Coos County Planning Department Application to Develop in a Special Flood Hazard Area

Official Use Only

Fee	2080.00
Receipt No.	130172867
Check No./Cash	
Date	02/23/23
Received By	COrr
File No.	FP-23-003

The undersigned hereby makes application for a permit to develop in a designated Special Flood Hazard Area ("floodplain"). The work to be performed is described below and in attachments hereto. The undersigned agrees that all such work shall be done in accordance with the requirements of the Coos County Comprehensive Plan, Coos County Zoning and Land Development Ordinance, and any other applicable Local, State, and Federal regulations. This application does not create liability on the part of the Coos County Planning Department or any officer or employee thereof for any flood damage that results from the reliance on this application or any decision made lawfully thereunder.

Owner(s):	Haynes Drainage District c/o Fred Messerle	Telephone:	541-404-6105
Address:	60196 Old Wagon Rd		
City/State:	Coos Bay	Zip Code:	97420
Agent(s):	Coos Watershed Association c/o Allison Tarbox	Telephone:	541-888-5922 x307
Address:	P.O Box 388		
City/State:	Coos Bay	Zip Code:	97420
Township:	24S	Section:	25
Range:	13W	Tax Lot:	just north of 24S13W25 TL 400
Situs Address:			
City/State:		Zip Code:	

A. Description of Work (Complete for All Proposals):

1. Proposed Development Description:

- ☐ New Building
- ☐ Improvement to Existing Building
- ☐ Manufactured Structure
- ☐ Fill
- ☒ Other Removing existing tide gate structure, and installing a new tide gate upstream that keys into North Bay Rd that restores tidal processes on Palouse Slough. See attached report for more detail.

2. Size and location of proposed development (a site plan must be attached):

Approximately 2.7 miles up on North Bay Road, at the confluence of Palouse Slough to Haynes Inlet, in Coos County. This existing and proposed structure locations are outside of tax lot boundaries, but construction will affect the following: 24S13W25 TL 400, 24S13W25 TL100, 25S13W24 TL400, 25S13W24 TL 100.

3. Is the proposed development in a Special Flood Hazard Area (Zones A, AE, A1-A30, AH, AO, V, or VE)?

☒ Yes Zone: AE
☐ No

4. Per the FIRM, what is the zone and panel number of the area of the proposed development?

Zone: AE

Panel Number: 41011C0180F

5. Have any other Federal, State, or Local permits been obtained?

☐ Yes – Copies of all permits must be attached.
☒ No

6. Is the proposed development in an identified floodway?

☐ Yes – A "No Rise Certification" with supporting data must be attached.
☒ No

B. Complete for New Structures and Building Site:

1. Base Flood Elevation (BFE) at the site (complete one):

☐ NGVD 29 _____ feet Source: _____

☐ NAVD 88 _____ feet Source: _____

2. Required lowest floor elevation, including basement (complete one):

☐ NGVD 29 _____ feet Source: _____

☐ NAVD 88 _____ feet Source: _____

3. Number and area of flood openings (vents): _____

4. Enclosed area below BFE (in square feet): _____

C. Complete for Alterations, Additions, or Improvements to Existing Structures:

1. What is the estimated market value of the existing structure? Justification for the estimate must be attached and may include, but is not limited to, appraisals completed by private agencies or the County Assessor's office.

_____

2. What is the cost of the proposed construction? Justification for the estimate must be attached. The estimate is required to include fair market value for any work provided by the property owner or without compensation.

_____

3. If the cost of the proposed construction equals or exceeds 50 percent of the market value of the structure, then the substantial improvement provisions shall apply.

D. Complete for Non–Residential Floodproofed Construction:

1. Type of floodproofing method:

_____

_____

_____

2. The required floodproofing elevation is (complete one):

☐ NGVD 29 _____ feet Source: _____

☐ NAVD 88 _____ feet Source: _____

3. Floodproofing certification by a registered engineer must be attached.

E. Complete for Land Divisions, Subdivisions, and Planned Unit Development:

1. Does the proposal contain 50 lots or 5 acres?

☐ Yes – The plat or proposal must clearly identify base flood elevation.
☐ No

2. Are the 100-year Floodplain and Floodway delineated on the site plan?

☐ Yes
☐ No

F. **Authorization: All areas must be initialed by all applicant(s) prior to the Planning Department accepting any application.**

FRM
Applicant

I hereby attest that I am authorized to make the application for Application to Develop in a Special Flood Hazard Area and the statements within this application are true and correct to the best of my knowledge and belief. I affirm that this is a legally created tract, lot or parcel of land. I understand that I have the right to an attorney for verification as to the creation of the subject property. I understand that any action authorized by Coos County may be revoked if it is determined that the action was issued based upon false statements or misrepresentation.

FRM
Applicant

I understand it is the function of the Planning Department to impartially review my application and to address all issues affecting it regardless of whether the issues promote or hinder the approval of my application. In the event a public hearing is required to consider my application, I agree I bear the burden of proof. I understand that approval is not guaranteed and the applicant(s) bear the burden of proof to demonstrate compliance with the applicable review criteria.

FRM
Applicant

As applicant(s) I/we acknowledge that is in my/our desire to submit this application and staff has not encouraged or discouraged the submittal of this application.

Fred R Musick
Applicant(s) Original Signature

2/22/2023
Date

Applicant(s) Original Signature

Date

RDG
RIVER DESIGN GROUP

Technical Memorandum

DATE: February 22, 2023

TO: Allison Tarbox, Restoration Project Manager
Coos Watershed Association

FROM: Russell Bartlett, PE
River Design Group, Inc.

SUBJECT: Floodplain hydraulic modeling for Haynes Drainage District primary tide gate project.

River Design Group, Inc. (RDG) was retained by the Coos Watershed Association (CoosWA) to provide professional services for the Palouse Slough primary tide gate replacement project (Project). The Project site is located within an unincorporated portion of Coos County near Coos Bay, Oregon. The Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) for Palouse Slough at the project site is contained in Community Number 410042 (Coos County, Unincorporated Areas) and on the Flood Insurance Rate Map (FIRM) 41011C0180F which has an effective date December 7, 2018.

The Palouse Slough/Coos Bay floodplain is mapped FEMA Zone AE (Figure 1) within the vicinity of the Project site. This mapping designation identifies Special Flood Hazard Areas (SFHA) with a one-percent chance of being inundated by the 100-year base flood with mapping determined by detailed methods with base flood elevations (BFEs) defined. No Floodway is defined at the Project site. Project elements are proposed to be compliant with Coos County Zoning Code Section 4.11.251(7)(b) for "other development" within the floodplain by showing no cumulative increase greater than 1.0 ft during the occurrence of the base flood discharge. *This is shown by zero-net rise in the base flood elevation resultant of Project actions.*

The Project aims to develop a tide gate design and Water Management Plan (WMP) to enhance natural stream processes, improve ecological function, maximize potential working lands, and improve water quality of Palouse Slough upstream of the Haynes Drainage District's (HDD) primary tide gate. The Project includes replacing the existing tide gate infrastructure and site restoration and revegetation.

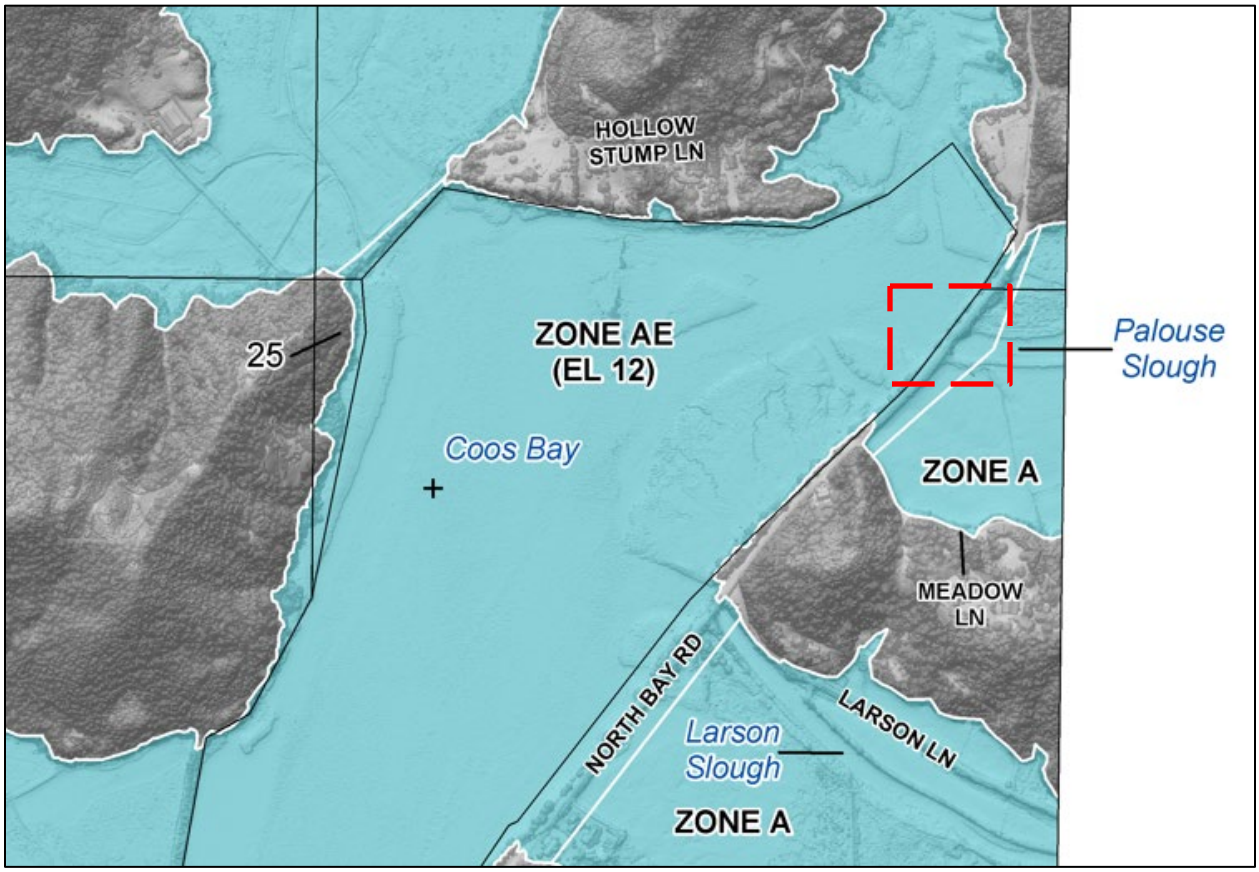

Figure 1. FEMA FIRM panel (Dec. 7, 2018) showing location of Project area in red polygon.

PROJECT SITE IMPROVEMENTS

Natural stream processes and improved ecological function restorative enhancements include proposed tide gate headwall/door replacement; and subsequent stabilization of the existing County bridge structure accounting for the Project's "filling, grading, and excavation". *Overall, the Project results in the net removal of ~10 cubic yards (cy) associated with the tide gate structures and placement of ~50 cy of riprap within the Palouse Slough channel*.

METHODOLOGY

Two-dimensional (2D), steady-state HEC-RAS models were used to analyze existing and post-project floodplain conditions. The Effective Approximate Hydraulic Analysis conducted by STARR in 2016 was obtained from the FEMA Engineering Library and found not to be applicable for our analysis of the proposed restorative enhancements due to it not including the existing North Bay Road bridge or tide gate structure. Rather a 2D model used in the project design was modified to analyze anticipated floodplain impacts of the Project. The model was developed within HEC-RAS v6.2 utilizing the software's unsteady capabilities which utilizes an implicit finite-volume iterative solution to the diffusion wave equations. This technique results in an output of various hydraulic variables (i.e., velocity, hydraulic head, friction losses, etc.) at any point within the model domain.

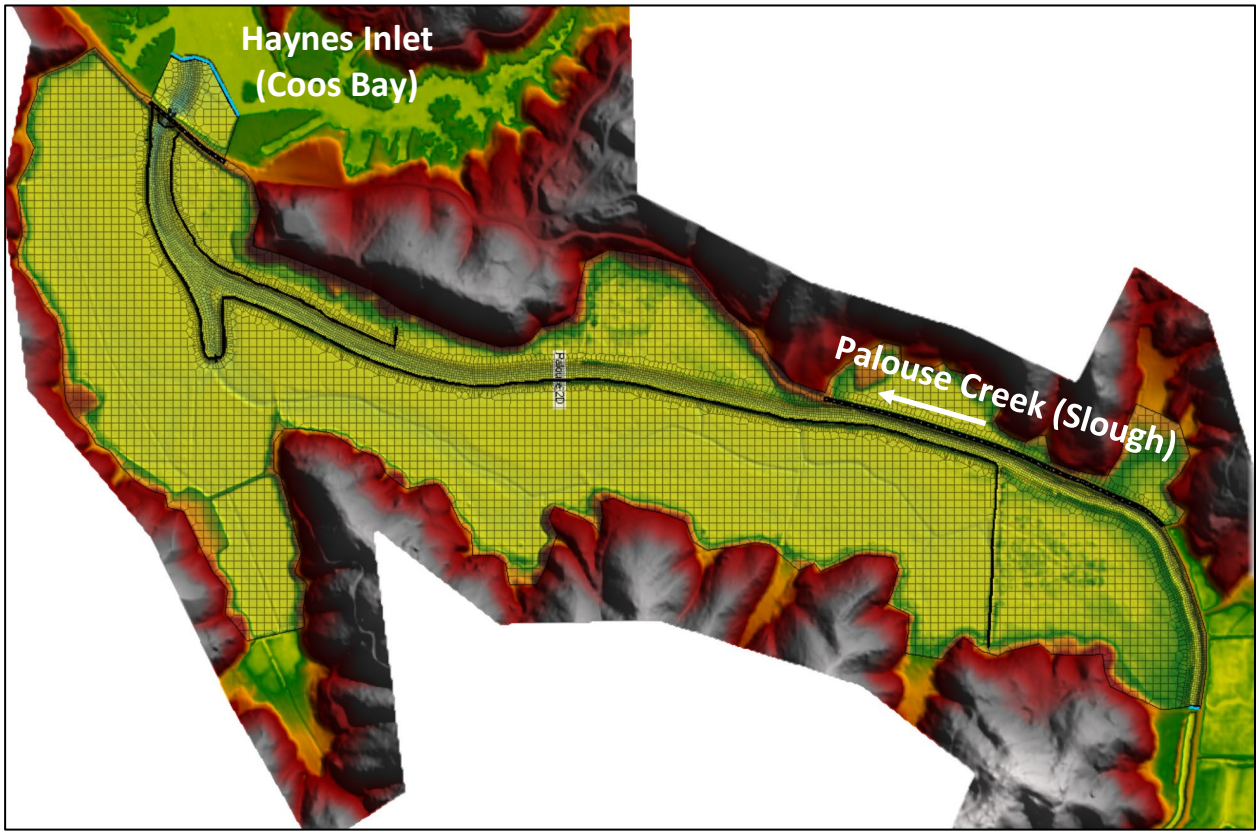

Figure 2. Plan view of hydraulic model layout showing 2D model boundary and upstream and downstream boundary conditions. Figure is oriented with North to the right and water flow from right to left.

For the pre-project and with-project conditions, geometric data was derived from ground geometry comprised of 2008 DOGAMI LiDAR and RDG bathymetric survey data collected in 2020. These data characterize current ground, bay, and slough geometry and incorporates any changes to the channel or floodplain that have occurred since the Zone AE inundation extents were published. A plan view of the hydraulic model geometry is shown in Figure 2. Also, both models incorporate the North Bay bridge and tide gate structures. Tide gate headwalls are depicted as "block obstructions" due to the assumption that the Coos Bay water surface "backwater" results in tide gate doors being closed. These features are input as "2D Connections".

A with-project hydraulic model was developed by editing the 2D geometry as appropriate to depict proposed features created as part of the Project. This included the removal of the existing tide gate, subsequent placement of riprap along the downstream edge of the North Bay bridge, and inclusion of the proposed sheetpile headwall and tide gate system. The with-project model represents the as-designed topography and structures throughout the Project and represents unaltered portions of ground adjacent to, upstream and downstream from proposed Project actions. The with-project model was run using the same flows, Manning's values as applicable, and boundary conditions as the pre-project model. Results from the models were used to evaluate water surface elevation changes.

The 2D HEC-RAS model utilizes a spatially varied roughness. Channel and overbank (floodplain) zones were delineated throughout the model area and assigned Manning's n values of 0.03, 0.06 respectively. These values were determined from approximate calibrations at lower flows with measured water surface elevations. Given the low velocities at the base flood event (tidal backwater), the model is not very sensitive to changes in Manning's n, therefore the extrapolation from low flows to high flows is reasonable.

While both models were run to steady state conditions, the equations governing the hydraulics are unsteady (include a time derivative). As such, both a downstream and upstream boundary condition is required. The downstream boundary was defined with a known water surface elevation (ft, NAVD88) and the upstream inflow boundary was kept to a constant flow. Flow is distributed along the upstream boundary assuming an energy grade slope of 0.001 ft/ft. Table 1 describes the boundary conditions modeled.

Table 1. Boundary conditions modeled

Downstream Boundary	Upstream Boundary
Downstream WS = 12.4 ft (FIS 100-yr, Coos Bay)	Upstream Flow = 2,100 cfs (RDG 100-yr, Palouse Slough)

100-YEAR BASE FLOOD IMPACTS

Base flood water surface elevations (WSELs) were compared between the two models to isolate rise impacts attributable to the Project. A series of sample points delineated along the Palouse Slough channel alignment at 400 ft increments (Figure 3) were used to sample the pre- and with-project modeled WSELs. *A comparison of WSELs is summarized in Table 2 showing no rise, thus the proposed Project actions are compliant with Coos County Zoning Code Section 4.11.251(7)(b).*

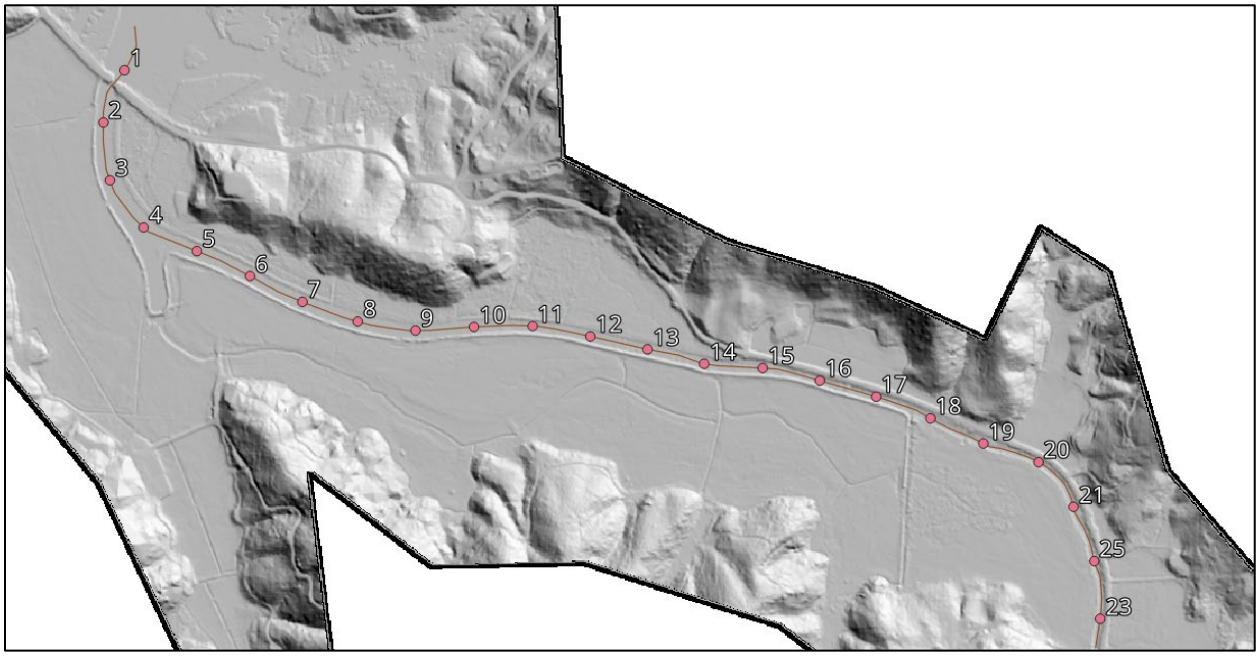

Figure 3. Water surface elevation sample point locations presented in Table 2.

Table 2. Base Flood WSEL HEC-RAS model output comparing pre-project to with-project conditions.

Point Number	Location	WSELs Existing (Pre-Project)	WSELs Proposed (With-Project)	WSEL Difference (With-Pre)[1]
1	DS of Bridge	12.40	12.40	0.00
2	US of New Tidegate	12.96	12.64	-0.33
3		12.96	12.64	-0.33
4		12.97	12.64	-0.33
5		12.97	12.64	-0.33
6		12.97	12.64	-0.33
7		12.97	12.64	-0.33
8		12.97	12.64	-0.33
9		12.97	12.65	-0.33
10		12.97	12.65	-0.33
11		12.97	12.65	-0.33
12		12.98	12.65	-0.33
13		12.98	12.65	-0.33
14		12.98	12.65	-0.33
15		12.98	12.66	-0.33
16		12.99	12.67	-0.33
17		13.00	12.67	-0.33
18		13.01	12.68	-0.33
19		13.01	12.69	-0.32
20		13.01	12.69	-0.32
21		13.01	12.69	-0.32
22		13.02	12.69	-0.32
23	DS of Cahill Bridge	13.03	12.70	-0.32

[1]negative number denotes post-project water surface lowering

SUMMARY

Based on our hydraulic analysis of existing and with-project conditions, this letter conveys assurance the proposed Project as analyzed by RDG will not produce a rise in base flood elevations. Hence, the Project meets the intent of Coos County Zoning Code Section 4.11.251(7)(b) for “other development” within the floodplain. All materials proposed for the Project that will become permanent features in the floodplain are designed to be resistant to flood damage.

If you have questions or need further assistance please do not hesitate to contact our Corvallis Office, telephone 541-738-2920.