Conceptual Site Civil Design Summary

Humboldt Offshore Wind and Heavy Lift Marine Terminal

Prepared for:

Moffatt & Nichol

September 2022

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Reference: 022054

September 22, 2022

Shane Phillips, P.E., D.PE, D.CE
Moffatt & Nichol
600 University Street, Suite 610
Seattle, WA 98101

Subject: Conceptual Site Civil Design Summary, Humboldt Offshore Wind and Heavy Lift Marine Terminal

Dear Shane Phillips:

This report summarizes the key elements of the conceptual site civil design approach for the Humboldt Offshore Wind and Heavy Lift Marine Terminal. This report also summarizes key considerations that should be addressed in future phases of the project. The conceptual site civil design includes the following elements:

- Site grading and drainage
- Stormwater management
- Site access
- Site utilities (domestic water, fire water, and sewer)

Conceptual design figures are provided in the appendices.

Sincerely,

SHN

Jared O'Barr, PE
Project Engineer

JXO:lam

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Table of Contents

Abbreviations and Acronyms

Units of Measure

Term	Definition
ft	feet

Additional Terms

Term	Definition
ATS	Active Treatment System
BMPs	best management practices
CAD	computer-aided design
CGP	Construction General Permit
CSD	Community Services District
FFE	finish floor elevation
HBMWD	Humboldt Bay Municipal Water District
IGP	Industrial General Permit
LID	low impact development
MS4	Municipal Separate Storm Sewer System
RWQCB	North Coast Regional Water Quality Control Board.
SWRCB	State Water Resources Control Board
WWTP	wastewater treatment plant

1.0 Project Layout and Phasing

The site civil conceptual design was based on the Master Plan Figure, dated July 29, 2021 (Appendix 1). This master plan figure provides a conceptual facility layout plan. Given that the site is likely to be developed in phases, the site civil conceptual design also considered anticipated project phasing. The phasing plan for the site is provided in Appendix 2.

2.0 Grading and Drainage

The conceptual grading plan alternatives for the site are provided in Appendix 3, and the conceptual drainage plan for the site is provided in Appendix 4.

2.1 Primary Grading Design Criteria

The criteria used for the conceptual grading and drainage design is summarized below:

- Minimum elevation of site (working yard surface): 17.00 feet (ft)
- Minimum building finish floor elevation (FFE): 18.00 ft
- Bottom of bioretention basins (bottom of gravel layer): 13.00 ft
- Minimum LID storm drain invert elevation: 13.00 ft
- Minimum slope of finish grade surface: 0.5% to 1%
- Site surfacing material: Class 2 aggregate base (3 ft thick)
- Preliminary set-aside for low impact development (LID) features: 5% of site footprint

2.2 Conceptual Grading & Drainage Approach

The conceptual site civil design was based on the master plan figure for the site. Alternative site layouts for the site would result in in different approaches to grading, drainage, and LID.

Alternative 1—LID Approach: The perimeter of the working yard surface was set at the minimum elevation of 17.00 ft, and LID features (bioretention basins) were placed along the perimeter of the site. The site was then graded at approximately 1% to 2% up toward the center of the site. This results in the center of the site being higher in elevation than the perimeter, which allows surface runoff to flow toward the perimeter of the site where the bioretention basins are located. This grading approach resulted in finish grade elevations at the high points on the site that vary between 21.00 ft to 27.00 ft. The majority of the existing ground surface of the site varies between approximately 10.00 ft and 22.00 ft. Therefore, a significant amount of engineered fill material will need to be imported to the site in order to accomplish this grading approach. The amount of fill needed to develop the site will depend on how the project is phased. Based on preliminary estimates, the amount of imported fill material needed to achieve this approach is expected to be in the range of 1,000,000 cubic yards to 1,500,000 cubic yards. This volume estimate includes the 3-ft thick aggregate base surface material.

Alternative 2—LID with Reuse of Industrial Outfall (concept developed by Moffatt & Nichol): The perimeter of the working yard surface was set at the minimum elevation of 17.00 ft, and LID features (bioretention basins w/underdrain and overflow) were placed along the perimeter of the site. A 300-ft swath at 1% was then graded up to create a perimeter that would sheet flow into the bioretention basins. The interior of the project site would then be graded into individual collection areas of roughly 3 acres each. This approach would produce interior elevations between 20.00 ft at the east side of the project site and 25.00 ft at the west side of the project site. Each collection area would have a stormwater inlet that connects to a new industrial stormwater mainline that would drain from north to south. Stormwater treatment would happen with a combination of media filters at the inlets and/or a buried infiltration system near the southwest end of the site. Storms that exceed the capacity of the infiltration system would then be by-passed to a storm drain lift station that is connected to the existing RMT II Ocean Outfall. Storms that exceed the capacity of the lift station would pond within each collection area and then overflow to the lower elevation collection area to the east until reaching the Samoa Federal Channel.

3.0 Stormwater Compliance

The project site lies within the County of Humboldt's jurisdiction, but is outside the regulated Municipal Separate Storm Sewer System (MS4) permit boundaries. Therefore, MS4 stormwater mitigation requirements do not apply to this project. However, this project will disturb more than an acre of ground and will be required to meet the post-construction stormwater requirements for the State Water Resources Control Board's (SWRCB) Construction General Permit (CGP). The CGP specifies post-construction runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 National Pollutant Discharge Elimination System (NPDES) permit.

The CGP post-construction standards require that the project replicate the pre-project water balance (runoff) for the smallest storms up to the 85th percentile storm event. The CGP emphasizes runoff reduction through onsite stormwater reuse, interception, evapotranspiration, and infiltration through non-structural controls (for example, porous pavement, interceptor trees, downspout disconnection, impervious area disconnection, landscape soil quality preservation/enhancement, and so on). If the use of structural control methods (for example, bioretention basins, detention basins, rain cisterns) is needed, the project will have to demonstrate the infeasibility of using non-structural practices on the site, or document that there will be fewer water quality impacts through the use of structural practices, and the North Coast Regional Water Quality Control Board (RWQCB) must approve the use of structural practices.

During the conceptual design phase for this project, there was some discussion regarding the possible need or desire to install an engineered treatment system (referred to as an Active Treatment System [ATS] in the CGP) to meet the stormwater quality objectives for the site. An ATS is a treatment system that is designed to reduce targeted pollutant loads in captured stormwater runoff by various methods (for example, introducing chemicals or an electric current to enhance flocculation, coagulation, and settling of the suspended sediment). Although this type of system may be effective in improving stormwater quality, it does not reduce stormwater runoff volumes. Therefore, an ATS is not considered to be a suitable approach to complying with the post-construction water balance requirements in the CGP.

An ATS may be used to meet construction-phase stormwater quality objectives of the CGP, but it is typically preferrable to achieve stormwater quality objectives during construction through the use of good housekeeping practices and construction best management practices (BMPs; for example, straw wattles, silt fences, mulching, drain inlet protection, and so on). ATSs can play a valuable role in achieving stormwater quality requirements, but they can be complex and costly to design and construct, and they require knowledgeable staff to operate and maintain the system. Also, the systems that use additives/polymers to mitigate sedimentation also pose a potential risk to water quality (for example, operational failure, equipment failure, additive/polymer release, and so on).

Engineered treatment systems may be used to meet Industrial General Permit (IGP) stormwater quality objectives, but more detailed information is needed about the intended activities on the site and their proposed locations before recommendations can be made regarding methods for complying with the IGP. In many cases, it is possible to comply with IGP without using highly engineered, complex treatment systems. The IGP emphasizes effective minimum BMPs such as good housekeeping, preventative maintenance, spill and leak prevention and response, material handling and waste management, and erosion and sediment controls. In the IGP, LID features are considered "advanced BMPs" and can provide effective means of achieving IGP stormwater quality objectives when the minimum BMPs prove ineffective. Engineered treatment systems are typically used as a last resort, when other methods of obtaining stormwater quality have proven unsuccessful.

3.1 Primary Stormwater Design Assumptions

The assumptions used for the conceptual stormwater mitigation design are summarized below:

- The conceptual site civil design assumes that stormwater mitigation requirements will be achieved through the use of bioretention basins. As mentioned in the grading and drainage section of this report, the bioretention basins are located around the perimeter of the site.
- The conceptual plan assumes compacted Class 2 aggregate base will be used as the surface material for the site. Because Class 2 aggregate base typically contains fines (between 0%-12%), it can create a fairly impermeable surface when compacted. The conceptual design treats the Class 2 aggregate base surface as impermeable.
- Preliminary set-aside for LID features is 5% of the site footprint.

3.2 Conceptual Stormwater Compliance Approach

The conceptual post-construction stormwater volume reduction design was based on the master plan figure for the site (Appendix 1). Alternative site layouts would result in in different approaches to grading, drainage, and LID. Stormwater mitigation features are shown in the conceptual grading plan for the site (Appendix 3), and the conceptual drainage plan for the site (Appendix 4).

The conceptual site civil design assumes that stormwater mitigation requirements will be achieved through the use of bioretention basins. Surface runoff from the site will flow into the bioretention basins which will provide stormwater treatment and reduce stormwater runoff by promoting infiltration into the subsurface soils. Bioretention basins are depressed landscaped areas that typically allow for approximately 6 inches of ponding, and are typically equipped with a raised drain inlet that provide a means of bypass during larger storm events. Under the ponding zone is the planting zone, which consists of a sand/compost mix that supports plant growth and also filters stormwater runoff and retains pollutants. Mulch is sometimes applied over the planting zone for plant health and weed management. Below the planting zone is a subsurface gravel storage layer. This storage layer collects the treated stormwater that has passed through the planting zone, and allows it to infiltrate into the subsurface soils. Often, a subsurface drainage system (perforated pipes) is installed at the top of the gravel storage layer so that the bioretention basins can drain if the subsurface soils do not allow for adequate infiltration. This will help to ensure that ponded water does not remain in the bioretention basins for extended periods of time so that they are available to provide treatment for subsequent storm events, and so that habitat for vectors does not develop.

Alternative stormwater volume reduction methods (other than bioretention basins) may be considered in future phases of the site design. As more information regarding the site uses and layout becomes available, volume reduction and treatment methods other than bioretention basins may be preferred. Also, certain activities on the site may require coverage under the IGP, which establishes different performance criteria than the CGP. Stormwater treatment features may need to be designed to meet the requirements of both the CGP and the IGP.

4.0 Site Access

There are various points of access to the site provided in the master plan figure. A figure showing highlighted (yellow) access routes is provided in Appendix 5.

4.1 Primary Access Road Design Criteria

The criteria used for the conceptual grading and drainage design are summarized below:

- Minimum elevation of access roads: 16.00 ft
- Road Configuration: 12 ft lanes, 8 ft paved shoulders, 2ft gravel shoulders, 4:1 max slope for fill prism
- Preliminary approach to meeting LID requirements: Use impervious area disconnect credits along the side slopes and adjacent ground surfaces. Mitigation credit area must be at least half the size of the impervious tributary area.

4.2 Access Alternatives

- Primary access to the northern end of the site will be provided along Cookhouse Road, Vance Avenue, and a new road segment connecting to the northern end of the site. Two alternatives were considered for the new road segment.
    - Alternative 1 (Appendix 6) runs along the existing driveway that begins at the intersection of Cookhouse Road and Vance Avenue and provides access to the museum site. This alternative provides a more direct access route to the site. However, it has several drawbacks:
        - Raising this road to a minimum elevation of 16 ft will require raising the driveways serving the museum site.
        - Sharing this access road with the museum's increases the potential for vehicle conflicts along the access road.
        - Based on preliminary wetland mapping, this access road will impact larger areas of wetlands, which will require more extensive mitigation.
        - Alternative 2 (Appendix 7) intersects Vance Avenue approximately 640 ft northeast of the intersection of Cookhouse Road and Vance Avenue. This alternative is expected to be preferred over Alternative 1 because it does not have the same disadvantages that are associated with Alternative 1.

- There are multiple access roads that will serve the southern end of the site. The master plan figure shows access points at LP Drive at Wind Avenue, and connecting to the road that will be constructed between the project site and the adjacent Nordic Aquafarms site.
- Utility services may connect to the site along the access roads. The northern access road is not expected to provide any utility services, but the access roads on the southern end of the site will likely need to consider utility corridors for water, sewer, electrical, and communications.

5.0 Site Utilities

The conceptual site civil design includes a preliminary layout for fire water, domestic water, and sewer services for the site. The conceptual utility plan is provided in Appendix 8. The approach to bringing utilities onto the site will be significantly impacted by the site layout and the phasing plan for the development of the site. The conceptual utility plan provides a preliminary layout for how utilities might serve the site, but the sizes/capacities of these utilities have not been evaluated. More information about the fire water, domestic water, and sewer demands for the proposed development will be needed in order to begin evaluating the sizes of these utilities, and to ensure that the utility providers can meet the demands of this project.

5.1 Early Phase Utility Services

The northern end of the site is expected to be developed as part of the earlier phases of the project, therefore water and sewer services will likely need to be provided by the Town of Samoa. Onsite treatment and disposal of wastewater was not considered as part of the conceptual design. The conceptual utility plan shows water and sewer tie-ins at N. Bay View Drive in Samoa. The conceptual utility plan provides services to the Fabrication & Assembly Building, but there may be additional requirements in the yard area that need to be considered. Further coordination with the Town of Samoa and Peninsula Community Services District (CSD) is needed to confirm that these entities have the capacity to provide the needed services for this project.

- Fire and Domestic Water: Fire and domestic water will likely be provided from the same source and point of connection in Samoa. Domestic water and fire water demands for the early phases of the project need to be determined.
- Sewer: Sewer will likely need to be pumped in order to tie in to connect to Samoa's sewer system. This will require a sewage lift station and force main. The existing museums and the Samoa Cookhouse may also need to be served by the sewage lift station and force main. Evaluation of wastewater treatment capacity at the Samoa wastewater treatment plant (WWTP) will be required. Expansion of this facility may be needed in order to support this project.

5.2 Late Phase Utility Services

The southern end of the site is expected to be developed during the later phases of the project. Water services will be provided by Humboldt Bay Municipal Water District (HBMWD), and sewer services will likely need to be provided by the Town of Samoa. Onsite treatment and disposal of wastewater was not considered as part of the conceptual design. Further coordination with the Town of Samoa, Peninsula CSD, and HBMWD is needed to confirm that these entities have the capacity to provide the needed services for this project.

- Fire Water: Fire water is expected to be served by HBMWD's industrial water main. The tie-in point is expected to be near the proposed connection serving the Nordic Aquafarms site, and a new fire water line will need to be installed along Vance Avenue to the project site. The existing Red Tank will need to remain active until it is replaced by a new fire water storage tank. This tank will need to serve the Nordic Aquafarms site in addition to meeting the fire water needs for this project.
- Domestic Water: Domestic water is expected to be served by HBMWD's domestic water main. The tie-in point is expected to be near the intersection of LP Drive and Vance Avenue, near the main access point to the project site. HBMWD's domestic water main may have limited capacity that needs to be considered.
- Sewer: The conceptual utility plan shows an onsite gravity sewer main serving the various buildings on the southern end of the site. This gravity sewer main will tie in to a new sewage lift station that will convey sewage flows from the site to the Samoa WWTP. Evaluation of wastewater treatment capacity at the Samoa WWTP will be required. Expansion of this facility will likely be needed in order to support this project.

5.3 Maintaining Existing Utility Services

There are a number of existing utilities on the project site that need to be either maintained or replaced during the development of this site. Some of these considerations are discussed in the following section, but a more thorough evaluation is required to confirm which existing utilities need to be maintained.

6.0 Next Phase Considerations

As the project progresses, there are some primary considerations that should be addressed to inform and refine the approach to developing the site. Primary considerations are summarized below:

1. The overall layout and function of the site should be further considered. The site layout plays a significant role in determining how the site should be constructed for grading, drainage, and stormwater treatment purposes. Developing alternative site layouts will allow the design team to evaluate different approaches to the grading and drainage of the site, which could have a significant impact on the amount of imported fill material that is needed for the development of this site.
2. A thorough evaluation of all easements needs to be conducted, and the base map needs to be updated to show the location of all easements and property lines as they currently exist. The current master plan figure shows Wind Avenue occupying the railroad corridor, which will not be permitted. Future site plans should fully consider all property lines, easements, and project phasing.
3. The phasing plan for the site is still evolving. As the phasing approach for the site nears finalization, the overall approach to the project will need to be reconsidered. The phasing plan for the site will have a significant impact on earthwork material balance and utility layout.
4. Minor changes to the minimum design elevations on the site could have a significant impact on the volume of material that needs to be imported to the site. Therefore, the minimum elevations for the site should be confirmed.

5. Detailed grading surfaces should be developed in computer-aided design (CAD) so that more accurate volume estimates can be determined, and so that additional opportunities and constraints can be revealed.
6. More specific information regarding the intended uses of the site is needed. This includes the types of activities that this site should be able to accommodate, the scale of these activities, and the locations of these activities.
7. Drainage of the site during large storm events needs to be considered more thoroughly. The site is very large and relatively flat, which could make drainage challenging in some areas, especially on the inland perimeter of the site.
8. Drainage of the museum site needs to be considered as the design progresses. This is already a low-lying area, and the proposed development of the terminal site and northern access road could make drainage of the museum site more complicated. A better understanding of how this area currently drains is needed, and an approach to draining this area in the future needs to be considered.
9. Further consideration is needed in order to verify the approach to complying with the CGP post-construction volume reduction requirements. A detailed evaluation of pre-construction runoff vs. post-construction runoff should be conducted to determine runoff volume reduction requirements that the design will need to achieve.
10. Further evaluation of the surface material for the site is needed. Class 2 aggregate base contains fines that could become mobilized in the surface runoff during storm events. Some of the fines suspended in the stormwater runoff may clog the stormwater conveyance/ treatment devices, and many of the suspended fines will likely pass through these devices, which could be problematic for meeting IGP stormwater numeric action levels. Additionally, compacted Class 2 aggregate base is often considered an impermeable surface, but if the fines (passing #200 sieve) are removed from the material, it may provide a more permeable surface. Coordination with the RWQCB will be necessary to get guidance on what surface materials can be treated as permeable. Guidance from the geotechnical engineering team will also be needed in order to verify what types of materials will be able to handle the heavy loads that will occur on this site.
11. The next phase of the project should evaluate site layout, proposed uses, and compliance requirements in more detail so that potential alternatives for complying with the IGP can be considered.
12. The overall approach to stormwater compliance through treatment BMPs needs to be refined. The current conceptual design employs bioretention basins as the primary approach to meeting CGP post-construction volume reduction requirements. However, other potential approaches will require further evaluation.
13. Infiltration testing is needed across the site to identify areas where subsurface materials are suitable for stormwater infiltration.
14. The CGP is being updated, and there could be changes that will impact the design approach for this project. Updates to the CGP should be tracked closely to verify that the design meets the necessary requirements.
15. The next phase of the project should develop a clear concept of what will be constructed along the shoreline. There are multiple opportunities and constraints along the shoreline. More

clarity is needed regarding this portion of the site in order to inform the design approach for grading, drainage, and stormwater mitigation.

16. Sources of suitable engineered fill material need to be considered. This project will require the import of a significant amount of fill material; therefore, it will be important to begin identifying potential sources of this fill material so that costs, logistics, and options can be considered in more detail.
17. More information is needed regarding the proposed facilities and operations at the site so that fire water demands can be estimated. This will require further coordination with the fire marshal.
18. The need to keep the Red Tank in service, and options for replacing the Red Tank need to be considered in more detail. More information is needed regarding how this tank currently functions, who it serves, and what services need to be maintained throughout the project.
19. The need to maintain the function of the sea water intake and conveyance pipe needs to be considered. Will any of the existing infrastructure need to be replaced as part of this project?
20. More information is needed so that the domestic water, fire water, and wastewater demands for each phase of the project can be evaluated. The early phases of the project (on the north end of the site) will likely need domestic water, fire water, and sewer connections with the Town of Samoa. Later phases of the project (on the south end of the site) will likely receive domestic water and fire water (industrial water) directly from HBMWD, but wastewater needs will still likely need to be met by sending wastewater to the Samoa WWTP.
21. Domestic and fire water demands need to be established so that the suppliers (HBMWD and Peninsula CSD) can determine if they have the capacity to meet the demands of the project.
22. Further evaluation is needed to determine what utility services need to be provided to the Samoa Cookhouse and the museum buildings.
23. Further evaluation is needed to determine the wastewater demands for each phase of the project so that the capacity of the Samoa WWTP can be considered, and the need to expand this WWTP can be evaluated.
24. Water and sewer service needs for the wharf need to be confirmed.
25. Opportunities and constraints associated with the adjacent Nordic Aquafarms development need to be considered.
26. Further collaboration is needed between the various project teams so that design, construction, and permitting constraints can be thoroughly evaluated.

Master Plan Figure 1

HUMBOLDT BAY HARBOR RECREATION & CONSERVATION DISTRICT

moffatt & nichol

0' 200' 500' 1,000'

HUMBOLDT BAY OFFSHORE WIND & HEAVY LIFT MULTIPURPOSE MARINE TERMINAL

CONCEPTUAL MASTER PLAN

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5.7.22

Phasing Plan 2

HUMBOLDT BAY HARBOR RECREATION & CONSERVATION DISTRICT

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0' 200' 500' 1,000'

HUMBOLDT BAY OFFSHORE WIND & HEAVY LIFT MULTIPURPOSE MARINE TERMINAL

CONCEPTUAL PHASING PLAN - ALTERNATE 2

5.22.22

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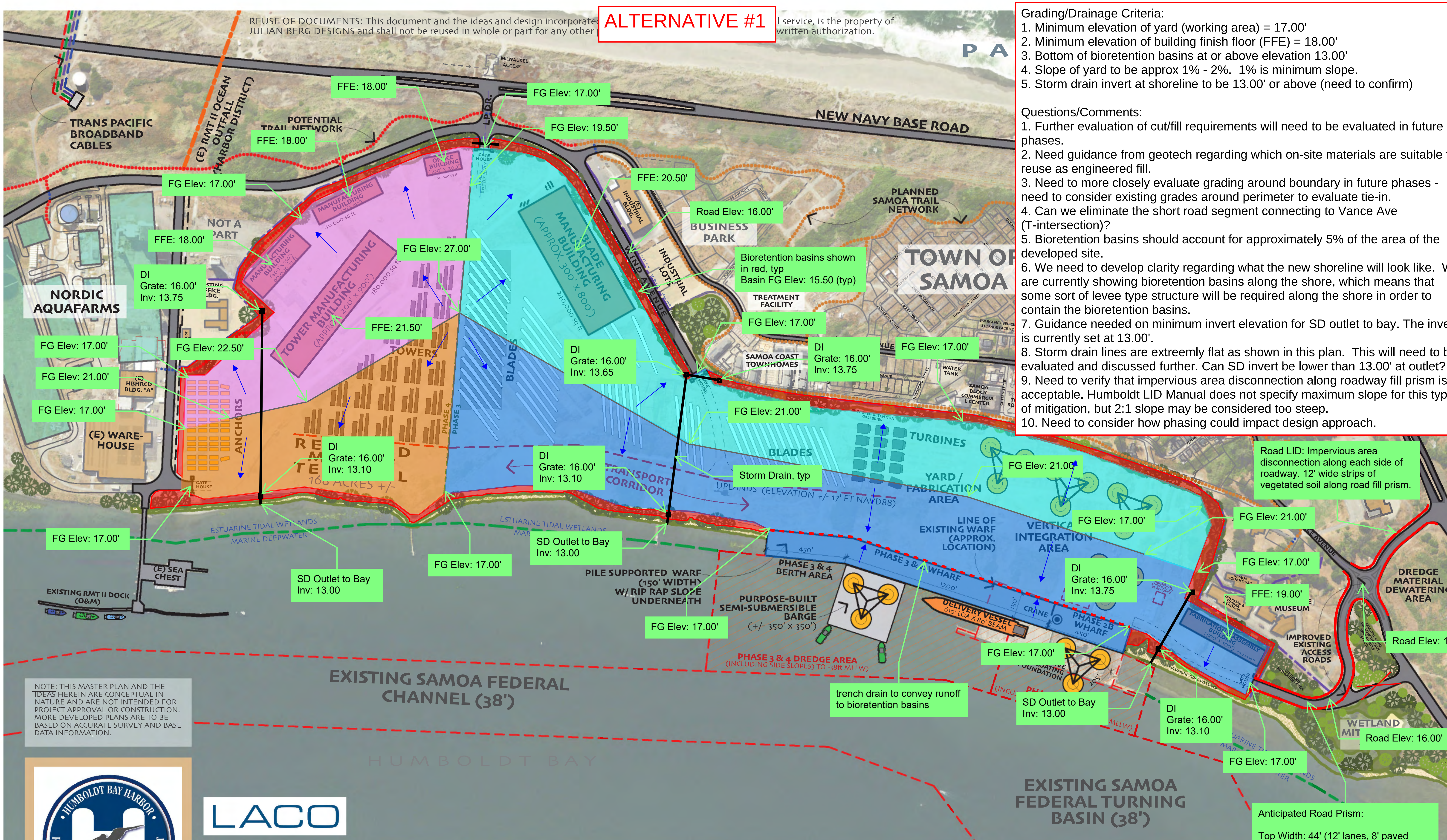
Conceptual Grading Plan

3

ALTERNATIVE #1

Grading/Drainage Criteria:
1. Minimum elevation of yard (working area) = 17.00'
2. Minimum elevation of building finish floor (FFE) = 18.00'
3. Bottom of bioretention basins at or above elevation 13.00'
4. Slope of yard to be approx 1% - 2%. 1% is minimum slope.
5. Storm drain invert at shoreline to be 13.00' or above (need to confirm)

Questions/Comments:
1. Further evaluation of cut/fill requirements will need to be evaluated in future phases.
2. Need guidance from geotech regarding which on-site materials are suitable for reuse as engineered fill.
3. Need to more closely evaluate grading around boundary in future phases - need to consider existing grades around perimeter to evaluate tie-in.
4. Can we eliminate the short road segment connecting to Vance Ave (T-intersection)?
5. Bioretention basins should account for approximately 5% of the area of the developed site.
6. We need to develop clarity regarding what the new shoreline will look like. We are currently showing bioretention basins along the shore, which means that some sort of levee type structure will be required along the shore in order to contain the bioretention basins.
7. Guidance needed on minimum invert elevation for SD outlet to bay. The invert is currently set at 13.00'.
8. Storm drain lines are extreemly flat as shown in this plan. This will need to be evaluated and discussed further. Can SD invert be lower than 13.00' at outlet?
9. Need to verify that impervious area disconnection along roadway fill prism is acceptable. Humboldt LID Manual does not specify maximum slope for this type of mitigation, but 2:1 slope may be considered too steep.
10. Need to consider how phasing could impact design approach.



HUMBOLDT BAY HARBOR RECREATION & CONSERVATION DISTRICT

LACO

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HUMBOLDT BAY OFFSHORE WIND AND HEAVY LIFT MARINE TERMINAL

MASTER PLAN

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7.29.21

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0' 200' 500' 1,000'

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CONCEPTUAL MASTER PLAN

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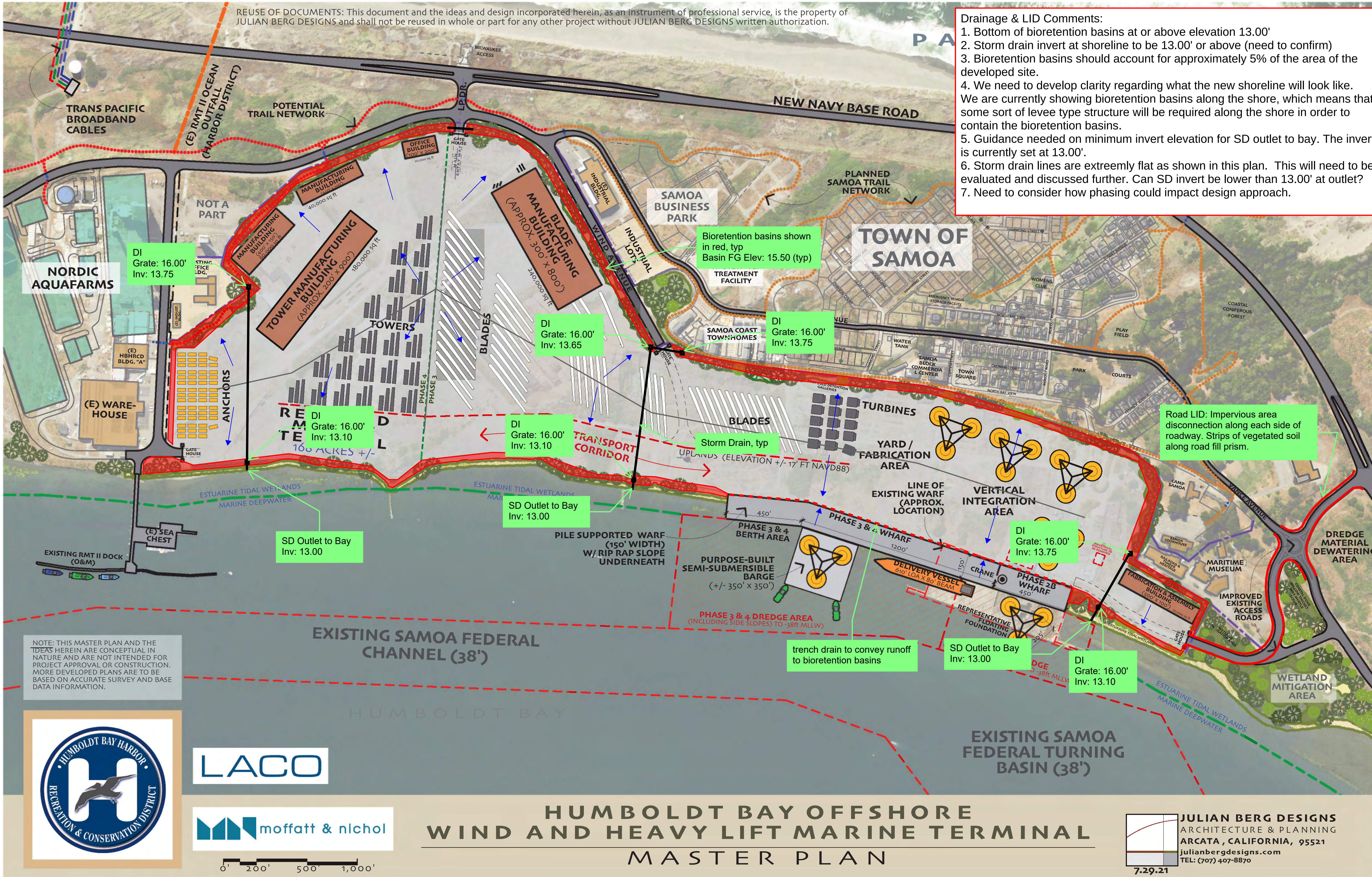
Conceptual Drainage and LID Plan

4



HUMBOLDT BAY OFFSHORE WIND AND HEAVY LIFT MARINE TERMINAL

MASTER PLAN

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Access Road Overview

5

HUMBOLDT BAY HARBOR RECREATION & CONSERVATION DISTRICT

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0' 200' 500' 1,000'

HUMBOLDT BAY OFFSHORE WIND & HEAVY LIFT MULTIPURPOSE MARINE TERMINAL

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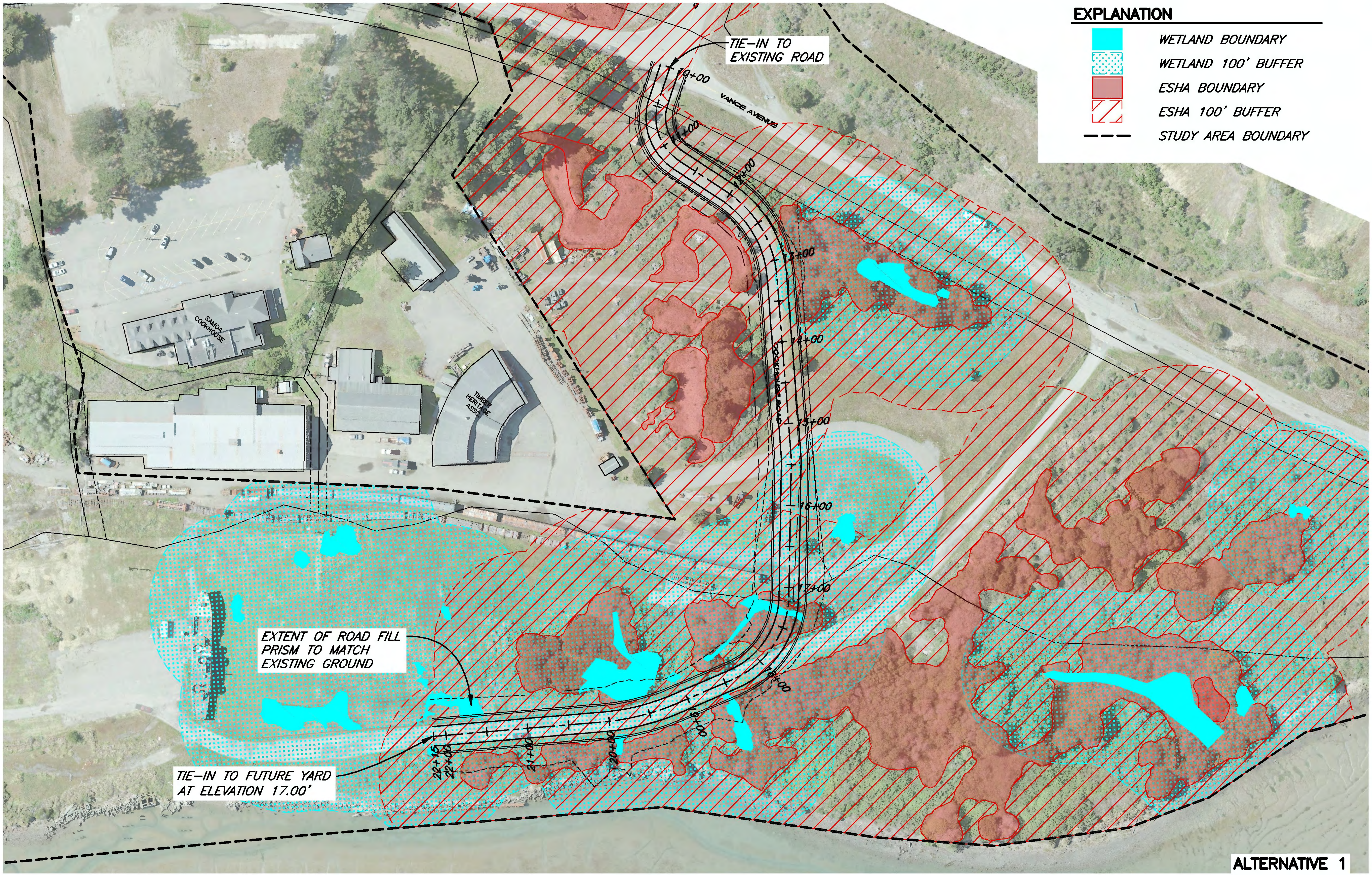
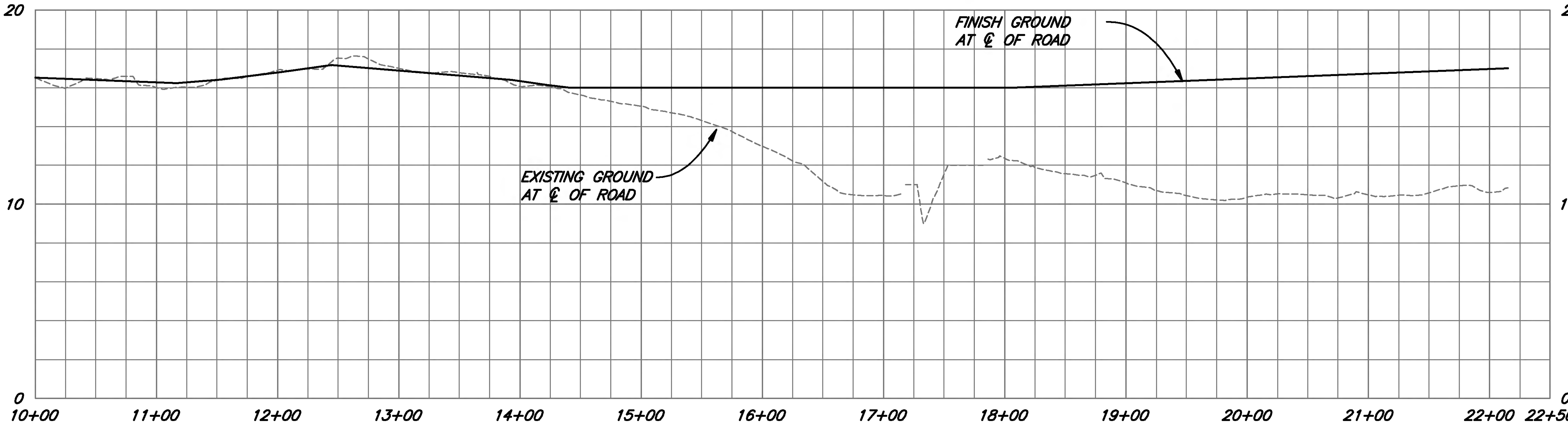
Northern Access Alternative 1

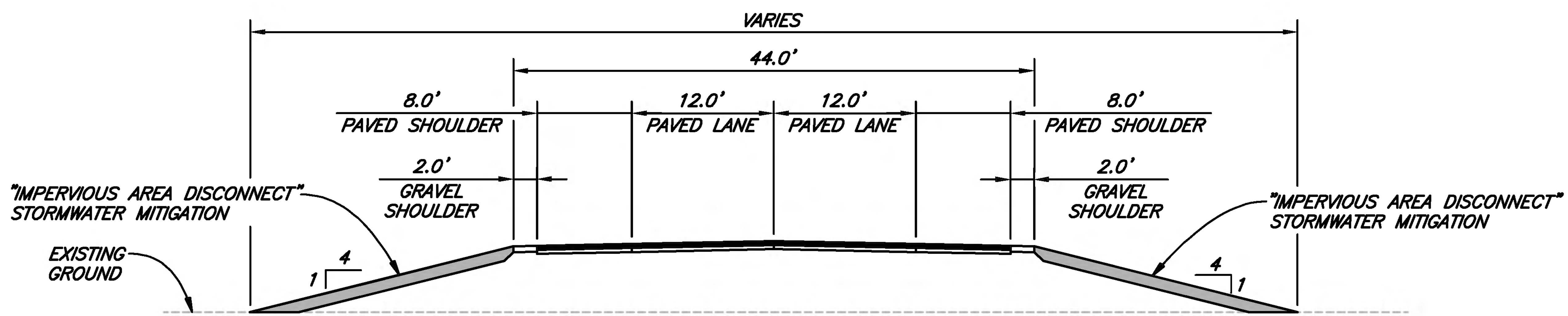
6


EXPLANATION
WETLAND BOUNDARY
WETLAND 100' BUFFER
ESHA BOUNDARY
ESHA 100' BUFFER
STUDY AREA BOUNDARY
TIE-IN TO EXISTING ROAD
VANCE AVENUE
SAMOA COOKHOUSE
TIMBER HERITAGE ASSOC.
EXTENT OF ROAD FILL PRISM TO MATCH EXISTING GROUND
TIE-IN TO FUTURE YARD AT ELEVATION 17.00'
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
22+15
ALTERNATIVE 1



PROFILE

SCALE: 1"=80' H
1"=5' V



TYPICAL ROAD CROSS SECTION

NTS

Northern Access Alternative 2

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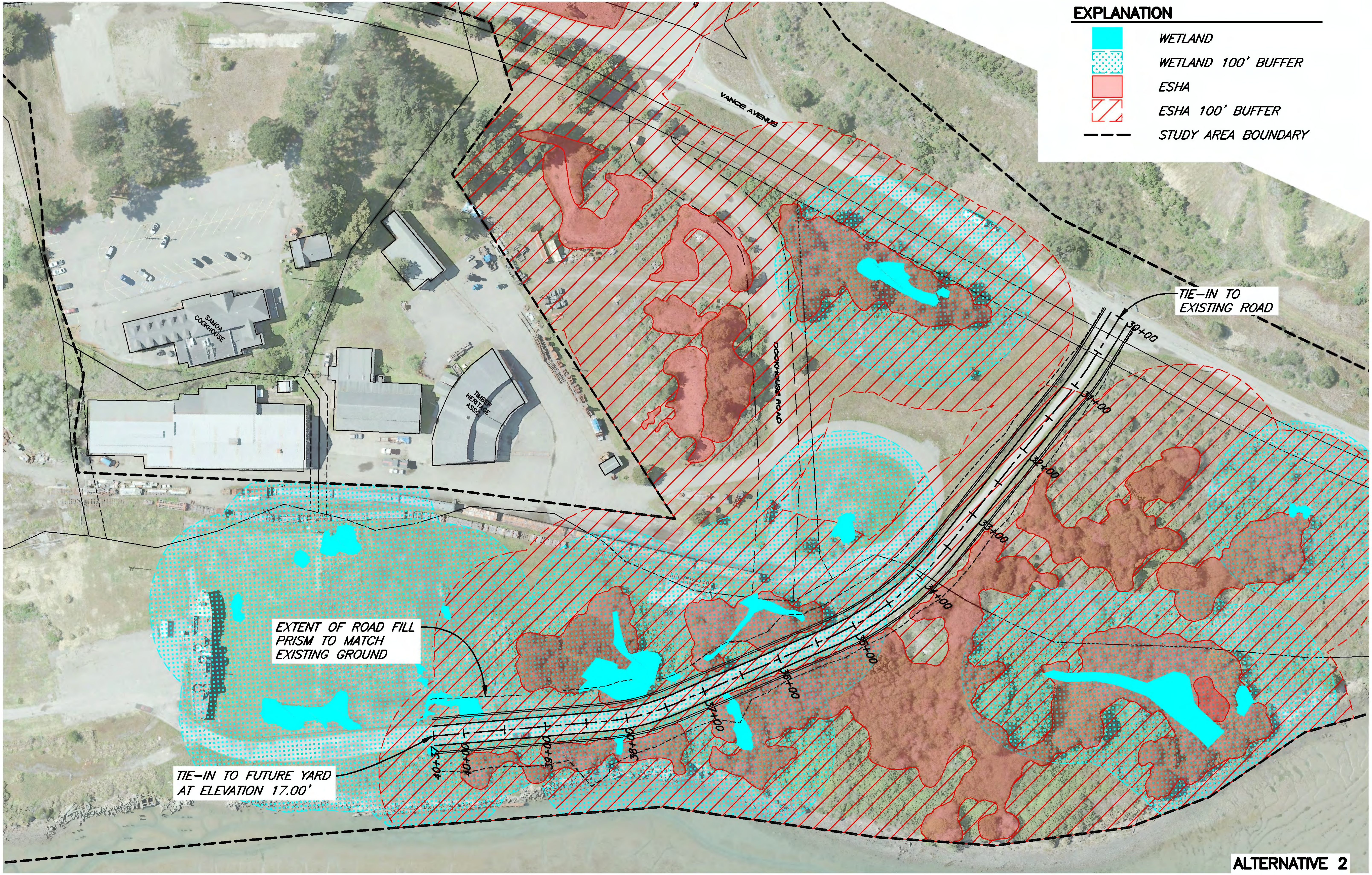
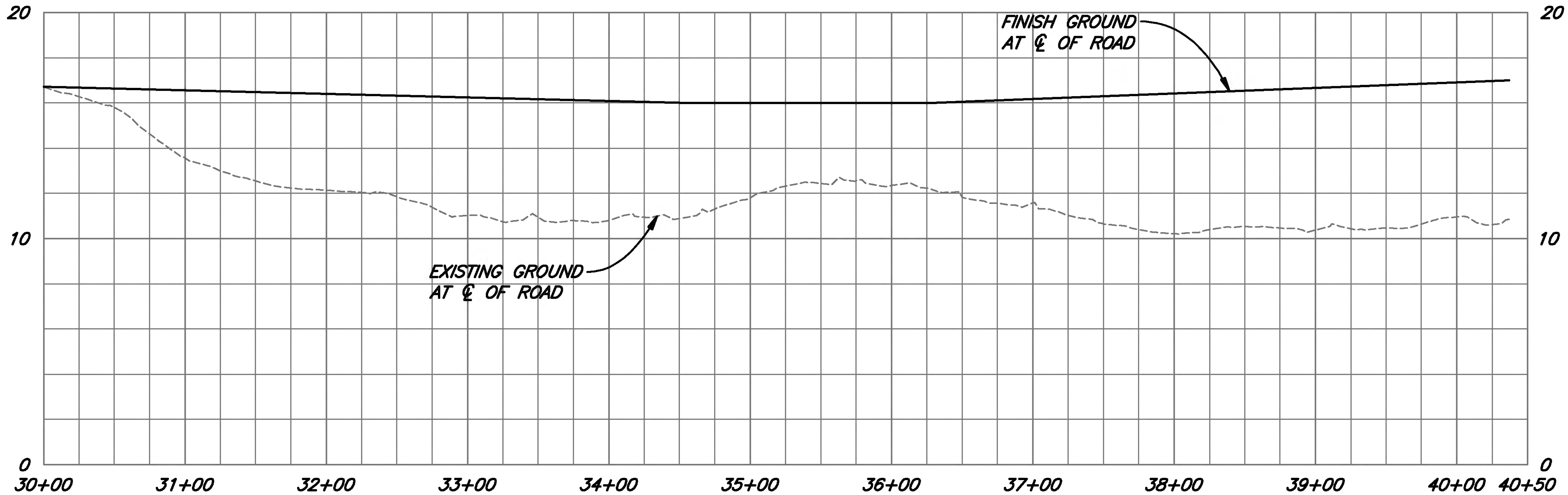
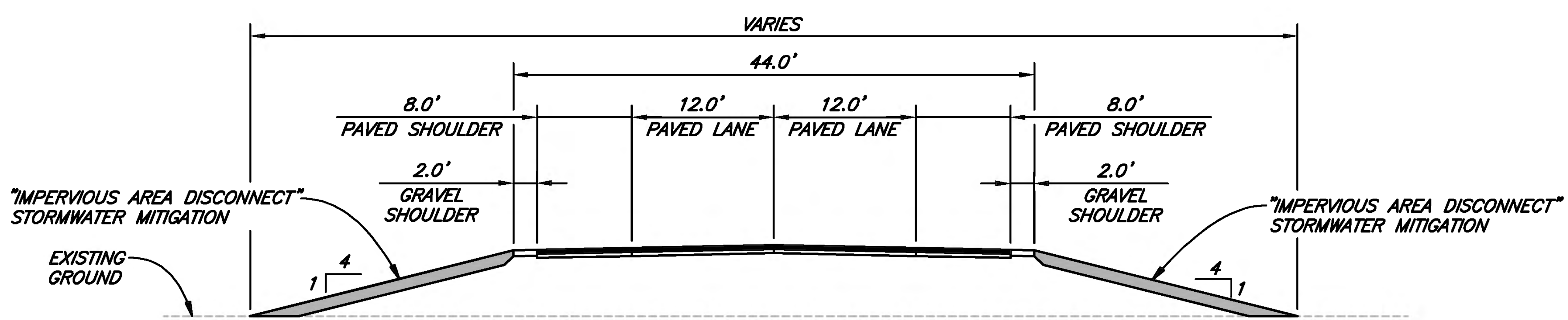


EXPLANATION
WETLAND
WETLAND 100' BUFFER
ESHA
ESHA 100' BUFFER
STUDY AREA BOUNDARY
VANCE AVENUE
COOKHOUSE ROAD
SAMOA COOKHOUSE
TIE-IN TO EXISTING ROAD
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
EXTENT OF ROAD FILL PRISM TO MATCH EXISTING GROUND
TIE-IN TO FUTURE YARD AT ELEVATION 17.00'
ALTERNATIVE 2



PROFILE

SCALE: 1"=80' H
1"=5' V

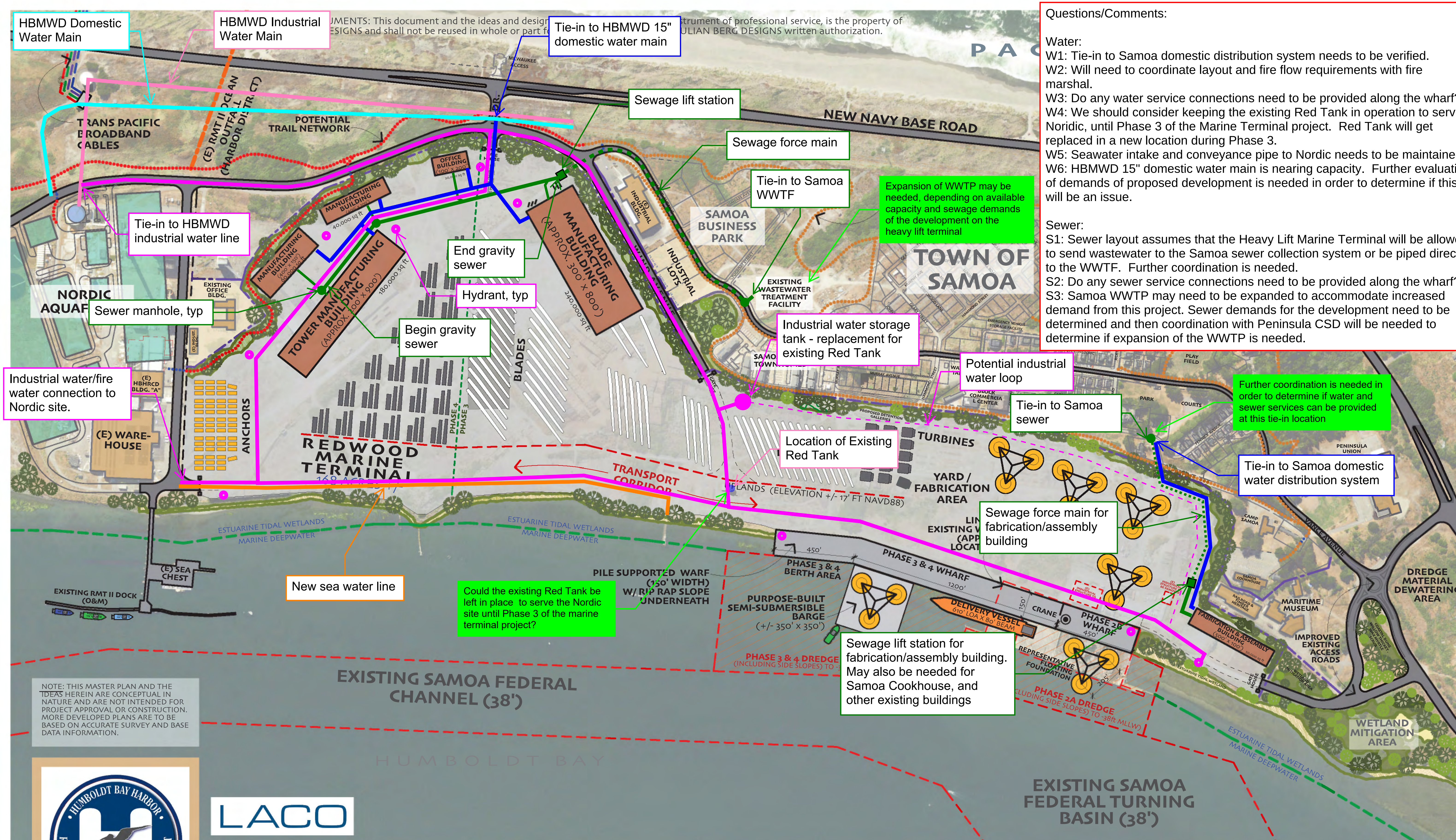


TYPICAL ROAD CROSS SECTION

NTS

Conceptual Utility Plan

8



Questions/Comments:

Water:
W1: Tie-in to Samoa domestic distribution system needs to be verified.
W2: Will need to coordinate layout and fire flow requirements with fire marshal.
W3: Do any water service connections need to be provided along the wharf?
W4: We should consider keeping the existing Red Tank in operation to servie Noridic, until Phase 3 of the Marine Terminal project. Red Tank will get replaced in a new location during Phase 3.
W5: Seawater intake and conveyance pipe to Nordic needs to be maintained.
W6: HBMWD 15" domestic water main is nearing capacity. Further evaluation of demands of proposed development is needed in order to determine if this will be an issue.

Sewer:
S1: Sewer layout assumes that the Heavy Lift Marine Terminal will be allowed to send wastewater to the Samoa sewer collection system or be piped directly to the WWTF. Further coordination is needed.
S2: Do any sewer service connections need to be provided along the wharf?
S3: Samoa WWTP may need to be expanded to accommodate increased demand from this project. Sewer demands for the development need to be determined and then coordination with Peninsula CSD will be needed to determine if expansion of the WWTP is needed.

Humboldt Bay Harbor Recreation & Conservation District

LACO

moffatt & nichol

0' 200' 500' 1,000'

HUMBOLDT BAY OFFSHORE WIND AND HEAVY LIFT MARINE TERMINAL
MASTER PLAN

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7.29.21

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