PORT OF BROOKINGS HARBOR
CURRY COUNTY, OREGON

RESOLUTION NO. 2021-13

A RESOLUTION OF THE BOARD OF PORT COMMISSIONERS FOR THE PORT OF BROOKINGS HARBOR AUTHORIZING SUBMISSION OF BUSINESS OREGON GENERAL APPLICATION FOR SPECIAL PUBLIC WORKS FUND, FEMA DR-4432 MITIGATION AND REPAIR, #648-14634

WHEREAS, the Port of Brookings Harbor is a port district, organized and operated under the provisions of ORS Chapter 777, and has the authority to adopt resolutions; and

WHEREAS, a severe storm occurred on February 24, 2019 causing enough damage in Curry County and to the Port to activate FEMA disaster relief protocol for which the Port submitted storm damage to Basin 2 slopes and approximately 8,000 cubic yards of dredging. FEMA 406 Mitigation measures will reinforce existing infrastructure to reduce future storm related damages to Port facilities; and

WHEREAS, FEMA disaster relief requires 25% matching from the applicant for the repair and mitigation costs. The Port does not have the funds required for the 25% matching.; and

WHEREAS, Business Oregon Special Public Works Fund provides matching amounts for disaster relief repair and mitigation projects.

NOW, THEREFORE, be it resolved by the Board of Commissioners of the Port of Brookings Harbor, Curry County, Oregon as follows:

1. The Port of Brookings Harbor Board of Commissioners authorizes the Board President, Richard Heap, to sign and submit on the behalf of the Port of Brookings Harbor, Business Oregon General Application for Special Works Fund, FEMA DR-4432 Mitigation and Repair, #648-14634.

APPROVED AND ADOPTED and made effective the same day by the Board of Port Commissioners of the Port of Brookings Harbor this 17th day of November, 2021.

Richard Heap, President

ATTEST:

Sharon Hartung, Secretary/Treasurer

November 9, 2021

Richard Heap, President
Port of Brookings Harbor
16330 Lower Harbor Rd.
PO Box 848
Brookings, Oregon, 97415

RE: Invitation to Apply for Special Public Works Fund, FEMA DR-4432 Mitigation and Repair, #648-14634

Dear Richard:

Business Oregon is pleased to invite you to submit an application for funding for the above referenced project.

Please submit the enclosed Application and the Application Supplement form(s) to our office.

We request that you complete the Application and Application Supplement within 45 days of receiving this letter.

Should you have any questions, please contact me at 503-779-3221 or e-mail to: Ted.Werth@oregon.gov I will be your Business Oregon point of contact for this project moving forward.

Sincerely,

Ted Werth

Ted Werth, Regional Project Manager
Business Oregon

Enclosures

c: Gary Dehlinger
File

business oregon

General Application

775 Summer St NE, Suite 200
Salem, OR 97301-1280

Applicant

Port of Brookings Harbor
Name

93-6013807
Federal Tax ID Number

16330 Lower Harbor Road, Brookings, OR 97415
Street Address

P.O. Box 848, Brookings, OR 97415
Mailing Address

Organization Type:

☐ City ☐ County ☐ Special District under ORS _____ ☒ Port District under ORS 777 ☐ Tribe

Gary Dehlinger
Contact Name
(Person we should contact with project questions)

Port Manager
Title

541-254-4162
Phone Number

541-359-3999
Fax Number

portmanager@portofbrookingsharbor.com
Email Address

Representation (Information may be found at www.leg.state.or.us/findlegsltr)

01
Senate District Number

Dallas Heard
Senator's Name

01
House District Number

David Brock Smith
Representative's Name

Project Information

FEMA DR-4432 Mitigation & Repair, #648-14634
Project Name: (e.g., Stayton Water System Improvements)

Opportunity/Problem
Briefly describe the opportunity or problem facing the applicant:

A severe storm occurred on February 24, 2019 causing enough damage in Curry County and to the Port to activate FEMA disaster relief protocol for which the Port submitted storm damage to Basin 2 slopes and approximately 8,000 cubic yards of dredging. FEMA 406 Mitigation measures will reinforce existing infrastructure to reduce future storm related damages to Port facilities. FEMA disaster relief requires 25% matching from the applicant for the repair and mitigation costs. The Port does not have the funds required for the 25% matching.

Response to Opportunity/Problem

Briefly describe the major alternatives considered to address this opportunity or problem:
The Port would need to seek private loans for the required 25% matching and cause further debt issues.

Detailed Project Description

Clearly describe the proposed project work to be accomplished:
Please see Attachment "B" report from EMC Engineers/Scientists dated 5/16/2021.

Project Work Plan

List project activity milestones with estimated start and completion dates. Identify estimated date of first cash draw:

Activity	Estimated Date	
	Start	Completion
Joint Permit Applicant approved	Nov 1, 2021	Jan 1, 2022
Completion of construction drawings	Nov 1, 2021	Sep 1, 2022
Purchase of dredge, electric generator and piping	Jan 1, 2022	Sep 1, 2022
RFP to select project contractor	May 1, 2022	Jul 1, 2022
Grading and construction of the sediment storage area in the Commercial area	Jul 1, 2022	Sep 1, 2022
Dredging Basins 1 & 2	Oct 1, 2022	Mar 1, 2024
Basin 2 Slope Repairs	Oct 1, 2022	Mar 1, 2023
Mitigation Repairs	Mar 1, 2023	Jan 1, 2025

Estimated First Draw Date: Feb 1, 2022

Project Budget

List individual project budget line items with requested budgeted amounts by IFA and non-IFA funding sources. Change budget column labels to identify the specific requested IFA funding sources. Non-IFA sources are those funds other than those requested from IFA.

Please be aware that the award loan amount will be subject to a less than 1% issuance fee if the loan is included in the Oregon Bond Bank. Please contact Business Oregon for additional information.

Budget Line Item (Adjust budget items to suit the project) *Below are general items most used*	IFA Funding Source 1	IFA Funding Source 2	Non-IFA Funds	Total
Engineering/Architecture	$0	$0	$0	$0
Construction	474,732		1,424,196	1,898,928
Construction Contingency				0
Land Acquisition				0
Legal				0
Construction Management				0
Other (Specify)				0
Other (Specify)				0
Other (Specify)				0
Other (Specify)				0
Totals	474,732	0	1,424,196	1,898,928

Note: *Attach Engineer's Cost Estimate completed within the past 6 months.*

Details of Non-IFA Funds

Source of Non-IFA Funds	Amount	Status: C-Committed, A-Application S-Submitted, AI-Application Invited, PS-Potential Source	Dates Required Funds will be Committed and Available
FEMA/OEM	$1,424,196	S	1-Jan-22
Totals	1,424,196		

If "Non-IFA funds" include USDA Rural Development funding that will require interim financing, please indicate the source of the interim financing.

General Certification

I certify to the best of my knowledge all information, contained in this document and any attached supplements, is valid and accurate. I further certify that, to the best of my knowledge:

1. The application has been approved by the governing body or is otherwise being submitted using the governing body's lawful process, and
2. Signature authority is verified.

Check one:

☒ Yes, I am the highest elected official. (e.g., Mayor, Chair or President)

☐ No, I am not the highest elected official so I have attached documentation that verifies my authority to sign on behalf of the applicant. (Document such as charter, resolution, ordinance or governing body meeting minutes must be attached.)

The department will only accept applications with proper signature authority documentation.

Signature

November 17, 2021
Date

Richard Heap
Printed Name

President
Printed Title

FOR BUSINESS OREGON USE ONLY

Concept Number

Intake Approval Date

Project Type:

☐ Planning ☐ Construction ☐ Other:

☐ Design ☐ Design & Construction

business oregon

Application Supplement
for Special Public Works Fund
Emergency Project Funding

Applicant: **Port of Brookings Harbor**

Project Name: **FEMA DR-4432 Mitigation & Repair, #648-14634**

Section I: Project Type / Acquisition / Ownership / Operation

A. Will the project provide the local match for an **emergency project** receiving federal disaster relief? ☒ Yes ☐ No

If yes, briefly describe the emergency project activities: Dredging, Basin slope repair and mitigation measures.

Note**: Attach copies of the FEMA approved "Project Worksheets" as **Attachment A.

B. Will the project result in the restoration, rehabilitation or new construction of essential community facilities that provide support services to public health and safety, including but limited to police and fire protection, medical treatment, public utilities, transportation and auxiliary shelter facilities? ☐ Yes ☒ No

If yes, explain:

C. What is the physical location of the project?

16330 Lower Harbor Road and 16035 Boat Basin Road, Brookings, OR 97415

D. Will the applicant own the facility / improvements once constructed? ☒ Yes ☐ No

If no, explain:

E. Will the applicant operate and maintain the facility / improvements once constructed? ☒ Yes ☐ No

If no, describe:

F. Does the project include any acquisition of real property, including permanent easements and rights-of-way, which are directly related to or necessary for the project? ☐ Yes ☒ No

If yes, describe:

G. Does the project include the purchase of motor vehicles or any other equipment which is essential to the project? ☒ Yes ☐ No

If yes, describe: **Remote control dredge, generator and discharge piping**

H. Will a private entity or business have a special legal entitlement to the project? (e.g., through either a transfer of, or partnership in ownership, a lease, management contract, special user rates or development fees, or priority for use) ☐ Yes ☒ No

If yes, describe:

Section II: Additional Project Information

A. What is the estimated useful life of the improvements included in the project?

50-100 years

B. Please list the permits and regulatory authorizations needed for the project to be ready to proceed with construction and indicate whether they have been obtained or not.

Permit Type	Review Agency	Status of Approval	If pending, anticipated approval date
Joint Permit Application	**USACE & ODSL**	☐ Obtained ☒ Pending	**Jan 1, 2022**
		☐ Obtained ☐ Pending	
		☐ Obtained ☐ Pending	
		☐ Obtained ☐ Pending	

Section III: *For Drinking Water System Improvement Projects Only*

A. Water system identification number:

Section IV: Financial Information

A. What sources of revenue can be pledged to repay a loan?

*Note: Loan funding for all or a portion of the requested local match **may** be necessary if funding requests for local match assistance exceeds the Emergency Project grant funds available.*

Port's understanding, FEMA declared disaster matching from SPWF is not a loan.

B. Is other debt serviced or secured by those revenues? ☐ Yes ☒ No

If yes, is the other debt described in the applicant's audit reports? ☐ Yes ☐ No

If the other debt is not described in the audit report, refer to the specific authorization, such as an ordinance or resolution. List below and attach a copy.

Lender	Amount of Note	Year Incurred

C. Has the applicant ever defaulted on a debt? ☐ Yes ☒ No

If yes, provide a complete summary of the circumstances related to the default:

D. Is there actual/pending litigation that could impair the applicant's ability to repay debt? ☐ Yes ☒ No

If yes, describe:

Section V: Budget Information

A. Does the project budget (as included on the General Application) propose direct project management expenses? ☐ Yes ☒ No

(Direct project management is defined as expenses that will be incurred that are directly related to and necessary solely to support or manage project activities and are not routine or ongoing expenses of the municipality or expenses for current staff that are already included in the municipality's adopted budget.)

If yes, describe how the direct project management services will be provided:

B. A current engineer's cost estimate must be included as **Attachment G**. Who prepared the cost estimates for the project?

***Note:** To be considered current, the cost estimate must have been completed within the past 6 months.*

Name: **Jack Akin**
Title: **Owner**
Company: **EMC Engineers/Scientists, LLC**
Phone Number: **541-474-9434**
Date of project cost estimate: **May 16, 2021**

Attachments

		Attachment Description	For IFA Use (X Attached?)
Required with all applications	**A**	Attach a copy of the FEMA approved "Project Worksheet(s)" that are the basis for this funding request.	☐
	B	Map(s) showing the location of the project, including tax lots / parcels and road widths, et cetera.	☐
	C	If the project overlaps municipal boundaries, attach an executed copy of an intergovernmental cooperation agreement that sets out the duties and obligations of each entity.	☐
	D	If the applicant will own the facility and another entity will operate the facility, attach an executed copy of the operating agreement between the parties.	☐
	E	If available, the plans and specifications for the project.	☐
	F	If available, the architectural / engineering / planning work or study conducted to determine the feasibility of the proposed repairs or other improvements. The documents must be certified by a professional architect / registered engineer licensed in Oregon.	☐
	G	Current engineer's cost estimate (see Section 5 B)	☐

304670 Harbor - Basins 1 and 2

**********Version 1 Summary**********

Version 1 captures work to be completed and supersedes Version 0 SOW.

V1.1 Total volume of debris to be removed increased from 8,000 CY to 38,000 CY after detailed engineering analysis and transfer of project 110140 SOW to this project (see special note 1).

V1.2: Riprap replacement added to SOW as part of dredging work, determined necessary after detailed engineering analysis.

V1.3: Work to be completed costs have increased from $972,299.00 to $2,465,157.00 due to above changes.

V1.4: Include $80,400 of transferred de-obligated funding from DR4452, project 110140.

****

Work to be Completed

The applicant will utilize contracts for the repairs to harbor Basins 1 and 2 to return the facility back to its pre-disaster design, function and capacity within the existing footprint.

Basin 1 GPS: 42.047097, -124.266318 through 42.044543, -124.264013

Basin 2 GPS: 42.051155, -124.268378 through 42.050387, -124.268139

Facility Damage

1. Remove and dispose of 8,000 Cubic Yard of Sand/Soil/Mud debris from Basin 1.
2. Remove and dispose of 30,000 Cubic Yard of Sand/Soil/Mud debris from Basin 2.
3. Replace 1911 CY of riprap in Basin 2 :
    1. 542 CY of unclassified mixed riprap on East slope, 195 FT long x 5 FT wide x 15 FT deep
    2. 578 CY of unclassified mixed riprap on South Slope, 208 FT long x 5 FT wide x 15 FT deep
    3. 289 CY of unclassified mixed riprap on Transient Slope, 104 FT long x 5 FT wide x 15 FT deep
    4. 502 CY of unclassified mixed riprap on Basin 2 West Slope, 452 FT long x 5 FT wide x 6 FT deep

Work to be Completed Total: $2,465,157.00

Special Notes:

1. The actual dredging work of this project is directly associated with the dredging work of Project #110140 of DR4452OR, therefore the Engineering Services include the composite design documents for both damages. The projects are not mutually exclusive (e.g. as the sediment of the first event DR4432 is

beneath the sediment of DR4452, it technically cannot be removed until the DR4452 sediment is removed), thus the need for a combined engineering program.

Project Notes:

1. All site estimates for work to be completed were generated using applicant provided estimates. See attachment labelled *ST 104046 Cost Validation.xlsx* and *ST 104046 Appendix A Cost Validation Checklist.pdf*
2. As engineering design evolved, total volume of debris has become more accurate and volume totals are now 38,000 CY for projects 104046 and 110140.
3. The updated SOW includes 1911 CY of replacement riprap, determined necessary after detailed engineering analysis
4. Applicant plans to use a an in-house, small dredge system, utilizing the DragFlow DPR-120 remote controlled dredge, rigged with the EL 1204HH C Model pump system. See attached document *DR4432 & DR4452_POBH_Repairs, Mitigtion, Exhibits DWGs and Budgets.pdf*, page 26.
5. The applicant is coordinating with US Army Corp of Engineers and Oregon Department of Public Lands regarding required permits. See attached document *DR4432_DR4452_Port of Brookings Harbor_JPA_071321.pdf*
6. All work will be completed within the applicants ROW. If staging of equipment and materials would be needed, that work will be staged within the applicants ROW.
7. Disposal of work to be completed is expected to be deposited at an acceptable location (landfill). Location will be provided by applicant once work commences.
8. All borrow, or fill must come from pre-existing stockpiles, material reclaimed from maintained roadside ditches (provided the designed width or depth of the ditch is not increased), or commercially procured material from a source existing prior to the event. For any FEMA-funded project requiring the use of a non-commercial source or a commercial source that was not permitted to operate prior to the event (e.g. a new pit, agricultural fields, road ROWs, etc.) in whole or in part, regardless of cost, the Applicant must notify FEMA and the Recipient prior to extracting material. FEMA must review the source for compliance with all applicable federal environmental planning and historic preservation laws and executive orders prior to a sub recipient or their contractor commencing borrow extraction. Consultation and regulatory permitting may be required. Non-compliance with this requirement may jeopardize receipt of federal funding. Documentation of borrow sources utilized is required at closeout.
9. Construction Date of Basin 1 is 1950s – 1960s, the construction date of Basin 2 is 1975 and the construction date of the Fuel Dock is 2004/2010."
10. The EHP site inspection report uploaded to GM references major archeological concerns along east bank of Basin 1 and north of Basin 2 as well as some environmental concerns.
11. This project was moved to category G and qualifies for hazard mitigation funding, however the DI is still listed as category A thus this SOW is implementing an agreed-upon work-around to include the proposed Hazard Mitigation Proposal (HMP). See below.

Hazard Mitigation Proposal (HMP)
GM Project # 104046
DI #: 304670
DR-4432- OR
HMP Date: 10/4/2021

Damage Description & Dimensions (DDD):
This permanent work project addresses dredging work and rip rap replacement following two storm events, with a total estimated repair cost of $2,465,157. The damages occurred from the displacement of all of the materials from upslope during heavy precipitation and winter storm

events. An engineering analysis (DR4432 & DR4452_POBH_Repairs, Mitigtion, Exhibits DWGs and Budgets.pdf) was conducted to provide the details regarding the repairs needed and the proposed mitigation.

Hazard Mitigation Proposal (HMP) Scope of Work
For the purpose of erosion control to mitigate against future damages from similar events, the applicant has provided a detailed scope of work which includes resiliency measures upslope that are in keeping with Appendix J section I.B as well as a lesser cost method of repair for the damages their selves. This holistic approach of addressing the repairs and resiliency will result in mitigation that addresses the causes and source of the disaster related damages. See previously mentioned attachment for details.

Hazard Mitigation Proposal (HMP) Cost:
The applicant provided estimate for the mitigation is Exhibit C, found on page 11 of 105 within the engineering analysis. Due to the various approaches used in compartmentalizing the funding, the information on that estimate regarding where the funding could come from should be disregarded as no longer representing the best available information. The cost, designs, and items included remain valid. The cost of the proposed mitigation is derived previously noted attachments, for $3,833,249. This mitigation will be performed in lieu of the predisaster repair. Therefore, the total additional cost needed for this mitigation is: $3,833,249 minus $2,465,157 = $1,368,092.

Hazard Mitigation Ratio:
The estimated predisaster repairs (excluding engineering) is $2,465,157. The proposed mitigation is $1,368,092, or 55% of the repair costs.

HMP Feasibility & Cost Effectiveness:
This Hazard Mitigation Proposal is cost effective in accordance with the 100% Rule, FEMA Public Assistance Program and Policy Guide (PAPPG) V3.1 and Appendix J section I.B.

Compliances and Assurances:
The Applicant is responsible for permits and compliance with all regulatory codes and standards for the State of Oregon and contractors and vendors. FEMA will not pay for duplication of cost between repairs and mitigation measures. If this HMP is approved to change SOW, the Applicant must apply for a change in SOW so FEMA can review to ensure program compliance.

portmanager@portofbrookingsharbor.com

From: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>
Sent: Tuesday, October 19, 2021 9:22 AM
To: 'Jack '; portmanager@portofbrookingsharbor.com
Cc: GWIN Dan * OMD
Subject: FW: DR4432/4452 - POBH: DREDGING projects #104046 & 110140
Attachments: DR4432-POBH Project#104046-V1 Dredging Amendment SOW.docx

FYI

From: WERTH Ted * BIZ <Ted.Werth@oregon.gov>
Sent: Monday, October 18, 2021 4:45 PM
To: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>
Subject: Re: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Julie,

This is very helpful. I'll be in touch once I have a chance to look at this closer and discuss with the program manager who oversees SPWF program. It should be later this week.

Thanks,
Ted

Ted Werth
Regional Project Manager
503-779-3221

From: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>
Sent: Monday, October 18, 2021 1:33:39 PM
To: WERTH Ted * BIZ <Ted.Werth@oregon.gov>
Cc: GWIN Dan * OMD <dan.gwin@mil.state.or.us>
Subject: FW: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Hi Ted, per our discussion , I think a couple of weeks ago, attached is the two projects into for Port of Brookings Harbor. Does this help with POBH grant limitations?

Please let me know if you have any questions,

Julie Slevin
503.378.2235

From: Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Sent: Monday, October 18, 2021 1:28 PM
To: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>; Gregory Jackson <gjackson@acdisaster.com>; Lucas Pagan <lpagan@acdisaster.com>; Marusin, Lee <lee.marusin@fema.dhs.gov>; Leigh, Jordan <jordan.leigh@fema.dhs.gov>;

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Malone, Jack <Jack.Malone@fema.dhs.gov>; Talbot, Jessica <jessica.talbot@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Hi Julie,

Attached is the updated/amended Scope-of-Work for project #104046, which describes the combined dredging work and mitigation measures of the merged projects. We trust this information will meet the requirements of OR Biz. If additional documentation is needed please let us know, at your earliest convenience. Thank you. ..... Doug

Douglas C Grant
PDMG – Public Assistance
DR4432OR
732-804-9239
Douglas.grant@fema.dhs.gov

From: Marusin, Lee <lee.marusin@fema.dhs.gov>
Sent: Thursday, September 16, 2021 2:47 PM
To: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>; Grant, Douglas <Douglas.Grant@fema.dhs.gov>; Leigh, Jordan <jordan.leigh@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>; Gregory Jackson <gjackson@acdisaster.com>; Lucas Pagan <lpagan@acdisaster.com>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Hi All,

Per my discussion with Julie S., I have approved the POBH Amendment Request for the Dredging projects. Business Oregon will need an explanation covering two projects consolidated into one so that the Applicant will be able to receive support from Biz Oregon in support of both.

Let me know if you have any questions.

Thank you.

L.
Lee M. Marusin
DR4519 OR PD TFL
lee.marusin@fema.dhs.gov
FEMA Mobile 202-615-6193

From: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>
Sent: Thursday, September 16, 2021 12:34 PM
To: Marusin, Lee <lee.marusin@fema.dhs.gov>; Grant, Douglas <Douglas.Grant@fema.dhs.gov>; Leigh, Jordan <jordan.leigh@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>; Gregory Jackson <gjackson@acdisaster.com>; Lucas Pagan <lpagan@acdisaster.com>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

HI Lee, all, do you have a write up for the scope of work that documents the combination of both projects combined into one? I just talked to OR Biz who is looking at funding the match for the Port, all OR Biz really needs is a description on

how two projects/two events have been combined into one project, this will document that this is two projects, therefore match may be able to rolled together.

From: Marusin, Lee <lee.marusin@fema.dhs.gov>
Sent: Thursday, September 16, 2021 11:06 AM
To: Grant, Douglas <Douglas.Grant@fema.dhs.gov>; SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>; Leigh, Jordan <jordan.leigh@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>; Gregory Jackson <gjackson@acdisaster.com>; Lucas Pagan <lpagan@acdisaster.com>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Thanks Doug,

Will review but wait for additional info before advancing.

Thanks.

Lee

From: Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Sent: Thursday, September 16, 2021 11:04 AM
To: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>; Leigh, Jordan <jordan.leigh@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>; Gregory Jackson <gjackson@acdisaster.com>; Lucas Pagan <lpagan@acdisaster.com>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140
Importance: High

ALL,

The amendment request for project#104046 (DR4432) has been prepared and is entered into Grants Manager/Grants Portal. Please feel free to review it, but not advance it in the process until we have an answer to the following issue raised by the Applicant-POBH:

From: Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Sent: Monday, September 13, 2021 1:49 PM
To: Marusin, Lee <lee.marusin@fema.dhs.gov>
Subject: FW: DR4432-POBH: - - RE: DR4432/Engineering-Permitting Assistance

Lee,

Just got off the phone with Jack Akin (EMC Engineering). He said Gary D (Port Mgr) is concerned that the State supposedly has a matching fund limit per project of $500,000; and if we consolidate the projects they might lose out on $500,000? I told him I hadn't heard of that, but I felt he should contact Julie for clarification, and he said would and keep me in the loop. [9/16: I haven't heard back from Jack A]

As soon as the State provides the clarification we'll know whether or not to advance this request. In the meantime, presuming the answer is " no, POBH will not lose out on $500k", I am drafting the amendment request needed to de-obligate the $80,400 A&E Services funding from project#110140 (DR4452), so it can be transferred to DR4432.

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If anyone has questions, comments or other input please share with the entire group. Thanks for your help.
..... Doug

Douglas C Grant
PDMG – Public Assistance
DR4432OR
732-804-9239
Douglas.grant@fema.dhs.gov

From: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>
Sent: Thursday, September 9, 2021 1:03 PM
To: Leigh, Jordan <jordan.leigh@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>; Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Thank you Jordan! What you wrote below was my understanding. In regards to the 4452 to 4432, I believe deob and move to 4432 was the plan.

From: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Sent: Thursday, September 9, 2021 12:21 PM
To: Malone, Jack <Jack.Malone@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>; SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>; Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Hey Jack/All, I spoke with Lee again this morning and I think we're all on the same page. We will be requesting an amendment for 4432 and that is the one that we will capture all the costs, and mitigation in.

The only question that remained is regarding the funding already obligated under 4452 and whether or not we would need to write an amendment to move those funds from one disaster to another, or choose to leave them where they are. My opinion was that we would need to de-obligate the funds from 4452 and move them over to 4432 but I am not the Region and that would be a question for Steve, and the fabulous Region 10 closeout team.

Thank you,

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From: Malone, Jack <Jack.Malone@fema.dhs.gov>
Sent: Wednesday, September 8, 2021 4:34 PM
To: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>; SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>; Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Good Afternoon – Jordan -

To weigh in on all this – it appears that all the necessary information is available and was attached on 7/14/21 under 4432 project #104046. There were 3 attachments total that were added.

Therefore – it seems the operative question is – what is the SOP for initiating a version on an obligated project for an applicant that has not had an RTM? Does it need to be a formal amendment request from the Grantee, or is there some more direct way that we could proceed forward on this? Can you advise or redirect to someone who could advise? I think we know where we want to go – we just need some direction on how to go about getting there.

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From: SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>
Sent: Tuesday, September 7, 2021 2:51 PM
To: Leigh, Jordan <jordan.leigh@fema.dhs.gov>; Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Thanks Jordan for update! we should have all the information ready, to include cost estimate to pre-disaster. I believe its all been uploaded into GP? Should we have a call to discuss?

From: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Sent: Tuesday, September 7, 2021 11:52 AM
To: Grant, Douglas <Douglas.Grant@fema.dhs.gov>

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Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>; GWIN Dan * OMD <dan.gwin@mil.state.or.us>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Good morning,

We at the CRC have not received the versions for either projects yet in the CRC. We are unable to work a project until it reaches us at the CRC. My assumption is that both projects would need to be versioned, one to withdraw the A/E funding, and the other for validating the cost and writing up the project.

Please let me know if that is correct. In addition please let us know when we may see the versions at the CRC so we may begin working on them.

Thank you,

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From: Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Sent: Tuesday, September 7, 2021 10:56 AM
To: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>; SLEVIN Julie * OMD <julie.slevin@mil.state.or.us>; Gwin, Dan <Dan.Gwin@state.or.us>; Gregory Jackson <gjackson@acdisaster.com>; Lucas Pagan <lpagan@acdisaster.com>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140
Importance: High

Good morning Jordan,

Earlier I left you a voice message inquiring about the progress on the cost validation of these merged projects. In this morning's daily huddle, Julie Slevin (State Public Assistance Officer) mentioned that the Applicant's Consulting Engineer, Jack Akin, had contacted her regarding the project status. She asked that Greg Jackson (State OEM rep) and I respond to Mr. Akin as soon as possible.

While Region 10 determines how the financial conditions are processed, the CRC cost estimate validation is underway as I understand your August 31st email, correct? Do you have an approximate timeline for concluding this step? Do your specialists need any additional information to continue? Would the R10 financial directives have to be in place before you can advance the project to the next steps? Thanks for updating the group. ..... Doug

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From: Grant, Douglas
Sent: Tuesday, August 31, 2021 2:08 PM
To: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Ducote, David <david.ducote@fema.dhs.gov>; Ntagbu, Anthony <anthony.ntagbu@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Jordan,

Thanks for the heads up. I'll request some input and direction from Steve; as we don't want this complex project to hit any approval snags once you finish developing it. ..... DCG

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From: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Sent: Tuesday, August 31, 2021 1:47 PM
To: Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Ducote, David <david.ducote@fema.dhs.gov>; Ntagbu, Anthony <anthony.ntagbu@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Hi Doug, since I am not the Region I cannot determine if funding should remain or be de-obligated for the 4452 project. My recommendation would be to consolidate the two costs on 4432 since that is the project we are moving forward with. But again the Region would need to determine how they would like to handle the obligated funds.

Thank you,

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From: Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Sent: Tuesday, August 31, 2021 1:30 PM
To: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Ducote, David <david.ducote@fema.dhs.gov>; Ntagbu, Anthony <anthony.ntagbu@fema.dhs.gov>; Johnson III, Lawrence <lawrence.johnsoniii@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Hi Jordan,

It's been a couple of weeks already, so I thought I'd check in with you to see how the project merger is going. Since the original A&E projects have been obligated, I am not able to track the subsequent 'version' developments. Thanks for an update. ..... Doug

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From: Grant, Douglas
Sent: Monday, August 16, 2021 3:31 PM
To: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Ducote, David <david.ducote@fema.dhs.gov>; Ntagbu, Anthony <anthony.ntagbu@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

Many thanks, Jordan. Please let me know if I need to do anything within GM to have the DR4452 A&E costs withdrawn and reallocated to DR4432. ..... Doug

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From: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Sent: Monday, August 16, 2021 3:18 PM
To: Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Cc: Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Ducote, David <david.ducote@fema.dhs.gov>; Ntagbu, Anthony <anthony.ntagbu@fema.dhs.gov>
Subject: RE: DR4432/4452 - POBH: DREDGING projects #104046 & 110140

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Good afternoon Doug,

We should be good to go on these projects. I spoke with our senior leadership. We should be able to capture the entire project costs on the one project in DR 4432, which will simplify the mitigation and scope. We will use project notes to reference the compounding damages.

I believe the remaining project under 4452 will need to have the A/E costs withdrawn and captured instead under the project on 4432.

Thank you,

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From: Grant, Douglas <Douglas.Grant@fema.dhs.gov>
Sent: Monday, August 16, 2021 3:06 PM
To: Leigh, Jordan <jordan.leigh@fema.dhs.gov>
Cc: Slevin, Julie <Julie.Slevin@state.or.us>; Gwin, Dan <Dan.Gwin@state.or.us>; Lucas Pagan <lpagan@acdisaster.com>; Gregory Jackson <gjackson@acdisaster.com>; Michaels, Steven <Steven.Michaels@fema.dhs.gov>; Marusin, Lee <lee.marusin@fema.dhs.gov>; McCartney, Scott <Scott.Mccartney@fema.dhs.gov>; Kerschke, William <William.Kerschke@fema.dhs.gov>; Malone, Jack <Jack.Malone@fema.dhs.gov>; Ducote, David <david.ducote@fema.dhs.gov>; Ntagbu, Anthony <anthony.ntagbu@fema.dhs.gov>
Subject: DR4432/4452 - POBH: DREDGING projects #104046 & 110140
Importance: High

Good afternoon Jordan,

Thanks for conferencing with Lee and me late last week, regarding the two above-referenced Port of Brookings Harbor dredging projects. Under the two initial A&E v0s, the Applicant's engineering design was completed and the Joint Permit Application (JPA) was submitted to the USACE. For detailed information, please refer to the design and permit documentation uploaded July 14, 2021 into Grants Manager under DR4432OR-project #104046 – Dredging. As we understand the process, the next step for the CRC would be to complete cost estimates to establish the Version 1s.

As discussed, per the full initial project descriptions, the two projects are not independent of each other, and the current design and permit documents reflect this. As well, the documents identify substantial mitigation measures needed to secure the repair works and prevent future similar disaster conditions. The State/Recipient has requested that we now combine the scope and costs of these into the one DR4432 project#104046, so that project recovery to pre-disaster conditions and 406 mitigation measures can be addressed in total. Due to the upcoming, short annual dredging allowable work window we are requesting the CRC to expedite the GM processes as much as possible so that hopefully, the EHP and Mitigation activities are concluded in time for the Applicant to initiate the dredging operations early this Fall [note: this window is only from October 2021 thru March 2022].

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Thanks for undertaking the next steps towards finalization of the comprehensive project. Please let us know if we need to provide any additional information or documentation. ..... Doug

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ATTACHMENT "B"

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5/16/21

Gary Dehlinger
Port Manager
Port of Brookings Harbor
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Scope of Work for FEMA 4432, 4452

PA-10-OR-4432

Title 104046-Dredging, Application No. PA-10-0R-4432 (4432) is assigned a period of performance beginning May 2, 2019. The Subgrant Application proposes to repair damages as a result of the February 23rd – 26th severe storms that engendered landslides and deposited debris throughout the Port of Brookings Harbor, and included the shallowing of key marine vessel moorage, the destabilization of embankments (particularly along the West Basin 2 wall), and the accumulation of sediment beneath docks near the west embankment of Basin 2.

The sediment accumulating beneath the docks caused them to rest on the mudline beneath during low tides, causing damage to the docks. Landslides that occurred during the storm along the Basin 2 west embankment covered previously existing riprap along areas identified as Sites 1, 2 and 3, and revealed previously buried riprap in areas along embankment between these three sites. 4432 as it was proposed was purposed to remove sediment that had accumulated from the storm. The sediment volumes, about 7500 yd.^{3} in Basin 2 and 500 yd.^{3} in Basin 1, were estimated from comparisons of recent, sequential bathymetric surveys. Sediment migrated into identified areas of the Port basins via wild fire-generated material from the Chetco River, overtopping stormwater along the south and west embankments in Basin 2 and along the west and north Ice House Inlet embankments, and from pore water from the embankment walls themselves.

Connection with Application Title: 110140 - Port Dredging, Application Number: PA-10-OR-4452

Noted in the Special Notes of the 4432 Application is that the sediment issues and solutions associated with 4452 are inextricably connected to those of 4432.

Engineering determinations, including comparative bathymetric surveys, found that about 15,500 yd.^{3} of sand/soil/mud debris had accumulated in Basin 1, and about 12,500 yd.^{3} of the same accumulated in Basin 2 as a result of the April, 2019 storm.

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These two events were back to back and overlapping with respect to hydrographic data, as it would be noted that the rising limb of the April flows would overlap the falling limb of February flows, creating a "one- two punch" on vulnerable Port locations, so that the second event in April, 2019 created more damage than the first event in February.

Completing these two projects (4432 and 4452) as one provides not only logical, but economic benefit, in that the duplication of engineering, permitting and mobilization/demobilization of equipment required for both of these projects, as well as for any proposed mitigation actions, can be averted.

As it now stands, these two projects have each been separated by FEMA into two subprojects, (Phase 1 and Phase 2) the first of which is the engineering and permitting functions necessary to assess, design and permit both 4432 and 4452. $39,600 was assigned to 4432 and $80,400 was assigned to 4452 for the engineering/permitting Phase.

The two projects (4432 and 4452) would be accomplished simultaneously, saving several hundred thousand dollars. Thereby the preliminary estimated cost for dredging the 38,000 $yd.^3$ is $1,770,000. .

The Work Orders 47755 and 45060 were filled and submitted by the Port describe the dredge volumes with attached bathymetric and engineering documentation, provided after the 9/20/2019 FEMA Site Inspection.

Engineering estimates place the budget close to the original at **$1,790,000**, as itemized in the attached **EXHIBIT A – Dredging**.

Damage #304676; Basin 2 - Slope Failure and Scope of Work

The severe storm deposited a mixture of sand/soil/mud within the harbor. The debris caused a loss of soil cohesion in the slopes and steep embankments of the Harbor. Previously buried toe slabs and rocks meant to armor and help support the steep overlying embankment are now revealed, particularly along the west side of Basin 2.

Cause of Damage: The severe storm deposited a mixture of sand/soil/mud within the harbor. The debris caused a loss of soil cohesion in the slopes and steep embankments of the Harbor. Previously buried toe slabs and rocks meant to armor and help support the steep overlying embankment are now revealed, particularly along the west side of Basin 2. The erosive mechanism is described in more detail below in the section named **Storm and Erosion Processes.**

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Damage Description: Primary damages to Port embankments from 4432 and 4452 Disasters were observed and have been recorded in Basin 2, the south basin of the Port of Brookings Harbor. Generally, riprap repair is the most economical repair method for these slopes.

On the 2 East Slope, 542 CY of unclassified mixed riprap, 195 FT long x 5 FT wide x 15 FT deep would be required.

On the South Slope, 578 CY of unclassified mixed riprap, 208 FT long x 5 FT wide x 15 FT deep would be required.

On the Transient Slope, 289 CY of unclassified mixed riprap, 104 FT long x 5 FT wide x 15 FT deep would be required.

On the Basin 2 West Slope, 502 CY of unclassified mixed riprap, 452 FT long x 5 FT wide x 6 FT deep would be required.

The measurements for the embankment are based on applicant provided engineering information.

The unitized engineering budget for the riprap repair is **$675,157**, as itemized on **EXHIBIT A - Slope Repairs**.

The scope of work for Slope Repairs is herein proposed to be revised, replacing partial and therefore vulnerable small repair slopes, some of which (east and transient) are more stable and of lower priority, with the recommended, continuous repair of the west and south slopes of Basin 2. Volumes of riprap needed remain unchanged.

The unitized total engineering budget for the revised scope of work is presented on the attached **Exhibit A – FEMA Repairs** to pre-disaster Conditions is therefore **$2,465,157.** The engineered drawings showing the Slope Repairs are attached as files named **Slope Repairs DWG - West Basin 2 Wall**, and **Slope Repairs DWG - South Basin 2 Wall**.

Proposed Lower Cost Dredging Alternative, and Scope of Work

A Feasibility Study was produced for the Port of Brookings Harbor, investigating dredging alternatives. The Study was summarized in a PowerPoint Presentation to the Port of Brookings Harbor Staff and Board of Commissioners. A trimmed version to reduce file size) of the Presentation, with videos, disposal, case study, maintenance and permitting requirements removed, is attached as **EXHIBIT D**.

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The Study was generated by the growing concerns about sedimentation in the harbor that is being accelerated by Chetco wildfire erosion. The Study investigated the feasibility of implementing an in-house maintenance dredging program and operation at the Port, in comparison to other dredging alternatives. The analyses included barge and scow, hydraulic suction dredging, mechanical, or clamshell dredging; disposing of sediments upland via storage piling on land, or other out-of-water beneficial or non-beneficial uses such as trucking to a more distant disposal area (e.g. landfill or private property), in-water, including ocean disposal, beach nourishment, flow-lane and tidal/intertidal storage, all evaluated via data and experience.

A continuous reduction in the availability of safe moorage due to shoaling is occurring at the Port. In order to focus on solutions that make sense, a these options were considered in the Study. Some have been reviewed in the past and have been determined to be too expensive, cumbersome and/or unpredictable. Overall budgetary constraints, primarily caused by high dredging costs, limit the Port's ability to maintain its moorage. Funds for necessary paving and stormwater control that would otherwise be implemented to protect the duration of the Port embankment repairs have instead been allocated to the maintenance of navigable depths.

In order to construct a more permanent hardening of these embankments, and to provide remedy against future predicted sediment flows generated by the Chetco wildfires, the Port presents an alternative that could assist the Port to respond, not only to sediment from the 2019 disasters, but also to increasing sediment, already observed (see attached **EXHIBIT E**) shoaling increases.

The dredging costs for this lower cost alternative is **$1,192,174**, reduced $597,826 from that of the original dredging method proposed.

This alternative, additional to the estimated savings, reduces the Port's vulnerability to damages from future, predicted shoaling. Budget details for the Lower Cost Alternative are presented in the attached **EXHIBIT B**. Note that the Total Project cost in **EXHIBIT B** of **$1,717,331** includes the **$675,157** for Slope Repair.

Preliminary drawings showing the proposed Lower Cost Alternative, are attached, files entitled **Sediment Storage - Proposed Dredging Alternative DWGS** and **Equipment Storage-Proposed Dredging Alternative DWGS,** which show the proposed Scopes of Work.

Public Assistance 406 Mitigation Funding Request, and Scope of Work

The Port proposes that the Public Assistance Program and Policy Guidelines (V3.1), Appendix J, 1.B, enlists the mitigation of the erosion threat to be cost effective, as described below. 100% of the Total Repairs budget for 4432 (**$949,464**) and 100% of the Total Repairs budget for 4452 (**$917867**).

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The mitigation funding would be used in part to extend paving from the Sediment Storage access road and work area in the Commercial Area, shown in the drawings with file name **Sediment Storage - Proposed Dredging Alternative DWGS**, southward to the presently unprotected embankments adjacent to the commercial receiving docks and Ice House Inlet, shown in the drawings with file name **Mitigation of Paving to Commercial Embankments DWGs**.

The mitigation funding would also be used in part to extend paving from the Equipment Storage access and work area in the Boatyard, shown in the drawings with file name **Equipment Storage-Proposed Dredging Alternative DWGS**, north and westward to the presently unprotected embankments adjacent to the Boatyard which is the south Basin 2 wall, shown in the drawings with file name **Mitigation of Paving to Boatyard Embankments DWGs**.

The last portion of mitigation funding would be used to protect the wesin part to extend paving from the Equipment Storage access and work area in the Boatyard, shown in the drawings with file name **Equipment Storage-Proposed Dredging Alternative DWGS**, north and westward to the presently unprotected embankments adjacent to the Boatyard which is the west wall of Basin 2, and the most impacted embankment at the Port. This proposed project shown in the drawings with file name **Mitigation of Paving to Basin 2 West Embankment DWGs.**
Although it can be seen that an intended use for this pavement is as an RV area, it is herein underscored that no infrastructure (buildings, water lines, electric service, sewer lines or connections, etc.) are included in this budget. The paving shown will effectively cut off surface stormwater flows, and intercept 85% of the water seeping into permeable soils.

The Need for Proposed Mitigation

It is evident that three recurring factors (1. Existing unstable embankments; 2. High winds and severe winter storms and 3. Increased erosion and sediment migration do to the Chetco wildfires) will continue to degrade and block future Port operations. The recurrence of these factors is documented by, among other events and repairs, FEMA repairs that have occurred at the Port of Brookings Harbor in the last 10 or 11 years. These recurrences have been presented in the Benefit/Cost Analyses, produced within the framework of Version 6.0.0 of Build 20200819-1933, attached as **EXHIBIT F**. The following analyses the erosion processes occurring along the south and west embankments of Basin 2, and the exposed embankments adjacent to the commercial receiving docks and Ice House Inlet.

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- Engineers/Scientists, LLC

Storm and Erosion Processes

Contributing factors to embankment failure and subsequent sediment accumulation, and associated Port dock damages, are high winds and storm-generated erosion from embankment overtopping (stormwater flows that combine into streams and flow over the top of embankments, scoring and weakening the grade) and pore water (water seeping into permeable landings and, via hydraulic head, breaking through side banks, accelerating embankment erosion. Paving these landings and controlling stormwater flows along the west and south Basin 2 walls, and the Ice House Inlet commercial areas, would provide permanent protection to the Port.

Stormwater Flow Volumes

Rainfall at the Port of Brookings Harbor averages 83.5 inches/year, 2.2 times the national average. Of the 106.2 days in a given year that rain falls at the Port, nearly falls between late September and early to mid-April of each year. An affected landing zone of 50 – 100' in width, borders the Port Basin shorelines. This margin covers a footprint of about 734,500 ft.^{2}.
Along that total area about 117.34 acre feet (5,111,473 ft.^{3}) of rain water flows over or infiltrates along the approximately 5800 foot long Port Basin shoreline.

Affected and Relatively Non-affected Embankments

The margin areas along the embankments of the north and east of Basin 1 are paved, and the stormwater in those areas is controlled by catch basin and piping systems. On the west side of Basin 1 is a heavy riprap jetty. A couple hundred feet of the north end of the west Basin 2 landings are also paved and stormwater is similarly managed, as that area is occupied by the US Coast Guard. Much of the landing area approaching the Boatyard on the east side of Basin 2 has been paved and is equipped with stormwater catch basins and piping. The landing area margin above and including the fueling supply and Fuel Dock have recently been paved, and catch basins and piping installed.
This was done because of the recent failure of the Dock Access Pad, which was falling westward into Basin 2, due to the same erosive mechanisms described in this section. The concrete pad was removed, the area above the pad embankment (about 1300 ft^2) was paved and two catch basins and connecting underground piping placed.

Most of the approaching landing between the Fuel Dock area and the Boatyard area along the east side of Basin 2 are more gradually sloped and erosion due to stormwater infiltration and overtopping are of much less concern to the Port.

Concerns with respect to accelerated erosion therefore remain at Port Basin shorelines surrounding the Commercial Receiving Dock areas, the Icehouse Inlet and the Basin 2 south and west embankments.

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Accelerated erosion from stormwater overtopping and infiltrating the Commercial Receiving Dock and Icehouse Inlet areas are not directly attributable to the 2019 February and April damages (4432 and 4452), but are caused by the erosive mechanisms described in this section.

Damage Process

Existing riprap has been buried or unraveled, and embankment cave-ins have, as a result of these two back-to-back events, occurred and continue to occur along the approximate 1300 linear feet of exposed embankment along the south and west Basin 2 walls.

The average soil permeability coefficients (using C.I.A. ground surface classifications) of the landings approaching these embankments is about 0.4, and so approximately 40% precipitation on the landings affecting these embankments (about 352.5 ft.^{3} /linear foot/season) sinks into the ground and joins the high groundwater flows during storm season, found by average piezometric data to be at about 8 foot below ground surfaces.

This excess water works its way by pore pressure (8 feet head or greater) at elevations of 8 to 10 feet from top of bank and erodes the base material along these embankments. The remaining 60 percent (about 529 ft.^{3} /per linear foot/season) overtop the embankment on these unpaved areas, scoring and weakening the embankment structure.

The above would not be enough data to guide remediative design, unless augmented by duration data. This data is available via the Rainfall Intensity-Duration-Recurrence Interval (RDI) Curves (these can be obtained from the ODOT Manual, Appendix A, Zone 1).

There it can be seen that rainfall often occurs in the area with RDI coefficients of 1 for about 60 minutes, and as high as 4 for five minute intervals. Such coefficients, using classical stormwater flow calculations result in 4 to 16 cubic feet per second over the embankments for durations ranging from 5 minutes to an hour. The narrow margin lengths mean that concentration times are nearly instantaneous. This data represents a small winter storm at the Port. Major storms, such as the ones that occurred in April. 2019, last for days, with stormwater flows that range as described. High embankments of non-cohesive soils (sand) that are margined with permeable soils are not well protected against such stormwater flows, often driven by high (60 – 100 mph) winds.

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Stormwater Contamination

On a side note, natural, commercial and industrial releases of state and federally regulated hazardous constituents have, via stormwater sampling and laboratory analysis, been found to be carried to measured monitored stormwater outfalls during winter storm events.

Engineering and Port management investigations have concluded that containment and encapsulation of landings and presently eroding surfaces, and embankment stabilization, as provided by stormwater catch basin/piping and paving, would not only permanently stabilize slopes and harden the Port's infrastructure against overtopping and pore water erosion, but would also provide the added benefit of protecting the public health and environment, including ESA-listed species, from excessive contamination from regulated substances.

All stormwater data reports (DMRs) showing the exceedances are available upon request.

Therefore the proposed mitigation would provide the additional benefit to effectively reduce soil-borne contaminants presently being released into the waters of the US/State.

Sincerely

Jack (John) Akin, MS, PE, IC, HMS, CAI
EMC-Engineers/Scientists, LLC

EXHIBIT A - FEMA 4432 AND 4452 REPAIRS

Dredging	Equipment Mobe/Demobe, and Settling Basin	Trucking and Disposal $/cy	Hydraulic Dredging, $/cy	Volume in cy	Pipe Cost, 10 SDR 21 HDPE, 3000 ft, $14/ft	Dredging Costs
FEMA 4432	190,000	25	16	8,000	42000	560000
FEMA 4452	0	25	16	30,000	0	1230000
TOTAL BUDGET						1790000

Slope Repairs	LS Equipment Mobe/Demobe	$/sf Excavation, Erosion Control	$/cy Move, Mix, Place, Compact	$/cy Purchase & Deliver Riprap	$/cy Place Riprap	Fabric $/sf
All Slopes- #304676	65000	2.25	97	102	35	0.65
$/cy Base Rock Purchase, Delivery and Placement	Volume of Base Rock, cy	Area of Erosion Controlled, sf	Volume Soil/cy	Volume Riprap cy	Area Fabric, sf	
140	1010	28700	1250	1911	32500	
Excavation and Erosion Control Total	Move, Mix and Compact Total	Riprap Purchase and Deliver Total	Riprap Placement Total	Fabric Total	Base Rock Total	TOTAL BUDGET
64575	121250	194922	66885	21125	141400	675157

Engineering/Permitting	Slope Repairs Total	675157	Dredging Total	1790000	PROJECT TOTAL	2465157
120000						

811

EXHIBIT B - FEMA 4432 AND 4452 REPAIRS, Lower Cost Alternative

Dredging	120 HP Electric Dredge, Training, Shipping	Trailer-Mounted Generator, Shipped	3000 ft. 8" Dia. HDPE Pipe, $4/ft.	Volume in cy	LABOR: per 300 cy/dy, 2600 labor-hrs total rqd, @ $20/hr	Dredging Costs
FEMA 4432	230,000	60000	12000	8,000	11200	321,200
FEMA 4452	0	0	0	30,000	42000	72,000
Totals						393200

Access & Work Areas	Coverage, sf	$/cy Excavation, Grading	$/sf Subgrade Compaction	$/cy Mixed Aggregate for Subbase, placed and compacted	$/Ton Asphalt, Placed	$/cy Concrete
Sediment Storage	37250	20	0.5	50	125	130
Equipment Storage	10750	20	0.5	50	125	130

$/Specified Catch Basin, ea	$/ft Curb & Gutter, Labor	Cut/Fill Volumes, cy	Volume of Sub-base and Base Rock, cy	Volume of Asphalt, Tons, 3" Thick	Length of Curb & Gutter, ft	12" SW Pipe Installed/ft.
3000	32	3290	1150	745	1911	25
3000	32	600	332	215	65	25

SW Pipe Length, ft	No. Catch Basins	SW System Total	Grading Total	Sub-Grade Compaction Total	Aggregate Total	Asphalt Total
800	4	32000	65800	18625	57485	93125
100	1	5500	12000	5375	16590	26875

Curb & Gutter Total	$/sf Sediment Storage Wall, with footing	Sediment Storage Wall Area (L X 3' H), sf	Sediment Storage Wall Total	16' X 16' X45' Prefab Equipment Storage Bldg, Steel	Engineering & Permitting	Riprap Wall (See EXHIBIT A)
72629	30	3300	99000	0	39,600	0
2470	30	0	0	21500	80,400	675157

Repair of Damaged Sidewalk from West & South Wall Excavations	PROJECTS	TOTAL BUDGET	TOTAL REPAIRS-LOWER COST ALTERNATIVE	1867331
150000	FEMA 4432	949464		
	FEMA 4452	917867		

EXHIBIT C - FEMA 4432/4452 MITIGATION, Assuming Implementation of the Lower Cost Alternative

Access & Work Areas	Coverage, sf	$/cy Excavation, Grading	$/sf Subgrade Compaction	$/cy Mixed Aggregate for Subbase, placed and compacted	$/Ton Asphalt, Placed	$/cy Concrete
Commercial Area	101815	20	0.5	50	125	130
Boatyard	93750	20	0.5	50	125	130
Kite Field RV Area	100200	20	0.5	50	125	130

$/Specified Catch Basin, ea	$/ft Curb & Gutter, Labor	Cut/Fill Volumes, cy	Volume of Sub-base and Base Rock, cy	Volume of Asphalt, Tons, 3" Thick	Length of Curb & Gutter, ft	12" SW Pipe Installed/ft.
3000	32	12800	3142	2036	1100	25
3000	32	2500	2894	1875	1200	25
3000	32	11333	887	575	1500	25

SW Pipe Length, ft	No. Catch Basins	SW System Total	Grading Total	Sub-Grade Compaction Total	Aggregate Total	Asphalt Total
3200	5	95000	256000	50908	157122	254538
1500	4	49500	50000	46875	144676	234375
1500	4	49500	226660	50100	84367	71875

Curb & Gutter Total	TOTAL BUDGET	PROJECTS	$ Mitigation
41807	855374	4432	1110544
45607	571033	4452	855374
57009	539511		

TOTAL BUDGET FOR PROPOSED MITIGATION, ADDITIONAL TO TOTAL REPAIRS	1965918

	HMGP Request
	98,587
4452+HMGP	1,934,321

TOTAL BUDGET FOR PROPOSED REPAIRS, AND FEDERAL/STATE MITIGATION	3,833,249

	406-4432	406-4452
Mitigation	949464	917867
Repair	949464	917867
TOTAL/Project	1898928	1835734
TOTAL	3734662	

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EXHIBIT D – POWER POINT PRESENTATION

(Videos and Other Sections Removed)

A Feasibility Study Was Done for the Port

IN-HOUSE DREDGING: FEASIBILITY STUDY

By Jack Akin, MS, PE, IC, HMS, AI

For

Port of Brookings Harbor
Gary Dehlinger, Port Manager
Travis Webster, Harbormaster

In Summary

This study investigated the feasibility of implementing an in-house maintenance dredging program and operation at the Port, in comparison to other dredging alternatives.

A continuous reduction in the availability of safe moorage due to shoaling is occurring at the Port. In order to focus on solutions that make sense, a number of options have been considered in the Study. Some of these options have been reviewed in the past and have been determined to be too expensive, cumbersome and/or unpredictable.

Barge and scow, hydraulic suction dredging, mechanical, or clamshell dredging; disposing of sediments upland via storage piling on land, beach nourishment, or other out-of-water beneficial or non-beneficial uses, trucking to a more distant disposal area (e.g. landfill or private property), or in-water, including ocean disposal, beach nourishment, flow-lane and tidal/intertidal storage were evaluated via data and experience.

For the purposes of comparison these dredging and disposal options use a volume of 25,000 cubic yards of sediment.

Barge and scow dredging has been found to be both expensive and impractical, primarily due to considerations of navigability and availability. The standard barge may be as large as 200-foot long and 50-foot wide, with a 12-deep scow. Such a barge would be outfitted with appropriate duty spuds for anchoring and stability once it is in the desired location. The spuds on the barge must be of sufficient length allowing it to anchor itself in harbor depth of water. Out of the USACE's most recent abstract of offers for the barge and scow dredging of several port locations nearby, mobilization and demobilization alone, depending upon the selected sediment placement location, varies in the cited bid from $477,211 to about $756,250. Dredging/disposal per cubic yard was bid competitively, based on the large total volume of sediment to be dredged for this multi-locational project.

During third quarter 2019, for example, while McAmis, a barge and scow USACE winning subcontractor, was fulfilling their contract with the USACE at Winchester Bay, they accepted an offer from Salmon Harbor Marina to add to their federally contracted work by "piggybacking" the Marina's work. A $21/cubic yard charge was proposed to the Marina, rather than the $11 or $12/ cubic yard offered to the USACE as part of the federal project. The Marina would have had to pay hundreds of thousands of dollars to mobilize such equipment for themselves, unless they were able to gain agreement to "piggyback" as described. The cost to dredge 25,000 cubic yards, if "piggybacking" was available, is therefore estimated at the Port of Brookings Harbor to be $525,000, and, if "piggybacking" was not available, at best, $777,000 ($12/cy + $477,000 mobe/demobe). However, many areas requiring dredging in Basins 1 and 2 would not be accessible via this equipment.

Hydraulic suction dredging utilizing contracting standard swing-ladder dredges has been seen to be a viable method at the Port, but comes with high mobe/demobe costs, and does not lend itself to in-house maintenance dredging at smaller ports and marinas. Mobe/demobe costs to and from nearby locations have been seen to range from $40,000 to $55,000. Dredging costs additional to mobe/demobe have been found to range from $20 to $35/cubic yard, if sediment is disposed to nearby in-water or upland locations.

However, without development, no nearby in-water or upland disposal locations are available for the Port, and so the only other alternative is that of ocean disposal.

A number of analytical routines have been done for the Port, including selection of an appropriate pipe diameter (14" OD), determination of the required DR or SDR (17 SDR HDPE), determination of the required weighting, and of the design, construction and spacing of ballast weights, buoyant force, weight of pipe and pipe contents, methods of installation, preparation of land-to-water transition zones and, when required, underwater bedding, assembly of individual lengths of pipe into long continuous lengths, launching of pipeline into water, bending radius at which buckling can be initiated, etc. The higher sediment slurry velocities required in long pipelines to prevent clogging result in higher total dynamic head (TDH).

Combinations of pipe thicknesses necessary to resist the high total dynamic head (TDH) created by slurry traveling through 12,000 foot pipe lines at the recommended velocity are not found to be available for reasonably sized dredges, and so, booster pumping would be required.

Additional to the complexities associated with pumping slurry such long distances are those presented by the challenging task of working with a pipeline placed through river and ocean currents, whether floating or sunken. EMC has estimated designed and provided project engineering for ocean disposal and estimates the cost for such a project (25,000 cubic yards to the ocean disposal location via pipeline) from the Port to be $980,000.

Disposal Limitations

1. Available ocean disposal location is about 12000 feet from the furthest Port reach.
2. Hydraulic suction dredges small enough to navigate throughout the Port docks would be equipped with pump horsepower not sufficient to pump that distance, without at least one in-line booster pump. Potential pipeline pathways require a combination of land and water routes unfriendly to a successful dredging operation during winter weather.
3. USACE has determined in the past that the Chetco River reach and entrance are not approached with enough river flow energy to deliver flow-lane sediments beyond the federal channel.
4. No nearby in-water storage areas are permitted to be used by the Port.

5. When considering upland storage during a dredging event at the Port, it must be taken into account that any possible storage and de-watering area within the Port limits sediment volumes during a single event to 25,000 cubic yards, and reasonable volumes of 6 – 8000. Therefore, use of a large dredge for upland disposal at the Port would require multiple events and subsequently multiple mobe/demobe costs, rendering this option infeasible.

6. Likewise, to utilize barge and scow for upland storage at the Port would present the Port, in addition to multiple handling of the sediment for placement, the same volume limitations and associated multiple mobe/demobe costs.

So this Study concludes that a low cost, in-house dredging operation would bring many advantages to the Port. Flexibility and rapid response to ongoing mooring challenges would bring a level of internal control not often experienced at small ports in Southern Oregon. During our review of practicable alternatives, we concluded that a smaller and more mobile dredging unit could provide the required navigability, and in-house control, that would be affordable and be more able to provide the Port with long-term maintenance dredging.

It is also concluded that annual maintenance dredging volume requirements at the Port are relatively small, because the major portion of shoaled sediments from Port facilities slough to federally maintained channels, and so a modest maintenance program, on an annual basis, could maintain the Port mooring spaces, and additionally could enable the Port to gradually and affordably reduce its backlog, which has been accumulating over decades.

The above conclusions bring us to the analyses of in-house operational scenarios, utilizing small, maneuverable dredges, and local, perhaps even beneficial sediment disposal options.

EMC in the past has specified portable, centrifugal pump-driven slurry pumps, well fitted for the dredging of dock locations (e.g. Port of Port Orford).

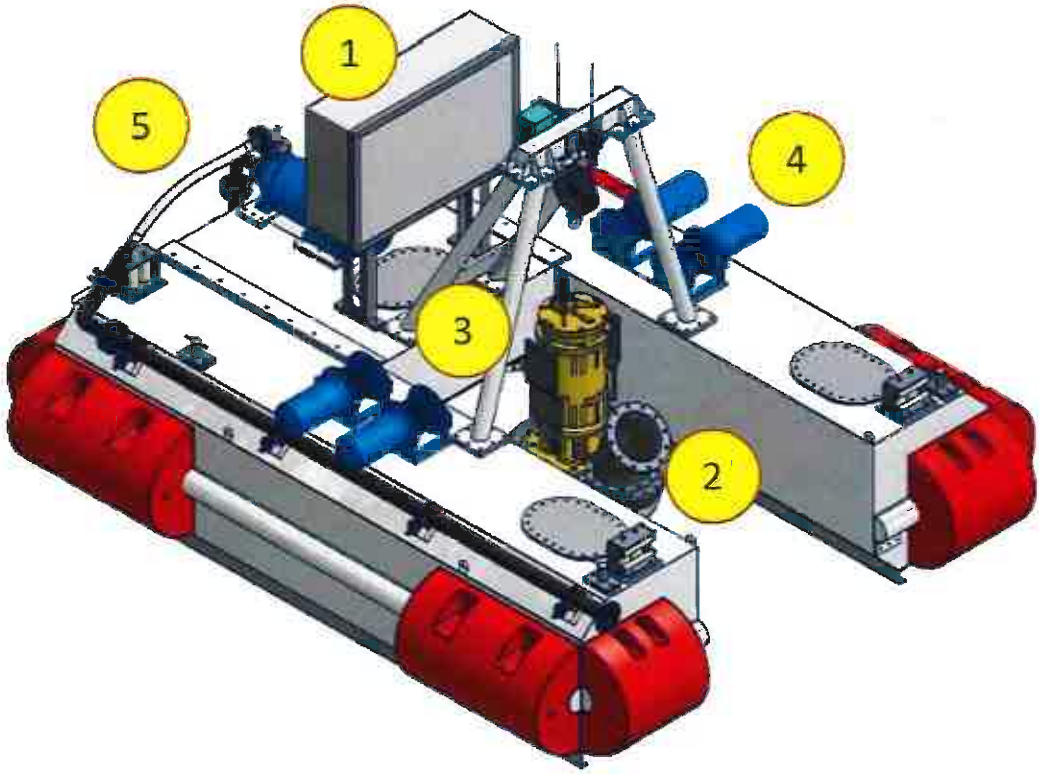
So equipment provided by BPH, Eddy, DragFlow and TOYO Pumps were analyzed and compared.

After considering economic value, equipment design, horsepower, maneuverability, etc., EMC recommends that the Port consider an in-house, small dredge system, utilizing the DragFlow DPR-120 remote controlled dredge, rigged with the EL 1204HH C Model pump system.

Slides and video clips focus on this equipment, its applicability, function and maintenance. We will also briefly review the proposed upland disposal option, permitting requirements and costs associated with this recommended in-house dredging option.

Dredge Details:

1. Control Panel
2. Dredging pump
3. Electric Hoist
4. 4 Winches (45 – 110m)
5. Jet Ring System for breaking the material to be dredged

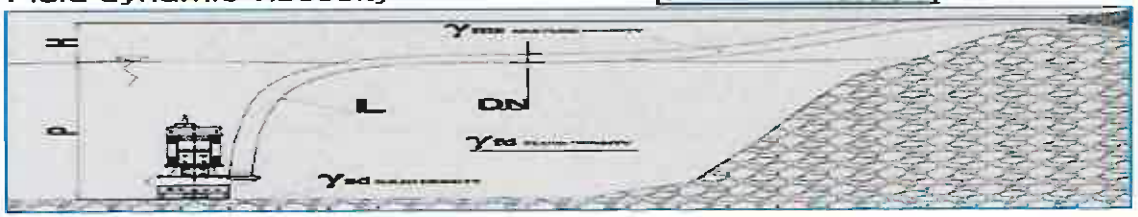


Client: Jack Akin - EMC-Engineers-Scientists, LLC-Oregon-US	Date: Oct 28, 2020
Project:SHM feasibility-	Author: Maurice

Mixture Details

Solids concentration in the mixture		
% by volume	25	%
corresponding to % by weight	40	%
Solid Particles Dimension	d50 > 15 mm	
Particle Median Diameter	1	kg/dm^3
Liquid SG	2	kg/dm^3
Solids SG	1.25	kg/dm^3
Mixture Specific Gravity	0.001	Pa s
Fluid dynamic viscosity		

DRAGFLOW
ULTIMATE EFFICIENCY



Application Details

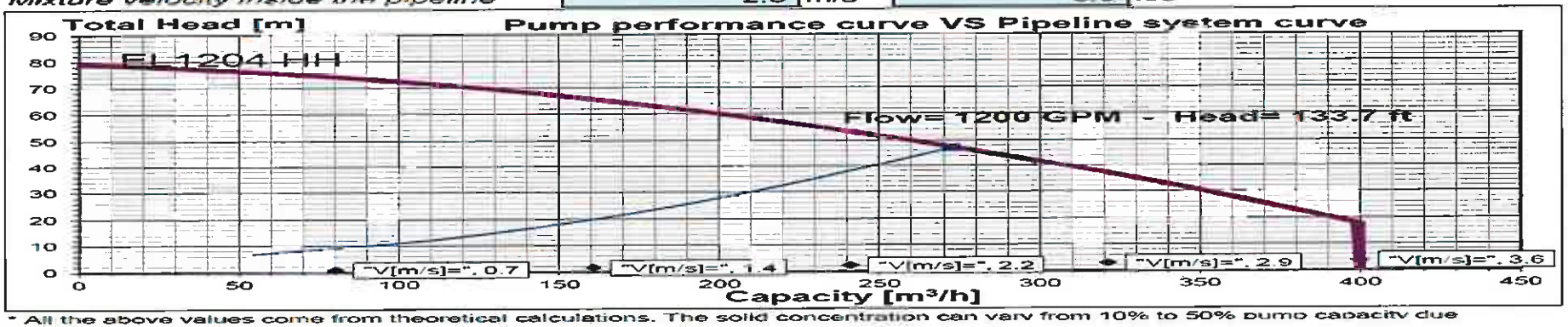
Geodetic Height (Air) =	H	1.2	m	4 ft
Geodetic Height (Water) =	P	15.2	m	50 ft
Pipeline Total Length =	L	914.4	m	3000 ft
Pipe Internal Diameter =	DN	198.2	mm	7.803 inch
Total Mixture Capacity		273	m^3/h	1200 GPM

System TDH at set capacity

	SLURRY [m]		SLURRY [ft]	
Friction loss along the pipeline	35.3	m	115.7	ft
Concentrated pressure drops	0.5	m	1.5	ft
Geodetic: [H+(mixSG-liqSG)*P]	5.0	m	16.5	ft
Total Dynamic Head (TDH)	40.8	m	133.7	ft
Mixture velocity inside the pipeline	2.5	m/s	8.0	ft/s

REQUIRED POWER
100 HP

PUMP POWER
120 HP



* All the above values come from theoretical calculations. The solid concentration can vary from 10% to 50% pump capacity due

Port of Brookings-Harbor
Calculation Sheet For 6" and 8", SDR 21 Pipeline, 120 hp
by Jack Akin, MS, PE

Q_{gpm}	1098.00	1200.00	3000.00	1000.00	1720.00	3000.00
C_{HW}	155.00	155.00	155.00	155.00	155.00	155.00
$L_{ft.}$	3000.00	3000.00	3000.00	3000.00	3000.00	3000.00
d_{in}	5.96	5.96	5.96	7.75	7.75	7.75
$Q_{ft^3/s}$	2.45	2.67	6.68	2.23	3.83	6.68
$V_{ft/s}$	12.65	13.82	34.55	6.80	11.69	20.39
$e_{ft.}$	5.00E-06	5.00E-06	5.00E-06	5.00E-06	5.00E-06	5.00E-06
ν_{sec}	1.45E-05	1.45E-05	1.45E-05	1.45E-05	1.45E-05	1.45E-05
R_e	4.34E+05	4.74E+05	1.19E+06	3.04E+05	5.22E+05	9.11E+05
$e/D_{ft.}$	1.01E-05	1.01E-05	1.01E-05	7.74E-06	7.74E-06	7.74E-06
$R_e^{0.9}$	1.18E+05	1.28E+05	2.93E+05	8.59E+04	1.40E+05	2.31E+05
F Log_{10} Precalc	-4.29	-4.32	-4.65	-4.16	-4.37	-4.57
Square of Previous	18.41	18.70	21.63	17.32	19.06	20.88
F Approx.	1.36E-02	1.34E-02	1.16E-02	1.44E-02	1.31E-02	1.20E-02
$1/F^{1/2}$	8.58	8.65	9.30	8.32	8.73	9.14
$1/F^{1/2}$ Calc	8.56	8.63	9.30	8.30	8.71	9.13
$h_{f\text{-}DW}$	203.79	239.74	1294.87	48.09	129.30	359.02
$h_{e\text{-}ft.}$	0.00	0.00	0.00	0.00	0.00	0.00
$h_{s\text{-}ft.}$	0.00	0.00	0.00	0.00	0.00	0.00
$h_{v\text{-}ft.}$	2.48	2.97	18.54	0.72	2.12	6.46
$h_{f\text{-}HW}$	198.58	234.04	1274.93	46.31	126.31	353.50
TDH-HW	201.06	237.01	1293.47	47.03	128.44	359.96
TDH-DW	206.28	242.70	1313.41	48.81	131.42	365.48
$HP_{Brake\text{-}HW}$	55.75	71.82	979.90	11.88	55.79	272.70
$HP_{Brake\text{-}DW}$	57.20	73.55	995.01	12.33	57.08	276.88
Assumed total eff	0.65	0.65	0.65	0.65	0.65	0.65
HP_{HW}	85.77	110.49	1507.54	18.27	85.82	419.54
HP_{DW}	87.99	113.15	1530.78	18.96	87.82	425.97
Yds^3/hr. (Production Rate)	32.62	35.65	89.13	29.71	51.10	89.13
10-Hr Days to Move .000 Yds^3 - 0.10 Solids*	76.64	70.13	28.05	84.15	48.92	28.05

Port of Brookings-Harbor
Calculation Sheet For 6" and 8", SDR 21 Pipeline, 120 hp
by Jack Akin, MS, PE

Adjusted $h_{f\text{-}HW}$	278.01	327.66	1784.90	64.84	176.84	494.91
Adjusted HP_{HW}**	119.65	154.14	2101.91	25.47	119.59	584.34
Adjusted ν_{50} (assumes 20% slurry)	1.84E-05	1.84E-05	1.84E-05	1.84E-05	1.84E-05	1.84E-05
Adjusted R_e	3.42E+05	3.73E+05	9.33E+05	2.39E+05	4.11E+05	7.17E+05
Adjusted $R_e^{0.9}$	9.55E+04	1.03E+05	2.36E+05	6.93E+04	1.13E+05	1.86E+05
Adjusted F Log_{10} Precalc	-4.20E+00	-4.24E+00	-4.57E+00	-4.07E+00	-4.28E+00	-4.48E+00
Adjusted Square of Previous	17.66	17.94	20.87	16.57	18.29	20.09
Adjusted F Approx.	1.42E-02	1.39E-02	1.20E-02	1.51E-02	1.37E-02	1.24E-02
Adjusted $1/F^{1/2}$	8.40	8.47	9.14	8.14	8.55	8.97
Adjusted $1/F^{1/2}$ Calc	8.38	8.45	9.13	8.12	8.53	8.95
Adjusted TDH_{DW}	217.58	255.93	1380.14	51.73	139.09	386.24
Adjusted HP_{DW}	92.82	119.31	1608.56	20.10	92.94	450.16

Notes

* Production assumes 100% efficiency. The actual production rate and dredging period must be adjusted per project.

** Safe recommended coefficient of 1.4 for various concentrations of slurry when using Hazen Williams.

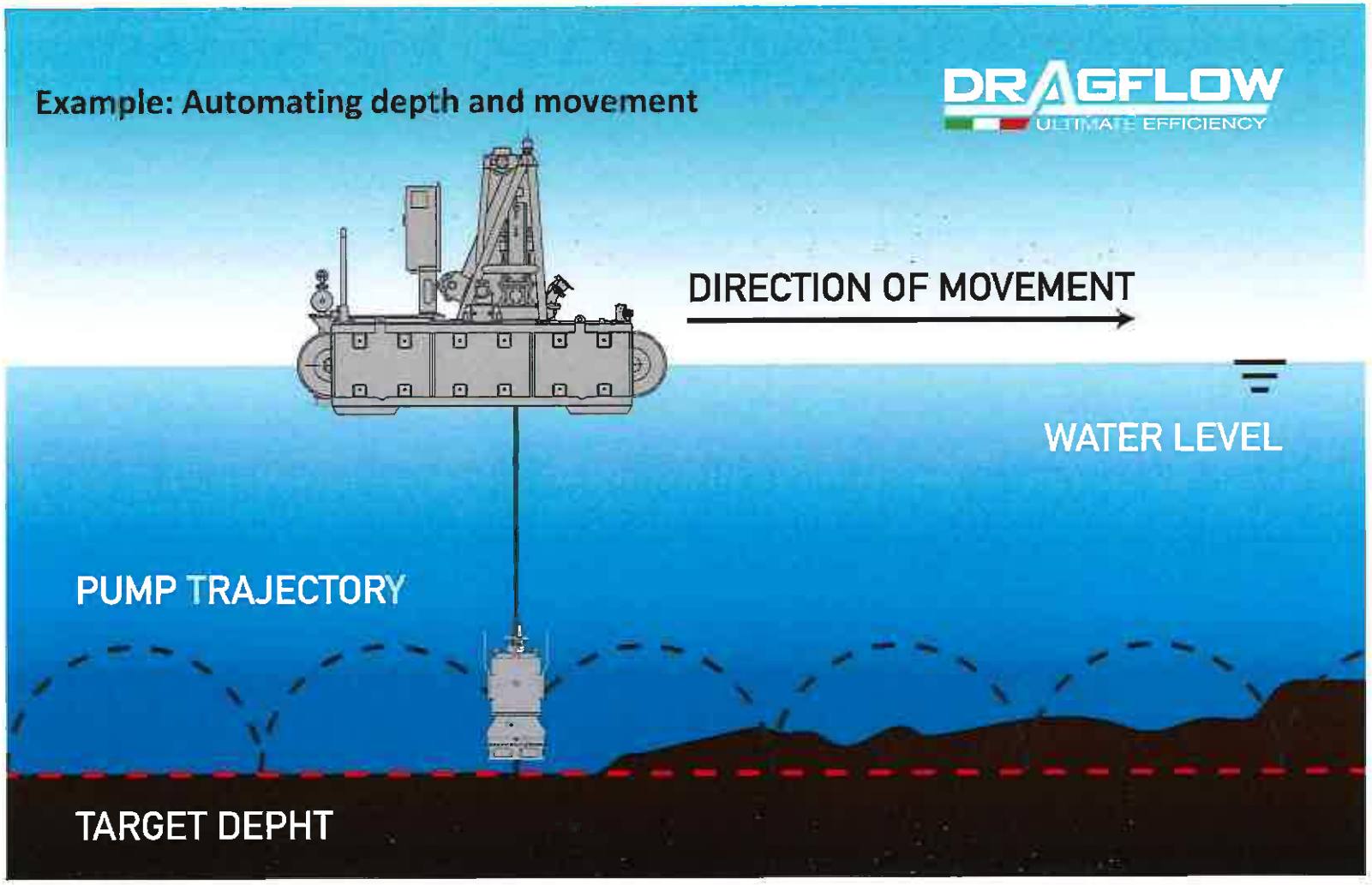

Example: Automating depth and movement
DRAGFLOW
ULTIMATE EFFICIENCY
DIRECTION OF MOVEMENT
WATER LEVEL
PUMP TRAJECTORY
TARGET DEPHT

EXHIBIT E – Bathymetric Comparison to Investigate Shoaling Rates

EMC
Grants Pass * Jacksonville * Medford, OR
GP Office: 1867 Williams Hwy., Suite 216, Grants Pass, OR, 97527
Jville Office: 450 Conestoga Dr., Jacksonville, OR, 97530
Ph: 541-474-9434 * Cell: 541-261-9929 * Fax 541-727-5488
emc@emcengineersscientists.com; http://www.emcengineersscientists.com
- Engineers/Scientists, LLC

7/10/19

Gary Dehlinger
Manager, Port of Brookings Harbor

7/10/19

Travis
Port of Brookings Harbor Harbormaster

MEMO 7102019-1; 2019 Bathymetric Survey Results

Attached are the key plans and volume calculations that indicate the volumes of sediments that have migrated into the Port of Brookings Harbor basins since shortly after the last major dredging event, which occurred in 2012, and that exists within the Port basins in 2019.

The bathymetric survey used to map out and compare 2013 volume levels with those in 2017 show a total volume increase of 16,683 yd.^{3}. However, the most recently completed bathymetric survey has been mapped out, and its calculated volumes, utilizing the 2017 sediment elevations as its baseline, show a total sediment accumulation of 49,760 yd.^{3}. If a standard averaging were to be used, the shoaling rate for the period between 2017 and 2019 can be estimated at approximately 24,880 yd.^{3} per year. This shoaling rate, when compared with the normally expected rate of about 4500 yd.^{3} per year, is dramatic, but not unexpected, based on observations that have been made in 2019.

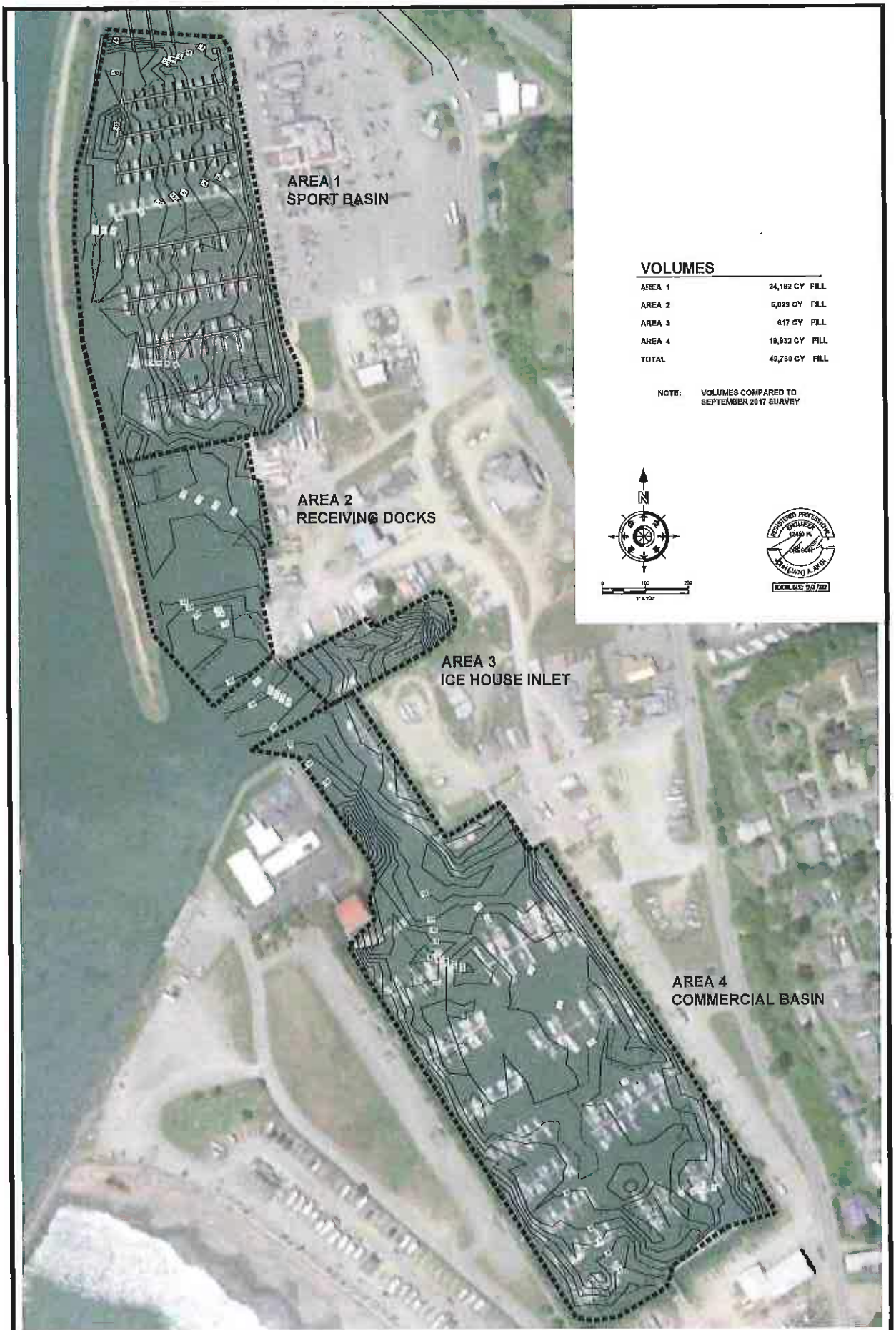
As observed and previously estimated by EMC, it is believed that nearly all of 40,000 yd.^{3} has accumulated within the Port basins due to storms and erosion from nearby wild fire residues on stream watersheds to the Port. Nevertheless, even a conservative and weighted value of 24,880 yd.^{3} is about six times that which should be expected and have previously been observed to have shoaled into the Port basins.

Sincerely

Jack (John) Akin, MS, PE, IC, HMS, CAI
EMC-Engineers/Scientists, LLC

09-15-17

SHEET 1 OF 1



EMC

BATHYMETRIC SURVEY

JULY, 2019

PORT OF BROOKINGS HARBOR

DRAWN:	TAM
CHECKED:	JA
DATE:	07/11/2019

1 OF 1

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EXHIBIT F – BCA Produced and Submitted for HMGP Funding Request

FEMA Benefit-Cost Calculator

V.6.0 (Build 20200819.1933)

Benefit-Cost Analysis

Project Name: POBH Embankment Stabilization/Stormwater Protection

Map Marker	Mitigation Title	Property Type	Hazard	Benefits (B)	Costs (C)	BCR (B/C)
1	Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy	•••	DFA - Severe Storm	$ 7,446,159	$ 4,302,140	1.73
2	Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy	•••	DFA - Severe Storm	$ 7,446,159	$ 4,302,140	1.73
TOTAL (SELECTED)				$ 14,892,318	$ 8,604,280	1.73
TOTAL				$ 14,892,318	$ 8,604,280	1.73

147

Property Configuration

Property Title:	Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy
Property Location:	97415, Curry, Oregon
Property Coordinates:	42.05127, -124.26676
Hazard Type:	Severe Storm
Mitigation Action Type:	Other
Property Type:	Other
Analysis Method Type:	Professional Expected Damages

Cost Estimation

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy

Project Useful Life (years):	40
Project Cost:	$4,258,897
Number of Maintenance Years:	40 Use Default:Yes
Annual Maintenance Cost:	$14,167

148

Comments

•

Project Useful Life:

Not all work will last, without repair, for 40 years. Therefore note that for asphalt pavement construction, added ongoing expenses for periodic seal-coating and repair are added under Annual Maintenance Cost. Also, dredging having been done assumes subsequent normal sediment shoaling into the Port annually of 4500 cy. However, a 20% increase has been estimated from recent observations made by the engineer-of-record, which amounts to an additional 900 cy/yr., or 4500 cy/5 yrs. This amount over 40 years is placed under Damages After Mitigation in this BCA.

•

Mitigation Project Cost:

Please see the attached Project Budget Sheets (see attachments C-1, C-2 and C-3). These layout the three subprojects (Parking Lot, Roads & Storage; Boat Yard & Kite Field RV Park), with associated itemized cost estimates, totaling 1,858,897, which is the request from the HMGP (it may be that not enough funding via the HMGP is presently available, and so a PA request is also in process). This workbook contains three calculating sheets, the sheets are named "Parking Lot, Roads and Storage", "Boat Yard" and "Kite Field RV Park". In all three sheets the last column to the right, labeled "4452 HMGP", is that which is applicable to this project. So, for the sub-project "Parking Lot, Roads and Storage", the subtotal is $546,805. The sub-project subtotal for the "Boat Yard" is $812,828 The sub-project subtotal for the "Kite Field RV Park" is $499,265. The total for all three of the sub-projects is $1,858,897,. This total is added to the previously submitted total for the declared disasters during February (4432-DR-OR) and April (4452-DR-OR) of 2019. Attached FEMA inspections (see attachments E-1a, E-1b & E-1c for background and copies of WO 45060 and WO 47755) were conducted on 9/20/2019. Damage assessment via sequential bathymetric survey and historical photography were submitted to FEMA. As of the date of this Report, the approval process is in ongoing. Further, recent publication and engineering study has identified wildfire-related erosion and sedimentation within the Port basins. Upland layering would be used to beneficially grade surfaces for protective paving. Paving is recommended to 1) stabilize embankment slopes and control erosive stormwater flows, and 2) mitigate issues associated with the environmental threat outlined below. Additionally, stormwater pollutants are found to be posing a threat to the environment,. Recent (1st and 2nd 1/4ly, 2020) ODEQ-required stormwater sampling has shown the release of pollutants being delivered to the waters of the State. To these are added previously applied for 4432 and 4452 funding requests. 4432 requests $755,000 and 4452 $1,710,000 for embankment repair and sediment removal. Since that request we have found alternative sediment handling that can reduce, and that beneficially, 4452 costs by $125,000, that is; from $1,770,000 to $1,645,000, and thus the total from $2,525,000 to $2,400,000. As a result of declared disasters during February (4432-DR-OR) and April (4452-DR-OR) of 2019 the Port of Brookings Harbor petitioned for assistance via the HMGP. Attached FEMA inspections (WO 45060 and WO 47755) were conducted on 9/20/2019. Damage assessment via sequential bathymetric survey and historical photography were submitted to FEMA. As of the date of this Report, the approval process is in ongoing. The total of all requests would therefore be $4,258,897 which is the total Project Cost Estimation used for this BCA. Also, referenced within the Project Budget Sheets are preliminary engineered drawings (attached as B-4 and B-5). These are not construction drawings. RE the attached preliminary drawings: These drawings, entitled HMGP-DR-4452, 2020 Improvements, include some master planning, most but not all of which are applicable to this Project. All of these drawings, notes, specifications are adequate for cost estimation and regulatory review, but are preliminary. Construction drawings will follow. The drawing package consists of 21 sheets. Sheet C1.0 is the cover sheet for the packet. 149

Sheet C1.1 contains applicable General Notes, Grading Notes, etc. Sheet C1.2 contains other Notes and several Sections, all of which are applicable to this Project. Sheet C1.3 is simply an overall plan view of Basin 2. Sheets C2.0, 2.1 and 2.2 contain Notes and ESCP Details that are applicable to this project. Sheet C3.0 is of the Kite field – RV Park, showing 25 concrete pads and vehicle parking for pull-through RV units. This drawing will be revised to accommodate a total of 15, rather than 25 units. Cut and fill volumes as shown on the sheet are still correct. On a preliminary basis. Construction drawings will be more accurate, as they will be based on field surveyed data, rather than the GIS data presently being used. Sheet C4.0 is a preliminary drawing showing the north roads and parking lot, along with dredge sediments cut and fill volumes. The storage buildings on Sheet C4.0, as well as the details on Sheets C4A & C4B, the photos on Sheet C4C do not pertain to this project. The top and profile views of the roads on Sheets C4 .1 through C4.6 are preliminary and applicable, but must be revised for construction drawings after professional survey or data is obtained. Sheet C5.0 shows the Boat Yard with planned cut and fill estimates, applicable to this project. Sheet C6.0 provides pre-design cross sections and Notes as specified by the engineer-of-record for wheel stops, curb with taper, conduit trenching, sewer trenching, concrete sidewalk, vertical curbing, curb and gutter, rolled curbing, control Joints, water and joint trenching, driveway guttering, typical clean outs, storm manholes, catch and junction basin details, all of which are applicable to this project. Under the newly obtained ODEQ 1200-Z Industrial Stormwater Permit, the Port completed its first two water sampling events and the laboratory results show considerable exceedances. The 5-14-20 Stormwater Review and Recommendations and POBH SWPCP for reference (see attached D-4a and D-4b) indicate that dirt/gravel roads, gear storage and boat yard facilities contribute to the non-compliant total suspended solids and regulated metals. Needed stormwater control as would be provided via paved surfaces directed to catch basins with Best Management practices.

-

Annual Maintenance Cost:

Proposed improvements (cut/fill, paving, embankment repair & stabilization) will decrease maintenance requirements. At present unpaved areas and unstable slopes must be routinely, temporarily repaired. Assuming a rigorous sealcoating schedule every three years, annual paved road and parking lot maintenance costs may be conservatively estimated at $14,167/yr.

Damage Analysis Parameters - Damage Frequency Assessment
Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy

Year of Analysis Conducted:	2020
Year Property was Built:	1978
Analysis Duration:	43 Use Default:Yes

Professional Expected Damages Before Mitigation
Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy

	OTHER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Damages ($)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
8	2,525,000	0	0	0	0	0	3,550,000
1	95,758	0	0	0	0	0	95,758

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Comments

•

Damages Before Mitigation:

Expected Damages are considered to be the cost of damage repair to restore action areas to their original condition ($2,525,000). This budget has been submitted to FEMA via DR 4432 and 4452. An 8-yr. recurrence is deemed reasonable because, as noted in the attached Special Districts 2018 POBH NHMP (see attachment F-1, P13, Gen. SW Drainage, and P14, Embankments), degradation due to flood and storm damage is accelerating. Ongoing erosion and structural damage to Port, as seen from repairs required due to storm/flood damages in the last eight (8) years total, not including that caused by the 2011 tsunami, $4,645,000 ($120k+$280k+$650k+$3595k), is shown in the Application, Section 3.1.5, Table. Attached engineering reports for these disasters over the last eight years are, respectively, GeoDesign Engineering Report and accompanying Overall Map of Slides; POBH Dock Failure Preliminary Reports-1 and 2; 3-24-17 Sport Basin Boardwalk Memo and, the most recent submitted 4432 and 4452 application; (WO 45060 & WO 47755 attached for the convenience of the reader). Projects not being done at present, that are already in-progress or have already been completed are not included in this BCA, except to support the overall periodicity of severe storm/erosive damages. RE required annual stormwater treatment as a result of newly discovered Port NPDES (1200-Z) non-compliance: Bioretention areas, swales, channels, detention areas, sand filters, gravity separators, dry wells, trenches, stormwater ponds, pavers, porous concrete, rain harvesting, and stormwater wetlands were reviewed. Swales,retention areas, trenches, ponds, harvesting and stormwater wetlands are not feasible due to limited treatment areas and high flows. R-D-I 50 for the Brookings area w/ Tc (3-6 minutes) estimated at 4.0. High intensity storms in the area require a coefficient adjustment of 1.2. The total volume of stormwater produced by the 18 acres area produces 73.34 $ft.^3/s$, or about 32,917 GPM. Estimated stormwater treatment costs/yr., based on previous work reviewed by EMC, to treat to benchmark concentrations is about $2.91/GPM/season. Attached is the 5-14-20 Stormwater Review and Recommendations, and the POBH SWPCP for reference. (Note: Reviewer can see all attached documents, spreadsheets, drawings citations in the "Attachment Index" Table in the Application.)

Annualized Damages Before Mitigation

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
1	95,758	510,164
8	3,550,000	443,750
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	3,645,758	953,914

Professional Expected Damages After Mitigation

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy

	OTHER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Damages ($)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
5	1,282,500	0	0	0	0	0	1,282,500
1	23,500	0	0	0	0	0	23,500

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Comments

-

Damages After Mitigation:

A recent bathymetric survey analyses was performed by the Port showing elevated shoaling rates, attributable to recent wildfires above the Chetco watershed. It is attached, entitled Memo RE Elevated 2017-2019 Shoaling Rates. The narrative examines recent shoaling rates as about six times that of average experienced at the Port. However, this phenomenon can not be predicted via available research. A 20% increase has been estimated from recent observations made by the engineer-of-record, which amounts to an additional 900 cy/yr., or 4500 cy/5 yrs. Therefore the average rate of 4500 cy sediment/yr. is used in this analysis. The dredging estimate of $57/cy, disposed to EPA-managed ocean unit, is conservatively used. This volume is funded via Port resources. Paving and embankment repair are included in the maintenance cost/yr section of this analysis. Stormwater treatment to obtain acceptable levels will be greatly diminished by separating stormwater from Port soils, but not entirely diminished. Final polishing will likely be required at Gear Storage # 1 and Boat Yard. Filtering is estimated to cost about $12,750 per outfall/year for the two outfalls.

Annualized Damages After Mitigation

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
1	23,500	138,884
5	1,282,500	256,500
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	1,306,000	395,384

Benefits-Costs Summary

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy

Total Standard Mitigation Benefits:	$7,446,159
Total Additional Benefits - Social:	$0
Total Additional Benefits - Ecosystem Services:	$0
Total Mitigation Project Benefits:	$7,446,159
Total Mitigation Project Cost:	$4,302,140
Benefit Cost Ratio - Standard:	1.73
Benefit Cost Ratio - Standard + Additional:	1.73

152

Property Configuration

Property Title:	Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy
Property Location:	97415, Curry, Oregon
Property Coordinates:	42.05127, -124.26676
Hazard Type:	Severe Storm
Mitigation Action Type:	Other
Property Type:	Other
Analysis Method Type:	Professional Expected Damages

Cost Estimation

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy

Project Useful Life (years):	40
Project Cost:	$4,258,897
Number of Maintenance Years:	40 Use Default:Yes
Annual Maintenance Cost:	$14,167

Comments

•

Project Useful Life:

Not all work will last, without repair, for 40 years. Therefore note that for asphalt pavement construction, added ongoing expenses for periodic seal-coating and repair are added under Annual Maintenance Cost. Also, dredging having been done assumes subsequent normal sediment shoaling into the Port annually of 4500 cy. However, a 20% increase has been estimated from recent observations made by the engineer-of-record, which amounts to an additional 900 cy/yr., or 4500 cy/5 yrs. This amount over 40 years is placed under Damages After Mitigation in this BCA.

•

Mitigation Project Cost:

Please see the attached Project Budget Sheets (see attachments C-1, C-2 and C-3). These layout the three subprojects (Parking Lot, Roads & Storage; Boat Yard & Kite Field RV Park), with associated itemized cost estimates, totaling 1,858,897, which is the request from the HMGP (it may be that not enough funding via the HMGP is presently available, and so a PA request is also in process). This workbook contains three calculating sheets, the sheets are named "Parking Lot, Roads and Storage", "Boat Yard" and "Kite Field RV Park". In all three sheets the last column to the right, labeled "4452 HMGP", is that which is applicable to this project. So, for the sub-project "Parking Lot, Roads and Storage", the subtotal is $546,805. The sub-project subtotal for the "Boat Yard" is $812,828 The sub-project subtotal for the "Kite Field RV Park" is $499,265. The total for all three of the sub-projects is $1,858,897,. This total is added to the previously submitted total for the declared disasters during February (4432-DR-OR) and April (4452-DR-OR) of 2019. Attached FEMA inspections (see attachments E-1a, E-1b & E-1c for background and copies of WO 45060 and WO 47755) were conducted on 9/20/2019. Damage assessment via sequential bathymetric survey and historical photography were submitted to FEMA. As of the date of this Report, the approval process is in ongoing. Further, recent publication and engineering study has identified wildfire-related erosion and sedimentation within the Port basins. Upland layering would be used to beneficially grade surfaces for protective paving. Paving is recommended to 1) stabilize embankment slopes and control erosive stormwater flows, and 2) mitigate issues associated with the environmental threat outlined below. Additionally, stormwater pollutants are found to be posing a threat to the environment,. Recent (1st and 2nd 1/4ly, 2020) ODEQ-required stormwater sampling has shown the release of pollutants being delivered to the waters of the State. To these are added previously applied for 4432 and 4452 funding requests. 4432 requests $755,000 and 4452 $1,710,000 for embankment repair and sediment removal. Since that request we have found alternative sediment handling that can reduce, and that beneficially, 4452 costs by $125,000, that is; from $1,770,000 to $1,645,000, and thus the total from $2,525,000 to $2,400,000. As a result of declared disasters during February (4432-DR-OR) and April (4452-DR-OR) of 2019 the Port of Brookings Harbor petitioned for assistance via the HMGP. Attached FEMA inspections (WO 45060 and WO 47755) were conducted on 9/20/2019. Damage assessment via sequential bathymetric survey and historical photography were submitted to FEMA. As of the date of this Report, the approval process is in ongoing. The total of all requests would therefore be $4,258,897 which is the total Project Cost Estimation used for this BCA. Also, referenced within the Project Budget Sheets are preliminary engineered drawings (attached as B-4 and B-5). These are not construction drawings. RE the attached preliminary drawings: These drawings, entitled HMGP-DR-4452, 2020 Improvements, include some master planning, most but not all of which are applicable to this Project. All of these drawings, notes, specifications are adequate for cost estimation and regulatory review, but are preliminary. Construction drawings will follow. The drawing package consists of 21 sheets. Sheet C1.0 is the cover sheet for the packet. 154

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•

Annual Maintenance Cost:

Proposed improvements (cut/fill, paving, embankment repair & stabilization) will decrease maintenance requirements. At present unpaved areas and unstable slopes must be routinely, temporarily repaired. Assuming a rigorous sealcoating schedule every three years, annual paved road and parking lot maintenance costs may be conservatively estimated at $14,167/yr.

Damage Analysis Parameters - Damage Frequency Assessment
Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy

Year of Analysis Conducted:	2020
Year Property was Built:	1978
Analysis Duration:	43 Use Default:Yes

Professional Expected Damages Before Mitigation
Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy

	OTHER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Damages ($)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
8	2,525,000	0	0	0	0	0	3,550,000
1	95,758	0	0	0	0	0	95,758

155

Comments

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Damages Before Mitigation:

Expected Damages are considered to be the cost of damage repair to restore action areas to their original condition ($2,525,000). This budget has been submitted to FEMA via DR 4432 and 4452. An 8-yr. recurrence is deemed reasonable because, as noted in the attached Special Districts 2018 POBH NHMP (see attachment F-1, P13, Gen. SW Drainage, and P14, Embankments), degradation due to flood and storm damage is accelerating. Ongoing erosion and structural damage to Port, as seen from repairs required due to storm/flood damages in the last eight (8) years total, not including that caused by the 2011 tsunami, $4,645,000 ($120k+$280k+$650k+$3595k), is shown in the Application, Section 3.1.5, Table. Attached engineering reports for these disasters over the last eight years are, respectively, GeoDesign Engineering Report and accompanying Overall Map of Slides; POBH Dock Failure Preliminary Reports-1 and 2; 3-24-17 Sport Basin Boardwalk Memo and, the most recent submitted 4432 and 4452 application; (WO 45060 & WO 47755 attached for the convenience of the reader). Projects not being done at present, that are already in-progress or have already been completed are not included in this BCA, except to support the overall periodicity of severe storm/erosive damages. RE required annual stormwater treatment as a result of newly discovered Port NPDES (1200-Z) non-compliance: Bioretention areas, swales, channels, detention areas, sand filters, gravity separators, dry wells, trenches, stormwater ponds, pavers, porous concrete, rain harvesting, and stormwater wetlands were reviewed. Swales,retention areas, trenches, ponds, harvesting and stormwater wetlands are not feasible due to limited treatment areas and high flows. R-D-I 50 for the Brookings area w/ Tc (3-6 minutes) estimated at 4.0. High intensity storms in the area require a coefficient adjustment of 1.2. The total volume of stormwater produced by the 18 acres area produces 73.34 $ft.^3/s$, or about 32,917 GPM. Estimated stormwater treatment costs/yr., based on previous work reviewed by EMC, to treat to benchmark concentrations is about $2.91/GPM/season. Attached is the 5-14-20 Stormwater Review and Recommendations, and the POBH SWPCP for reference. (Note: Reviewer can see all attached documents, spreadsheets, drawings citations in the "Attachment Index" Table in the Application.)

Annualized Damages Before Mitigation

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy

Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
1	95,758	510,164
8	3,550,000	443,750
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	3,645,758	953,914

Professional Expected Damages After Mitigation

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy

	OTHER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Damages ($)	Category 1 ($)	Category 2 ($)	Category 3 ($)	Number of Volunteers	Number of Days	Damages ($)
5	1,282,500	0	0	0	0	0	1,282,500
1	23,500	0	0	0	0	0	23,500

156

Comments

•

Damages After Mitigation:

A recent bathymetric survey analyses was performed by the Port showing elevated shoaling rates, attributable to recent wildfires above the Chetco watershed. It is attached, entitled Memo RE Elevated 2017-2019 Shoaling Rates. The narrative examines recent shoaling rates as about six times that of average experienced at the Port. However, this phenomenon can not be predicted via available research. A 20% increase has been estimated from recent observations made by the engineer-of-record, which amounts to an additional 900 cy/yr., or 4500 cy/5 yrs. Therefore the average rate of 4500 cy sediment/yr. is used in this analysis. The dredging estimate of $57/cy, disposed to EPA-managed ocean unit, is conservatively used. This volume is funded via Port resources. Paving and embankment repair are included in the maintenance cost/yr section of this analysis. Stormwater treatment to obtain acceptable levels will be greatly diminished by separating stormwater from Port soils, but not entirely diminished. Final polishing will likely be required at Gear Storage # 1 and Boat Yard. Filtering is estimated to cost about $12,750 per outfall/year for the two outfalls.

Annualized Damages After Mitigation

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy

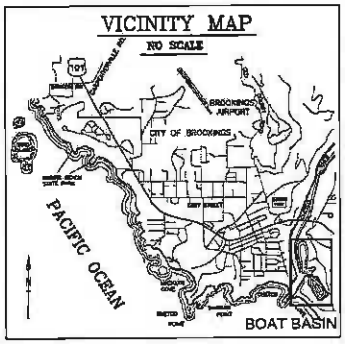
Annualized Recurrence Interval (years)	Damages and Losses ($)	Annualized Damages and Losses ($)
1	23,500	138,884
5	1,282,500	256,500
	Sum Damages and Losses ($)	Sum Annualized Damages and Losses ($)
	1,306,000	395,384

Benefits-Costs Summary

Other @ 16330 Lower Harbor Rd, Brookings, Oregon, 97415_copy_copy_copy_copy_copy

Total Standard Mitigation Benefits:	$7,446,159
Total Additional Benefits - Social:	$0
Total Additional Benefits - Ecosystem Services:	$0
Total Mitigation Project Benefits:	$7,446,159
Total Mitigation Project Cost:	$4,302,140
Benefit Cost Ratio - Standard:	1.73
Benefit Cost Ratio - Standard + Additional:	1.73

157

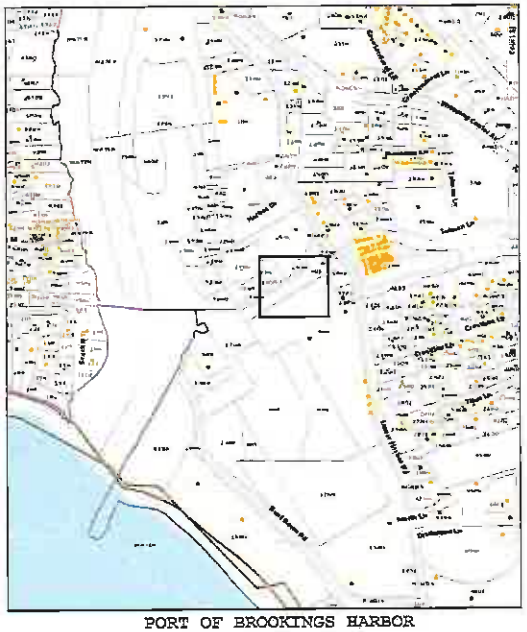


PORT OF BROOKINGS HARBOR

PORT OF BROOKINGS-HARBOR
2021 CIVIL IMPROVEMENTS

SEDIMENT STOCKPILE LOCATION #2

PROJECT OVERVIEW
SCALE 1":100'



PORT OF BROOKINGS HARBOR
MAP OF TAX LOTS

NATURAL FEATURES
EXISTING NATURAL RESOURCES OR NATURAL HAZARDS ON THE SUBJECT PROPERTY, INCLUDING WETLANDS, STREAMS, RIPARIAN AREAS, FLOOD PLAINS, OR FLOODWAYS TO BE DETERMINED BY ENGINEER

EXISTING TREE CANOPY
THERE ARE NO EXISTING TREES ON THE SUBJECT PROPERTY

CULTURAL RESOURCES
LOCALLY, OR FEDERALLY DESIGNATED HISTORIC AND/OR CULTURAL RESOURCES ON THE SITE OR ON ADJACENT PARCELS TO BE DETERMINED BY ENGINEER.

PUBLIC SERVICES
PUBLIC UTILITY SERVICES, INCLUDING WATER, SEWER, STORM DRAINAGE, POWER, TELEPHONE, CABLE INTERNET, AND GAS ARE AVAILABLE TO THE SUBJECT PROPERTY.

UTILITY STATEMENT
EXISTING UNDERGROUND UTILITIES ILLUSTRATED IN THESE PLANS ARE APPROXIMATED BASED ON MAPS OBTAINED FROM CURRY COUNTY GIS ELEVATIONS ESTIMATES, OR HAVE BEEN LOCATED BY A UTILITY LOCATE COMPANY. LAYOUT INDICATED IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. ALL LINES WITHIN PROJECTED WORK ZONE SHALL BE FIELD VERIFIED AS REQUIRED PRIOR TO CONSTRUCTION.

PROJECT DESCRIPTION

TITLE: SEDIMENT STOCKPILE
REFERENCE: PB114
LOCATION: HARBOR ST
TAX LOT(S): 2500

DRAWING REGISTER

PRELIM GRADING NOTES

1. DEQ 1200-C PERMIT IS REQUIRED.
2. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE AT AN APPROVED LOCATION.
3. PRIOR TO THE START OF CONSTRUCTION, VERIFY GRADES AT SAWCUT LOCATIONS AND MATCHING OF EXISTING GRADE LOCATIONS.
4. MINIMIZE TRAFFIC ON SOIL AREAS DURING WET WEATHER. IF THE SITE SOILS ARE EXPOSED DURING WET WEATHER, THE USE OF CRUSHED ROCK PLACED AS ENGINEERED FILL IN THE BOTTOM OF THE EXCAVATIONS MAY BE NECESSARY TO PROTECT THE SUBGRADE. TAKE ALL PRECAUTIONS TO LIMIT SURFACE DISTURBANCE AND PROTECT THE SITE GRADING AREA FROM EROSION AND RUNOFF.
5. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOBSITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY A CERTIFIED TESTER. RESULTS OF THE TESTS SHALL BE SENT DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR, BY THE LABORATORY. LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
6. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

LEGEND

- 5 ELEVATION
- SUBGRADE MINOR CONTOUR
- SUBGRADE MAJOR CONTOUR
- PARCEL
- GEOTEXTILE
- CONCRETE PAD
- GRASS
- JETTY
- SLIP WAY
- PAVED ROAD

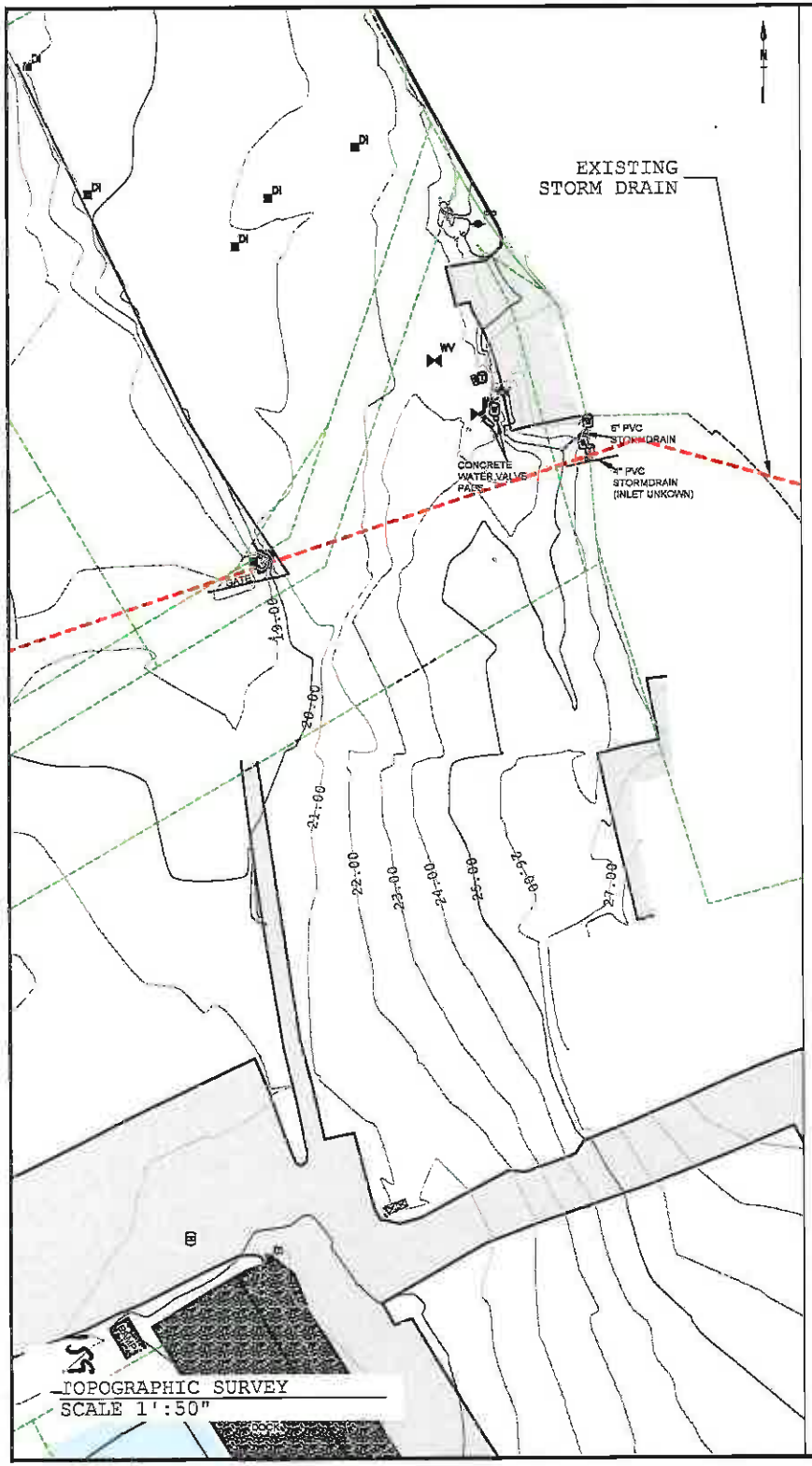
ENGINEER: EMC Engineering Consultants, LLC

NO	DATE	REVISION	BY

PREPARED FOR: PORT OF BROOKINGS HARBOR
(LOT 2500, MAP "36S32DB")
16330 Lower Harbor Rd, Brookings, OR 97415

Date 04/04/2021
Drawn By INFRADRAFT
Sheet No. C-100
File No. PB114

13B



GRADING NOTES

1. PRIOR TO THE CONSTRUCTION OF EMBANKMENTS, THE CONTRACTOR SHALL EXCAVATE UNSUITABLE FOUNDATION MATERIAL. BASEMENTS, TRENCHES AND HOLES ENCOUNTERED WITHIN EMBANKMENT LIMITS SHALL BE FILLED WITH APPROVED MATERIAL. PRIOR TO BACKFILLING THE CONTRACTOR SHALL BREAK CONCRETE FLOORS OF BASEMENTS AS DIRECTED. THE CONTRACTOR SHALL BREAK UP AND ROUGHEN THE GROUND SURFACE BEFORE EMBANKMENTS MATERIAL IS PLACED THE NATURAL GROUND UNDERLYING EMBANKMENTS SHELL BE COMPACTED TO THE DENSITY SPECIFIED FOR THE EMBANKMENT MATERIALS TO BE PLACED, AND TO THE DEPTH OF THE GRUBBING OR A MINIMUM OF 6 INCHES.
2. EMBANKMENT CONSTRUCTION SHALL INCLUDE PREPARATION OF THE AREAS UPON WHICH EMBANKMENTS ARE PLACED, THE PLACEMENT AND COMPACTION OF APPROVED EMBANKMENT MATERIALS AND FILLING OF HOLES, PITS AND OTHER DEPRESSIONS WITHIN THE SUBDIVISION.
3. THE CONTRACTOR SHALL PLACE EMBANKMENTS AND FILLS IN THE HORIZONTAL LAYERS OF 8 INCHES MAXIMUM DEPTH AND COMPACT EACH LAYER TO THE DENSITY SPECIFIED.
4. EMBANKMENT SHALL NOT BE CONSTRUCTED WHEN THE EMBANKMENT MATERIAL OR THE FOUNDATION ON WHICH THE EMBANKMENT WOULD BE PLACED IS FROZEN.
5. IMMEDIATELY PRIOR TO COMPLETION OF THE EARTHWORK, THE CONTRACTOR SHALL CLEAN THE ENTIRE WORK AREA OF DEBRIS AND FOREIGN MATTER.
6. THE MAXIMUM DENSITY OF COMPACTED MATERIAL WILL BE DETERMINED BY AASHTO T-99
7. THE CONTRACTOR SHALL COMPACT ALL EMBANKMENTS, FILLS AND BACKFILLS TO A MINIMUM IN PLACE DENSITY OF 95 PRESENT.
8. THE CONTRACTOR SHALL WATER THE MATERIALS TO PROVIDE OPTIMUM MOISTURE FOR COMPACTION OF EMBANKMENT AND BACKFILLS. EMBANKMENTS OD BACKFILL MATERIALS SHALL NOT BE PLACED IN FINAL POSITION UNTIL MOISTURE IN EXCESS OF OPTIMUM MOISTURE HAS BEEN REMOVED.
9. IF THE SPECIFIED COMPACTION IS NOT OBTAINED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER. THE CONTRACTOR MAY BE REQUIRED TO USE A MODIFIED COMPACTION PROCEDURE OR APPLY ADDITIONAL COMPACTIVE EFFORT. IF APPROVED MATERIALS MEETING THE SPECIFICATIONS CANNOT BE COMPACTED TO THE REQUIRED DENSITY REGARDLESS OF COMPACTIVE EFFORT OR METHOD, THE ENGINEER MAY REDUCE THE REQUIRED DENSITY OR DIRECT THE ALTERNATE MATERIALS BE USED. IN NO CASE SHALL EARTHWORK OPERATIONS PROCEED UNTIL THE CONTRACTOR IS ABLE TO COMPACT THE MATERIAL TO THE SATISFACTION OF THE ENGINEER.
10. DEQ 1200-C PERMIT IS NOT REQUIRED.
11. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE AT AN APPROVED LOCATION.
12. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOBSITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY A CERTIFIED TESTER. RESULTS OF THE TESTS SHALL BE SENT DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR, BY THE LABORATORY. LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
13. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

GEOTECHNICAL NOTE

THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE PROJECT ENGINEER FOR REQUIRED REMEDIATION. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER FOR REQUIRED SITE OBSERVATIONS AND TESTING OF ALL FILLS.

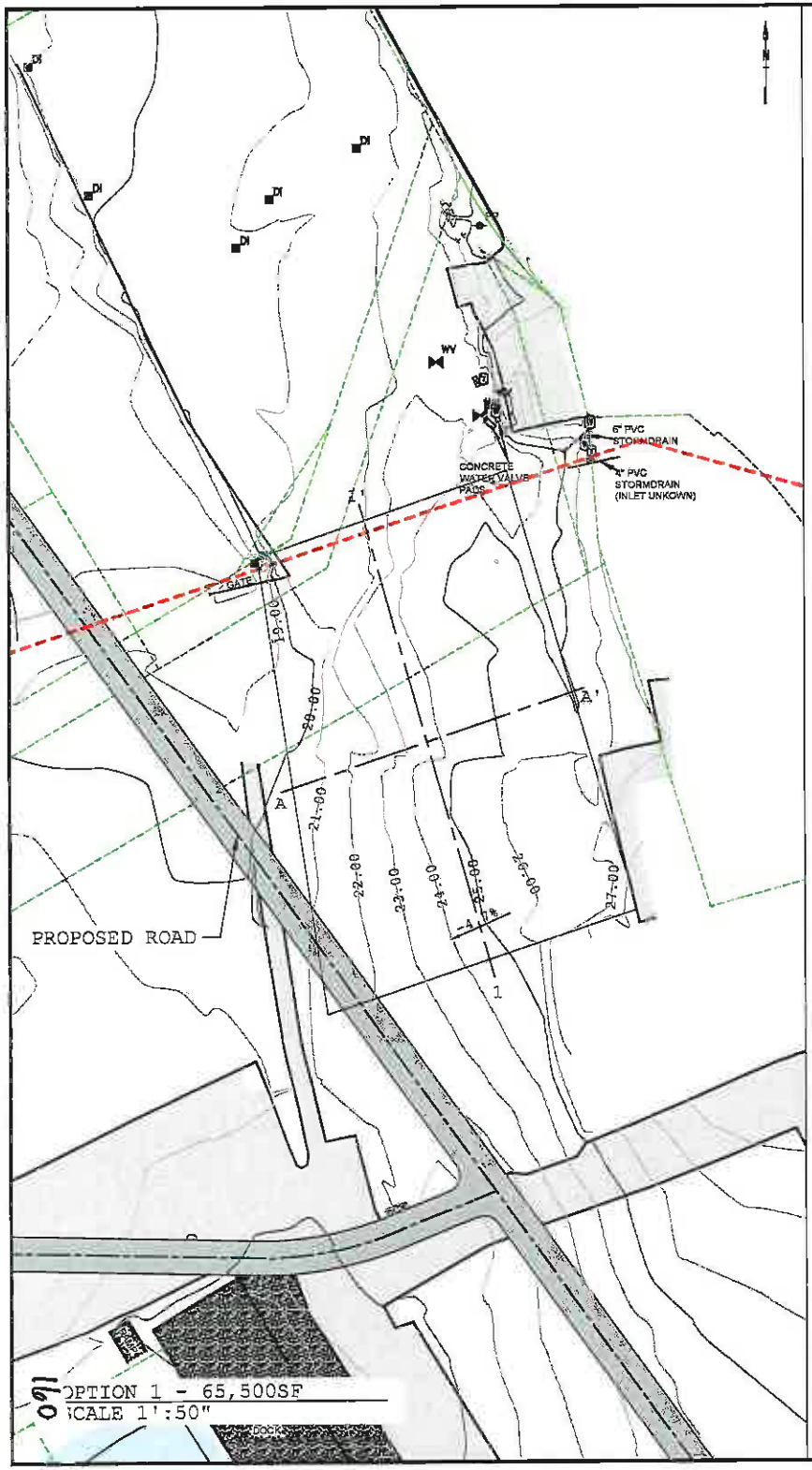
ENGINEER: EMC

NO	DATE	REVISION	BY

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2900, MAP '3S0S220B')
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

Date: 04/04/2021
Drawn By: INFRADRAFT
Sheet No.: C-101
File No.: PB114



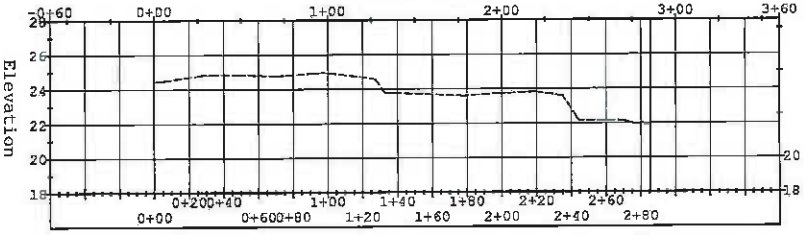
NEW SEDIMENT STORAGE AREA

AREA: 45,185SF

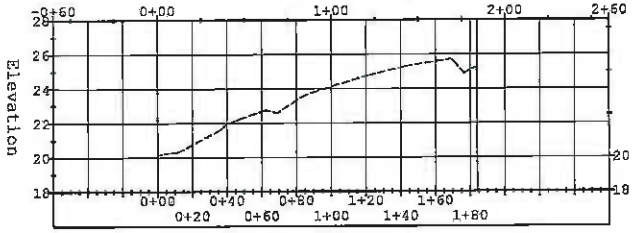
APPROX. STORAGE CAPACITY
7,350 cu.yards

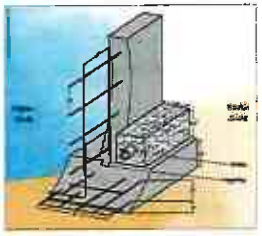
PROFILES NTS

11' PROFILE

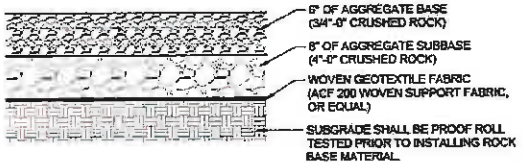


AA' PROFILE

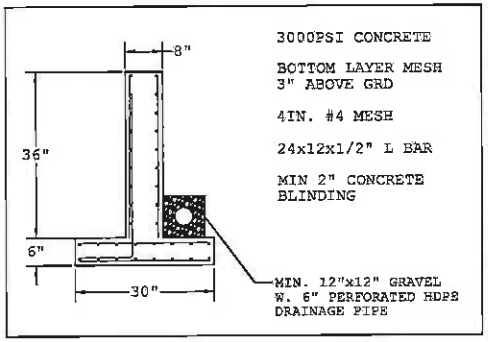




RETAINING WALL
DETAIL NTS



SUB-GRADE
PREPARATION DETAIL



REINFORCED CONCRETE
RETAINING WALL DETAIL

ENGINEER:
EMC | Engineering Sciences, LLC

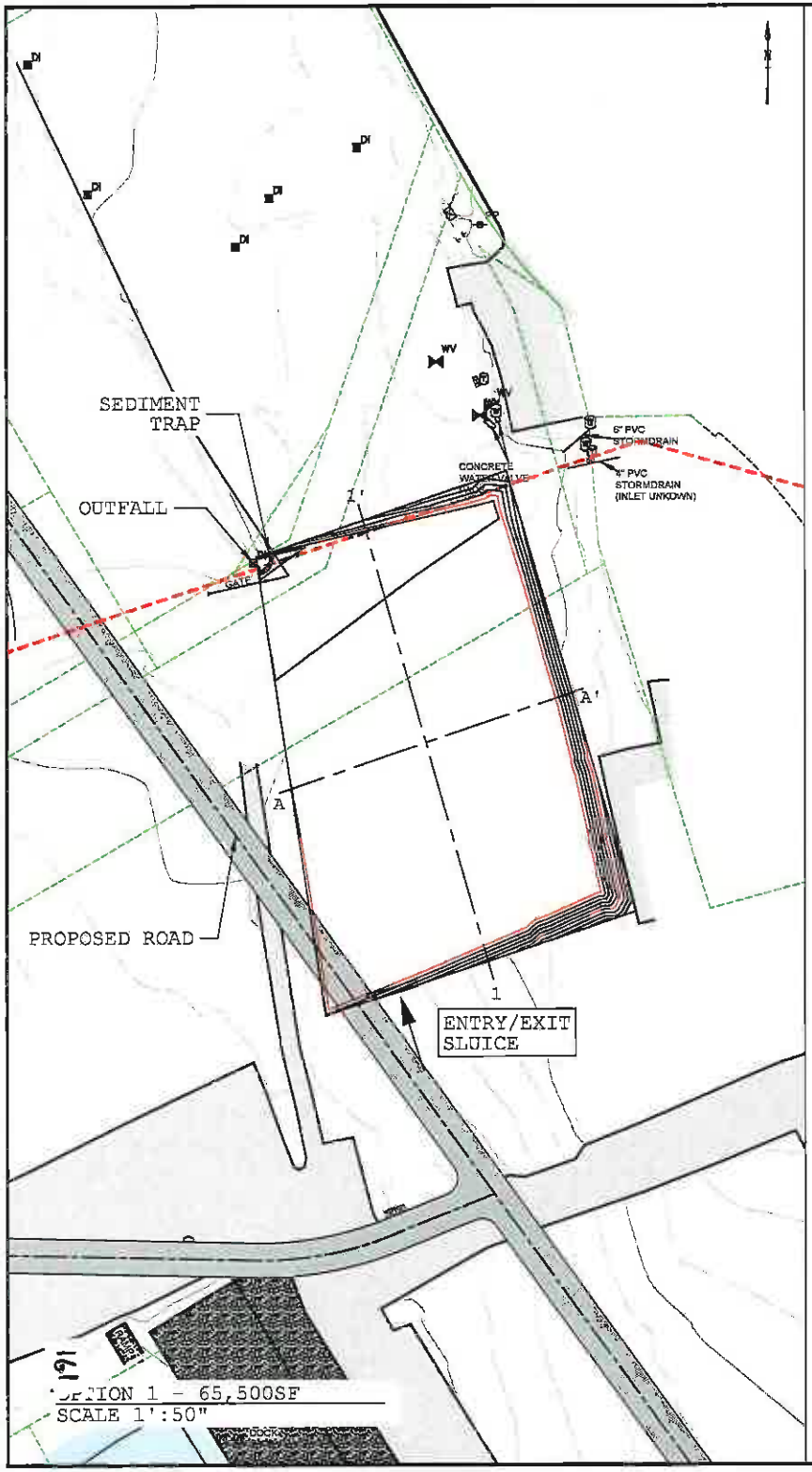
NO	DATE	REVISION

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2800, MAP '39S12W08')
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

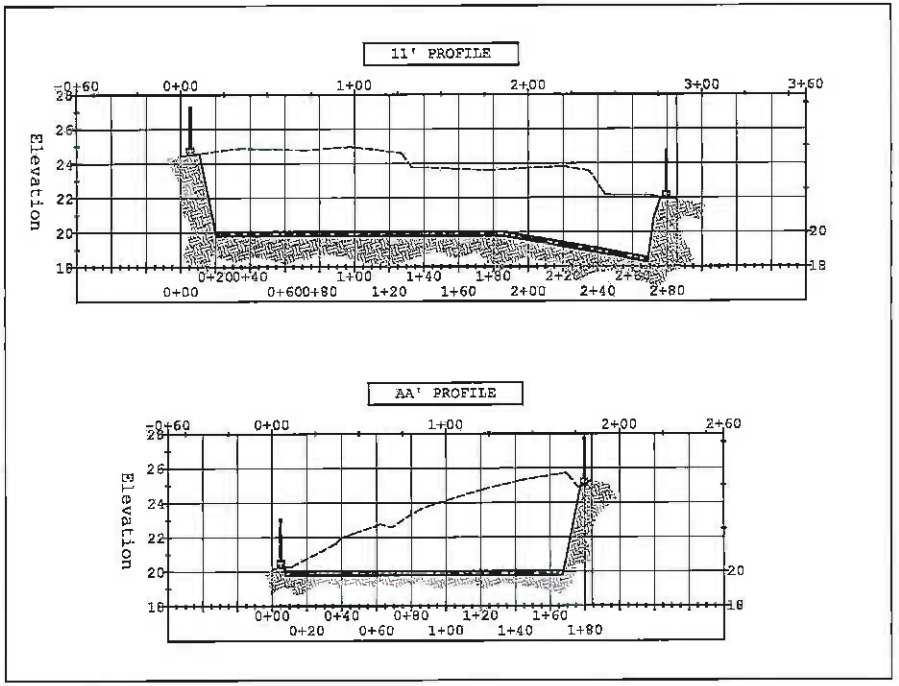
Date 04/04/2021
Drawn By INFRADRAFT
Sheet No. C-102
File No. PB114

NEW SEDIMENT STORAGE AREA



LEGEND

- 6" AGGREGATE BASE 3/4"-0" CRUSHED ROCK
- ~~8" AGGREGATE SUBBASE 4" 0" CRUSHED ROCK~~
- WOVEN GEOTEXTILE FABRIC ACF200
- PROOF ROLLED SUBGRADE
- ~~ENGINEERED FILL~~



SEDIMENT STORAGE GRADING
NTS

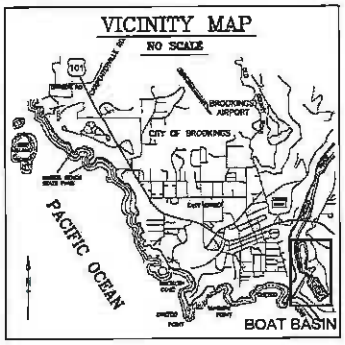
ENGINEER:
EMC
Engineering Management Consultants, LLC

NO.	DATE	REVISION	BY

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2900, MAP "3S13220BD")
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

Date	04/04/2021
Drawn By	INFRADRAFT
Sheet No.	C103
File No.	PB114

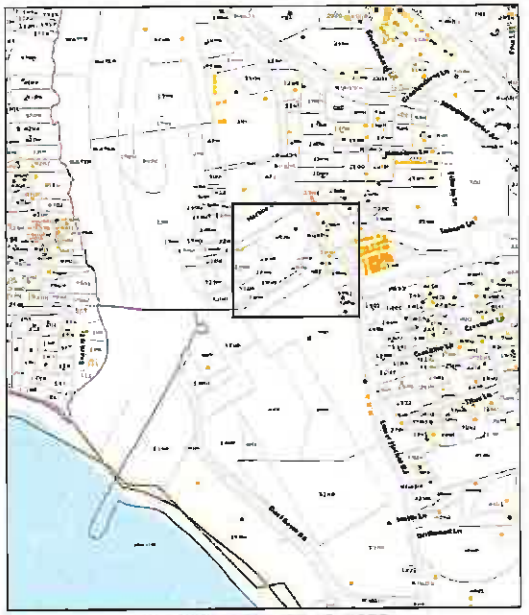


PORT OF BROOKINGS HARBOR

PORT OF BROOKINGS-HARBOR
2021 CIVIL IMPROVEMENTS

PROPOSED ROAD

PROJECT OVERVIEW
SCALE 1":200'



PORT OF BROOKINGS HARBOR
MAP OF TAX LOTS

NATURAL FEATURES
EXISTING NATURAL RESOURCES OR NATURAL HAZARDS ON THE SUBJECT PROPERTY, INCLUDING WETLANDS, STREAMS, RIPARIAN AREAS, FLOOD PLAINS, OR FLOODWAYS TO BE DETERMINED BY ENGINEER

EXISTING TREE CANOPY
THERE ARE NO EXISTING TREES ON THE SUBJECT PROPERTY

CULTURAL RESOURCES
LOCALLY, OR FEDERALLY DESIGNATED HISTORIC AND/OR CULTURAL RESOURCES ON THE SITE OR ON ADJACENT PARCELS TO BE DETERMINED BY ENGINEER.

PUBLIC SERVICES
PUBLIC UTILITY SERVICES, INCLUDING WATER, SEWER, STORM DRAINAGE, POWER, TELEPHONE, CABLE INTERNET, AND GAS ARE AVAILABLE TO THE SUBJECT PROPERTY.

UTILITY STATEMENT
EXISTING UNDERGROUND UTILITIES ILLUSTRATED IN THESE PLANS ARE APPROXIMATED BASED ON MAPS OBTAINED FROM CURRY COUNTY GIS ELEVATIONS ESTIMATES, OR HAVE BEEN LOCATED BY A UTILITY LOCATE COMPANY. LAYOUT INDICATED IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. ALL LINES WITHIN PROJECTED WORK ZONE SHALL BE FIELD VERIFIED AS REQUIRED PRIOR TO CONSTRUCTION.

PRELIM GRADING NOTES
1. DEQ 1200-C PERMIT IS REQUIRED.
2. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE AT AN APPROVED LOCATION.
3. PRIOR TO THE START OF CONSTRUCTION, VERIFY GRADES AT SAWCUT LOCATIONS AND MATCHING OF EXISTING GRADE LOCATIONS.
4. MINIMIZE TRAFFIC ON SOIL AREAS DURING WET WEATHER. IF THE SITE SOILS ARE EXPOSED DURING WET WEATHER, THE USE OF CRUSHED ROCK PLACED AS ENGINEERED FILL IN THE BOTTOM OF THE EXCAVATIONS MAY BE NECESSARY TO PROTECT THE SUBGRADE. TAKE ALL PRECAUTIONS TO LIMIT SURFACE DISTURBANCE AND PROTECT THE SITE GRADING AREA FROM EROSION AND RUNOFF.
5. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOBSITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY A CERTIFIED TESTER. RESULTS OF THE TESTS SHALL BE SENT DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR, BY THE LABORATORY. LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
6. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

PROJECT DESCRIPTION

TITLE: PROPOSED ROAD
REFERENCE: 140
LOCATION: HARBOR ST
TAX LOT(S): 2500,2600,2700,2800
2900,2999,402

DRAWING REGISTER

162

LEGEND

- 5 ELEVATION
- SUBGRADE MINOR CONTOUR
- SUBGRADE MAJOR CONTOUR
- PARCEL
- GEOTEXTILE
- CONCRETE PAD
- GRASS
- JETTY
- SLIP WAY
- PAVED ROAD

ENGINEER: EMC Engineering Consultants, LLC

NO.	DATE	REVISION	BY

PREPARED FOR: PORT OF BROOKINGS HARBOR
16330 Lower Harbor Rd, Brookings, OR 97415
(LOT 2900, MAP '39S12CB')

Date 04/04/2021
Drawn By INFRADRAFT
Sheet No. CV
File No. 140

GRADING NOTES

1. PRIOR TO THE CONSTRUCTION OF EMBANKMENTS, THE CONTRACTOR SHALL EXCAVATE UNSUITABLE FOUNDATION MATERIAL. BASEMENTS, TRENCHES AND HOLES ENCOUNTERED WITHIN EMBANKMENT LIMITS SHALL BE FILLED WITH APPROVED MATERIAL. PRIOR TO BACKFILLING THE CONTRACTOR SHALL BREAK CONCRETE FLOORS OF BASEMENTS AS DIRECTED. THE CONTRACTOR SHALL BREAK UP AND ROUGHEN THE GROUND SURFACE BEFORE EMBANKMENTS MATERIAL IS PLACED THE NATURAL GROUND UNDERLYING EMBANKMENTS SHELL BE COMPACTED TO THE DENSITY SPECIFIED FOR THE EMBANKMENT MATERIALS TO BE PLACED, AND TO THE DEPTH OF THE GRUBBING OR A MINIMUM OF 6 INCHES.
2. EMBANKMENT CONSTRUCTION SHALL INCLUDE PREPARATION OF THE AREAS UPON WHICH EMBANKMENTS ARE PLACED, THE PLACEMENT AND COMPACTION OF APPROVED EMBANKMENT MATERIALS AND FILLING OF HOLES, PITS AND OTHER DEPRESSIONS WITHIN THE SUBDIVISION.
3. THE CONTRACTOR SHALL PLACE EMBANKMENTS AND FILLS IN THE HORIZONTAL LAYERS OF 8 INCHES MAXIMUM DEPTH AND COMPACT EACH LAYER TO THE DENSITY SPECIFIED.
4. EMBANKMENT SHALL NOT BE CONSTRUCTED WHEN THE EMBANKMENT MATERIAL OR THE FOUNDATION ON WHICH THE EMBANKMENT WOULD BE PLACED IS FROZEN.
5. IMMEDIATELY PRIOR TO COMPLETION OF THE EARTHWORK, THE CONTRACTOR SHALL CLEAN THE ENTIRE WORK AREA OF DEBRIS AND FOREIGN MATTER.
6. THE MAXIMUM DENSITY OF COMPACTED MATERIAL WILL BE DETERMINED BY AASHTO T-99
7. THE CONTRACTOR SHALL COMPACT ALL EMBANKMENTS, FILLS AND BACKFILLS TO A MINIMUM IN PLACE DENSITY OF 95 PRESENT.
8. THE CONTRACTOR SHALL WATER THE MATERIALS TO PROVIDE OPTIMUM MOISTURE FOR COMPACTION OF EMBANKMENT AND BACKFILLS. EMBANKMENTS OD BACKFILL MATERIALS SHALL NOT BE PLACED IN FINAL POSITION UNTIL MOISTURE IN EXCESS OF OPTIMUM MOISTURE HAS BEEN REMOVED.
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13. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

GEOTECHNICAL NOTE

THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE PROJECT ENGINEER FOR REQUIRED REMEDIATION. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER FOR REQUIRED SITE OBSERVATIONS AND TESTING OF ALL FILLS.

163

GENERAL NOTES
NO SCALE

ENGINEER:
EMC
Engineering Consultants, LLC

No.	DATE	REVISION	BY

PREPARED FOR:
PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415

(LOT 2900, MAP '36S12W')

PORT OF BROOKINGS HARBOR

Date: 04/04/2021
Drawn By: INFRADRAFT
Sheet No.: C-100
File No.: 140

LEGEND

- 5.0 ELEVATION
- SUBGRADE MINOR CONTOUR
- SUBGRADE MAJOR CONTOUR
- PARCEL
- GEOTEXTILE
- CONCRETE PAD
- GRASS
- JETTY
- SLIP WAY
- PAVED ROAD

EXISTING STORM DRAIN

LOWER HARBOR ROAD

EXISTING PAVED ACCESS ROAD

20.00

16.00

18.00

28.00

26.00

24.00

22.00

20.00

22.00

BOAT BASIN

EXISTING CONDITIONS
SCALE 1':100"

ENGINEER:
EMC
Civil Engineers • Surveyors • Planners
Engineering Solutions, LLC

BY	REVISION	DATE

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2900, MAP "36S22DB")
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

Date	04/04/2021
Drawn By	INFRADRAFT
Sheet No.	C-101
File No.	140

LEGEND

- 5.0 ELEVATION
- SUBGRADE MINOR CONTOUR
- SUBGRADE MAJOR CONTOUR
- PARCEL
- GEOTEXTILE
- CONCRETE PAD
- GRASS
- JETTY
- SLIP WAY
- PAVED ROAD

EXCAVATE SUBGRADE TO ±1.5' BELOW TOP OF CONC AND TOP OF BANK ELEVATION

PROPOSED SEDIMENT STOCKPILE AREA (GRADED, UNPAVED)

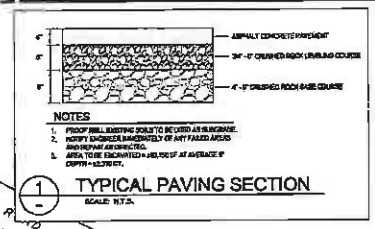
LOWER HARBOR ROAD

EXCAVATE SUBGRADE TO 1.5' BELOW EXISTING ROAD

EXISTING PAVED ACCESS ROAD

OPERATIONS AREA

EXCAVATE SUBGRADE TO ±1.5' BELOW TOP OF CONC AND TOP OF BANK ELEVATION



NOTES

1. PROOF ROLL EXISTING SOILS TO BE USED AS SUBGRADE.
2. NOTIFY ENGINEER IMMEDIATELY OF ANY FAILED AREAS AND REPAIR AS DIRECTED.
3. AREA TO BE EXCAVATED = 40,100 SF AT AVERAGE OF DEPTH = 2,278 CUT.

1 - TYPICAL PAVING SECTION

SCALE: N.T.S.

EARTHWORK REPORT

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
ISOPACH	full	1.000	1.000	37142.89	3239.65	0.00	3239.65<Cut>

GRADING PLAN
SCALE 1':100"

ENGINEER:
EMC
Engineering Consultants, LLC

No	DATE	REVISION	BY

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2900, MAP 39S32CDD')
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

Date	04/04/2021
Drawn By	INFRADRAFT
Sheet No.	C-102
File No.	140

Item	Unit	Quantity
Asphalt pavement	SF	37,215
Standard curb and gutter	FT	1,338

FINISHED ASPHALT SURFACE TO MATCH EXISTING CONCRETE ELEVATIONS

EXISTING CATCH BASIN

NO PAVING IN STOCKPILE AREA

2% CROSS-FALL TO SOUTH SIDE ROAD

AREA 20,165SF

AREA 17,050SF

NEW CATCH BASIN

NEW CURB & GUTTER

EXISTING CATCH BASIN

NEW CATCH BASIN

NEW CURB & GUTTER

NEW CATCH BASIN

NEW CATCH BASIN

FINISHED ASPHALT SURFACE TO MATCH EXISTING CONCRETE ELEVATIONS

NEW CATCH BASIN

PROPOSED PAVING
SCALE 1':100"

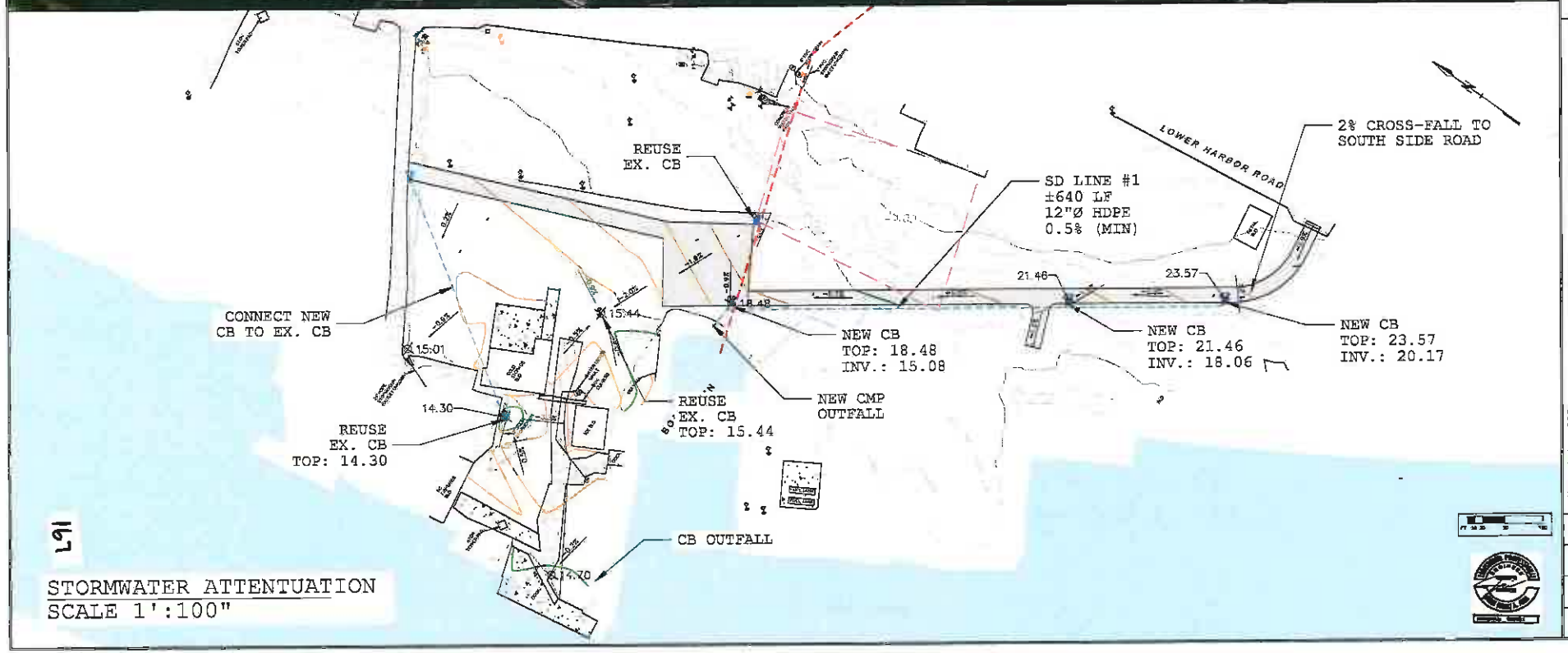
ENGINEER:
EMC
Engineering Consultants, LLC

NO.	DATE	REVISION	BY

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2900, MAP 39S12W8)
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

Date	04/04/2021
Drawn By	INFRADRAFT
Sheet No.	C-103
File No.	140



STORMWATER ATTENTUATION
SCALE 1':100"

ENGINEER:
EMC
Civil • Structural • Water Resources
Engineering, Surveying, Planning, Natural Resources
Engineering Consultants, LLC

NO.	REVISION	DATE

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2900, MAP '3505220B')
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

Date	04/04/2021
Drawn By	INFRADRAFT
Sheet No.	C-104
File No.	140

PORT OF BROOKINGS HARBOR

BOAT YARD PAVING

16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415

DRAWN BY:	JG
DATE:	11 MAY 2021
JOB No:	
SHEET No:	C1.0
	COVER SHEET

EMC
Engineers/Scientists, LLC
Grants Pass • Jacksonville • Medford, OR
CA Office: 1487 Minnesota Hwy., Suite 256, Grants Pass, OR 97527
Phone: (541) 474-3929 • FAX: 541-787-1944
Email: mail@emcnw.com • Website: www.emcnw.com

REV	DESCRIPTION	BY

VICINITY MAP

NO SCALE

GRADING NOTES

1. PRIOR TO THE CONSTRUCTION OF EMBANKMENTS, THE CONTRACTOR SHALL EXCAVATE UNSUITABLE FOUNDATION MATERIAL, INCLUDING PEAT, TOPSOIL AND LOOSE SATURATED WITHIN CONSTRUCTION LIMITS AS DIRECTED BY THE ENGINEER. AFTER THE FOUNDATION IS CLEAR OF UNSUITABLE MATERIAL, THE CONTRACTOR SHALL BREAK CONCRETE FLOORS OF BASEMENTS AS DIRECTED. THE CONTRACTOR SHALL BREAK UP AND SCRAPIN THE GROUND SURFACE BEFORE EMBANKMENT MATERIAL IS PLACED. THE GROUND SURFACE SHALL BE SCARIFIED TO A DEPTH OF 6 INCHES, MOISTURE CONDITIONED TO WITHIN 2% OF OPTIMUM MOISTURE CONTENT AND COMPACTED TO THE EMBANKMENT MATERIALS TO BE PLACED, AND TO THE DEPTH OF THE GROUNDING OR A MINIMUM OF 6 INCHES.
2. EMBANKMENT CONSTRUCTION SHALL CONSIST OF THE PLACEMENT OF THE APPROVED UPON WHICH EMBANKMENT CONSTRUCTION OR APPLACEMENT AND COMPACTION OF APPROVED EMBANKMENT MATERIALS AND FILLING OF HOLES, PITS AND OTHER DEPRESSIONS WITHIN THE SUBDIVISION.
3. THE CONTRACTOR SHALL PLACE EMBANKMENTS AND FILLS IN THE HORIZONTAL LAYERS OF 6 INCHES OR LESS IN LOOSE DEPTH BEFORE COMPACTION. EACH LAYER OF THE EMBANKMENT SHALL NOT BE CONSTRUCTED WHEN THE EMBANKMENT MATERIAL OR THE FOUNDATION ON WHICH THE EMBANKMENT WOULD BE PLACED IS FROZEN.
4. THE CONTRACTOR SHALL REMOVE ALL TREES, BRUSH, PLANTS, ROCKS AND OTHER DEBRIS SHALL CLEAN THE ENTIRE WORK AREA OF DEBRIS AND FOREIGN MATTER.
5. THE MAXIMUM DENSITY OF COMPACTED MATERIAL WILL BE DETERMINED BY AASHTO T-99, THE CONTRACTOR SHALL ACHIEVE A MINIMUM IN PLACE DENSITY OF 95 PERCENT.
6. THE CONTRACTOR SHALL WATER TITE MATERIALS TO PROVIDE OPTIMUM MOISTURE FOR COMPACTION. THE MOISTURE CONTENT SHALL BE UNIFORM THROUGHOUT EACH LAYER. A FILL SHALL NOT BE PLACED IN FINAL POSITION UNTIL MOISTURE IN EXCESS OF OPTIMUM MOISTURE HAS BEEN REMOVED.
7. IF THE REQUIRED COMPACTION IS NOT OBTAINED, THE CONTRACTOR SHALL MODIFY THE ENGINEER. THE CONTRACTOR MAY BE REQUIRED TO USE A MODIFIED COMPACTION PROCEDURE OR APPLY ADDITIONAL COMPACTIVE EFFORT, IF APPROVED MATERIALS MEETING THE SPECIFICATIONS REQUIREMENTS ARE NOT AVAILABLE ON THE JOB SITE, THE CONTRACTOR SHALL IMPORT SUCH MATERIALS AS DIRECTED BY THE ENGINEER.
8. PROCEED UNTIL THE CONTRACTOR IS ABLE TO COMPACT THE MATERIAL TO THE SPECIFICATION REQUIRED UNTIL THE CONTRACTOR IS ABLE TO COMPACT THE MATERIAL TO THE SPECIFICATION REQUIRED.
9. USE 100C PERMIT IS REQUIRED.
10. UNLESS DIRECTED OTHERWISE, REMOVE ALL DEBRIS AT AN APPROVED LOCATION. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOB SITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR BY THE LABORATORY, LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
11. ALL DRY WELLS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.

GEOTECHNICAL NOTE

THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE PROJECT ENGINEER FOR THE PURPOSE OF OBSERVATION AND TESTING IN ACCORDANCE WITH THE PROJECT ENGINEER FOR REQUIRED SITE OBSERVATIONS AND TESTING OF ALL FILLS.

SHEET INDEX

SURVEY BY
ROBERTS & ASSOCIATES LAND SURVEYING, INC.
611 SPRUCE STREET
BROOKINGS, OR 97415
(541) 469-2182

HORIZONTAL DATUM
OREGON COORDINATE REFERENCE SYSTEM (OREGON COAST ZONE) AS DEFINED IN OREGON ADMINISTRATIVE RULES 734-005-0006 THRU 734-005-0015. COORDINATES WERE CONSTRAINED TO THE OREGON REAL-TIME (VRS) REFERENCE NETWORK (CORS) REFERENCED TO NAD 83(2011) EPOCH 2010, INTERNATIONAL FEET, WITH A RELATIVE ACCURACY OF <2cm.

VERTICAL DATUM
MEAN LOWER LOW WATER EPOCH 1983-2001.
BENCH MARK UTILIZED FOR THIS SURVEY
US ARMY CORPS OF ENGINEERS
BENCH MARK - "TUEL 2"
ELEVATION - 21.58 FEET

0 15 30 60
SCALE: 1" = 30'

EXISTING CONDITIONS
SCALE: 1" = 30' (24x36)

NORTH

EMC | Engineers/Scientists, LLC
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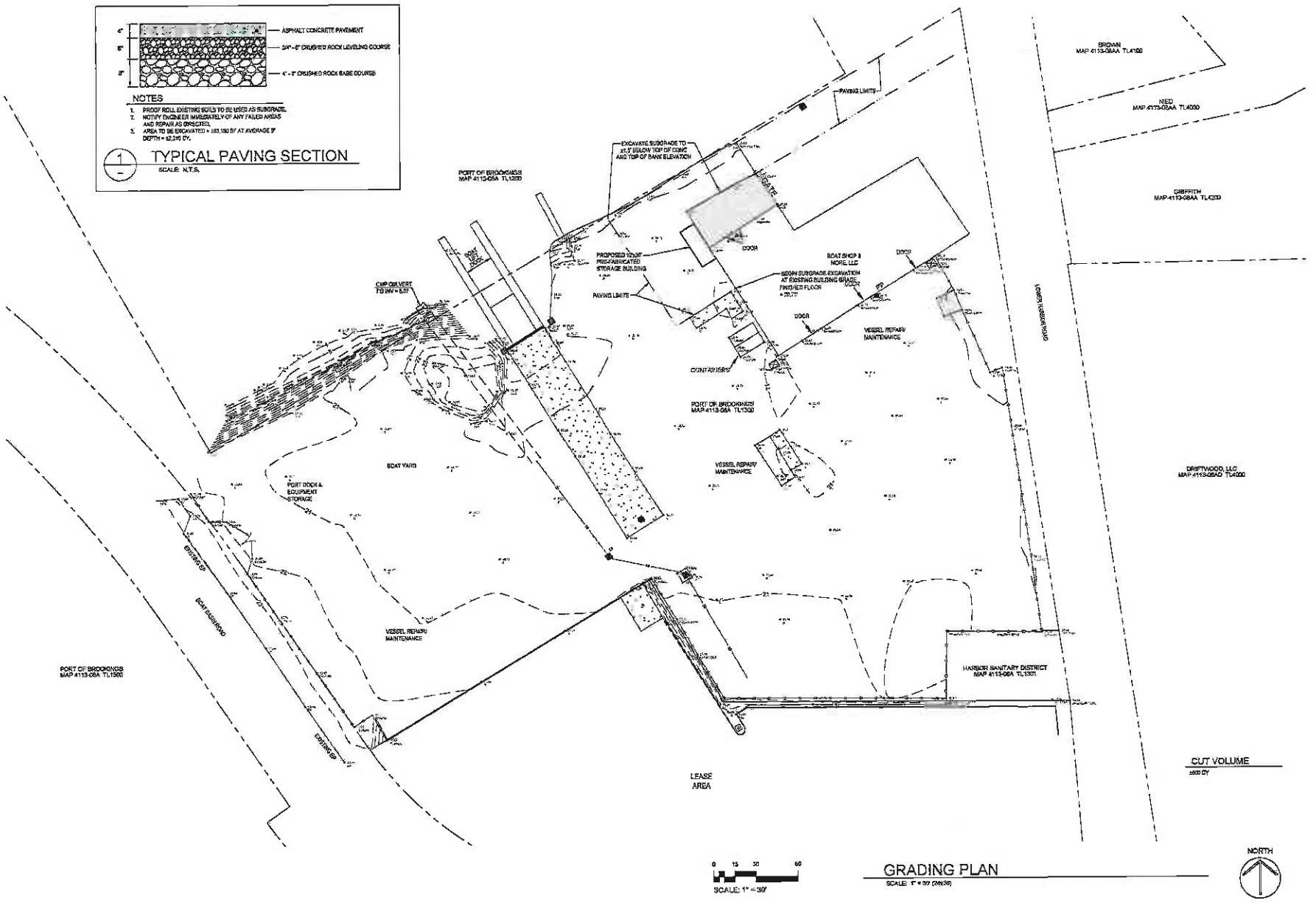
OREGON PROFESSIONAL ENGINEER — RENEWAL DATE: 12/31/22

PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY:	JG
DATE:	11 MAY 2021
JOB No:	#
SHEET No:	C2.0
	EXISTING CONDITIONS



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PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY:	JG
DATE:	11 MAY 2021
JOB No:	#
SHEET No:	C2.1
	GRADING PLAN

C2.1

PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY: JS
DATE: 11 MAY 2023
JOB No:
SHEET No: C2.2
FINISHED PAVING PLAN

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REVISIONS | BY

NORTH

FINISHED PAVING PLAN
SCALE: 1" = 30'

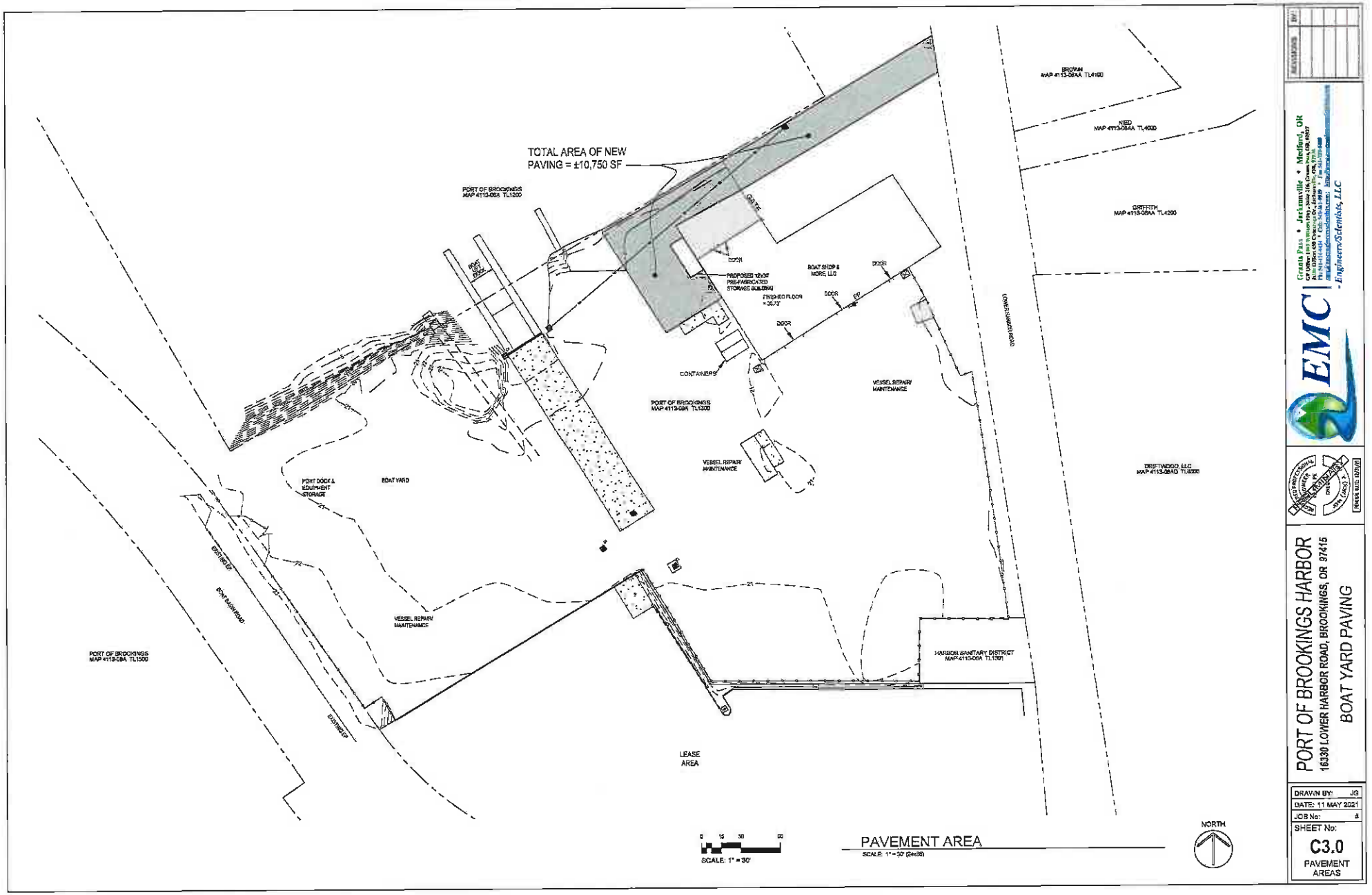
SCALE: 1" = 30'

LOWER HARBOR ROAD

LEASE AREA

BOAT YARD

BOAT BASIN ROAD



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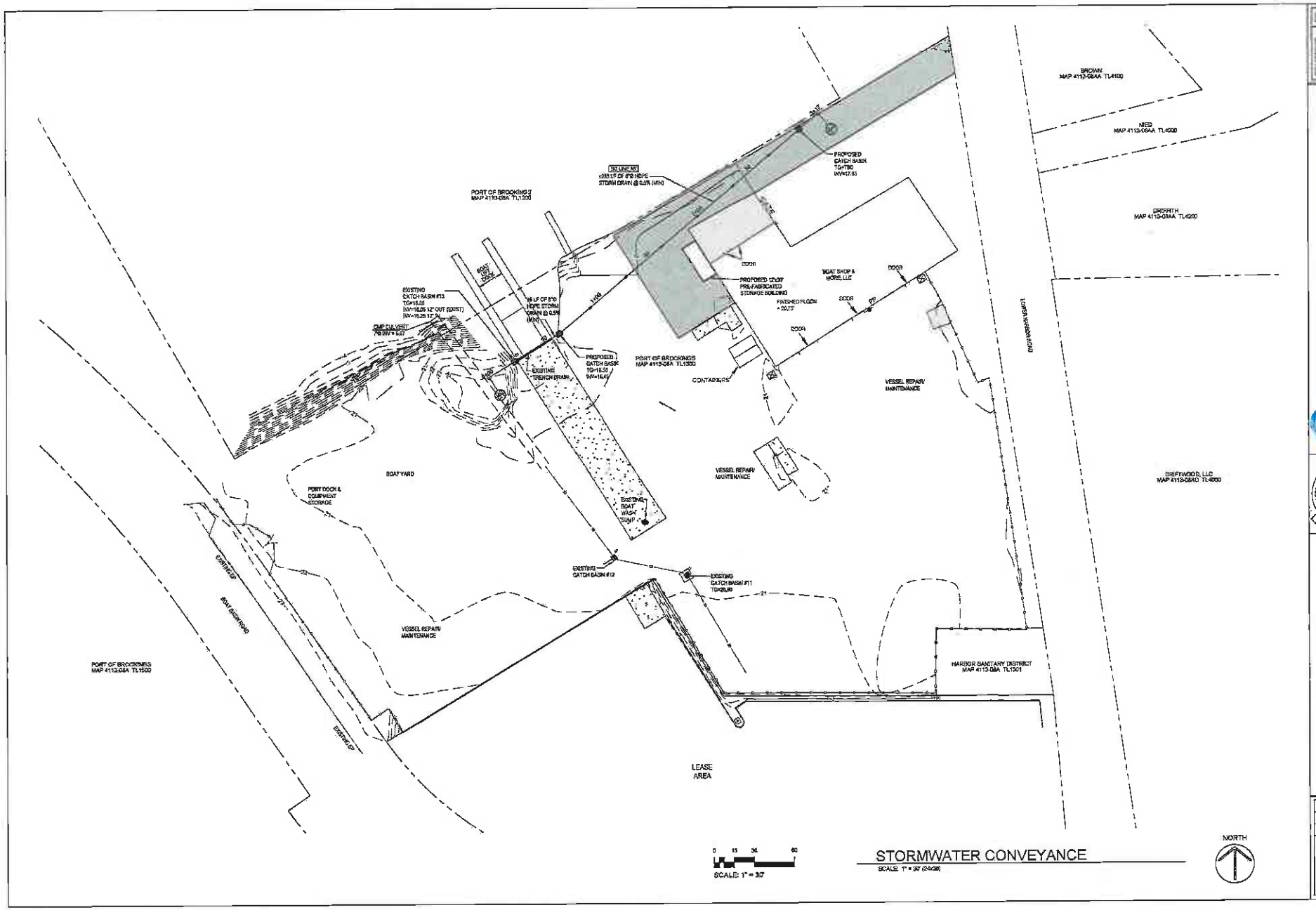
PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY:	JG
DATE:	11 MAY 2021
JOB No:	#
SHEET No:	C3.0 PAVEMENT AREAS



STORMWATER CONVEYANCE

SCALE: 1" = 30' (24x36)

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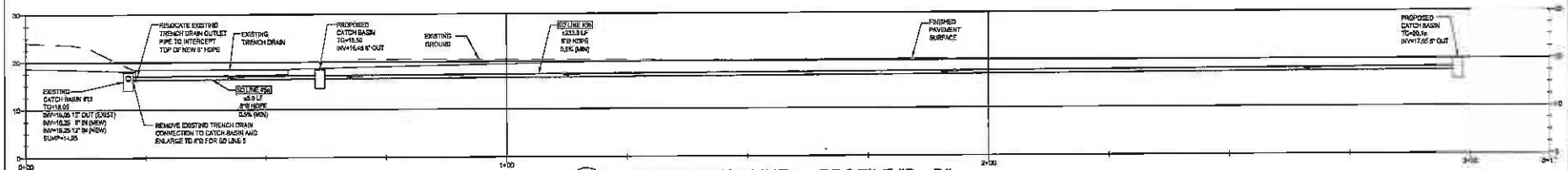
PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY:	JG
DATE:	11 MAY 2021
JOB No:	#
SHEET No:	C4.0
	STORMWATER CONVEYANCE



D-D STORMDRAIN LINE 5 - PROFILE "D - D"

SCALE: 1" = 10' (H & V)

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PORT OF BROOKINGS HARBOR

16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415

BOAT YARD PAVING

DRAWN BY: JG

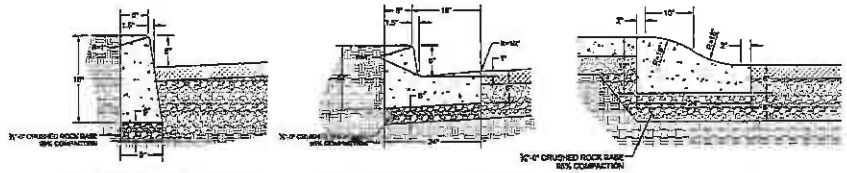
DATE: 11 MAY 2021

JOB No: #

SHEET No: C4.1

STORMDRAIN PROFILES

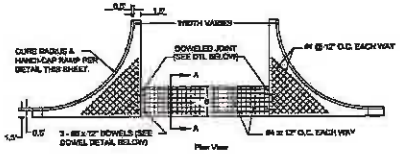
174

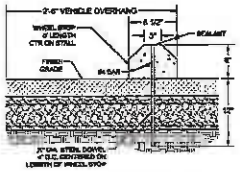


301 VERTICAL CURB
SCALE: NTS

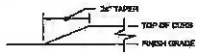
302 CURB & GUTTER
SCALE: NTS

303 ROLLED CURB
SCALE: NTS

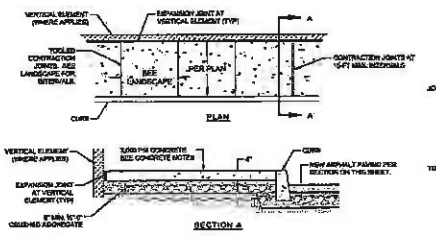




391 WHEEL STOP
SCALE: NTS

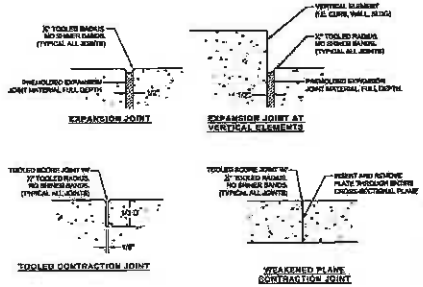


305 CURB TAPER
SCALE: NTS

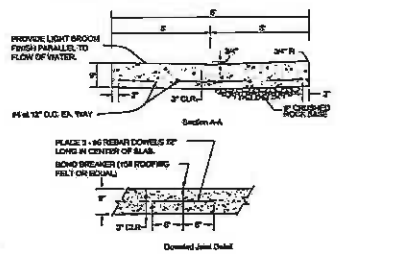


NOTES
1. COMPACT SUBGRADE AND AGGREGATE TO 95% OF MAXIMUM DRY DENSITY.
2. FINISH SHALL BE MEDIUM BROOM PERPENDICULAR TO PEDESTRIAN TRAFFIC UNLESS OTHERWISE DIRECTED.
3. CROSS SLOPE OF SIDEWALK SHALL BE 2% AWAY FROM THE BUILDING.
4. SEE CONCRETE CONTROL JOINT DETAIL ON THIS SHEET.

311 CURB LINE CONCRETE SIDEWALK
SCALE: NTS

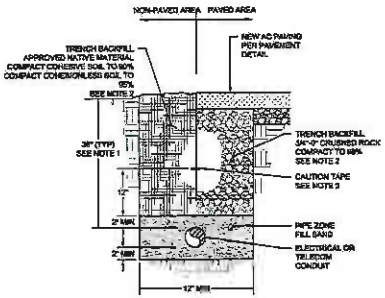


309 CONCRETE CONTROL JOINTS
SCALE: NTS



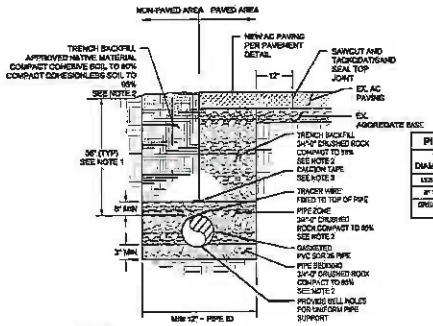
NOTES
1. CONCRETE TO BE COMMERCIAL GRADE CONCRETE (CCC) PER 2002 EDCTC/OREGON APWA SECTION 00440.00
2. SUBGRADE AND BASE SHALL BE UNYIELDING AND FIRMLY COMPACTED.
3. VALLEY GUTTER SHALL PASS A WATER TEST TO ASSURE FLOW.

327 DRIVEWAY APRON WITH VALLEY GUTTER
SCALE: NTS



NOTES
1. COVER OVER PIPE MAY VARY FROM 24" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 3557 MAXIMUM DRY DENSITY.
3. ELECTRIC 6" WIDE RED POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED ELECTRIC BELOW" TELECOM: 3" WIDE ORANGE POLYETHYLENE TAPE IMPRINTED "CAUTION: COMMUNICATIONS LINE BURIED BELOW"

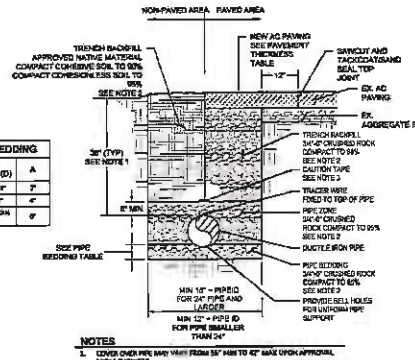
553 CONDUIT TRENCH DETAIL
SCALE: NTS



PIPE BEDDING	
PIPE DIAMETER (D)	A
UNDER THAN 8"	3"
8" THRU 12"	4"
GREATER THAN 12"	6"

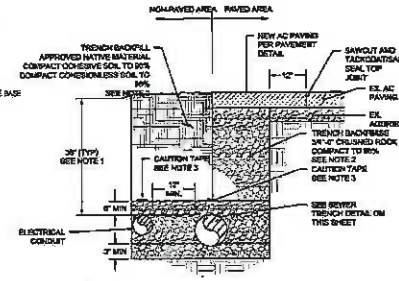
NOTES
1. COVER OVER PIPE MAY VARY FROM 24" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 3557 MAXIMUM DRY DENSITY.
3. SEWER: 3" WIDE GREEN POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED SEWER LINE BELOW"

581 SEWER TRENCH DETAIL
SCALE: NTS



NOTES
1. COVER OVER PIPE MAY VARY FROM 36" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 3557 MAXIMUM DRY DENSITY.
3. 3" WIDE BLUE POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED WATER LINE BELOW"

566 WATER TRENCH DETAIL
SCALE: NTS



NOTES
1. COVER OVER PIPE MAY VARY FROM 36" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 3557 MAXIMUM DRY DENSITY.
3. ELECTRIC 6" WIDE RED POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED ELECTRIC BELOW"
SEWER: 3" WIDE GREEN POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED SEWER LINE BELOW"

584 JOINT TRENCH DETAIL
SCALE: NTS

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16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY: JG
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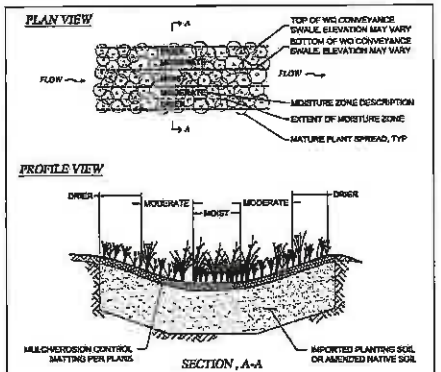
SHEET No:
C6.0
PROJECT DETAILS

171



LEGEND:
---- INDICATES GRADE BREAK
---- MOISTURE ZONE
PLANT SPECIES APPROPRIATE FOR MOISTURE ZONE:
- DRIER
- MODERATE
- MOIST

NOTES:
1. THIS DETAIL IS PROVIDED AS A SCHEMATIC EXAMPLE OF THE RANDOM PLANT PLACEMENT AND 90% COVERAGE AFTER ESTABLISHMENT PERIOD DESIRED TO REDUCE EROSION AND WEEDS.
2. INSTALL PLANTS PER PLANS, ACCORDING TO LANDSCAPE DESIGN PLANT TABLE, WHICH SHOULD INCLUDE PLANT SPECIES, SPACING, AND QUANTITIES IN EACH MOISTURE ZONE.
3. MOISTURE ZONES VARY FROM THOSE SHOWN DEPENDING ON GRADING PLAN, LOCATION OF INLET(S) AND OUTLET(S) AND FACILITY SHAPE.

Rogue Valley Stormwater Design Manual	Water Quality Conveyance Swale Planting Schematic	BMP 8.03 1 of 1 Scale: NTS

General Notes for Vegetated BMPs

1. Excluding construction of the facility itself, control/treatment area is to not be used for parking, storage, loading, unloading, and management activities.
2. Build and vegetate swales as early as possible to establish plantings before directing stormwater runoff to it or divert stormwater around facility. Preferably, vegetation will be given a minimum of 3 months to become established, or per maximum specifications/requirements.
3. Call the construction supervisor 48 hours in advance of commencing this facility so construction observation may be performed to identify variations in the field that may affect design and verify proper installation.
4. Over-saturated soils that result in ruts or compaction of amended or imported soils up to frost depth.
5. Placement of any wood mulch or topdressing will take place as follows:
   a. Prior to or in both treatment and dry swales.
   b. Do not place if soil is saturated.
   c. Lightly compact new fill, by e. a roller filled halfway with ice across entire construction. Do not compact with heavy machinery or vibratory compaction.
6. Install energy dissipation below all outfalls per approved plans.
7. If neighborhood soil has been assessed to need fill, amend the soil mix to a depth of 4 inches to restore filtration capacity.
8. Install ODOT Type II erosion control matting, if specified in submitted plans.
9. Landscaping plan must adhere to one of the measures in Section 1 and 2 of section 4.5.2. Please see the sampling plan and standard detail 4.5.2.C. Contact approving jurisdiction 48 hours in advance of planting to find jurisdiction can assess plant purchased prior to plant installation.
10. Install mulch, if specified in approved plans. Use shredded wood chips or coarse compost. Mulch must be dry, pesticide and weed free. Spread to a minimum two inch layer over bare soil or in a way around plants to increase water retention. Ensure that mulch does not touch plant stems.
11. Side slopes outside of flow area must be permanently stabilized with mulch and vegetation.

AMENDED PLANTING SOIL MIX SPECIFICATIONS

1. Planting soil may be either amended native or ODOT/APWA soil mix with the following characteristics:
   A. Infiltration between 0.5 and 10 inches/hour.
   B. Be free of weed seeds, overgrowth, and Prohibited materials.
   C. Organic content matter from 5-10% by weight
   D. Cation exchange capacity (CEC) greater than or equal to 5 milliequivalents/100 grams of dry soil
   E. 2-3% clayey fines content
   F. pH between 6.5 and 8.0
   G. Conform to the following gradation for the mix:

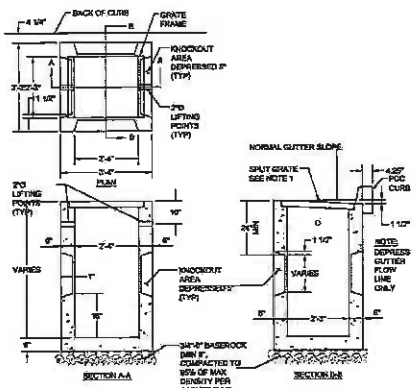
US Standard Sieve Size	Percent Passing
1/2"	100
#4	90-100
#10	75-90
#40	25-60
#100	7-30
#200	2-5

2. Imported soil shall be roughly 1/3 plant-derived compost, 1/3 topsoil and 1/3 gravelly sand.
3. Amended native planting soil mix shall be created by blending compost into the native soil at a rate of 1 part compost to two parts soil. Soil mix report will meet the specifications in Note 1 above.
4. Amended native or imported soil mix must be uniformly mixed.

Chemical Inert Products

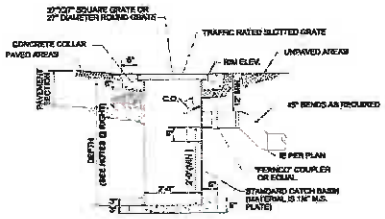
Must be stored from rain, protected and fully contained, lined in certified wood until free. A Hazmat Data Sheet has to be on file Consulting Control Sheet of Training Personnel must be provided to the approving jurisdiction. The Data Sheet must show that the compost meets the following criteria:

- Organic matter content between 40 and 60 percent.
- pH between 5.5 and 8.5, 5-the pH for blue spruce, 5 may be favored by adding iron sulfate and sulfur or raised by adding lime. If lime is used, investigate first how the material will affect the compost blend, and then the soil, as it may affect the soil.
- Soluble salt content shall be less than 6 dmhos/cm.
- 100% plastic free is 100-inch screen.
- Stability Test Result shall be Stable or Very Stable.
- Maturity by indicator for emergence and vigor shall be 80-90%.
- Trace Metals Test Result shall Be Pass.
- Carbon nitrogen ratio between 20:1 and 30:1.



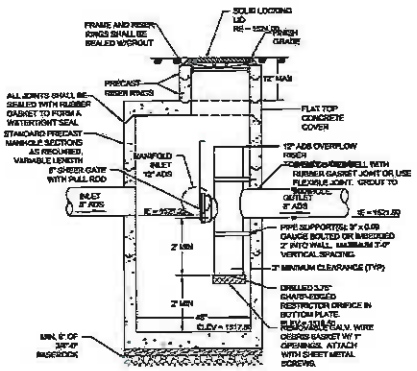
NOTES
1. GRATE AND FRAME MAY EACH BE OF CAST IRON OR WELDED STEEL CONSTRUCTION. GRATE AND FRAME TO BE ODOT G-2 TYPE 2 (BICYCLE SAFE).
2. FOR PRECAST BOX, CURB MUST BE HAND FORMED 10' EACH SIDE OF CATCH BASIN.
3. CONCRETE STRENGTH SHALL BE 3500 PSI WITH FIBER MESH.
4. CATCH BASIN AND GRATE SHALL MEET H20 LOADING.
5. A MINIMUM SUMP DEPTH OF 18" IS REQUIRED.
6. OUTLET PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

2 CATCH BASIN
C6.1 SCALE: NTS



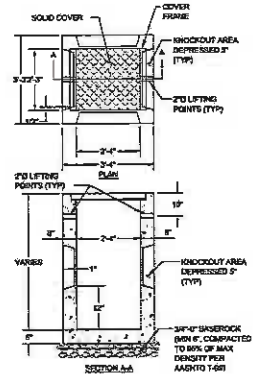
GENERAL NOTES:
1. ASPHALT COAT ALL SURFACES OF CATCH BASIN AND CLEANOUT AFTER WELDING OR HOT DIP GALVANIZE (AT MANUFACTURERS DISCRETION)
2. BREAK SHARP CORNERS AFTER WELDING.
3. ALL WELDED STEEL CONSTRUCTION
4. 10 GAUGE STEEL MINIMUM THICKNESS
5. OPENING ON BOTTOM OF WATERSEAL TO BE GREATER, OR EQUAL TO AREA IN OUTLET PIPE.
6. STANDARD DEPTH: 4'0"

3 LYNCH STYLE CATCH BASIN
C6.1 SCALE: NTS



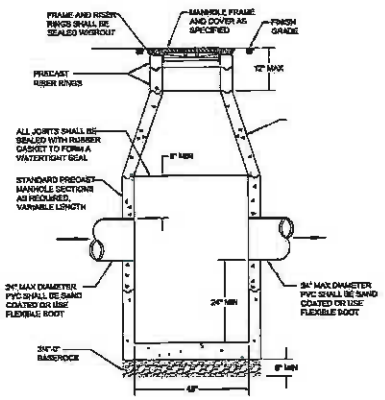
NOTE
ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C 478.

4 CONTROL STRUCTURE MANHOLE
C6.1 SCALE: NTS (FOR 48" Ø)



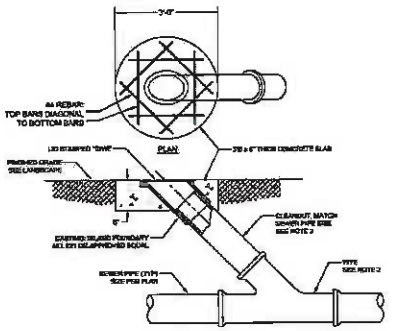
CONSTRUCTION NOTES:
1. COVER AND FRAME MAY EACH BE OF CAST IRON OR WELDED STEEL CONSTRUCTION.
2. CONCRETE STRENGTH SHALL BE 3500 PSI WITH FIBER MESH.
3. JUNCTION BASIN AND GRATE SHALL MEET H20 LOADING.
4. A MINIMUM SUMP DEPTH OF 18" IS REQUIRED.
5. OUTLET PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

6 JUNCTION BASIN
C6.1 SCALE: NTS



NOTE
ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C 478.

7 48" STORM MANHOLE
C6.1 SCALE: NTS



NOTES
1. CONCRETE TO BE COMMERCIAL GRADE CONCRETE (CGC) PER 2015 ODOT STANDARD SPECIFICATIONS, SECTION 00440, MINIMUM 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
2. FITTINGS AND PIPE TO BE GASKETED PVC SDR 26.

5 TYPICAL CLEANOUT
C6.1 SCALE: NTS

EMC | Engineers/Scientists, LLC
Grants Pass • Jacksonville • Medford, OR
CF Office: 541 Williams Hwy., Suite H3, Grants Pass, OR 97527
Phone: 541-474-3486 • Fax: 541-474-3487
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Phone: 541-734-1034 • Fax: 541-734-1035
emc@emcengineers.com • www.emcengineers.com

PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY: JG
DATE: 11 MAY 2021
JOB No: #
SHEET No:
C6.1
PROJECT DETAILS

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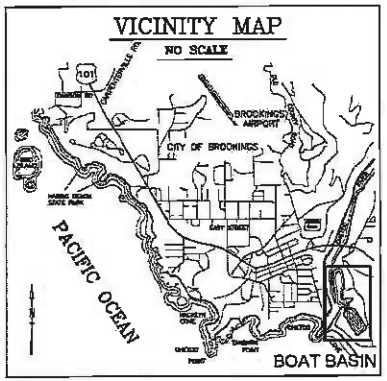
VICINITY MAP

NO SCALE



NATURAL FEATURES
EXISTING NATURAL RESOURCES OR NATURAL HAZARDS ON THE SUBJECT PROPERTY, INCLUDING WETLANDS, STREAMS, RIPARIAN AREAS, FLOOD PLAINS, OR FLOODWAYS TO BE DETERMINED BY ENGINEER

EXISTING TREE CANOPY
THERE ARE NO EXISTING TREES ON THE SUBJECT PROPERTY

CULTURAL RESOURCES
LOCALLY, OR FEDERALLY DESIGNATED HISTORIC AND/OR CULTURAL RESOURCES ON THE SITE OR ON ADJACENT PARCELS TO BE DETERMINED BY ENGINEER.

PUBLIC SERVICES
PUBLIC UTILITY SERVICES, INCLUDING WATER, SEWER, STORM DRAINAGE, POWER, TELEPHONE, CABLE INTERNET, AND GAS ARE AVAILABLE TO THE SUBJECT PROPERTY.

UTILITY STATEMENT
EXISTING UNDERGROUND UTILITIES ILLUSTRATED IN THESE PLANS ARE APPROXIMATED BASED ON MAPS OBTAINED FROM CURRY COUNTY GIS ELEVATIONS ESTIMATES, OR HAVE BEEN LOCATED BY A UTILITY LOCATE COMPANY. LAYOUT INDICATED IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. ALL LINES WITHIN PROJECTED WORK ZONE SHALL BE FIELD VERIFIED AS REQUIRED PRIOR TO CONSTRUCTION.

PROJECT DESCRIPTION

TITLE: SOUTH BASIN EMBANKMENT RECONSTRUCTION
REFERENCE: PB113
LOCATION: SOUTH BASIN
TAX LOT(S): 401,498,1100,1200,1300,1400

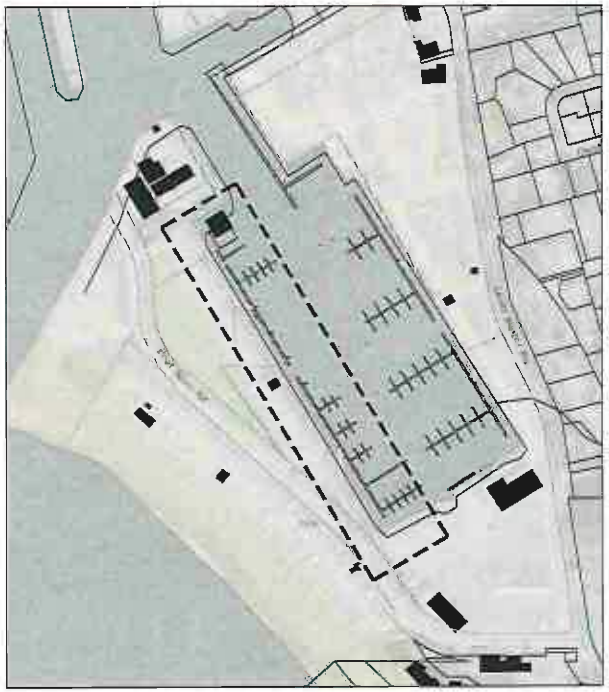
DRAWING REGISTER

PB113-C100	Cover sheet
PB113-C101	Notes
PB113-C102	Existing Condition
PB113-C102A	EXISTING EMBANKMENT VIEWS
PB113-C103	Embankment
PB113-C104	Details
PB113-C105	Plan details

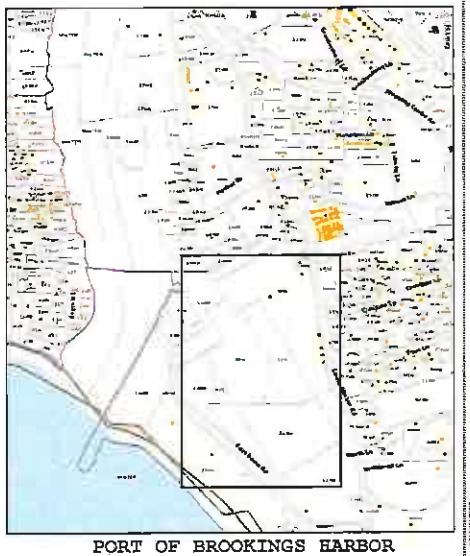
PORT OF BROOKINGS HARBOR

PORT OF BROOKINGS-HARBOR
2021 CIVIL IMPROVEMENTS

SOUTH BASIN EMBANKMENT RECONSTRUCTION



PROJECT OVERVIEW
SCALE 1":200'



PORT OF BROOKINGS HARBOR
MAP OF TAX LOTS

PRELIM GRADING NOTES

1. DEQ 1200-C PERMIT IS REQUIRED.
2. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE AT AN APPROVED LOCATION.
3. PRIOR TO THE START OF CONSTRUCTION, VERIFY GRADES AT SAWCUT LOCATIONS AND MATCHING OF EXISTING GRADE LOCATIONS.
4. MINIMIZE TRAFFIC ON SOIL AREAS DURING WET WEATHER. IF THE SITE SOILS ARE EXPOSED DURING WET WEATHER, THE USE OF CRUSHED ROCK PLACED AS ENGINEERED FILL IN THE BOTTOM OF THE EXCAVATIONS MAY BE NECESSARY TO PROTECT THE SUBGRADE. TAKE ALL PRECAUTIONS TO LIMIT SURFACE DISTURBANCE AND PROTECT THE SITE GRADING AREA FROM EROSION AND RUNOFF.
5. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOBSITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY A CERTIFIED TESTER. RESULTS OF THE TESTS SHALL BE SENT DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR, BY THE LABORATORY. LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
6. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

LEGEND

- 5 ELEVATION
- SUBGRADE MINOR CONTOUR
- SUBGRADE MAJOR CONTOUR
- PARCEL
- GEOTEXTILE
- CONCRETE PAD
- GRASS
- JETTY
- SLIP WAY
- PAVED ROAD

EMC ENGINEERING

PREPARED FOR: PORT OF BROOKINGS
(LOT 2000, MAP "Assessors")
16330 Lower Harbor Rd, Brookings, OR 97415

Date 12/8/2020
Drawn By INFRADRAFT
Sheet No. C-100
File No. 113

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GENERAL NOTES

These notes are intended for use in interpreting and implementing the tasks shown on the following construction plans and specifications sheets. These are in addition to the overall project specification and bid documents and contractual items.

These are intended for the use of the general contractor and his/her subcontractors in the demolition and reconstruction of the subject area of the Port of Brookings Harbor. Use for other purposes or at other sites is not recommended and is accomplished at the sole risk of the user.

These items are to be used as a supplement to the details provided on the plan sheets and specification pages. Any discrepancies found among the Drawings, the Specifications, referenced reports, these General Notes and other items listed on this sheet and the site conditions shall be reported to the Engineer, who shall correct such discrepancy in writing. Any work done by the General Contractor after discovery of such discrepancy shall be done at the General Contractor's risk. The General Contractor shall verify and coordinate dimensions among all drawings prior to proceeding with any work.

The embankment repair has been designed to resist anticipated vertical and lateral forces after the construction of all structural elements has been completed. Stability of the structure and slope areas prior to completion is the responsibility of the General Contractor. This responsibility includes, but is not limited to jobsite safety, construction means, methods, and sequences, temporary shoring, slope stability, formwork and bracing, use of equipment and construction procedures.

Construction observation by the Engineer is for checking for conformance with design aspects only and is not intended in any way to review and/or approve the General Contractor's construction procedures or relieve the contractor from providing a completed project, consistent with the plans and specifications and good construction practices. Special inspection by the engineer does not provide a certification of the project or relieve the contractor of all responsibility for a properly constructed project.

Standards Used for Design

All methods, materials and workmanship shall conform to the plans and specifications and ODOT Standard Specifications, unless elsewhere herein specified otherwise. International Building Code (IBC) 2009; 2010 Oregon Structure Specialty Code (OSSC); American Society of Civil Engineers (ASCE)

Other Notes

1. Jobsite safety is the responsibility of the Contractor.
2. All products and workmanship shall be new materials of good quality, acceptable for this type of construction. Work to be accomplished in a good and workmanlike manner.
3. All materials to be shipped, handled and stockpiled in accordance with the manufacturers recommendations and good construction practices.
4. Locations must be verified at the site with the geotechnical engineer and the Port of Brookings Harbor representative prior to placement.
5. Abide by local, state and federal building ordinances, including all safety requirements, in all phases of the project.
6. All phases of the project are to conform to the plans and specifications attached hereto and specifications provided by the owner and the engineer-of-record.
7. Proposed changes to project plans and specifications must be approved by the designer prior to acceptance and implementation at the site.
8. Proposed changes must be submitted in writing for review and approval/disapproval by the designer and the owner.
9. In no case shall changes, substitutions or omissions be made to the design or materials without the written authorization of the designer and the owner.
10. Authorization of a design change by the engineer does not constitute acceptance by the Port of Brookings Harbor, nor does it authorize additional funds for the changes. The Port's representative must authorize in writing the design change and applicable changes in the contract amount and/or construction time period prior to implementation of such changes.
11. Project schedule and general sequencing of all work must be reviewed and approved by the design engineer and the owner. Such approval does not relieve the contractor or his/her subcontractors of all responsibilities for proper execution of the subject project construction.
12. Sequencing of tasks that requires varying the installed sizes of project materials must be reviewed and approved by the design engineer and owner.
13. Traffic control and signage must be provided by the contractor unless otherwise so stated in the contract. Access to the US Coast Guard facilities must be maintained during construction.
14. Contractor must understand that the project site is in a Harbor area subject to tidal fluctuations. Therefore, sequencing and project work must take into account effects of high and low tides.
15. Replacement of specified products by an "Equivalent" product must be approved by the design engineer and the owner. Redesign required for use of alternate "Equivalent" materials is to be borne by the contractor.

GRADING NOTES

1. DEQ 1200-C PERMIT IS NOT REQUIRED.
2. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE AT AN APPROVED LOCATION.
3. PRIOR TO THE START OF CONSTRUCTION, VERIFY GRADES AT SAWCUT LOCATIONS AND MATCHING OF EXISTING GRADE LOCATIONS.
4. MINIMIZE TRAFFIC ON SOIL AREAS DURING WET WEATHER. IF THE SITE SOILS ARE EXPOSED DURING WET WEATHER, THE USE OF CRUSHED ROCK PLACED AS ENGINEERED FILL IN THE BOTTOM OF THE EXCAVATIONS MAY BE NECESSARY TO PROTECT THE SUBGRADE. TAKE ALL PRECAUTIONS TO LIMIT SURFACE DISTURBANCE AND PROTECT THE SITE GRADING AREA FROM EROSION AND RUNOFF.
5. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOBSITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY A CERTIFIED TESTER. RESULTS OF THE TESTS SHALL BE SENT DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR, BY THE LABORATORY. LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
6. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

EROSION, SEDIMENTATION & POLLUTION CONTROL PLAN NOTES

1. PROJECT/PURPOSE – ITH THE PURPOSE OF MAINTAINING, REHABILITATING, REPLACING, AND UPGRADING THE EXISTING WESTERN EMBANKMENT AT THE SOUTH BASIN OF PORT OF BROOKINGS. THE EXISTING EMBANKMENT WILL BE CLEARED DOWN TO SUITABLE SUBGRADE AT A SLOPE BETWEEN 1.5:1 AND 2:1. A 4FT DEEP TRENCH WILL BE EXACAVATED AT THE BASE OF THE EMBANKMENT. A 3FT DEEP LAYER OF AGGREGATE WILL BE PLACED ON TOP OF THE SLOPE AND INTO THE TRENCH
2. CONTRACTOR ACTIVITIES – CONTRACTOR ACTIVITIES ARE DESCRIBED AS EXCAVATION AND CLEARING USING A 25T EXCAVATOR. EXCAVATION AND SPREADING AT THE BASE OF THE SLOPE USING A LONG REACH EXCAVATOR. PLACEMENT OF GEOGRID. PLACEMENT OF CRUSHED AGGREGATE FROM FINE GRAVEL TO 2FT BOULDERS
3. SOIL DISTURBING ACTIVITIES – EXCAVATION WILL BE LIMITED TO EXISTING MARINA EDGES AS SHOWN ON DRAWING C102
4. NON-STORMWATER DISCHARGES – NO DEWATERING, WATER-LINE FLUSHING, PAVEMENT WASH WATERS OR IRRIGATION WATER DISCHARGES ARE PLANNED FOR THIS PROJECT.
5. ESTIMATED START DATE FOR CONSTRUCTION – 02/01/21 – 03/30/21
6. NEAREST SURFACE WATER BODIES – PORT OF BROOKINGS ICE HOUSE INLET IN THE COMMERCIAL BASIN (SOUTH BASIN) AND THE SPORT BASIN, NEAR DOCK A (NORTH BASIN).
7. RECEIVING WATERS – PACIFIC OCEAN
8. SPECIAL ENVIRONMENTAL CONSIDERATIONS – SEE SECTION BELOW DESCRIBING PRECAUTION REGARDING CREOSOTE COATED PILES TO BE EXTRACTED. ESA OPINIONS PROVIDED BY USACE, NMFS AND ODFW.
9. DESIGNATED EPCM – THE DESIGNATED EROSION AND POLLUTION CONTROL MANAGER (EPCM) WHO WILL ASSURE COMPLIANCE WITH ALL ITEMS IN THIS PLAN IS TED FITZGERALD, PORT DIRECTOR, OR HIS DESIGNEE.
10. EROSION, SEDIMENTATION AND POLLUTION CONTROL BMPS – BEST MANAGEMENT PRACTICES (BMP) TO BE USED, WHEN APPLICABLE, TO PREVENT POLLUTION RELATED TO CONTRACTOR ACTIVITIES LISTED IN THIS SECTION ARE AS FOLLOWS: A) OFFSITE VEHICLE TRACKING AND DUST PREVENTION – MEASURES WILL BE TAKEN TO PREVENT OFFSITE TRACKING OF MATERIALS, INCLUDING SWEEPING PAVEMENTS, COVERING LOADS AND WETTING SOIL TO PREVENT DUST. THERE WILL BE NO AGGREGATE CONSTRUCTION. B) MATERIAL MANAGEMENT AND SPILL PREVENTION – ALL ON SITE FUELS WILL BE DELIVERED, HANDLED, STORED, USED, AND APPLIED SO AS NOT TO BE RELEASED INTO THE WATERS OF THE STATE/US. FUELING WILL BE ACCOMPLISHED AWAY FROM THE WORK AREA A SPILL CLEANUP KIT WILL BE AVAILABLE IF DEEMED BY THE EPCM TO BE REQUIRED. C) WASTE MANAGEMENT – HANDLING, STORAGE AND DISPOSAL OF SOLID WASTE AND/OR HAZARDOUS WASTE WILL BE DISPOSED INTO SUITABE LANDFILL OFFSITE D) INSPECTION AND MAINTENANCE – DAILY INSPECTION AND MAINTENANCE FOR ALL CONTROLS INCLUDED IN THE POLLUTION CONTROL PLAN AND THE ESCP WILL BE PERFORMED BY THE EPCM OR HIS DESIGNEE. E) EMPLOYEE AND SUBCONTRACTOR TRAINING – EMPLOYEE AND SUBCONTRACTOR EDUCATION AT A MINIMUM WILL INCLUDES INFORMING PERSONNEL OF THE POSTED LOCATIONS OF THE POLLUTION CONTROL PLAN/EROSION AND SEDIMENT CONTROL PLAN/MSDS'S AND IMPORTANT EMERGENCY PHONE NUMBERS. EDUCATION WILL ALSO INCLUDE INFORMING PERSONNEL OF REVISED MATERIAL MANAGEMENT PROCEDURES FOLLOWING A SPILL F) (CRITERIA 15) PRECONSTRUCTION ACTIVITY – BEFORE ALTERATION OF THE ACTION AREA, FLAG THE BOUNDARIES OF CLEARING LIMITS ASSOCIATED WITH SITE ACCESS AND CONSTRUCTION TO MINIMIZE SOIL AND VEGETATION DISTURBANCE, AND ENSURE THAT ALL TEMPORARY EROSION CONTROLS ARE IN PLACE AND FUNCTIONAL. G) (CRITERIA 16) SITE PREPARATION – DURING SITE PREPARATION, CONSERVE NATIVE MATERIALS FOR RESTORATION, INCLUDING LARGE WOOD, VEGETATION, TOPSOIL AND CHANNEL MATERIALS (GRAVEL, COBBLE AND BOULDERS) DISPLACED BY CONSTRUCTION. WHENEVER PRACTICAL, LEAVE NATIVE MATERIALS WHERE THEY ARE FOUND AND IN AREAS TO BE CLEARED, CLIP VEGETATION AT GROUND LEVEL TO RETAIN ROOT MASS AND ENCOURAGE REESTABLISHMENT OF NATIVE VEGETATION. BUILDING AND RELATED STRUCTURES MAY NOT BE CONSTRUCTED INSIDE THE RIPARIAN MANAGEMENT AREA H) (CRITERIA 17) HEAVY EQUIPMENT – HEAVY EQUIPMENT WILL BE SELECTED AND OPERATED AS NECESSARY TO MINIMIZE ADVERSE EFFECTS ON THE ENVIRONMENT; AND ALL VEHICLES AND OTHER HEAVY EQUIPMENT WILL BE USED AS FOLLOWS:
    (A.) STORED, FUELED AND MAINTAINED IN A VEHICLE STAGING AREA PLACED 150 FEET OR MORE FROM ANY WATERBODY, OR IN AN ISOLATED HARD ZONE SUCH AS A PAVED PARKING LOT.
    (B.) INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 50 FEET OF ANY WATERBODY.
    (C.) STEAM-CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION TO REMAIN FREE OF ALL EXTERNAL OIL, GREASE, MUD, SEEDS, ORGANISMS AND OTHER VISIBLE CONTAMINANTS.
    (D.) GENERATORS, CRANES AND ANY OTHER STATIONARY EQUIPMENT OPERATED WITHIN 150 FEET OF ANY WATERBODY WILL BE MAINTAINED AND PROTECTED AS NECESSARY TO PREVENT LEAKS AND SPILLS FROM ENTERING THE WATER I) (CRITERIA 18)

IN-WATER WORK PERIOD –
ALL WORK WITHIN THE ACTIVE CHANNEL WILL BE COMPLETED IN ACCORDANCE WITH THE OREGON GUIDELINES FOR TIMING OF IN-WATER WORK TO PROTECT FISH AND WILDLIFE RESOURCES (ODFW 2000, OR THE MOST RECENT VERSION).

J) (CRITERIA 21) EMBANKMENT INSTALLATION –
<TBC>

K) (CRITERIA 24) SUBGRADE PREPARATION –
<TBC>

ENGINEER: EMC

PREPARED FOR: PORT OF BROOKINGS
(Lot 2&3, Map 34S-13W-33AB)
16330 Lower Harbor Rd, Brookings, OR 97415

Date: 12/8/2020
Drawn By: INFRADRAFT
Sheet No.: C-101
File No.: 113

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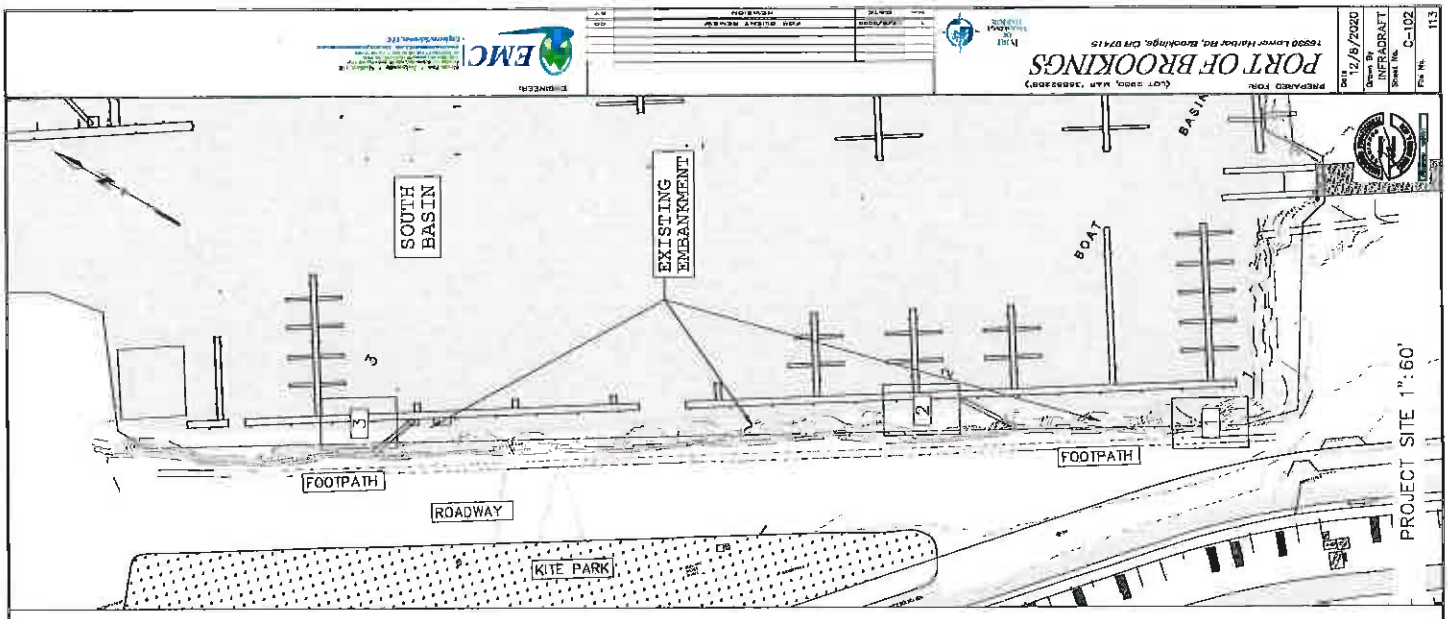
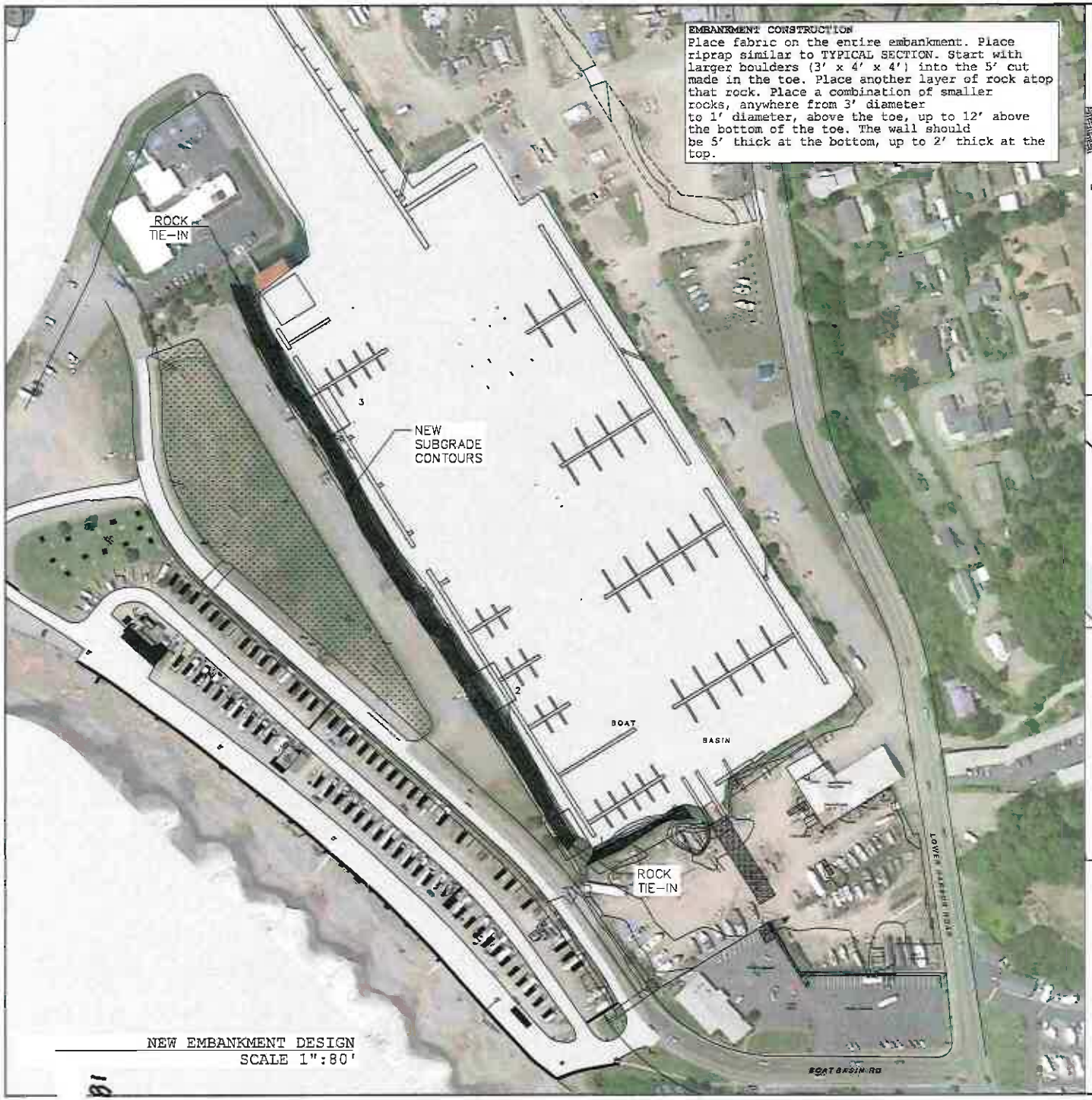


EXISTING CONDITIONS
SCALE 1":100'

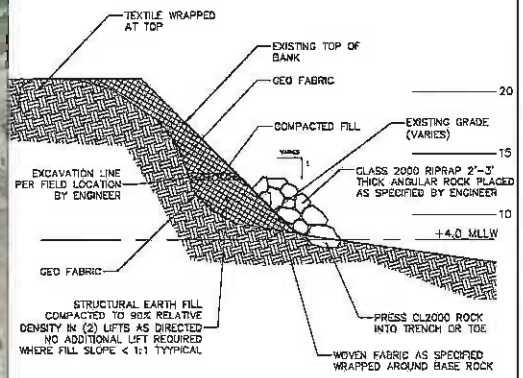
EXISTING EMBANKMENT VIEWS

EMBANKMENT CONSTRUCTION

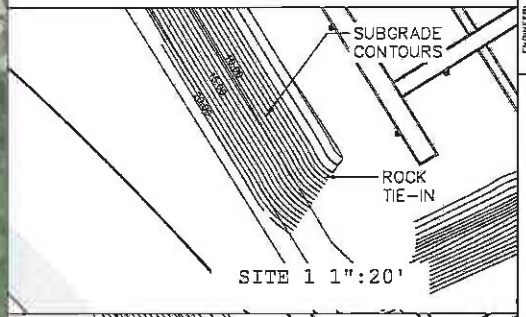
Place fabric on the entire embankment. Place riprap similar to TYPICAL SECTION. Start with larger boulders (3' x 4' x 4') into the 5' cut made in the toe. Place another layer of rock atop that rock. Place a combination of smaller rocks, anywhere from 3' diameter to 1' diameter, above the toe, up to 12' above the bottom of the toe. The wall should be 5' thick at the bottom, up to 2' thick at the top.



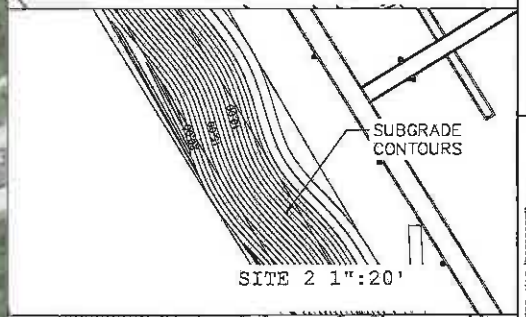
NEW EMBANKMENT DESIGN
SCALE 1":80'



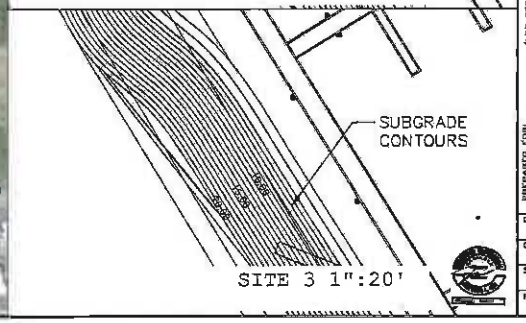
TYPICAL EMBANKMENT
CROSS-SECTION



SITE 1 1":20'



SITE 2 1":20'



SITE 3 1":20'

EMC ENGINEERS

PREPARED FOR:
PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415

Date 12/8/2020
Drawn By INFRADRAFT
Sheet No. C-103
File No. 113

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Design Specifics of Rock & Construction
The rock used (if 406 Mitigation is approved) for this project will be specified to follow test requirements found within AASHTO 85 (Apparent specific gravity, percent absorption); ODOT TM 208A (degradation); and AASHTO T 104 (soundness). All rock specified in this project must be angular in shape, and the thickness of any single rock shall not be less than one third of its length. Round rock will not be accepted unless authorized by EMC. The rock must meet the gradation requirements for the class specified, be free from overburden, spoiled, shale and organic material. Non-durable rock, shale or rock with shale seams is not acceptable. Class 2000 rip rap is by definition comprised of rocks that are 20% by weight of 1400 pounds to 2000 pounds, 30% by weight of 700 to 1400 pounds, 40% by weight 40 to 700 pounds and 0 to 10% 0 to 40 pounds. Either a filter blanket of 16 inch layer of class 50, or specified filter fabric will be laid beneath the rock.

A clamshell, orange peel bucket, skip or similar approved device will be used which will transport the riprap material to its final destination. This revetment repair is for flow assumed to generally be uniform, steady and subcritical. However, rapidly varying, unsteady flow conditions occur occasionally, and excessive wave action, hydraulic jumps and extreme flow turbulence can occur at this location. These conditions are among the reasons for the extent of protection proposed. The longitudinal extent of this repair should be continuous for a distance greater than the length that is impacted. The vertical extent of protection required for this revetment includes design height and foundation or toe depth. The design height of the rip rap installation is to be equal to the design high water elevation (King tide plus storm surge) with adequate freeboard to accommodate wave action, super elevation from the channel bend, hydraulic jump, and flow irregularities, plus erratic phenomena such as unforeseen embankment settlement, accumulation of trash and debris from the river.

Scour depth is estimated at about 4 feet from the lowest elevation in the cross-section of the basin at this point, utilizing the conservative assumption of a median diameter of bed material to be about 0.15 m. Riprap thickness for Class 2000 is specified to be at least a 4 foot layer.

The filter beneath the riprap and overlying the structural fill is to prevent the migration of fine soil particles through structural voids and to distribute the weight of the armoring units (riprap) to provide more uniform settlement, and also permits relief of hydrostatic pressures within the soils.

For the areas above the waterline at any given time the fabric or geotextile also prevents surface water from causing erosion beneath the rip rap. In addition to toe considerations with respect to scour the flanks of this revetment are designed for upstream and downstream conditions

General Construction, Erosion & Control Notes
Final bank slope will be between 1V:1.5H and 1V:2H. Bank preparation will consist of clearing debris and minor grading. Riprap placement will be by machine placing and hand placing. Hand placing will be performed as specified by EMC on steeper side slopes.
Re-handling or dragging to smooth revetment services tend to result in segregation and breakage of stone and are to be avoided. Stone will not be dropped from an excessive height.

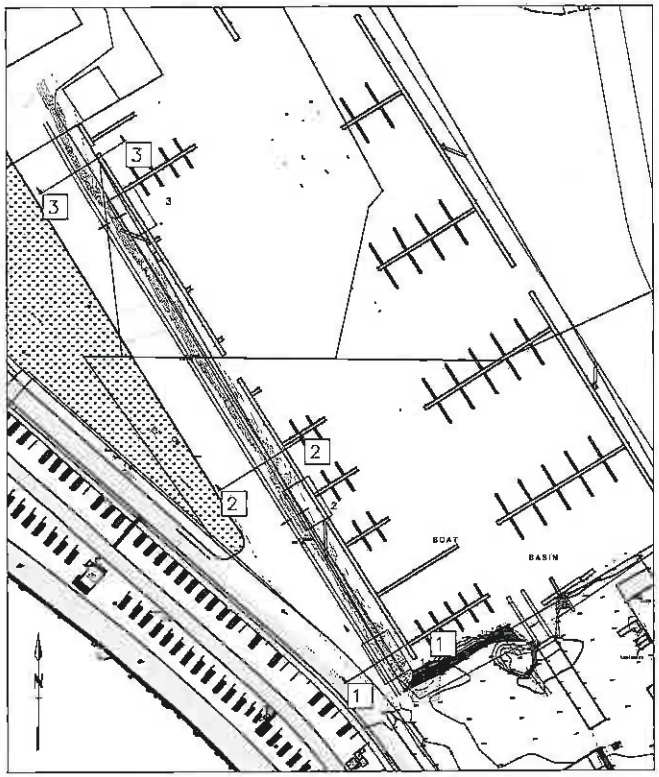
Actions that will require the use of materials that are hazardous or toxic to aquatic life (such as motor fuel, oil, or drilling fluid), are included within the pollution and erosion control plan sections of this narrative, to be managed by EMC and enforced by the Port of Brookings-Harbor. The plan includes practices to minimize erosion and sedimentation associated with all aspects of the project (e.g., staging areas, stockpiles, grading); to prevent debris from dropping or otherwise entering any stream or waterbody; and to prevent and control hazardous material spills.

Erosion controls will be monitored and maintained daily during the rainy season and weekly during the dry season as necessary to ensure controls are properly functioning. If monitoring shows that the erosion controls are ineffective at preventing visible sediment discharge, the project will stop to evaluate erosion control measures. Repairs, replacements or the installation of additional erosion control measures will be completed before the project resumes.

If applicable, maintenance will include removal of sediment and debris from erosion controls like silt fences or hay bales once it has reached on-third of the exposed height of the control. Whenever practical, native materials are to be left where they are found and in areas to be cleared, vegetation is to be clipped at ground level to retain root mass and encourage reestablishment of native vegetation.

Heavy equipment will be selected and operated as necessary to minimize adverse effects on the environment (e.g., minimally-sized, low pressure tires, minimal hard turn paths for tracked vehicles, temporary mats or plates within wet areas or sensitive soils); and all vehicles and other heavy equipment will be used as follows:

1) Stored, fueled and maintained in a vehicle staging area placed 150 feet or more from any waterbody, or in an isolated hard zone such as a paved parking lot, or lined surface;
2) Inspected daily for fluid leaks before leaving the vehicle staging area for operation within 50 feet of any waterbody;
3) Steam-cleaned before operation below ordinary high water, and as often as necessary during operation to remain free of all external oil, grease, mud, seeds, organisms and other visible contaminants and
4) Generators, cranes and any other stationary equipment operated within 150 feet of any waterbody will be maintained and protected as necessary to prevent leaks and spills from entering the water.



SITES 1, 2, 3 SECTION LINES

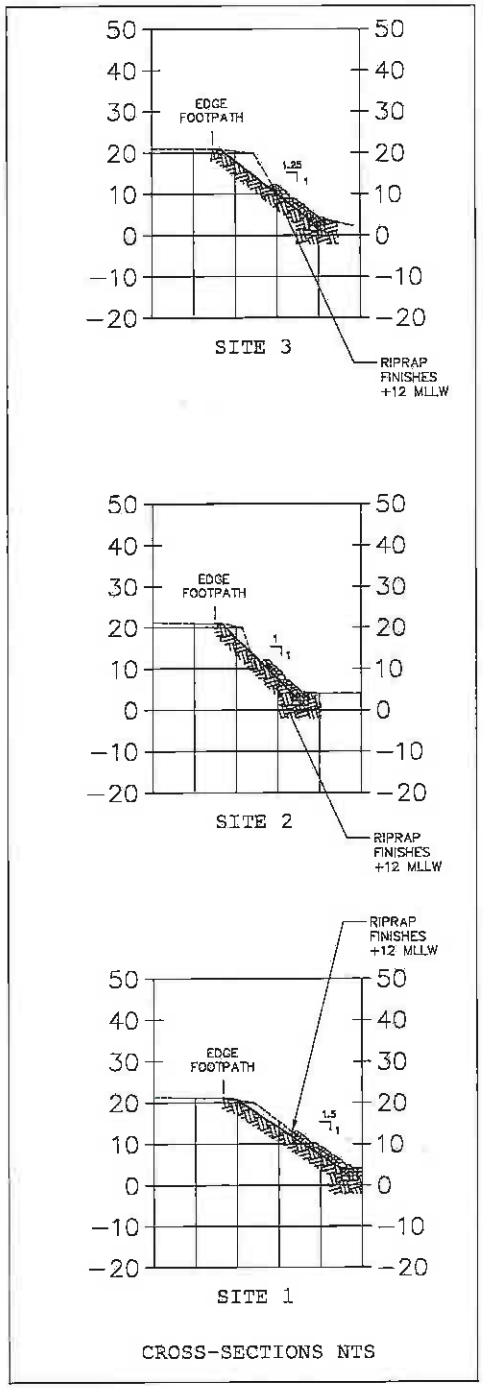
Nonwoven Geotextile

NTPEP APPROVED - GTX-2013-01-019. US 300NW is a nonwoven needlepunched geotextile made of 100% polypropylene staple filaments. US 300NW resists ultraviolet and biological deterioration, rotting, naturally encountered bases and acids. Polypropylene is stable within a pH range of 2 to 13. US 300NW meets the following M.A.R.V. values except where noted:

PROPERTY	TEST METHOD	ENGLISH	METRIC
Weight - Typical	ASTM D-5261	12 oz/sy	407 g/sm
Tensile Strength	ASTM D-4632	300 lbs	1,335 N
Elongation @ Break	ASTM D-4632	50%	50%
Mullen Burst*	ASTM D-3786*	580 psi	3,999 kPa
Puncture Strength*	ASTM D-4833*	180 lbs	801 N
CBR Puncture	ASTM D-6241	850 lbs	3,782 N
Trapezoidal Tear	ASTM D-4533	115 lbs	511 N
Apparent Opening Size	ASTM D-4751	100 US Sieve	0.150 mm
Permittivity	ASTM D-4491	1.00 Sec-1	1.00 Sec-1
Water Flow Rate	ASTM D-4491	75 gl/min/sf	3,055 l/min/sm
UV Resistance @ 500 Hours	ASTM D-4355	70%	70%

ROLL SIZE	ROLL DIAMETER	AREA WEIGHT
12.5' x 360'	23.0 in	500 sys 380 lbs
15' x 300'	25.0 in	500 sys 380 lbs

VOLUME REPORT (APPROXIMATE)		
GEOTEXTILE FABRIC	4498	SQ YD
CLASS 2000 RIP RAP	2462.34	CU YD
CUT	1792	CU YD
FILL	966	CU YD

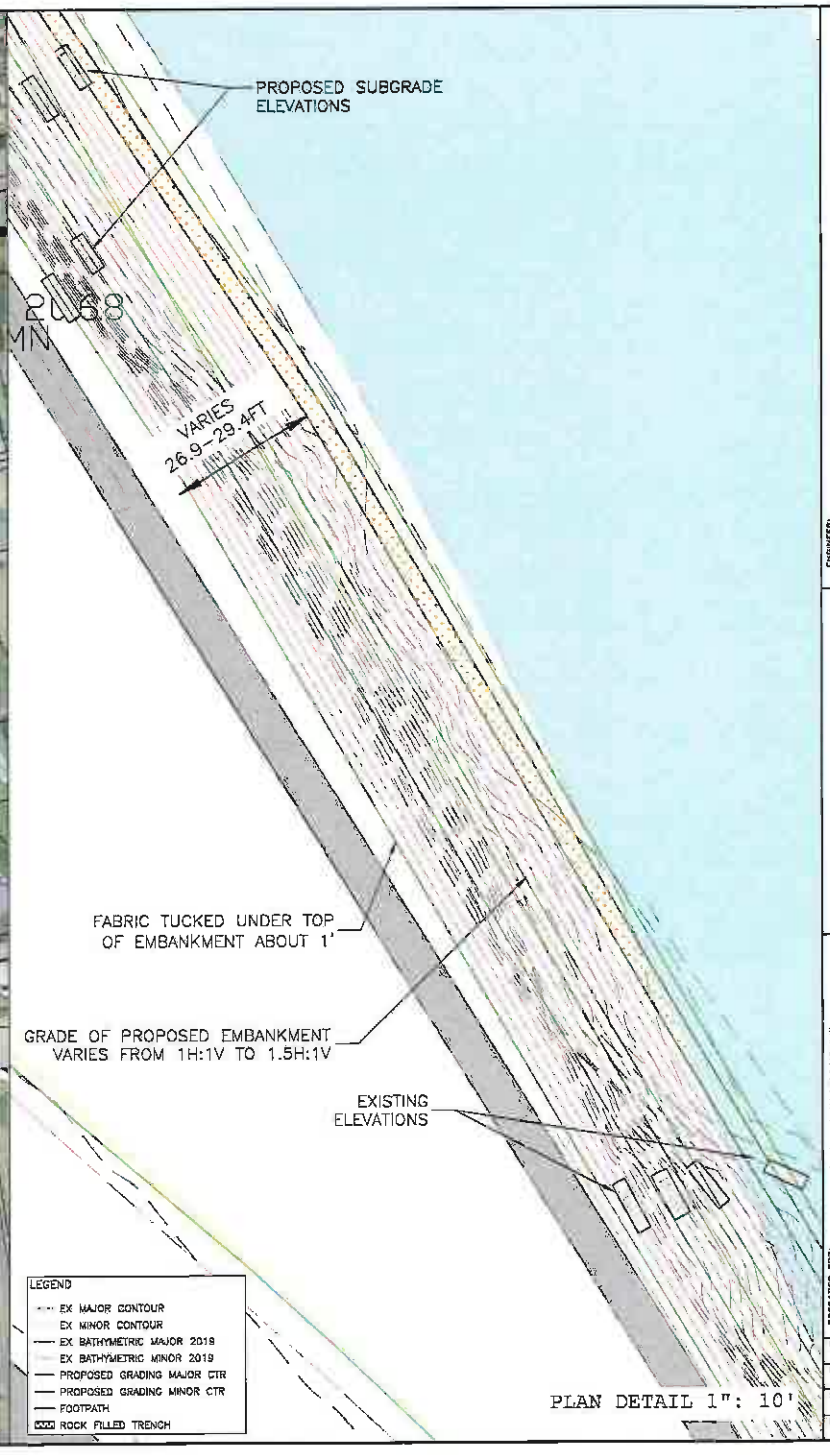


CROSS-SECTIONS NTS

ENGINEERS
EMC
PREPARED FOR:
PORT OF BROOKINGS
(541)469-2218
16330 Lower Harbor Rd, Brookings, OR 97415
Date 12/8/2020
Drawn By INFRADRAFT
Sheet No. C-104
File No. 113

192

NEW AND EXISTING CONTOURS
SCALE 1":80'



PLAN DETAIL 1": 10'

PREPARED FOR:
PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415

Date: 12/27/2020
Drawn By: INFRADRAFT
Sheet No.: C105
File No.: 113

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SHEET INDEX

DRAWN BY:	JG
DATE:	18 APR 2021
JOB No:	
SHEET No:	C0.0
	COVER SHEET

PORT OF BROOKINGS HARBOR

16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415

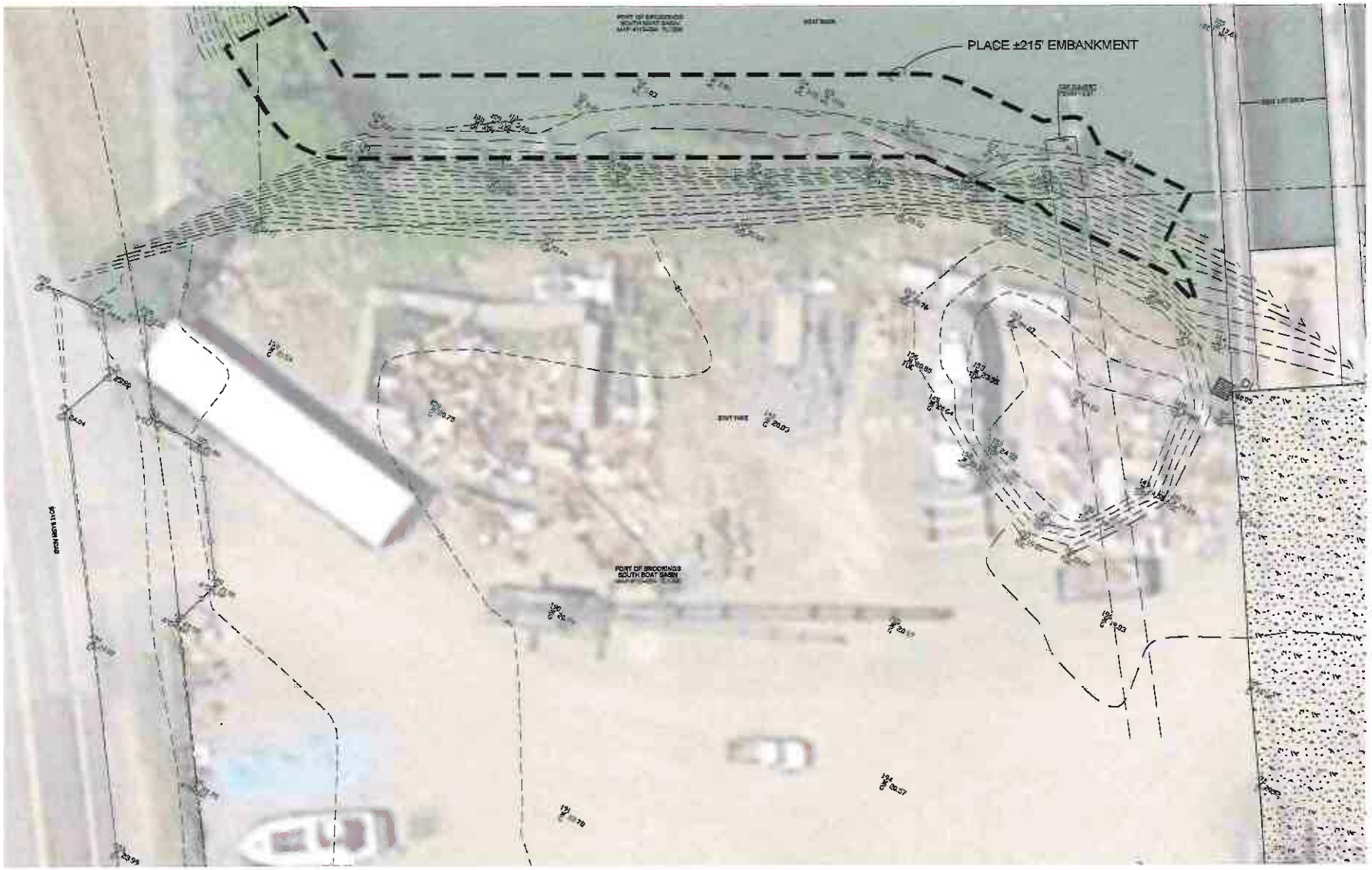
SOUTH BOAT BASIN WALL

REGISTERED PROFESSIONAL ENGINEER — OREGON — JOHN GRAY — RENEWAL DATE: 12/31/21

EMC — Grants Pass • Jacksonville • Medford, OR

- Engineers/Scientists, LLC

REVISIONS	BY



SURVEY BY
ROBERTS & ASSOCIATES LAND SURVEYING, INC.
511 SPRUCE STREET
BROOKINGS, OR 97415
(541) 469-2182

HORIZONTAL DATUM
OREGON COORDINATE REFERENCE SYSTEM (OREGON COAST ZONE) AS DEFINED IN OREGON ADMINISTRATIVE RULES 734-005-0005 THRU 734-005-0015. COORDINATES WERE CONSTRAINED TO THE OREGON REAL-TIME (GPS) REFERENCE NETWORK (ORGN) REFERENCED TO NAD 83(2011) EPOCH 2010, INTERNATIONAL FEET, WITH A RELATIVE ACCURACY OF <2cm.

VERTICAL DATUM
MEAN LOWER LOW WATER EPOCH 1983-2001.
BENCH MARK UTILIZED FOR THIS SURVEY
US ARMY CORPS OF ENGINEERS
BENCH MARK - "FUEL 2"
ELEVATION - 21.55 FEET

0 10 20 40
SCALE: 1" = 20'

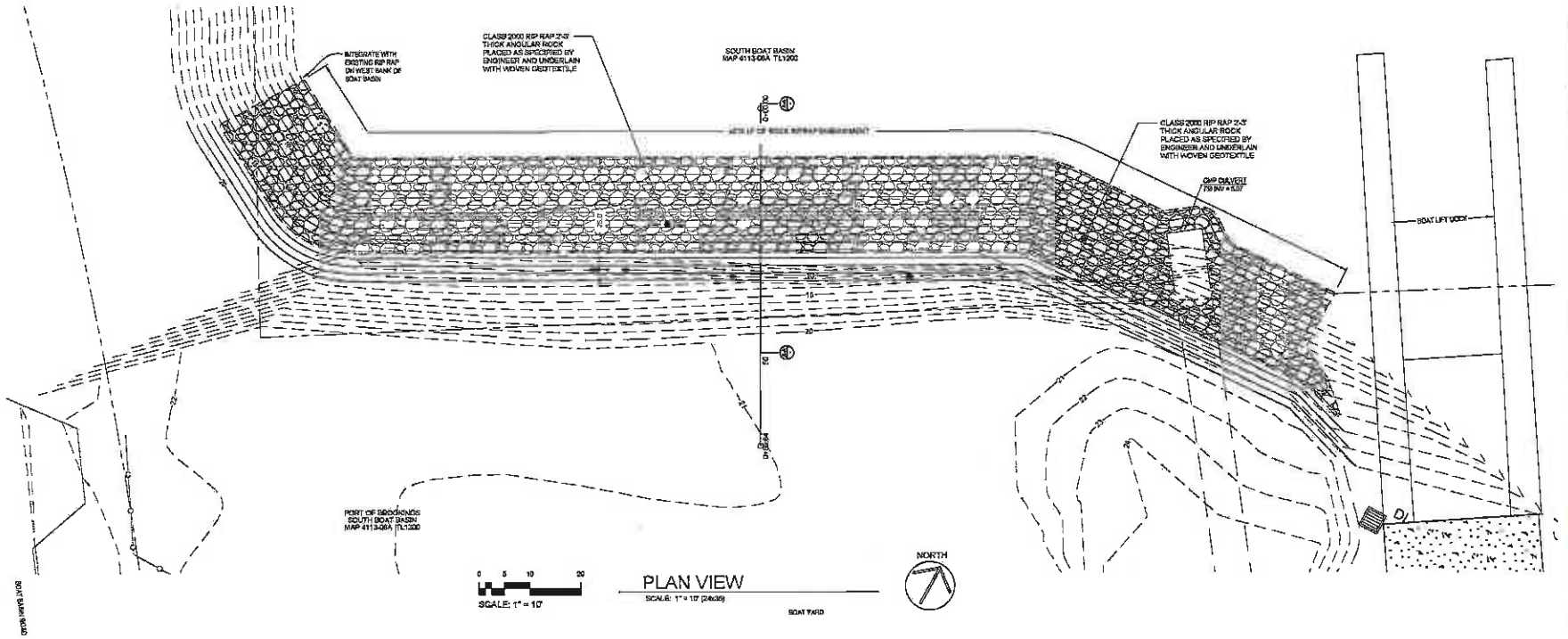
EXISTING CONDITIONS
SCALE: 1" = 20' (24x36)

NORTH

Grants Pass • Jacksonville • Medford, OR
EMC
Engineers/Scientists, LLC

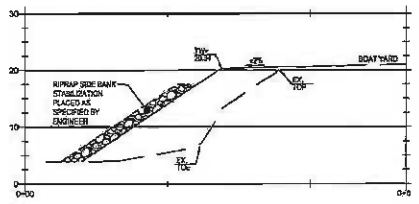
PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
SOUTH BOAT BASIN WALL

DRAWN BY: JG
DATE: 15 APR 2021
JOB No:
SHEET No:
C1.0
EXISTING CONDITIONS



PLAN VIEW

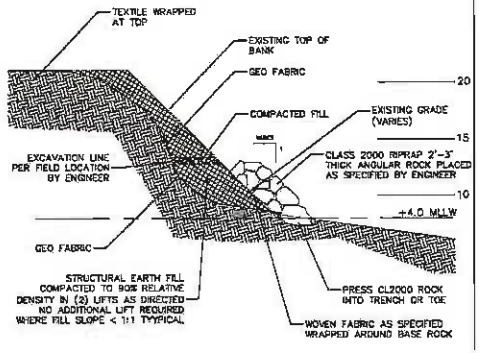
SCALE: 1" = 10' (24x36)



A-A

ROCK EMBANKMENT - SECTION A - A

SCALE: 1" = 10' (H & V)



TYPICAL EMBANKMENT CROSS SECTION

NOT TO SCALE

PLACE FABRIC ON THE ENTIRE EMBANKMENT. PLACE RIPRAP SIMILAR TO TYPICAL SECTION. START WITH LARGER BOULDERS (3' x 4' x 4') INTO THE 5' CUT MADE IN THE TIDE. PLACE ANOTHER LAYER OF ROCK ATOP THAT ROCK. PLACE A COMBINATION OF SMALLER ROCKS, ANYWHERE FROM 9" DIAMETER TO 1' DIAMETER, ABOVE THE TOE, UP TO 12' ABOVE THE BOTTOM OF THE TIDE. THE WALL SHOULD BE 9' THICK AT THE BOTTOM, UP TO 2' THICK AT THE TOP.

EMBANKMENT CONSTRUCTION NOTES

PROPOSED ROCK EMBANKMENT - OPTION 4

SCALE: 1" = 10' (24x36)

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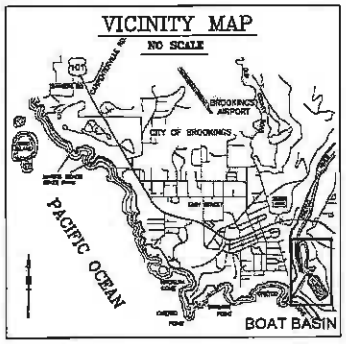
PORT OF BROOKINGS HARBOR

16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415

SOUTH BOAT BASIN WALL

DRAWN BY:	JG
DATE:	18 APR 2021
JOB No:	#
SHEET No:	C2.0
	OPTION 4 ROCK WALL

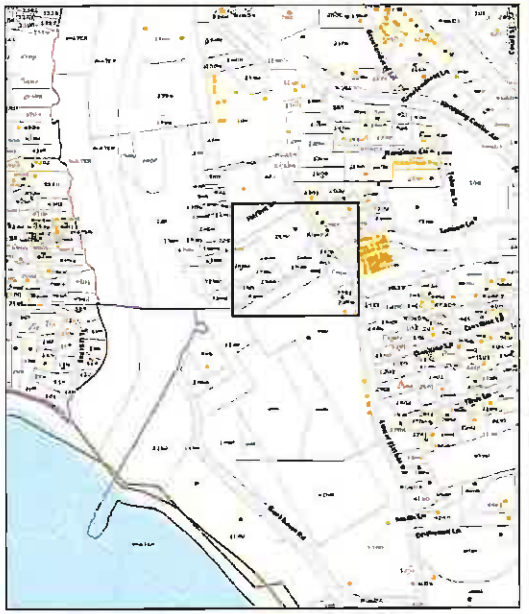
181



PORT OF BROOKINGS HARBOR

PORT OF BROOKINGS-HARBOR
2021 CIVIL IMPROVEMENTS

PROPOSED ROAD



PORT OF BROOKINGS HARBOR
MAP OF TAX LOTS

NATURAL FEATURES
EXISTING NATURAL RESOURCES OR NATURAL HAZARDS ON THE SUBJECT PROPERTY, INCLUDING WETLANDS, STREAMS, RIPARIAN AREAS, FLOOD PLAINS, OR FLOODWAYS TO BE DETERMINED BY ENGINEER

EXISTING TREE CANOPY
THERE ARE NO EXISTING TREES ON THE SUBJECT PROPERTY

CULTURAL RESOURCES
LOCALLY, OR FEDERALLY DESIGNATED HISTORIC AND/OR CULTURAL RESOURCES ON THE SITE OR ON ADJACENT PARCELS TO BE DETERMINED BY ENGINEER.

PUBLIC SERVICES
PUBLIC UTILITY SERVICES, INCLUDING WATER, SEWER, STORM DRAINAGE, POWER, TELEPHONE, CABLE INTERNET, AND GAS ARE AVAILABLE TO THE SUBJECT PROPERTY.

UTILITY STATEMENT
EXISTING UNDERGROUND UTILITIES ILLUSTRATED IN THESE PLANS ARE APPROXIMATED BASED ON MAPS OBTAINED FROM CURRY COUNTY GIS ELEVATIONS ESTIMATES, OR HAVE BEEN LOCATED BY A UTILITY LOCATE COMPANY. LAYOUT INDICATED IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. ALL LINES WITHIN PROJECTED WORK ZONE SHALL BE FIELD VERIFIED AS REQUIRED PRIOR TO CONSTRUCTION.

PROJECT OVERVIEW
SCALE 1":200'

PRELIM GRADING NOTES

1. DEQ 1200-C PERMIT IS REQUIRED.
2. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE AT AN APPROVED LOCATION.
3. PRIOR TO THE START OF CONSTRUCTION, VERIFY GRADES AT SAWCUT LOCATIONS AND MATCHING OF EXISTING GRADE LOCATIONS.
4. MINIMIZE TRAFFIC ON SOIL AREAS DURING WET WEATHER. IF THE SITE SOILS ARE EXPOSED DURING WET WEATHER, THE USE OF CRUSHED ROCK PLACED AS ENGINEERED FILL IN THE BOTTOM OF THE EXCAVATIONS MAY BE NECESSARY TO PROTECT THE SUBGRADE. TAKE ALL PRECAUTIONS TO LIMIT SURFACE DISTURBANCE AND PROTECT THE SITE GRADING AREA FROM EROSION AND RUNOFF.
5. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOBSITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY A CERTIFIED TESTER. RESULTS OF THE TESTS SHALL BE SENT DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR, BY THE LABORATORY. LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
6. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

PROJECT DESCRIPTION

TITLE: PROPOSED ROAD
REFERENCE: 140
LOCATION: HARBOR ST
TAX LOT(S): 2500,2600,2700,2800
2900,2999,402

DRAWING REGISTER

187

LEGEND

- 5 ELEVATION
- SUBGRADE MINOR CONTOUR
- SUBGRADE MAJOR CONTOUR
- PARCEL
- GEOTEXTILE
- CONCRETE PAD
- GRASS
- JETTY
- SLIP WAY
- PAVED ROAD

ENGINEER: EMC Engineering Services, Inc.

No.	REVISION	BY	DATE

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2800, MAP '3605220B')
16330 Lower Harbor Rd, Brookings, OR 97415

Date: 04/04/2021
Drawn By: INFRADRAFT
Sheet No.: CV
File No.: 140

GRADING NOTES

1. PRIOR TO THE CONSTRUCTION OF EMBANKMENTS, THE CONTRACTOR SHALL EXCAVATE UNSUITABLE FOUNDATION MATERIAL. BASEMENTS, TRENCHES AND HOLES ENCOUNTERED WITHIN EMBANKMENT LIMITS SHALL BE FILLED WITH APPROVED MATERIAL. PRIOR TO BACKFILLING THE CONTRACTOR SHALL BREAK CONCRETE FLOORS OF BASEMENTS AS DIRECTED. THE CONTRACTOR SHALL BREAK UP AND ROUGHEN THE GROUND SURFACE BEFORE EMBANKMENTS MATERIAL IS PLACED THE NATURAL GROUND UNDERLYING EMBANKMENTS SHELL BE COMPACTED TO THE DENSITY SPECIFIED FOR THE EMBANKMENT MATERIALS TO BE PLACED, AND TO THE DEPTH OF THE GRUBBING OR A MINIMUM OF 6 INCHES.
2. EMBANKMENT CONSTRUCTION SHALL INCLUDE PREPARATION OF THE AREAS UPON WHICH EMBANKMENTS ARE PLACED, THE PLACEMENT AND COMPACTION OF APPROVED EMBANKMENT MATERIALS AND FILLING OF HOLES, PITS AND OTHER DEPRESSIONS WITHIN THE SUBDIVISION.
3. THE CONTRACTOR SHALL PLACE EMBANKMENTS AND FILLS IN THE HORIZONTAL LAYERS OF 8 INCHES MAXIMUM DEPTH AND COMPACT EACH LAYER TO THE DENSITY SPECIFIED.
4. EMBANKMENT SHALL NOT BE CONSTRUCTED WHEN THE EMBANKMENT MATERIAL OR THE FOUNDATION ON WHICH THE EMBANKMENT WOULD BE PLACED IS FROZEN.
5. IMMEDIATELY PRIOR TO COMPLETION OF THE EARTHWORK, THE CONTRACTOR SHALL CLEAN THE ENTIRE WORK AREA OF DEBRIS AND FOREIGN MATTER.
6. THE MAXIMUM DENSITY OF COMPACTED MATERIAL WILL BE DETERMINED BY AASHTO T-99
7. THE CONTRACTOR SHALL COMPACT ALL EMBANKMENTS, FILLS AND BACKFILLS TO A MINIMUM IN PLACE DENSITY OF 95 PRESENT.
8. THE CONTRACTOR SHALL WATER THE MATERIALS TO PROVIDE OPTIMUM MOISTURE FOR COMPACTION OF EMBANKMENT AND BACKFILLS. EMBANKMENTS OD BACKFILL MATERIALS SHALL NOT BE PLACED IN FINAL POSITION UNTIL MOISTURE IN EXCESS OF OPTIMUM MOISTURE HAS BEEN REMOVED.
9. IF THE SPECIFIED COMPACTION IS NOT OBTAINED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER. THE CONTRACTOR MAY BE REQUIRED TO USE A MODIFIED COMPACTION PROCEDURE OR APPLY ADDITIONAL COMPACTIVE EFFORT. IF APPROVED MATERIALS MEETING THE SPECIFICATIONS CANNOT BE COMPACTED TO THE REQUIRED DENSITY REGARDLESS OF COMPACTIVE EFFORT OR METHOD, THE ENGINEER MAY REDUCE THE REQUIRED DENSITY OR DIRECT THE ALTERNATE MATERIALS BE USED. IN NO CASE SHALL EARTHWORK OPERATIONS PROCEED UNTIL THE CONTRACTOR IS ABLE TO COMPACT THE MATERIAL TO THE SATISFACTION OF THE ENGINEER.
10. DEQ 1200-C PERMIT IS NOT REQUIRED.
11. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE AT AN APPROVED LOCATION.
12. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOBSITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY A CERTIFIED TESTER. RESULTS OF THE TESTS SHALL BE SENT DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR, BY THE LABORATORY. LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
13. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

GEOTECHNICAL NOTE

THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE PROJECT ENGINEER FOR REQUIRED REMEDIATION. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER FOR REQUIRED SITE OBSERVATIONS AND TESTING OF ALL FILLS.

GENERAL NOTES
NO SCALE

ENGINEER:
EMC
Engineering Consultants, LLC

NO	DATE	REVISION	BY

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2800, MAP 39S02W28D)
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

Date: 04/04/2021
Drawn By: INFRADRAFT
Sheet No.: C-100
File No.: 140

LEGEND

- 5.0 ELEVATION
- SUBGRADE MINOR CONTOUR
- SUBGRADE MAJOR CONTOUR
- PARCEL
- GEOTEXTILE
- CONCRETE PAD
- GRASS
- JETTY
- SLIP WAY
- PAVED ROAD

EXISTING STORM DRAIN

LOWER HARBOR ROAD

BOAT BASIN

20.00
16.00
16.00
20.00
28.00
26.00
24.00
22.00
20.00
22.00

EXISTING CONDITIONS
SCALE 1':100"

ENGINEER:
EMC | Engineers & Scientists, LLC

NO	DATE	REVISION	BY

PREPARED FOR:
PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415

(LOT 2900, MAP 39052DB)

PORT OF BROOKINGS HARBOR

Date: 04/04/2021
Drawn By: INFRADRAFT
Sheet No.: C-101
File No.: 140

LEGEND

- 5.0 ELEVATION
- SUBGRADE MINOR CONTOUR
- SUBGRADE MAJOR CONTOUR
- PARCEL
- GEOTEXTILE
- CONCRETE PAD
- GRASS
- JETTY
- SLIP WAY
- PAVED ROAD

EXCAVATE SUBGRADE TO ±1.5' BELOW TOP OF CONC AND TOP OF BANK ELEVATION

PROPOSED SEDIMENT STOCKPILE AREA

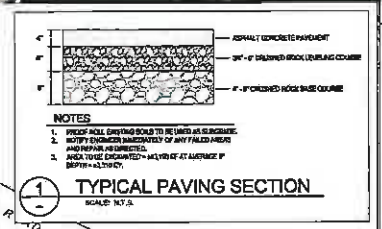
LOWER HARBOR ROAD

EXCAVATE SUBGRADE TO 1.5' BELOW EXISTING ROAD

EXCAVATE SUBGRADE TO ±1.5' BELOW TOP OF CONC AND TOP OF BANK ELEVATION

EXCAVATE SUBGRADE TO ±1.5' BELOW TOP OF CONC AND TOP OF BANK ELEVATION

BOAT BASIN



1 TYPICAL PAVING SECTION
SCALE: N.T.S.

140

GRADING PLAN
SCALE 1':100"

ENGINEER: EMC | Engineering Solutions, LLC

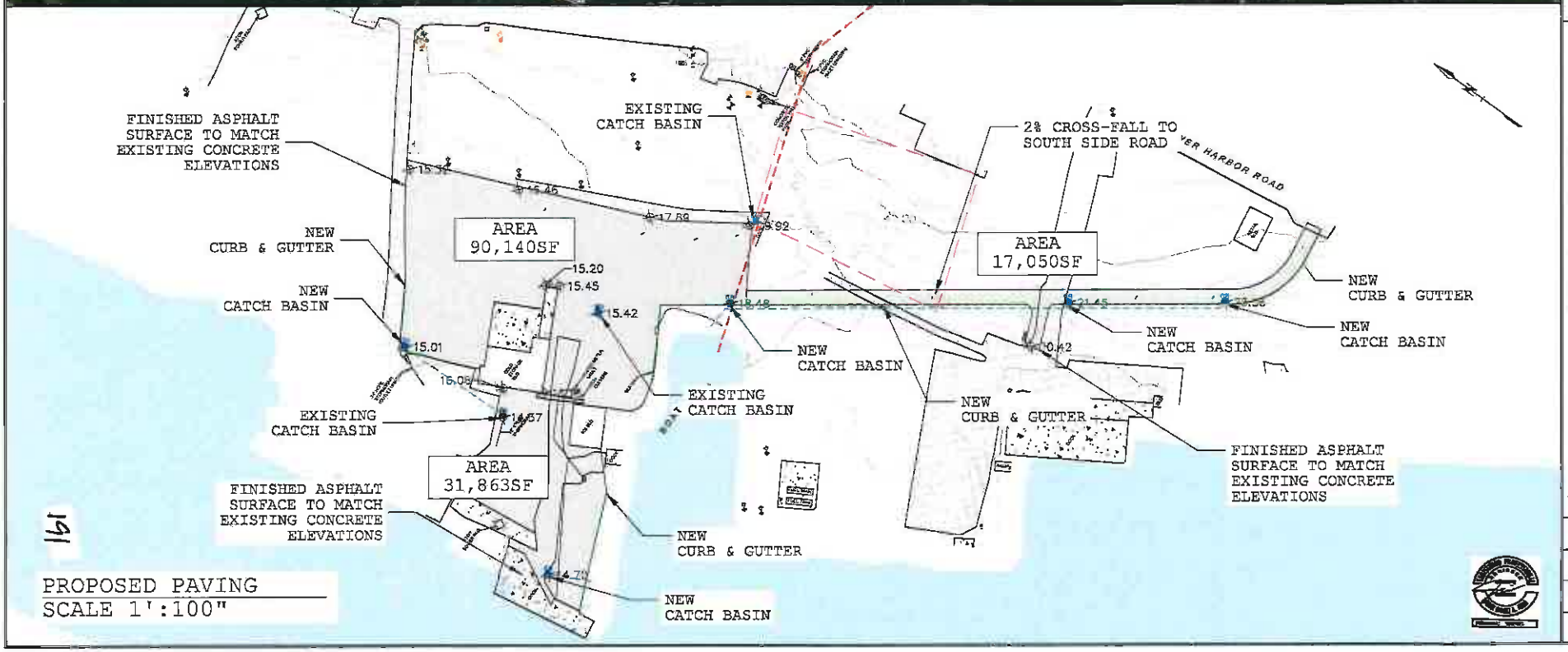
No.	DATE	REVISION	BY

PREPARED FOR: PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

(LOT 3900, MAP '35S12W08')

Date 04/04/2021
Drawn By INFRADRAFT
Sheet No. C-102
File No. 140



PROPOSED PAVING
SCALE 1':100"

191

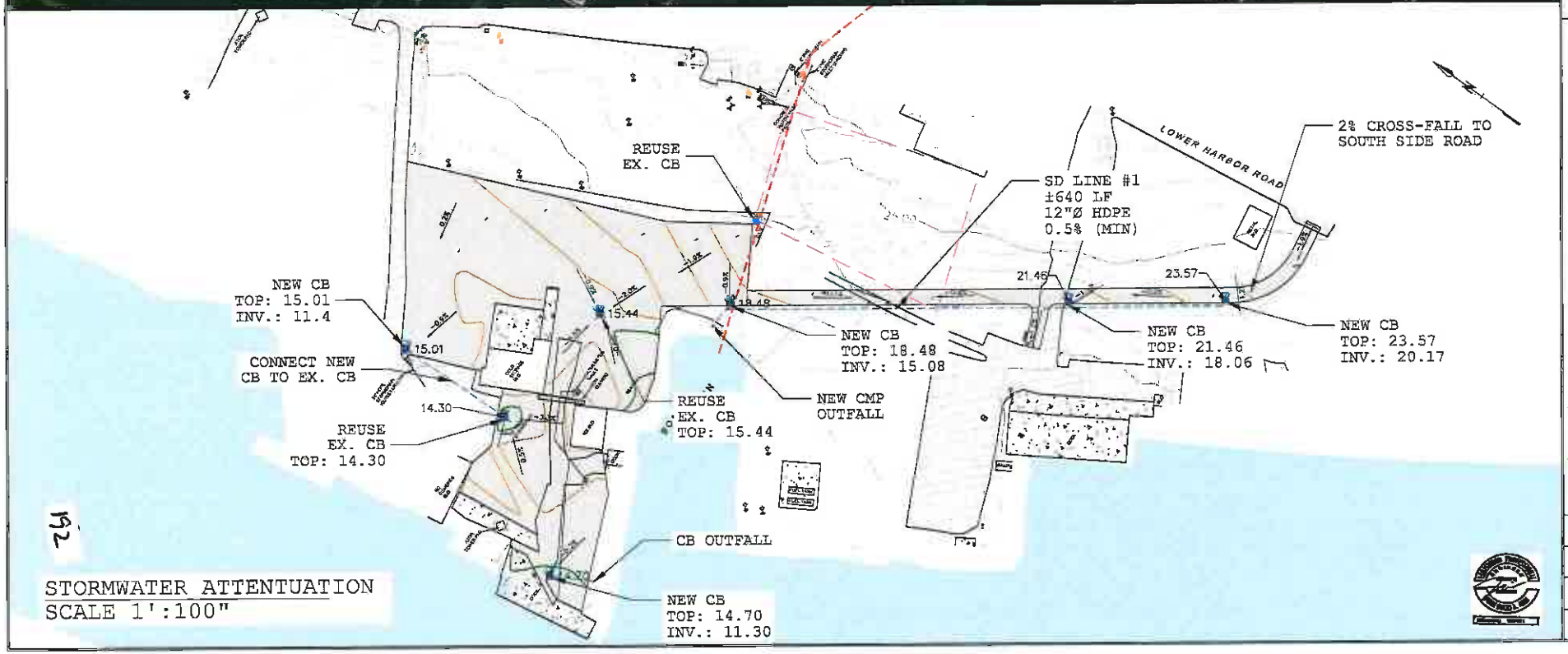
ENGINEER:
EMC
Civil Engineering • Land Surveying • Planning
Engineering Consultants, LLC

REVISION | DATE | BY

PREPARED FOR:
PORT OF BROOKINGS
(LOT 2900, MAP '36052DB')
16390 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

Date: 04/04/2021
Drawn By: INFRADRAFT
Sheet No.: C-103
File No.: 140



STORMWATER ATTENTUATION
SCALE 1':100"

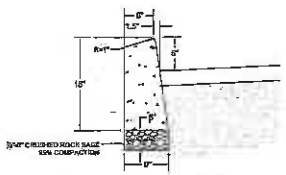
ENGINEER:
EMC
Engineering Consultants, LLC

NO.	REVISION	DATE	BY

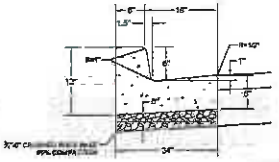
PREPARED FOR:
PORT OF BROOKINGS
(LOT 2900, MAP '39052DB')
16330 Lower Harbor Rd, Brookings, OR 97415

PORT OF BROOKINGS HARBOR

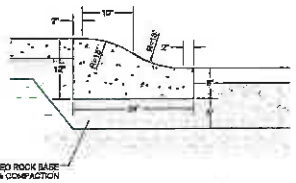
Date	04/04/2021
Drawn By	INFRADRAFT
Sheet No.	C-104
File No.	140



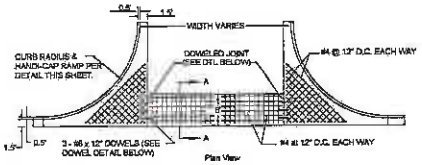
301 VERTICAL CURB
SCALE: NTS



302 CURB & GUTTER
SCALE: NTS

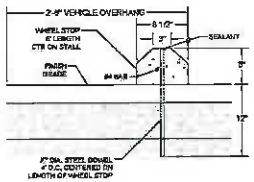


303 ROLLED CURB
SCALE: NTS



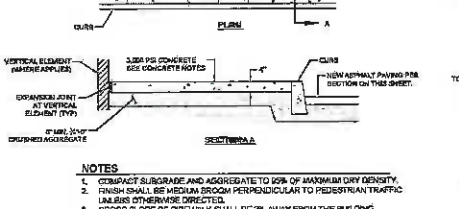
327 DRIVEWAY APRON WITH VALLEY GUTTER
SCALE: NTS

NOTES
1. CONCRETE TO BE COMMERCIAL GRADE CONCRETE (CGC) PER 2002 ODOT/OREGON APWA SECTION 00440.00
2. SUBGRADE AND BASE SHALL BE UNYIELDING AND FIRMLY COMPACTED.
3. VALLEY GUTTER SHALL PASS A WATER TEST TO ASSURE FLOW.



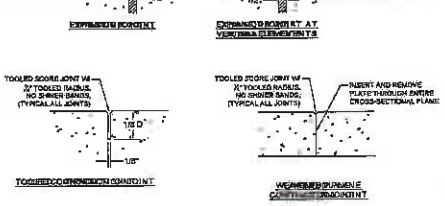
391 WHEEL STOP
SCALE: NTS

305 CURB TAPER
SCALE: NTS

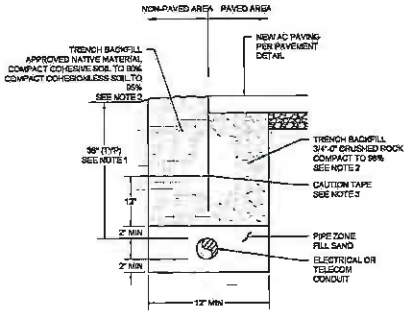


311 CURB LINE CONCRETE SIDEWALK
SCALE: NTS

NOTES
1. COMPACT SUBGRADE AND AGGREGATE TO 95% OF MAXIMUM DRY DENSITY.
2. FINISH SHALL BE MEDIUM BROOM PERPENDICULAR TO PEDESTRIAN TRAFFIC UNLESS OTHERWISE DIRECTED.
3. CROSS SLOPE OF SIDEWALK SHALL BE 2% AWAY FROM THE BUILDING.
4. SEE CONCRETE CONTROL JOINT DETAIL ON THIS SHEET.

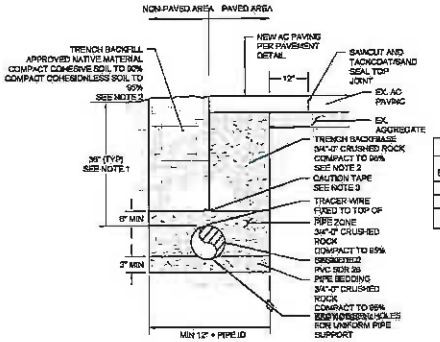


309 CONCRETE CONTROL JOINTS
SCALE: NTS



583 CONDUIT TRENCH DETAIL
SCALE: NTS

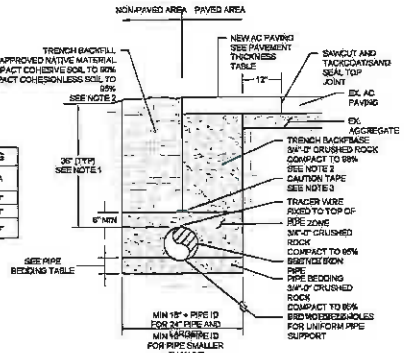
NOTES
1. COVER OVER PIPE MAY VARY FROM 24" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 1557 MAXIMUM DRY DENSITY.
3. ELECTRIC: 6" WIDE RED POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED ELECTRIC BELOW" TELECOM: 3" WIDE ORANGE POLYETHYLENE TAPE IMPRINTED "CAUTION: COMMUNICATIONS LINE BURIED BELOW"



PIPE BEDDING	
PIPE DIAMETER (D)	A
LESS THAN 4"	3"
4" THRU 12"	4"
GREATER THAN 12"	6"

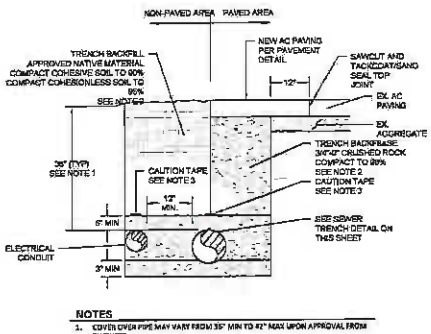
581 SEWER TRENCH DETAIL
SCALE: NTS

NOTES
1. COVER OVER PIPE MAY VARY FROM 36" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 1557 MAXIMUM DRY DENSITY.
3. SEWER: 3" WIDE GREEN POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED SEWER LINE BELOW"



580 WATER TRENCH DETAIL
SCALE: NTS

NOTES
1. COVER OVER PIPE MAY VARY FROM 36" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 1557 MAXIMUM DRY DENSITY.
3. 2" WIDE BLUE POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED WATER LINE BELOW"



584 JOINT TRENCH DETAIL
SCALE: NTS

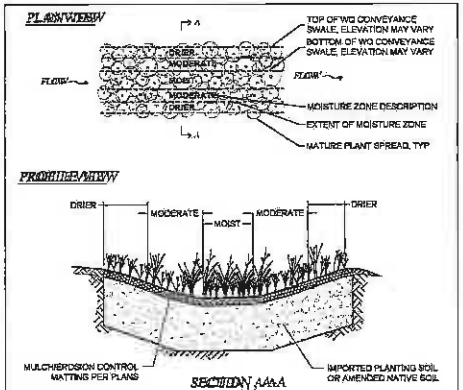
NOTES
1. COVER OVER PIPE MAY VARY FROM 36" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 1557 MAXIMUM DRY DENSITY.
3. ELECTRIC 6" WIDE RED POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED ELECTRIC BELOW"
SEWER: 3" WIDE GREEN POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED SEWER LINE BELOW"

EMC | Engineering Consultants, LLC
Grants Pass • Jacksonville • Medford, OR
Ph: 541-476-0429 • Fax: 541-471-7116
- Engineers/Scientists, LLC in Medford, Oregon -

PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OREGON 97415
HMGP DR4-4052
2020 IMPROVEMENTS

DRAWN BY: TAM
DATE: 09/01/20
JOB NO: 20-XXX

C105
PROJECT DETAILS



LEGEND:
- —— INDICATES GRADE BREAK
- ---- MOISTURE ZONE

PLANT SPECIES APPROPRIATE FOR MOISTURE ZONE:
- (D) DRIER
- (M) MODERATE
- (MS) MOIST

NOTES:
1. THIS DETAIL IS PROVIDED AS A SCHEMATIC EXAMPLE OF THE RANDOM PLANT PLACEMENT AND 90% COVERAGE AFTER ESTABLISHMENT PERIOD DESIRED TO REDUCE EROSION AND WEEDS.
2. INSTALL PLANTS PER PLANS, ACCORDING TO LANDSCAPE DESIGN PLANT TABLE, WHICH SHOULD INCLUDE PLANT SPECIES, SPACING, AND QUANTITIES IN EACH MOISTURE ZONE.
3. MOISTURE ZONES VARY FROM THOSE SHOWN DEPENDING ON GRADING PLAN, LOCATION OF INLET(S) AND OUTLET(S) AND FACILITY SHAPE.

Rogue Valley Stormwater Design Manual	Water Quality Conveyance Swale Planting Schematic	BMP 8.03 1 of 1 Scale: NTS

General Notes for Vegetated BMPs

1. Excluding construction of the facility itself, compact treatment area subgrade shall be fenced to prohibit impacts from construction (including materials and equipment storage).
2. Build and operate swale as early as possible to establish plantings before directing stormwater runoff to it or divert stormwater around facility. Preferably, vegetation will be given a minimum of 3 months to become established, or per jurisdictional requirements.
3. Call the following agency (hours in advance of construction so construction observation may be performed to identify variations in the field that may affect design and verify proper construction.
4. Over-excavate within the swale to allow for placement of amended or imported soil up to final grade.
5. Placement of amended native or imported soil mix shall occur as follows:
   a. Place soil in 6 inch maximum lifts (no footing).
   b. Do not place if soil is saturated.
   c. Lightly compact each lift, (e.g., a water filled footing roller) to achieve 85% compaction. Do not compact with heavy machinery or vibratory compaction.
6. Install energy dissipation below all outfalls per approved plans.
7. If impermeable soil has been exposed to rainfall, scarify the surface to a depth of 4 inches to restore filtration capacity.
8. Install CDOT Type II erosion control matting, if specified in approved plans.
9. Landscaping plan must adhere to one of the alternatives in Tables 1 and 2 of Section 4.5.2. Plant per Landscaping plans and standards detail 4.5.2C. Contact approving jurisdiction 48 hours in advance of planting so that jurisdiction can review plant placement prior to plant installation.
10. Weed control, if specified in approved plans. Use either pre-applied weed preventer or coarse compost. Mulch must be free from weeds, seeds, and weed parts. Spread to a minimum two inch layer over bare soil or in a ring around plants to reserve water retention. Ensure that mulch does not cover plant stems.
11. Side slopes outside of flow area must be permanently stabilized with mulch and vegetation.

AMENDED PLANTING SOIL MIX SPECIFICATIONS:

1. Planting soil may be either amended native or imported soil mix with the following characteristics:
   A. Infiltration between 0.5 and 12 inches/hour,
   B. Be free of weed seeds, rocks/cobbles, and hazardous materials.
   C. Organic content shall be from 5-10% by weight.
   D. Cation-exchange capacity (CEC) greater than or equal to 5 milliequivalents/100 grams of dry soil
   E. 2-5% clay by free content
   F. pH between 5.5 and 8.0
   G. Conform to the following gradation for the mix:

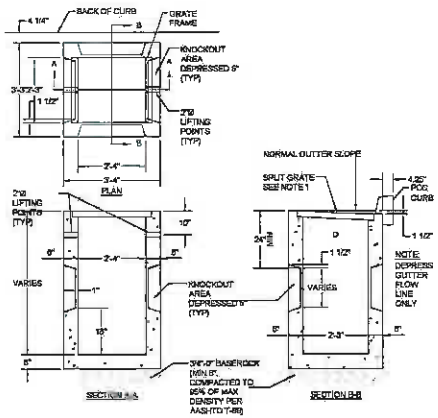
US Standard Sieve Size	Percent Passing
3/8"	100
#4	95-100
#16	70-90
#50	40-70
#100	20-40
#200	2-5

2. Imported soil shall be roughly 1/3 plant derived compost, 1/3 topsoil and 1/3 gravelly sand.
3. Amended native planting soil mix shall be created by blending composted bio-fine native soil at a rate of 1 part compost to two parts soil. Soil mix shall meet the specifications in Note 1 above.
4. Amended native or imported soil mix shall be uniformly mixed.

Compost specification:

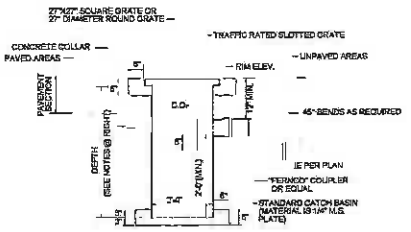
Shall be derived from plant material and fully composted, must be certified weed seed free, A Technical Data Sheet from the US Composting Council Seal of Testing Assurance must be provided to the governing jurisdiction. The Data Sheet must show that the compost meets the following criteria:

- Organic matter content between 45 and 55 percent.
- pH between 6.5 and 8.0. If the pH isn't quite right, it may be lowered by adding iron sulfate and sulfur or raised by adding lime. If lime is used, make certain that into the compost, not the compost alone, and then blend mixture into the soil.
- Soluble salt content shall be less than 6.0mmhos/cm.
- 100% should pass a 1/2-inch screen.
- Stability Test Result shall be Stable or Very Stable.
- Maturity indicator for germination and vigor shall be ≥ 80%.
- Trace Metals Test Result shall be Pass.
- Carbon: Nitrogen ratio between 25:1 and 35:1.



NOTES
1. GRATE AND FRAME MAY EACH BE OF CAST IRON OR WELDED STEEL CONSTRUCTION. GRATE AND FRAME TO BE ODOT CL-2 TYPE 2 (BICYCLE SAFE).
2. FOR PRECAST BOX, CURB MUST BE HAND FORMED 10' EACH SIDE OF CATCH BASIN.
3. CONCRETE STRENGTH SHALL BE 5000 PSI WITH FIBER MESH.
4. CATCH BASIN AND GRATE SHALL MEET H520 LOADING.
5. A MINIMUM SUMP DEPTH OF 18" IS REQUIRED.
6. OUTLET PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

2 C6.1 CATCH BASIN
SCALE: NTS

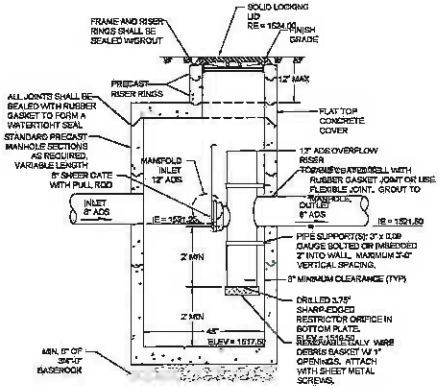


*NOTE: LYNCH OR APPROVED EQUAL CATCH BASIN.

*NOTE: LOCATE ROUND BASIN IN PAVED AREAS, AND SQUARE BASINS ARE TO BE USED WHEN LOCATED NEXT TO CURB.

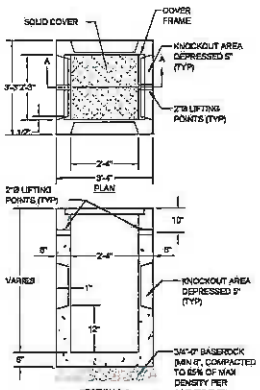
GENERAL NOTES:
1. ASPHALT COAT ALL SURFACES OF CATCH BASIN AND CLEANOUT AFTER WELDING OR HOT DIP GALVANIZE (AT MANUFACTURER'S DISCRETION)
2. BREAK SHARP CORNERS AFTER WELDING.
3. ALL WELDED STEEL CONSTRUCTION
4. 10 GAUGE STEEL MINIMUM THICKNESS
5. OPENING ON BOTTOM OF WATERSEAL TO BE GREATER, OR EQUAL TO AREA IN OUTLET PIPE.
6. STANDARD DEPTH: 48"

3 C6.1 LYNCH STYLE CATCH BASIN
SCALE: NTS



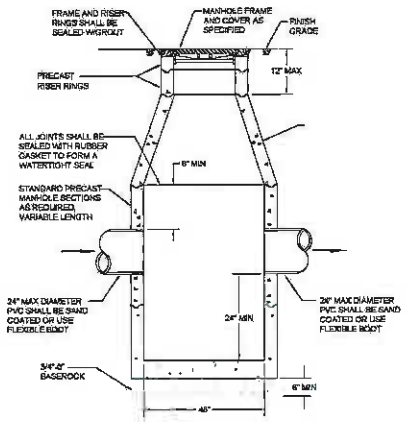
NOTE
ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C 478.

4 C6.1 CONTROL STRUCTURE MANHOLE
SCALE: NTS (PONDS 2 & 3)



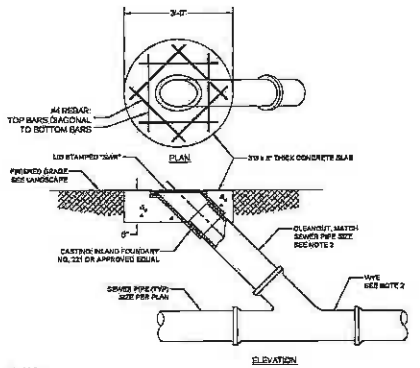
CONSTRUCTION NOTES:
1. COVER AND FRAME MAY EACH BE OF CAST IRON OR WELDED STEEL CONSTRUCTION.
2. CONCRETE STRENGTH SHALL BE 5000 PSI WITH FIBER MESH.
3. JUNCTION BASIN AND GRATE SHALL MEET H520 LOADING.
4. A MINIMUM SUMP DEPTH OF 18" IS REQUIRED.
5. OUTLET PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

6 C6.1 JUNCTION BASIN
SCALE: NTS



NOTE
ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C 478.

7 C6.1 48" STORM MANHOLE
SCALE: NTS



NOTES:
1. CONCRETE TO BE COMMERCIAL GRADE CONCRETE (CGC) PER 2015 ODOT STANDARD SPECIFICATIONS SECTION 00440. MINIMUM 3500 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
2. FITTINGS AND PIPE TO BE GASKETED PVC-SDR 35.

5 C6.1 TYPICAL CLEANOUT
SCALE: NTS

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Engineering/Surveying, LLC (a Michigan Professional Corporation)

PORT OF BROOKINGS HARBOR
1 BOAT BASIN DRIVE, BROOKINGS, OREGON 97415
HARBOR DRIVE AREA
2020 IMPROVEMENTS

DRAWN BY: TAM
DATE: 09/01/20
JOB NO: 20-XXX

C106
PROJECT DETAILS

191

PORT OF BROOKINGS HARBOR

BOAT YARD PAVING

16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415

DRAWN BY:	JS
DATE:	26 JAN 2021
JOB No:	#
SHEET No:	C1.0 COVER SHEET

EMC
Engineering & Scientific, LLC
Crown Pass • Jacksonville • Medford, OR
Phone (541) 423-7023 • Fax 541-772-2028

VICINITY MAP

NO SCALE

GRADING NOTES

1. PRIOR TO THE CONSTRUCTION OF EMBANKMENTS, THE CONTRACTOR SHALL EXCAVATE UNSUITABLE FOUNDATION MATERIAL, BASEMENTS, TRENCHES AND HOLES ENCOUNTERED WITHIN THE LIMITS OF THE EMBANKMENT FOUNDATION AREA. ALL ORGANIC MATERIAL RESULTING FROM CLEARING AND GRUBBING OPERATIONS SHALL BE DISPOSED OF IN A MANNER SATISFACTORY TO THE ENGINEER. AFTER REMOVAL OF PAVEMENT AND BASE COURSE MATERIALS, CONCRETE FLOORS, FOUNDATIONS, AND UNDERGROUND UTILITIES, THE CONTRACTOR SHALL BREAK UP AND REMOVE THE GROUND SURFACE BENEATH EMBANKMENTS TO EXPOSE SUITABLE MATERIAL. ALL SUCH EXCAVATED MATERIALS SHALL BE DISPOSED OF AS DIRECTED BY THE ENGINEER. EXCAVATION OF UNSUITABLE MATERIALS TO BE PLACED UNDER EMBANKMENTS SHALL BE MADE TO A MINIMUM DEPTH OF 2 FEET BELOW THE NATURAL GROUND SURFACE, AND TO SUCH GREATER DEPTH AS MAY BE DIRECTED BY THE ENGINEER. EXCAVATED MATERIALS TO BE PLACED IN THE EMBANKMENT SHALL BE FREE OF TRASH, DEBRIS, ROOTS, AND OTHER DELETERIOUS MATERIAL AND SHALL CONTAIN NO ROCK OR SIMILAR HARD MATERIAL LARGER THAN 6 INCHES IN DEPTH OF THE COMPACTED LAYER, OR A MINIMUM OF 6 INCHES.
2. EMBANKMENT CONSTRUCTION SHALL INCLUDE PREPARATION OF APPROVED EMBANKMENT MATERIALS AND FILLING OF HOLES, PITS AND OTHER DEPRESSIONS WITHIN THE SUBDIVISION.
3. THE CONTRACTOR SHALL PLACE EMBANKMENTS AND FILLS IN THE HORIZONTAL LAYERS OF 6 INCHES OR LESS IN LOOSE DEPTH BEFORE COMPACTION, AND SHALL DISC OR BLEND EACH EMBANKMENT SHALL NOT BE CONSTRUCTED WHEN THE EMBANKMENT MATERIAL ON THE FOUNDATION OR UPON THE EMBANKMENT WOULD BE PUDDLED OR FROZEN.
4. THE CONTRACTOR SHALL CONSTRUCT EMBANKMENTS TO THE LINES, GRADES, AND CROSS SECTIONS SHOWN ON THE PLANS OR STAKED BY THE ENGINEER. THE CONTRACTOR SHALL PLACE AND COMPACT THE EMBANKMENT MATERIAL ON THE ENTIRE WORK AREA OF DEBRIS, AND FOREIGN MATTER.
5. THE MAXIMUM DENSITY OF COMPACTED MATERIAL SHALL BE DETERMINED BY AASHTO T-99.
6. THE CONTRACTOR SHALL COMPACT ALL EMBANKMENTS, TELLS AND SHOULDERS TO A MINIMUM IN PLACE DENSITY OF 95 PERCENT.
7. THE CONTRACTOR SHALL WATER THE MATERIALS TO PROVIDE OPTIMUM MOISTURE FOR COMPACTION. THE CONTRACTOR SHALL ADD WATER UNIFORMLY TO ALL MATERIALS SHALL NOT BE PLACED IN FINAL POSITION UNTIL MOISTURE IN EXCESS OF OPTIMUM MOISTURE HAS BEEN REMOVED.
8. IF THE REQUIRED DEGREE OF COMPACTION IS NOT OBTAINED, THE CONTRACTOR SHALL MODIFY THE EQUIPMENT, THE COMPACTIVE EFFORT, OR THE METHOD OF OPERATION AS NECESSARY TO OBTAIN THE REQUIRED COMPACTION. THE CONTRACTOR MAY BE REQUIRED TO USE A MODIFIED COMPACTION PROCEDURE ON AREAS OF LIMITED ACCESS.
9. ADDITIONAL COMPACTIVE EFFORT, IF APPROVED MATERIALS MEETING THE SPECIFICATIONS CANNOT BE COMPACTED TO THE REQUIRED DENSITY OR IF MOISTURE CONTENT CANNOT BE CONTROLLED TO WITHIN REQUIRED LIMITS OF DIRECT THE ALTERNATE MATERIALS BE USED, IN NO CASE SHALL EARTHWORK OPERATIONS PROCEED UNTIL THE CONTRACTOR IS BACK TO COMPACT THE MATERIAL TO THE SATISFACTION OF THE ENGINEER.
10. ZERO TO 2 FOOT SETTLEMENT IS REQUIRED.
11. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE OF IN A LEGAL MANNER. BURNING OF MATERIAL IS NOT PERMITTED.
12. WHEN THE SHIPPING AND TESTING OF MATERIALS FOR USE ON THE JOB SITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE ENGINEER. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR (IF THE LABORATORY) LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
13. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1.

GEOTECHNICAL NOTE

THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE PROJECT ENGINEER FOR REQUIRED SITE OBSERVATIONS AND TESTING OF ALL FILLS.

SHEET INDEX

SURVEY BY
ROBERTS & ASSOCIATES LAND SURVEYING, INC.
511 SPRUCE STREET
BROOKINGS, OR 97415
(541)469-0102

HORIZONTAL DATUM
OREGON COORDINATE REFERENCE SYSTEM (OREGON COAST ZONE) AS DEFINED IN OREGON ADMINISTRATIVE RULES 734-020-0035 THRU 734-020-0015. COORDINATES WERE CONSTRAINED TO THE OREGON REAL-TIME GPS (GPS) REFERENCE NETWORK (ORGN) REFERENCED TO NAD 83(2011) EPOCH 2010, INTERNATIONAL FEET, WITH A RELATIVE ACCURACY OF <2cm.

VERTICAL DATUM
MEAN LOWER LOW WATER EPOCH 1983-2001.
BENCH MARK UTILIZED FOR THIS SURVEY
US ARMY CORPS OF ENGINEERS
BENCH MARK - "FUEL 2"
ELEVATION - 21.85 FEET

0 15 30 60
SCALE: 1" = 30'

EXISTING CONDITIONS
SCALE: 1" = 30' (24x36)

NORTH

REVISIONS	BY

EMC
Ernest Fees • Jacksonville • Medford, OR
CF Office: 1482 Williams Hwy., Suite 216, Grants Pass, OR 97527
Jville Office: 434 Dunaway Rd., Jacksonville, OR, 97530
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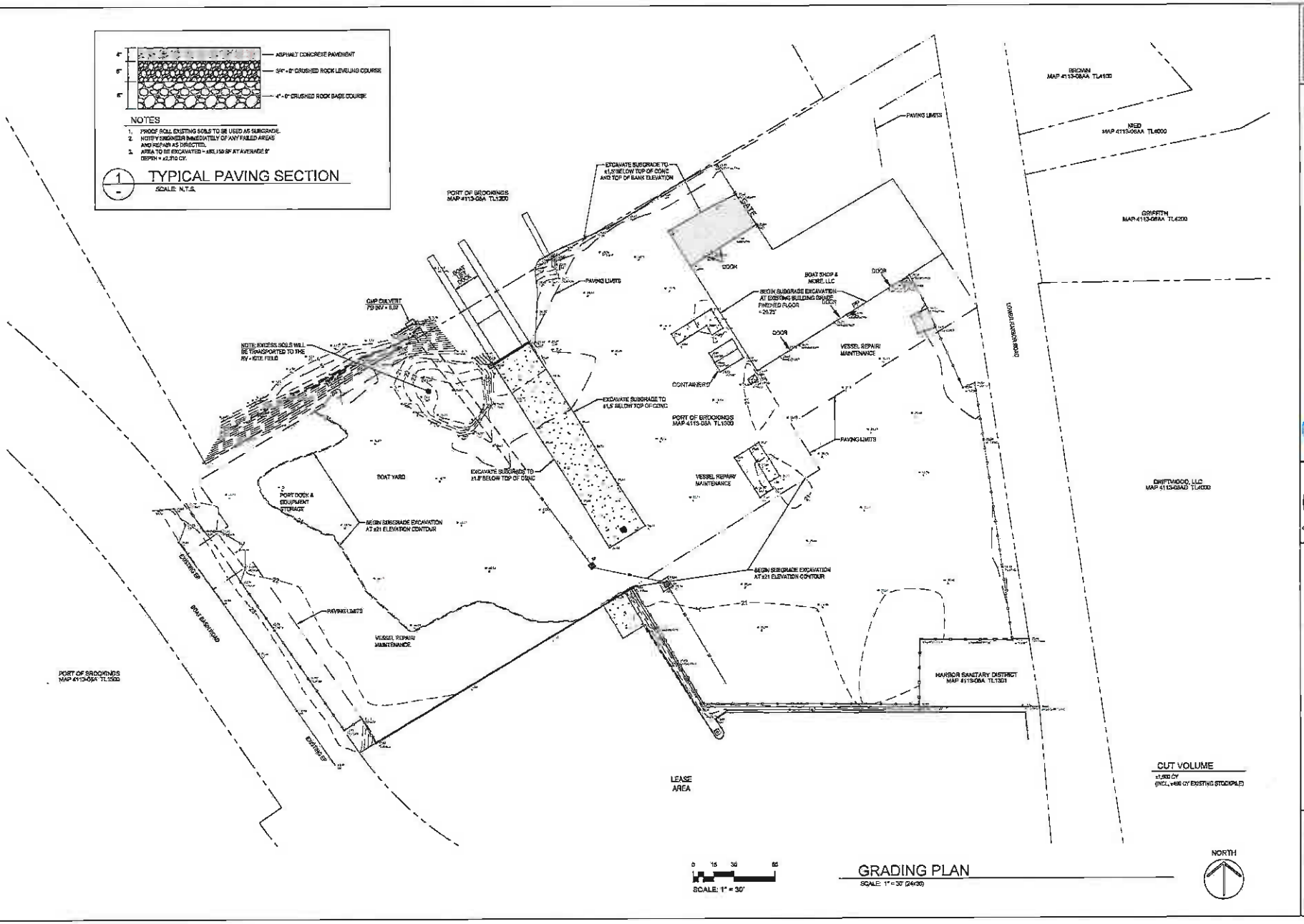
info@ernestmcclain.com www.ernestmcclain.com
- Engineers/Scientists, LLC -

PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY:	JG
DATE:	26 JAN 2021
JOB No:	#
SHEET No:	C2.0
	EXISTING CONDITIONS

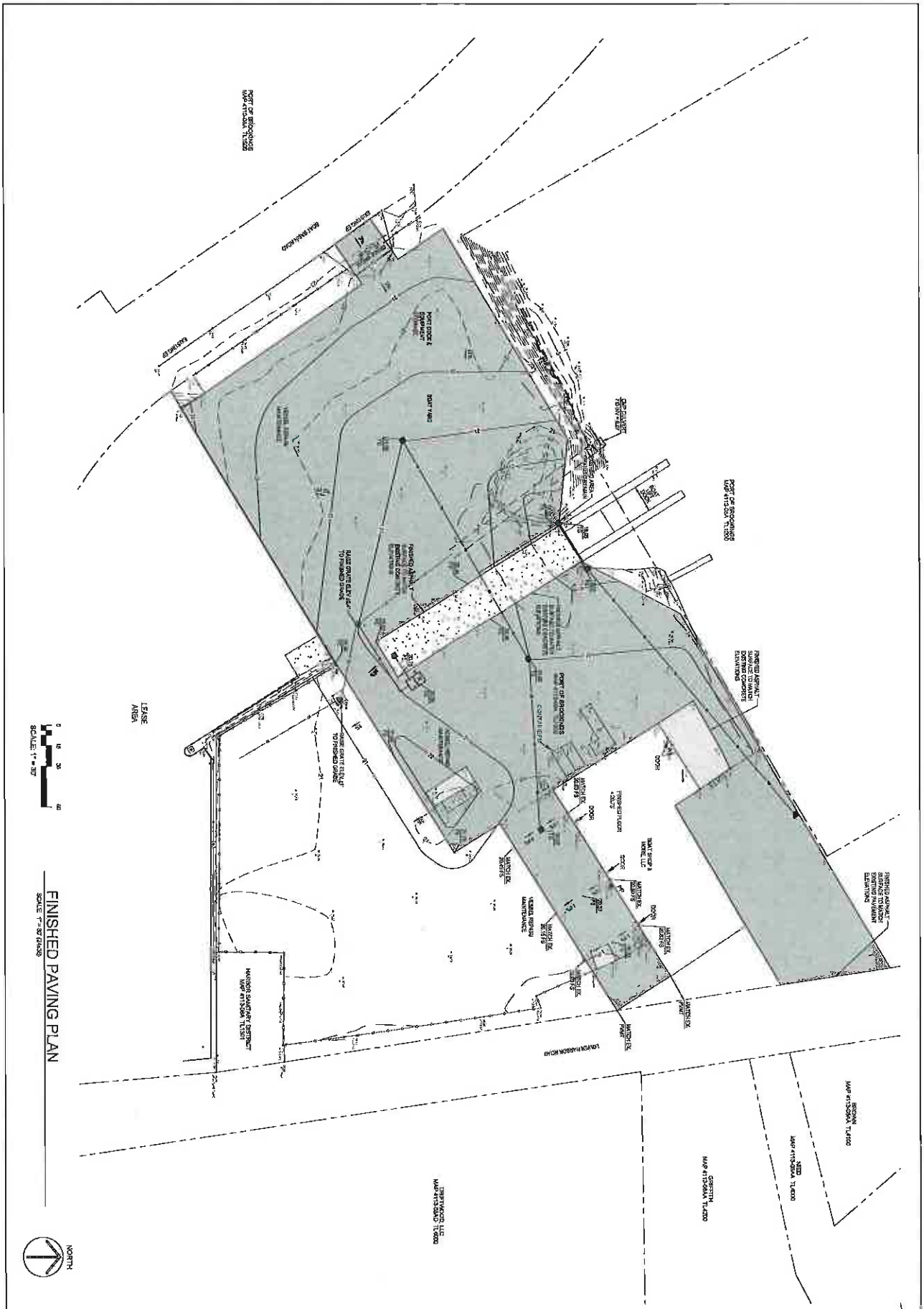


EMC
Civil • Structural • Land Development
Crescent Pass • Jacksonville • Medford, OR
- Engineers/Scientists, LLC -

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 14, 2003
JOHN GOETZ
RENEWAL DATE: 12/31/21

PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY: JG
DATE: 26 JAN 2021
JOB No: a
SHEET No:
C2.1
GRADING PLAN



FINISHED PAVING PLAN
SCALE: 1" = 30' (24x36)

FINISHED PAVING PLAN	C2.2
SHEET No:	8
JOB No:	
DATE:	26 JAN 2021
DRAWN BY:	JG

PORT OF BROOKINGS HARBOR

16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415

BOAT YARD PAVING

REGISTERED PROFESSIONAL ENGINEER — OREGON — JEFFREY A. GOLLEHON — RENEWAL DATE: 12/31/21

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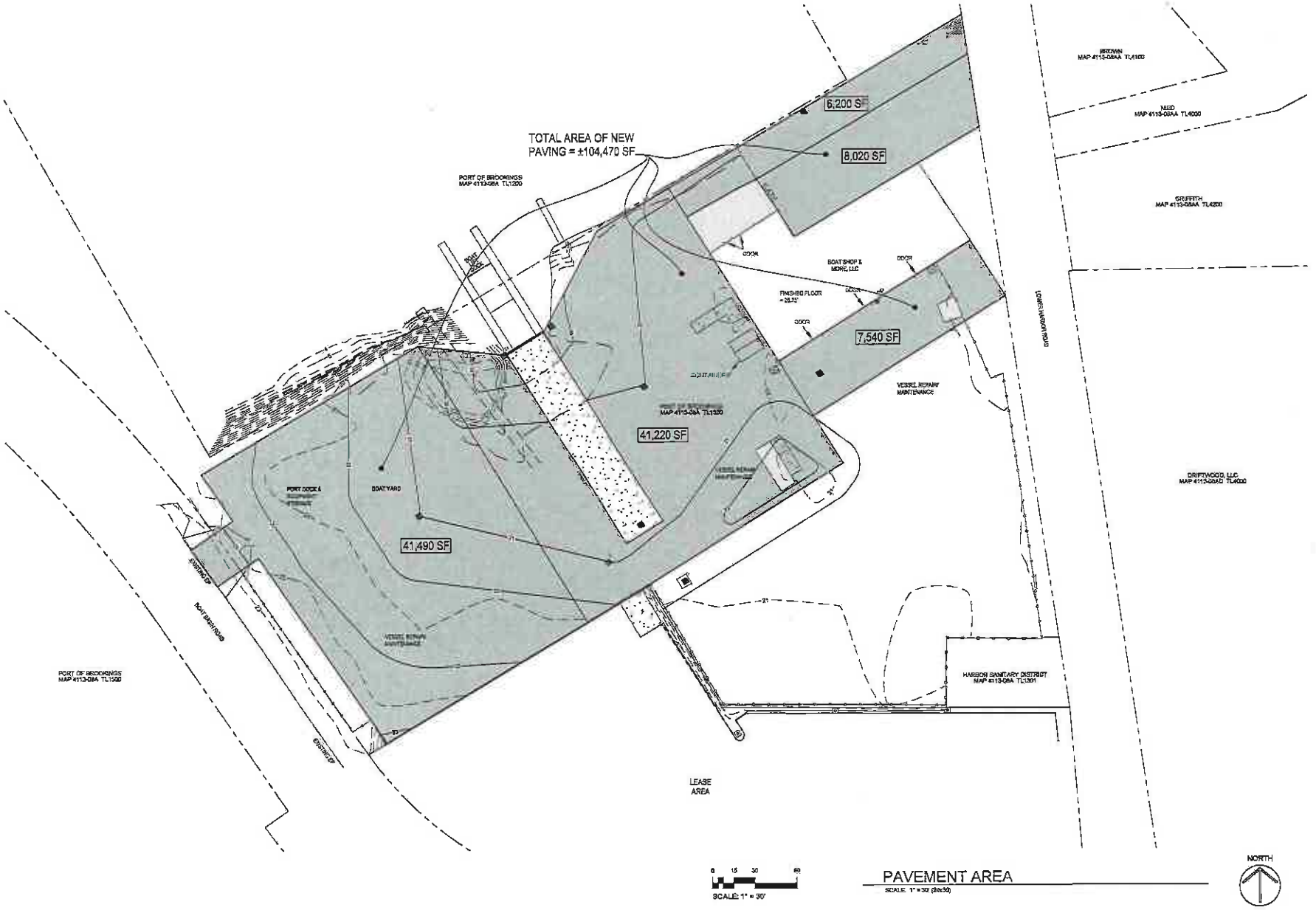
REVISIONS	BY



Civil • Structural • Marine
Coastal Office: 888 Willamette St., Suite 500, Eugene, OR 97401
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Email: info@emcengr.com
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Phone: 541-779-0578 • Fax: 541-779-0579
Email: info@emcengr.com
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Engineers/Scientists, LLC

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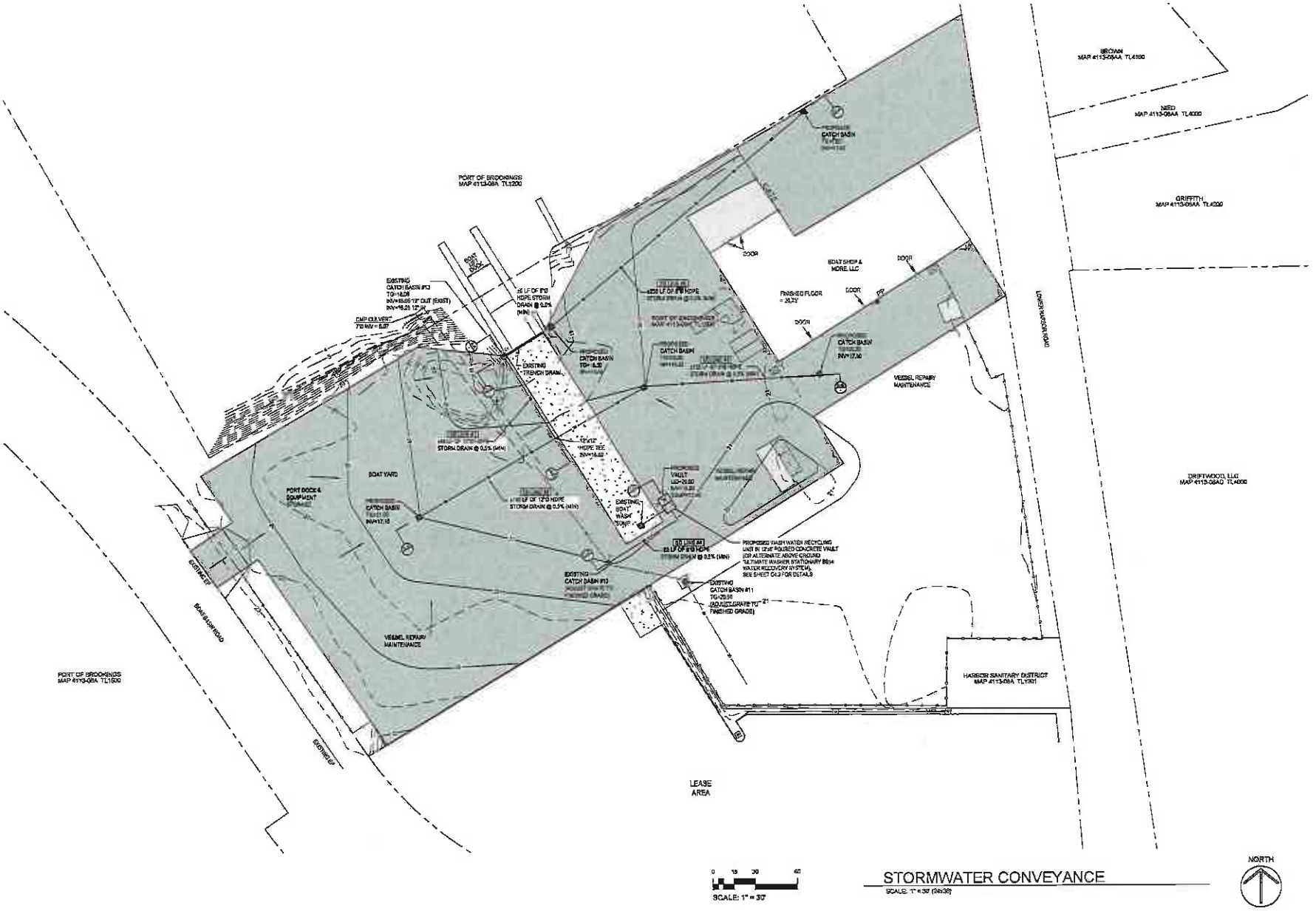
PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY:	JG
DATE:	28 JAN 2021
JOB No:	#
SHEET No:	C3.0
	PAVEMENT AREAS



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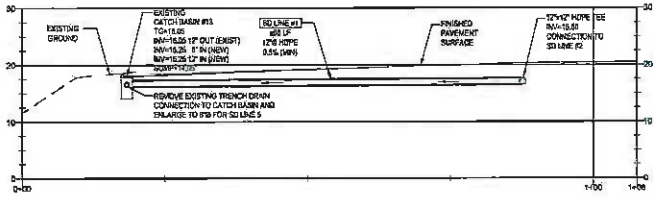
PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

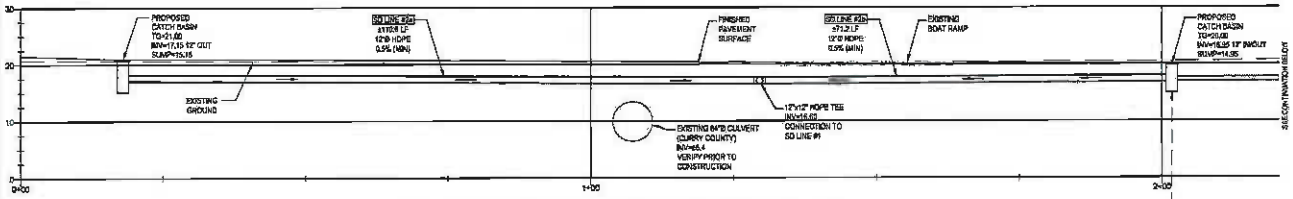
DRAWN BY:	JG
DATE:	28 JAN 2021
JOB No:	#
SHEET No:	C4.0
	STORMWATER CONVEYANCE

200



A-A — STORMDRAIN LINE 1 - PROFILE "A - A"

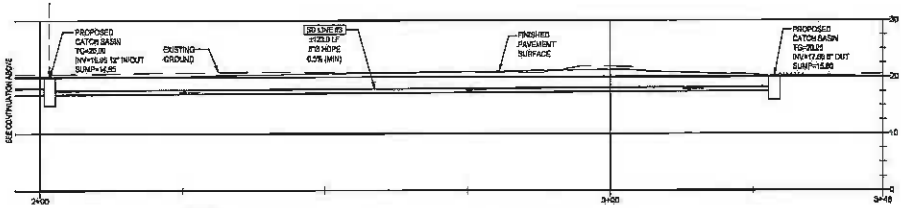
SCALE: 1" = 10' (H & V)



B-B — STORMDRAIN LINE 2 - PROFILE "B - B"

SCALE: 1" = 10' (H & V)

SAME CATCH BASIN



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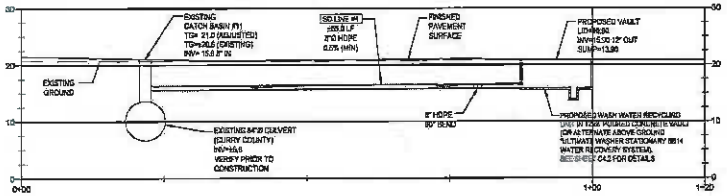
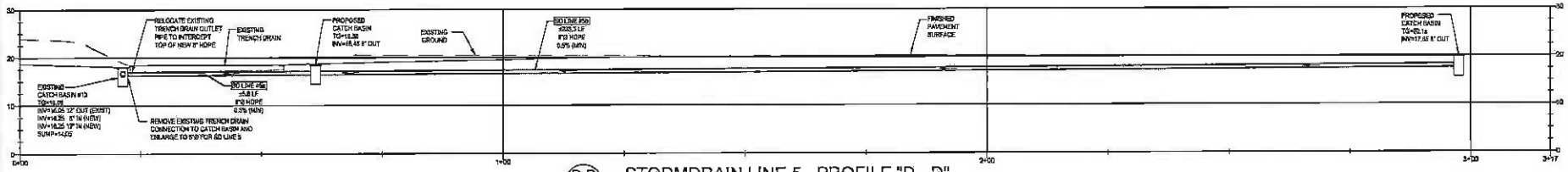


C-C — STORMDRAIN LINE 4 - PROFILE "C - C"

SCALE: 1" = 10' (H & V)



D-D — STORMDRAIN LINE 5 - PROFILE "D - D"

SCALE: 1" = 10' (H & V)

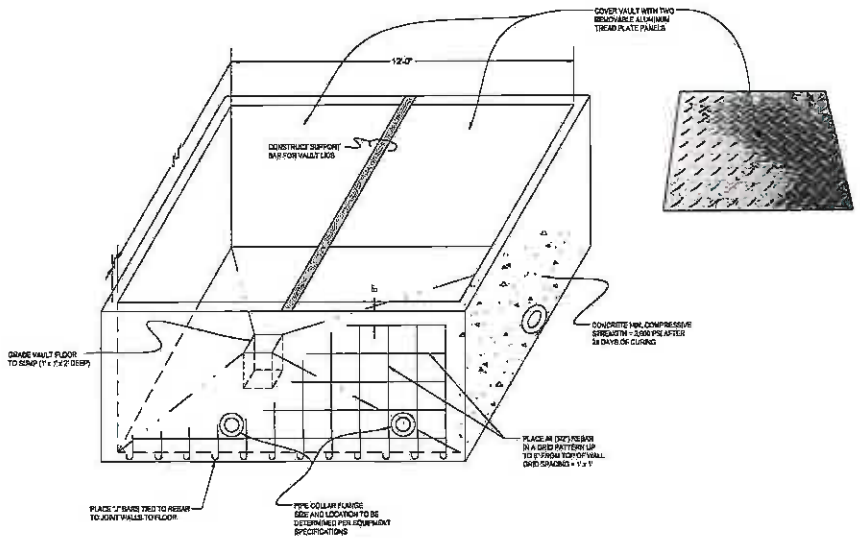
EMC
Engineers/Scientists, LLC
Grants Pass • Jacksonville • Medford, OR
Corvallis • Bend • Klamath Falls • Grants Pass, OR 97526
Ph: 541-474-3669 • Fax: 541-956-7523

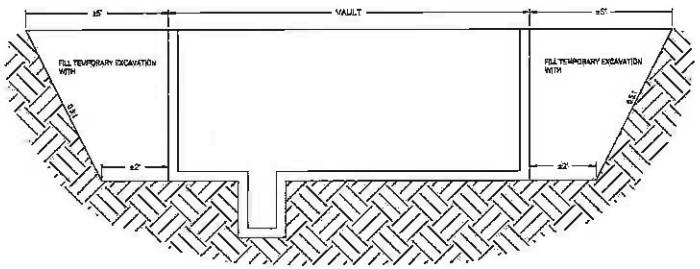
PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY: JG
DATE: 26 JAN 2021
JOB No: 6

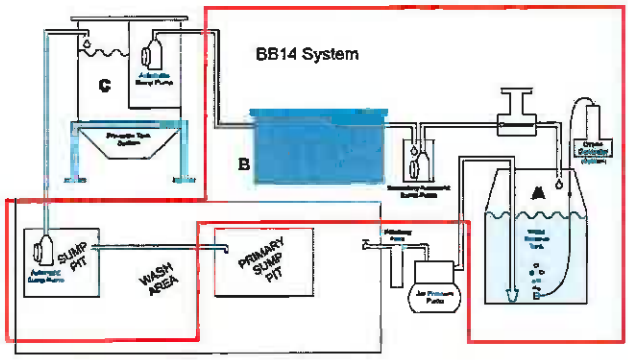
SHEET No:
C4.1
STORMDRAIN PROFILES

102





1 PRELIMINARY WASHWATER RECYCLING VAULT
SCALE: N.T.S.



ULTIMATE WASHER STATIONARY BB14 WATER RECOVERY SYSTEM

SPECIFICATIONS
- FILTERS ARE REACHABLE FROM OUTSIDE
- 3/4 HP ELECTRIC MOTOR, 110V, 9 AMP
- TWO 20" POLISHING FILTERS
- OIL/EMULSION ATTRACTING COALESCING PLATES
- REUSABLE OIL FILTERING FOAM MEDIA
- OIL ABSORPTION SKIMMER MEDIA
- WASHABLE OIL PLATES
- POLYETHYLENE HOUSING
- AUTO PUMP OUT SYSTEM
- 1 YEAR WARRANTY
- 25 AND 5 MICRON FILTERS
- WEIGHT, 200 LBS
- 220 GALLON RESERVE WATER TANK WITH 6" MANWAY ACCESS AND STAND
- IN-LINE CHLORINATOR
- AUTOMATIC OPERATION
- SUPPLY PUMP W/CHECK VALVE (110V/9A)
- SAFETY INSTRUCTION AND MAINTENANCE SCHEDULE

2 ALTERNATE ABOVE-GROUND WASHWATER RECYCLING UNIT
SCALE: N.T.S.

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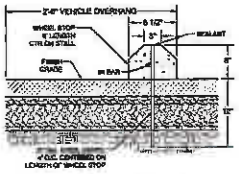
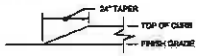
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY: JG
DATE: 28 JAN 2021
JOB No: #
SHEET No: C4.2
WASHWATER RECYCLING DETAILS

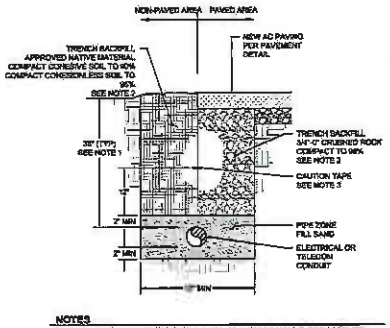
202



391 **WHEEL STOP**
SCALE: NTS

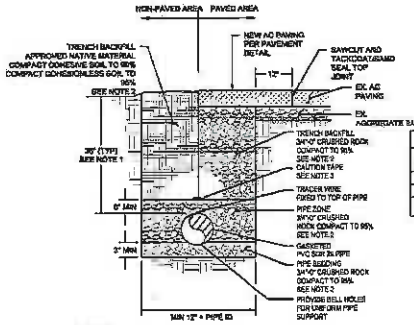


305 **CURB TAPER**
SCALE: NTS



NOTES
1. COVER OVER PIPE MAY VARY FROM 24" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 1557 MAXIMUM DRY DENSITY.
3. ELECTRIC: 6" WIDE RED POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED ELECTRIC BELOW" TELECOM: 3" WIDE ORANGE POLYETHYLENE TAPE IMPRINTED "CAUTION: COMMUNICATIONS LINE BURIED BELOW"

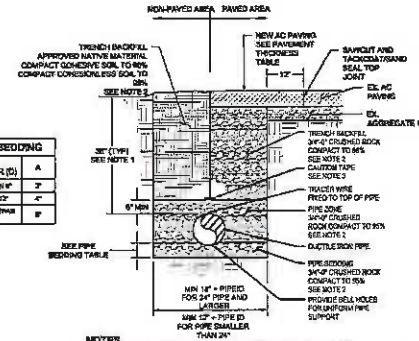
583 **CONDUIT TRENCH DETAIL**
SCALE: NTS



PIPE BEDDING	
PIPE DIAMETER (D)	A
LESS THAN 6"	3"
6" THRU 12"	4"
GREATER THAN 12"	6"

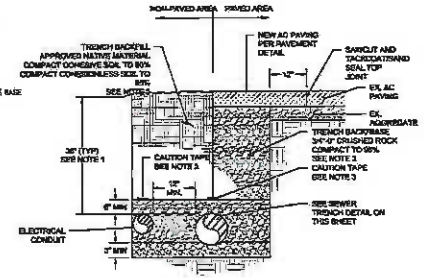
NOTES
1. COVER OVER PIPE MAY VARY FROM 36" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 1557 MAXIMUM DRY DENSITY.
3. UTAPE: 3" WIDE GREEN POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED SEWER LINE BELOW"

581 **SEWER TRENCH DETAIL**
SCALE: NTS



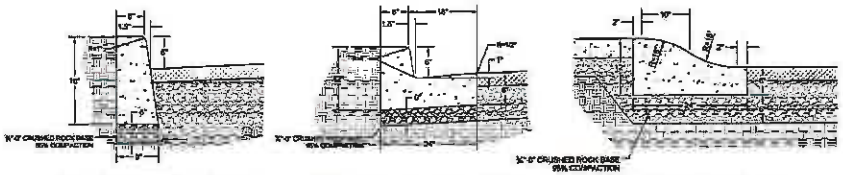
NOTES
1. COVER OVER PIPE MAY VARY FROM 36" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 1557 MAXIMUM DRY DENSITY.
3. 2" WIDE BLUE POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED WATER LINE BELOW"

580 **WATER TRENCH DETAIL**
SCALE: NTS



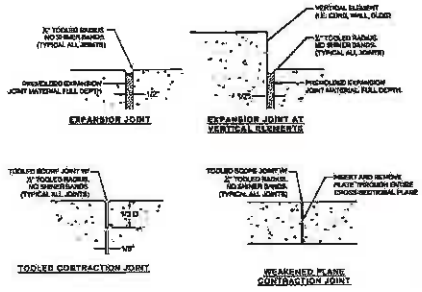
NOTES
1. COVER OVER PIPE MAY VARY FROM 36" MIN TO 42" MAX UPON APPROVAL FROM ENGINEER.
2. REQUIRED COMPACTION ACCORDING TO ASTM D 1557 MAXIMUM DRY DENSITY.
3. ELECTRIC: 6" WIDE RED POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED ELECTRIC BELOW" SEWER: 3" WIDE GREEN POLYETHYLENE TAPE IMPRINTED "CAUTION: BURIED SEWER LINE BELOW"

584 **JOINT TRENCH DETAIL**
SCALE: NTS

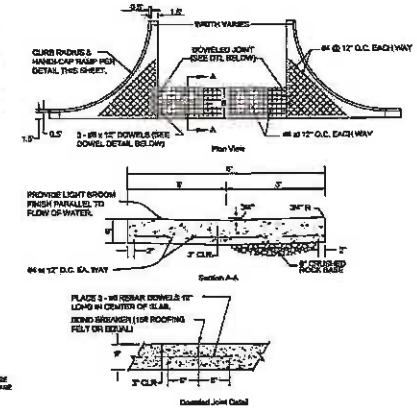


311 **CURB LINE CONCRETE SIDEWALK**
SCALE: NTS

NOTES
1. COMPACT SUBGRADE AND AGGREGATE TO 95% OF MAXIMUM DRY DENSITY.
2. FINISH SHALL BE MEDIUM BROOM PERPENDICULAR TO PEDESTRIAN TRAFFIC UNLESS OTHERWISE DIRECTED.
3. CROSS SLOPE OF SIDEWALK SHALL BE 2% AWAY FROM THE BUILDING.
4. SEE CONCRETE CONTROL JOINT DETAIL ON THIS SHEET.



308 **CONCRETE CONTROL JOINTS**
SCALE: NTS



NOTES
1. CONCRETE TO BE COMMERCIAL GRADE CONCRETE (CGC) PER 2023 ODOT/APWA OREGON APWA SECTION 00440.00
2. SUBGRADE AND BASE SHALL BE UNYIELDING AND FIRMLY COMPACTED.
3. VALLEY GUTTER SHALL PASS A WATER TEST TO ASSURE FLOW.

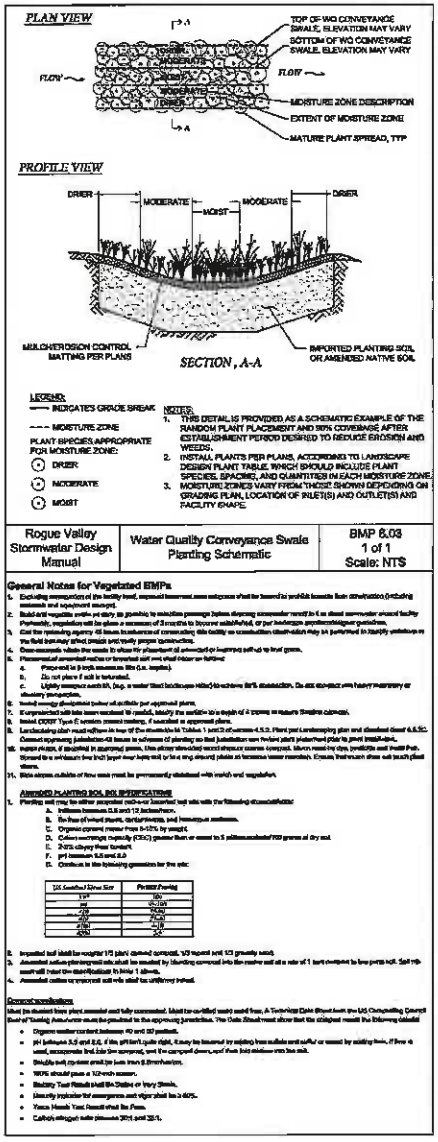
327 **DRIVEWAY APRON WITH VALLEY GUTTER**
SCALE: NTS

EMC
Grants Pass • Jacksonville • Medford, OR
Engineers/Surveyors, LLC

REVISIONS

PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY:	JC
DATE:	26 JAN 2021
JOB No:	
SHEET No:	C6.0
	PROJECT DETAILS



Rogue Valley Stormwater Design Manual	Water Quality Conveyance Swale Planting Schematic	BMP 6.03 1 of 1 Scale: NTS

General Notes for Vegetated BMPs

1. Excluding components of the facility itself, exposed basement soils contiguous shall be treated to prohibit weeds from germination (including materials and equipment storage).
2. Build and vegetate swales as quickly as possible to minimize passage failure exposing stormwater runoff to it or about stormwater around facility. Particularly, vegetation will be given a minimum of 3 months to become established, or per landscape architect/designer guidelines.
3. Get the reviewing agency 48 hours in advance of construction; this facility or construction sheet which may be performed to identify problems or the field team may attend periodic and weekly progress construction.
4. Commercially viable the seeds to allow for placement of selected or beginning soil up to level grade.
5. Placement of amended media or imported soil area shall occur as follows:
   a. Place soil in 3 inch maximum lifts (i.e. angles).
   b. Do not place if soil is saturated.
   c. Lightly compact each lift, (e.g., a water filled landscape roller) to achieve 85% compaction. Do not compact with heavy machinery or excessive compaction.
6. Install energy dissipation below all outfalls per approved plans.
7. If unprotected soil lots were created 10 months, identify the surface to a depth of 4 inches or mature Surface cultivate.
8. Install COOT Type C erosion control matting, if specified or approved plans.
9. Landscaping shall meet uniform in lieu of the standards in Table 1 and 2 of sections 4.5.2. Plant per Landscaping plan and standard Sheet 4.5.2. Correct improving jurisdiction 48 hours in advance of planting so that jurisdiction can review plant selection prior to plant installation.
10. Inspect weeds, if identified in approved areas, then shall be removed and replaced as needed. Mulch materials (bio, synthetic and Plant Pak. Spread to a minimum two inch layer over bare soil or in a way around plants to minimize water transfer. Ensure that mulch does not touch plant stems.
11. Store stones outside of flow area must be permanently stabilized with mulch and vegetation.

AMENDED PLANTING SOIL MIX SPECIFICATIONS

1. Planting soil may be either amended native soil mix with the following characteristics:
   A. Inflows between 0.5 and 1.2 inches/hour.
   B. No free of refuse (trash, debris/waste), and hazardous substances.
   C. Organic content, coarse from 5-10% by weight.
   D. Cation exchange capacity (CEC) greater than or equal to 5 milliequivalents/100 grams of dry soil.
   E. 3-5% clayey fines content.
   F. pH between 5.5 and 8.0
   G. Conform to the following gradation for fine mix:

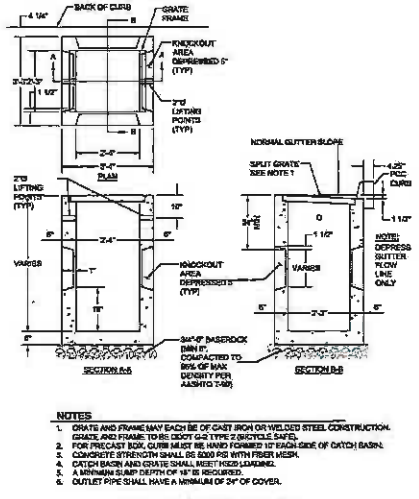
US Standard Sieve Size	Percent Passing
1"	100
#4	95-100
#10	75-90
#40	40-60
#100	10-30
#200	2-5

2. Imported soil shall be roughly 1/3 plant debris compost, 1/3 topsoil and 1/3 gravelly sand.
3. Amended native planting soil mix shall be created by blending compost into the native soil at a rate of 1 part compost to two parts soil. Soil mix amendment rates may be modified to fit the 1 above.
4. Amended native or imported soil mix shall be uniformly mixed.

Seeds Considerations

Must be planted from plant material and fully germinated. Must be certified weed seed free. A Technical Data Sheet from the US Composting Council Seal of Testing Assurance must be provided to the approving jurisdiction. The Data Sheet must show that the compost meets the following criteria:

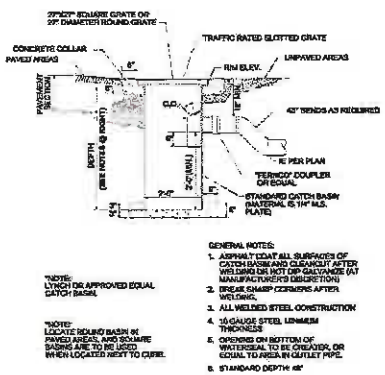
- Organic matter content between 40 and 60 percent.
- pH between 6.5 and 8.0, if the pH isn't quite right, it may be lowered by adding free sulfate and sulfur or raised by adding lime. If lime is used, incorporate first into the compost, wet the compost down, and then test moisture into the soil.
- Particle soil moisture must be less than 0.5 mm/cm.
- 100% should pass a 1/2-inch screen.
- Salinity Test Result shall be Stable or Very Stable.
- Laboratory analysis for manganese and vigor shall be ≥ 80%.
- Toxic Metals Test Result shall be Pass.
- Carbon nitrogen ratio between 20:1 and 25:1.



NOTES

1. GRATE AND FRAME MAY EACH BE OF CAST IRON OR WELDED STEEL CONSTRUCTION.
2. FOR PRECAST BOX, CURB MUST BE HAND FORMED 12" EACH SIDE OF CATCH BASIN.
3. CONCRETE STRENGTH SHALL BE 5000 PSI WITH FIBER MESH.
4. CATCH BASIN AND GRATE SHALL MEET H20 LOADING.
5. A MINIMUM SUMP DEPTH OF 18" IS REQUIRED.
6. OUTLET PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

2 CATCH BASIN
C6.1 SCALE: NTS



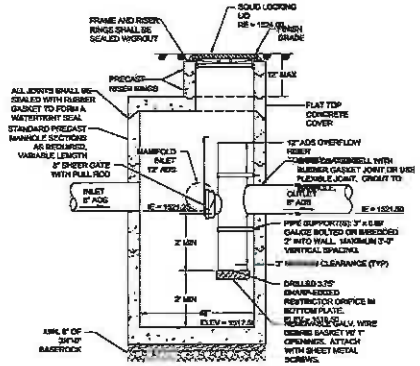
"NOTE: LYNCH OR APPROVED EQUAL CATCH BASIN.

"NOTE: LOCATE ROUND BASIN IN PAVED AREAS, AND SQUARE BASINS ARE TO BE USED WHEN LOCATED NEXT TO CURB.

GENERAL NOTES:

1. ASPHALT COAT ALL SURFACES OF CATCH BASIN AND CLEANOUT AFTER WELDING (DO NOT DIP GALVANIZE (AT MANUFACTURER'S DISCRETION)
2. BREAK SHARP CORNERS AFTER WELDING.
3. ALL WELDED STEEL CONSTRUCTION
4. 10 GAUGE STEEL MINIMUM THICKNESS
5. OPENING ON BOTTOM OF WATERSEAL TO BE GREATER, OR EQUAL TO AREA IN OUTLET PIPE.
6. STANDARD DEPTH 48"

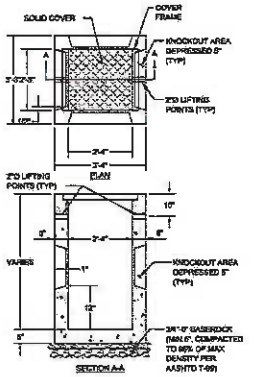
3 LYNCH STYLE CATCH BASIN
C6.1 SCALE: NTS



NOTE

ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C 478.

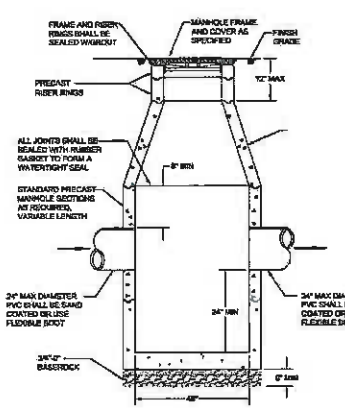
4 CONTROL STRUCTURE MANHOLE
C6.1 SCALE: NTS (FIGURES 2 & 3)



CONSTRUCTION NOTES:

1. COVER AND FRAME MAY EACH BE OF CAST IRON OR WELDED STEEL CONSTRUCTION.
2. CONCRETE STRENGTH SHALL BE 5000 PSI WITH FIBER MESH.
3. JUNCTION BASIN AND GRATE SHALL MEET H20 LOADING.
4. A MINIMUM SUMP DEPTH OF 18" IS REQUIRED.
5. OUTLET PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

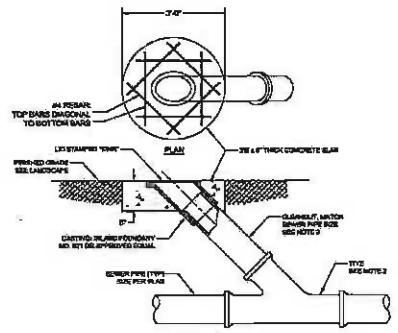
6 JUNCTION BASIN
C6.1 SCALE: NTS



NOTE

ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C 478.

7 48" STORM MANHOLE
C6.1 SCALE: NTS



NOTES

1. CONCRETE TO BE COMMERCIAL GRADE CONCRETE (CGC) PER 2015 ODOT STANDARD SPECIFICATIONS, SECTION 00442, MINIMUM 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
2. FITTINGS AND PIPE TO BE GASKETED PVC SDR 26.

5 TYPICAL CLEANOUT
C6.1 SCALE: NTS

EMC
Grants Pass • Jacksonville • Medford, OR
(Or Office) 1143 Williams Hwy., Suite 116, Grants Pass, OR 97527
Ph: 541-471-7476 • Cell: 541-660-0619 • Fax: 541-723-5184
mail@emcengineers.com • http://www.emcengineers.com
Engineers/Scientists, LLC

PORT OF BROOKINGS HARBOR
16339 LOWER HARBOR ROAD, BROOKINGS, OR 97415
BOAT YARD PAVING

DRAWN BY:	JG
DATE:	25 JAN 2021
JOB No:	#
SHEET No:	C6.1
	PROJECT DETAILS

hor

LOCATION MAP
NOT TO SCALE

PORT OF BROOKINGS HARBOR

PORT OF BROOKINGS HARBOR

KITE FIELD RV PARK

KITE FIELD PARK EXTENTS

PROJECT OVERVIEW
SCALE: 1" = 200' (24 x 36) 1" = 400' (11 x 17)

DRAWING REGISTER

Number	Title
C1.0	COVER SHEET
C1.1	EXISTING CONDITIONS
C2.0	SEQUENCING
C2.1	SEQUENCING
C2.2	SEQUENCING
C2.3	SEQUENCING DETAILS
C3.0	PRELIMINARY RV PARK DESIGN
C4.0	ROAD SECTIONS
C4.1	GENERAL NOTES
C5.0	ECS STANDARD DETAILS
C5.1	ECS GENERAL NOTES

LEGEND:

EXIST. FIRE HYDRANT	FIRE HYDRANT
EXIST. WATER VALVE	WATER VALVE
EXIST. BLOW OFF	WATER METER
EXIST. WATER METER	BACKFLOW DEVICE
EXIST. HOSE BIB	IRRIGATION WATER METER
EXIST. IRRIGATION VALVE	AIR RELEASE VALVE
EXIST. AIR RELEASE VALVE	BLOWOFF DEVICE ASSEMBLY
EXIST. STORM DRAIN MANHOLE	FIRE DEPARTMENT CONNECTION
EXIST. CLEANOUT	END PLUG
EXIST. SANITARY SEWER MANHOLE	TEE
EXIST. MAILBOX	SANITARY SEWER CLEANOUT
CURB RAMP	SANITARY SEWER MANHOLE
PARALLEL RAMP	STORM DRAIN CLEANOUT
HANDICAP PARKING SYMBOL	STORM DRAIN MANHOLE
PARALLEL PARKING STRIPING	ATRIUM DRAIN / BUBBLER
BICYCLE LANE SYMBOL	CATCH BASIN INLET
EXIST. SANITARY SEWER	CURB INLET
EXIST. STORM DRAIN	STORM DRAIN CONTROL STRUCTURE
EXIST. WATER	ELECTRIC BOX
EXIST. GAS	ELECTRIC TRANSFORMER
EXIST. ELECTRIC	LIGHTS
EXIST. OVERHEAD POWER	CONTROL POINT
EXIST. TELEPHONE	MONUMENT
EXIST. FIBER OPTIC	TRAFFIC SIGNAL LIGHT
EXIST. CURB AND GUTTER	SIGN (TRAFFIC, INFORMATION)
EXIST. CENTERLINE	BOLLARD
EXIST. RIGHT OF WAY	BICYCLE PARKING SPACE
EXIST. CONTOUR	DECIDUOUS TREE
PROPOSED CONTOUR	CONIFER TREE
EXIST. EDGE OF PAVEMENT	NEW CONCRETE
CHAIN LINK FENCE	NEW GRAVEL PAVING
BARB WIRE FENCE	NEW HMAC PAVING - STANDARD
SANITARY SEWER	NEW HMAC PAVING - HEAVY
STORM DRAIN	NEW LANDSCAPING
WATER	NEW RIP RAP
GAS	
ELECTRIC	
CURB AND GUTTER	
PROPOSED RIGHT OF WAY	
FLOW LINE	
PROPERTY LINE	

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 1-800-332-2344. 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.

EMC

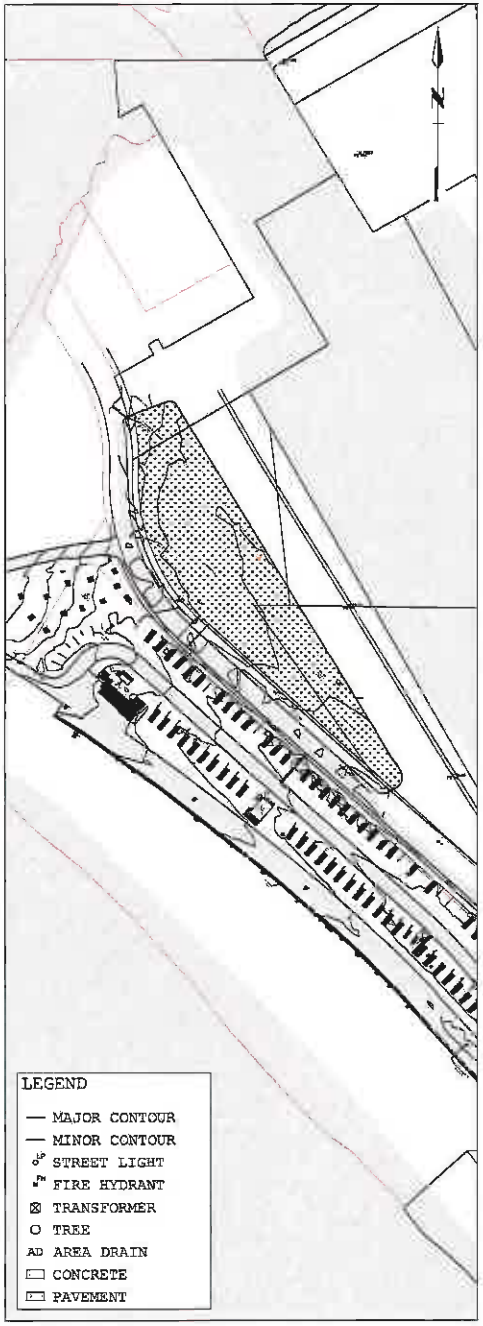
PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
KITE FIELD RV PARK

DRAWN BY: TAM
DATE: 17/01/21
JOB NO: 20-XXX

C1.0
PROJECT DETAILS

20

PORT OF BROOKINGS-HARBOR
TAX LOTS



PORT OF BROOKINGS-HARBOR
TOPOGRAPHIC SURVEY

PORT OF BROOKINGS-HARBOR
EXISTING ACTION AREA

ENGINEER:
EMC
Engineering Management Consultants, LLC

NO	DATE	REVISION	BY

PORT OF BROOKINGS HARBOR

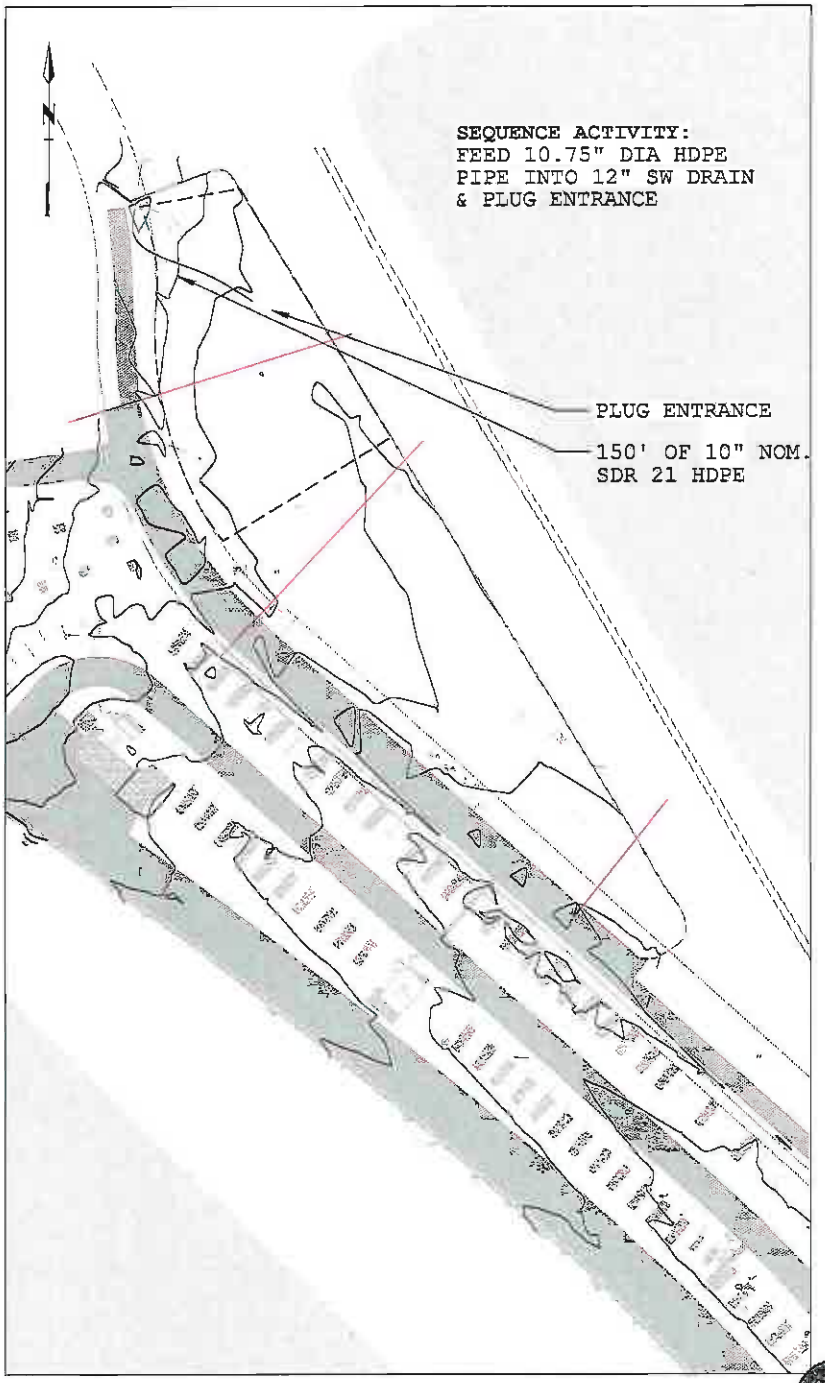
PORT OF BROOKINGS

16330 Lower Harbor Rd, Brookings, OR 97415

KITE FIELD RV PARK
FILE NUM: PB116

Date 17/01/21
Drawn By INFRADRAFT
Sheet No. C1.1
EXISTING CONDITIONS

SEQUENCE #0: EXISTING CONDITIONS
SCALE 1":80'



SEQUENCE #1: SEDIMENT & COLLECTION AREA
SCALE 1":80'

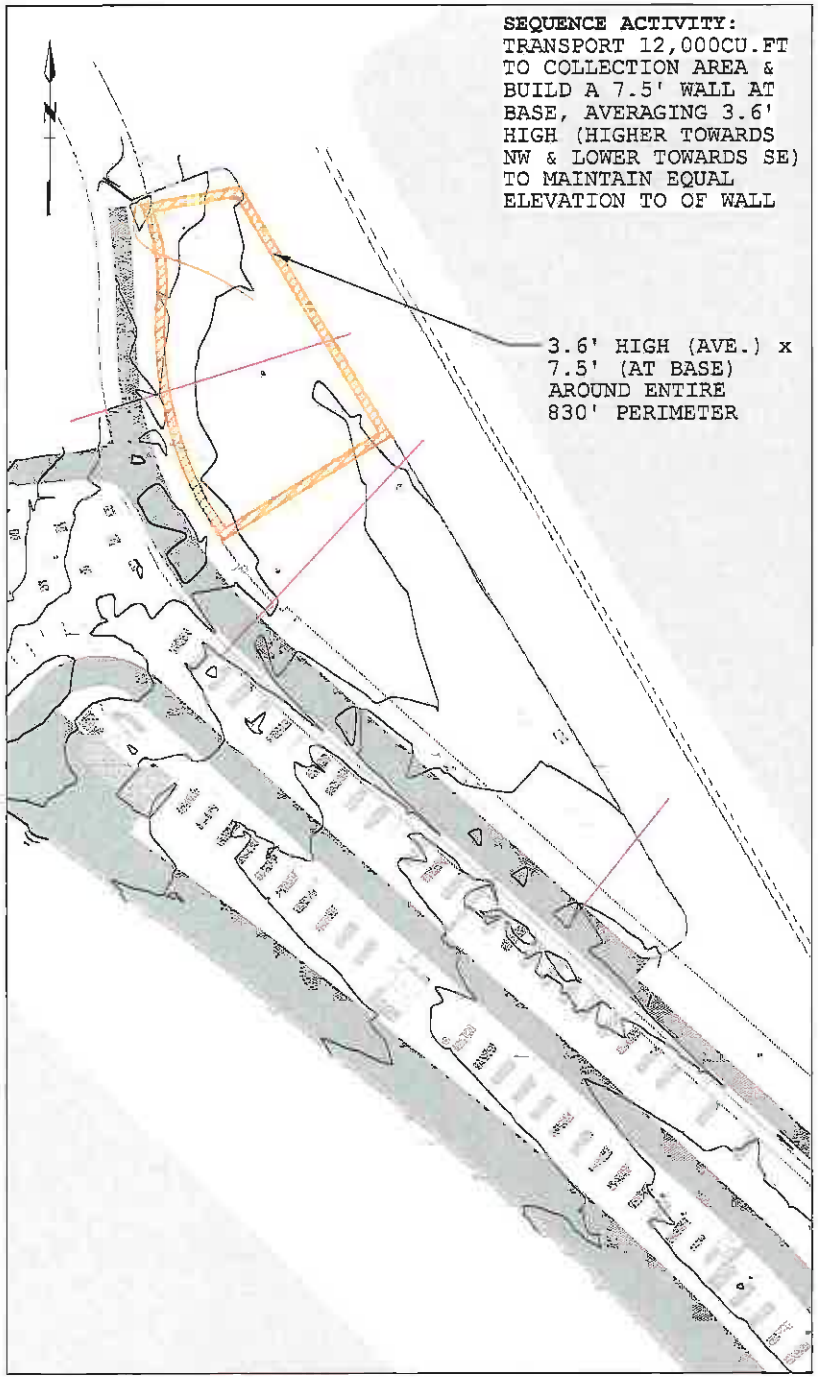
ENGINEER:
EMC | Engineering Management Consultants, LLC

NO.	DATE	REVISION	BY

PORT OF BROOKINGS HARBOR

PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415
KITE FIELD RV PARK
FILE NUM: PB116

Date: 17/01/2021
Drawn By: INFRADRAFT
Sheet No.: **C2.0**
SEQUENCING



SEQUENCE #2: PERIMETER WALL
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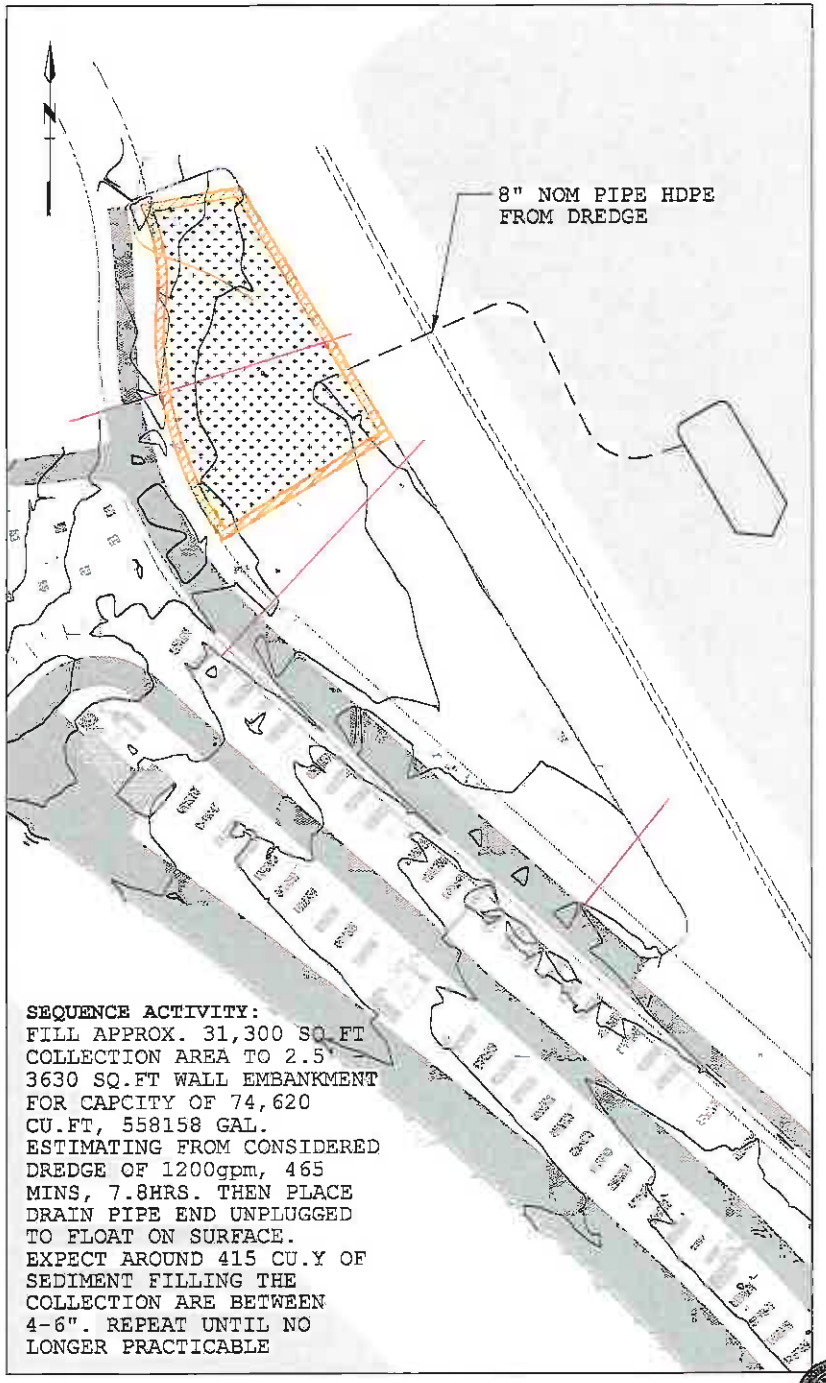


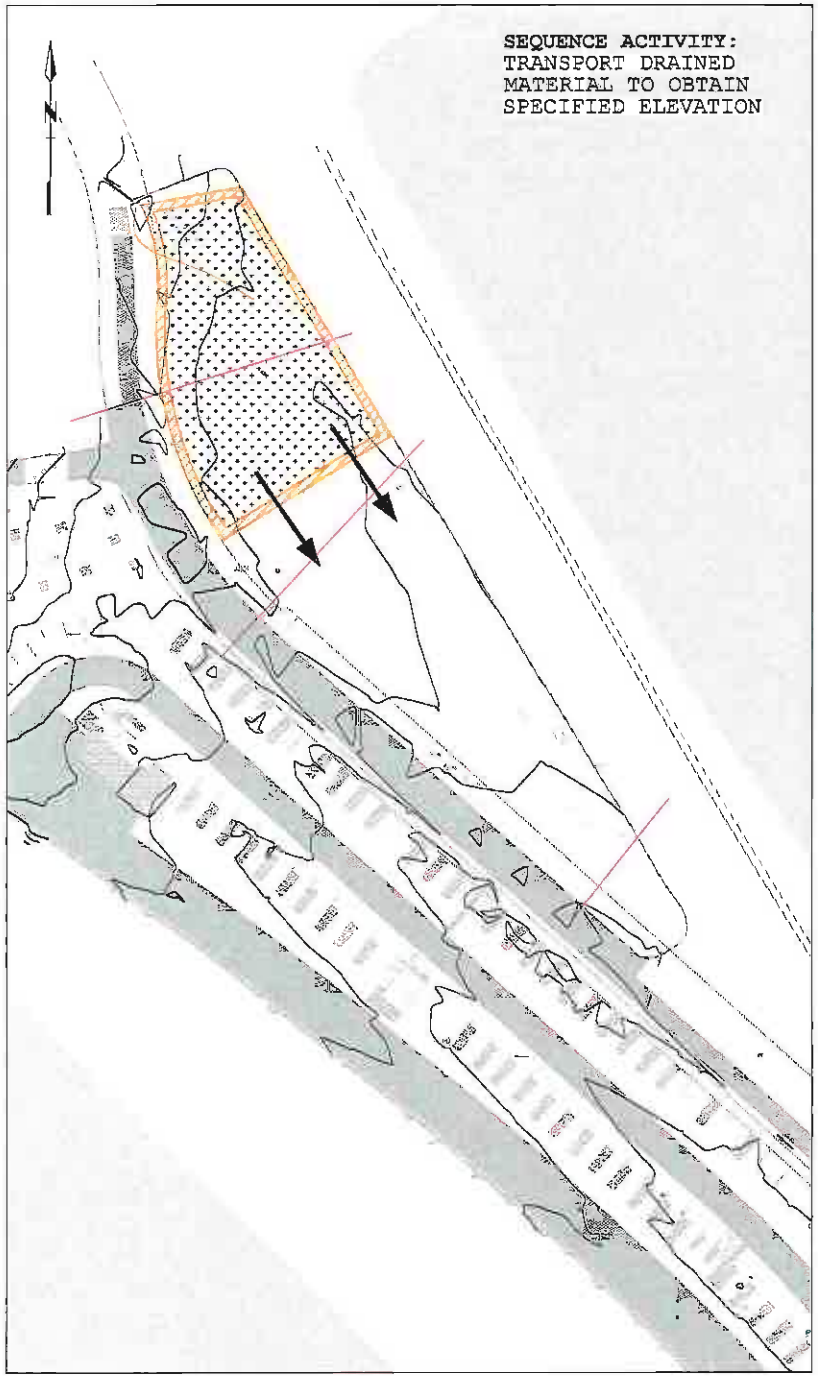
SEQUENCE #3: FILLING PART 1
SCALE 1":80'

ENGINEER: EMC Engineering Solutions, LLC

PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415
KITE FIELD RV PARK
FILE NUM: PB116

Date 17/01/2021
Drawn By INFRADRAFT
Sheet No. C2.1
SEQUENCING

208



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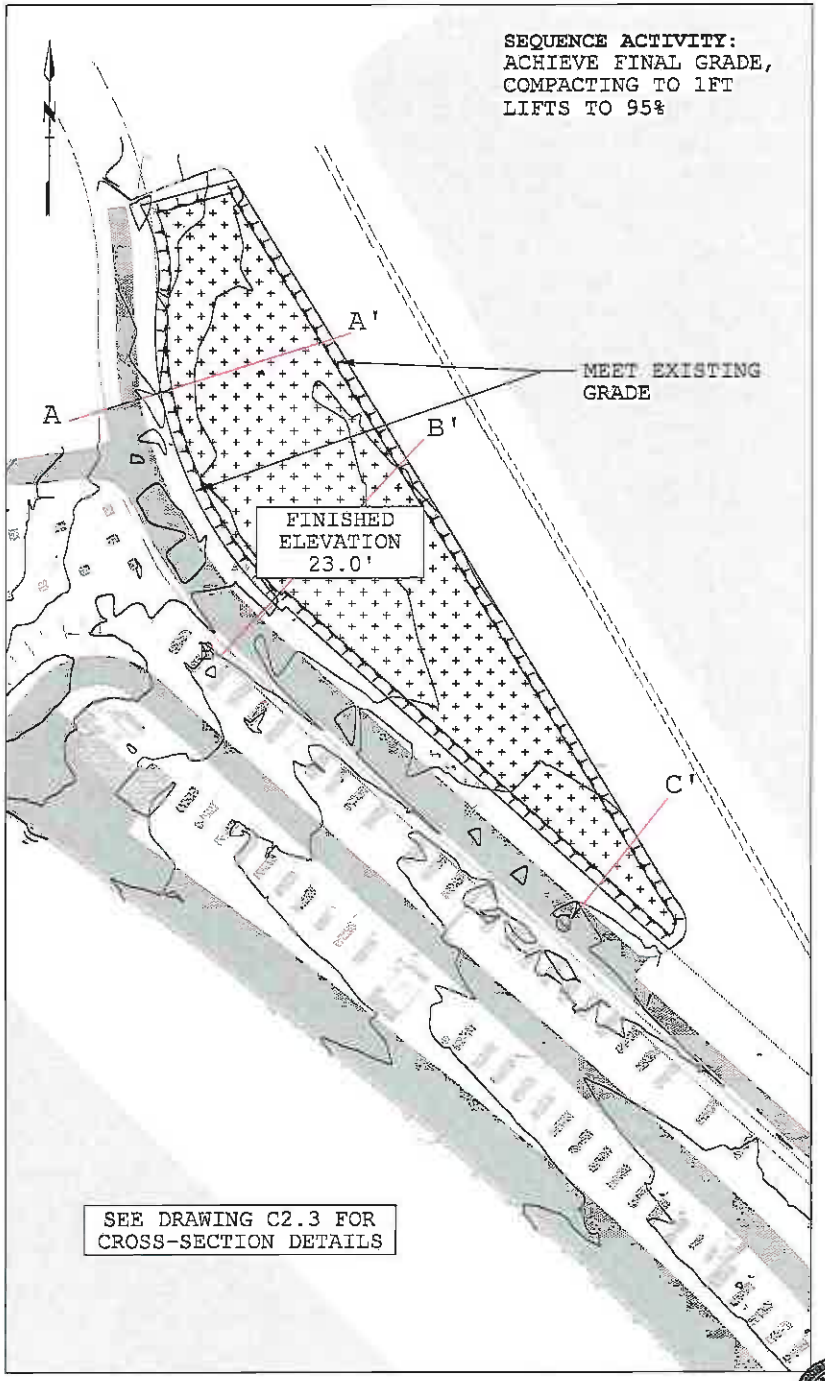


SEQUENCE #5: GRADING AND COMPACTION
SCALE 1":80'

ENGINEER:
EMC
Engineering Consultants, LLC

NO	DATE	REVISION	BY

PORT OF BROOKINGS HARBOR

PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415
KITE FIELD RV PARK
FILE NUM: PB116

Date 17/01/2021
Drawn By INFRADRAFT
Sheet No. C2.2
SEQUENCING

CROSS-SECTIONS NTS
SEE DRAWING C2.2

SEDIMENT DRAGFLOW SPECIFICATIONS

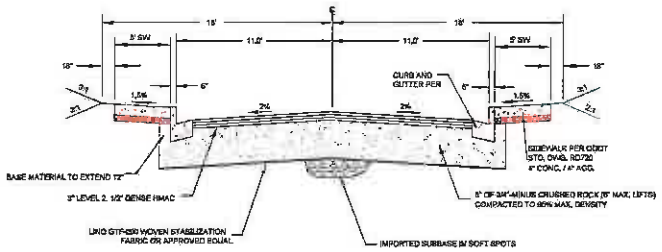
PORT OF BROOKINGS
16330 Lower Harbor Rd, Brookings, OR 97415
KITE FIELD RV PARK
FILE NUM. P81 16

Date 17/01/2021
Drawn By INFRADRAFT
Sheet No. C3.0 PRELIM LAYOUT

NO	DATE	REVISION	BY

ENGINEER: EMC

KITE FIELD RV PARK PRELIMINARY LAYOUT
SCALE 1':50"



STREET SECTION

1 / C1.2 SCALE: NTS THE PORT OF BROOKINGS HARBOR STREET STANDARDS

NOTES

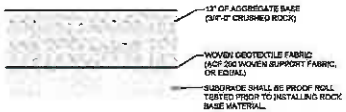
1. AGGREGATE BASE AND SUBBASE SHALL BE INSTALLED IN MAXIMUM 6" LIFTS AND MECHANICALLY COMPACTED TO MINIMUM 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH THE AASHTO T-99 METHOD.
2. JUST PRIOR TO PAVING, THE AGGREGATE BASE SHALL BE PROOF ROLLED. AGGREGATES THAT DO NOT PASS PROOF ROLL TESTING SHALL BE REMOVED, RECOMPACTED, AND TESTED AGAIN.
3. JUST PRIOR TO INSTALLING AGGREGATE BASE ROCK THE SUBGRADE SHALL BE PROOF ROLLED. SUBGRADE MATERIAL THAT DOES NOT PASS PROOF ROLL TESTING SHALL BE REMOVED AND ADDITIONAL CRUSHED ROCK INSTALLED.
4. PAVEMENT SECTION IS BASED ON THE ASSUMPTION THAT PAVEMENT CONSTRUCTION WILL BE ACCOMPLISHED DURING THE DRY SEASON.
5. PAVEMENTS SUBJECT TO CONSTRUCTION TRAFFIC MAY REQUIRE REPAIR.

GENERAL NOTES

1. MAXIMUM CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1 FOR FILL AND MAXIMUM OF 2:1 FOR CUT.
2. PUE GRADE AS SHOWN. EMBANKMENT, WHERE REQUIRED, SHALL BE CONSTRUCTED FROM SELECT NATIVE SOILS.
3. IMPORTED SUBBASE (WHERE APPLICABLE) TO BE 4"-0" CRUSHED ROCK.

CONCRETE NOTES

1. PROVIDE A MINIMUM 8' TRANSITION SECTION WHEN JOINING CURBS OF DIFFERENT CROSS SECTIONS.
2. CONCRETE SHALL NOT BE PLACED UNTIL FORMS HAVE BEEN INSPECTED AND APPROVED.
3. CONCRETE SHALL BE COMMERCIAL GRADE RETAINING THE FOLLOWING CHARACTERISTICS: ENTRAINED AIR – 4.0% TO 7.0%; SLUMP – 5 INCHES OR LESS; COMPRESSIVE STRENGTH – MINIMUM 3,000 PSI AT 28 DAYS; TEMPERATURE – MINIMUM 60°F TO MAXIMUM 90°F.
4. ALL CONCRETE STRUCTURES REINFORCED WITH REBAR SHALL BE VIBRATED TO REMOVE VOIDS.
5. SURFACE SHALL HAVE A FINISHED TEXTURE THAT WILL NOT BE SLICK WHEN WET (MEDIUM BROOM FINISH). CURING COMPOUND MAY BE APPLIED IMMEDIATELY AFTER CONCRETE IS FINISHED. WHITE PIGMENT RECOMMENDED, CLEAR ACCEPTABLE.
6. AN EDGING TOOL SHALL BE USED ON ALL EDGES AND JOINTS.
7. PROVIDE CONTRACTION JOINTS AT 10' INTERVALS AND "DUMMY" TOOLED JOINTS AT 5' INTERVALS ON CURBS, SIDEWALKS AND APPROACHES. CONTRACTION JOINT GROOVES SHALL BE AT MINIMUM, 1 ¼" DEEP OR ONE-THIRD THE THICKNESS OF THE CONCRETE.
8. PROVIDE EXPANSION JOINTS OPPOSITE ABUTTING EXPANSION JOINTS IN ABUTTING CONCRETE, AT EACH POINT OF TANGENCY IN THE STRUCTURE ALIGNMENT, BETWEEN DRIVEWAYS AND CONCRETE PAVEMENT, AROUND POLES, POSTS, SIGNS AND OTHER FIXTURES WHICH PROTRUDE THROUGH OR ADJOINT THE STRUCTURES, AT ALL BENDS AND ELL'S, AT MAXIMUM OF 100' INTERVALS. EXPANSION JOINT MATERIAL SHALL BE OF THE BITUMINOUS, PREFORMED FILLER TYPE NOT LESS THAN ½" WIDE, PLACED FLUSH OR NO MORE THAN 1/8" BELOW THE CONCRETE SURFACE.
9. STRAIGHT LINE EDGES SHALL NOT VARY MORE THAN ½" UNDER A TWELVE-FOOT STRAIGHT EDGE.
10. CURE AND PROTECT CONCRETE AFTER PLACING AND FINISHING. KEEP STRUCTURES FREE FROM CONTACT, STRAIN AND PUBLIC TRAFFIC FOR AT LEAST SEVEN DAYS OR LONGER AS DIRECTED. MIKES TO EXPEDITE CURING MAY BE USED WITH APPROVAL OF CITY ENGINEER.
11. CONCRETE SHALL BE REMOVED TO THE NEAREST CONTRACTION JOINT, COLD JOINT OR CRACK WITHIN 4' OF THE REPLACEMENT AREA. CONCRETE SHALL BE SAWCUT WITH A SMOOTH, UNIFORM JOINT PROVIDED.
12. EXISTING A/C SHALL BE REMOVED/REPLACED ALONG ENTIRE CURB SECTION TO A MINIMUM 18" WIDTH UNLESS APPROVED BY ENGINEER OF RECORD.

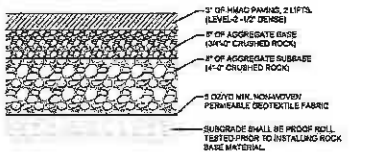


NOTES

1. AGGREGATE BASE AND SUBBASE SHALL BE INSTALLED IN MAXIMUM 6" LIFTS AND MECHANICALLY COMPACTED TO MINIMUM 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH THE AASHTO T-99 METHOD.
2. JUST PRIOR TO INSTALLING AGGREGATE BASE ROCK THE SUBGRADE SHALL BE PROOF ROLLED. SUBGRADE MATERIAL THAT DOES NOT PASS PROOF ROLL TESTING SHALL BE REMOVED AND ADDITIONAL CRUSHED ROCK INSTALLED.

EMERGENCY VEHICLE GRAVEL SECTION

2 / C1.2 SCALE: NTS

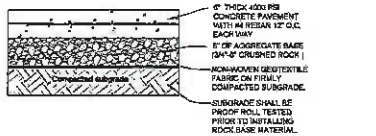


NOTES

1. AGGREGATE BASE AND SUBBASE SHALL BE INSTALLED IN MAXIMUM 6" LIFTS AND MECHANICALLY COMPACTED TO MINIMUM 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH THE AASHTO T-99 METHOD.
2. JUST PRIOR TO PAVING, THE AGGREGATE BASE SHALL BE PROOF ROLLED. AGGREGATES THAT DO NOT PASS PROOF ROLL TESTING SHALL BE REMOVED, RECOMPACTED, AND TESTED AGAIN.
3. JUST PRIOR TO INSTALLING AGGREGATE BASE ROCK THE SUBGRADE SHALL BE PROOF ROLLED. SUBGRADE MATERIAL THAT DOES NOT PASS PROOF ROLL TESTING SHALL BE REMOVED AND ADDITIONAL CRUSHED ROCK INSTALLED.
4. PAVEMENT SECTION IS BASED ON THE ASSUMPTION THAT PAVEMENT CONSTRUCTION WILL BE ACCOMPLISHED DURING THE DRY SEASON.
5. PAVEMENTS SUBJECT TO CONSTRUCTION TRAFFIC MAY REQUIRE REPAIR.

ASPHALT SECTION - DRIVE AISLES

3 / C1.2 SCALE: NTS



NOTES

1. 3/4"-0" AGGREGATE BASE SHALL BE INSTALLED IN MAXIMUM 6" LIFTS AND MECHANICALLY COMPACTED TO MINIMUM 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH THE AASHTO T-99 METHOD A.
2. JUST PRIOR TO INSTALLING AGGREGATE BASE ROCK THE SUBGRADE SHALL BE PROOF ROLLED. SUBGRADE MATERIAL THAT DOES NOT PASS PROOF ROLL TESTING SHALL BE REMOVED, INSTALL ADDITIONAL CRUSHED ROCK PER ENGINEERS RECOMMENDATIONS.

REINFORCED CONCRETE SECTION

4 / C1.2 SCALE: NTS

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PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
KITE FIELD RV PARK

DRAWN BY: TAM
DATE: 17/01/21
JOB NO: 20-XXX

C4.0
ROAD SECTIONS

GENERAL NOTES

1. ALL WORK SHALL BE IN CONFORMANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES, SPECIFICATIONS AND STANDARDS SHALL MEAN, AND ARE INTENDED TO BE, THE LATEST EDITION, AMENDMENT OR REVISION OF SUCH REFERENCE STANDARD IN EFFECT AS OF THE DATE OF THE CONTRACT DOCUMENTS. APPLICABLE CODES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:
   1.1. CURRENT OREGON STRUCTURAL SPECIALTY CODE
   1.2. CURRENT OREGON PLUMBING SPECIALTY CODE
   1.3. CURRENT OREGON ELECTRICAL SPECIALTY CODE
   1.4. NATIONAL FIRE PROTECTION ASSOCIATION
   1.5. CURRENT CURRY COUNTY STANDARDS SPECIFICATIONS FOR PUBLIC WORKS INFRASTRUCTURE.
2. WORK AND MATERIALS SHALL CONFORM TO THE PROVISIONS OF THE CURRENT "STANDARD SPECIFICATIONS FOR CONSTRUCTION", ODOT/AMERICAN PUBLIC WORKS ASSOCIATION (APWA), UNLESS OTHERWISE COVERED BY THE SPECIFICATIONS WRITTEN FOR THIS PROJECT OR THE COUNTY SPECIFICATIONS.
3. ALL WORK PERTAINING TO THIS PROJECT SHALL BE SUBJECT TO INSPECTION BY THE PROJECT ENGINEER AND/OR CITY ENGINEER, PRIOR TO ANY SITE WORK, THE CONTRACTOR SHALL CONTACT THE CITY AND PROJECT ENGINEER TO SCHEDULE A PRE-CONSTRUCTION CONFERENCE.
4. PRIOR TO ANY SITE DISTURBING ACTIVITY INCLUDING CLEARING, LOGGING OR GRADING, THE SITE BOUNDARIES & CLEARING LIMITS AS SHOWN ON THESE PLANS SHALL BE LOCATED AND FIELD IDENTIFIED BY THE PROJECT SURVEYOR AND ALL ESC MEASURES SHALL BE INSTALLED AS IDENTIFIED ON THE EROSION & SEDIMENT CONTROL PLAN.
5. A COPY OF THESE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
6. ALL SITE WORK IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THESE APPROVED PLANS. ANY DEVIATION FROM THESE PLANS WILL REQUIRE PRIOR APPROVAL FROM THE OWNER, ENGINEER AND APPROPRIATE PUBLIC AGENCIES PRIOR TO PERFORMING THE CHANGES IN THE FIELD.
7. ALL LOCATIONS OF EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN. THE CONTRACTOR SHALL CONTACT THE UNDERGROUND UTILITIES LOCATION SERVICE (DIAL 811) AT LEAST TWO BUSINESS DAYS PRIOR TO CONSTRUCTION. THE APPLICANT OR HIS REPRESENTATIVE AND THE ENGINEER SHALL BE CONTACTED IMMEDIATELY IF CONFLICTS EXIST.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACT.
9. THE CONTRACTOR SHALL KEEP OFF-SITE STREETS CLEAN AT ALL TIMES BY SWEEPING. STREET WASHING WILL NOT BE ALLOWED WITHOUT PRIOR CITY APPROVAL.
10. THE CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS PRIOR TO INITIATING WORK. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER WHEN CONFLICTS OCCUR BETWEEN THE PLANS AND FIELD CONDITIONS. CONFLICTS SHALL BE RESOLVED PRIOR TO PROCEEDING WITH CONSTRUCTION. REVISIONS SHALL BE FORMALLY APPROVED BY THE APPLICANT AND PROJECT ENGINEER PRIOR TO MAKING CHANGES IN THE FIELD.
11. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ANY UTILITY RELOCATIONS WITH UTILITY COMPANIES.
12. ALL NEW UTILITIES SHALL BE INSTALLED UNDERGROUND.
13. CONTRACTOR SHALL DOCUMENT AND RECORD FIELD CHANGES, PIPE INVERT, PIPE SLOPE, AND ANY OTHER CRITICAL AS-CONSTRUCT DATA. AS-BUILT DRAWINGS AND FINAL REPORTS WILL BE REQUIRED BEFORE FINAL APPROVAL.
14. WORK IN COUNTY RIGHT-OF-WAY REQUIRES AN ENCROACHMENT PERMIT FROM THE LOCAL AUTHORITY.
15. APPROVED PERMANENT TRAFFIC CONTROL SIGNS AND MARKINGS WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE INSTALLED PRIOR TO FINAL APPROVAL.
16. DURING PROJECT CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL TEMPORARY CONSTRUCTION SIGNS, TRAFFIC CONTROL SIGNS, DELINEATORS AND TEMPORARY MARKINGS AS REQUIRED.
17. ACCESS BY EMERGENCY VEHICLES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
18. ALL CLEARED AND GRUBBED MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION SITE AND DISPOSED AT AN APPROVED LOCATION.
19. ALL AREAS WITH ABANDONED UTILITY LINES, STORM DRAINS, UNDERGROUND TANKS, ETC. WHICH MAY PROVIDE VOID SPACE BENEATH THE SURFACE SHALL BE REMOVED. WHEN APPROVED BY THE ENGINEER THE VOID SPACE MAY BE FILLED WITH APPROVED MATERIAL. ALL TANKS OR HAZARDOUS MATERIALS SHALL BE DEALT WITH IN ACCORDANCE TO ALL LOCAL, STATE AND FEDERAL LAWS.
20. PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR SHALL VERIFY GRADES AT SAWCUT LOCATIONS AND MATCHING OF EXISTING GRADE LOCATIONS.
21. CONTRACTOR IS RESPONSIBLE FOR ANY ASPHALT GRINDING, OVERLAY AND SLURRY SEAL. ALL SPECIFICATIONS SHALL COMPLY WITH ALL LOCAL AUTHORITY REQUIREMENTS.
22. CONSTRUCTION SHALL CONFORM TO THE 2018 STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PUBLISHED BY THE OREGON CHAPTER OF APWA, AND THE CURRENT AMENDMENTS OF THE APPROVING AGENCY.
23. ALL CONCRETE SHALL BE 3000 PSI AT 28 DAYS UNLESS OTHERWISE SPECIFIED.
24. CONTRACTOR SHALL BE RESPONSIBLE TO CLEAN AND/OR MAINTAIN EXISTING PUBLIC STREETS OF SOIL OR OTHER DEBRIS DEPOSITED BY CONSTRUCTION OPERATIONS AND REPAIR ALL STREETS DAMAGED BY CONSTRUCTION OPERATIONS IN A TIMELY MANNER TO AVOID INCONVENIENCES OR HAZARDS TO THE PUBLIC.
25. CONTRACTOR SHALL NOTIFY OREGON UTILITY NOTIFICATION CENTER AT 1-800-332-2344.
26. ALL CONTRACTORS AND SUBCONTRACTORS SHALL BE PRE-QUALIFIED WITH THE PORT OF BROOKINGS HARBOR PRIOR TO ANY CONSTRUCTION OF THIS PROJECT.
27. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN AND SECURE APPROVAL OF THE PLAN FROM THE AGENCY AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING WORK.
28. THE CONTRACTOR SHALL NOT PERFORM WORK WITHOUT AGENCY INSPECTIONS WHERE INSPECTIONS ARE REQUIRED BY THE SPECIFICATIONS.
29. WHERE CONNECTING TO AN EXISTING PIPE, THE CONTRACTOR SHALL EXPOSE THE END OF THE EXISTING PIPE AND ALLOW THE ENGINEER TO VERIFY EXACT LOCATION AND ELEVATION BEFORE LAYING ANY NEW PIPE ON THAT SYSTEM.
30. REQUESTS BY THE CONTRACTOR FOR CHANGES TO THE PLANS MUST BE APPROVED BY THE CONSULTING ENGINEER BEFORE CHANGES ARE IMPLEMENTED.
31. WHEN PERFORMING EXCAVATIONS, THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF ORS 757.542 TO 757.562, WHICH INCLUDE REQUIREMENTS THAT THE CONTRACTOR HAND-EXPOSE (POTHOLE) UNDERGROUND FACILITIES AND USE REASONABLE CARE TO AVOID DAMAGING THEM.
32. PLACEMENT OR STORAGE OF SPOILS FROM THE SEWER LINE TRENCHES IS NOT PERMITTED ON HARD SURFACE STREETS WITHIN PUBLIC RIGHT-OF-WAY. SPOILS STORED IN OTHER RIGHT-OF-WAY AREAS SHALL BE COVERED TO PREVENT EROSION.
33. FORMS OF ADEQUATE SIZE AND CONFIGURATION TO MEET CONCRETE THICKNESS REQUIREMENTS SHALL BE USED AROUND OUTSIDES OF OUTSIDE-DROP MANHOLES.
34. GRANULAR MATERIALS SHALL BE OBTAINED FROM A SOURCE APPROVED BY TTHE PORT OF BROOKINGS HARBOR. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE MATERIAL

GRADING NOTES

1. DEQ 1200-C PERMIT IS REQUIRED.
2. UNLESS DIRECTED OTHERWISE, REMOVE CLEARED AND GRUBBED MATERIAL FROM THE SITE AND DISPOSE AT AN APPROVED LOCATION.
3. PRIOR TO THE START OF CONSTRUCTION, VERIFY GRADES AT SAWCUT LOCATIONS AND MATCHING OF EXISTING GRADE LOCATIONS.
4. MINIMIZE TRAFFIC ON SOIL AREAS DURING WET WEATHER. IF THE SITE SOILS ARE EXPOSED DURING WET WEATHER, THE USE OF CRUSHED ROCK PLACED AS ENGINEERED FILL IN THE BOTTOM OF THE EXCAVATIONS MAY BE NECESSARY TO PROTECT THE SUBGRADE. TAKE ALL PRECAUTIONS TO LIMIT SURFACE DISTURBANCE AND PROTECT THE SITE GRADING AREA FROM EROSION AND RUNOFF.
5. UNLESS OTHERWISE NOTED, THE SAMPLING AND TESTING OF MATERIALS FOR USE ON THE JOBSITE SHALL BE AT THE EXPENSE OF THE CONTRACTOR. ALL TESTING OF MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY A CERTIFIED TESTER. RESULTS OF THE TESTS SHALL BE SENT DIRECTLY TO THE PROJECT ENGINEER AS WELL AS THE CONTRACTOR, BY THE LABORATORY. LOCATION AND FREQUENCY OF TESTS SHALL BE DESIGNATED BY THE GENERAL CONTRACTOR.
6. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM OF 2:1 FOR FILL AND MAXIMUM OF 2:1 FOR CUT.
7. USE OF CURRY COUNTY WATER SUPPLY FOR DUST CONTROL.

STORM DRAIN NOTES

1. ALL STORM SEWER PIPE SHALL MEET THE OREGON STATE PLUMBING SPECIALTY CODE.
2. ALL PIPE SHALL BE PLACED ON STABLE EARTH, OR IF IN THE OPINION OF THE PROJECT ENGINEER THE EXISTING FOUNDATION IS UNSATISFACTORY, THEN IT SHALL BE EXCAVATED BELOW GRADE AND BACKFILLED WITH A GRAVEL MATERIAL TO SUPPORT THE PIPE.
3. THE BACKFILL SHALL BE PLACED EQUALLY ON BOTH SIDES OF THE PIPE IN LAYERS WITH A LOOSE AVERAGE DEPTH OF 8", MAXIMUM DEPTH 8"-9", THOROUGHLY TAMPING EACH LAYER. THESE COMPACTED LAYERS MUST EXTEND FOR ONE DIAMETER ON EACH SIDE OF THE PIPE OR TO THE SIDE OF THE TRENCH. MATERIALS TO COMPLETE THIS FILL OVER PIPE SHALL BE THE SAME AS DESCRIBED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING ALL MANHOLE, INLET AND CATCH BASIN FRAMES AND GRATES TO GRADE JUST PRIOR TO PAVING.
5. UNLESS OTHERWISE NOTED, ALL STORM SEWER PIPE SHALL BE CORRUGATED POLYETHYLENE PIPE: THE MATERIAL SUPPLIED UNDER THIS SPECIFICATION SHALL BE HIGH-DENSITY CORRUGATED POLYETHYLENE SMOOTH INTERIOR PIPE AND SHALL BE MANUFACTURED IN CONFORMITY WITH THE LATEST AASHTO SPECIFICATIONS. COUPLERS SHALL COVER NOT LESS THAN ONE FULL CORRUGATION ON EACH ANNULAR SECTION OF PIPE.
6. CULVERT ENDS AT OUTFALLS SHALL BE BEVELED TO MATCH SIDE SLOPES. FIELD CUT OF CULVERT ENDS IS PERMITTED WHEN APPROVED BY THE ENGINEER OF RECORD OR HIS DESIGNATED REPRESENTATIVE. CULVERT OUTFALLS SHALL BE RIPRAPPED WITH A PAD MINIMUM OF 12" THICK EXTENDING MINIMUM OF 5' FROM DISCHARGE POINT.
9. ALL STEEL PIPES, CULVERTS, TANKS AND OTHER STEEL PARTS OF ANY STORM DRAINAGE SYSTEM SHALL BE GALVANIZED OR HAVE A TREATMENT 1 ASPHALT COATING OR BETTER AS SPECIFIED IN THE ODOT STANDARD SPECIFICATIONS. ALUMINUM AND CONCRETE PIPES AND STRUCTURES DO NOT REQUIRE A TREATMENT 1 COATING.
10. STORM WATER RETENTION/DETENTION FACILITIES, STORM DRAINAGE PIPE AND CATCH BASINS SHALL BE FLUSHED AND CLEANED PRIOR TO CITY ACCEPTANCE.
11. ALL PIPES SHALL HAVE A MINIMUM OF 30" COVER AT THE TOP OF THE BELL, OR SHALL HAVE MINIMUM COVER PER THE MANUFACTURER'S SPECIFICATIONS, WHICHEVER IS GREATER.
12. CATCH BASIN STATIONS AND OFFSETS ARE MEASURED TO CENTER OF GRATE.
13. 100-FT MAX LINEAR RUN BETWEEN CLEANOUTS, 135° MAX AGGREGATE HORIZONTAL CHANGE IN DIRECTION WITHOUT CLEANOUT.

SANITARY SEWER NOTES

1. THE SANITARY SEWER SYSTEM IS TO BE OWNED AND MAINTAINED BY THE PORT OF BROOKINGS HARBOR
2. INSPECTION AND ACCEPTANCE IS TO BE THE RESPONSIBILITY OF THE PORT OF BROOKINGS HARBOR.
3. ALL WORK SHALL CONFORM TO THE LATEST VERSION OF THE APWA/ODOT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND COB STANDARD SPECIFICATIONS AND DRAWINGS. CURRY COUNTY STANDARDS SHALL TAKE PRECEDENCE.
4. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR AND THE PORT OF BROOKINGS HARBOR IS REQUIRED PRIOR TO STARTING WORK.
5. CONTRACTOR SHALL NOTIFY COB 48 HOURS IN ADVANCE OF CONSTRUCTION.
6. CONTRACTOR SHALL OBTAIN PREQUALIFIED STATUS WITH COB PRIOR TO PERFORMING WORK ON SEWER TO BE OWNED AND MAINTAINED BY THE PORT OF BROOKINGS HARBOR, INCLUDING TAPS ON EXISTING SEWER MAINS.
7. CONFINED SPACE CERTIFICATION WILL BE VERIFIED PRIOR TO PERFORMING WORK ON THE PORT OF BROOKINGS HARBOR FACILITIES REQUIRING CONFINED SPACE ENTRY. PERSONAL PROTECTIVE EQUIPMENT INCLUDING BUT NOT LIMITED TO GAS DETECTION METERS, FALL PROTECTION AND A CONFINED SPACE RESCUE SYSTEM WILL BE REQUIRED.
8. CONTRACTOR IS RESPONSIBLE FOR THE TESTING OF SANITARY SEWER FACILITIES PER COB SPECIFICATIONS. TESTING OF SEWER FACILITIES IS SUBJECT TO THE PORT OF BROOKINGS HARBOR ACCEPTANCE.
9. CONTRACTOR IS RESPONSIBLE FOR THE MANAGEMENT OF EXISTING SEWER FLOWS DURING CONSTRUCTION. UPON REQUEST, A SEWER BYPASS PLAN MUST BE SUBMITTED TO THE PORT OF BROOKINGS HARBOR FOR APPROVAL PRIOR TO BYPASSING OR BLOCKING EXISTING SEWER.
10. SANITARY SEWER WORK SHALL MEET THE OREGON STATE PLUMBING SPECIALTY CODE.
11. NOTIFY ENGINEER IF ANY EXISTING ONSITE SEWER LATERALS ARE FOUND. UTILIZATION OF SUCH LATERALS IS SUBJECT TO COMPLETION OF TV INSPECTION, DYE TEST, AND APPROVAL OF LOCAL AUTHORITIES. ABANDON EXISTING LATERALS NOT UTILIZED PER LOCAL AUTHORITY STANDARDS.
12. 100-FT MAX LINEAR RUN BETWEEN CLEANOUTS, 135° MAX AGGREGATE HORIZONTAL CHANGE IN DIRECTION WITHOUT CLEANOUT.

WATER NOTES

ALL WATER WORKS SHALL BE DONE IN ACCORDANCE WITH THE CURRENT REQUIREMENTS OF THE PORT OF BROOKINGS HARBOR STANDARDS STANDARD SPECIFICATIONS.

1. SERVICE CONNECTIONS ARE TO BE INSTALLED FOR EACH PARCEL PER CURRY COUNTY STANDARDS.
2. COVER OVER EXISTING MAINS SHALL NOT BE CHANGED WITHOUT WRITTEN AUTHORIZATION OF THE PORT OF BROOKINGS HARBOR.
3. NEW MAINS ARE TO BE PRESSURE TESTED, DISINFECTED AND PROVEN TO BE BACTERIOLOGICALLY SAFE PRIOR TO PLACING NEW MAINS IN SERVICE BY THE PORT OF BROOKINGS HARBOR. PRESSURE TESTING SHALL NOT BE DONE UNTIL ALL EXCAVATION AND BACKFILL UP TO SUBGRADE HAS BEEN ESTABLISHED.
4. INITIAL BACKFILL TO TOP OF WATER MAINS AND FIRE HYDRANTS RUNS SHALL BE COMPACTED IN ACCORDANCE WITH CURRY COUNTY STANDARD SPECIFICATION FOR TRENCH EXCAVATION AND BACKFILL OR BACKFILL MATERIAL AND COMPACTION SHALL MEET THE REQUIREMENTS OF THE CONTROLLING AGENCY.
5. WATER MAINS AND FIRE HYDRANTS ARE TO BE INSTALLED WITH REFERENCE ALIGNMENT AND GRADE STATUS AND ONLY UPON NOTIFICATION OF CURRY COUNTY INSPECTOR.
6. WATER MAINS ARE TO BE INSTALLED AFTER SEWERS.
7. FIRE HYDRANT RUNS ARE TO BE INSTALLED BEFORE CURBS AND GUTTERS. IN THE EVENT A WATER MAIN IS INSTALLED LARGER THAN EIGHT (8) INCHES, OR IF THE MAIN HAS MORE THAN THREE (3) FEET OF COVER, THE CONTRACTOR WILL BE REQUIRED TO INSTALL AN OFFSET SHALL BE STANDARD DETAIL 4.37 TO PERMIT USE OF A STANDARD 3'-0" BURY FIRE HYDRANT.
8. STUBS SERVICE RUNS SHALL BE INSTALLED PRIOR TO CURB AND GUTTER AND AFTER PUBLIC UTILITY EASEMENTS ARE GRADED TO CURB LEVELS.
9. APPROVED PLANS AND SPECIFICATION SHALL BE AVAILABLE AT SITE OF THE CONSTRUCTION AT ALL TIMES DURING CONSTRUCTION OF WATER FACILITIES.
10. SEPARATION OF WATER MAIN, INCLUDING SERVICE LINES AND SANITARY SEWER, SHALL BE IN ACCORDANCE WITH CURRENT OREGON STATE HEALTH DIVISION RULES. THE STANDARDS EXCEPT IN ALL CASES RUNNING PARALLEL WITH EACH OTHER, THERE SHALL BE A 10 FOOT SEPARATION CENTER LINE TO CENTER LINE. REFER CURRY COUNTY STANDARDS (STANDARD DETAILS NO 4.36).
11. NO ABOVE-GROUND APPURTENANCES ORE PHYSICAL STRUCTURES OF ANY KIND SHALL BE WITHIN FIVE (5) FEET (HORIZONTALLY) OF ANY WATER FACILITY WHETHER THAT WATER FACILITY IS ABOVE OR BELOW GROUND. THIS DISTANCE SHALL BE TEN (10) FEET (HORIZONTALLY) WHEN WATER AND SANITARY SEWER FACILITIES ARE CONSIDERED.
12. NO BELOW-GROUND UTILITY LINES OR OTHER SERVICE OF ANY KIND SHALL BE WITHIN FIVE (5) FEET (HORIZONTALLY) OF ANY WATER FACILITY WHEN RUNNING PARALLEL TO THE WATER FACILITY.
13. NO BELOW-GROUND UTILITY LINES OR OTHER SERVICE OF ANY KIND SHALL BE WITHIN SIX (6) INCHES (VERTICALLY) OF ANY WATER FACILITY WHEN RUNNING APPROXIMATELY PERPENDICULAR TO THE WATER FACILITY. THIS DISTANCE SHALL BE EIGHTEEN (18) INCHES (VERTICALLY) WHEN WATER AND SANITARY SEWER FACILITIES ARE CONSIDERED.
14. BLASTING OR EXPLOSIVE WORK WILL NOT BE ALLOWED WITHIN 30 FEET OF EXISTING WATER FACILITIES AND ONLY THEN USING PROPER INDUSTRY STANDARDS AND THROUGH A PERMIT PROCESS WITH THE FIRE DEPARTMENT OR OTHER AGENCY JURISDICTION.
15. THE CURRY COUNTY REQUIRES "POLY PIGS" TO BE USED ON ALL NEWLY LAID WATER LINES.
16. ALL DRY TAP WATER SERVICES AND AIR RELEASE VALVES SHALL BE INSTALLED BY A CURRY COUNTY PRE-QUALIFIED INSTALLER.
17. ONLY STATE OF OREGON-APPROVED BACKFLOW PREVENTION ASSEMBLIES SHALL BE INSTALLED.

APPLICABLE CODES

ALL WORK SHALL BE IN CONFORMANCE WITH ALL FEDERAL, STATE, AND CITY CODES, SPECIFICATIONS AND STANDARDS SHALL MEAN, AND ARE INTENDED TO BE, THE LATEST EDITION, AMENDMENT OR REVISION OF SUCH REFERENCE STANDARD IN EFFECT AS OF THE DATE OF THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

OREGON STANDARD DRAWINGS (ODOT)

CURRY COUNTY ADOPTED STANDARD DETAILS AND SPECIFICATIONS

OPSC, OREGON PLUMBING SPECIALTY CODE, LATEST EDITION

OFC, OREGON FIRE CODE, LATEST EDITION

NFPA1 NATIONAL FIRE PROTECTION ASSOCIATION 101 LIFE SAFETY CODE, LATEST EDITION

PAVEMENT MARKING NOTES

1. ALL STRIPING AND SIGNAGE SHALL BE PER MUTCD STANDARDS OR AS DIRECTED BY THE LOCAL AUTHORITY.
2. ALL STRIPING AND MARKINGS INSIDE PUBLIC RIGHT OF WAY SHALL BE PER LOCAL AUTHORITY STANDARDS.
3. ALL STRIPING SHALL MEET ADA REQUIREMENTS.

ADA NOTES

1. ALL ADA ACCESSIBLE FACILITIES SHALL BE INSTALLED PER THE CURRENT ADA REQUIREMENTS AND PUBLIC RIGHT OF WAY ACCESSIBILITY GUIDELINES. (PROWAG)
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE ACCESSIBLE PATH OF TRAVEL COMPLIES WITH AMERICAN DISABILITIES ACT AND ALL LOCAL CODES.
3. THE ACCESSIBLE PATH OF TRAVEL AS INDICATED ON PLANS IS A BARRIER FREE ACCESS ROUTE WITHOUT ANY ABRUPT LEVEL CHANGES EXCEEDING ½" BEVELED AT 1:2 MAX SLOPE, OR VERTICAL CHANGES NOT EXCEEDING ¼" MAX AND AT LEAST 48" WIDE. SURFACE IS SLIP RESISTANT, STABLE, FIRM, AND SMOOTH. CROSS SLOPE DOES NOT EXCEED 2% AND SLOPE IN THE DIRECTION OF TRAVEL IS LESS THAN 5% UNLESS OTHERWISE NOTED.

INSPECTION AND TESTING NOTES

1. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING ALL TESTING, INSPECTIONS, AND SPECIAL INSPECTIONS AS REQUIRED BY PROJECT ENGINEER, CURRENT BUILDING CODES, OR JURISDICTIONS HAVING AUTHORITY. ALL TESTING MUST BE COMPLETED AND APPROVED PRIOR TO SUBSEQUENT WORK. ADDITIONAL OR FREQUENT TESTS MAY BE REQUIRED BY AGENCY, BUILDING OFFICIAL, OR ENGINEER.
2. TESTING MUST BE PERFORMED BY AN APPROVED INDEPENDENT TESTING LABORATORY RETAINED BY CONTRACTOR.
3. IN ADDITION TO IN-PLACE DENSITY TESTING, THE SUB-GRADE AND BASE ROCK SHALL BE PROOF-ROLLED WITH A LOADED DUMP TRUCK OR HEAVY NON-VIBRATORY ROLLER. SOILS SHALL BE REMOVED AND RE-COMPACTED OR REPLACED WITH APPROVED IMPORTED STRUCTURAL FILL IF THEY DO NOT DEMONSTRATE A FIRM, UNYIELDING CONDITION. SUBGRADE PROOF-ROLL SHALL TAKE PLACE LESS THAN 24 HOURS PRIOR TO PAVING AND SHALL BE WITNESSED BY THE ENGINEER OR GOVERNING AGENCY.
4. THE APPROVED INDEPENDENT LABORATORY SHALL PROVIDE CERTIFICATION STAMPED BY AN ENGINEER LICENSED IN THE STATE OF OREGON THAT THE SUB-GRADE IS PREPARED AND ALL ENGINEERED FILLS ARE PLACED IN ACCORDANCE WITH THE CONTRACT DRAWINGS AND DOCUMENTS.
5. PROVIDE ENGINEER WITH SPOT ELEVATION VERIFICATION FOR SUB-GRADE AND TOP OF AGGREGATE PRIOR TO PLACING CONCRETE, ASPHALT, AND/OR STRUCTURES (WHEN INCLUDED IN THE PROJECT).

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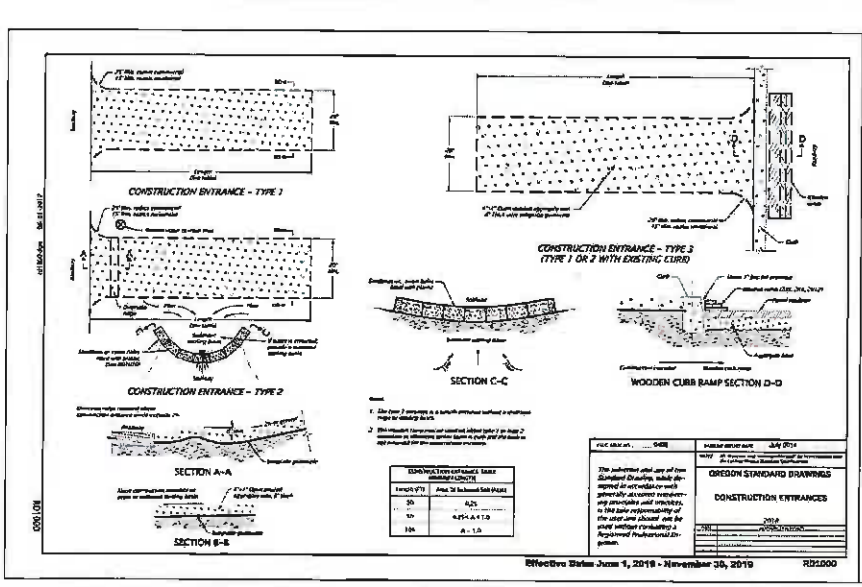
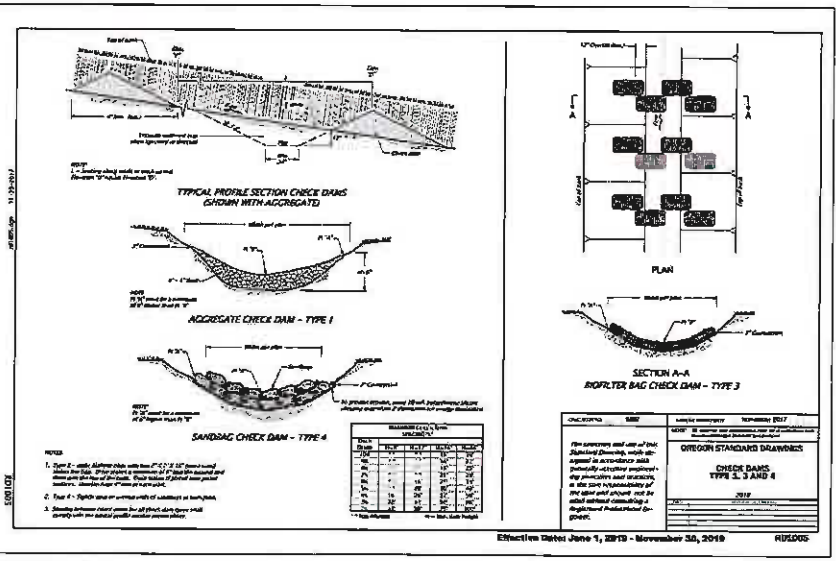
PROFESSIONAL ENGINEER — OREGON — JULY 13, 2005 — RENEWS: 12/31/2021

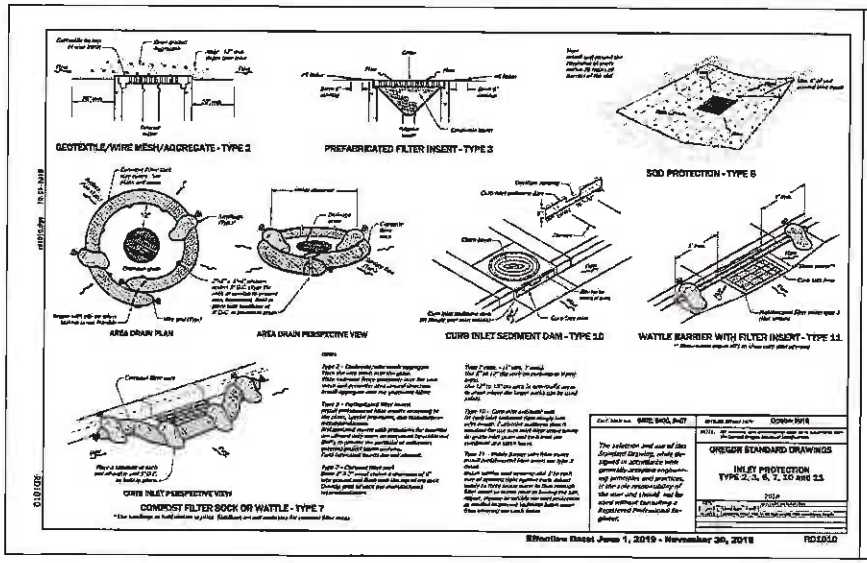
PORT OF BROOKINGS HARBOR
16330 LOWER HARBOR ROAD, BROOKINGS, OR 97415
KITE FIELD RV PARK

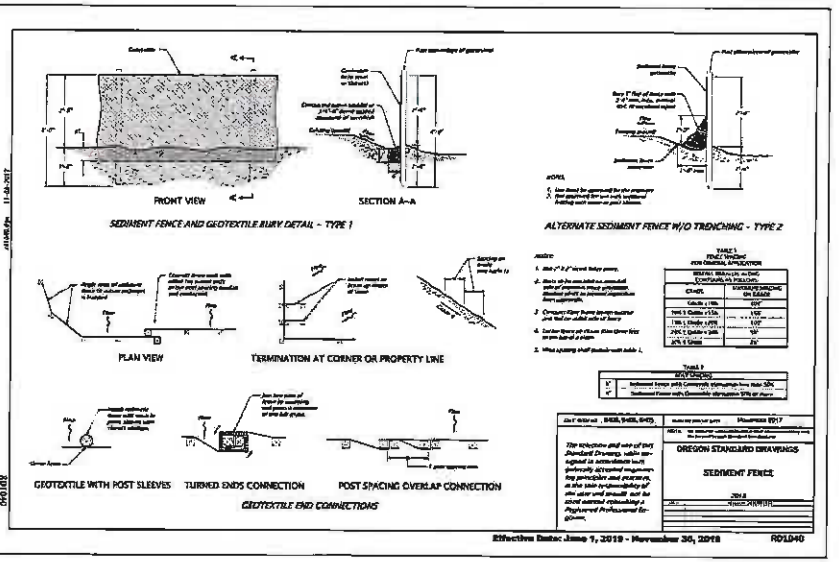
DRAWN BY:	TAM
DATE:	17/01/21
JOB NO:	20-XXX

C4.1
GENERAL NOTES









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PORT OF BROOKINGS HARBOR
16359 LOWER HARBOR ROAD, BROOKINGS, OR 97415

KITE FIELD RV PARK

DRAWN BY: TAM
DATE: 17/01/21
JOB NO: 20-XXX

C5.0
ECS STANDARD DETAILS

ESCP STANDARD NOTES:

1) HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE ENGINEER TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS. (SCHEDULE A.6.C.(J.)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.4.A)
6) THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS. (SCHEDULE A.13.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.II)
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.6.C.II.1) AND (2))
10) PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND REVEGETATE OPEN AREAS. REVEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND 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 (9)(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.6.C.I.(b))
13) CONTROL BOTH PEAK FLOW RATES AND TOTAL STORMWATER 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.6.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.6.C.II.(3))
17) ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. (SCHEDULE A.6.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.6.C.II.4))
19) WHEN TRUCKING 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.8)
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.II)
23) USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WINDBLOWN SOIL. (SCHEDULE A.7.A.V)
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.5.B.III)
25) IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTROCOAGULATION, 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.8.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.6.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.6.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.6.C.III & 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 RELEASED SEDIMENTS. (SCHEDULE A.8.B.II)
34) THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, 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 SLOUGH 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 AREAS 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.6.C.III.(1) AND D.4.C.II.1 AND III)

WET WEATHER CONSTRUCTION

THE SITE SOILS ARE CONSIDERED VERY MOISTURE-SENSITIVE AND, AS SUCH, ARE SUSCEPTIBLE TO DISTURBANCE BY CONSTRUCTION EQUIPMENT, PARTICULARLY DURING PERIODS OF WET WEATHER. DURING WET WEATHER, THE CONTRACTOR SHALL MINIMIZE TRAFFIC ON PREPARED SOIL SUBGRADE AREAS. IF THE SITE SOILS ARE EXPOSED DURING WET WEATHER, THE USE OF CRUSHED ROCK PLACED AS ENGINEERED FILL IN THE BOTTOM OF THE EXCAVATIONS MAY BE NECESSARY TO PROTECT THE SUBGRADE. THE GRADING CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO LIMIT SURFACE DISTURBANCE AND PROTECT THE SITE GRADING AREA FROM EXCESSIVE RUNOFF/EROSION.

INSPECTION FREQUENCY	
SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOWMELT, IS OCCURING, AT LEAST ONCE EVERY TWO WEEKS, REGARDLESS OF WHETHER OR NOT 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) CALENDAR DAYS.	ONCE EVERY MONTH.
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.

IMPLEMENTATION OF CONTROL MEASURES:

A. ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP (PARAGRAPH A.13). FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT.

B. ALL PERMIT REGISTRANTS MUST PREVENT THE DISCHARGE OF SIGNIFICANT AMOUNTS OF SEDIMENT TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. THE FOLLOWING CONDITIONS INDICATE THAT A SIGNIFICANT AMOUNT OF SEDIMENT HAS LEFT OR IS LIKELY TO LEAVE THE SITE:
- I. EARTH SLIDES OR MUD FLOWS;
- II. CONCENTRATED FLOWS OF STORMWATER SUCH AS RILLS, RIVULETS OR CHANNELS THAT CAUSE EROSION WHEN SUCH FLOWS ARE NOT FILTERED, SETTLED OR OTHERWISE TREATED TO REMOVE SEDIMENT;
- III. SEDIMENT LADEN OR TURBID FLOWS OF STORMWATER THAT ARE NOT FILTERED OR SETTLED TO REMOVE SEDIMENTS AND TURBIDITY;
- IV. DEPOSITS OF SEDIMENT AT THE CONSTRUCTION SITE IN AREAS THAT DRAIN TO UNPROTECTED STORMWATER INLETS OR TO CATCH BASINS THAT DISCHARGE TO SURFACE WATERS, INLETS AND CATCH BASINS WITH FAILING SEDIMENT CONTROLS DUE TO LACK OF MAINTENANCE OR INADEQUATE DESIGN ARE CONSIDERED UNPROTECTED;
- V. DEPOSITS OF SEDIMENT FROM THE CONSTRUCTION SITE ON ANY PROPERTY (INCLUDING PUBLIC AND PRIVATE STREETS) OUTSIDE OF THE CONSTRUCTION ACTIVITY COVERED BY THIS PERMIT.

C. THE PERMIT REGISTRANT MUST ENSURE THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP ARE IMPLEMENTED ACCORDING TO THE FOLLOWING SEQUENCE:

I. BEFORE CONSTRUCTION,
- (1) IDENTIFY, MARK, AND PROTECT (WITH CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION (INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES AND VEGETATION AREAS TO BE PRESERVED.
- (2) IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (FOR EXAMPLE, WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS.
- (3) HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE ENGINEER REQUIRED BY CONDITION A.12.B.III TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS.
- (4) STABILIZE SITE ENTRANCES AND ACCESS ROADS INCLUDING, BUT NOT LIMITED TO CONSTRUCTION ENTRANCES, ROADWAYS AND EQUIPMENT PARKING AREAS (FOR EXAMPLE, USING GEOTEXTILE FABRIC UNDERLAY).
- (5) INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET PROTECTION AS WELL AS ALL SEDIMENT BASINS, TRAPS, AND BARRIERS.
- (6) ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK.
- (7) ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS.
- (8) STABILIZE STREAM BANKS AND CONSTRUCT THE PRIMARY RUNOFF CONTROL MEASURES TO PROTECT AREAS FROM CONCENTRATED FLOWS.

II. DURING CONSTRUCTION,
- (1) LAND CLEARING, GRADING AND ROADWAYS,
  - (A) BEGIN LAND CLEARING, EXCAVATION, TRENCHING, CUTTING OR GRADING ONLY AFTER INSTALLING APPLICABLE SEDIMENT AND RUNOFF CONTROL MEASURES.
  - (B) PROVIDE APPROPRIATE EROSION AND SEDIMENT CONTROL BMPS FOR ALL ROADWAYS INCLUDING GRAVEL ROADWAYS.
  - (C) INSTALL ADDITIONAL CONTROL MEASURES AS WORK PROGRESSES AS NEEDED.
  - (D) PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION.
- (2) SURFACE STABILIZATION,
  APPLY TEMPORARY OR PERMANENT SOIL STABILIZATION MEASURES (FOR EXAMPLE, TEMPORARY AND PERMANENT SEEDING, OR MULCHING) IMMEDIATELY ON ALL DISTURBED AREAS AS WORK IS COMPLETED. STABILIZATION OF DISTURBED AREAS MUST BE INITIATED IMMEDIATELY WHENEVER ANY EARTH DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE.
- (3) CONSTRUCTION AND PAVING,
  KEEP EROSION AND SEDIMENT CONTROL MEASURES IN PLACE FOR THE DURATION OF CONSTRUCTION, INCLUDING PROTECTION FOR ACTIVE STORM DRAIN INLETS AND APPROPRIATE NON-STORMWATER POLLUTION CONTROLS.

III. FINAL STABILIZATION AND LANDSCAPING,
- (1) PROVIDE PERMANENT EROSION PREVENTION MEASURES ON ALL EXPOSED AREAS.
- (2) REMOVE AND PROPERLY DISPOSE OF CONSTRUCTION MATERIALS AND WASTE, INCLUDING SEDIMENT RETAINED BY TEMPORARY BMPS.
- (3) REMOVE ALL TEMPORARY CONTROL MEASURES AS AREAS ARE STABILIZED, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS.

ESCP RESPONSIBILITY

IT IS THE INTENT OF THIS TEMPORARY EROSION AND SEDIMENT CONTROL PLAN THAT STORM WATER RUNOFF BE CONTROLLED AT ALL TIMES TO PREVENT SOIL EROSION AND TO MAINTAIN WATER QUALITY. ANY AND ALL MEASURES NECESSARY TO DO SO SHALL BE EMPLOYED BY THE CONTRACTOR.

1. REGARDLESS OF SITE, WEATHER, SOIL OR OTHER CONDITIONS, THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ENSURING THAT EROSION DOES NOT OCCUR ON THE SITE AND THAT POLLUTED OR SILT-LADEN RUNOFF DOES NOT LEAVE THE SITE OR ENTER INTO ANY CREEK, STREAM, WETLANDS OR WATER BODY ON THE SITE.
2. BEYOND THE MINIMUM REQUIREMENTS SHOWN ON THIS PLAN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING AND IMPLEMENTING APPROPRIATE METHODS, "BEST MANAGEMENT PRACTICES" (BMPS), FOR STORM WATER TREATMENT AND CONTROL THAT MEET THE REQUIREMENTS OF THE STATE AND LOCAL JURISDICTION.
3. THE CONTRACTOR SHALL REPORT ALL WATER QUALITY CONCERNS AND ACTIVITIES TO THE PROJECT ENGINEER. IN THE EVENT THAT THE INSTALLED WATER QUALITY CONTROL MEASURES ARE INEFFECTIVE AT CONTROLLING EROSION AND SEDIMENT, THE CONTRACTOR SHALL IMMEDIATELY REPORT TO AND CONSULT WITH THE PROJECT ENGINEER TO FIND AN APPROPRIATE REMEDY. ALL CONSTRUCTION ACTIVITIES, WITH THE EXCEPTION OF EROSION AND SEDIMENT CONTROL MEASURES, SHALL CEASE UNTIL SUCH TIME AS THE WATER QUALITY IS BROUGHT UNDER CONTROL.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MONITORING WEATHER FORECASTS AND ANTICIPATING STORM ACTIVITY AND SHALL SCHEDULE ALL PROJECT ACTIVITIES IN ANTICIPATION OF THE WEATHER.
5. ALL SUPPLIES AND MATERIALS NECESSARY FOR IMPLEMENTING BMPS SHALL BE STORED ON SITE AND SHALL BE IMMEDIATELY AVAILABLE FOR USE. SUCH SUPPLIES AND MATERIALS SHALL INCLUDE, BUT NOT BE LIMITED TO, STRAW BALES OR OTHER MULCHING MATERIAL, SILT FENCING AND STAKES, FILTER FABRIC, ETC.
6. DURING AND AFTER RUNOFF PRODUCING STORM EVENTS, CONTRACTOR SHALL MONITOR ALL EROSION CONTROL MEASURES AND SHALL PRIORITIZE IMPLEMENTATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES ABOVE ALL OTHERS.

ENGINEER

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NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS
UNPAVED PARKING LOTS, OUTSIDE STORAGE, RECREATIONAL FIELD, BOAT YARD

DEVELOPED CONDITIONS
PAVED PARKING LOTS, STORM WATER SEWER SYSTEM, UTILITIES, RECREATIONAL VEHICLE USE, PAVED BOAT YARD

RECEIVING WATER BODIES
PORT BASIN THEN PACIFIC OCEAN/CHETCO MOUTH & ESTUARY

811
Know what's below.
Call before you dig.

INSPECTION FREQUENCY:

* HOLD A PRE-CON MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE EC ENGINEER.
* ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200 C PERMIT REQUIREMENTS.
* INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQS 1200 C PERMIT REQUIREMENTS.
* CHANGES TO THE APPROVED ESC PLAN MUST BE SUBMITTED TO DEQ IN THE FORM OF AN ACTION PLAN.

RATIONAL STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQS 1200-C PERMIT APPLICATION AND BROF GUIDANCE DOCUMENT HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMPS 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, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESCP, AN ACTION PLAN WILL BE SUBMITTED.

INITIAL

STOCKPILE SOILS

TEMPORARY STOCKPILE LOCATIONS MAY BE ADJUSTED BY CONTRACTOR IN FIELD. CARE SHOULD BE TAKEN TO AVOID UNINTENTIONAL DRAINAGE IMPOUND OR DIVERSION. TEMPOR STRIPPINGS MAY BE INCORPORATED INTO EROSION CONTROL DIVERSION BERMS.

STOCKPILES SHALL NOT BE PLACED WITHIN PROTECTED AREAS, SCREEN BUFFERS, EXISTING DRAINAGE WAYS, UTILITIES EASEMENT, OR RIGHT-OF-WAYS. STOCKPILE MANAGEMENT SHALL COMPLY WITH THE ESC PLAN. ONSITE TEMPORARY STOCKPILES SHALL BE REMOVED PRIOR TO FINALIZING CONSTRUCTION.

CONSTRUCTION ACTIVITY / ESTIMATED TIME

CLEARING:	TO BE DETERMINED
GRADING:	TO BE DETERMINED
UTILITY INSTALL.:	TO BE DETERMINED
STREET CONSTRUCTION:	TO BE DETERMINED
FINAL STABILIZATION:	TO BE DETERMINED

SHEET INDEX

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C5.1
ECS GENERAL NOTES