IPM protocols for weed management (see "Additional Maintenance Resources" section for more information on IPM protocols)
Excessive vegetation		Once in early to mid- May and once in early- to mid-September	Low-lying vegetation growing beyond facility edge onto sidewalks, paths, or street edge poses pedestrian safety hazard or may clog adjacent permeable pavement surfaces due to associated leaf litter, mulch, and soil	• Edge or trim groundcovers and shrubs at facility edge • Avoid mechanical blade-type edger and do not use edger or trimmer within 2 feet of tree trunks • While some clippings can be left in the facility to replenish organic material in the soil, excessive leaf litter can cause surface soil clogging
	As needed		Excessive vegetation density inhibits stormwater flow beyond design ponding or becomes a hazard for pedestrian and vehicular circulation and safety	• Determine whether pruning or other routine maintenance is adequate to maintain proper plant density and aesthetics • Determine if planting type should be replaced to avoid ongoing maintenance issues (an aggressive grower under perfect growing conditions should be transplanted to a location where it will not impact flow) • Remove plants that are weak, broken or not true to form; replace in-kind • Thin grass or plants impacting facility function without leaving visual holes or bare soil areas • Consultation with a landscape architect is recommended for removal, transplant, or substitution of plants
	As needed		Vegetation blocking curb cuts, causing excessive sediment buildup and flow bypass	• Remove vegetation and sediment buildup
Mulch				
Mulch		Following weeding	Bare spots (without mulch cover) are present or mulch depth less than 2 inches	• Supplement mulch with hand tools to a depth of 2 to 3 inches • Replenish mulch per O&M manual. Often coarse compost is used in the bottom of the facility and arborist wood chips are used on side slopes and rim (above typical water levels) • Keep all mulch away from woody stems
Watering				
Irrigation system (if any)		Based on manufacturer's instructions	Irrigation system present	• Follow manufacturer's instructions for O&M
	A		Sprinklers or drip irrigation not directed/located to properly water plants	• Redirect sprinklers or move drip irrigation to desired areas

Summer watering (first year)		Once every 1-2 weeks or as needed during prolonged dry periods	Trees, shrubs and groundcovers in first year of establishment period	• 10 to 15 gallons per tree
				• 3 to 5 gallons per shrub
				• 2 gallons water per square foot for groundcover areas
				• Water deeply, but infrequently, so that the top 6 to 12 inches of the root zone is moist
				• Use soaker hoses or spot water with a shower type wand when irrigation system is not present
				  ○ Pulse water to enhance soil absorption, when feasible
				  ○ Pre-moisten soil to break surface tension of dry or hydrophobic soils/mulch, followed by several more passes. With this method , each pass increases soil absorption and allows more water to infiltrate prior to runoff
				• Add a tree bag or slow-release watering device (e.g., bucket with a perforated bottom) for watering newly installed trees when irrigation system is not present

[a] Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least one visit should occur during the wet season (for debris/clog related maintenance, this inspection/maintenance visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

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Table 3 (continued). Maintenance Standards and Procedures for Bioretention Facilities.

Component	Recommended Frequency [a]		Condition when Maintenance is Needed (Standards)	Action Needed (Procedures)
	Inspection	Routine Maintenance		
Watering (cont'd)				

Summer watering (second and third years)		Once every 2-4 weeks or as needed during prolonged dry periods	Trees, shrubs and groundcovers in second or third year of establishment period	• 10 to 15 gallons per tree
				• 3 to 5 gallons per shrub
				• 2 gallons water per square foot for groundcover areas
				• Water deeply, but infrequently, so that the top 6 to 12 inches of the root zone is moist
				• Use soaker hoses or spot water with a shower type wand when irrigation system is not present
				  ○ Pulse water to enhance soil absorption, when feasible
				  ○ Pre-moisten soil to break surface tension of dry or hydrophobic soils/mulch, followed by several more passes. With this method , each pass increases soil absorption and allows more water to infiltrate prior to runoff

Summer watering (after establishment)		As needed	Established vegetation (after 3 years)	• Plants are typically selected to be drought tolerant and not require regular watering after establishment; however, trees may take up to 5 years of watering to become fully established • Identify trigger mechanisms for drought-stress (e.g., leaf wilt, leaf senescence, etc.) of different species and water immediately after initial signs of stress appear • Water during drought conditions or more often if necessary to maintain plant cover
Pest Control				
Mosquitoes	B, S		Standing water remains for more than 3 days after the end of a storm	• Identify the cause of the standing water and take appropriate actions to address the problem (see "Ponded water") • To facilitate maintenance, manually remove standing water and direct to the storm drainage system (if runoff is from non pollution-generating surfaces) or sanitary sewer system (if runoff is from pollution-generating surfaces) after getting approval from sanitary sewer authority. • Do not use pesticides or *Bacillus thuringiensis israelensis* (Bti)
Nuisance animals	As needed		Nuisance animals causing erosion, damaging plants, or depositing large volumes of feces	• Reduce site conditions that attract nuisance species where possible (e.g., plant shrubs and tall grasses to reduce open areas for geese, etc.) • Place predator decoys • Follow IPM protocols for specific nuisance animal issues (see "Additional Maintenance Resources" section for more information on IPM protocols) • Remove pet waste regularly • For public and right-of-way sites consider adding garbage cans with dog bags for picking up pet waste.
Insect pests	Every site visit associated with vegetation management		Signs of pests, such as wilting leaves, chewed leaves and bark, spotting or other indicators	• Reduce hiding places for pests by removing diseased and dead plants • For infestations, follow IPM protocols (see "Additional Maintenance Resources" section for more information on IPM protocols)

[a] Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least one visit should occur during the wet season (for debris/clog related maintenance, this inspection/maintenance visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

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USDA Soils Report 3

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Coos County, Oregon

August 24, 2020

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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Contents

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.

Custom Soil Resource Report
Soil Map (BLUFFS SUBDIVISION)

Map Scale: 1:3,170 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Coos County, Oregon
Survey Area Data: Version 15, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 5, 2019—Oct 10, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (BLUFFS SUBDIVISION)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
28	Heceta fine sand	0.7	1.9%
43D	Netarts loamy fine sand, 2 to 30 percent slopes	2.4	7.0%
59D	Waldport fine sand, 0 to 30 percent slopes	21.4	61.5%
W	Water	10.3	29.7%
Totals for Area of Interest		**34.9**	**100.0%**

Map Unit Descriptions (BLUFFS SUBDIVISION)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Coos County, Oregon

28—Heceta fine sand

Map Unit Setting

National map unit symbol: 21n8
Elevation: 0 to 80 feet
Mean annual precipitation: 50 to 70 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Heceta and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Heceta

Setting

Landform: Deflation basins on dunes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits

Typical profile

H1 - 0 to 4 inches: fine sand
H2 - 4 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Forage suitability group: Poorly Drained (G004AY018OR)
Other vegetative classification: Poorly Drained (G004AY018OR)
Hydric soil rating: Yes

43D—Netarts loamy fine sand, 2 to 30 percent slopes

Map Unit Setting

National map unit symbol: 21p3

Elevation: 0 to 200 feet
Mean annual precipitation: 50 to 70 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Netarts and similar soils: 75 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Netarts

Setting

Landform: Dunes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 5 inches: loamy fine sand
H2 - 5 to 31 inches: fine sand
H3 - 31 to 61 inches: fine sand

Properties and qualities

Slope: 2 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Heceta

Percent of map unit: 6 percent
Landform: Deflation basins on dunes
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G004AY018OR)
Hydric soil rating: Yes

59D—Waldport fine sand, 0 to 30 percent slopes

Map Unit Setting

National map unit symbol: 21q8
Elevation: 0 to 120 feet
Mean annual precipitation: 50 to 70 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Waldport and similar soils: 75 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Waldport

Setting

Landform: Dunes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands

Typical profile

H1 - 0 to 7 inches: fine sand
H2 - 7 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Heceta

Percent of map unit: 9 percent
Landform: Deflation basins on dunes
Down-slope shape: Linear

Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G004AY018OR)
Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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.

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.

Engineering Properties (BLUFFS SUBDIVISION)

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–Coos County, Oregon														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			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*
28—Heceta fine sand														
Heceta	80	A/D	0-4	Fine sand	SM	A-2	0- 0- 0	0- 0- 0	100-100-100	100-100-100	65-73-80	20-25-30	0-5 -10	NP
			4-60	Sand, fine sand, loamy sand	SM, SP-SM	A-2, A-3	0- 0- 0	0- 0- 0	100-100-100	100-100-100	50-65-80	5-18- 30	0-5 -10	NP
43D—Netarts loamy fine sand, 2 to 30 percent slopes														
Netarts	75	A	0-1	Slightly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	100-100-100	100-100-100	60-75-100	50-65-90	—	—
			1-5	Loamy fine sand	SM	A-2	0- 0- 0	0- 0- 0	100-100-100	100-100-100	75-78-80	20-25-30	0-5 -10	NP
			5-31	Loamy fine sand, fine sand, sand	SM, SP, SP-SM	A-2, A-3	0- 0- 0	0- 0- 0	100-100-100	100-100-100	65-73-80	0-13- 25	0-5 -10	NP
			31-61	Fine sand, loamy fine sand	SM, SP, SP-SM	A-2, A-3	0- 0- 0	0- 0- 0	100-100-100	100-100-100	65-73-80	0- 8- 15	0-5 -10	NP
59D—Waldport fine sand, 0 to 30 percent slopes														
Waldport	75	A	0-7	Fine sand	SM	A-2	0- 0- 0	0- 0- 0	100-100-100	100-100-100	70-75-80	15-20-25	0-5 -10	NP
			7-60	Fine sand	SM	A-2	0- 0- 0	0- 0- 0	100-100-100	100-100-100	70-75-80	15-18-20	0-5 -10	NP

Physical Soil Properties (BLUFFS SUBDIVISION)

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)

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

Physical Soil Properties–Coos County, Oregon														
Map symbol and soil name	**Depth**	**Sand**	**Silt**	**Clay**	**Moist bulk density**	**Saturated hydraulic conductivity**	**Available water capacity**	**Linear extensibility**	**Organic matter**	**Erosion factors**			**Wind erodibility group**	**Wind erodibility index**
										Kw	**Kf**	**T**		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
28—Heceta fine sand														
Heceta	0-4	-92-	- 1-	3- 7- 10	1.20-1.30-1.40	42.00-92.00-141.00	0.05-0.06-0.07	0.0- 1.5- 2.9	1.0- 2.5-4.0	.02	.02	5	1	250
	4-60	-90-	- 2-	3- 9- 15	1.30-1.45-1.60	42.00-92.00-141.00	0.05-0.06-0.07	0.0- 1.5- 2.9	0.1- 0.6-1.0	.02	.02			
43D—Netarts loamy fine sand, 2 to 30 percent slopes														
Netarts	0-1	-35-	-50-	0-15- 25	0.10-0.20-0.30	42.00-373.00-705.00	0.30-0.45-0.60	—	60.0-75.0-95.0			5	2	134
	1-5	-80-	-17-	1- 3- 5	1.30-1.45-1.60	42.00-92.00-141.00	0.08-0.09-0.10	0.0- 1.5- 2.9	4.0- 5.0-6.0	.24	.24			
	5-31	-96-	- 1-	1- 3- 5	1.30-1.45-1.60	14.00-28.00-42.00	0.05-0.08-0.10	0.0- 1.5- 2.9	0.5- 0.8-1.0	.15	.15			
	31-61	-96-	- 1-	1- 3- 5	1.30-1.45-1.60	42.00-92.00-141.00	0.05-0.08-0.10	0.0- 1.5- 2.9	0.0- 0.3-0.5	.02	.02			
59D—Waldport fine sand, 0 to 30 percent slopes														
Waldport	0-7	-96-	- 1-	1- 3- 5	1.30-1.45-1.60	141.00-300.00-705.00	0.05-0.06-0.07	0.0- 1.5- 2.9	3.0- 5.5-8.0	.02	.02	5	1	250
	7-60	-96-	- 1-	1- 3- 5	1.30-1.45-1.60	141.00-300.00-705.00	0.05-0.06-0.07	0.0- 1.5- 2.9	0.0- 0.3-0.5	.02	.02			
W—Water														
Water	—	—	—	—	—	—	—	—	—					

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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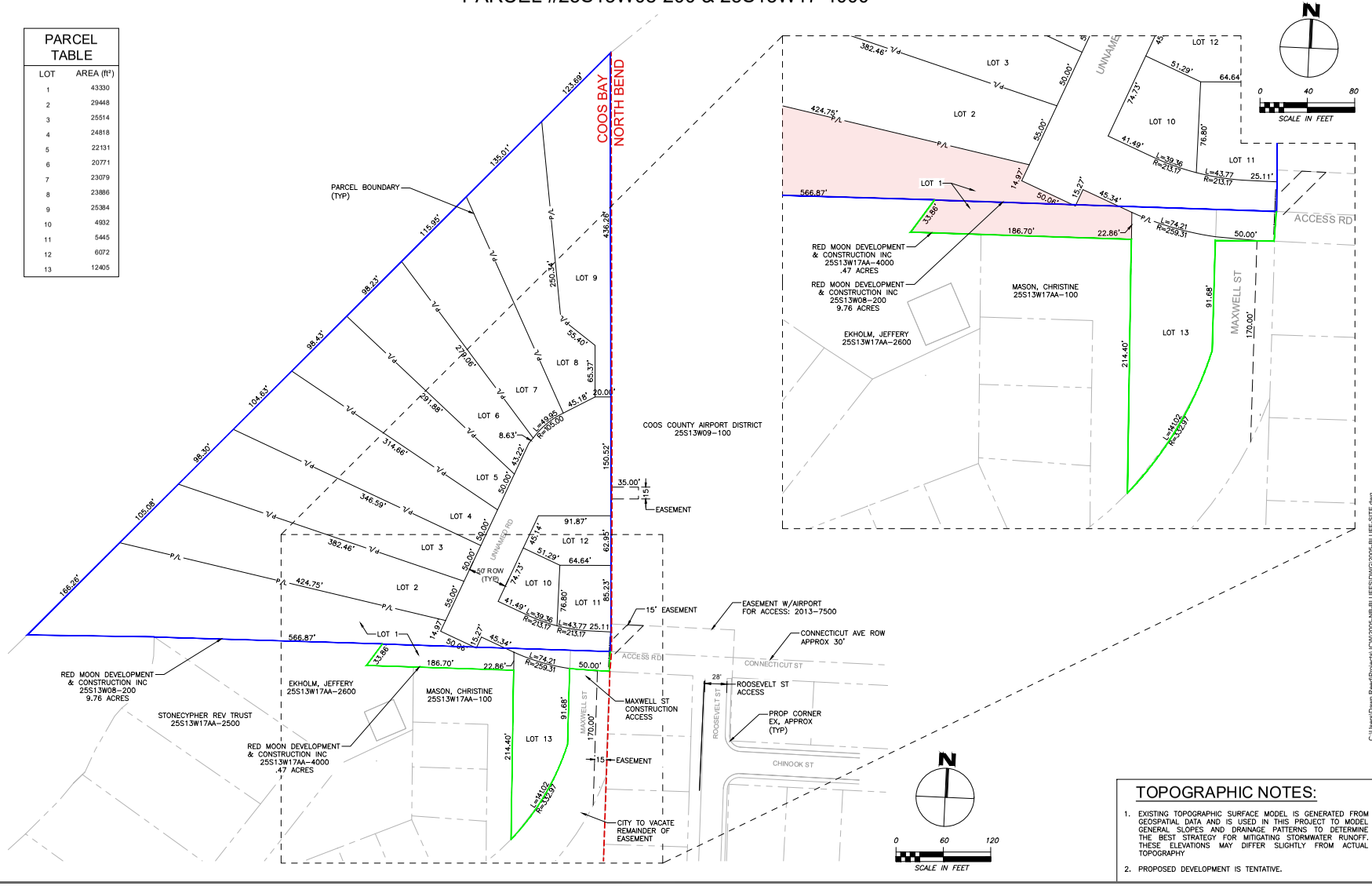
ATTACHMENT 13

PRELIMINARY PLAT MAP

PARCEL #25S13W08-200 & 25S13W17-4000

PARCEL TABLE	
LOT	AREA (ft²)
1	43330
2	29448
3	25514
4	24818
5	22131
6	20771
7	23079
8	23886
9	25384
10	4932
11	5445
12	6072
13	12405



TOPOGRAPHIC NOTES:

1. EXISTING TOPOGRAPHIC SURFACE MODEL IS GENERATED FROM GEOSPATIAL DATA AND IS USED IN THIS PROJECT TO MODEL GENERAL SLOPES AND DRAINAGE PATTERNS TO DETERMINE THE BEST STRATEGY FOR MITIGATING STORMWATER RUNOFF. THESE ELEVATIONS MAY DIFFER SLIGHTLY FROM ACTUAL TOPOGRAPHY
2. PROPOSED DEVELOPMENT IS TENTATIVE.

PRELIMINARY PLAT MAP
BLUFFS SUBDIVISION
COOS BAY, OREGON
RED MOON DEVELOPMENT

JC WILSON ENGINEERING & CONSULTING, LLC
PO BOX 162
NORTH BEND, OR 97459
WWW.JCWILSONENGINEERING.COM
PH: (458) 550-6742

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SYM.	REVISION	DATE

DATE: 10-2020
SCALE: AS SHOWN
DESIGNED BY: DSR
DRAWN BY: DSR
CHECKED: JCW
REVIEW: CITY

SHEET:
PLAT