

# PNW LNG Project Design Mitigation

Final Report



Prepared for:

Canadian Environmental Assessment Agency  
Pacific and Yukon Regional Office  
410-701 Georgia Street West  
Vancouver, BC V7Y 1C6

Prepared by:

Pacific NorthWest LNG Limited Partnership  
Oceanic Plaza, Suite 1900 – 1066 West Hastings Street  
Vancouver, BC V6E 3X1

Stantec Consulting Ltd.  
4370 Dominion Street, 5th Floor  
Burnaby, BC V5G 4L7  
Tel: (604) 436-3014  
Fax: (604) 436-3752

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## **1.0 INTRODUCTION**

Pacific NorthWest LNG Limited Partnership (PNW LNG) is proposing changes to the Pacific NorthWest LNG Project (the Project) to avoid, and further reduce, potential effects of the Project on the environment. These design mitigations include:

- Redesigning the **marine terminal and relocating the berths** to remove project infrastructure (i.e., piles) on Flora Bank; and eliminate the need for dredging on Agnew Bank and the associated disposal at sea of the dredged materials.
- Moving the construction worker accommodation facility (accommodation camps) from the proposed Lelu Island location and using **third party owned-and-operated worker accommodation camps** on private property in Port Edward and/or in the Prince Rupert area.

These design changes are mitigation measures proposed to reduce the potential effects of the Project on the environment. The design mitigation proposed replaces the design described in the Environmental Impact Statement and Environmental Assessment Certificate Application (EIS/Application).

The purpose of this report is to provide the Canadian Environmental Assessment (CEA) Agency information on the design changes to inform the CEA Agency's determination of next steps in the environmental assessment. This report includes:

1. A description of the changes to Project components (including drawings and figures, as well as information on the responsibilities of PNW LNG with respect to the third party owned-and-operated accommodation camps).
2. A description of how the assessment of the effects of the Project is expected to change as a result of the design changes.
3. A description of new environmental effects (as defined in CEAA 2012), arising from the design mitigation.
4. A list of sections in the EIS/Application that could require updating to reflect the changes to Project design.

The objective of the design mitigation is to avoid the activities in the marine environment with the greatest potential environmental effects (i.e., effects on marine fish and fish habitat) and to eliminate the need to compensate for potential effects on these resources. Overall, the design mitigation addresses key concerns raised by First Nations, government agencies, and the public during the review of the EIS/Application.

The Project design changes will be implemented to mitigate the following effects on the environment:

- Effects of dredging on salmon populations and commercial, recreational and Aboriginal (CRA) fisheries
- Effects of Project infrastructure on Flora Bank
- Interference of dredging equipment and barges on marine traffic and fishing
- Perceived health risk from sediment mobilization during dredging
- Effects of disposal at sea on marine resources at Brown Passage
- Worker health and safety.

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The Project design changes are limited to changes to Project infrastructure in the marine environment and the location of the accommodation camps. There are no changes proposed to the construction or operation of the LNG Facility on Lelu Island. There is no change to the purpose of the Project (to convert natural gas from BC into LNG for export) or to the Project location (on Lelu Island, in Port Edward BC).

Table 1-1 provides a list of the Project components listed in Section 2.2 of the EIS/Application and indicates (with a checkmark) those that will be affected by the design changes. Table 1-2 provides an overview of the corresponding changes to the Project activities.

Section 2 (of this report) provides a detailed description of the changes to the Project components and Project activities due to the design mitigations.

Section 3 (Table 3-1) summarizes how the assessment of the effects of the Project on the environment is expected to change as a result of the design compared to the EIS/Application (submitted February 2014). The two design mitigations result in changes to the assessment of almost all of the VCs in the EIS/Application. Table 3-2 provides a list of the chapters of the EIS/Application and identifies which chapters are affected by the Project design mitigations. PNW LNG anticipates filing an Addendum to the EIS that will provide further details regarding the conclusions set out in Table 3-1 where the CEA Agency considers that further information is required. The Addendum will also provide any further information requested by the CEA Agency.

**Table 1-1: Overview of Project Components Affected by the Design Change**

Project Components			
<b>LNG Trains</b>		<b>Utilities and Offsite (cont'd)</b>	
Feed Gas Receiving Unit		Wastewater Treatment Systems	
Pressure Let Down Unit		Stormwater Management Infrastructure	
Gas Treatment Unit		Fire Control Infrastructure	
Gas Dehydration Unit		Nitrogen Generation System	
Mercury Removal Unit		Compressed Air System	
Fractionation Unit		<b>Non-Manufacturing Facilities</b>	
Liquefaction Unit		Materials Offloading Facility	
<b>LNG Storage and Loading</b>		Bridge and Roads	
Storage tanks		Administration and Maintenance Buildings	
Marine Infrastructure	✓	Site Fencing	
Loading and Vapour Return Arms		Site Lighting	✓
<b>Utilities and Offsite</b>		Fish Habitat Compensation	✓
Flare System		Wetland Compensation	
Electrical Power Supply		<b>Temporary Construction Facilities</b>	
Other Bulk Storage		Pioneer Dock	
Water Supply Infrastructure	✓	Temporary Construction Camp	✓

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**Table 1-2: Overview of Project Activities**

Project Activities	Description of Activity (from Table 4-4 of the EIS/Application)	Change in Activity from the Design Change
<b>Construction</b>		
Site Preparation (land-based)	<ul style="list-style-type: none"> <li>Tree removal (including CMTs), vegetation clearing, peat removal, grading, and general site preparation within terrestrial project development area (including the facility on Lelu Island, the bridge, and road access to the mainland)</li> </ul>	<ul style="list-style-type: none"> <li>No change</li> </ul>
Onshore Construction	<ul style="list-style-type: none"> <li>Construction of a two-lane bridge connecting Lelu Island to the mainland (including bridge footings on the mainland)</li> </ul>	<ul style="list-style-type: none"> <li>No change</li> </ul>
	<ul style="list-style-type: none"> <li>Construction, operation, and decommissioning of a temporary camp that would accommodate 3,500 to 4,500 people at peak construction for the purposes of constructing the facility and all related infrastructure, services, and facilities</li> </ul>	<ul style="list-style-type: none"> <li>No work camps will be developed on Lelu Island.</li> <li>Third party accommodation camp providers would develop and operate accommodation camps that would be expanded as necessary to meet the needs of all projects in the area (e.g., Canpotex, Prince Rupert LNG, etc.) including the PNW LNG Project.</li> </ul>
	<ul style="list-style-type: none"> <li>Construction of a heavy-haul road for construction traffic and transport of facility modules</li> </ul>	<ul style="list-style-type: none"> <li>No change</li> </ul>

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Project Activities	Description of Activity (from Table 4-4 of the EIS/Application)	Change in Activity from the Design Change
Onshore Construction (cont'd)	<ul style="list-style-type: none"> <li>• Construction of the LNG production facility (up to the point of connection with the natural gas transmission line), including:                             <ul style="list-style-type: none"> <li>– Operation of a concrete batch facility</li> <li>– Excavating and pouring foundations</li> <li>– Installation of drainage systems</li> <li>– Constructing of the LNG trains (three 6.4 MTPA trains):                                     <ul style="list-style-type: none"> <li>• Feed gas receiving unit</li> <li>• Pressure let down unit</li> <li>• Gas treatment unit</li> <li>• Gas dehydration unit</li> <li>• Mercury removal unit</li> <li>• Fractionation Unit</li> <li>• Liquefaction unit</li> </ul> </li> <li>– Construction of LNG storage tanks (three 180,000 m<sup>3</sup> tanks)</li> <li>– Construction of utilities and offsite facilities:                                     <ul style="list-style-type: none"> <li>• Flare system</li> <li>• Electrical power supply</li> <li>• Bulk storage</li> <li>• Water supply infrastructure</li> <li>• Wastewater treatment systems</li> <li>• Storm water management infrastructure</li> <li>• Fire control infrastructure</li> <li>• Nitrogen generation system</li> <li>• Compressed air system</li> </ul> </li> <li>– Construction of non-manufacturing facilities:                                     <ul style="list-style-type: none"> <li>• MOF</li> <li>• Site roads</li> <li>• Administrative and maintenance buildings</li> <li>• Site fencing</li> <li>• Site lighting</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>

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Project Activities	Description of Activity (from Table 4-4 of the EIS/Application)	Change in Activity from the Design Change
Onshore Construction (cont'd)	<ul style="list-style-type: none"> <li>Air emissions, noise, and light from use of construction equipment</li> </ul>	<ul style="list-style-type: none"> <li>No change</li> </ul>
	<ul style="list-style-type: none"> <li>Power generation (use of diesel/generators)</li> </ul>	<ul style="list-style-type: none"> <li>Diesel powered generators likely will not be used for accommodation camps located in Port Edward and/or in the Prince Rupert general area as electricity could be provided by local utilities.</li> </ul>
Vehicle Traffic	<ul style="list-style-type: none"> <li>Use of the two-lane bridge connecting Lelu Island to the mainland by construction workers and vehicles</li> <li>Use of roads on and offsite</li> <li>Air emissions</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle traffic may increase from daily transportation of workers from the accommodation camp over the bridge from the mainland to the Lelu Island worksite. Worker transportation to the worksite will be by bus.</li> </ul>
Dredging	<ul style="list-style-type: none"> <li>Dredging within the MOF [<math>\sim 690,000 \text{ m}^3</math>] and for the marine terminal [<math>\sim 7 \text{ million m}^3</math>]</li> </ul>	<ul style="list-style-type: none"> <li>Dredging of <math>\sim 7 \text{ million m}^3</math> of sediment will not be conducted at the marine terminal berth.</li> </ul>
Marine Construction	<ul style="list-style-type: none"> <li>Construction of the pioneer dock</li> <li>Construction of a two-lane bridge connecting Lelu Island to the mainland (including bridge footings in Lelu Slough)</li> <li>Construction and use of the MOF                             <ul style="list-style-type: none"> <li>Pile driving</li> <li>Berthing large roll-on-roll off barges and ships</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No change</li> </ul>
	<ul style="list-style-type: none"> <li>Construction of the marine terminal                             <ul style="list-style-type: none"> <li>2.4 km conventional pipe pile supported trestle</li> <li>Trestle and berth topside infrastructure including a control room, insulated cryogenic piping, pumping equipment, and LNG loading infrastructure</li> <li>Two LNG carrier berths (capable of berthing two 217,000 m<sup>3</sup> LNG carriers up to 315 m in length)</li> <li>Two loading arms (one hybrid arm and one vapor return)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Construction of the marine terminal                             <ul style="list-style-type: none"> <li>2.7 km jetty/bridge deck consisting of:                                     <ul style="list-style-type: none"> <li>a <math>\sim 1.6 \text{ km}</math> suspended span suspension bridge over Flora Bank from Lelu Island to Agnew Bank</li> <li>A <math>\sim 1.1 \text{ km}</math> conventional pipe pile trestle from the suspension bridge to the marine terminal berth in Chatham Sound.</li> </ul> </li> <li>The other aspects of the marine terminal (i.e., topside infrastructure, berths, and loading arms) described in the EIS/Application will not change.</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>Construction of breakwaters</li> </ul>	<ul style="list-style-type: none"> <li>No breakwaters will be constructed</li> </ul>

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Project Activities	Description of Activity (from Table 4-4 of the EIS/Application)	Change in Activity from the Design Change
Waste Management and Disposal	<ul style="list-style-type: none"> <li>• Disposal of cleared vegetation, peat, waste rock, and overburden</li> <li>• Wastewater treatment systems (for sewage and other oily effluent) and a pipe connecting the mainland and the Port Edward wastewater sewage treatment facility</li> <li>• Storm water management</li> <li>• Solid wastes (garbage removed from island)</li> <li>• Liquid wastes (effluents)</li> <li>• Hazardous wastes</li> </ul>	<ul style="list-style-type: none"> <li>• Removing the accommodation camp from Lelu Island also removes the need to trench water, wastewater, and utility pipelines through Lelu Slough.</li> <li>• Utility pipelines from Port Edward will provide water and sewer services for the LNG facility and will be attached to the permanent road bridge from Lelu Island to the mainland.</li> <li>• During initial construction (when the workforce is &lt;100 people) potable water will be barged to Lelu Island and portable toilet facilities will be used. As the workforce increases modular construction-support buildings will be installed that include toilet facilities and sewage collection systems and storage capacity.</li> <li>• Sewage and grey water from the toilets will be removed by septic truck and barge. Wastes will be discharged appropriately into waste water treatment facilities on the mainland.</li> </ul>
Disposal at Sea	<ul style="list-style-type: none"> <li>• Removal, transportation, and disposal of dredged sediments in Brown Passage [~7.7 million m<sup>3</sup> of marine sediment]</li> </ul>	<ul style="list-style-type: none"> <li>• Overall, the Project will require disposal of approximately 200,000 m<sup>3</sup> of marine sediment at sea.               <ul style="list-style-type: none"> <li>– No removal, transportation, or disposal of ~7 million m<sup>3</sup> of sediment will be conducted at the marine terminal berth.</li> <li>– Removal, transportation, and disposal of approximately 200,000 m<sup>3</sup> of sediment from the MOF (compared to ~690,000 m<sup>3</sup> in the EIS/Application) will be disposed of at Brown Passage. The remaining material (~490,000 m<sup>3</sup> rock) will be used for Project construction.</li> </ul> </li> </ul>
Operational Testing and Commissioning	<ul style="list-style-type: none"> <li>• Air emissions</li> <li>• Noise emissions</li> <li>• Light emissions</li> <li>• Wastewater from tank commissioning</li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>
Site Clean Up and Reclamation	<ul style="list-style-type: none"> <li>• Post-construction site clean up</li> <li>• Re-vegetation (if appropriate)</li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>



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Project Activities	Description of Activity (from Table 4-4 of the EIS/Application)	Change in Activity from the Design Change
<b>Operations</b>		
LNG Facility and Supporting Infrastructure on Lelu Island	<ul style="list-style-type: none"> <li>• Operate 24 hours per day, 365 days per year</li> <li>• LNG production and storage:                             <ul style="list-style-type: none"> <li>– Up to three identical 6.4 MTPA liquefaction trains (two to be constructed in Phase 1 with provision for a third train in Phase 2)</li> <li>– Up to three 180,000 m3 full containment LNG storage tanks (two to be construction in Phase 1 with a provision for a third in Phase 2)</li> <li>– Two or more nitrogen generation and vaporization packages with liquid nitrogen storage</li> <li>– Instrument and facility compressed air system</li> <li>– Storage and use of additional facility materials</li> </ul> </li> <li>• Operation of gas-fired turbines capable of producing up to 1,100 MW of combined mechanical and electrical power (including spare units)</li> <li>• Facility maintenance and testing                             <ul style="list-style-type: none"> <li>– Maintenance of equipment to ensure safe and reliable operation</li> <li>– Inspection of equipment and facilities to maintain mechanical integrity and performance</li> <li>– Road and site maintenance</li> <li>– Inspection and maintenance of safety, civil structures, and environmental monitoring devices</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>
Marine Terminal Use	<ul style="list-style-type: none"> <li>• Berthing and hoteling LNG carriers (315 m Q-Flex LNG carriers)</li> <li>• Loading of LNG on LNG carriers</li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>
Shipping	<ul style="list-style-type: none"> <li>• For Phase 1 of the Project, one LNG carrier would be calling at the terminal approximately every two days</li> <li>• For Phase 2 (at full build out) this would increase to approximately one LNG carrier per day and 350 per year calls on the terminal</li> <li>• Ship and tug activities (including moorage and transit) between the terminal and the Triple Island pilotage station</li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>

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Project Activities	Description of Activity (from Table 4-4 of the EIS/Application)	Change in Activity from the Design Change
Waste Management and Disposal	<ul style="list-style-type: none"> <li>• Facility Emissions and Waste:               <ul style="list-style-type: none"> <li>– Air emissions of NOx, CO, SO2, PM, VOCs, HAPs, and GHGs</li> <li>– Storm water runoff</li> <li>– Solid wastes (domestic waste, paper, cardboard, wood and metal)</li> <li>– Liquid waste (liquid effluent treated onsite, treated effluent transported to Port Edward municipal system)</li> <li>– Hazardous wastes (solvents, trace mercury, catalyst, oil, medical and biological waste )Physical and chemical management of vegetation on Lelu Island and the mainland</li> </ul> </li> <li>• Vegetation Management:               <ul style="list-style-type: none"> <li>– Herbicides and disposal of vegetation</li> </ul> </li> <li>• Shipping waste:               <ul style="list-style-type: none"> <li>– Waste from shipping will be managed in accordance with MARPOL and other applicable regulations</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>
Fish Habitat Offsetting	<ul style="list-style-type: none"> <li>• Fish habitat constructed as part of the fish habitat offsetting strategy</li> </ul>	<ul style="list-style-type: none"> <li>• The marine terminal design reduces the area of serious harm to fish habitat; therefore smaller scale fish offsetting projects will be proposed.</li> </ul>
Wetland Habitat Compensation	<ul style="list-style-type: none"> <li>• Wetland habitat constructed or enhanced as a component of the wetland compensation strategy</li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>
<b>Decommissioning</b>		
Dismantling Facility and Supporting Infrastructure	<ul style="list-style-type: none"> <li>• Dismantle/recycle facility equipment and supporting infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>
Dismantling of Marine Terminal	<ul style="list-style-type: none"> <li>• Terminal and MOF likely to remain in place</li> <li>• Associated infrastructure (piping etc.) would be dismantled</li> </ul>	<ul style="list-style-type: none"> <li>• No change; however, since submission of the EIS/Application PNW LNG has entered into a Project Development Agreement with the Prince Rupert Port Authority (PRPA) which gives PRPA the option to keep marine infrastructure (e.g., bridge to mainland, jetty and marine terminal) in place after decommissioning.</li> </ul>
Waste Disposal	<ul style="list-style-type: none"> <li>• Facility components recycled or disposed of</li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>
Site Clean Up and Reclamation	<ul style="list-style-type: none"> <li>• Preparation of the disturbed portion of Lelu Island for other industrial purposes or reclamation to restore ecological values in consultation with PRPA</li> </ul>	<ul style="list-style-type: none"> <li>• No change</li> </ul>

## **2.0 DESCRIPTION OF THE DESIGN CHANGES**

### **2.1 MARINE INFRASTRUCTURE**

The marine terminal design mitigation will move the marine terminal and berths from Agnew Bank out into deep water in Chatham Sound. The new marine terminal location is approximately 2.7 km southwest of the northwest corner of Lelu Island (Figure 2-1). Key elements of the design mitigation include:

- No Project infrastructure (i.e., piles) will be constructed on Flora Bank.
- No construction activities will be conducted on Flora Bank.
- A clearance height of a minimum of 11.3 metres above higher high water (HHW) to allow local vessels (e.g., gill netters) to transit Flora Bank via the use of the passage west of Lelu Island.
- No dredging will be conducted at the marine terminal.
- The marine Project footprint will be reduced and will reduce potential serious harm to fish habitat (and thereby the need to extensively offset effects on fish habitat).

The new design for the marine terminal and berths includes a 2.7 km jetty that consists of a 1.6 km clear-span suspension bridge over Flora Bank from Lelu Island to Agnew Bank, and a 1.1 km conventional pipe pile trestle from the suspension bridge to the LNG Carrier berths (Figure 2-2). The east bridge abutment will be on Lelu Island. The west bridge abutment will be just north of Flora Bank and is on Agnew Bank. Construction of the bridge will eliminate any Project infrastructure (i.e., piles to support the jetty) and construction activities on Flora Bank.

Changes to the marine infrastructure will not affect the terrestrial project development footprint on Lelu Island.

#### **2.1.1 Project Components**

##### **2.1.1.1 Suspension Bridge**

The suspension bridge to support the jetty is 1,618 m in length. It includes a 128 m approach structure from Lelu Island, a 1,170 m suspended span over Flora Bank, and a 320 m suspended span over Agnew Bank (Figure 2-2). The jetty/bridge deck is approximately 24 m wide. The width of the jetty/bridge deck provides space for hanger cables, a vehicle access roadway, two walkway access corridors, LNG pipelines, thermal expansion loops and associated utilities (Figure 2-3). The bridge deck will be paved; stormwater and fluid spills from vehicles will be directed to a pipe and gutter collection system and pumped back to the LNG Facility for treatment and disposal.

The bridge is supported by two 128 m tall prefabricated steel towers designed as an aerodynamic, steel orthotropic box for wind stability. The towers sit on a cast-in-place concrete base (up to 11.6 m tall). The total tower height is approximately 140 m above sea level. Each tower foundation is a rectangular (36.4 by 20.2 m) concrete footing supported by 28 steel pipe piles; the outer piles are battered to provide lateral support (Figure 2-4). The tower footings and pile support structures for the suspension bridge avoid Flora Bank.

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Suspension cables will be anchored on Lelu Island 260 m from the northeast tower and 390 m from the southwest tower by a pile supported gravity anchor block located on Agnew Bank (Figure 2-5 and Figure 2-6).



Lighting will include:

- Marine navigation and aviation lighting in accordance with Transport Canada requirements.
- Deck lighting will be shielded and pointed downward at the jetty surface to reduce light spill into the water.

There will be a minimum vertical clearance height for vessels of approximately 11.3 meters above higher high water (HHW) to allow passage by gillnetters. This clearance height is consistent with the clearance height of the jetty-trestle proposed in the EIS/Application. The suspension bridge follows the alignment of the jetty-trestle described in the EIS/Application; it is at least 200 metres from the navigation course of Porpoise Channel.

### 2.1.1.2 Trestle and Berths

The jetty extends from the west end of the suspension bridge and will consist of a 1.1 km conventional pipe pile trestle to the LNG carrier berths (Figure 2-1 and Figure 2-2). The trestle design is similar to the design described in Section 2 of the EIS/Application; it will be approximately 15 metres wide with 27 m wide sections at approximately 200 metre intervals to allow for pipe expansion loops. The trestle will support the jetty and the marine terminal berths including the field control room, LNG carrier berths, loading arms, and insulated cryogenic piping.

The marine terminal design mitigation will move the marine terminal and berths from Agnew Bank out into deep water (~-15m in depth) in Chatham Sound. The new marine terminal location is approximately 2.7 km southwest of the northwest corner of Lelu Island. No dredging, slope armouring, or breakwaters will be required for the marine terminal at this location. The design of the berths themselves will be similar to the design described in Section 2 of the EIS/Application. The berths at the end of the trestle will be capable of berthing two 217,000 m<sup>3</sup> LNG carriers (Q-Flex) up to 315 m in length.

The design of the trestle has not changed since submission of the EIS/Application. However, additional engineering drawing details are now available and are included in Appendix A.

### 2.1.1.3 Water Supply Infrastructure

The accommodation camp is proposed to be relocated from Lelu Island to sites in Port Edward or the Prince Rupert general area (see Section 2.2). Removing the accommodation camp from Lelu Island also removes the need to trench water, wastewater, and utility pipelines through Lelu Slough. Utility pipelines from Port Edward will provide water and sewer services for the LNG facility during operations and will be attached to the permanent road bridge from Lelu Island to the mainland.

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### 2.1.1.4 Fish Habitat Offsetting

The marine terminal design mitigation substantially reduces the area of potential serious harm to fish habitat; therefore smaller scale fish offsetting projects will be developed and proposed as part of the Fisheries Act authorization for the Project.

### 2.1.2 Project Activities

#### 2.1.2.1 Suspension Bridge

The suspension bridge will be constructed in ten stages.

**Stage 1** - Steel pipe-piles for the suspension bridge will be installed at the southwest anchor block, the southwest tower and northeast tower. Low-noise pile installation methods (e.g., vibratory hammer) will be used to install the piles to bedrock. The piles will then be drilled and reinforced with concrete into the rock. The piles will be reinforced with cast-in-place concrete in pile heads. The pile caps for the southwest and northeast tower will then be constructed (Figure 2-7).

**Stage 2** – Concrete will be cast for the southwest anchor block (including strand shoes) and the lower legs of the southeast and northeast towers. The northeast anchorage will be constructed on Lelu Island and will include a tunnel and concrete cast for a temporary highline anchor. The steel legs and cross frames for both towers will then be erected (Figure 2-7).

**Stage 3** – Deviation saddles will be installed at the southwest and northeast towers and splay saddles at the southwest anchor block and northeast anchor block. A pilot cable will then be installed using a helicopter or other means that has no interaction with Flora Bank. Cross over trusses, the catwalk system and catwalk cables will then be installed (Figure 2-7).

**Stage 4** – The suspension cable will be installed and compacted. Concrete will then be cast and finishing works completed for the northeast anchor tunnel. Bents and abutments will be installed for the northeast approach span on Lelu Island. Southwest pier piles will then be installed using low-noise installation methods. The southwest pier footing cap and pier will then be cast (Figure 2-8).

**Stage 5** – A cable crane will be installed on the highline cable and cable clamps, hanger cables and the northeast approach span girders and deck slab will be installed (Figure 2-8).

**Stage 6** – The bridge superstructure will be delivered by barge to a dedicated delivery area along the northeast face of the southwest tower footing cap over Agnew Bank. The cable crane will hoist mainspan segments off the barge (Figure 2-8).

**Stage 7** – The cable crane will position the mainspan segment of superstructure into final position where four hanger cables will be attached. The cable crane then returns to the dedicated delivery area for the next mainspan segment (Figure 2-9).

## PNW LNG PROJECT DESIGN MITIGATION

Description of the Design Changes  
October 6, 2014

**Stage 8** – The cable crane will continue to position mainspan segments as described in Stage 7. Sidespan superstructure segments will be delivered by barge and installed using a barge mounted crane; four hanger cables will be attached to the sidespan segments (Figure 2-9).

**Stage 9** – The remainder of the mainspan and sidespan segments will be installed as described in Stage 7 and 8. Mainspan segments will be spliced concurrently with each segment installation as will sidespan segments (Figure 2-9).

**Stage 10** – Barrier, expansion joints, piping and electrical works will be installed. Final tightening of cable clamp bolts will be performed and the suspension cable wrapped and corrosion protection measures installed. The cable crane, highline cable, temporary anchor block and catwalk system will be removed (Figure 2-10).

### 2.1.2.2 Trestle and Berths

The trestle and berths will be constructed as described in the EIS/Application.

Low-noise pile installation methods (e.g., vibratory or hydraulic low noise installation) will be used to install the piles to bedrock. The piles will then be drilled an additional 3 m into bedrock and reinforced with concrete poured into the pile. Both the trestle and berths will consist of cast-in-place concrete caps, pre-stressed precast girders, and cast-in-place deck slabs. The deck slabs will be installed using marine equipment.

### 2.1.2.3 Materials Offloading Facility

The MOF will largely be constructed as described in the EIS/Application.

However, the EIS/Application assessed potential effects of dredging and disposal of approximately 690,000 m<sup>3</sup> of marine sediment at the MOF. Since submission of the EIS/Application, PNW LNG has advanced the Project engineering and determined that of the total volume, less than 200,000 m<sup>3</sup> is marine sediment, and the remaining material is rock. The marine sediment will be dredged and disposed of at the Brown Passage disposal at sea site. Dredging and disposal of marine sediment from the MOF can be completed in less than 6 months.

The rock will be removed by blasting during least risk work windows recommended by Fisheries and Oceans Canada, or at low tide. The rock will be used for project construction.

### 2.1.3 Summary of Marine Infrastructure Design Change

Table 2-1 provides a summary of the changes to key components of the marine infrastructure from the design mitigation, compared to the infrastructure design described in the EIS/Application. An illustration of the Project design mitigation compared to the design submitted in the EIS/Application is provided in (Figure 2-11).

## PNW LNG PROJECT DESIGN MITIGATION

Description of the Design Changes  
October 6, 2014

**Table 2-1: Summary of the Marine Infrastructure Design Mitigations compared to the EIS/Application Project Design**

Marine Terminal Component	EIS/Application	Design Mitigation
Berth Location	~ 2.4 km southwest of Lelu Island on Agnew Bank	~ 2.7 km southwest of Lelu Island off Agnew Bank in Chatham Sound
Length of the marine terminal (m) (from Lelu Island up to and including the berths)	2.4 km	2.7 km
Width of Jetty/Bridge Deck (m)	15 to 27 m	24 m
Dredge Slope Armouring at the Marine Terminal Berth	21 ha	No armouring required at the berth
Breakwaters	5.4 ha	No breakwaters required
Marine Terminal Pile Numbers and Size	546 piles Pile Diameter = 1.217m Pile Area = 1.163 m <sup>2</sup> ~0.06 ha (635 m <sup>2</sup> )	464 piles total 354 piles–1.217m in diameter (area=1.163 m <sup>2</sup> ) 110 piles–1.8m in diameter (area=2.55 m <sup>2</sup> ) ~ 0.07 ha (692 m <sup>2</sup> )
Dredging at Marine Terminal Berth	~7 million m <sup>3</sup> of sediment 84.6 ha area Maintenance dredging every 2 to 5 years	No dredging required for construction or maintenance.
Dredging at the MOF	~690,000 m <sup>3</sup> of sediment 5.4 ha Duration =~ 6 months	~200,000 m <sup>3</sup> of sediment ~490,000 m <sup>3</sup> of rock 6 ha Duration =~ 6 months
Disposal at Sea	~ 7.7 million m <sup>3</sup> of sediment to be disposed of at Brown Passage over 27 months ~1,280 return barge trips	~200,000 m <sup>3</sup> of sediment to be disposed of at Brown Passage over ~6 months (weather dependent) ~85 return barge trips

## 2.2 CONSTRUCTION WORKER ACCOMMODATION CAMP

The EIS/Application included plans for an construction worker accommodation camp to be built on the southeast end of Lelu Island, in the area of the main flare stack, to accommodate between 3,500 and 4,500 people at peak construction of the LNG facility. The rationale for locating the camp on Lelu Island included reducing the need to transport workers to Lelu Island and the impact of a temporary influx of workers on Port Edward.

Since submission of the EIS/Application, PNW LNG has advanced the Project engineering and identified that an accommodation camp on Lelu Island increased potential risks to worker safety and limited space for other construction activities (e.g., peat/overburden storage, laydown areas, batch plant and plant infrastructure). Further, PNW LNG (through their engineering contractors) has been made aware that third party accommodation

## PNW LNG PROJECT DESIGN MITIGATION

Description of the Design Changes  
October 6, 2014

camp service providers are working directly with municipalities to plan, construct and operate expandable accommodation camps on private land (appropriately zoned) in Port Edward and/or in the Prince Rupert area. Port Edward has written to PNW LNG to confirm that they support these accommodation camps in their community. These accommodation camps will not be developed, owned, or operated by PNW LNG; nor will PNW LNG have control over the design, construction, operation and decommissioning.

The accommodation camps will be available for use by other projects such as pipelines, Prince Rupert LNG and the Canpotex Potash Terminal Project. They are not for the sole use of the PNW LNG Project.

Removing the accommodation camp from Lelu Island will not change the terrestrial project development footprint on Lelu Island. As described in the EIS/Application, facility infrastructure (the flare stack) was to be located in the area of the temporary camp after it was dismantled (prior to Project commissioning).

### 2.2.1 PNW LNG Worker Accommodation Requirements

PNW LNG has established requirements for housing PNW LNG workers in the accommodation camps (through their Engineering, Procurement, Construction and Commissioning [EPCC] contractor) to ensure the health and well-being of the workforce and to mitigate potential effects to the local communities. The EPCC Contractor must demonstrate to PNW LNG that the camp provider they have selected meets those requirements. These requirements apply regardless of where the accommodation camps are located, and include:

- Compliance with the Industrial Camp Regulations made pursuant to BC's *Public Health Act*
- Compliance with the Food Premises Regulation made pursuant to BC's *Public Health Act*
- Development and implementation of emergency plans and procedures (e.g., fire, earthquake, injury, spills) and evacuation routes
- Development and Implementation of a Traffic Management Plan
- Development and implementation of security measures at the facility to protect workers and assets
- The provision of appropriate medical facilities, personnel, and related prevention health services. The EPCC contractor must ensure that their worker accommodation service provider has staffed the medical facilities at the accommodation camp (and at the worksite on Lelu Island) with nurse practitioners and advanced care paramedics.
- Prohibitions against worker use of illegal drugs when in accommodation and at the work site.
- Implementation of an Alcohol Management Plan prohibiting consumption of alcohol in worker's rooms and measures to limit consumption of beverages containing alcohol at any facility-provided and licensed alcohol serving facility
- Wellness and recreation facilities (e.g., sports facilities and activities)
- Accommodation camp "Code of Conduct"
- Accommodation camp management structures and appropriate stakeholder committees to manage and address temporary work force issues at the accommodation camp and with the surrounding community.



## PNW LNG PROJECT DESIGN MITIGATION

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### 2.2.2 PNW LNG Commitments for the Accommodation Camps

As the accommodation camps will be owned and operated by an independent third party (parties) service provider, on private land, within the governance of a local municipality, PNW LNG cannot:

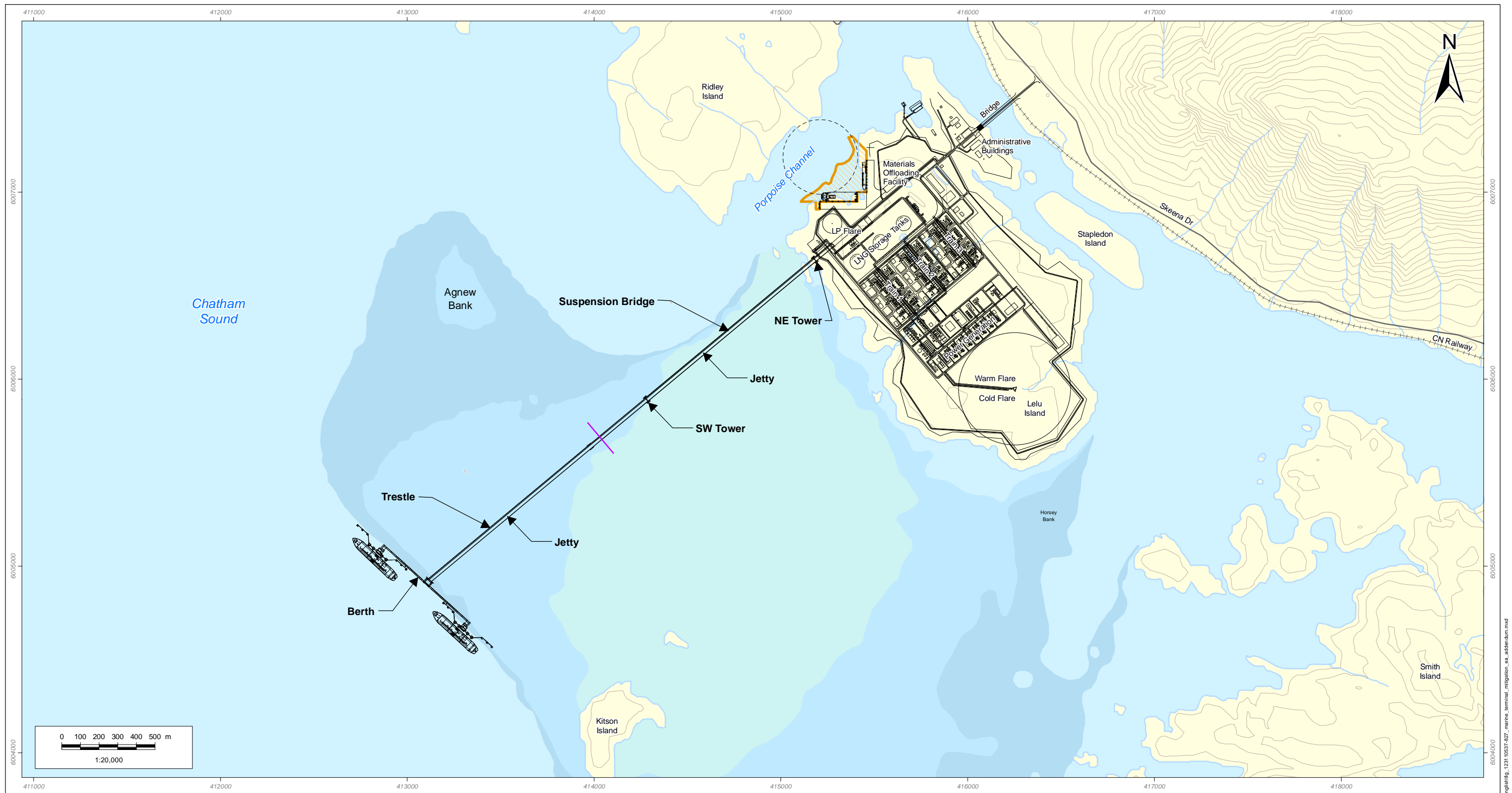
- Make commitments regarding the location, design or footprint of the camp. This is now the developer/owner's choice.
- Make commitments regarding minimizing (i.e., mitigating) effects of the camp on the environment (wildlife, vegetation, noise, fish and fish habitat, air quality, etc.), heritage, and health.

PNW LNG will:

- Identify measures to mitigate economic and social effects as they relate to construction worker management, such as requiring employees to take an employer provided bus (as there will be no parking facilities at the job site) and to require employees to abide by established employment rules, protocols and conditions of employment (e.g., policy on drugs, alcohol, etc.)
- Consult with the EPCC contractor, the service provider, the District of Port Edward and other municipalities to identify measures to minimize, to the extent reasonably feasible, the effects of the influx of a large number of temporary workers on the community.

## 2.3 FIGURES

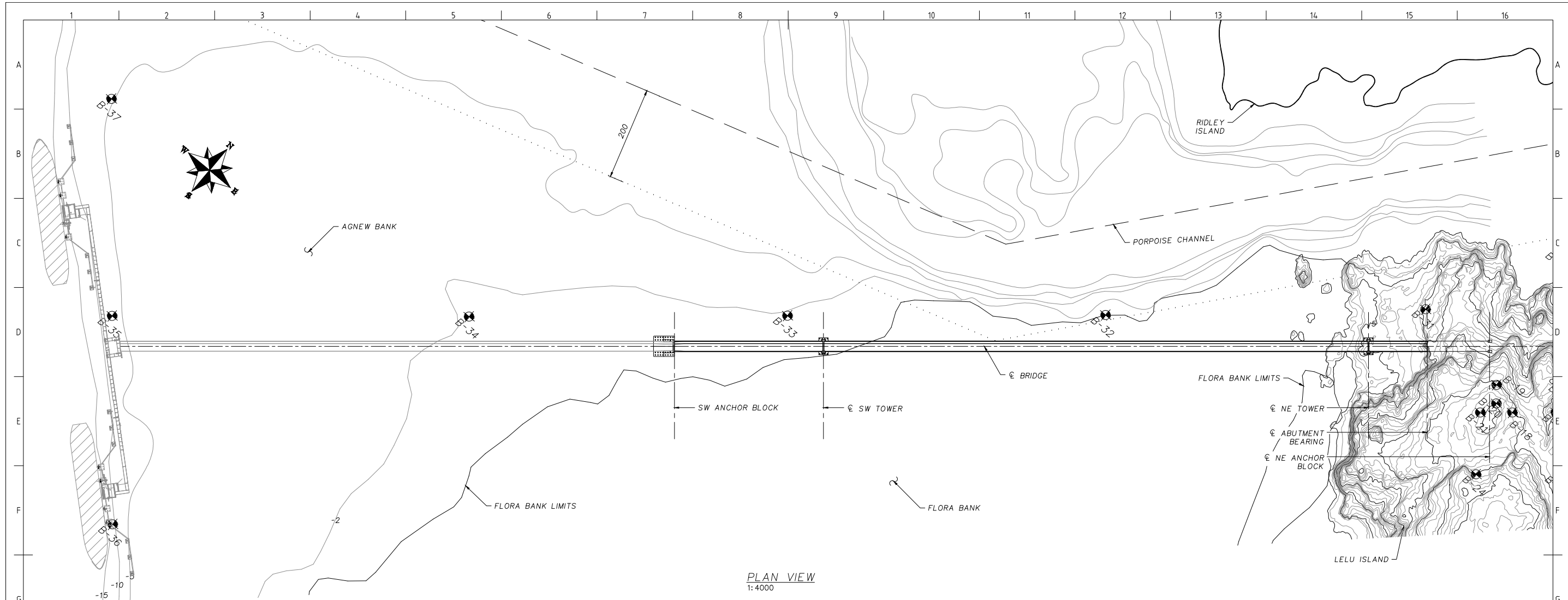
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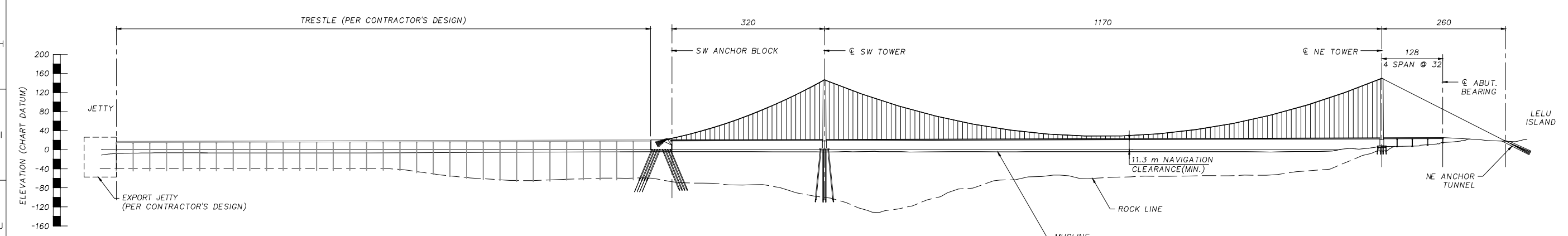
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— Marine Terminal Design Mitigation	Waterbody
++++ Railway	Agnew Bank
— Secondary Road	Flora Bank
---- Turning Basin	Horsey Bank
— Watercourse	

<b>Pacific NorthWest LNG</b>		PREPARED BY: 
<b>Marine Terminal Design Mitigation</b>		PREPARED FOR: 
<small>Sources: Government of British Columbia; Government of Canada, Natural Resources Canada, Centre for Topographic Information; Progress Energy Canada Ltd; WorldView-2 Imagery. Imagery date: 2011.</small>		
<small>Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the</small>		
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FIGURE ID: 123110537-827	DATUM: NAD 83	CHECKED BY: A. POMEROY
		FIGURE NO: <b>2-1</b>

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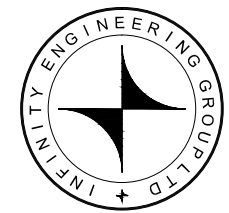


PLAN VIEW  
1:4000



ELEVATION VIEW  
1:4000

NOTE:  
1. ALL DIMENSIONS ARE IN METERS.



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B	13-SEP-2014	ISSUE FOR REVIEW	DJ
A	12-SEP-2014	ISSUE FOR INTERNAL REVIEW	DJ

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CHECKED:	G. SOHAL	DATE:	12-SEP-2014
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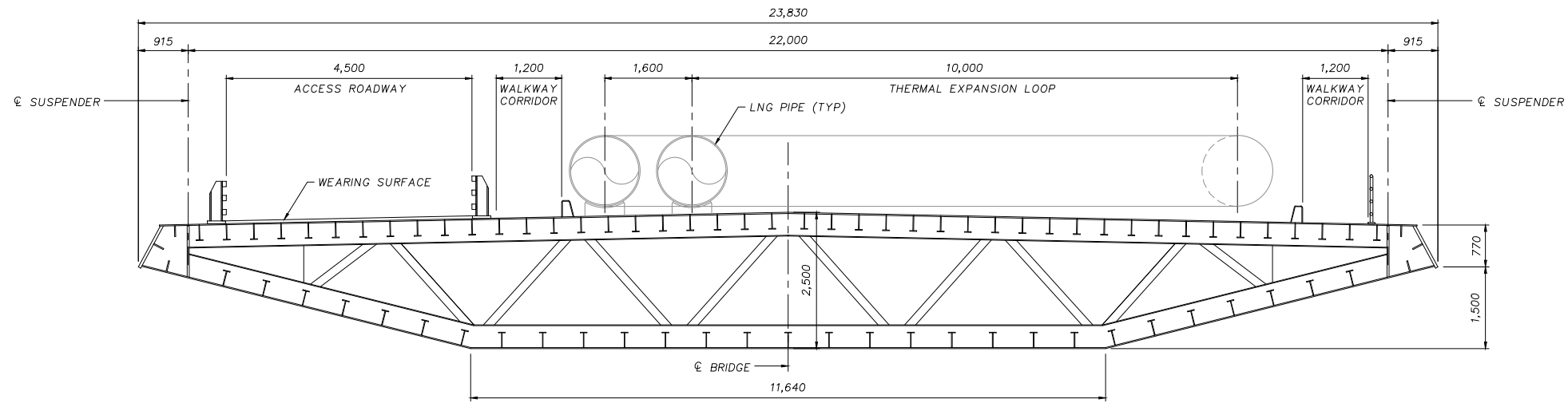
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PACIFIC NORTHWEST LNG BRIDGE

DWG. TITLE  
MARINE INFRASTRUCTURE

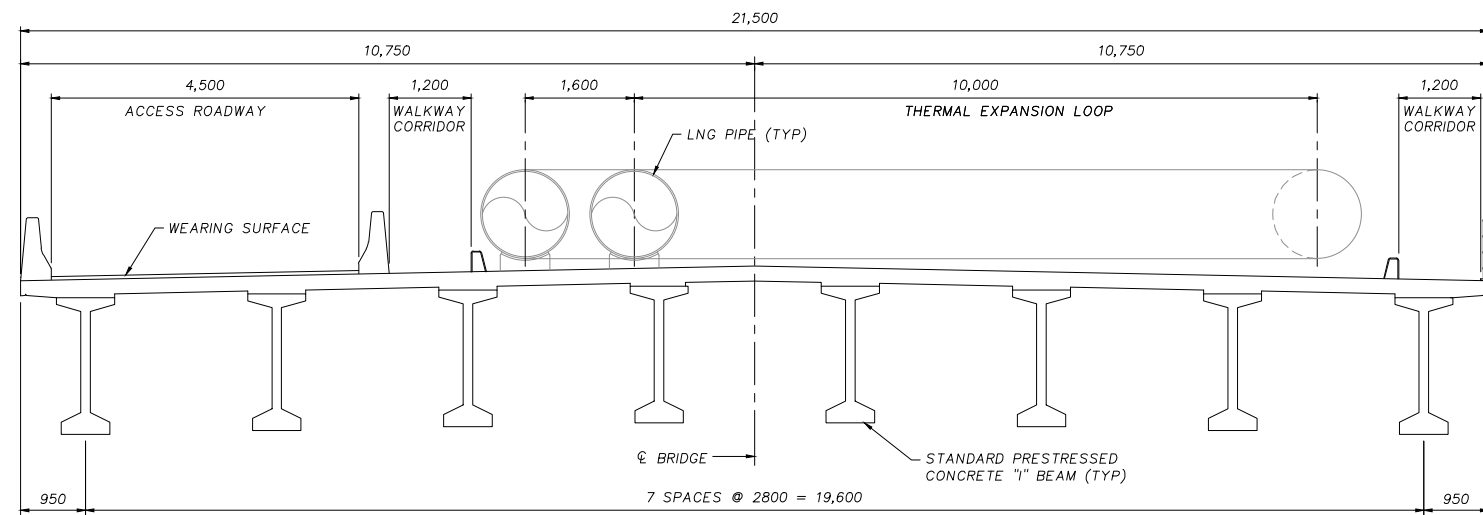
Figure 2-2

DWG. No.	101	REV.	2
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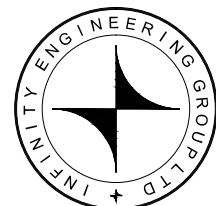


MAINSPAN UNIT TYPICAL DECK SECTION  
1:50



LELU ISLAND APPROACH STRUCTURE TYPICAL SECTION  
1:50

NOTE:  
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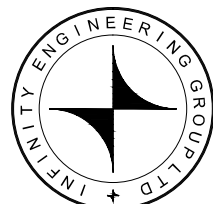
  

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DWG. TITLE	TYPICAL SECTIONS		
Figure 2-3	DWG. No.	REV.	
	102	1	

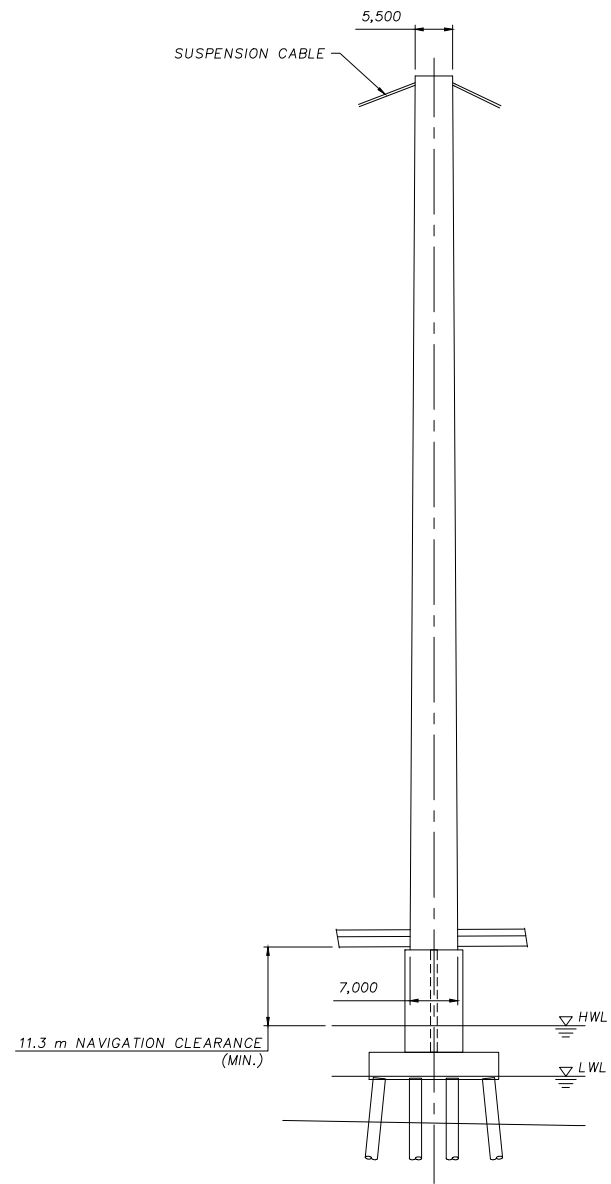


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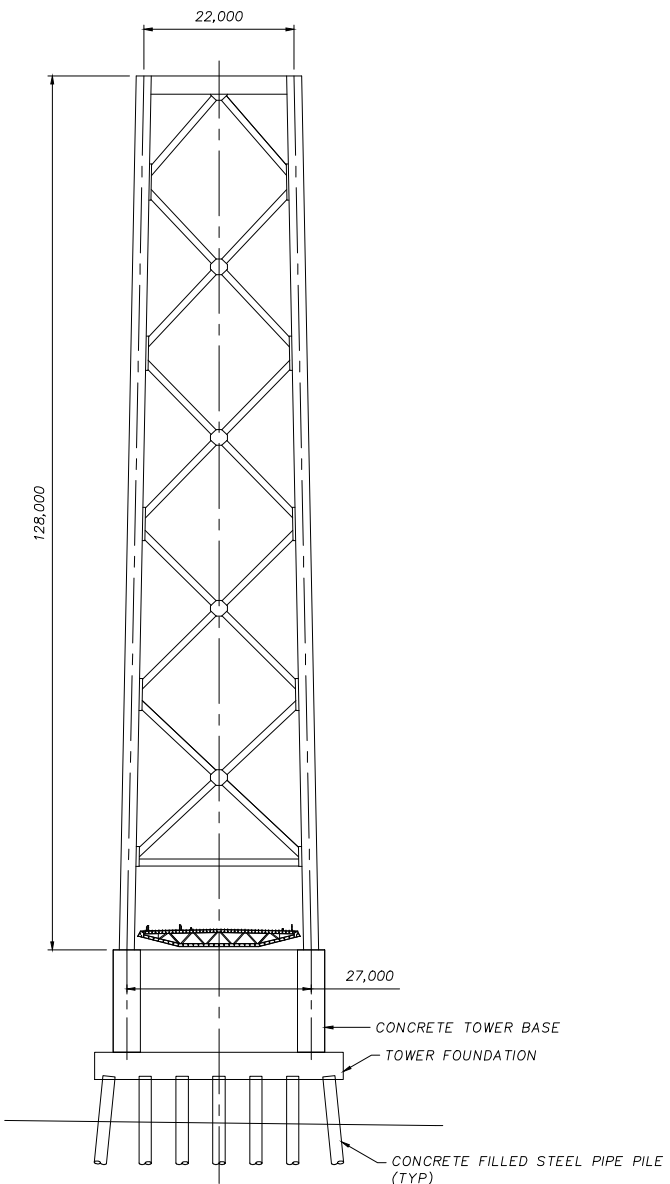
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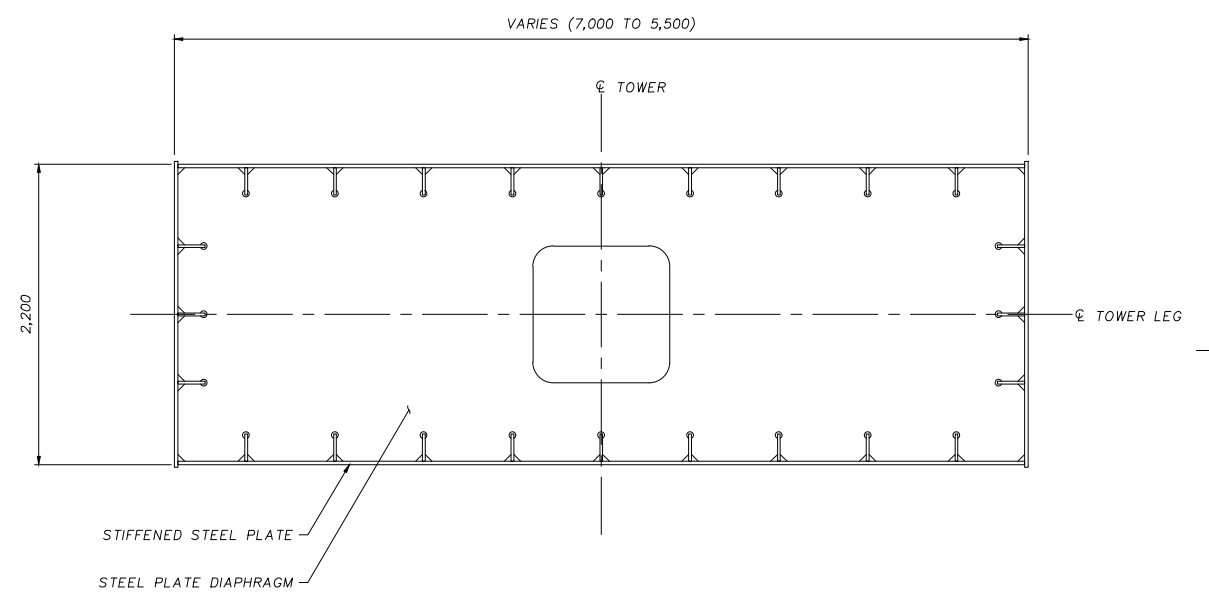
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DWG. TITLE <b>TOWER DETAILS</b>		
<b>Figure 2-4</b>	DWG. No. <b>103</b>	REV. <b>2</b>



TOWER ELEVATION  
1:500



TOWER CROSS SECTION  
1:500

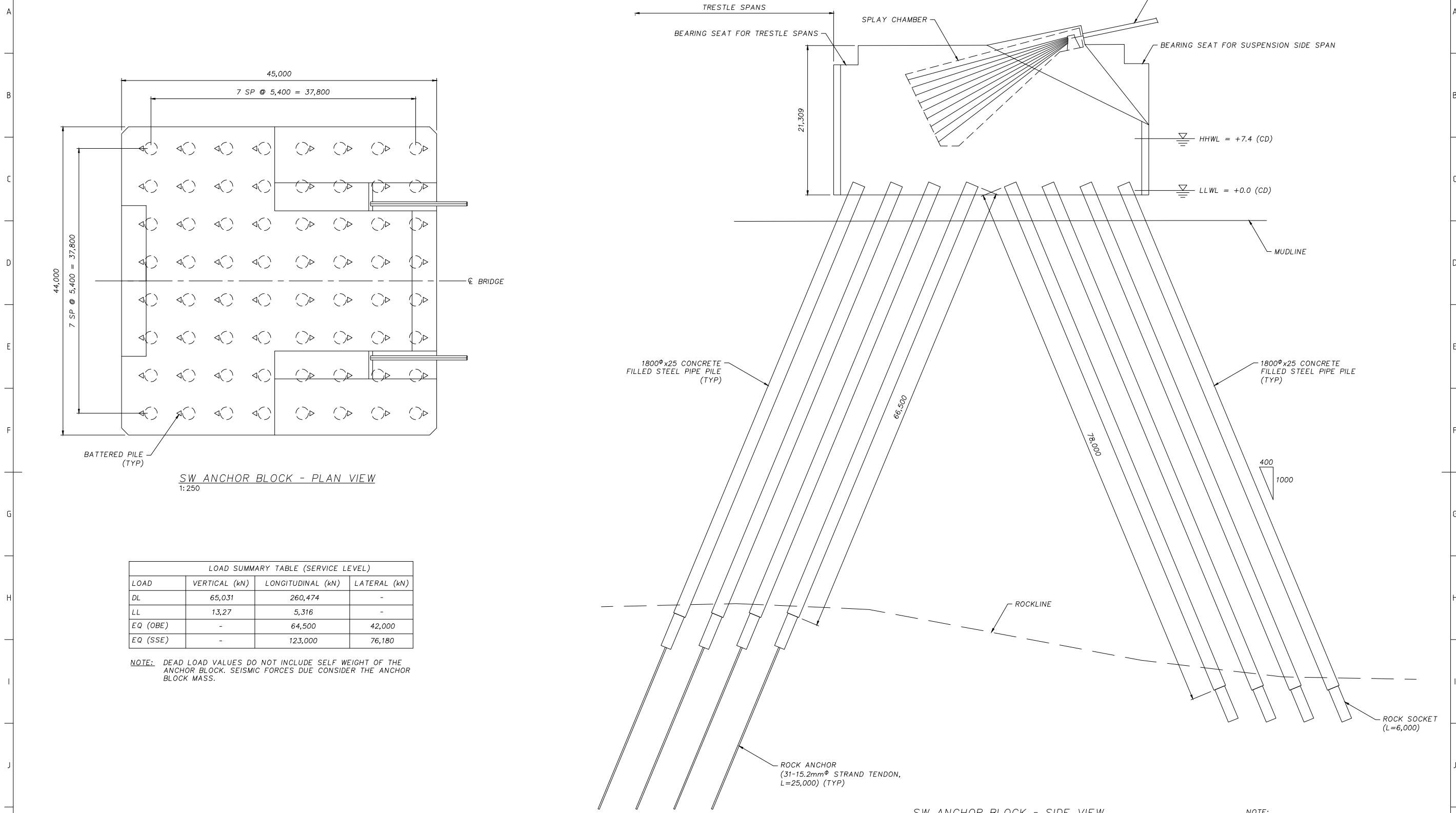


TOWER TYPICAL SECTION  
1:25

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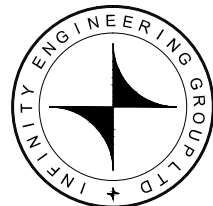
SW ANCHOR BLOCK - PLAN VIEW  
1:250

SW ANCHOR BLOCK - SIDE VIEW  
1:250

LOAD SUMMARY TABLE (SERVICE LEVEL)			
LOAD	VERTICAL (kN)	LONGITUDINAL (kN)	LATERAL (kN)
DL	65,031	260,474	-
LL	13,27	5,316	-
EQ (OBE)	-	64,500	42,000
EQ (SSE)	-	123,000	76,180

NOTE: DEAD LOAD VALUES DO NOT INCLUDE SELF WEIGHT OF THE ANCHOR BLOCK. SEISMIC FORCES DUE CONSIDER THE ANCHOR BLOCK MASS.

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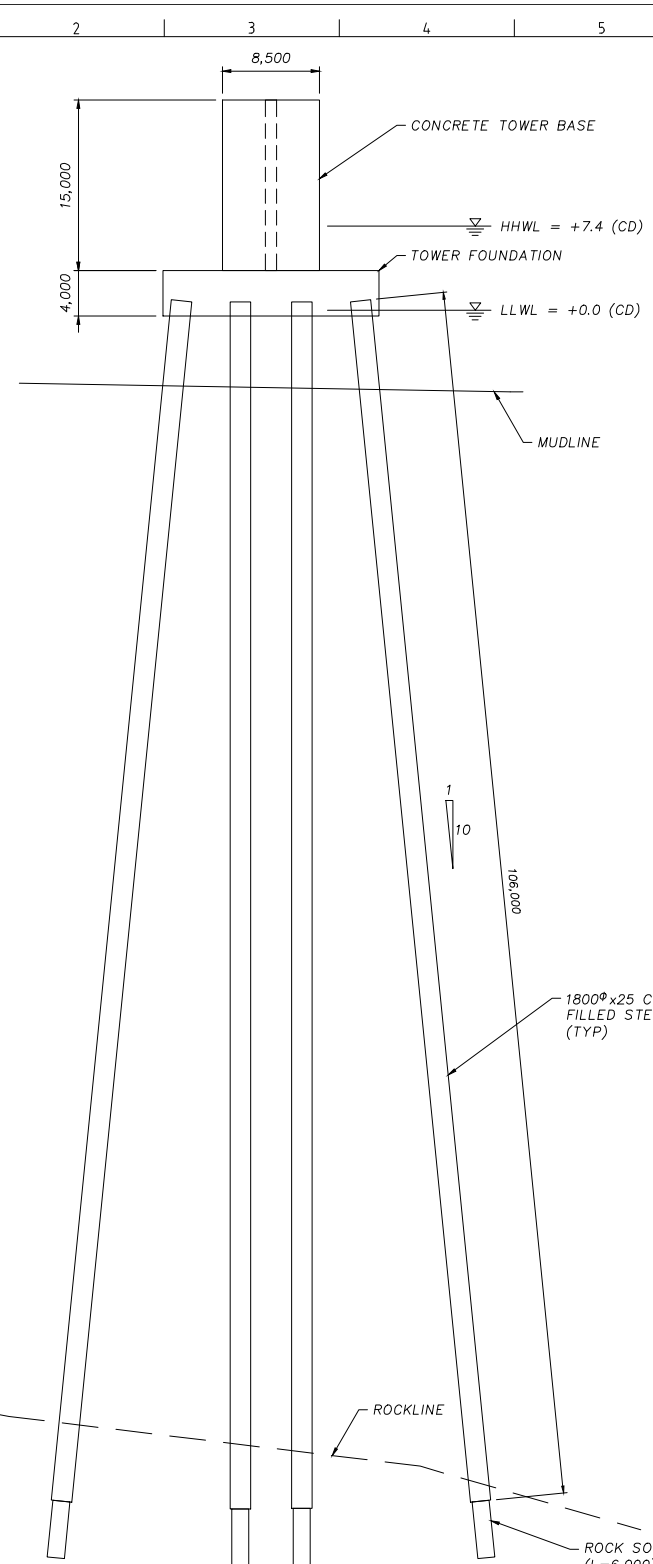
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**PACIFIC NORTHWEST LNG BRIDGE**

DWG. TITLE  
**SW ANCHOR BLOCK DETAILS**

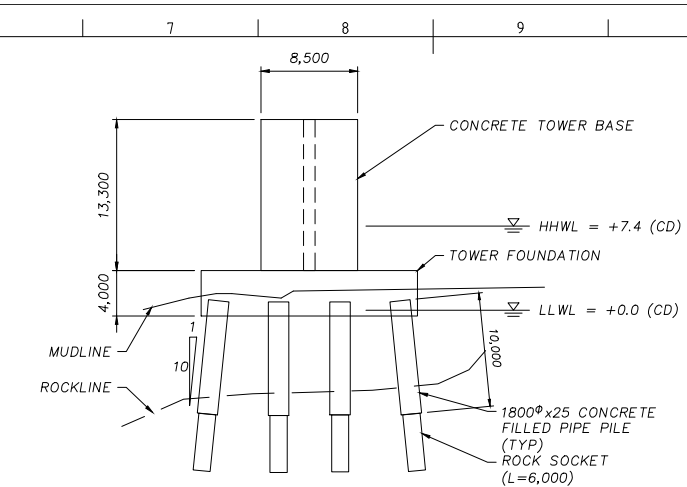
**Figure 2-5**

DWG. No.	104	REV.	A
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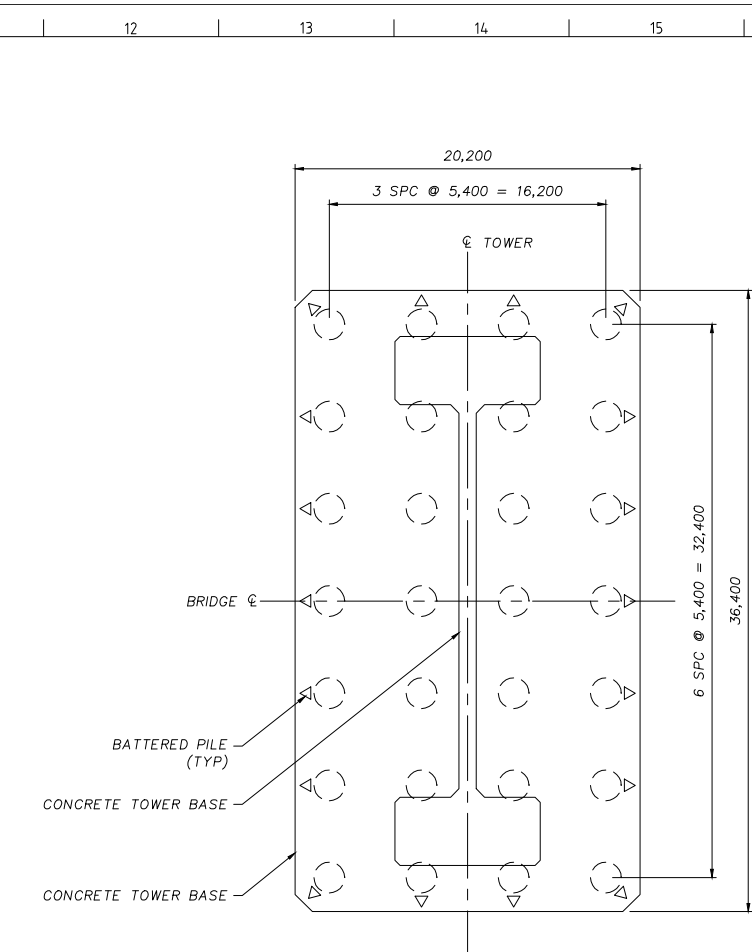
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SW TOWER FOUNDATION - SIDE VIEW  
1:300

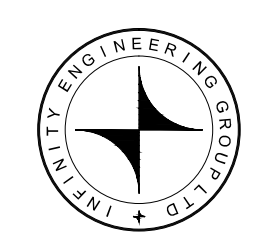


NE TOWER FOUNDATION - SIDE VIEW  
1:300



TOWER FOUNDATION PLAN VIEW  
1:250

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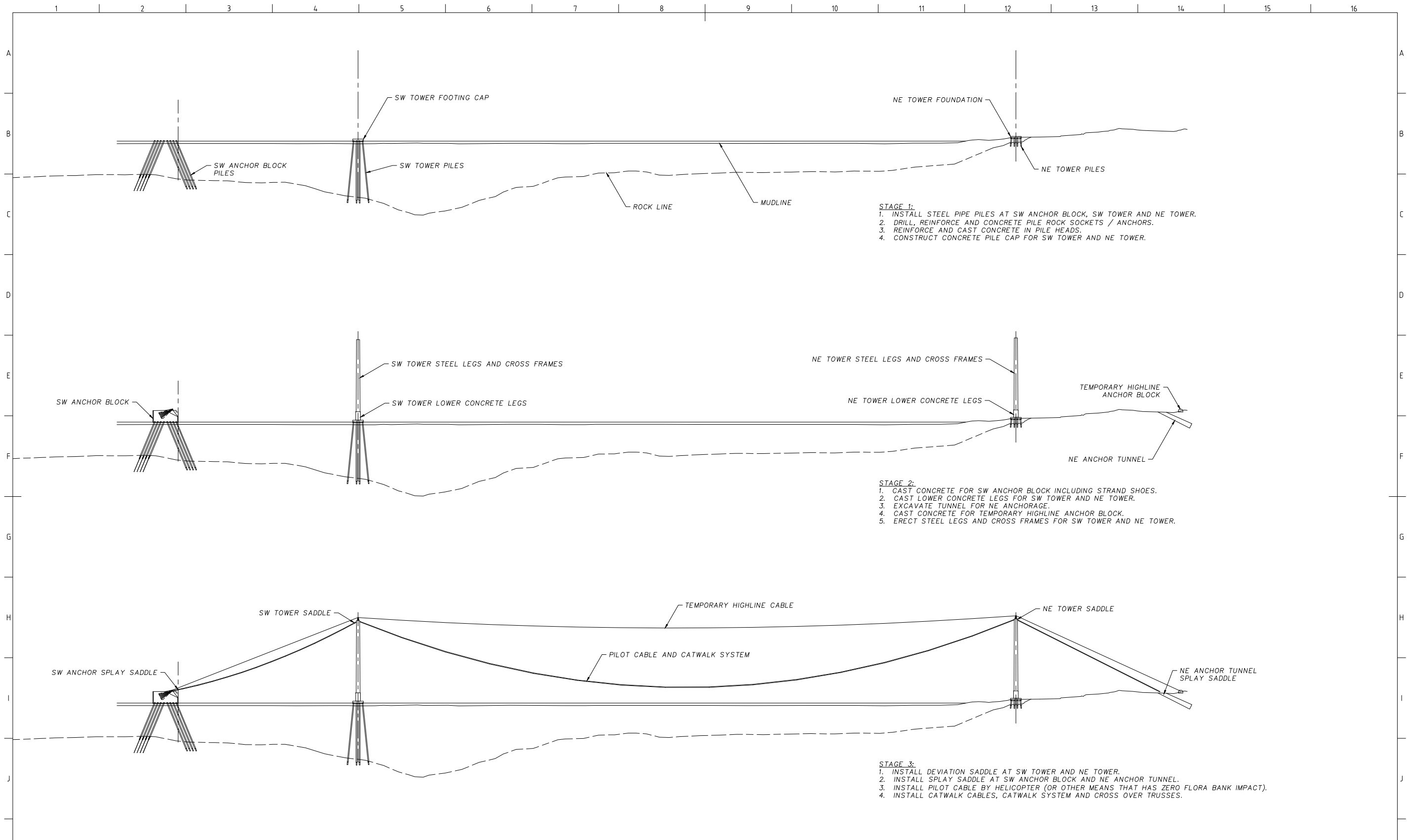
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 DWG. TITLE  
 SW and NE TOWER FOUNDATIONS  
**Figure 2-6**  
 DWG. No. 105  
 REV. A

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**STAGE 1:**  
 1. INSTALL STEEL PIPE PILES AT SW ANCHOR BLOCK, SW TOWER AND NE TOWER.  
 2. DRILL, REINFORCE AND CONCRETE PILE ROCK SOCKETS / ANCHORS.  
 3. REINFORCE AND CAST CONCRETE IN PILE HEADS.  
 4. CONSTRUCT CONCRETE PILE CAP FOR SW TOWER AND NE TOWER.

**STAGE 2:**  
 1. CAST CONCRETE FOR SW ANCHOR BLOCK INCLUDING STRAND SHOES.  
 2. CAST LOWER CONCRETE LEGS FOR SW TOWER AND NE TOWER.  
 3. EXCAVATE TUNNEL FOR NE ANCHORAGE.  
 4. CAST CONCRETE FOR TEMPORARY HIGHLINE ANCHOR BLOCK.  
 5. ERECT STEEL LEGS AND CROSS FRAMES FOR SW TOWER AND NE TOWER.

**STAGE 3:**  
 1. INSTALL DEVIATION SADDLE AT SW TOWER AND NE TOWER.  
 2. INSTALL SPLAY SADDLE AT SW ANCHOR BLOCK AND NE ANCHOR TUNNEL.  
 3. INSTALL PILOT CABLE BY HELICOPTER (OR OTHER MEANS THAT HAS ZERO FLORA BANK IMPACT).  
 4. INSTALL CATWALK CABLES, CATWALK SYSTEM AND CROSS OVER TRUSSES.

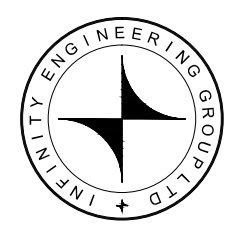
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DWG. TITLE  
**CONSTRUCTION SEQUENCE 1**

**Figure 2-7**

DWG. No.	107	REV.	2
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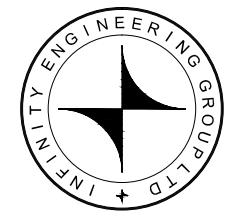
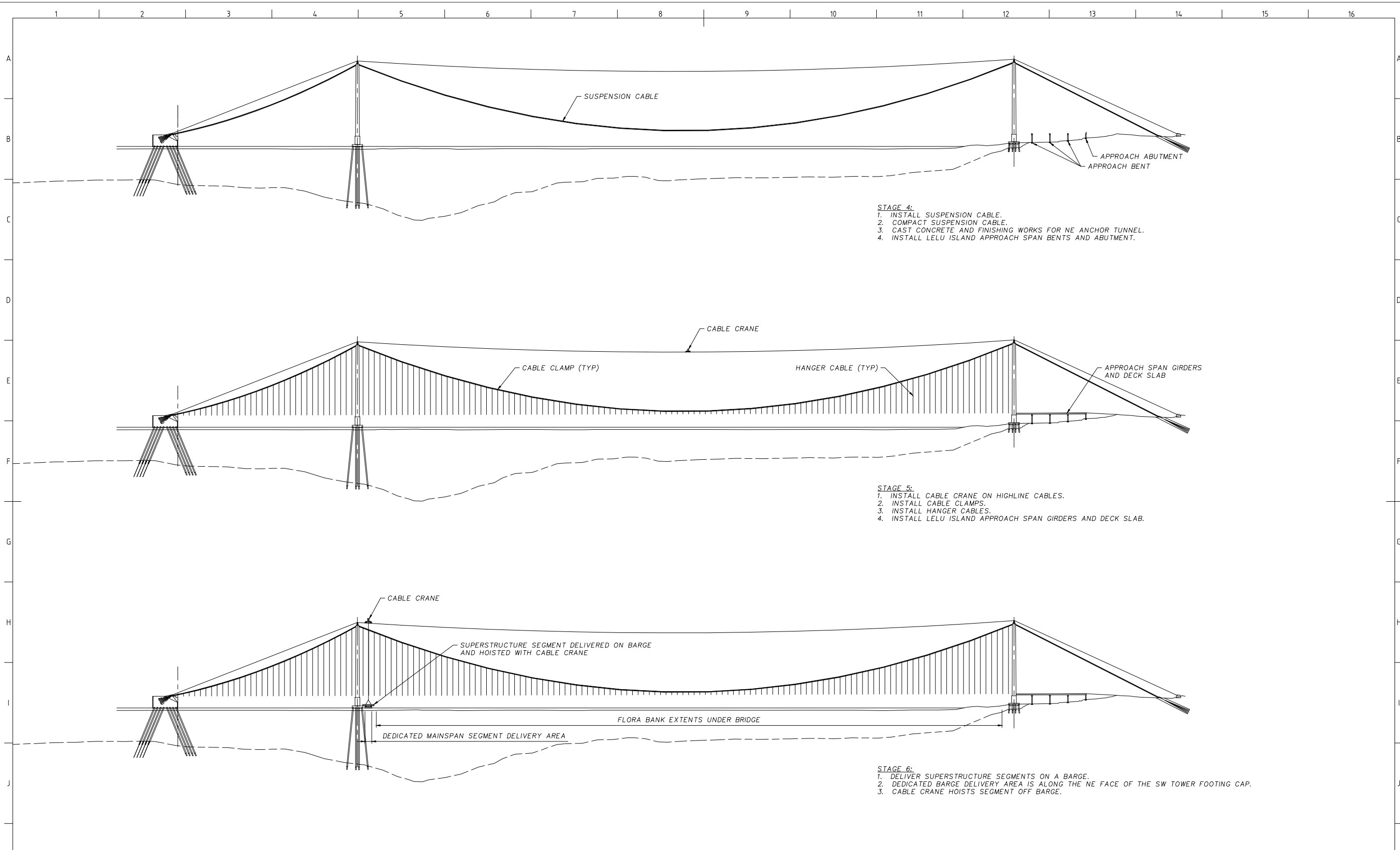


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REV.	DATE	REVISION DESCRIPTION	INITIAL
2	29-SEP-2014	ISSUE FOR INFORMATION	DJ
1	16-SEP-2014	ISSUE FOR INFORMATION	DJ
0	15-SEP-2014	ISSUE FOR INFORMATION	DJ
C	14-SEP-2014	ISSUE FOR APPROVAL	DJ
B	13-SEP-2014	ISSUE FOR REVIEW	DJ
A	12-SEP-2014	ISSUE FOR INTERNAL REVIEW	DJ

DESIGNED:	D. SAUER	DATE:	08-SEP-2014
DRAWN:	S. ZHANG	DATE:	12-SEP-2014
CHECKED:	G. SOHAL	DATE:	12-SEP-2014
APPROVED:	D. JEAKLE	DATE:	12-SEP-2014
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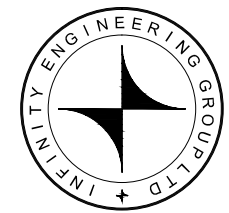
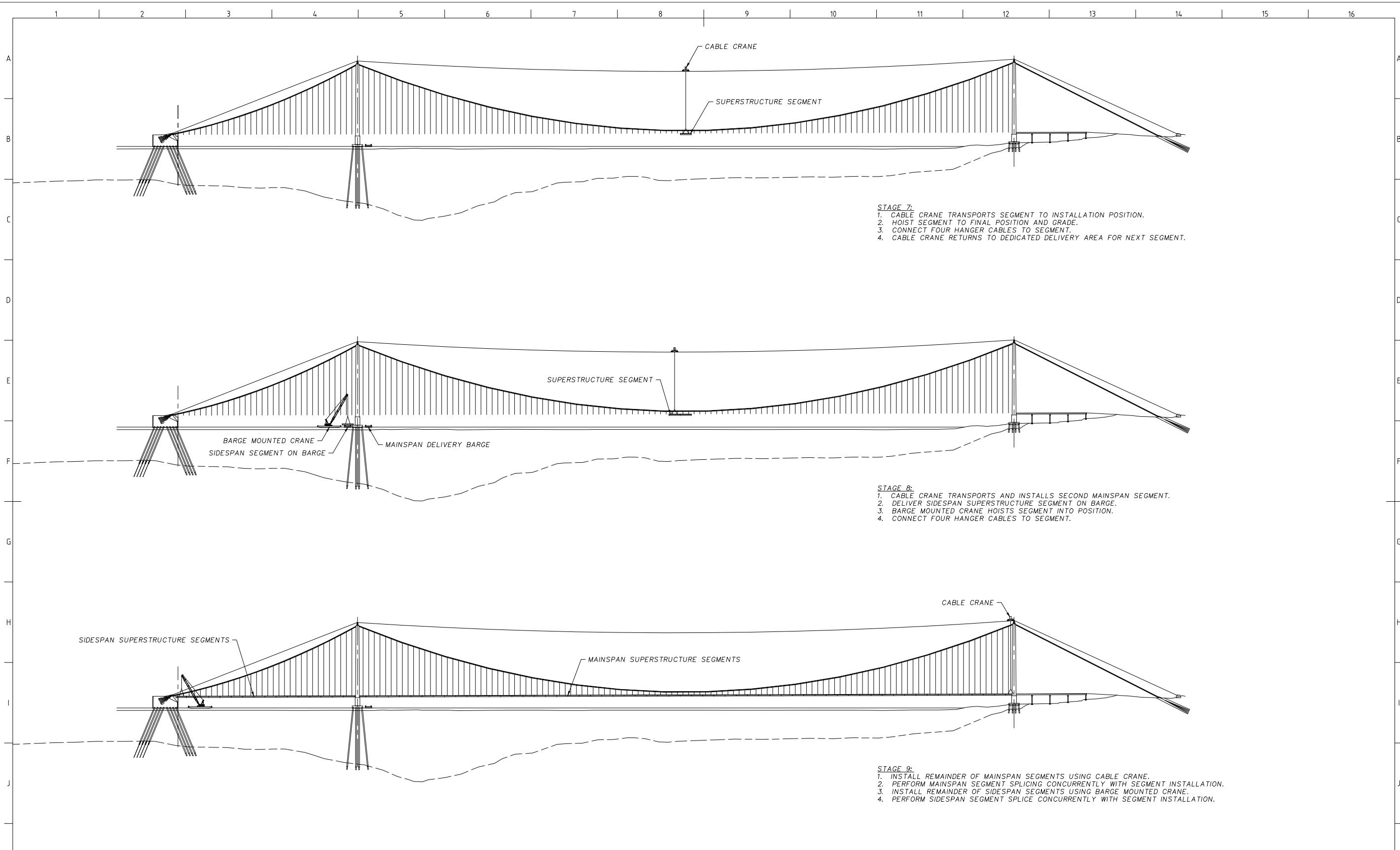
  
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 PROJECT TITLE  
**PACIFIC NORTHWEST LNG BRIDGE**  
 DWG. TITLE  
**CONSTRUCTION SEQUENCE 2**  
**Figure 2-8**

DWG. No.	REV.
108	2

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A	12-SEP-2014	ISSUE FOR INTERNAL REVIEW	DJ

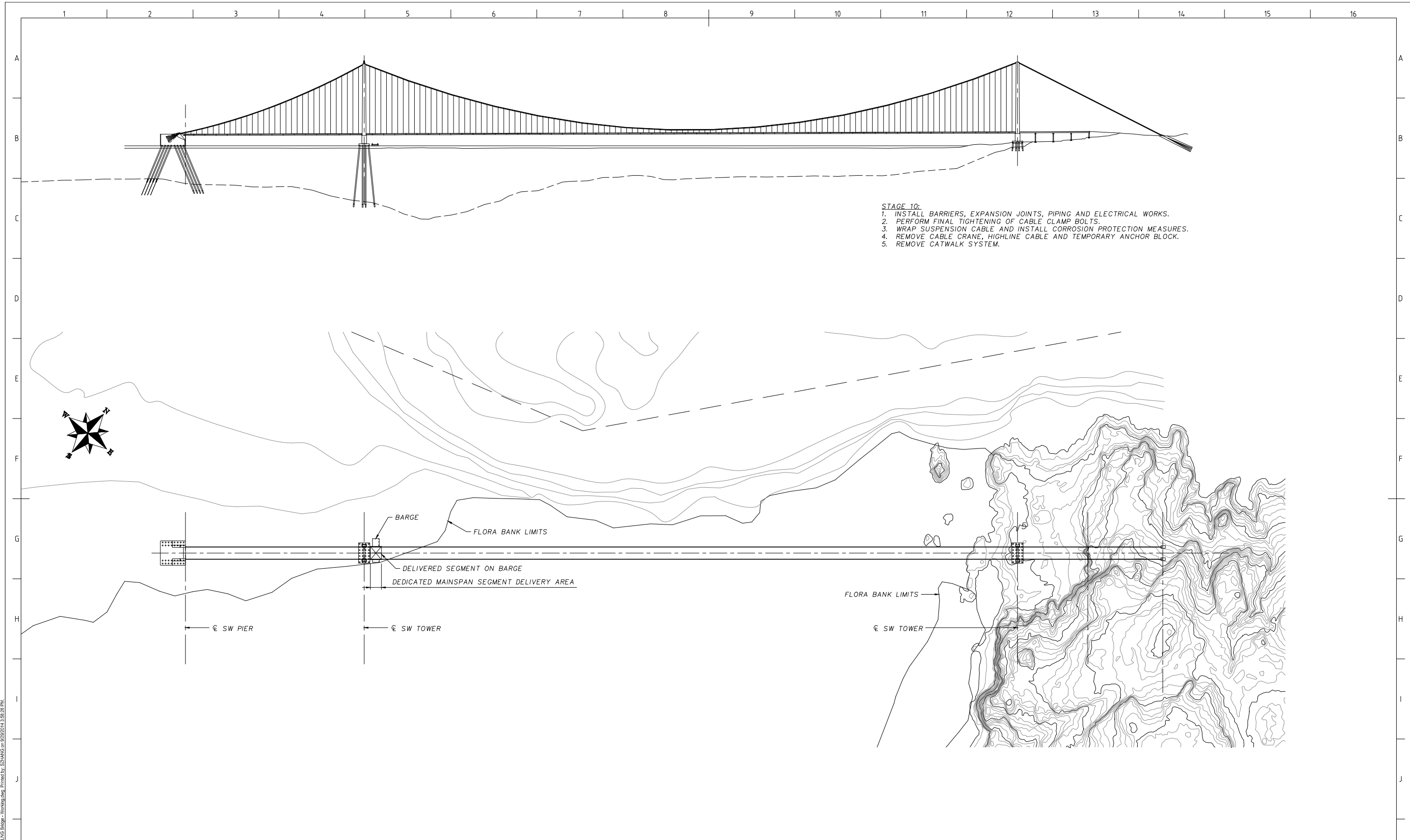
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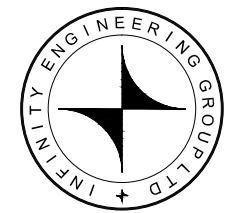
  
 PROJECT TITLE  
**PACIFIC NORTHWEST LNG BRIDGE**  
 DWG. TITLE  
**CONSTRUCTION SEQUENCE 3**  
**Figure 2-9**

DWG. No.	109	REV.	2
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- STAGE 10:**
1. INSTALL BARRIERS, EXPANSION JOINTS, PIPING AND ELECTRICAL WORKS.
  2. PERFORM FINAL TIGHTENING OF CABLE CLAMP BOLTS.
  3. WRAP SUSPENSION CABLE AND INSTALL CORROSION PROTECTION MEASURES.
  4. REMOVE CABLE CRANE, HIGHLINE CABLE AND TEMPORARY ANCHOR BLOCK.
  5. REMOVE CATWALK SYSTEM.



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B	13-SEP-2014	ISSUE FOR REVIEW	DJ
A	12-SEP-2014	ISSUE FOR INTERNAL REVIEW	DJ

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CHECKED:	G. SOHAL	DATE:	12-SEP-2014
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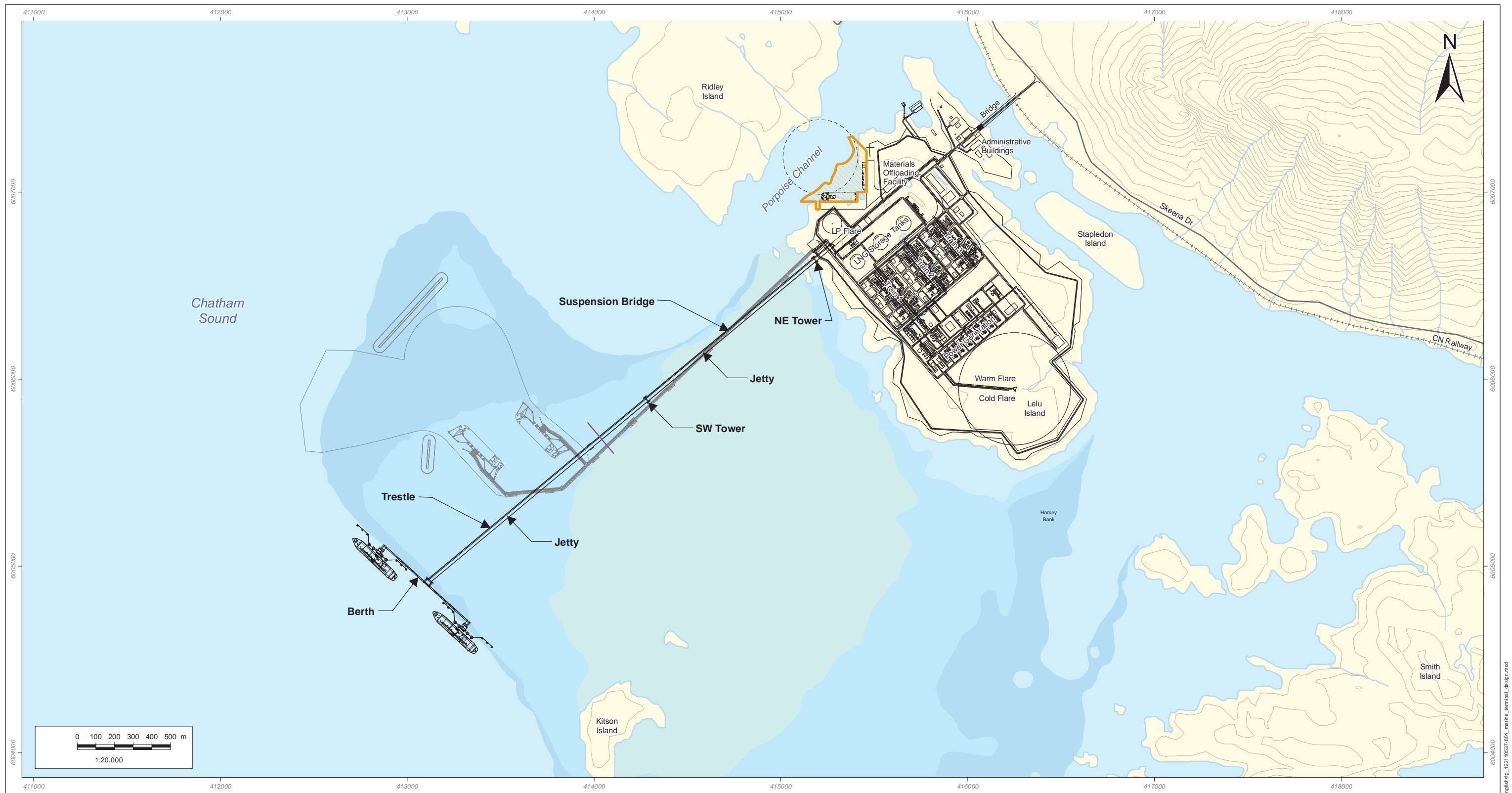
**Pacific Northwest LNG**

PROJECT TITLE  
**PACIFIC NORTHWEST LNG BRIDGE**

DWG. TITLE  
**CONSTRUCTION SEQUENCE 4**

<b>Figure 2-10</b>	DWG. No. <b>110</b>	REV. <b>2</b>
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<ul style="list-style-type: none"> <li>— Contour (m)</li> <li>— Marine Terminal Design Mitigation</li> <li>— Marine Terminal Design submitted in the EIS/Application</li> <li>++++ Railway</li> <li>— Secondary Road</li> <li>--- Turning Basin</li> <li>— Watercourse</li> </ul>		<ul style="list-style-type: none"> <li> Dredge Boundary</li> <li> Waterbody</li> <li> Agnew Bank</li> <li> Flora Bank</li> <li> Horsey Bank</li> </ul>		<p><b>Pacific NorthWest LNG</b></p> <p><b>Marine Terminal Design Submitted in the EIS/ Application Compared to the Design Mitigation</b></p> <p><small>Sources: Government of British Columbia; Government of Canada, Natural Resources Canada, Centre for Topographic Information; Progress Energy Canada Ltd; WorldView-2 Imagery. Imagery date: 2011.</small></p> <p><small>Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the</small></p>			<p>PREPARED BY: </p> <p>PREPARED FOR: </p> <p>FIGURE NO: <b>2-11</b></p>		
<p>DATE: 30-SEP-14 FIGURE ID: 123110537-804</p>		<p>PROJECTION: UTM - ZONE 9 DATUM: NAD 83</p>		<p>DRAWN BY: M. BATE CHECKED BY: A. POMEROY</p>					

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### **3.0 DESIGN MITIGATION EFFECTS ASSESSMENT**

Table 3-1 provides a high-level description of how the assessment of the effects of the Project on the environment is expected to change as a result of the design mitigations. The table is based on Table 28-1 of the EIS/Application and shows the summary of effects from the EIS/Application as well as the changes to the assessment from the design mitigations. Mitigation measures are updated where relevant; and the effects of the design mitigations on the conclusions of the EIS/Application are provided.

The purpose of the assessment conducted in Table 3-1 is to identify new or changed effects of the design mitigation on the environment. Potential effects that are unchanged from the EIS/Application are not repeated.

One new environmental effect (as defined in CEAA 2012) was identified as a result of the marine terminal design mitigation. The 1.6 km long suspension bridge to be constructed as part of the marine terminal includes two-towers and suspension cables up 140 m high (above sea level). The presence of the bridge has potential to affect air navigation. This potential effect, proposed mitigation, residual effects, and potential for significance is described in Table 3-1 within the Navigation and Marine Use Valued Component (VC).

PNW LNG PROJECT DESIGN MITIGATION

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Table 3-1: Summary of Potential Changes to the Assessment from the Design Mitigation

Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
<b>Air Quality</b>					<b>Air Quality</b>	
Increase in criteria air contaminant (CAC) concentrations	<p><b>Construction</b> Site preparation Onshore construction Vehicle traffic Dredging</p> <p><b>Operations</b> LNG facility Marine terminal use Shipping</p>	<ul style="list-style-type: none"> <li>Best achievable technology</li> <li>Best management practices.</li> <li>Natural gas leak detection program.</li> <li>Thermal oxidizer operation.</li> <li>Dust suppression.</li> <li>Equipment maintenance and low sulfur fuel.</li> <li>Vehicle idling restrictions.</li> <li>Adherence to the International Convention for the Prevention of Pollution from Ships (MARPOL).</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is that the atmosphere is expected to demonstrate a <b>high degree of resilience</b> to change in air quality</li> <li><b>Low</b> in magnitude (effect is detectable but within normal variability of baseline conditions)</li> <li><b>Local</b> in geographic extent (restricted to the LAA)</li> <li><b>Medium-term</b> in duration (effect occurs for the life of the Project)</li> <li>Reversible</li> <li>Is <b>continuous</b> in frequency</li> <li>The likelihood of a residual effect of an increase in criteria air contaminant concentrations is <b>high</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will reduce air emissions from dredging and disposal at sea equipment from 27 months to 6 months.</li> <li>Air emissions at the marine terminal during operations will be the same, but in a location approximately 600 m away from the location proposed in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or the Prince Rupert general area will increase air emissions from vehicle traffic associated with transporting workers from the camp to Lelu Island; however we expect air emissions from diesel generators to supply power to the camp will be eliminated.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment of effects on Air Quality have not changed.</p>	<p><b>Not significant</b> With a high level of confidence</p>
<b>Greenhouse Gas Management</b>					<b>Greenhouse Gas Management</b>	
Emission of GHG gases (CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O) from LNG facility	<p><b>Construction</b> Site preparation Onshore construction Vehicle traffic Dredging Marine construction</p> <p><b>Operations</b> LNG facility Marine terminal use Shipping</p>	<ul style="list-style-type: none"> <li>Develop and implement a GHG Management Plan.</li> </ul>	<ul style="list-style-type: none"> <li>The contribution of GHG emissions from the Project would cause a small material change relative to the total global emissions.</li> </ul>	<p><b>Not significant</b></p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will reduce GHG emissions from dredging and disposal at sea equipment from 27 months to 6 months.</li> <li>GHG emissions at the marine terminal during operations will be the same, but in a location approximately 600 m away from the location proposed in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or the Prince Rupert general area will increase GHG emissions from vehicle traffic associated with transporting workers from the camp to Lelu Island; however we expect GHG emissions from diesel generators to supply power to the camp will be eliminated.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment of effects on Greenhouse Gas Management have not changed.</p>	<p><b>Not significant</b></p>

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Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
<b>Acoustic Environment</b>					<b>Acoustic Environment</b>	
Increase in noise levels	<p><b>Construction</b> Site preparation Onshore construction Dredging Marine construction</p> <p><b>Operations</b> LNG facility Marine terminal use Shipping</p> <p><b>Decommissioning</b> Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>Nighttime construction activity will be limited to low noise activities (no impact type pile driving or blasting).</li> <li>Pile driving using vibro-hammer, where feasible.</li> <li>Noise Management Plan.</li> <li>Use of building enclosures and/or silencers on large machinery and equipment.</li> <li>Closure of building windows. Closure of doors when not in use.</li> <li>Implementation of a noise complaint mechanism.</li> <li>Specification of acoustic performance of noise emission equipment (not exceeding 85 dBA at 1 m from equipment and 120 dBA for emergencies).</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate resilience</b> (the effect takes place in an area currently disturbed by human development)</li> <li><b>Moderate</b> in magnitude (effect is perceptible compared to baseline)</li> <li><b>Regional</b> in extent (effects extend into the RAA for three receptors)</li> <li><b>Medium-term</b> in duration (effect occurs for the life of the Project)</li> <li>Reversible</li> <li>Is <b>continuous</b> in frequency</li> <li>The likelihood of a residual effect of an increase in noise levels is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will reduce noise emissions from dredging and disposal at sea equipment from 27 months to 6 months. It will also reduce noise emissions from pile installation since fewer piles will be required.</li> <li>Noise emissions at the marine terminal during operations will be the same, but in a location approximately 600 m away from the location proposed in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward or the Prince Rupert general area will increase vehicle traffic associated with transporting workers from the camp to Lelu Island for work during construction; however we expect noise emissions from diesel generators to supply power to the camp will be eliminated.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment of effects on the Acoustic Environment have not changed.</p>	<p><b>Not significant</b> With a moderate level of confidence</p>
<b>Ambient Light</b>					<b>Ambient Light</b>	
Increase in ambient lighting	<p><b>Construction</b> Site preparation Onshore construction Vehicle traffic Operational testing and commissioning</p> <p><b>Operations</b> LNG facility Marine terminal use</p>	<ul style="list-style-type: none"> <li>Fixtures selected to reduce wasted or stray light.</li> <li>Adherence to design specifications.</li> <li>Use of a centralized lighting control system.</li> <li>Maintain a 30 m vegetation buffer.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate resilience</b> (the effect takes place in an area currently disturbed by human development)</li> <li><b>Low</b> in magnitude (effect is detectable but reduced through design mitigation)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Medium-term</b> in duration (effect occurs for the life of the Project)</li> <li>Reversible</li> <li>Is <b>continuous</b> in frequency</li> <li>The likelihood of a residual effect of an increase in ambient lighting is <b>high</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>Lighting for aircraft will be added to the towers of the suspension bridge in accordance with Transport Canada requirements. This will not affect ambient light conditions in Port Edward.</li> <li>Lighting on the jetty/bridge top deck will be installed as described in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>PNW LNG expects that the outdoor lighting at the accommodation camps will meet relevant municipal requirements; therefore it is not expected to affect the ambient light of the surrounding area.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment of effects on Ambient Light have not changed.</p>	<p><b>Not significant</b> With a high level of confidence</p>

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Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
<b>Vegetation and Wetland Resources</b>					<b>Vegetation and Wetland Resources</b>	
Change in abundance of plant species of interest	<b>Construction</b> Site preparation	<ul style="list-style-type: none"> <li>Incorporate traditional use plants into wetland compensation plans wherever possible and practical.</li> <li>Incorporate weed and invasive plant control measures during construction and operations.</li> <li>Implement a Species-at-Risk Discovery Contingency Plan.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate</b> resilience (the effect takes place in an undisturbed area)</li> <li><b>Low</b> in magnitude</li> <li>Occurs within the <b>PDA</b></li> <li><b>Long term</b></li> <li>Change in plant abundance is <b>reversible</b></li> <li>Occurs <b>once</b></li> <li>The likelihood of a residual effect of a change in abundance of plant species of interest is <b>high</b></li> </ul>	<b>Not Significant</b> With a moderate level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>Changes to the marine terminal design do not affect Vegetation and Wetland Resources.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., riparian area provisions of the Fisheries Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<b>Not Significant</b> With a moderate level of confidence
Change in abundance or condition of ecological communities	<b>Construction</b> Site Preparation <b>Operation</b> LNG facility	<ul style="list-style-type: none"> <li>During construction, ecological communities of management concern located outside of the PDA will be marked and protected.</li> <li>Design and implement drainage and erosion control techniques to maintain the local surface and groundwater hydrology.</li> <li>Implement monitoring program to monitor effects of air emissions on ecological communities.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate resilience</b> (the effect takes place in a <b>moderately disturbed</b> area)</li> <li><b>Low</b> in magnitude</li> <li><b>Regional</b> in extent (potential effects of emissions extend to the RAA)</li> <li>Permanent</li> <li>Loss of plant communities within the PDA are <b>irreversible</b></li> <li>Is <b>continuous</b> in frequency (effects from facility emissions)</li> <li>The likelihood of a residual effect of a change in abundance or condition of ecological communities is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>Changes to the marine terminal design do not affect Vegetation and Wetland Resources.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., riparian area provisions of the Fisheries Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<b>Not significant</b> With a moderate level of confidence



PNW LNG PROJECT DESIGN MITIGATION

Design Mitigation Effects Assessment  
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Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Change in wetland functions	Construction Site Preparation	<ul style="list-style-type: none"> <li>Delineate wetlands outside the PDA as environmentally sensitive areas, mark with fencing, and restrict construction access.</li> <li>Develop and implement the wetland compensation plan.</li> <li>Drainage and erosion control techniques designed to maintain the local surface and groundwater hydrology will be designed and implemented.</li> </ul>	<ul style="list-style-type: none"> <li>With compensation there are <b>no residual effects</b> on loss of wetland function</li> <li>The ecological context is of <b>low resilience</b> (the effect takes place in an <b>undisturbed</b> area)</li> <li><b>Medium-term</b> in duration (including time to restore wetland function through compensation)</li> <li><b>Reversible</b> (with compensation)</li> <li>The likelihood of a residual effect of a change in wetland function is <b>low</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>Changes to the marine terminal design do not affect Vegetation and Wetland Resources.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., riparian area provisions of the Fisheries Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a high level of confidence</p>
<b>Terrestrial Wildlife and Marine Birds</b>					<b>Terrestrial Wildlife and Marine Birds</b>	
Change in wildlife habitat availability	<p><b>Construction</b> Site preparation Onshore construction Dredging Marine construction Disposal at sea</p> <p><b>Operations</b> LNG facility Marine terminal use Shipping</p> <p><b>Decommissioning</b> Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>Maintain a 30 m vegetation buffer.</li> <li>Limit clearing limits of the PDA and temporary work space.</li> <li>Apply mitigation measures for acoustic environment.</li> <li>Implement Wetland Habitat Compensation and Fish Habitat Offsetting Strategies.</li> <li>Vessels will not exceed a speed of 16 knots within the LAA.</li> <li>Implement a Blasting Management Plan.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate</b> resilience (effect occurs in a stable ecosystem and/or moderately disturbed environment)</li> <li><b>Moderate</b> in magnitude (many individuals or hectares of habitat in a regional population are affected)</li> <li><b>Local</b> in extent (potential effects are within the LAA)</li> <li><b>Long-term</b> in duration (occurs across multiple breeding seasons/generations and project phases)</li> <li>Reversible</li> <li>Occurs <b>once</b> in frequency</li> <li>The likelihood of a residual effect of a change in wildlife habitat availability is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation reduces effects on foraging habitat for marine birds from dredging and Project infrastructure (compared to the EIS/Application).                             <ul style="list-style-type: none"> <li>Dredge area is reduced from ~90 ha to ~6 ha</li> <li>Breakwaters (~5.4 ha) are eliminated</li> <li>Seabed armouring (~21.2 ha) at the berth is eliminated.</li> </ul> </li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a moderate level of confidence</p>

PNW LNG PROJECT DESIGN MITIGATION

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Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Risk of mortality	<p><b>Construction</b> Site preparation Dredging Marine construction</p> <p><b>Operations</b> LNG facility Marine terminal use</p>	<ul style="list-style-type: none"> <li>Maintain 30 m vegetation buffer around Lelu Island.</li> <li>Limit clearing to the PDA and temporary work space.</li> <li>Clearing activities will occur outside of the breeding season for terrestrial birds, amphibians, and bats. If clearing is required during these breeding periods, bird surveys will be conducted in advance.</li> <li>Removal of raptor nests within the clearing limits of the PDA will be subject to permit approval.</li> <li>Erect permanent fencing around the Project.</li> <li>Store waste and recycling materials on-site in wildlife-proof containers for permanent disposal at an approved facility.</li> <li>Prohibit feeding and harassment of wildlife.</li> <li>Provide wildlife education and awareness training. Reduce traffic between Prince Rupert, Port Edward, and the project site through the use of buses, crew cab trucks, water taxis, and other group transportation options when practical.</li> <li>Adhere to posted speed limits on road and vessel transportation routes.</li> <li>Apply lighting mitigations.</li> <li>Implement Management Plans (e.g., Blasting Management Plan).</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate</b> resilience (effect occurs in a stable ecosystem and/or moderately disturbed environment)</li> <li><b>Moderate</b> in magnitude (many individuals or hectares of habitat in a regional population are affected)</li> <li><b>Local</b> in extent (potential effects are within the LAA)</li> <li><b>Long-term</b> in duration (occurs across multiple breeding seasons/generations and project phases)</li> <li>Reversible</li> <li>Occurs at <b>multiple</b> times at an <b>irregular</b> frequency</li> <li>The likelihood of a residual effect of increased risk of mortality is <b>medium</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The suspension bridge design includes towers and cables up to 140 m high (above sea level), and may result in a small increase in bird mortality from collisions with the structure.</li> <li>The size of the suspension bridge towers and cables will make them visible to birds in flight. Aviation lighting on the top of the tower will be designed (in consultation with Transport Canada) to reduce risk of attracting migrating birds (e.g., red-flashing lights).</li> <li>Lighting on the jetty/bridge top-deck will be directed downward onto bridge deck and will not change from the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., the Wildlife Act, the Migratory Birds Convention Act, and the Species at Risk Act) will be applied through the development application process.</li> <li>Relocating the accommodation camp to Port Edward and/or the Prince Rupert general area will increase vehicle traffic associated with transporting workers from the camp to Lelu Island; even though buses will be used to transport workers, this may increase wildlife mortality risk from vehicle collisions.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a moderate level of confidence</p>

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Alteration of movement or behaviour patterns	<p><b>Construction</b> Site preparation Onshore construction Dredging Marine construction</p> <p><b>Operations</b> LNG facility Marine terminal use</p> <p><b>Decommissioning</b> Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>Limit clearing limits of the PDA and temporary work space.</li> <li>Vessels will not exceed a speed of 16 knots within the LAA.</li> <li>Apply mitigation measures for acoustic environment.</li> <li>Equipment will be properly maintained.</li> <li>Implement Management Plans (e.g. Blasting Management Plan).</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate</b> resilience (effect occurs in a stable ecosystem and/or moderately disturbed environment)</li> <li><b>Low</b> in magnitude (few individuals or hectares of habitat in a regional population are affected)</li> <li><b>Local</b> in extent (potential effects are within the LAA)</li> <li><b>Long-term</b> in duration (occurs across multiple breeding seasons/generations and project phases)</li> <li>Reversible</li> <li>Occurs at <b>multiple</b> times at an <b>regular</b> an <b>irregular</b> frequency</li> <li>The likelihood of a residual effect of alteration of movement or behaviour pattern is <b>high</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation reduces potential effects of disturbance to marine birds due to fewer construction vessels required for dredging and disposal at sea (compared to the EIS/Application).</li> <li>Dredging (and disposal of marine sediments) will only be conducted for construction of the MOF.</li> <li>The duration of dredging and disposal at sea for the Project will be reduced from ~27 months to ~6 months. The number of barge trips from the site to Brown Passage will be reduced from ~1,280 to ~85 return trips.</li> <li>The suspension bridge may have a negligible effect on alteration of marine bird movements as any course correction required to avoid it would be minor.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., the Wildlife Act, the Migratory Birds Convention Act, and the Species at Risk Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a high level of confidence</p>
<b>Freshwater Aquatic Resources</b>					<b>Freshwater Aquatic Resources</b>	

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Change in (permanent alteration or destruction of) fish habitat	<p><b>Construction</b> Site preparation Onshore construction</p> <p><b>Operations</b> LNG facility</p>	<ul style="list-style-type: none"> <li>The extent of infilling of water courses will be reduced, where practical.</li> <li>Infilling lower sections of watercourses (near the intertidal area) will be avoided, where practical.</li> <li>Sedimentation and erosion control plan will be in place to avoid downstream effects.</li> <li>Undertake fish habitat offsetting.</li> <li>A 30 m vegetation buffer will be maintained around Lelu Island.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>high</b> resilience (effect occurs in an undisturbed environment)</li> <li><b>Low</b> in magnitude (effect is measurable, but on low quality, marginal or non-critical habitat)</li> <li>Occurs within the <b>PDA</b></li> <li><b>Long-term</b> in duration (the effect extends from 1 to 5 years including time to restore habitat through compensation)</li> <li>Irreversible</li> <li>Occurs <b>once</b></li> <li>The likelihood of a residual effect of a change in fish habitat is <b>low</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation does not affect freshwater aquatic resources.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., the Fisheries Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a high level of confidence</p>

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Change in food and nutrient content	<p><b>Construction</b> Site preparation Onshore construction</p> <p><b>Operations</b> LNG facility</p>	<ul style="list-style-type: none"> <li>A 30 m vegetation buffer will be maintained around Lelu Island.</li> <li>Undertake fish habitat offsetting.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>high</b> resilience (effect occurs in an undisturbed environment)</li> <li><b>Low</b> in magnitude (effect is measurable, but on low quality, marginal or non-critical habitat)</li> <li>Occurs within the <b>PDA</b></li> <li><b>Long-term</b> in duration (the effect extends from 1 to 5 years including time to restore habitat through compensation)</li> <li>Irreversible</li> <li>Occurs <b>once</b></li> <li>The likelihood of a residual effect of a change in food and nutrient content is <b>low</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation does not affect freshwater aquatic resources.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., the Fisheries Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a high level of confidence</p>
Increased risk of fish mortality	<p><b>Construction</b> Site preparation Onshore construction</p> <p><b>Operations</b> LNG facility</p>	<ul style="list-style-type: none"> <li>Fish salvage program during construction.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>high</b> resilience (effect occurs in an undisturbed environment)</li> <li><b>No effect</b> (No measurable adverse effect on the function or use of the habitat; no measurable reduction in size of the fish population)</li> <li>Occurs within the <b>PDA</b></li> <li><b>Short-term</b> in duration (the effect is less than 1 week)</li> <li>Irreversible</li> <li>Occurs <b>once</b></li> <li>The likelihood of a residual effect of an increased risk of fish mortality is <b>low</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation does not affect freshwater aquatic resources.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by an independent third-party service provider and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., the Fisheries Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a high level of confidence</p>

Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
<b>Marine Resources</b>					<b>Marine Resources</b>	
Change in sediment or water quality	<p><b>Construction</b> Dredging Marine construction Disposal at sea</p> <p><b>Operations</b> Marine terminal use</p>	<ul style="list-style-type: none"> <li>A 30 m vegetation buffer around Lelu Island. Sediment and erosion control measures will be used.</li> <li>TSS and turbidity will be monitored, the rate of the activity will be adjusted, or additional mitigation measures implemented as required.</li> <li>Dredge operations will be conducted using methods that reduce sediment spill.</li> <li>Sediment will be disposed in an area distant from the area used on the previous trip (within the disposal site).</li> <li>Use of tugs with less sediment scour-inducing propulsion systems (such as the Voith-Schneider design), have been evaluated and will be used.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate to high</b> resilience (under baseline conditions, the marine resources occasionally or often experience anthropogenic effects and are sensitive to them, with changes triggering small and short-term ecological effects, or are unaffected by them)</li> <li><b>Low to moderate</b> in magnitude (effects result in a measurable change outside the range of natural variability but not posing a risk to population viability)</li> <li>Occurs within the <b>LAA</b></li> <li><b>Long-term</b> in duration (the effect continues for more than two years)</li> <li><b>Reversible</b></li> <li>Occurs either <b>continuously</b> or at <b>multiple</b> times at <b>regular</b> intervals</li> <li>The likelihood of a residual effect of a change in sediment or water quality is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation reduces potential effects on water and sediment quality (compared to the EIS/Application and follow-up reports).                             <ul style="list-style-type: none"> <li>Dredge volume is reduced from ~7.7million m<sup>3</sup> to ~690,000 m<sup>3</sup>; disposal at sea volume is reduced from ~7.7million m<sup>3</sup> to ~200,000 m<sup>3</sup></li> </ul> </li> <li>Dredge area is reduced from ~90 ha to ~6 ha; duration of dredging and disposal is reduced from ~27 to ~6 months TSS levels during dredging at the MOF are expected to be the same compared to the EIS/Application; but will occur over a shorter duration.</li> <li>TSS levels during disposal at the Brown Passage disposal site are expected to be the same compared to the EIS/Application; but will occur over a shorter duration</li> <li>Sediment deposition at the end of disposal (at the Brown Passage site) will be less than 2.1 m for the MOF sediments (described in the EIS/Application) and substantially less than the 8.7 m predicted for the total deposition from both the MOF and former terminal berth area described in the EIS/Application.</li> <li>The total amount of PCDD/Fs that may be disturbed and re-suspended during dredging will be reduced (due to the removal of dredging at the marine terminal berth and the lower concentrations in the MOF).</li> <li>Increases in TSS from vessel maneuvering (LNG carriers and tugs) during berthing at the new terminal location are predicted to be substantially less than at the former marine terminal berth location because the water depth is greater than 15 m at the new location.</li> <li>The bridge deck will be paved; stormwater and any fluid spills from vehicles will be directed to collection system and pumped back to the LNG Facility for treatment and disposal.</li> <li>The following mitigation measures from the EIS/Application are no longer required:                             <ul style="list-style-type: none"> <li>A portion of the seabed will be armoured in marine terminal berth area.</li> <li>Arrivals and departures of LNG carriers will be avoided at low water slack tide and as the tide rises from low water up to mean sea level.</li> </ul> </li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward or the Prince Rupert general area eliminates the need for utility lines (for water and wastewater) to be trenched through Lelu Slough; reducing effects on water and sediment quality (compared to the EIS/Application).</li> </ul> <p>Overall, as a result of the design mitigations, the potential effects on water and sediment quality are less than described in the EIS/Application. Two mitigation measures are no longer required due to the change. The residual effects on sediment and water quality are predicted to be not significant. Due to the reduction in the volume of sediment to be dredged and disposed, the confidence in this prediction is high.</p>	<p><b>Not significant</b> With a <b>high</b> level of confidence</p>

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Change in (permanent alteration or destruction of) fish habitat	<p><b>Construction</b> Dredging Marine construction Disposal at sea</p> <p><b>Operations</b> Marine terminal use</p> <p><b>Decommissioning</b> Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>Hard multi-faceted shoreline protection material will be used where needed (e.g., at the trestle abutment) to promote colonization by marine biota.</li> <li>Habitat offsetting will be implemented to achieve no net loss of productivity.</li> <li>The outer limits of foreshore construction areas will be demarcated.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate</b> resilience (under baseline conditions, the marine resources are occasionally exposed to anthropogenic effects and are sensitive to them)</li> <li><b>Moderate</b> in magnitude (measurable change outside the range of natural variability but not posing a risk to population viability)</li> <li>Occurs within the <b>LAA</b></li> <li><b>Permanent</b></li> <li><b>Reversible</b></li> <li>Occurs as a <b>single</b> event</li> <li>The likelihood of a residual effect of a change in fish habitat is <b>low</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation avoids effects of project infrastructure and dredging (compared to the EIS/Application and follow-up reports):                             <ul style="list-style-type: none"> <li>Project infrastructure – and its construction – avoids Flora Bank.</li> <li>Dredge area is reduced from ~90 ha to ~6 ha</li> <li>Maintenance dredging at the MOF is expected to be infrequent, if at all</li> <li>Breakwaters (~5.4 ha) are eliminated</li> <li>Seabed armouring (~21.2 ha) at the berth is eliminated</li> </ul> </li> <li>The southwest bridge footing will affect &lt; 1 ha of marine habitat; which will be offset by the fewer number of piles required to support the jetty.</li> <li>The width of the suspension bridge will increase from 15 to 27 m (as submitted in the EIS/Application) to 24 m. The width of the trestle as submitted in the EIS/Application will not change (15 to 24 m [at the pipe expansion loops]).</li> <li>The magnitude of potential effects on marine fish habitat from the design proposed in the EIS/Application required extensive habitat offsetting to mitigate potential serious harm to fisheries resources. The design mitigation avoids effects on ~110 ha of marine habitat (compared to the EIS/Application); and reduces the need to offset the potential for that habitat loss to cause serious harm to fisheries resources.</li> <li>Habitat offsetting will be implemented for the Project (to offset potential effects on habitat at the MOF); however, the offsetting project will be at a much smaller scale compared to the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the construction accommodation camp to Port Edward or the Prince Rupert general area eliminates the need for utility lines (for water and wastewater) to be trenched through Lelu Slough; avoiding effects on fish and fish habitat.</li> </ul> <p>As a result of the design mitigations, the potential effects on fish and fish habitat are less than described in the EIS/Application. As a result, the habitat offsetting project will be a smaller scale compared to the EIS/Application.</p> <p>Overall, with application of the mitigation measures described in the EIS/Application the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a high level of confidence</p>

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Direct mortality or physical injury to fish or marine mammals	<p><b>Construction</b> Dredging Marine construction Disposal at sea</p> <p><b>Operations</b> Marine terminal use</p>	<ul style="list-style-type: none"> <li>DFO's Blasting Guidelines will be implemented.</li> <li>Blasting will be conducted within DFO least-risk timing windows.</li> <li>Dungeness crabs will be relocated from construction zones.</li> <li>Material from the dredge area that is suitable for construction or habitat compensation will be used, where possible.</li> <li>Implement a Pile Driving Management plan to outline low noise techniques to be used to install piles. If an impact pile driver is used a marine mammal observation program will be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>moderate</b> resilience (under baseline conditions, the marine resources are occasionally exposed to anthropogenic effects and are sensitive to them)</li> <li><b>Moderate</b> in magnitude (measurable change outside the range of natural variability but not posing a risk to population viability)</li> <li>Occurs within the <b>LAA</b></li> <li><b>Long-term</b> in duration (effect continues through all project phases)</li> <li><b>Reversible</b></li> <li>Occurs <b>continuously</b></li> <li>The likelihood of a residual effect of direct mortality or physical injury to fish or marine mammals is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation avoids effects of construction of project infrastructure and dredging on potential direct mortality or physical injury to fish or marine mammals (i.e., from burial, crushing, or underwater noise):                             <ul style="list-style-type: none"> <li>Dredge area is reduced from ~90 ha to ~6 ha</li> <li>Duration of dredging and disposal is reduced from ~27 months to ~6 months</li> <li>Breakwaters (~5.4 ha) are eliminated</li> <li>Seabed armouring (~21.2 ha) at the berth is eliminated</li> <li>The number of piles required for the suspension bridge and trestle are reduced from 546 to 464.</li> </ul> </li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward or to the Prince Rupert general area eliminates the need for utility lines (for water and wastewater) to be trenched through Lelu Slough; avoiding potential direct mortality or physical injury to fish</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application the conclusions of the assessment have not changed. Eliminating dredging for the marine terminal reduces the risk of mortality to marine organisms from dredging, therefore the confidence in this prediction has increased to high.</p>	<p><b>Not significant</b> With a <b>high</b> level of confidence</p>



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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Change in behaviour of fish or marine mammals	<p><b>Construction</b> Dredging Marine construction Disposal at sea</p> <p><b>Operations</b> Marine terminal use Shipping</p> <p><b>Decommissioning</b> Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>Vessels will not exceed a speed of 16 knots within the LAA.</li> <li>LNG carrier vessel speed will be reduced to 6 knots when approaching the Triple Island Pilot Boarding Station.</li> </ul>	<ul style="list-style-type: none"> <li>The ecological context is of <b>low to moderate</b> resilience (under baseline conditions, the marine resources are either rarely or occasionally exposed to anthropogenic effects and are sensitive or highly sensitive to them)</li> <li><b>Moderate</b> in magnitude (measurable change outside the range of natural variability but not posing a risk to population viability)</li> <li>Occurs within the <b>LAA</b></li> <li><b>Long-term</b> in duration (effect continues through all project phases )</li> <li><b>Reversible</b></li> <li>Occurs either <b>continuously</b> or at <b>multiple</b> times at <b>regular</b> intervals</li> <li>The likelihood of a residual effect of a change in behaviour of fish or marine mammals is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation avoids effects of construction of project infrastructure and dredging on change in behaviour of fish or marine mammals (i.e., blasting, pile installation, dredging, and marine vessels produce underwater noise that could result in a behavioral response in marine mammals and fish):                             <ul style="list-style-type: none"> <li>Dredge volume is reduced from ~7.7million m<sup>3</sup> to ~690,000 m<sup>3</sup></li> <li>Volume of marine sediment for disposal at sea is reduced from ~7.7million m<sup>3</sup> to ~200,000 m<sup>3</sup></li> <li>Duration of dredging and disposal is reduced from ~27 months to ~6 months</li> <li>Construction of breakwaters and seabed armouring is eliminated</li> <li>The number of piles required for the suspension bridge and trestle are reduced from 546 to 464.</li> </ul> </li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward or to the Prince Rupert general area eliminates the need for utility lines (for water and wastewater) to be trenched through Lelu Slough avoiding potential effects on behaviour of fish</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a moderate level of confidence</p>

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
<b>Economic Environment</b>					<b>Economic Environment</b>	
Changes in regional labour supply and demand	<b>Construction Operations Decommissioning</b>	<ul style="list-style-type: none"> <li>Work with training and educational facilities so that programs necessary to prepare regional residents for work on the Project are available.</li> <li>Require that all of workers complete grade 12 or have an appropriate equivalency.</li> <li>Develop career pathways that would allow local construction workers to transition into operational employment.</li> <li>Facilitate hiring and employment opportunities for RAA residents.</li> <li>Work with EPCC contractors to remove barriers to employment for RAA residents.</li> <li>Identify work packages that would be consistent with the capabilities of local and regional businesses to maximize local procurement opportunities.</li> <li>Work with First Nations to identify partnership or other arrangements that would increase the opportunities for their participation.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of resilience</li> <li><b>Moderate</b> in magnitude</li> <li><b>Regional</b> in extent</li> <li><b>Long-term</b> in duration</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of changes in regional labour supply and demand is <b>low</b></li> </ul>	<p><b>Not significant</b></p> <p>With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will not change the effects of the Project on the Economic Environment described in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on the Economic Environment described in the EIS/Application.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b></p> <p>With a moderate level of confidence</p>
Changes in cost of living and economic activity	<b>Construction Operations Decommissioning</b>	<ul style="list-style-type: none"> <li>Develop a project closure strategy that would reduce the adverse effects that project closure would have upon regional workers</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of resilience</li> <li><b>Moderate</b> in magnitude</li> <li><b>Regional</b> in extent</li> <li><b>Long-term</b> in duration</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect is <b>low</b></li> </ul>	<p><b>Not significant</b></p> <p>With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will not change the effects of the Project on the Economic Environment described in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on the Economic Environment described in the EIS/Application.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b></p> <p>With a high level of confidence</p>

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Changes to municipal government finances	<b>Construction</b> <b>Operations</b> <b>Decommissioning</b>	<ul style="list-style-type: none"> <li>• Consultations with municipal governments will continue to monitor whether the Project is creating issues, in terms of effects on municipal finances or demands for infrastructure or services.</li> <li>• A community investment program will be developed.</li> </ul>	<ul style="list-style-type: none"> <li>• The context is within a <b>moderate</b> level of resilience</li> <li>• <b>Low</b> in magnitude</li> <li>• <b>Regional</b> in extent</li> <li>• <b>Long-term</b> in duration</li> <li>• Reversible</li> <li>• <b>Continuous</b> in frequency</li> <li>• The likelihood of a residual effect of changes to municipal government finances is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>• The marine terminal design mitigation will not change the effects of the Project on the Economic Environment described in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>• Relocating the accommodation camp to Port Edward or to the Prince Rupert general area will increase the local tax benefit collected by the municipality.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.</p>	<b>Not significant</b> With a high level of confidence
<b>Navigation and Marine Resource Use</b>					<b>Navigation and Marine Resource Use</b>	
Interference with marine navigation	<b>Construction</b> Dredging Marine construction <b>Operations</b> Marine terminal use <b>Decommissioning</b> Dismantling project infrastructure	<ul style="list-style-type: none"> <li>• Implement a Marine Communications Plan.</li> <li>• Establish safety zones during construction.</li> <li>• Lighting design to reduce stray lighting.</li> <li>• Installation of navigational aids.</li> <li>• Updated navigational charts.</li> <li>• Sufficient clearance (11m above HHW) for gillnetters will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> <li>• Use of escort vessels to confirm the route is clear and that other vessels do not intrude in safety zones.</li> <li>• Tugs will be used for the safe transit and docking of LNG carriers.</li> <li>• Limits on environmental conditions under which operations can be conducted safely (visibility, day-time operations, wind) will be set.</li> <li>• Traffic management and routing options will be assessed to determine if de-confliction of LNG carrier routes is necessary for small craft.</li> </ul>	<ul style="list-style-type: none"> <li>• The context is within a <b>low</b> level of disturbance</li> <li>• <b>Moderate</b> in magnitude</li> <li>• <b>Local</b> in extent (effects are within the LAA)</li> <li>• <b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>• Reversible</li> <li>• <b>Continuous</b> in frequency</li> <li>• The likelihood of a residual effect of interference with marine navigation is <b>moderate</b></li> </ul>	<b>Not significant</b> With a high level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>• The marine terminal design mitigation reduces the effects of project infrastructure construction and dredging upon navigation (compared to the EIS/Application):                             <ul style="list-style-type: none"> <li>• No dredging activities will occur at the marine terminal berth area</li> <li>• Overall, duration of dredging and disposal is reduced from ~27 months to ~6 months; the number of barge trips for sediment disposal is reduced from 1,280 to 85 return trips to Brown Passage.</li> <li>• Maintenance dredging at the MOF is expected to be infrequent, if at all</li> <li>• Breakwaters (~5.4 ha) are eliminated.</li> </ul> </li> <li>• The jetty length (including the suspension bridge and trestle) will be approximately 300 m longer; however vessels will continue to be able to pass underneath it.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>• Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on Navigation and Marine Resource Use described in the EIS/Application.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application the conclusions of the assessment have not changed.</p>	<b>Not Significant</b> With a high level of confidence

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Effects on fishing, recreation and marine use (including marine tourism)	<b>Construction</b> Dredging Marine construction  <b>Operations</b> Marine terminal use Shipping  <b>Decommissioning</b> Dismantling project infrastructure	<ul style="list-style-type: none"> <li>A Marine Communications Plan will be implemented.</li> <li>Sufficient clearance (11m above HHW) for gillnetters will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> <li>Effects related to navigation (see Section 15.5.2.2) will be mitigated.</li> <li>Other effects related to marine resources will be mitigated (see Section 13 Marine Resources).</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of disturbance</li> <li><b>Moderate</b> in magnitude</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of effects on fishing and recreation and marine use is <b>moderate</b></li> </ul>	<p><b>Not significant</b></p> <p>With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation reduces the effects of project infrastructure construction and dredging upon marine resource use (compared to the EIS/Application)                             <ul style="list-style-type: none"> <li>No dredging activities will occur at the marine terminal berth area</li> <li>Overall, duration of dredging and disposal is reduced from ~27 months to ~6 months; the number of barge trips for sediment disposal is reduced from 1,280 to 85 return trips.</li> <li>Maintenance dredging at the MOF is expected to be infrequent, if at all</li> <li>Breakwaters (~5.4 ha) are eliminated.</li> </ul> </li> <li>The design mitigation avoids and reduces potential effects on marine resources (described above); reducing potential effects on fisheries resources.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on Navigation and Marine Resource Use described in the EIS/Application.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application the conclusions of the assessment have not changed. Due to the reduction in potential effects on marine resources (described above), the confidence in this prediction is high.</p>	<p><b>Not Significant</b></p> <p>With a <b>high</b> level of confidence</p>

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Effects on air navigation	Not assessed	Not assessed	Not assessed	Not assessed	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The 1.6 km long suspension bridge to be constructed as part of the marine terminal includes two-towers and suspension cables up 140 m high (above sea level). The presence of the bridge has potential to affect the safe and efficient use of an aerodrome, airport or heliport within, or close to, the take-off or approach areas.</li> <li>PNW LNG will comply with all regulatory requirements with respect to aviation safety. This includes: <ul style="list-style-type: none"> <li>Submitting details necessary to support revising aeronautical charts to identify the location and height of the bridge towers</li> <li>Marking and/or lighting will be applied on the bridge and towers as prescribed in Standard 621.19 of the <i>Canadian Aviation Requirements</i>.</li> </ul> </li> <li>The Prince Rupert Airport is approximately 7 nm (13 km) northwest of the bridge at the nearest point. The runway is aligned such that aircraft approaching from or departing to the southeast may fly over the intended location of the suspension bridge. The vertical separation of aircraft flight paths from the bridge will be sufficient to avoid effects.</li> <li>Digby Island Seaplane Base and Seal Cove Seaplane Base are located approximately 8 nm (15 km) and 9 nm (17 km) north of the bridge, respectively. Seaplanes using these bases reach cruising altitudes (typically 200 to 500 ft [60 to 150 m] asl) shortly after take-off and well before reaching the suspension bridge.</li> <li>Discussions with local seaplane operators indicate that aircraft flying under visual flight rules (VFR) currently use the airspace over the proposed suspension bridge; and would navigate around the bridge to avoid it.</li> </ul> <p>Overall, with application of marking requirements to increase visibility of the bridge and changes to aeronautical charts, potential effects of the Project on air navigation are predicted to be not significant.</p> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not affect air navigation.</li> </ul>	<p><b>Not Significant</b> With a high level of confidence</p>

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<b>Infrastructure and Services</b>					<b>Infrastructure and Services</b>	
Change in traffic and pressure on transportation infrastructure	<b>Construction</b> Site preparation Onshore construction Vehicle traffic Waste management and disposal	<ul style="list-style-type: none"> <li>A Transportation Management Plan will be implemented to outline preferred ground transportation corridors, provide policies for the movement of loads, outline policies and procedures for the use of the Prince Rupert Airport and the Northwest Regional Airport Terrace-Kitimat, provide policies for the movement of workers, and require PNW LNG to engage in frequent communication between MOTI, RCMP, PRPA and the council members of Port Edward and Prince Rupert.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of resilience (infrastructure and services are able to accommodate changes with minor impacts to viability).</li> <li><b>Low</b> in magnitude (effects cannot be distinguished from baseline)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of change in traffic and pressure on transportation infrastructure is <b>moderate</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will not change the effects of the Project on Infrastructure and Services described in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will increase vehicle traffic associated with transporting workers from the camps to Lelu Island.</li> <li>Bus transportation will be used to transport workers from accommodation camps to Lelu Island. At peak construction this could add ~450 vehicle movements per day.</li> <li>A Transportation Management Plan will be developed and implemented and include measures to reduce effects of increased traffic.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.</p>	<b>Not Significant</b> With a moderate level of confidence
Change in housing availability and affordability	<b>Construction</b> Onshore construction	<ul style="list-style-type: none"> <li>A camp will be used to house workers during construction.</li> <li>An accommodation plan will be implemented to establish communication with city and district planners in Port Edward and Prince Rupert, provide housing policies for non-local temporary workers who are not housed in the construction camp on Lelu Island, and outline camp management policies and practices.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of resilience (infrastructure and services are able to accommodate changes with minor impacts to viability).</li> <li><b>Low</b> in magnitude (effects cannot be distinguished from baseline)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of change in housing availability and affordability is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will not change the effects of the Project on Infrastructure and Services described in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on change in housing and affordability.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.</p>	<b>Not Significant</b> With a moderate level of confidence

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Change in infrastructure and community services	<b>Construction</b> Onshore construction Waste management and disposal	<ul style="list-style-type: none"> <li>A First Nations and community training and employment strategy will be implemented that will ensure that local communities, including First Nations, have access to training and employment opportunities provided by the Project.</li> <li>A community crime prevention initiative between RCMP and PNW LNG will be developed</li> <li>A PNW LNG Project engagement plan will be implemented.</li> <li>An emergency response plan will be established and implemented with BC OGC, PRFR, PEFD, PRPA, and the RCMP.</li> <li>Mandatory awareness programs for employees will be implemented regarding fire suppression systems.</li> <li>Recreational facilities will be provided on site at the construction camp.</li> <li>Waste management, disposal, and recycling programs of construction and domestic waste will be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>high</b> level of resilience (infrastructure and services are well developed and able to accommodate change).</li> <li><b>Moderate</b> in magnitude (a measurable change that can be accommodated elsewhere in the RAA)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of change in infrastructure and community services is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will not change the effects of the Project on Infrastructure and Services described in the EIS/Application.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area may increase interactions between construction workers and local populations, thereby potentially increasing demands on infrastructure and community services.</li> <li>PNW LNG will mitigate potential effects through establishing requirements (through the EPCC contractor) to provide a suite of worker health services and recreation facilities and programs at the accommodation camp that houses their workers.</li> <li>PNW LNG will enforce a "Code of Conduct", through conditions of employment, which will address many of the potential effects of the temporary worker population on the socio-economic conditions of Port Edward and Prince Rupert.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, as well as the measures described in Section 2.2, the conclusions of the assessment have not changed.</p>	<b>Not Significant</b> With a moderate level of confidence
<b>Visual Quality</b>					<b>Visual Quality</b>	
Reduction in visual quality	<b>Construction</b> Site preparation Onshore construction Dredging Marine construction <b>Operations</b> LNG facility Marine terminal use Shipping	<ul style="list-style-type: none"> <li>A 30 m mature vegetation buffer will be retained around Lelu Island, except at access points, and will reduce the visual impact of the Project.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of resilience</li> <li><b>High</b> in magnitude (a measurable change exceeds visual quality objectives)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of reduction in visual quality is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation includes a 1.6 km long suspension bridge to be constructed as part of the marine terminal includes two-towers and suspension cables up 140 m high (above sea level).</li> <li>The suspension bridge will be distantly visible from the town centre of Port Edward and the waters around Lelu Island.</li> <li>Consultation with the Port Edward community is underway to understand if local residents are concerned about the effect of the project on the visual landscape of the area.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on Visual Quality.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.</p>	<b>Not significant</b> With a moderate level of confidence (depending on results of consultation)

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<b>Community Health and Well-Being</b>					<b>Community Health and Well-Being</b>	
Changes in social determinants of health	<b>Construction</b> Site preparation Onshore construction Dredging Marine construction <b>Operations</b> LNG facility Marine terminal use Shipping	<ul style="list-style-type: none"> <li>Provide training, employment and business opportunities.</li> <li>Provide an employee assistance program.</li> <li>Implement a vaccination policy.</li> <li>Enforce workplace hygiene policies.</li> <li>Provide contractor information sessions.</li> <li>Non-local construction workers will be housed in an accommodation camp.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>resilient</b> community</li> <li><b>Moderate</b> in magnitude (effect is measurable and will not affect quality of life)</li> <li><b>Regional</b> in extent (effects extend to the RAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of changes in social determinants of health is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence	<b>Marine Terminal</b> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will not change the effects of the Project on changes in social determinants of health described in the EIS/Application.</li> </ul> <b>Accommodation Camp</b> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area may increase interactions between construction workers and local populations, potentially affecting affect community cohesion, physical and mental health, demand on health infrastructure and services, and recreational opportunities.</li> <li>PNW LNG will mitigate potential effects through establishing requirements (through the EPCC contractor) to provide a suite of health services and recreation facilities and programs at the accommodation camp where their workers are housed.</li> <li>PNW LNG will enforce a "Code of Conduct", through conditions of employment, which will address many of the potential effects of the temporary worker population on the socio-economic conditions of Port Edward and Prince Rupert.</li> </ul> Overall, with the application of the mitigation measures described in the EIS/Application, as well as the measures described in Section 2.2, the conclusions of the assessment have not changed.	<b>Not Significant</b> With a moderate level of confidence
Change in diet and nutrition	<b>Construction</b> Site preparation Onshore construction Marine construction Operational testing and commissioning <b>Operations</b> LNG facility Marine terminal use Shipping	<ul style="list-style-type: none"> <li>Mitigation measures presented in biophysical, land and marine use and human health sections of the application serve as mitigation measures reducing residual effects on change in diet and nutrition.</li> <li>Public awareness and informational sessions will be available.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>resilient</b> community</li> <li><b>Moderate</b> in magnitude (effect is measurable and will not affect quality of life)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Irreversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of change in diet and nutrition is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence	<b>Marine Terminal</b> <ul style="list-style-type: none"> <li>The marine terminal design mitigation will reduce potential effects of the project on Marine Resources and Navigation and Marine Resource Use (see above).</li> <li>These changes will reduce concerns raised by the community about the effects of the project on the quality of country foods; and the ability to harvest marine resources.</li> </ul> <b>Accommodation Camp</b> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on diet and nutrition.</li> </ul> Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.	<b>Not Significant</b> With a moderate level of confidence



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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
<b>Human and Ecological Health</b>					<b>Human and Ecological Health</b>	
Change in human health	<b>Construction</b> Dredging <b>Operations</b> LNG facility Marine terminal use Shipping	See mitigations for Air Quality, Acoustic Environment, Ambient Light, and Marine Resources in Table 28-2.	<ul style="list-style-type: none"> <li>The context is <b>low</b> resilience due to the potential effects on sensitive receptors</li> <li><b>Low</b> in magnitude (exposures are near health-based guidelines)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of change in human health is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence	<b>Marine Terminal</b> <ul style="list-style-type: none"> <li>The marine terminal design mitigation reduces potential effects on water and sediment quality (compared to the EIS/Application and follow-up reports).                             <ul style="list-style-type: none"> <li>Dredge volume is reduced from ~7.7million m<sup>3</sup> to ~690,000 m<sup>3</sup></li> <li>Volume of marine sediment for disposal at sea is reduced from ~7.7million m<sup>3</sup> to ~200,000 m<sup>3</sup></li> <li>Duration of dredging will be reduced from ~27 to 6 months.</li> </ul> </li> <li>The total amount of dioxins and furans (PCDD/Fs) that may be disturbed and re-suspended during dredging will be reduced (due to the removal of dredging at the marine terminal berth and the lower concentrations in the MOF than the marine terminal berth area).</li> <li>These changes will reduce concerns about effects of redistribution of dioxins and furans from marine sediments into marine country foods.</li> </ul> <b>Accommodation Camp</b> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on human health.</li> </ul> Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.	<b>Not significant</b> With a high level of confidence

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Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Changes in ecological health	<b>Construction</b> Dredging <b>Operations</b> LNG facility Marine terminal use Shipping	See mitigations for Air Quality, Acoustic Environment, Ambient Light, and Marine Resources in Table 28-2.	<ul style="list-style-type: none"> <li>The context is of <b>moderate</b> resilience (effect occurs in a stable ecosystem and is not likely to contribute to change ecological health)</li> <li><b>Low</b> in magnitude (exposures are near health-based guidelines)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of change in ecological health is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>The marine terminal design mitigation reduces potential effects on water and sediment quality (compared to the EIS/Application and follow-up reports).                             <ul style="list-style-type: none"> <li>Dredge volume is reduced from ~7.7million m<sup>3</sup> to ~690,000 m<sup>3</sup></li> <li>Volume of marine sediment for disposal at sea is reduced from ~7.7million m<sup>3</sup> to ~200,000 m<sup>3</sup></li> <li>Duration of dredging will be reduced from ~27 to 6 months.</li> </ul> </li> <li>The total amount of dioxins and furans (PCDD/Fs) that may be disturbed and re-suspended during dredging at the MOF will be reduced (due to the removal of dredging at the marine terminal berth and the lower concentrations in the MOF than the marine terminal berth area).</li> <li>These changes will reduce concerns about effects of redistribution of dioxins and furans from marine sediments into marine organisms.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>Relocating the accommodation camp to Port Edward and/or to the Prince Rupert general area will not change the effects of the Project on ecological health.</li> </ul> <p>Overall, with the application of the mitigation measures described in the EIS/Application, the conclusions of the assessment have not changed.</p>	<b>Not significant</b> With a high level of confidence
<b>Archaeological and Heritage Resources</b>					<b>Archaeological and Heritage Resources</b>	
Destruction or disturbance of culturally modified trees	<b>Construction</b> Site preparation Onshore construction	<ul style="list-style-type: none"> <li>Systematic Data Recovery (SDR) studies for CMT sites will be conducted by systematically recording a representative sample of CMT features.</li> <li>Use of a Chance Find Protocol during project construction.</li> </ul>	<ul style="list-style-type: none"> <li>The Project is within a largely <b>undisturbed</b> context (there negligible disturbances within the PDA)</li> <li><b>Low/moderate</b> in magnitude (could be low or moderate in magnitude, depending on the archaeological context)</li> <li><b>Local</b> in extent (effects are within the PDA)</li> <li>Effects are permanent and irreversible</li> <li>Occurs <b>once</b></li> <li>The likelihood of a residual effect of destruction or disturbance of CMTs is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>Changes to the marine terminal design will not affect culturally modified trees.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The accommodation camps will be developed by independent third-party service providers and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., the Heritage Conservation Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<b>Not significant</b> With a high level of confidence

**PNW LNG PROJECT DESIGN MITIGATION**

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Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
Destruction or disturbance of archaeological or heritage sites	<p><b>Construction</b></p> <p>Site preparation Onshore construction Dredging Marine construction</p>	<ul style="list-style-type: none"> <li>Work affecting archaeological or heritage sites will cease until the site can be properly assessed by a professional archaeologist.</li> <li>Systematic Data Recovery (SDR) studies on affected heritage sites (if found).</li> <li>Archaeological or heritage resources of low significance may also be mitigated.</li> <li>Use of a Chance Find Protocol during project construction.</li> </ul>	<ul style="list-style-type: none"> <li>The Project is within a largely <b>undisturbed</b> context (there negligible disturbances within the PDA)</li> <li><b>Low/high</b> in magnitude (could be low or high in magnitude, depending on the archaeological context)</li> <li><b>Local</b> in extent (effects are within the PDA)</li> <li>Effects are permanent and irreversible</li> <li>Occurs <b>once</b></li> <li>The likelihood of a residual effect of destruction or disturbance of archaeological or heritage sites is <b>low</b></li> </ul>	<p><b>Not significant</b></p> <p>With a high level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>Changes to the marine terminal design will not affect destruction or disturbance of archaeological or heritage sites.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The temporary worker accommodation camps will be developed by independent third-party service providers and PNW LNG will not have care and control of the development plans or construction/operation of the facilities. PNW LNG assumes that municipal bylaws and applicable provincial and federal legislation (e.g., the Heritage Conservation Act) will be applied through the development application process.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b></p> <p>With a high level of confidence</p>

PNW LNG PROJECT DESIGN MITIGATION

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Table 28-1 of the EIS/Application					Changes from the Design Mitigation	
Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance	Changes to the Assessment from the Design Mitigation	Significance after the Design Mitigation
<b>Current Use of Land and Resources for Traditional Purposes</b>					<b>Current Use of Land and Resources for Traditional Purposes</b>	
Change in the use of land and resources for traditional purposes by Aboriginal people	<p><b>Construction</b> Site preparation Onshore construction Dredging Marine construction Disposal at sea Site clean-up and reclamation</p> <p><b>Operations</b> LNG facility and supporting infrastructure on Lelu Island Marine terminal use Shipping</p> <p><b>Decommissioning</b> Dismantling facility and infrastructure Dismantling of marine terminal and MOF Site clean-up and reclamation</p>	<ul style="list-style-type: none"> <li>PNW LNG will make good faith efforts to negotiate impact benefit agreements.</li> <li>Other mitigation measures for effects on the Current Use of Land and Resources for Traditional Purposes are found in the following valued components: Vegetation and Wetland Resources, Terrestrial Wildlife and Marine Birds, Marine Resources, Navigation and Marine Resource Use, Freshwater Aquatic Resource, Human and Ecological Health, Archaeological and Heritage Resources, Air Quality, Ambient Light, Acoustic Environment, and Visual Quality.</li> </ul>	<ul style="list-style-type: none"> <li>The Project is within a largely <b>moderately resilient</b> context (Aboriginal rights exercised by approximately 30-60% of community members and there is moderate interference with those rights; traditional community structures in place; some use of Aboriginal languages by community members)</li> <li><b>Moderate</b> in magnitude (varies from baseline and may result in noticeable changes to traditional practices, traditional knowledge or community perceptions of traditional territory, practices or knowledge [particularly on Lelu Island and immediately surrounding waters]; moderate exacerbation of existing conditions)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li>Effects are <b>long term</b> (certain effects extend beyond project closure)</li> <li>Reversible</li> <li>Occurs <b>continuously</b> in frequency</li> <li>The likelihood of a residual effect of change in the use of lands and resources for traditional purposes by Aboriginal people is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>	<p><b>Marine Terminal</b></p> <ul style="list-style-type: none"> <li>Changes to the marine terminal design will reduce potential effects of the Project on Terrestrial Wildlife and Marine Birds, Marine Resources, Navigation and Marine Resource Use, and Human and Ecological Health (as described above) compared to the EIS/Application.</li> <li>These changes will reduce the potential effects on Current Use of Lands and Resources for Traditional Purposes compared to the EIS/Application.</li> <li>Key changes include: <ul style="list-style-type: none"> <li>Reducing the project infrastructure in the marine environment and the extent of dredging reduces potential effects on fisheries resources.</li> <li>Eliminating dredging at the marine terminal berth reduces the duration of construction activity from dredging from ~27 months to ~6 months; it also reduces vessel traffic to dispose of sediment at sea from 1,280 to 85 return trips to Brown Passage.</li> <li>These changes will reduce concerns about the potential effects of redistribution of dioxins and furans from marine sediments into marine organisms.</li> </ul> </li> <li>The suspension bridge will increase potential effects on visual quality and may affect the experience of Aboriginal people using the lands and resources in the area.</li> </ul> <p><b>Accommodation Camp</b></p> <ul style="list-style-type: none"> <li>The land affected by development of the accommodation camps will be on private property within Port Edward and/or the Prince Rupert general area. No provincially administrated Crown lands will be impacted. Due to the small area requirement of the accommodation camps and the local, provincial and federal legislation that will apply to their development, construction of the accommodation camps is not expected to result in changes to the abundance, distribution or diversity of biological resources harvested by Aboriginal people. As a result, no new effects on the current use of land and resources for traditional purposes are predicted.</li> </ul> <p>Overall, with application of the mitigation measures described in the EIS/Application and the knowledge that the third-party camp service provider will be subject to the applicable regulatory regime, the conclusions of the assessment have not changed.</p>	<p><b>Not significant</b> With a moderate level of confidence</p>

## PNW LNG PROJECT DESIGN MITIGATION

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As noted previously, Table 3-1 provides a description of how the assessment of the effects of the Project on the environment is expected to change as a result of the design mitigations. Table 3-2 provides a list of the chapters of the EIS/Application and identifies which chapters are affected by the Project design mitigations. PNW LNG anticipates filing an Addendum to the EIS that will provide further details regarding the conclusions set out in Table 3-1 where the CEA Agency considers that further information is required. The Addendum will also provide any further information requested by the CEA Agency.

**Table 3-2: Proposed Updated Information Related to Project Design Mitigations**

EIS/Application Chapter	Effect of Project Design Mitigations on the Chapter
1. Introduction and Overview	Updated information on project layout and design has been provided in this submission. If additional engineering information becomes available it could be provided.
2. Project Description	Updated information on project layout and design has been provided in this submission. If additional engineering information becomes available it could be provided.
3. Summary of Engagement	A summary of any further engagement with federal and provincial agencies, First Nations and the public on the project design changes could be provided.
4. Scope of Assessment and Methods	Updated information on the changes to project activities and on the new potential effect on air navigation has been provided in this submission (Table 1-2 and Table 3-1). It is not anticipated additional information on the scope of assessment and methods used to assess the Project would be required.
5. Existing Environment	It is not anticipated that evaluation of the proposed project design mitigations would require updated information on the existing environment.
6. Air Quality	Table 3-1 describes how the assessment of the effects on Air Quality is expected to change. Effects of the design mitigations on the Air Quality assessment are expected to be minor. Further information can be provided if requested by the Agency.
7. Greenhouse Gas Management	Table 3-1 describes how the assessment of the effects on Greenhouse Gas Management is expected to change. Effects of the design mitigations on the Greenhouse Gas Management assessment are expected to be minor. Further information can be provided if requested by the Agency.
8. Acoustic Environment	Table 3-1 describes how the assessment of the effects on the Acoustic Environment is expected to change. Effects of the design mitigations on the Acoustic Environment assessment are expected to be minor. Further information can be provided if requested by the Agency.
9. Ambient Light	Table 3-1 describes how the assessment of the effects on Ambient Light is expected to change. Effects of the design mitigations on the Ambient Light assessment are expected to be minor. Further information can be provided if requested by the Agency.
10. Vegetation and Wetland Resources	It is not anticipated that evaluation of the proposed Project design mitigations would require updated information on effects to Vegetation and Wetland Resources.
11. Terrestrial Wildlife and Marine Birds	Table 3-1 describes how the assessment of the effects on Terrestrial Wildlife and Marine Birds is expected to change. The change to the marine terminal design is expected to change the assessment of effects on Marine Birds. Including effects on: <ul style="list-style-type: none"> <li>1. Change in habitat</li> <li>2. Risk of mortality risk</li> <li>3. Alteration of movement</li> </ul> Further information can be provided if requested by the Agency.

## PNW LNG PROJECT DESIGN MITIGATION

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EIS/Application Chapter	Effect of Project Design Mitigations on the Chapter
12. Freshwater Aquatic Resources	It is not anticipated that evaluation of the proposed Project design mitigations would require updated information on effects to Freshwater Aquatic Resources.
13. Marine Resources	<p>Table 3-1 describes how the assessment of the effects on Marine Resources is expected to change. The design mitigations are expected to change the assessment of effects on Marine Resources. Including effects on:</p> <ol style="list-style-type: none"> <li>1. Change in sediment or water quality</li> <li>2. Change in fish habitat</li> <li>3. Direct mortality or physical injury to fish or marine mammals</li> <li>4. Change in behaviour of fish or marine mammals</li> </ol> <p>Further information can be provided if requested by the Agency.</p>
14. Economic Environment	It is not anticipated that evaluation of the proposed Project design mitigations would require updated information on effects to the Economic Environment.
15. Navigation and Marine Resource Use	<p>Table 3-1 describes how the assessment of the effects on Navigation and Marine Resource Use is expected to change. The change to the marine terminal design is expected to change the assessment of effects on Navigation and Marine Resource Use. Including effects on:</p> <ol style="list-style-type: none"> <li>1. Interference with marine navigation</li> <li>2. Effects on fishing, recreation and marine use (including marine tourism)</li> </ol> <p>A new potential effect (effects on air navigation) has also been identified.</p> <p>Further information can be provided if requested by the Agency.</p>
16. Infrastructure and Services	<p>Table 3-1 describes how the assessment of the effects on Infrastructure and Services is expected to change. Effects of change in location of the accommodation camp are expected to be minor. Including effects on:</p> <ol style="list-style-type: none"> <li>1. Change in traffic pressure on transportation infrastructure</li> <li>2. Change in infrastructure and community services</li> </ol> <p>Further information can be provided if requested by the Agency.</p>
17. Visual Quality	Table 3-1 describes how the assessment of the effects on Visual Quality is expected to change. Further information can be provided if requested by the Agency.
18. Community Health and Well-Being	<p>Table 3-1 describes how the assessment of the effects on Community Health and Well-Being is expected to change. The design mitigations are expected to change the assessment of effects on Community Health and Well-Being. Including effects on:</p> <ol style="list-style-type: none"> <li>1. Changes in social determinants of health</li> <li>2. Change in diet and nutrition</li> </ol> <p>Further information can be provided if requested by the Agency.</p>
19. Human and Ecological Health	<p>Table 3-1 describes how the assessment of the effects on Human and Ecological Health is expected to change. The change to the marine terminal design is expected to change the assessment of effects on Human and Ecological Health. Including effects on:</p> <ol style="list-style-type: none"> <li>1. Changes in human health</li> <li>2. Changes in ecological health</li> </ol> <p>Further information can be provided if requested by the Agency.</p>
20. Archaeological and Heritage Resources	It is not anticipated that evaluation of the proposed Project design mitigations would require updated information on the effects to Archaeological and Heritage Resources.
21. Current Use of Lands and Resources for Traditional Purposes	Table 3-1 describes how the assessment of the effects on Current Use of Lands and Resources for Traditional Purposes is expected to change. Further information can be provided if requested by the Agency.

## PNW LNG PROJECT DESIGN MITIGATION

Summary  
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EIS/Application Chapter	Effect of Project Design Mitigations on the Chapter
22. Accidents or Malfunctions	It is not anticipated that evaluation of the proposed Project design mitigations would require updated information on Accidents or Malfunctions.
23. Effects of the Environment on the Project	It is not anticipated that evaluation of the proposed Project design mitigations would require updated information on Effects of the Environment on the Project.
24. Environmental Management Plans	It is not anticipated that evaluation of the proposed Project design mitigations would require updated information on Environmental Management Plans.
25. Changes to the Environment	The design mitigations are expected to result in changes to the summary of Changes to the Environment. Further information can be provided if requested by the Agency.
26. Effects of Changes to the Environment	The design mitigations are expected to result in changes to the summary of the Effects of Changes to the Environment. Further information can be provided if requested by the Agency.
27. Aboriginal Rights and Interests	The design mitigations are expected to result in some changes to the information on Aboriginal Rights and Interests. Further information can be provided if requested by the Agency.
28. Summary of the Assessment	Table 3 -1 provides a summary of how the assessment of the effects of the Project is expected to change as a result of the design mitigations. A further summary can be provided.
29. Benefits to Canadians	Additional information can be provided regarding the benefits to Canadians as a result of the design mitigations.
30. Follow-up Program and Compliance Monitoring	It is not anticipated that evaluation of the proposed Project design mitigations would require updated information on the Follow-up Program and Compliance Monitoring.
31. Conclusion	Additional information can be provided regarding how the project design mitigations affect the Conclusions of the assessment.

## 4.0 SUMMARY

This report provides an overview of the design mitigations proposed by PNW LNG to avoid, and further reduce, potential effects of the Project on the environment. The purpose of this report is to provide the Canadian Environmental Assessment (CEA) Agency information on the design changes to inform the CEA Agency's determination of next steps in the environmental assessment.

The design mitigations include:

- Redesigning the **marine terminal and relocating the berths** to remove project infrastructure (i.e., piles) on Flora Bank; and eliminate the need for dredging on Agnew Bank and the associated disposal at sea of the dredged materials.
- Moving the temporary work camp from Lelu Island and incorporating **third party owned-and-operated construction worker accommodation camps** on private land (zoned appropriately) in Port Edward and/or in the Prince Rupert general area.

Table 3-1 summarizes how the assessment of the effects of the Project on the environment is expected to change as a result of the design compared to the EIS/Application (submitted February 2014). The two design mitigations

## **PNW LNG PROJECT DESIGN MITIGATION**

Summary

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result in changes to the assessment of almost all of the VCs in the EIS/Application. Table 3-2 provides a list of the chapters of the EIS/Application and identifies which chapters are affected by the Project design mitigations. PNW LNG anticipates filing an Addendum to the EIS that will provide further details regarding the conclusions set out in Table 3-1 where the CEA Agency considers that further information is required. The Addendum will also provide any further information requested by the CEA Agency.

The objective of the design mitigations proposed is to avoid the activities in the marine environment with the greatest potential environmental effects (i.e., effects on marine fish and fish habitat) and reduces the need to compensate for potential effects on these resources. Overall, the design mitigations address key concerns raised by First Nations, government agencies, and the public during the review of the EIS/Application.

Overall, the effects of the design mitigations on the environment are positive and reduce potential effects. For each VC, the potential effects of the Project on the environment are expected to be not significant. The design mitigations proposed increase the level of confidence in this prediction.



# **Appendix A ENGINEERING DRAWINGS OF THE MARINE TRESTLE AND BERTHS**

H345670-1000-12-040-0041  
DWG. No.



DRAWING LIST		
DRAWING NO	REVISION	TITLE
H345670-1000-12-040-0041	A	COVER SHEET DRAWING LIST
H345670-1000-12-014-0042	A	EXISTING SITE PLAN
H345670-1000-12-042-0043	A	GENERAL ARRANGEMENT
H345670-1000-12-042-0044	A	JETTY LAYOUT
H345670-1000-12-042-0045	A	BERTH 1 - PLAN AND SECTION
H345670-1000-12-042-0046	A	BERTH 2 - PLAN AND DETAILS
H345670-1000-12-042-0047	A	TRESTLE PLAN AND PROFILE
H345670-1000-12-042-0048	A	TRESTLE CROSS SECTIONS
H345670-1000-12-042-0049	A	BERTH 1 - PILE LOCATION - PLAN
H345670-1000-12-042-0050	A	BERTH 2 - PILE LOCATION - PLAN

**NOTES:**

- FOR GENERAL NOTES SEE DWG. H345670-1000-12-014-0042.

**PRELIMINARY  
NOT FOR CONSTRUCTION**

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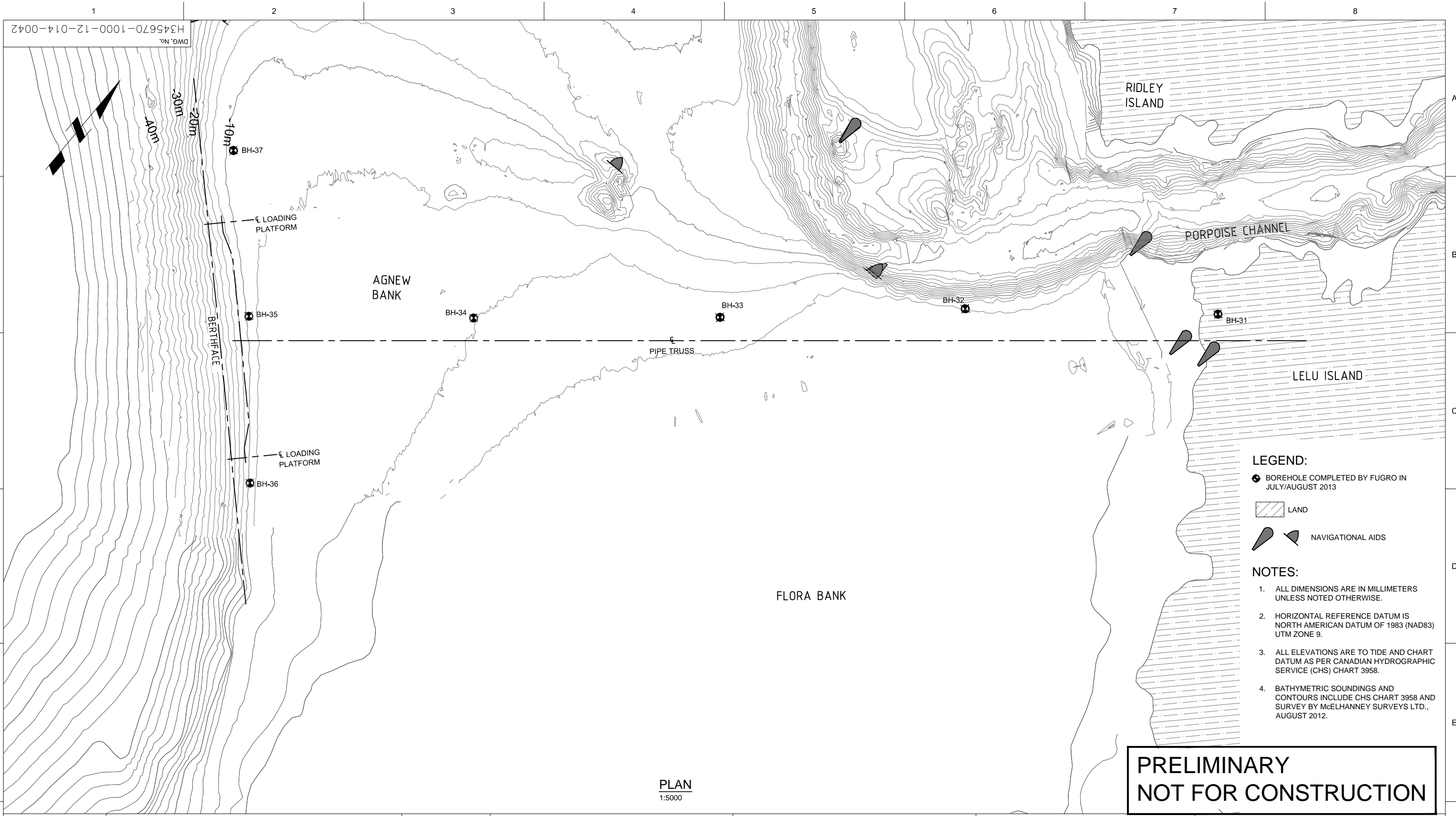


PACIFIC NORTHWEST LNG  
LNG JETTY AND TRESTLE

COVER SHEET DRAWING LIST

DRAWING No.	DRAWING TITLE	REGISTERED PROFESSIONAL	REVISIONS				DRAWING APPROVAL STATUS:				SCALE OR AS NOTED	DWG. No. H345670-1000-12-040-0041	REV A
			No.	DESCRIPTION	BY	CHK'D	DATE	ROLE	NAME	SIGNATURE			
A	ISSUED FOR CLIENT REVIEW					SEPT 26/14							

\$US\$ \$TIMES \$FILES



- LEGEND:**
- BOREHOLE COMPLETED BY FUGRO IN JULY/AUGUST 2013
  - LAND
  - NAVIGATIONAL AIDS

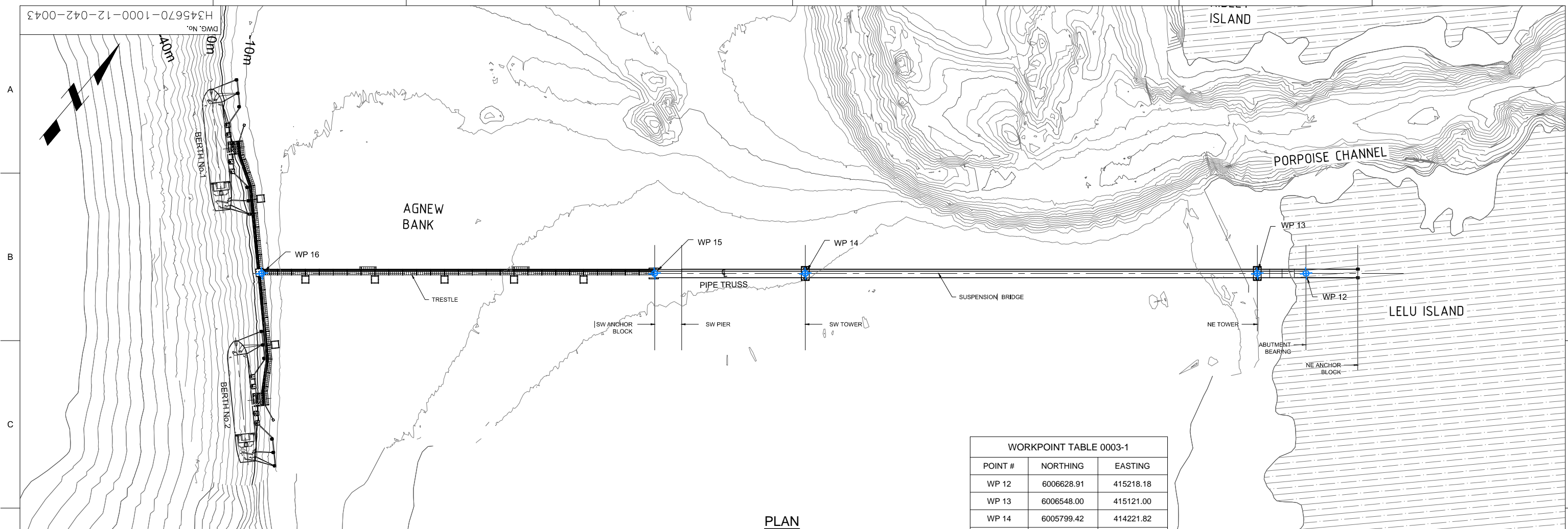
- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
  2. HORIZONTAL REFERENCE DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83) UTM ZONE 9.
  3. ALL ELEVATIONS ARE TO TIDE AND CHART DATUM AS PER CANADIAN HYDROGRAPHIC SERVICE (CHS) CHART 3958.
  4. BATHYMETRIC SOUNDINGS AND CONTOURS INCLUDE CHS CHART 3958 AND SURVEY BY McELHANNEY SURVEYS LTD., AUGUST 2012.

**PRELIMINARY  
NOT FOR CONSTRUCTION**

**PLAN**  
1:5000

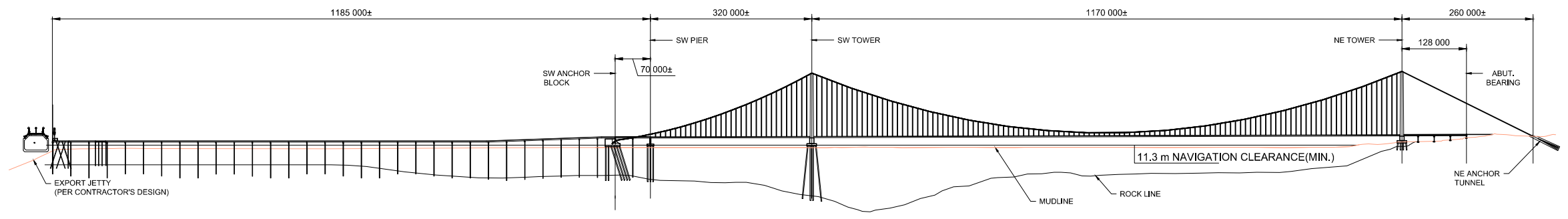
				THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF PACIFIC NORTHWEST LNG AND IS ISSUED PURSUANT TO BETWEEN CLIENT AND HATCH LTD. (HATCH). UNLESS OTHERWISE AGREED IN WRITING WITH CLIENT OR SPECIFIED ON THIS DRAWING, HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR MISUSE OF THIS DRAWING BY CLIENT, AND (B) THIS DRAWING IS CONFIDENTIAL AND ALL INTELLECTUAL PROPERTY RIGHTS EMBODIED OR REFERENCED IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.							
								DRAFTSPERSON A. BADESHA ASB DESIGNER H. WESTERMAN HW CHECKER O. SAYAO OS DESIGN COORD. N. STEWART NS RESP. ENG. LEAD DISC. ENG. ENG. MANAGER PROJ. MANAGER H. WESTERMAN HW		PACIFIC NORTHWEST LNG LNG JETTY AND TRESTLE	
								EXISTING SITE PLAN			
DRAWING No. 1 REFERENCE DRAWINGS		DRAWING TITLE 2 REGISTERED PROFESSIONAL		REVISIONS 5 No. A ISSUED FOR CLIENT REVIEW DESCRIPTION BY CHK'D DATE				DRAWING APPROVAL STATUS: 7 SCALE 1:5000 OR AS NOTED DWG. No. H345670-1000-12-014-0042 REV A		STIMES \$FILES	

H345670-1000-12-042-0043  
 DWG. No.



**PLAN**  
1:5000

WORKPOINT TABLE 0003-1		
POINT #	NORTHING	EASTING
WP 12	6006628.91	415218.18
WP 13	6006548.00	415121.00
WP 14	6005799.42	414221.82
WP 15	6005549.89	413922.09
WP 16	6004899.42	413140.77



**ELEVATION**  
1:5000

**NOTES:**  
 1. FOR GENERAL NOTES SEE DWG. H345670-1000-12-014-0042.

**PRELIMINARY  
 NOT FOR CONSTRUCTION**

DRAWING No.	DRAWING TITLE
1	REFERENCE DRAWINGS
2	
3	
4	
5	
6	
7	
8	

No.	DESCRIPTION	BY	CHK'D	DATE
A	ISSUED FOR CLIENT REVIEW			SEPT 26/14

DRAWING APPROVAL STATUS:			
ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	A. BADESHA	ASB	
DESIGNER	H. WESTERMAN	HW	
CHECKER	O. SAYAO	OS	
DESIGN COORD.	N. STEWART	NS	
RESP. ENG.			
LEAD DISC. ENG.			
ENG. MANAGER			
PROJ. MANAGER	H. WESTERMAN	HW	

**HATCH**

**Pacific NorthWest LNG**

PACIFIC NORTHWEST LNG  
 LNG JETTY AND TRESTLE

GENERAL ARRANGEMENT

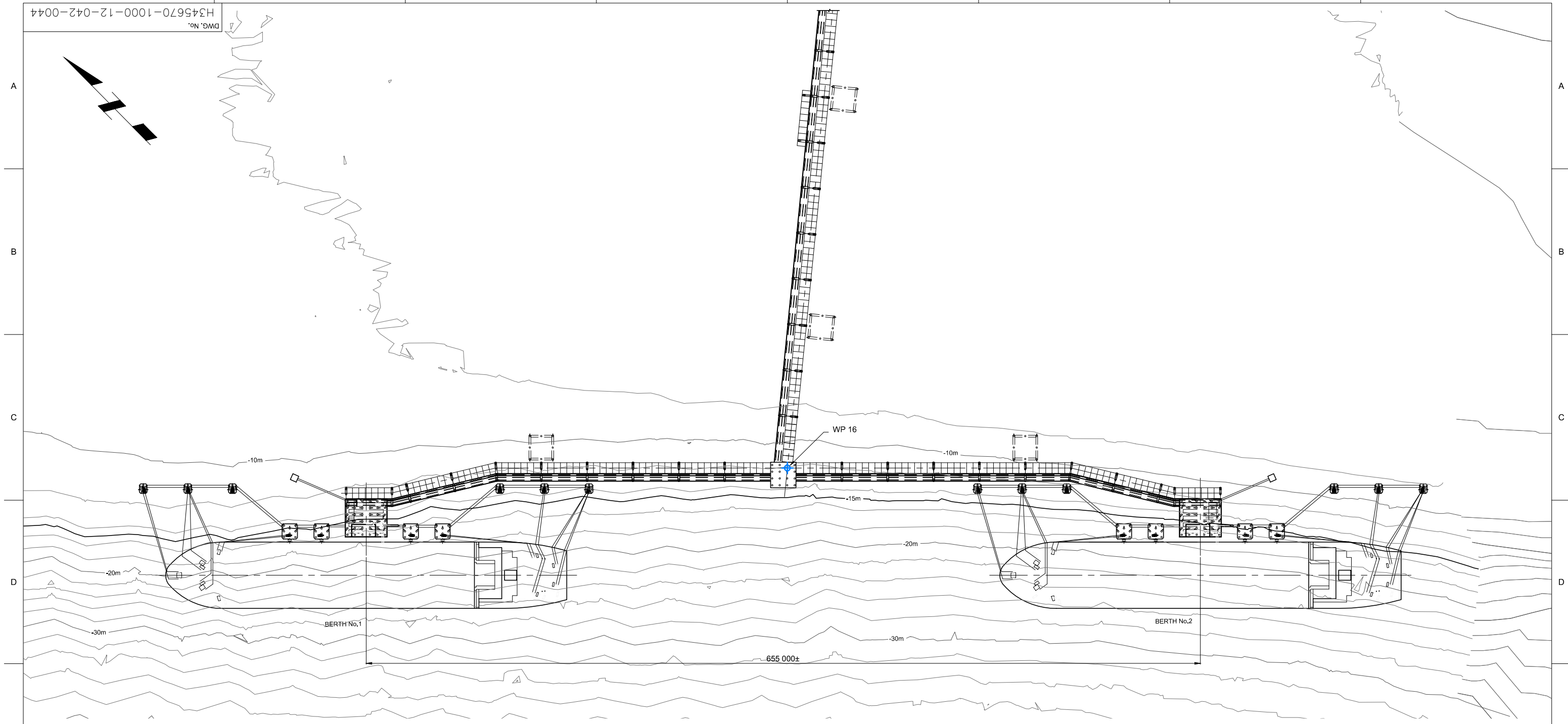
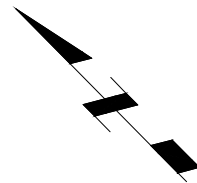
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DWG. No. H345670-1000-12-042-0043

REV A

SUSANAMES STIMES \$FILES

DWG. No. H345670-1000-12-042-0044



PLAN  
1:1500

- NOTES:  
1. FOR GENERAL NOTES SEE DWG. H345670-1000-12-014-0042.

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DRAFTSPERSON	A. BADESHA	ASB
DESIGNER	H. WESTERMAN	HW
CHECKER	O. SAYAO	OS
DESIGN COORD.	N. STEWART	NS
RESP. ENG.		
LEAD DISC. ENG.		
ENG. MANAGER		
PROJ. MANAGER	H. WESTERMAN	HW

PACIFIC NORTHWEST LNG  
LNG JETTY AND TRESTLE

JETTY LAYOUT

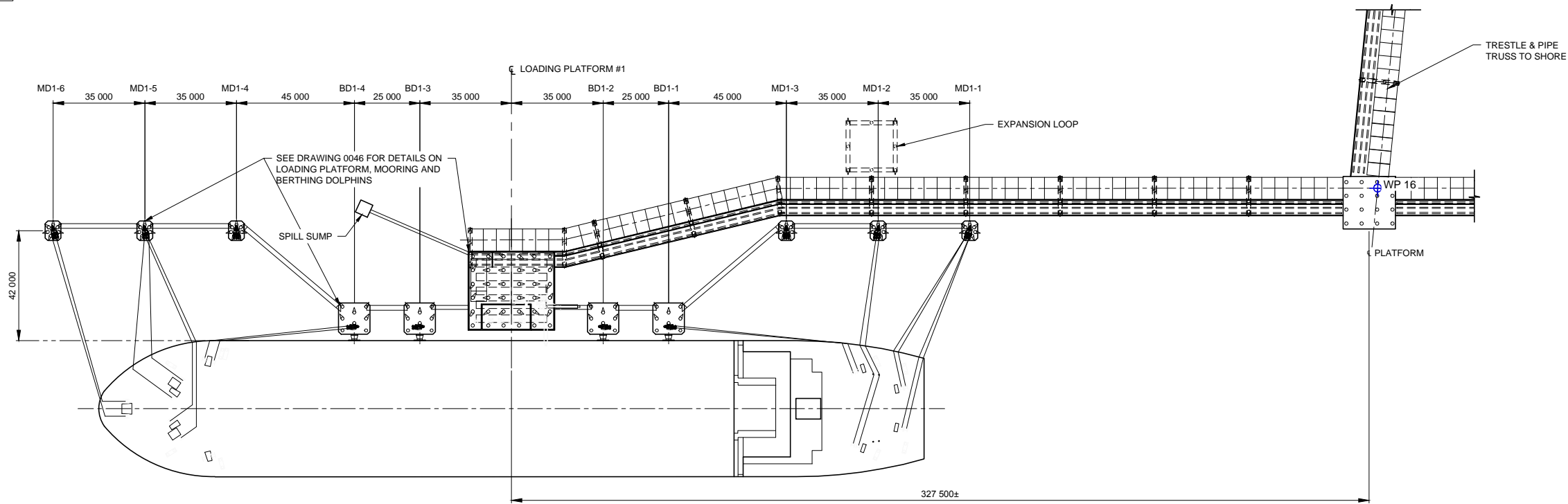
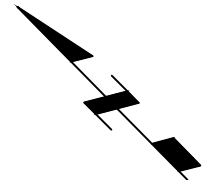
DRAWING No.	DRAWING TITLE	REGISTERED PROFESSIONAL
1	REFERENCE DRAWINGS	

No.	DESCRIPTION	BY	CHK'D	DATE
A	ISSUED FOR CLIENT REVIEW			SEPT 26/14

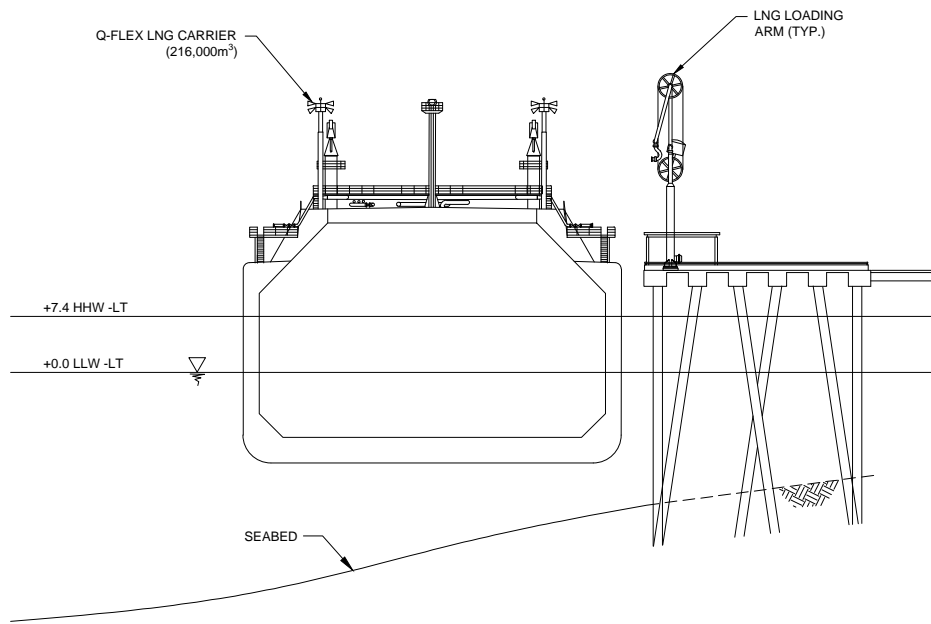
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ROLE	NAME	SIGNATURE	DATE

SCALE	DWG. No.	REV
1:1500 OR AS NOTED	H345670-1000-12-042-0044	A

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**BERTH 1 - PLAN**  
1:1000



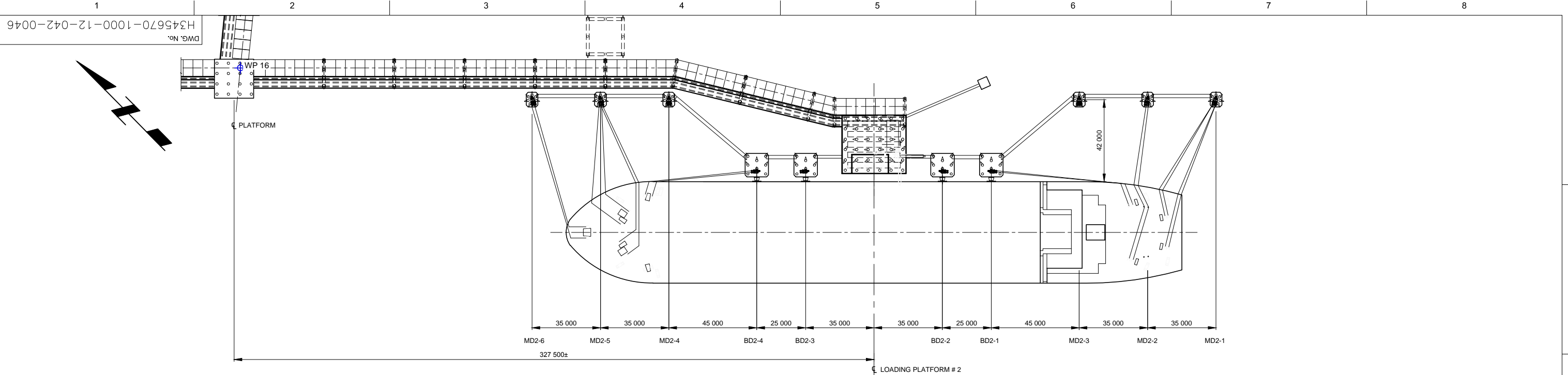
**TYPICAL BERTH SECTION**  
1:500

**NOTES:**  
1. FOR GENERAL NOTES SEE DWG. H345670-1000-12-014-0042.

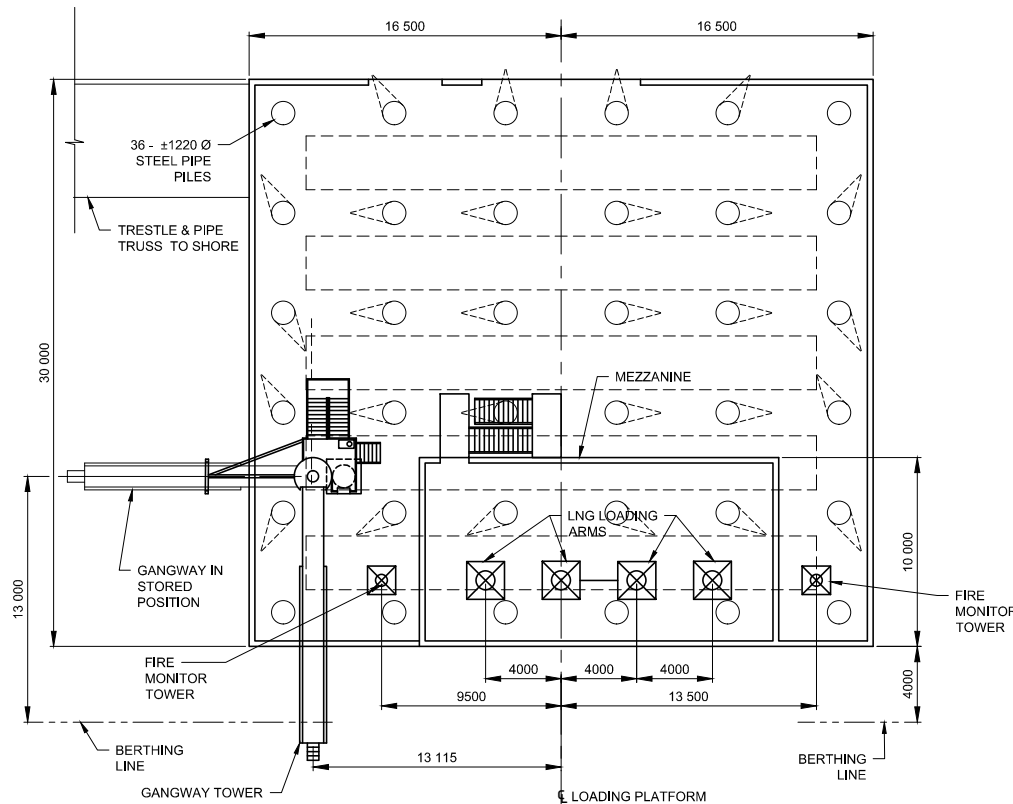
**PRELIMINARY  
NOT FOR CONSTRUCTION**

DRAWING No.		DRAWING TITLE		REGISTERED PROFESSIONAL		<small>THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF PACIFIC NORTHWEST LNG AND IS ISSUED PURSUANT TO AN AGREEMENT BETWEEN CLIENT AND HATCH LTD. (HATCH), UNLESS OTHERWISE AGREED IN WRITING WITH CLIENT OR SPECIFIED ON THIS DRAWING. (A) HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR MISUSE OF THIS DRAWING BY CLIENT, AND (B) THIS DRAWING IS CONFIDENTIAL AND ALL INTELLECTUAL PROPERTY RIGHTS EMBODIED OR REFERENCED IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.</small>							
1		2		3		4		DRAFTSPERSON A.S. BADESHA ASB DESIGNER T. MARTIN AGM CHECKER C. WONG CW DESIGN COORD. N. STEWART NS RESP. ENG. LEAD DISC. ENG. ENG. MANAGER PROJ. MANAGER H. WESTERMAN HW			PACIFIC NORTHWEST LNG LNG JETTY AND TRESTLE		
A		ISSUED FOR CLIENT REVIEW		No.		DESCRIPTION		SEPT 26/14 DATE			BERTH 1 PLAN AND SECTION		
DRAWING No.		DRAWING TITLE		REGISTERED PROFESSIONAL		REVISIONS		DRAWING APPROVAL STATUS:			SCALE AS NOTED OR AS NOTED DWG. No. H345670-1000-12-042-0045 REV A		
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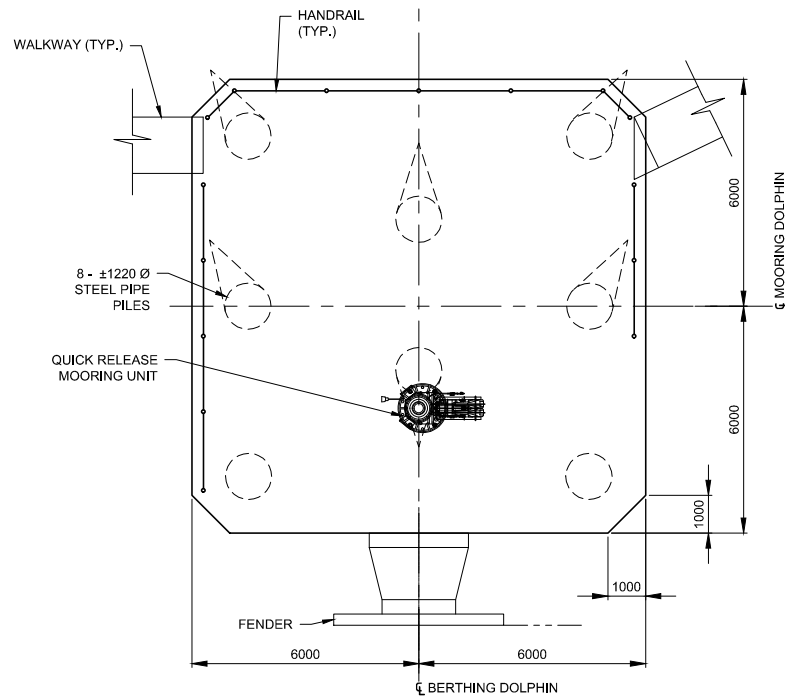
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 USER/NAME S  
 DATE S  
 FILE S



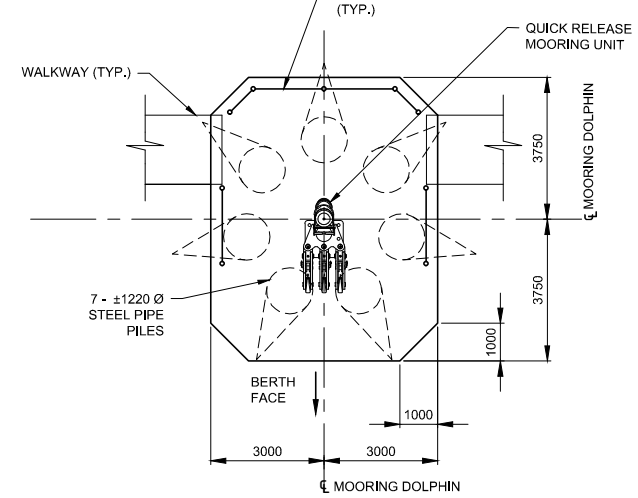
**BERTH 2 - PLAN**  
1:1000



**LOADING PLATFORM - PLAN**  
1:200



**TYPICAL BERTHING DOLPHIN - PLAN**  
(BD2-4 SHOWN, SIMILAR FOR BD1-1 TO BD1-4, BD2-1 TO BD2-4)  
1:100



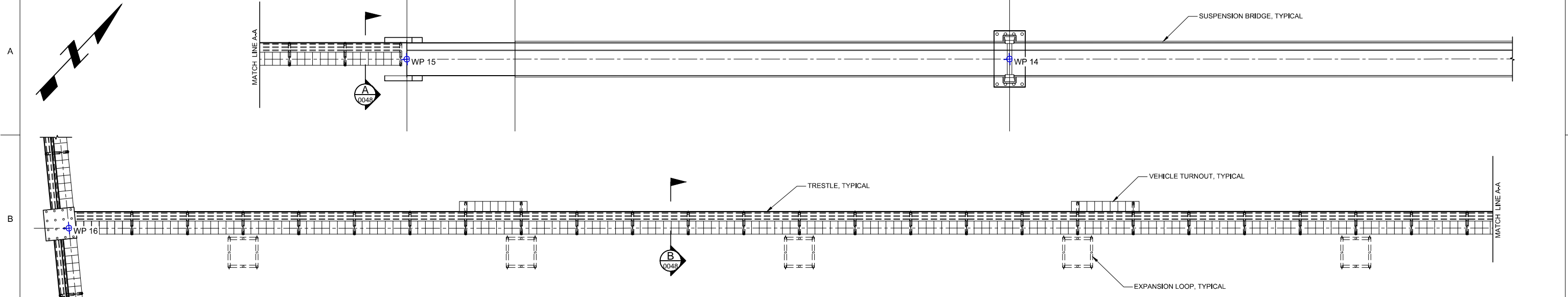
**TYPICAL MOORING DOLPHIN - PLAN**  
(MD2-2 SHOWN, SIMILAR FOR MD1-1 TO MD1-6, MD2-1 TO MD2-6)  
1:100

**NOTES:**  
1. FOR GENERAL NOTES SEE DWG. H345670-1000-12-014-0042.

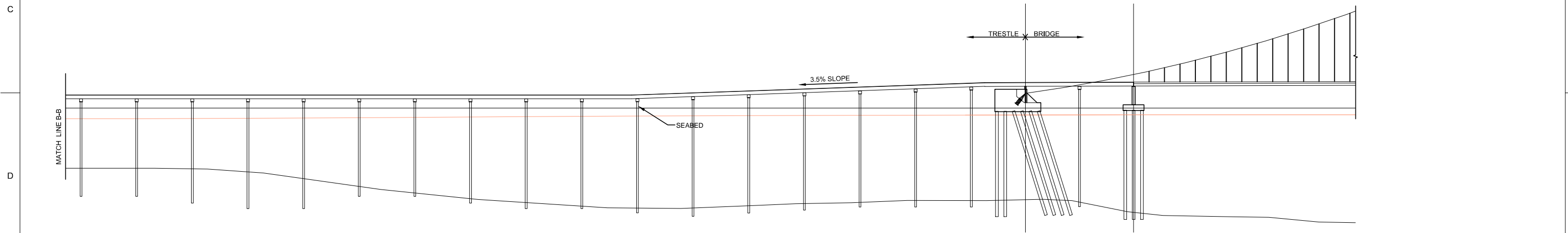
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A		ISSUED FOR CLIENT REVIEW		SEPT 26/14		DRAFTSPERSON: A. S. BADESHA DESIGNER: C. WONG CHECKER: T. MARTIN DESIGN COORD.: N. STEWART RESP. ENG.: LEAD DISC. ENG.: ENG. MANAGER: PROJ. MANAGER: H. WESTERMAN		ASB CW AGM NS HW		PACIFIC NORTHWEST LNG LNG JETTY AND TRESTLE	
1		2		3		4		5		6	
DRAWING No.		DRAWING TITLE		No.		DESCRIPTION		BY		CHK'D	
1		REFERENCE DRAWINGS		3		REVISIONS		6		7	
								DRAWING APPROVAL STATUS:		SCALE AS NOTED OR AS NOTED	
										DWG. No. H345670-1000-12-042-0046 BERTH 2 PLAN & DETAILS REV A	
1		2		3		4		5		6	

SUSANAMES STIMES  
SDATES SFILES



**TRESTLE PLAN**  
1:1250



**TRESTLE ELEVATION**  
1:1250

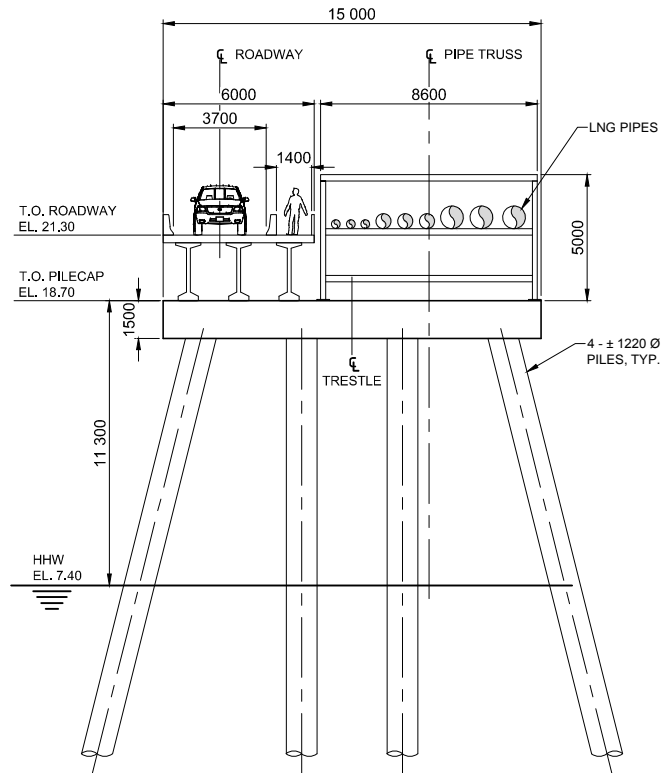
**NOTES:**  
1. FOR GENERAL NOTES SEE DWG. H345670-1000-12-014-0042.

**PRELIMINARY  
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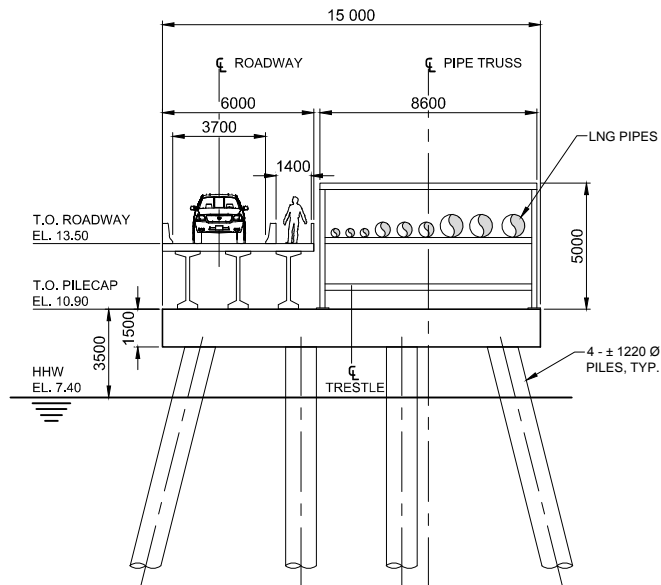
DRAWING No.		DRAWING TITLE		REGISTERED PROFESSIONAL		REVISIONS		BY		CHK'D		DATE		ROLE		NAME		SIGNATURE		DATE		SCALE		DWG. No.		REV	
1		REFERENCE DRAWINGS		3		4		5		6		7		8		HATCH		Pacific NorthWest LNG		PACIFIC NORTHWEST LNG LNG JETTY AND TRESTLE		1:2500 OR AS NOTED		H345670-1000-12-042-0047		A	
						A		ISSUED FOR CLIENT REVIEW				SEPT 26/14		DRAFTSPERSON		A. BADESHA		ASB									
														DESIGNER		T. MARTIN		AGM									
														CHECKER		C. WONG		CW									
														DESIGN COORD.		N. STEWART		NS									
														RESP. ENG.													
														LEAD DISC. ENG.													
														ENG. MANAGER													
														PROJ. MANAGER		H. WESTERMAN		HW									

STIMES  
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SECTION A  
1:150



SECTION B  
1:150

- NOTES:  
1. FOR GENERAL NOTES SEE DWG. H345670-1000-12-014-0042.

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DRAFTSPERSON	A. S. BADESHA	ASB	
DESIGNER	T. MARTIN	AGM	
CHECKER	C. WONG	CW	
DESIGN COORD.	N. STEWART	NS	
RESP. ENG.			
LEAD DISC. ENG.			
ENG. MANAGER			
PROJ. MANAGER	H. WESTERMAN	HW	

PACIFIC NORTHWEST LNG  
LNG JETTY AND TRESTLE

TRESTLE CROSS SECTIONS

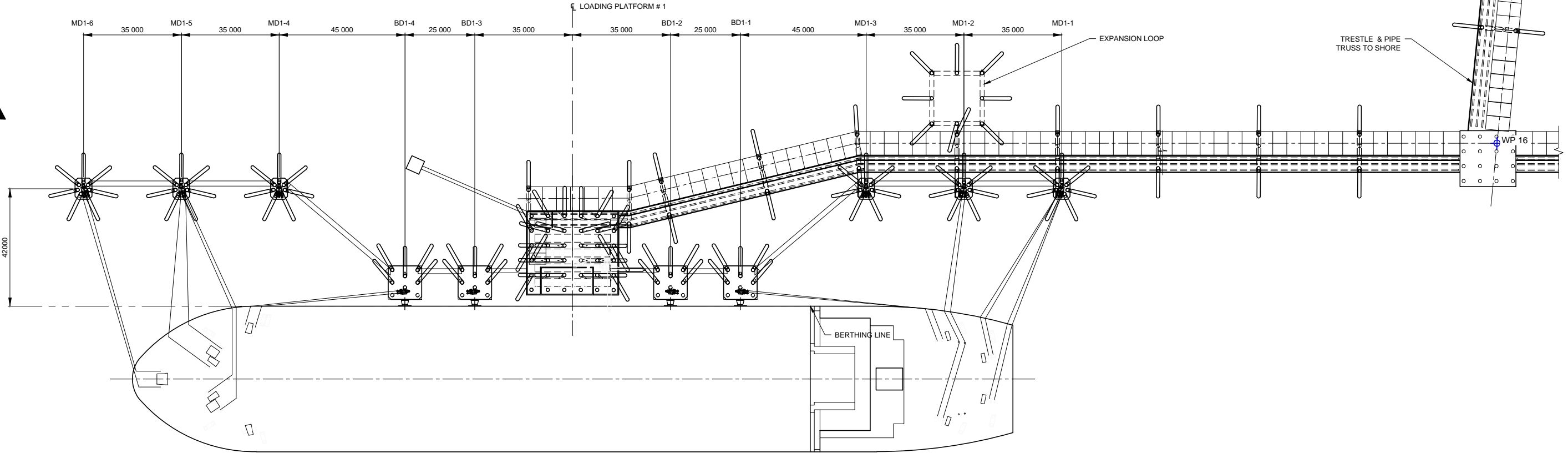
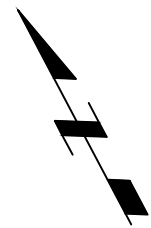
DRAWING No.	H345670-1000-12-042-0048
DRAWING TITLE	TRESTLE CROSS SECTIONS
REGISTERED PROFESSIONAL	
REFERENCE DRAWINGS	

No.	DESCRIPTION	BY	CHK'D	DATE
A	ISSUED FOR CLIENT REVIEW			SEPT 26/14

ROLE	NAME	SIGNATURE	DATE
DRAWING APPROVAL STATUS:			

SCALE	DWG. No.	REV
AS NOTED OR AS NOTED	H345670-1000-12-042-0048	A

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**BERTH 1 - PILE PLAN**  
1:750

- NOTES:**
- FOR GENERAL NOTES SEE DWG. H345670-1000-12-014-0042.

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DRAFTSPERSON	J.V. DOBRZANSKI	JVD
DESIGNER	C. WONG	CW
CHECKER	T. MARTIN	AGM
DESIGN COORD.	N. STEWART	NS
RESP. ENG.		
LEAD DISC. ENG.		
ENG. MANAGER		
PROJ. MANAGER	H. WESTERMAN	HW

PACIFIC NORTHWEST LNG  
LNG JETTY AND TRESTLE

BERTH 1  
PILE LOCATION - PLAN

SCALE  
1:750  
OR AS NOTED

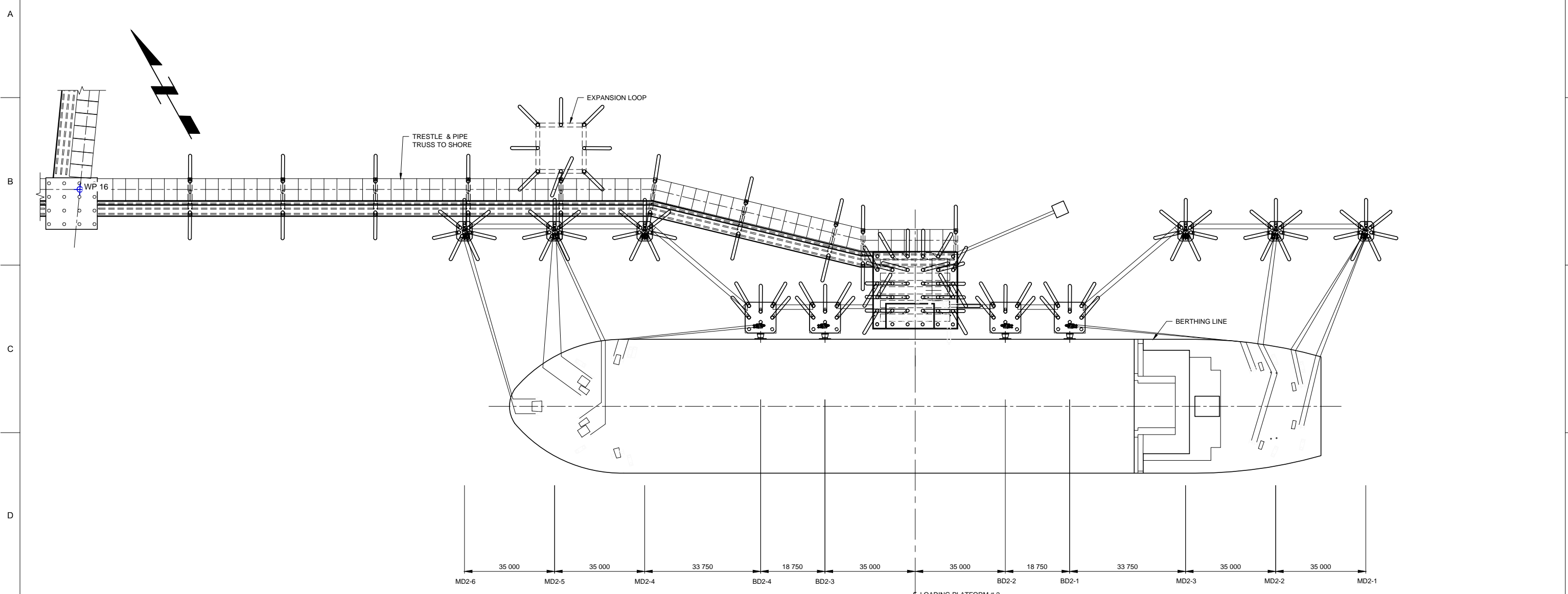
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DRAWING No.	1
DRAWING TITLE	REFERENCE DRAWINGS
REGISTERED PROFESSIONAL	

No.	DESCRIPTION	BY	CHK'D	DATE
A	ISSUED FOR CLIENT REVIEW			SEPT 26/14

DRAWING APPROVAL STATUS:			
ROLE	NAME	SIGNATURE	DATE



**BERTH 2 - PILE PLAN**  
1:750

- NOTES:**
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DRAFTSPERSON	A. S. BADESHA	ASB	
DESIGNER	C. WONG	CW	
CHECKER	T. MARTIN	AGM	
DESIGN COORD.	N. STEWART	NS	
RESP. ENG.			
LEAD DISC. ENG.			
ENG. MANAGER			
PROJ. MANAGER	H. WESTERMAN	HW	

PACIFIC NORTHWEST LNG  
LNG JETTY AND TRESTLE

BERTH 2  
PILE LOCATION - PLAN

DRAWING No.	DRAWING TITLE	REGISTERED PROFESSIONAL
1	REFERENCE DRAWINGS	

No.	DESCRIPTION	BY	CHK'D	DATE
A	ISSUED FOR CLIENT REVIEW			SEPT 26/14

DRAWING APPROVAL STATUS:			
ROLE	NAME	SIGNATURE	DATE

SCALE	DWG. No.	REV
1:750 OR AS NOTED	H345670-1000-12-042-0050	A

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