

**City Manager**  
Tom Moran

**Port Director**  
Joy Baker

**Harbormaster**  
Lucas Stotts



**Nome Port Commission**  
Jim West, Jr., Chairman  
Charlie Lean, Vice Chairman  
Doug Johnson  
*Vacancy – Seat G*  
*Vacancy – Seat A*  
Tony Cox  
*Vacancy – Seat D*

102 Division St. • P.O. Box 281  
Nome, Alaska 99762  
**(907) 443-6619**  
Fax (907) 443-5473

**AGENDA**  
**NOME PORT COMMISSION**  
**November 17, 2016**  
**REGULAR MEETING ~ 6:30 PM**  
**COUNCIL CHAMBERS**

- I. ROLL CALL**
- II. APPROVAL OF AGENDA**
  - *Vacancy – Seat D (Mark Johnson)*
- III. APPROVAL OF MINUTES**
  - 10.20.16 Regular Meeting (handout)
- IV. CITIZEN'S COMMENTS**
- V. COMMUNICATIONS**
  - Promise of the Arctic Agenda – Nov 2-3, 2016 Seattle Conference
  - USCG 11/2/16 presentation on IMO – Polar Code
  - NOAA 11/3/16 presentation on Charting/Surveys
- VI. CITY MANAGER REPORT**
  - 11.09.16 City Manager Report
- VII. HARBORMASTER REPORT**
  - Operations/Maintenance Update - Verbal
- VIII. PORT DIRECTOR REPORT/PROJECTS UPDATE**
  - 11.14.16 Port Director/Projects Status Report
    - Updated Historical Traffic Stats (at 2016)
    - Seawall Erosion Project – Elevation Report
- IX. OLD BUSINESS**
  - Dead Man Anchor Concepts Proposal for Services – PND Engineers
- X. NEW BUSINESS**
  -
- XI. CITIZEN'S COMMENTS**
- XII. COMMISSIONER COMMENTS**
- XIII. NEXT REGULAR MEETING**
  - December 15, 2016 - 5:30 pm
- XIV. ADJOURNMENT**

# The Evolution of Opportunity

November 2-3, 2016

Renaissance Seattle Hotel

THE PROMISE  
OF THE ARCTIC

HOME

AGENDA

SPEAKERS

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Alaska Division of Economic Development

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or (206) 284-8285

## Agenda

### DAY 1: WEDNESDAY, NOVEMBER 2

- 8:00am-9:00am **Continental Breakfast and Networking**
- 
- 9:00am-9:15am **Welcome**  
[Peter Philips](#), *Pacific Maritime Magazine*
- Opening Remarks**
- [RADM Mark Butt](#), US Coast Guard, Commander, Thirteenth Coast Guard District
- 
- 9:15am-10:30am **The US Legislative and Regulatory Climate: Impediments and Opportunities**  
Moderator: [Nils Andreassen](#), Institute of the North
- Marine Infrastructure Priorities**
- [Helen Brohl](#), Committee on the Marine Transportation System
- State-Federal Cooperation**
- [Craig Fleener](#), Office of the Governor, State of Alaska
- Arctic Commercial Fishing Considerations**
- [Mark Gleason](#), Washington Maritime Federation
- IMO Polar Code**
- [Capt. Ben Hawkins](#), US Coast Guard
- 
- 10:30am-11:00am **Coffee and Networking Break**
- 
- 11:00am-12:00pm **Workforce Development: Interstate Collaboration**  
Moderator: [John Hakala](#), US Dept. of Labor, Office of Apprenticeship
- [Sarah Scherer](#), Seattle Maritime Academy
  - [Brenda Pacarro](#), Calista Corporation
  - [Capt. Terry Federer](#), AVTEC-Alaska Maritime Training Center
- 
- 12:00pm-1:30pm **Lunch**

**The International Perspective**

- [Tero Vauraste](#), Arctia Ltd.

1:30pm-3:00pm

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**Partnering for Success:  
A Roadmap for Alaska and the Lower 48**

Moderator: [Peter Phillips](#), *Pacific Maritime Magazine*

- [Curtis Thayer](#), Alaska Chamber of Commerce
- [Joshua Berger](#), Washington State Dept. of Commerce
- [Representative Gael Tarleton](#), Washington State, 36th Legislative District
- [Senator Lesil McGuire](#), Alaska State Senate

3:00pm-3:30pm

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**Coffee and Networking Break**

3:30pm-4:30pm

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**Maritime Infrastructure:  
Economic and Strategic Drivers of Shoreside  
Infrastructure**

Moderator: [Matt Ganley](#), Bering Straits Native Corporation

- [Gary Watters](#), PND Engineers
- [Commissioner Marc Luiken](#), Alaska DOT & PF
- [Scott Pattison](#), Northwest Seaport Alliance

4:30pm-6:00pm

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**Reception**

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**DAY 2: THURSDAY, NOVEMBER 3**

8:00am-9:00am

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**Continental Breakfast and Networking**

9:00am-10:30am

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**Maritime Operations: Strategic Considerations**

Moderator: [Dermot Loughnane](#), Tactical Marine Solutions

- [Capt. David \(Duke\) Snider](#), Martech Polar Consulting
- [Mike Lauer](#), Foss Maritime
- [Johan Sperling](#) and [Bruce Harland](#), Crowley Marine Solutions

10:30am-11:00am

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**Coffee and Networking Break**

11:00am-12:00pm

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**Infrastructure Development and Maritime Support**

Moderator: [Craig Allen](#), University of Washington School of Law

**Mapping the Arctic**

- [Capt. Rick Brennan](#), NOAA

**Remote Energy and Effective Micro-grids**

- [George Roe](#), Alaska Center for Energy and Power

**Prevention Measures and Incident Response**

- [Paul Fuhs](#), Marine Exchange of Alaska & North Slope Port Authority

12:00pm-1:30pm

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**Lunch**

1:30pm-3:00pm

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**Opportunities for Adventure and Cultural Tourism**

Moderator: [Ethan Tyler](#), Alaska Division of Economic Development

- [Dennis McDonnell](#), Alaska Coach Tours

**The Crystal Serenity Experience**

- [Dermot Loughnane](#), Tactical Marine Solutions

3:00pm-3:30pm

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**Coffee and Networking Break**

3:30pm-4:30pm

---

**Capital Projects: The Way Ahead**

Moderator: [Michael Perkinson](#), Guggenheim Partners

- [Hugh Short](#), PT Capital
  - [John Springsteen](#), AIDEA
-



*The Promise of the Arctic:  
The Evolution of Opportunity*

*IMO's Polar Code –  
Strengths, Opportunities &  
Limitations*



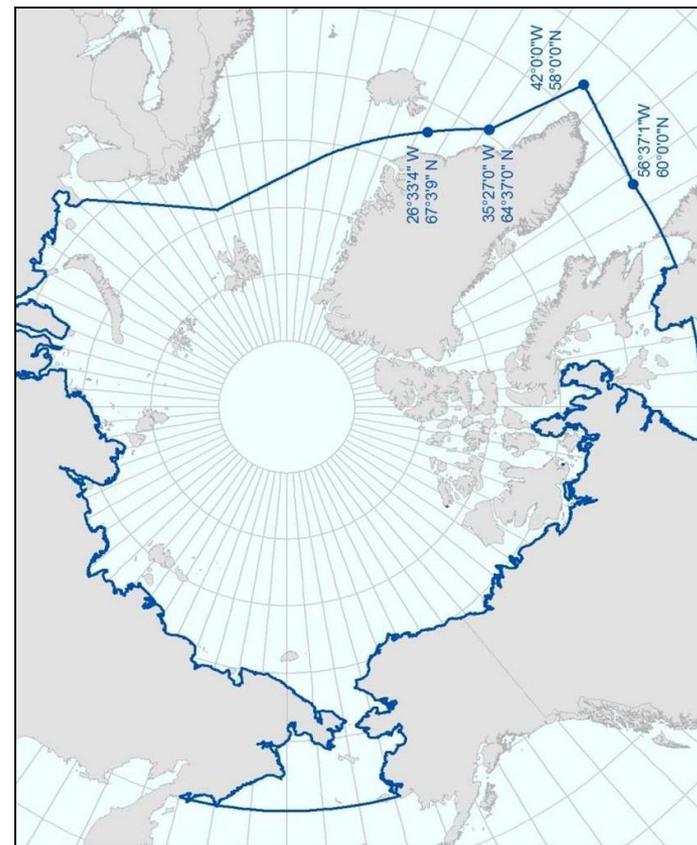
**U.S. Coast Guard  
CAPT Benjamin J. Hawkins  
Office of Design & Engineering Stds  
Commercial Regulations & Standards  
2 November 2016**



# Overview...



- International governance scheme
  - Amends existing international instruments under the IMO
- Two aspects
  - **Safety:** applies to cargo ships over 500 GT & passenger ships on international voyages in polar waters
  - **Environment:** applies to all ships in polar waters
- Adaptive, risk based code
- Complimented by training requirements



Arctic boundary



# ...Safety Aspects



## WHAT DOES THE POLAR CODE MEAN FOR SHIP SAFETY?

### EQUIPMENT



**WINDOWS ON BRIDGE**  
Means to clear melted ice, freezing rain, snow, mist, spray and condensation



**LIFEBOATS**  
All lifeboats to be partially or totally enclosed type



**CLOTHING I**  
Adequate thermal protection for all persons on board



**CLOTHING II**  
On passenger ships, an immersion suit or a thermal protective aid for each person on board



**ICE REMOVAL**  
Special equipment for ice removal: such as electrical and pneumatic devices, special tools such as axes or wooden clubs



**FIRE SAFETY**  
Extinguishing equipment able to operate in cold temperatures; protect from ice; suitable for persons wearing bulky and cumbersome cold weather gear



### OPERATIONS & MANNING



**NAVIGATION**  
Receive information about ice conditions

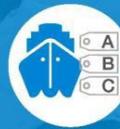


**CERTIFICATE & MANUAL**  
Required to have on board a Polar Ship Certificate and the ship's Polar Water Operational Manual



**TRAINING**  
Masters, chief mates and officers in charge of a navigational watch must have completed appropriate basic training (for open-water operations), and advanced training for other waters, including ice

### DESIGN & CONSTRUCTION



**SHIP CATEGORIES**  
Three categories of ship which may operate in Polar Waters, based on:  
A) medium first-year ice  
B) thin first-year ice  
C) open waters/ice conditions less severe than A and B



**MATERIALS**  
Ships intended to operate in low air temperature must be constructed with materials suitable for operation at the ships polar service temperature



**INTACT STABILITY**  
Sufficient stability in intact condition when subject to ice accretion and the stability calculations must take into account the icing allowance



**STRUCTURE**  
In ice strengthened ships, the structure of the ship must be able to resist both global and local structural loads

### BACKGROUND INFO

❄️ THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WAS ADOPTED NOVEMBER 2014 BY THE IMO MARITIME SAFETY COMMITTEE

❄️ IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS

❄️ THE AIM IS TO PROVIDE FOR SAFE SHIP OPERATION AND THE PROTECTION OF THE POLAR ENVIRONMENT BY ADDRESSING RISKS PRESENT IN POLAR WATERS AND NOT ADEQUATELY MITIGATED BY OTHER INSTRUMENTS



# ...Environmental Aspects

## HOW THE POLAR CODE PROTECTS THE ENVIRONMENT

### OIL



**DISCHARGES**  
Discharge into the sea of oil or oily mixtures from any ship is prohibited



**STRUCTURE**  
Double hull and double bottom required for all oil tankers, including those less than 5,000dwt (A/B ships constructed on or after 1 January 2017)



**HEAVY FUEL OIL**  
Heavy fuel oil is banned in the Antarctic (under MARPOL). Ships are encouraged not to use or carry heavy fuel oil in the Arctic



**LUBRICANTS**  
Consider using non-toxic biodegradable lubricants or water-based systems in lubricated components outside the underwater hull with direct seawater interfaces

### INVASIVE SPECIES



**INVASIVE AQUATIC SPECIES**  
Measures to be taken to minimize the risk of invasive aquatic species through ships' ballast water and biofouling

### SEWAGE



**DISCHARGES I**  
No discharge of sewage in polar waters allowed (except under specific circumstances)



**TREATMENT PLANTS**  
Discharge is permitted if ship has an approved sewage treatment plant, and discharges treated sewage as far as practicable from the nearest land, any fast ice, ice shelf, or areas of specified ice concentration



**DISCHARGES II**  
• Sewage not comminuted or disinfected can be discharged at a distance of more than 12nm from any ice shelf or fast ice  
• Comminuted and disinfected sewage can be discharged more than 3nm from any ice shelf or fast ice

### GARBAGE



**PLASTICS**  
All disposal of plastics prohibited (under MARPOL)



**FOOD WASTES I**  
Discharge of food wastes onto the ice is prohibited



**FOOD WASTES II**  
Food wastes which have been comminuted or ground (no greater than 25mm) can be discharged only when ship is not less than 12nm from the nearest land, nearest ice shelf, or nearest fast ice



**ANIMAL CARCASSES**  
Discharge of animal carcasses is prohibited



**CARGO RESIDUES**  
Cargo residues, cleaning agents or additives in hold washing water may only be discharged if: they are not harmful to the marine environment; both departure and destination ports are within Arctic waters; and there are no adequate reception facilities at those ports. The same requirements apply to Antarctic area under MARPOL

### BACKGROUND INFO

- THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WILL ENTER INTO FORCE ON 1 JANUARY 2017
- IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS: ADDITIONAL TO EXISTING MARPOL REQUIREMENTS
- IT PROVIDES FOR SAFE SHIP OPERATION AND PROTECTS THE ENVIRONMENT BY ADDRESSING THE UNIQUE RISKS PRESENT IN POLAR WATERS BUT NOT COVERED BY OTHER INSTRUMENTS

### DEFINITIONS



**SHIP CATEGORIES**  
Three categories of ship designed to operate in polar waters in:  
A) at least medium first-year ice  
B) at least thin first-year ice  
C) open waters/ice conditions less severe than A and B



**FAST ICE:** Sea ice which forms and remains fast along the coast, where it is attached to the shore, to an ice wall, to an ice front, between shoals or grounded icebergs



**ICE SHELF:** A floating ice sheet of considerable thickness showing 2 to 50m or more above sea-level, attached to the coast

### CHEMICALS



**DISCHARGES**  
Discharge of noxious liquid substances (NLS) or mixtures containing NLS is prohibited in polar waters



# Timeline



2002

Guidelines for ships operating in Arctic Ice-Covered Waters

2009

Guidelines for ships operating in Polar Waters

2015

IMO Adopts Polar Code

2017

Polar Code I-A begins Applying to existing ships



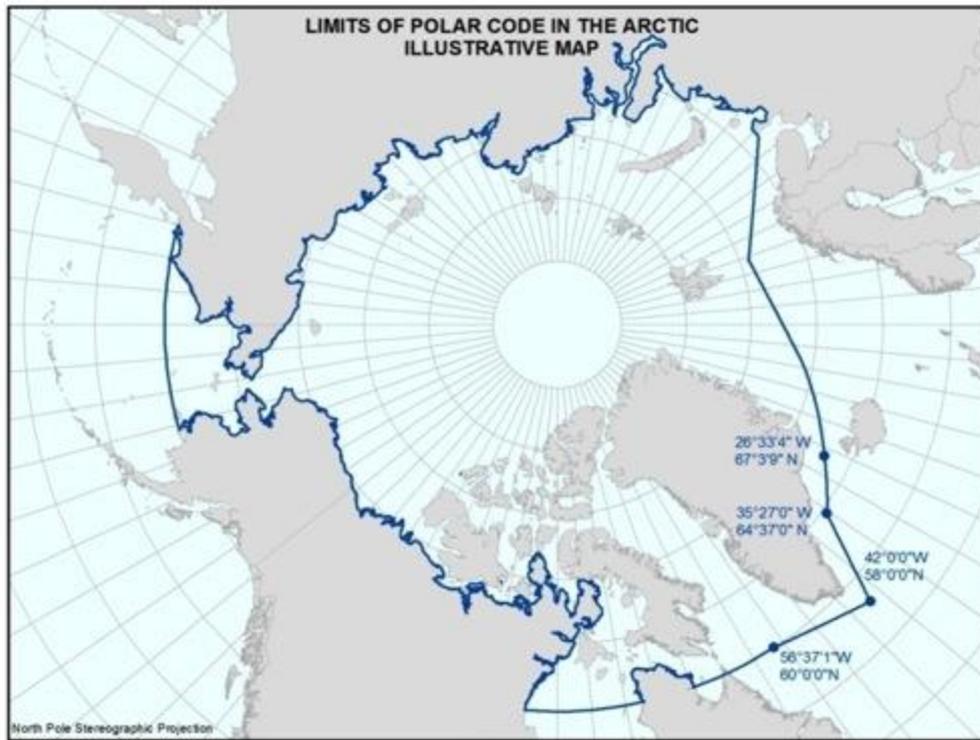
Polar Code Enters Into Effect

2018



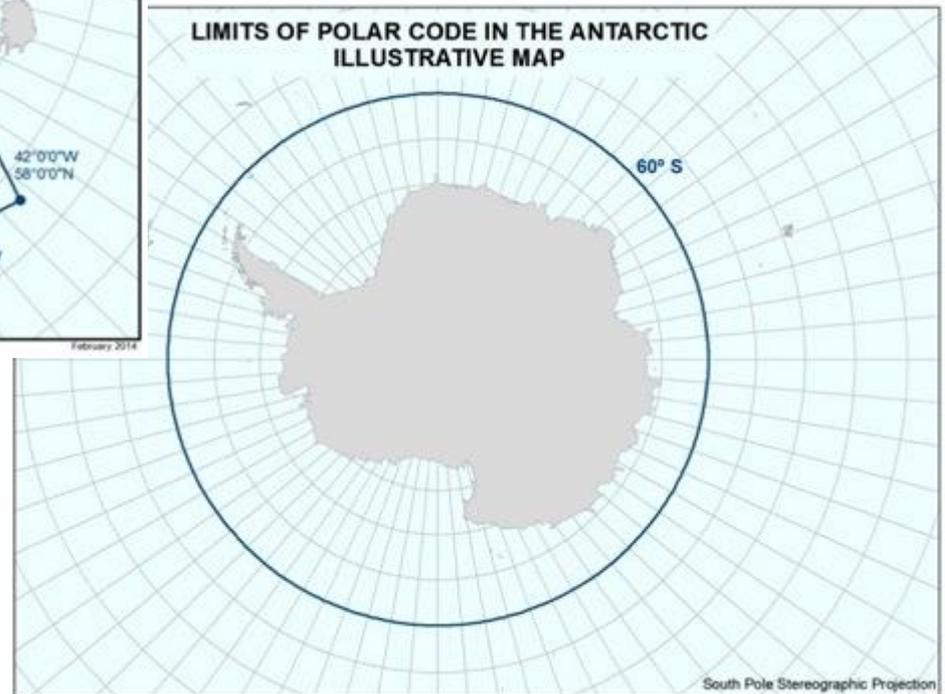


# One Code, Two Poles...



Office of Ocean and Polar Affairs

February 2014



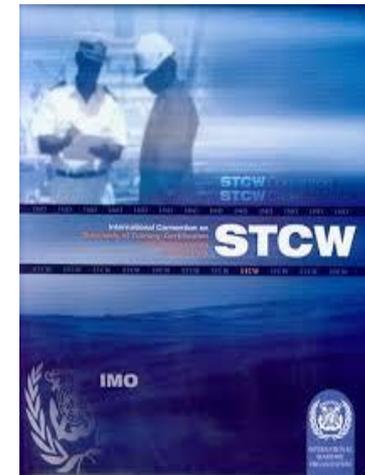
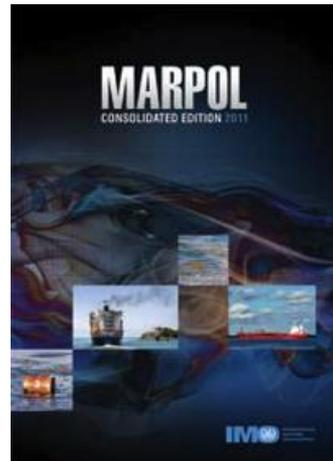
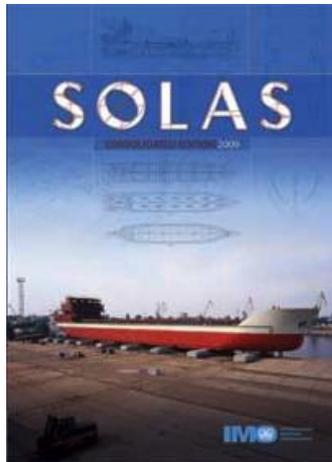
Office of Ocean and Polar Affairs

South Pole Stereographic Projection

February 2014



# ...Existing Instruments



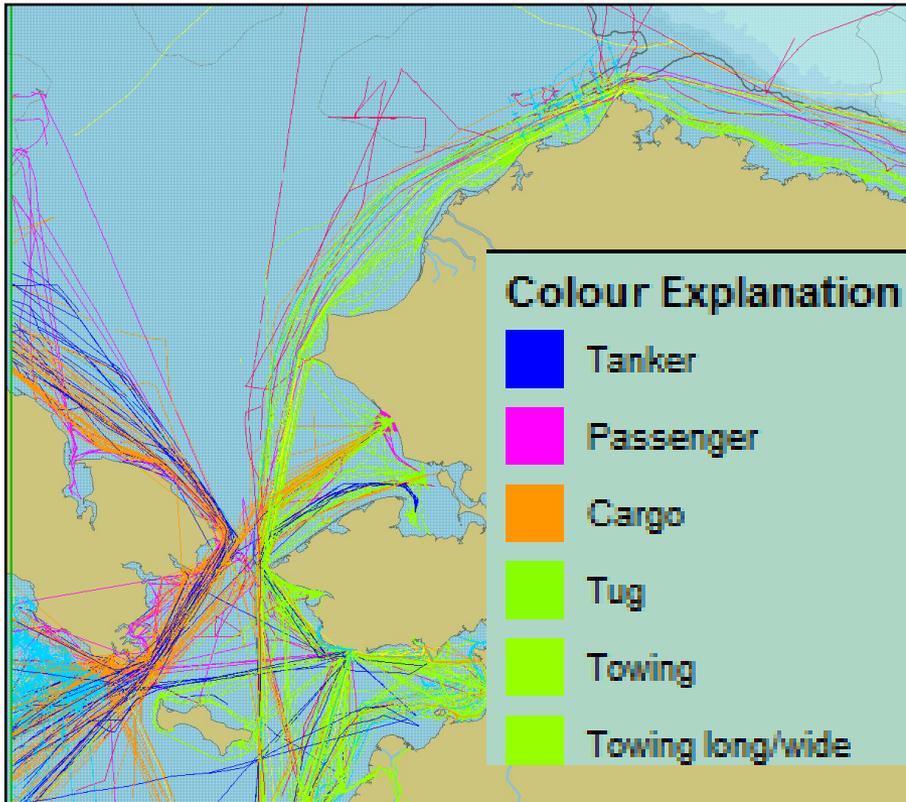


# Risk Based Standards

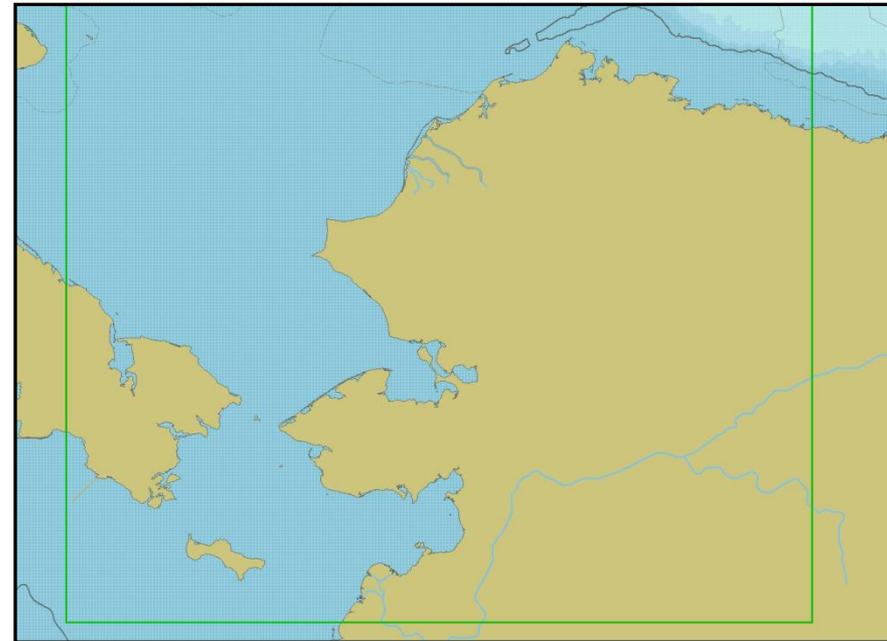


## Bering Strait Arctic Vessel Traffic

01 JUN to 30 NOV 2013



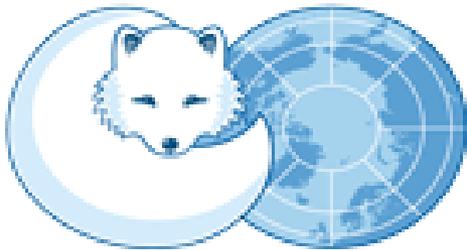
01 JAN to 31 MAY 2013



**AIS Data Courtesy of Marine Exchange of Alaska**



# International Cooperation



ARCTIC COUNCIL



INTERNATIONAL  
MARITIME  
ORGANIZATION





# Implementation



## Implementation

- Standard port state control & U.S. inspection regimes
- Regulatory Development
- Supporting National Policies

## Continued Development

- Polar Code Phase II
- Low Temperature Standards
- Unified Interpretations





# Opportunities Beyond the Code



- ✓ Uniform Ice-strengthening Standards
  - ❑ Further development within IACS
- ✓ Remoteness & High Latitude
  - ❑ MDA and Communications
- ✓ Rapidly Changing Severe Weather
  - ❑ Sensors and Forecasting
- ✓ Ice and Low Temperature
  - ❑ Ice Management and Forecasting
- ✓ Limited Charting
  - ❑ Surveys and Hydrography
- ✓ Environment & Indigenous Culture
  - ❑ IMO /Arctic Council Cooperation

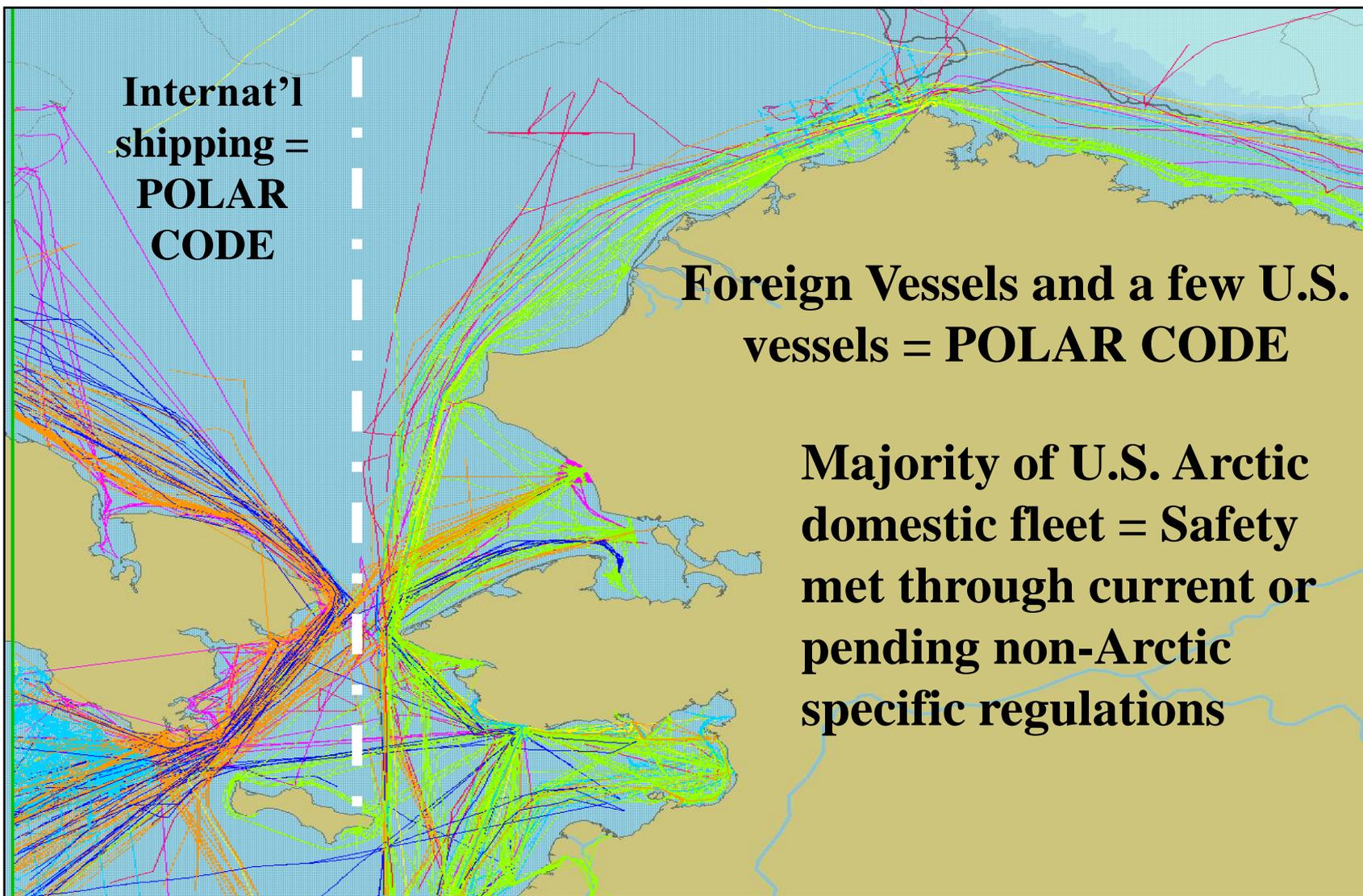




**U.S. Coast Guard**  
**CAPT Benjamin J. Hawkins**  
**Office of Design & Engineering Stds**  
**Commercial Regulations & Standards**  
**2 November 2016**



# Affected Vessel Populations



A wide-angle photograph of an Arctic sea ice environment. The water is a deep, clear blue, and the ice floes are white and translucent, with some showing greenish-brown algae. The ice floes are scattered across the water, with some large, irregular shapes in the foreground and middle ground. The sky is a pale, clear blue.

# U.S. Arctic Surveying & Nautical Charting Plan

November 2016

Office of Coast Survey



# Arctic Surveying

# Coast Survey defines the Arctic as the area above the ARPA Line

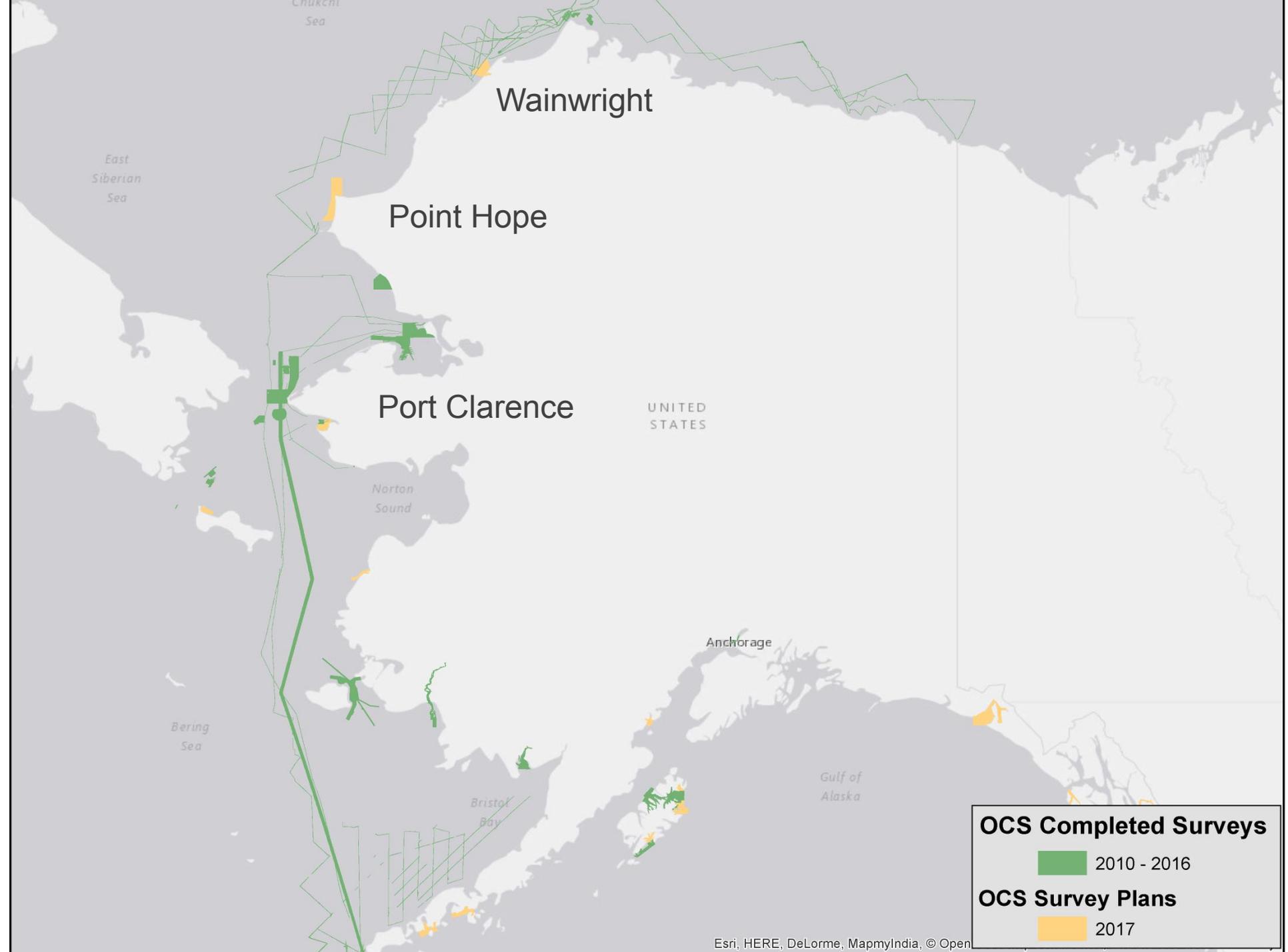


# Hydrographic Surveying Focus in the Arctic

1. Corridors, passages, ports, landings, harbors of refuge.
2. Emerging/changing usage patterns.
3. NOAA will seek to collaborate with other federal and state partners on all other areas.







# Arctic Nautical Charting

# U.S. Arctic Nautical Charting Plan



## U.S. Arctic Nautical Charting Plan

Supporting Sustainable Marine  
Transportation in Arctic Alaska

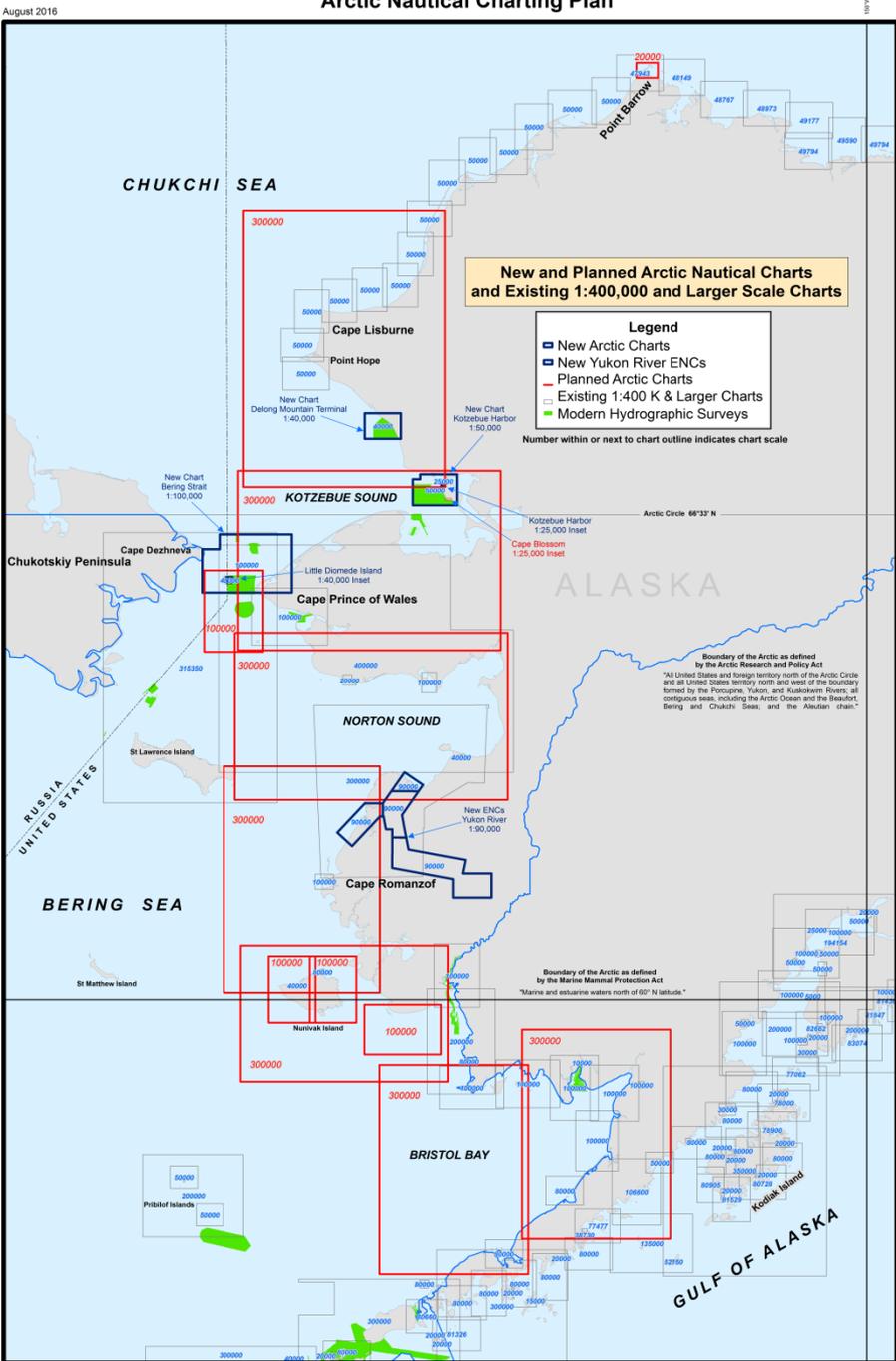
Office of Coast Survey  
Marine Chart Division

August 10, 2016



- Information about new and planned chart coverage in U.S. Arctic waters
  - Raster (paper) charts
  - Electronic Navigational Charts (ENC)
- First published in 2011
- Third and latest update, Aug 2016

[http://www.nauticalcharts.noaa.gov/mcd/docs/Arctic\\_Nautical\\_Charting\\_Plan.pdf](http://www.nauticalcharts.noaa.gov/mcd/docs/Arctic_Nautical_Charting_Plan.pdf)



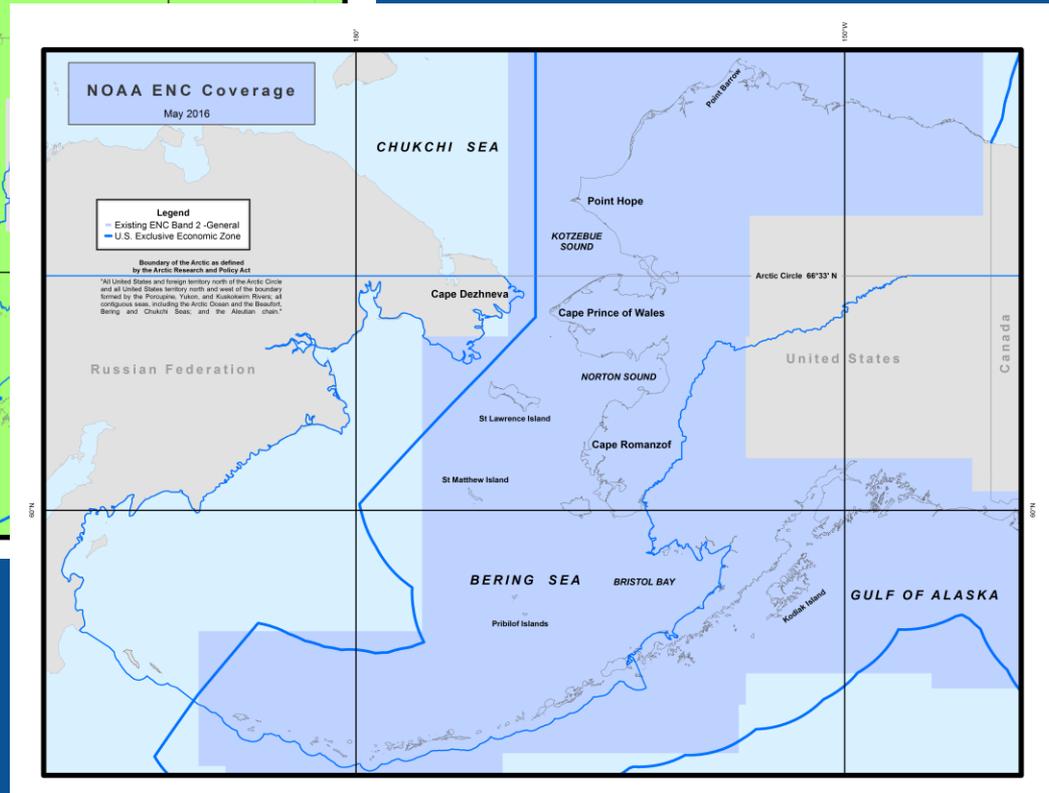
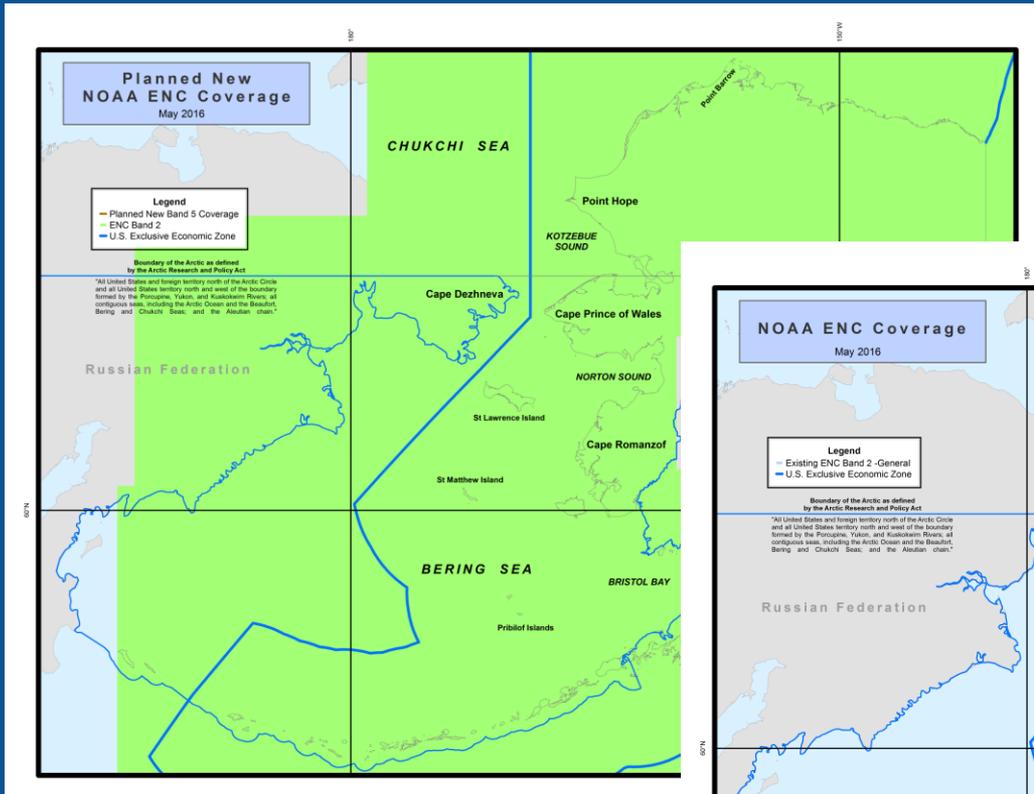
# Planned new chart coverage

- 15 new charts planned
  - *Outlined in red*
- 3 already published
  - *Outlined in blue*
  - Delong Mtn Terminal
  - Kotzebue Harbor
  - Bering Strait, North
- 3 Yukon River ENCs
  - *Outlined in blue*
  - Prototype use of Satellite Derived Bathymetry

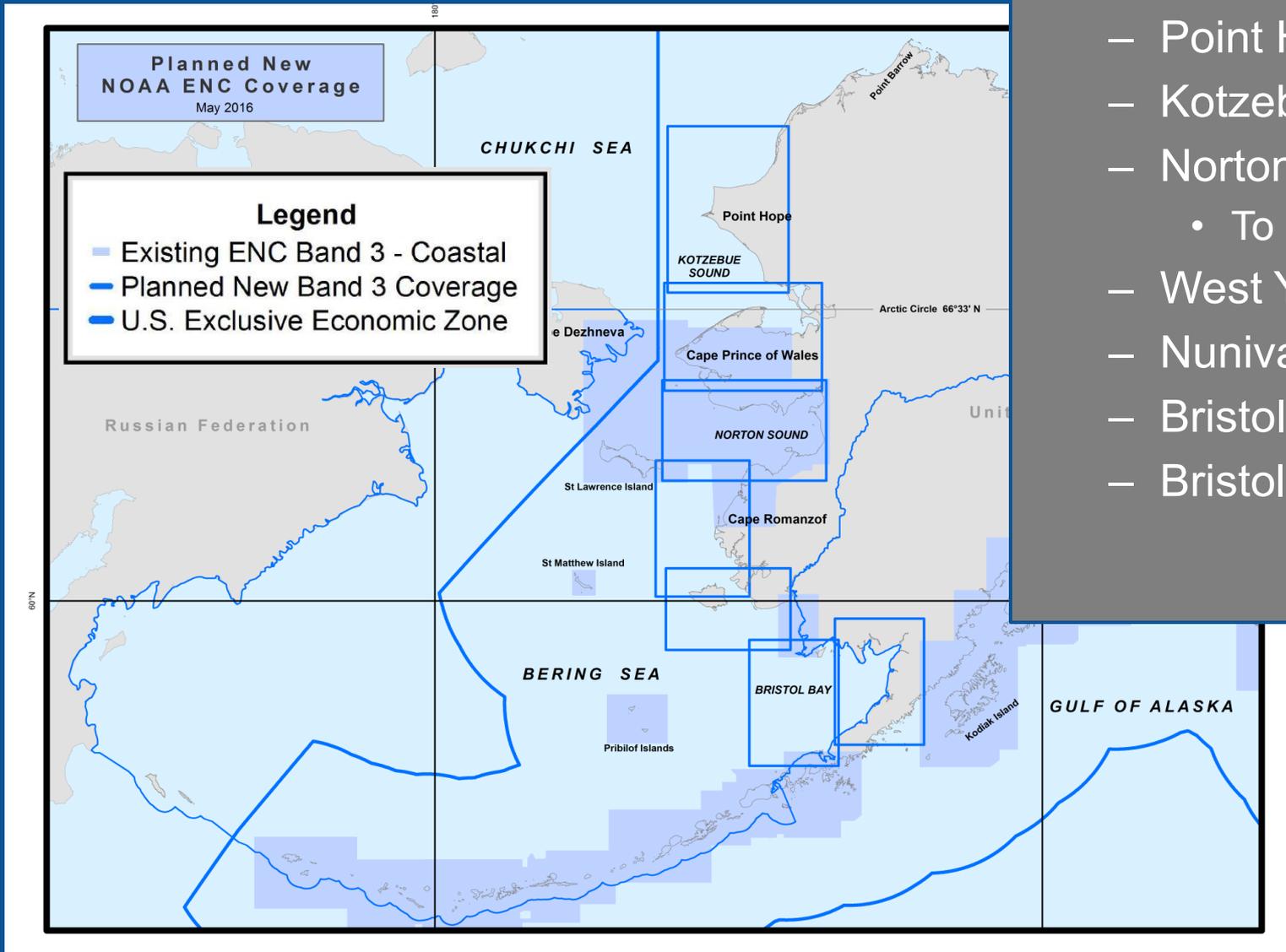


Number	Usage Band Name	Scale Range
1	Overview	Smaller than 1:1.5M
2	General	> 1:600K to 1:1.5M
3	Coastal	> 1:150K to 1:600K
4	Approach	> 1:50K to 1:150K
5	Harbor	> 1:5K to 1:50K
6	Berthing	Larger than 1:5K

# ENC Band 1 & 2 Coverage (complete)

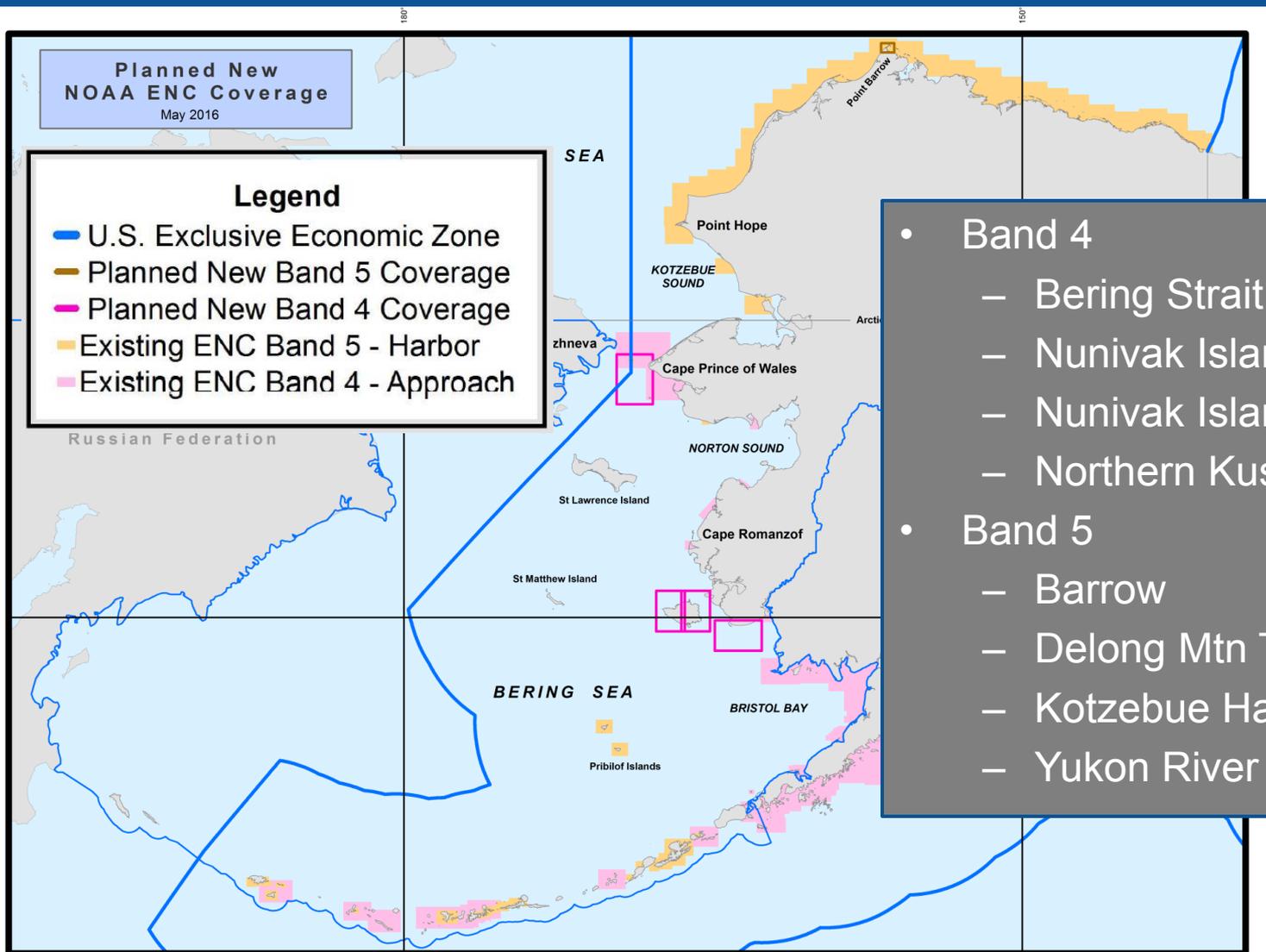


# ENC Band 3 Coverage



- New 1:300K ENC's
  - Point Hope
  - Kotzebue Sound
  - Norton Sound
    - To replace 1:400K
  - West Yukon Delta
  - Nunivak Island
  - Bristol Bay, West
  - Bristol Bay, East

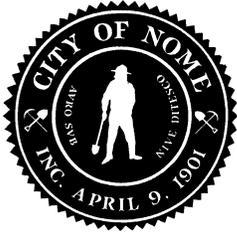
# ENC Band 4 & 5 Coverage



- Band 4
  - Bering Strait
  - Nunivak Island, W
  - Nunivak Island, E
  - Northern Kuskokwim Bay
- Band 5
  - Barrow
  - Delong Mtn Terminal
  - Kotzebue Harbor
  - Yukon River

# Final Thoughts

- We rely on user feed back. Are these the right priorities?
- We can't do this alone.
- Evaluating many forms of technology to gain efficiencies:
  - SDB
  - SAR
  - Unmanned systems (marine and aerial)



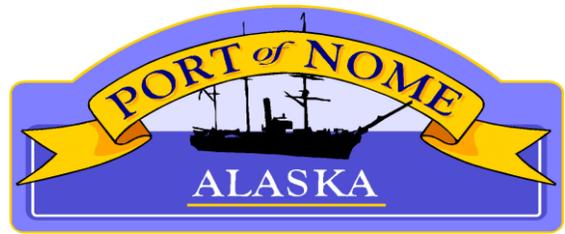
**CITY OF NOME**  
City Manager's Office  
P.O. Box 281  
Nome, Alaska 99762  
907.443.6600  
tmoran@nomealaska.org

## City Manager's Report

**From:** Tom Moran, City Manager  
**Reporting Period:** October 13 – November 9, 2016

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- Fall Clean-Up Week was held from October 10<sup>th</sup> – 15<sup>th</sup>. My thanks go out to Candace Weidler for organizing, the Clerk's Office for coordinating, and Public Works for executing. Spring Clean-Up (the next clean-up event) will be held in May.
- A fall search for missing resident Joseph Balderas, coordinated by NVFD, went from October 17<sup>th</sup> until the 19<sup>th</sup>. It included twelve (12) hours of volunteer foot and ATV patrols, plus six (6) hours of air support from Bering Air, and six (6) hours of ground support from two scent dogs/handlers from Wasilla. My thanks also go out to the multiple volunteers, including employees Preston Stotts and Seiji Heck.
- What an incredible weekend of events we had for the Grand Opening of the Richard Foster Building on October 29<sup>th</sup> and 30<sup>th</sup>. A true team effort from a huge number of individuals.
- Congressman Don Young was in town to campaign on October 31<sup>st</sup> and November 1<sup>st</sup>. Mayor Beneville and I spent a great deal of time with him, advocating for Nome's various needs and wants.
- Thanks to the entire Finance Department for their work to ensure that our FY16 financial audit went off without a hitch from October 31<sup>st</sup> until November 4<sup>th</sup>. Thanks to all other Department Heads for their patience during this incredibly busy time.
- As you all now know, there was a run-off election for Councilman Culley's seat on Tuesday, November 1<sup>st</sup>. Congratulations to challenger Mark Johnson, who was certified as the winner on November 3<sup>rd</sup>.
- Big things are happening with the cemetery, and there are a number of people to thank for that, especially Joe Horton, Chip Leeper, Dana Handeland, and Bryant Hammond. It's shocking to see what disarray it was in before this summer's push to improve it.
- City Clerk Bryant Hammond, Deputy City Clerk Jill Nederhood, Finance Director Liew, Mayor Beneville, Councilman Green, Councilman Johnson, and I will all be attending the Alaska Municipal League Conference next week.
- Congratulations to Cordell Murray (Janitor/Laborer) for being selected as the City's Employee-of-the-Month for the month of October. Keep up the good work, Cordell!



# Memo

To: Tom Moran – City Manager  
From: Joy L. Baker – Port Director  
CC: Mayor & Nome Common Council  
Nome Port Commission  
Date: 11/14/2016  
Re: Port & Harbor Report/Projects Update –November 2016

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The following provides a status update on active issues and projects pertaining to the Port & Harbor.

**Administrative:**

The 2016 Port & Harbor season has essentially wrapped up, with the exception of one anticipated call by UAF's Sikuliaq later this month on their final 2016 southbound voyage. Dock occupancy at the Port averaged 70% over the entire season with statistics showing overall docked traffic up 6% and anchored traffic up 227% from 2015 data.

Docking permits for the home-ported harbor fleet reached 125 for the 2016 season, covering fishing, sailing, research, and some cargo/fuel vessels on long layovers. F17 revenue at September 30 shows we have achieved 68.1% of forecasted revenue – with just 23.5% expended budget.

I attended the Promise of the Arctic Conference in Seattle on Nov 2-3, 2016, taking part in a variety of general discussions about infrastructure development, regulatory/legislative impact, economic and P3 opportunities, strategic considerations and expanding interstate collaboration between Alaska and the Pacific Northwest. This was another great networking opportunity to further demonstrate Nome's strategic location in the Arctic.

**Causeway:**

Arctic Deep Draft Port Study: Although various discussions at the local, state and federal levels continue, the project study awaits the reconciliation and conferencing of the Water Resources Development Act of 2016 legislation that passed the Senate and the House. We anticipate action on WRDA as well as the revised NDAA language to occur before the end of the year.

Middle Dock: Contractor change order pricing has been received on the concrete ramp extension, and is currently being evaluated by staff and administration for compliance with available grants. Once compliance with funding sources has been verified, the change order plans and costs will be presented to the Port Commission for review then submitted to Council for authorization for awarding the additional work (anticipated for June 2017).

**Inner Harbor:**

Nothing new to report

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**Port Industrial Pad:**Port Pad Development:

Final plans and specs on the river dredging and fill plans are anticipated in early December, then incorporated into a bid package for release in late December or early January.

Port Road Improvements: Another request has been submitted to ADOT in Fairbanks for a status update on this project and a revised cost-share agreement. (*Construction is scheduled for FY2018, based on STIP funding*).

West Nome Tank Farm (WNTF): A status request has been submitted to the USAF on progress made on the environmental stipulations, as well as updated property transfer timeline.

---

**External Facilities:**

Seawall Erosion Repair: The as-built drawings have been received from PND, along with the attached report reviewing elevation changes over time. This will provide a base line for monitoring the structure for the future and will be provided to the USACE for the historical record.

Cape Nome:

The Cape Nome Jetty Repair Project has shut down operations for winter, after sorting/stockpiling 24% of the A Rock and 47% of the B Rock specified for the project, and completing the required hydrographic survey work. Total material quantities are required to be stockpiled by June 30, 2017, with rock placement anticipated to follow through project completion. The City is awaiting receipt of FEMA's revised Project Worksheet 17, which will facilitate the additional scope and funds for Additive Alternates 3 and 4 that cover the 2017 rock placement.

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*Additional information on any of these projects is available upon request.*

# PORT OF NOME

## Vessel Calls By Season

Historical traffic review underway winter 2016/17

NOME PORT SEASON	BULK CARGO & FUEL		GRAVEL & EQUIP. BARGES	HARBOR DOCKING PERMITS		MISC. VESSELS @	CRUISE SHIPS	GOVT SHIPS	TOTAL DOCK CALLS	ANCHORED AT ROADSTEAD
2016 to 10/31	210		100	120		305	5	11	751 <i>partial</i>	369
2015	186	#	157	130	***	208	3	25	709 +	163
2014	180	#	68	154	***	75	6	15	498 +	45
2013	173	#	60	159	***	87	6	11	496 +	59
2012	159	#	33	179	***	62	2	9	444 +	61
2011	112	#	37	86	***	31	2	3	271 +	30
2010	83	#	76	60	***	67	2	8	296 +	49
2009	104	#	95	57	***	37	5	3	301 +	53
2008	91	#	51	52	***	31	4	5	234 +	27
2007	84	#	31	46	***	12	3	8	184 +	12
2006	89	#	15	44	***	6	3	5	162 +	
2005	78	#	21	37	***	13	3	3	155 +	
2004	88	#	32	28	***	5	4	7	164 +	
2003	65	#	25	65	***	4	5	6	170 +	
2002	79	#	61	55	***	26	8	8	237 +	
2001	53	#	34	43	***	13	1	2	146 +	
2000	54	#	38	26	***	40	0	2	160 +	
1999	62	#	40	25	***	30	0	1	158 +	
1998	42	#	60	19	***	18	4	2	145 +	
1997	51	#	32	23	***	20	2	1	129 +	
1996	19	*	30	43	***	43	4	0	139 +	
1995	22	*	24	45	***	36	3	0	130 +	
1994	35	*	24	41	***	23	2	3	128 +	
1993	56		18	0		32	4	0	110 +	
1992	67		20	0		21	1	2	111 +	
1991	18	**	14	0		14	2	1	49 +	
1990	18	**	5	0		10	0	1	34 +	

The total dockings number indicates how many vessels called at the port during the season, but does not depict how many days each vessel stayed. Vessels typically stay 2 to 3 days. Occasionally, a vessel may stay in port for up to 7 days or more due to weather, operational scheduling, or to layup for repairs.

"AT ROADSTEAD" indicates vessels that anchored off harbor entrance due to draft restrictions, weather, or waiting in queue. This number is not included as part of "TOTAL DOCKINGS" and counts the vessel call, not the number of days a vessel waits

@ increase in Misc vessels denotes surge in research vessel traffic working Arctic waters.

Increase in permits in 2012/2013 due to increased number of offshore gold dredges.

Increase in calls in 2008 due to oil exploration in the Chukchi Sea and a rise in gravel/rock exports.

Increase in calls in 2002 due to rise in gravel/rock exports.

# Increased quantity represents more vessels hauling village freight & gravel through 2010, and project equipment 2011-2013

+ Denotes closed season

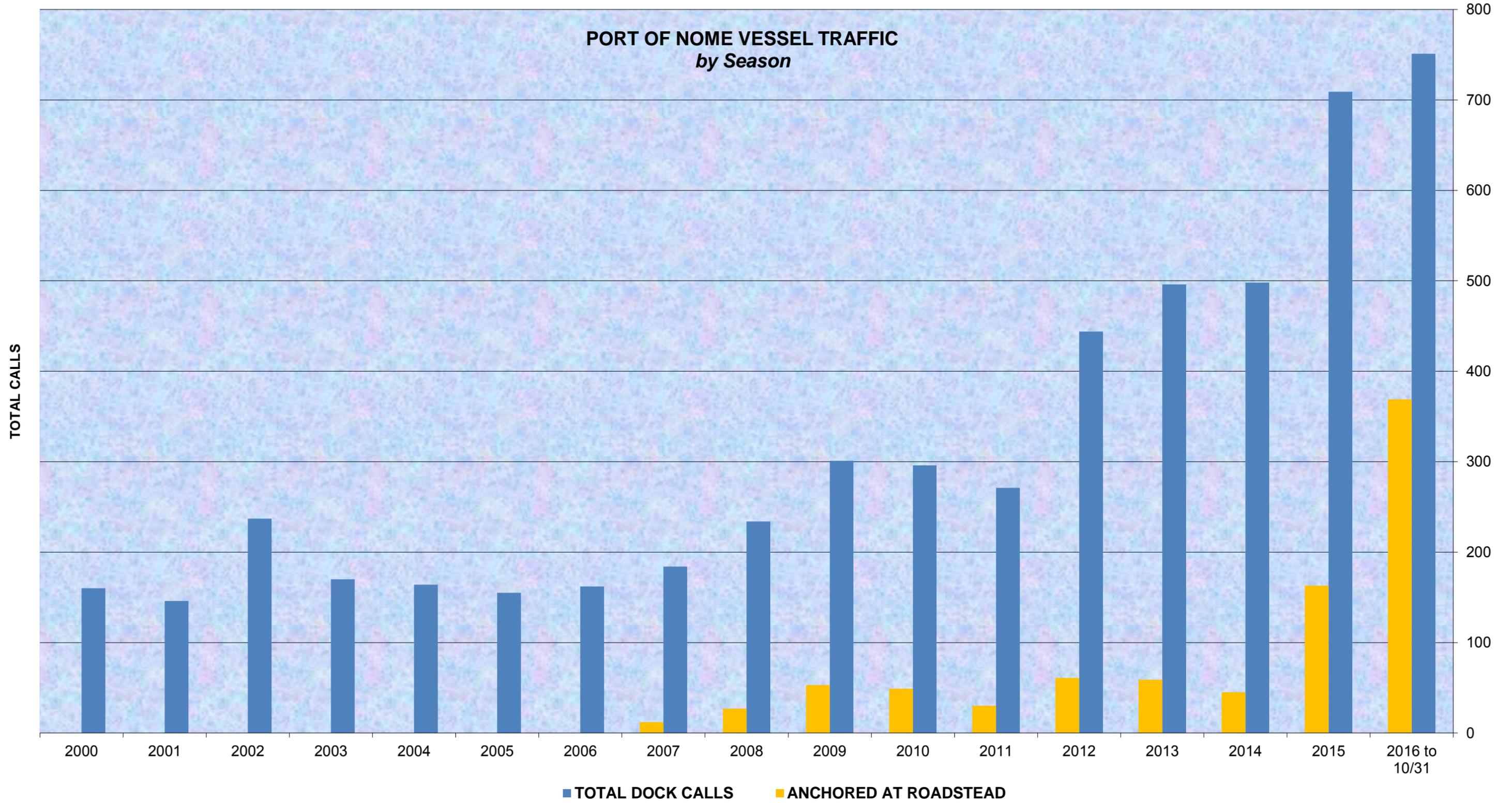
\* Village cargo barges issued docking permits for these seasons.

\*\* Village barges not tracked these seasons, just linehaul.

\*\*\* Total docking permits issued each season for home-ported vessels working out of the Small Boat Harbor consisting mostly of a small fleet of fishing vessels/suction dredges, with occasional sailboat or small tug/barge until 2012 dredge increase. Numbers reflect only how many vessels received permits, not how many calls they made.)

Note: CMS village barges were counted in 1992 & 1993 each time they docked to load for next trip.

# PORT OF NOME VESSEL TRAFFIC *by Season*





ENGINEERS, INC.

Ms. Joy Baker  
Harbormaster  
P.O. Box 281  
Nome, AK 99762

November 11, 2016

Subject: Nome Front Street Seawall Elevation Changes

PND #131043

Dear Ms. Baker:

At your request we have prepared the following letter report regarding the Nome Front Street Seawall elevation. The following will describe what we know about: the original Seawall construction, the geology and geotechnical aspects of the site, wear of the revetment, surveys and visual perceptions of the Seawall.

#### Seawall Construction

The Seawall was designed by the CORPS and constructed between 1949 and 1952. See figure 1 for the design cross section. As you can see the revetment was designed as a pass through revetment with a core of shot rock and a layer of 5-7 ton armor stone on both the fore slope and back slope of the revetment. When subjected to large storms the waves would approach and pass through the outer layer of rock, through the core and then overtopping the crest and then spilling out over the back slope. According to the design generally the shore side grade would slope towards the revetment back slope allowing any water to drain into the core material. Unfortunately we have not been able to find much additional detail or as-built plans of the original revetment. Other than the reference to +18' (with unknown datum) on the cross section we do not know at what elevation the Seawall was actually built.

#### Geologic and Geotechnical background

The material that the Seawall was built on is primarily sands with non-plastic silts and sands with gravels (placed over the last Holocene Epoch of 10,000 YBP), which is over older glacial till over marine sediments, which is over bedrock at a nominal depth of about 40 feet below MLLW.

These near surface sands have been reported to be *medium* to *dense* with high friction angles, are considered only moderately compressible, which means that they provide an excellent foundation of the Seawall. The glacial till and marine deposits appear to be *dense* with higher blow counts. These older Pleistocene (1.4 Million YBP) soils would be expected to be even stronger than the more recent nearer surface sand materials evidenced by the higher blow count data of soils logs in the area.

Glaciation from potentially 8 different glacial advances within the Pleistocene and Holocene Epochs appear to have over-consolidated the soils under the Seawall. What this means is that the soil previously carried a heavier load (in the form of glaciers) on the soil in the past than what it currently has to carry. Consolidation tests indicate that the near surface sand had a pre-consolidation pressure or load of at least 2000 pounds per square foot, which would equate to about 18 feet of vertical soil height higher than the upland natural grade. The near shore and off shore areas that have been recently eroded appear to have the same soil characteristics.

The effect of this is that these soils would not normally be expected to measurably settle if an additional load is applied. The weight of the Seawall or the weight of the fill behind the Seawall is relatively small compared to the weight of a glacier and so the Seawall would not be expected to settle from settling foundation subsurface soils.

#### Exposure and Wear of the Revetment

Over time revetments can lose core material and there will be natural consolidation of the core material that can cause settlement of the revetment Seawall crest. If this were to occur you would expect some variability in the settlement along the length of the Seawall. The Front Street Seawall was constructed in the early 1950's and was exposed fairly consistently until the construction of the Causeway in 1985 which sheltered the Seawall from the west. This sheltering is of course more pronounced on the west end of the Seawall. Also the CORPS has been directing beach nourishment from the harbor dredging project since 2009 which subsequently has further protected the western end of the Seawall.

In 2016 there was a length of about 850 feet of Seawall on the east end that was strengthened by adding toe stones and in-filling or rock near the toe of wall. This was initiated because of the degradation of armor stones, particularly near the toe of the revetment and there may have been some loss of core material that could cause some settlement. The elevation along the crest is primarily +18 feet MLLW with small variations. There are some small areas at +19 feet and one 250 foot section on the west end and a 50 foot section at the east end that are at +17 feet. So after 65 years of service there is about 10% of the Seawall that is about a foot lower than the mean elevation of the Seawall. This would indicate to us that the wall is actually performing fairly well.

#### Surveys

We have looked back through the available survey data for the Seawall from a number of surveys. Unfortunately the survey information available for the site has some uncertainty. The Nome vertical datum's adopted over time has been varied and changing depending on the agency. The normal 19 year epoch vertical datum defined by NOAA are not necessarily the standard anymore. The CORPS appear to have changed their published vertical datum 3 times over the last 20 years. ADOT uses completely different vertical datum yet.

These datum's do change over time and will change as the surface responds to changes in tectonics, glacial rebound, new spheroid models of the earth are used and as other adjustments are made. In some places like Kodiak these cumulative changes can amount to feet. In Nome the datum changes we have observed in are on the order of tenths of a foot.

In 2006 Bristol Environmental and Engineering prepared a study and summary of four then recent 2000 to 2005 surveys. See Figure 1. This overlay shows fairly good consistency of the surveys and consistency along the length of the Seawall. Most of the surveys appear to be spot checks of the Seawall crest. Unfortunately the survey notes are not available and the datum used are different, using both NAD27 and local coordinate grids.

All of this points out some variability in the surveys: likely changing datum's which likely is in the tenths of a foot, and how the rock may have been surveyed which could vary by 2 to 3 feet but in practice appears to be less than a foot for the surveys on the Seawall.

### Perception

One thing that may make it appear that the revetment is sinking could be perspective. Much of the shore side grades appears to have been built up over time to the revetment crest elevation. A number of properties have been filled right up to the backside of the revetment and even paved right up to the rock in some locations. I can recall when I lived in Nome in 1985 on the east end of Front Street that the grades were somewhat below the revetment crest. I have been trying to find photographic evidence that substantiates this but with the limits of time I have been unable to locate them.

Further the perspective of the water side of the Seawall revetment has changed substantially over the years, particularly since the CORPS started beach re-nourishment in 2009. A 1997 PND topographic survey shows a consistent narrow beach east of the breach. The effect of this is that on the water side the grades are now well above the toe elevation. On the west end much of the revetment is now covered by sand. On the east end you can walk along the sandy beach which is now several feet above the toe of the revetment.

What these separate effects may do is give people the impression that the Seawall has sunk when in reality the ground they are standing on is now higher than what it used to be. See photos 1 through 4 below. In 1985 I could not walk the beach on the east end of the Seawall. Now with the beach elevation being much higher you can on the west end walk along the beach with your head height near the crest of the breakwater. On the land side it also appears that some of the grades have been raised over time. See also the attached 2013 Seawall survey photos.

### Conclusions

In summary, from the evidence gathered: it does not appear that the subsurface soils settled significantly as the soils were already dense and pre-consolidated, that the Seawall crest elevation is still fairly consistent along the length of the Seawall after 65 years indicating that

loss of core rock and/or core settlement would be considered very minor, that the vertical survey data does not have more precision than about a foot and that the crest elevation is within that range of survey precision along the length of the Seawall. It would appear that the perception of the Seawall sinking may be attributable to a perception of change. Because the adjacent grades are higher they may make the appearance of the Seawall as if it were settling over time.

As an aside there maybe unintended consequences to filling both sides of the revetment. Where the grades on the shore side are higher the backflow of overtopping waves may be more of a problem and there could be more erosion. On the water side the combination of storm surge and large waves on a sand beach with a small exposed upper revetment may provide less energy absorption during the initial part of the storm. This may be worth looking into or querying the CORPS about.

Thank you for this opportunity to assist with this matter. Please contact either myself or Bryan Hudson if anything is unclear.

Sincerely,  
PND Engineers, Inc. | Anchorage Office



Garth Howlett, P.E.  
Principal

Encl:

PND 2013 Seawall survey photos Appendix A1  
Bristol Environmental and Engineering 2006 Elevation Comparison  
PND 2015 Seawall Design Drawings  
Orion 2016 As-built Survey

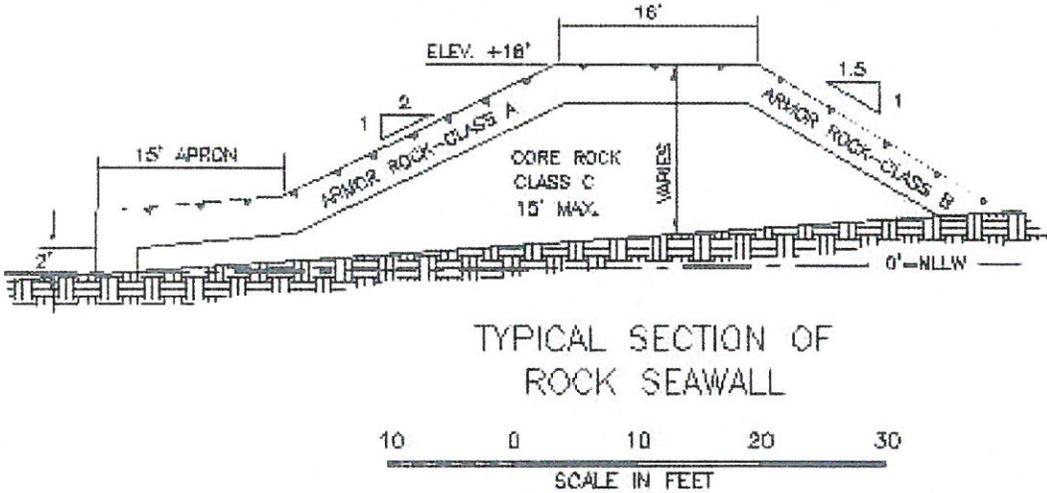


Figure 1 – 1949 CORPS Nome Seawall design cross section



Photo 1 – 1903 Nome Beach



Photo 2 – Nome Harbor and Seawall – June 1955. Note narrow starved beach on the east side of the breach. Note wide beach west side of the breach as the result of littoral processes.

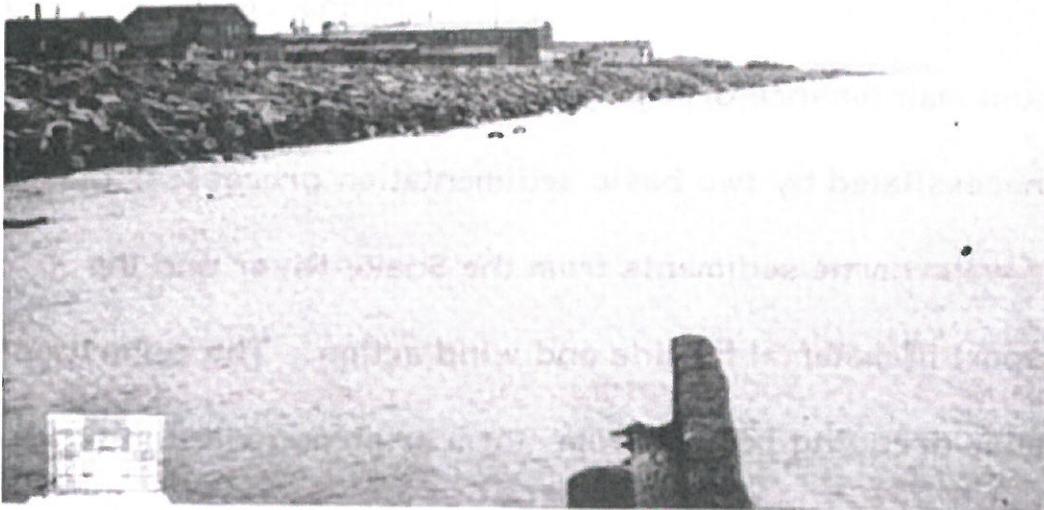


Photo 3 – 1955 view of Seawall to the east of the harbor entrance channel.



Photo 4 – 2016 east end of the Seawall



Photo 5 – 2015 west end of Seawall



View westward



View eastward

Grid A Beginning of New Seawall (NIC)



View westward



View eastward

Grid B New Seawall (NIC)



View westward



View eastward

Grid C Seawall



View westward



View eastward

Grid D Seawall



View westward



View eastward

Grid E Seawall



View westward

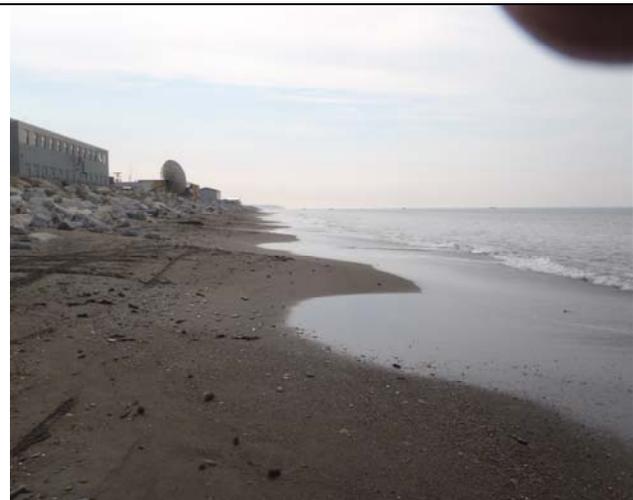


View eastward

Grid F Seawall



View westward



View eastward

Grid G Seawall



View westward



View eastward

Grid I Seawall  
Grid H photographs missing



View westward



View eastward

Grid J Seawall



View westward



View eastward

Grid K Seawall



View westward



View eastward

Grid L Seawall



View westward

View eastward missing

Grid M Seawall



View westward



View eastward

Grid N Seawall



View westward



View eastward

Grid O Seawall

Photographs of specific irregularities in the most critical seawall segment: 23+15 to 29+80



Rounded corners



Rounded corners



Exposed core rock, rounded edges



Missing armor—exposed core rock, rounded edges



Rounded edges



Oversteepened slope—core rock missing from 2:1 grade, rounded edges



Missing section of toe, rounded edges



Rounded stones, Missing armor stones



Missing Toe Rock, edges rounded



Missing Toe Rock



Missing toe rock, rounded corners



Missing armor stones near crest and at toe, rounded corners



Missing core rock on 2:1 constructed slope, missing toe stones, rounded stone in foreground



Wide angle of previous



Open gaps at toe



Missing armor units near toe



Exposed core rock at culvert

Drawing: I:\24051\_ENGINEERING\_TERM\_CONTRACT\_ADMIN\CAD-DESIGN\303\_SEAWALL\DWG-24051\_SEAWALL1.DWG - Layout: SURVEY SEAWALL  
 User: SKIDDER Mar 23, 2006 - 2:08pm Xrefs: BR\_11X17L.DWG - Images: NC\_LOW.TIF



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- ⊗ BEESC SURVEY POINT
- CE2 SURVEY POINT
- JJ SURVEY POINT
- ⊕ TWA SURVEY POINT

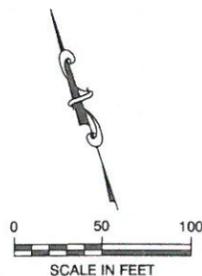
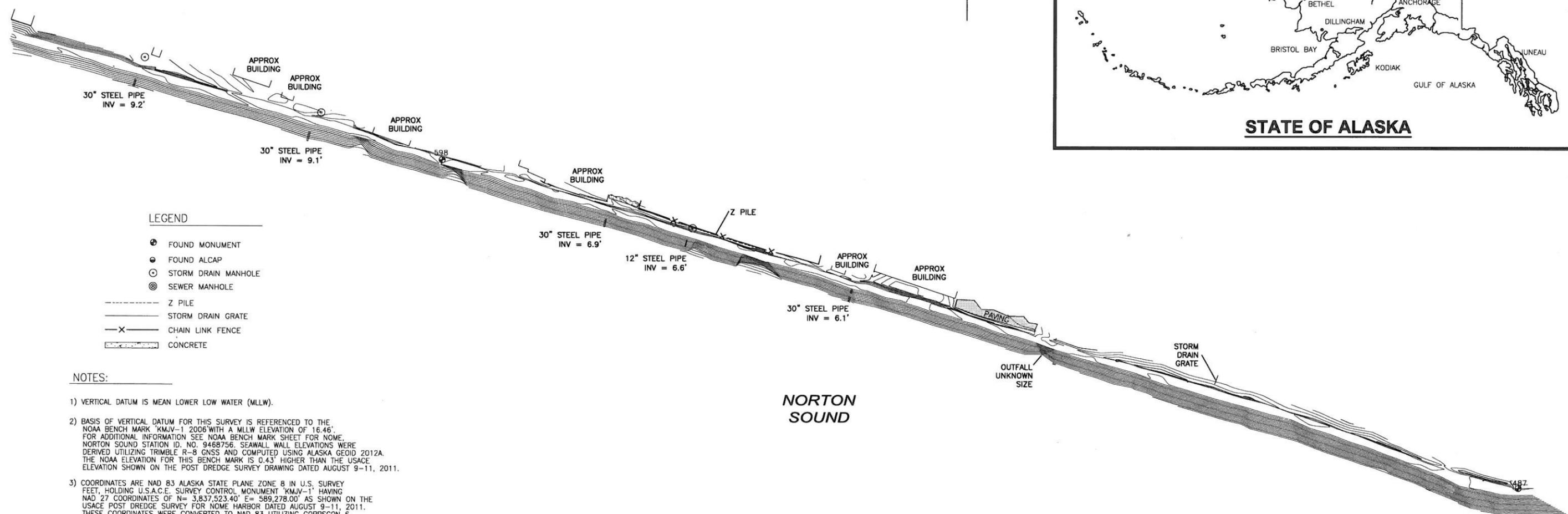
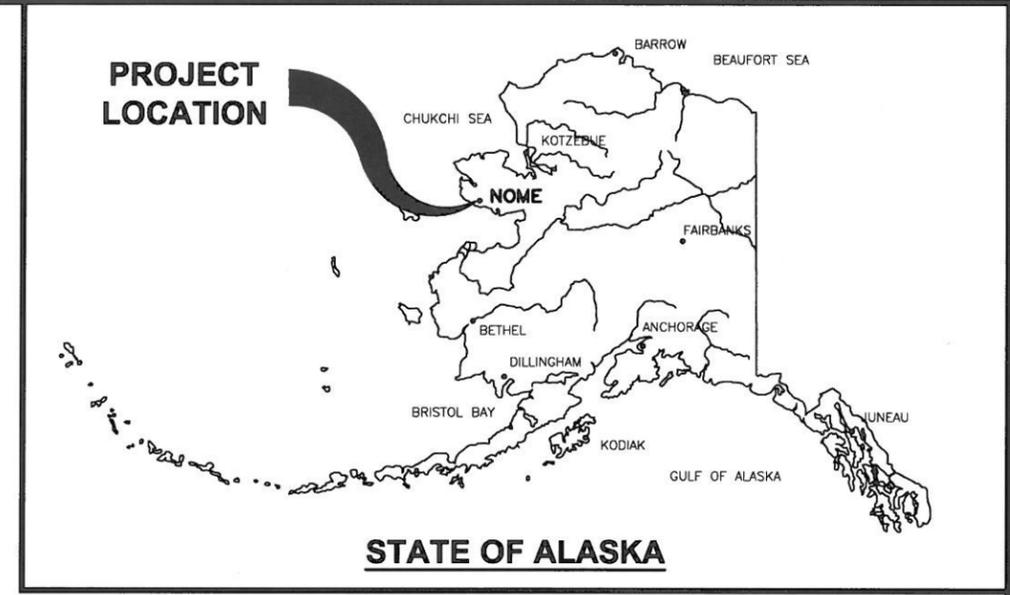


FIGURE 1  
 NOME, ALASKA  
 ROCK REVETMENT SEAWALL  
 ELEVATION COMPARISON

**Bristol**  
 ENVIRONMENTAL & ENGINEERING  
 SERVICES CORPORATION  
 Phone (907) 563-0013 Fax (907) 563-6713  
 Project No.24051

DATUM:	DATE	03/10/06	SHEET
NAD 83	DWN.	SLK	1
PROJECTION:	SCALE	SHOWN	of
ASP ZONE 8	APPRVD.	JV	1

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**LEGEND**

- ⊙ FOUND MONUMENT
- ⊙ FOUND ALCAP
- ⊙ STORM DRAIN MANHOLE
- ⊙ SEWER MANHOLE
- Z PILE
- STORM DRAIN GRATE
- X- CHAIN LINK FENCE
- ▭ CONCRETE

**NOTES:**

- 1) VERTICAL DATUM IS MEAN LOWER LOW WATER (MLLW).
- 2) BASIS OF VERTICAL DATUM FOR THIS SURVEY IS REFERENCED TO THE NOAA BENCH MARK 'KMJV-1 2006' WITH A MLLW ELEVATION OF 16.46'. FOR ADDITIONAL INFORMATION SEE NOAA BENCH MARK SHEET FOR NOME, NORTON SOUND STATION ID. NO. 9468756. SEAWALL WALL ELEVATIONS WERE DERIVED UTILIZING TRIMBLE R-8 GNSS AND COMPUTED USING ALASKA GEOID 2012A. THE NOAA ELEVATION FOR THIS BENCH MARK IS 0.43' HIGHER THAN THE USACE ELEVATION SHOWN ON THE POST DREDGE SURVEY DRAWING DATED AUGUST 9-11, 2011.
- 3) COORDINATES ARE NAD 83 ALASKA STATE PLANE ZONE 8 IN U.S. SURVEY FEET, HOLDING U.S.A.C.E. SURVEY CONTROL MONUMENT 'KMJV-1' HAVING NAD 27 COORDINATES OF N= 3,837,523.40' E= 589,278.00' AS SHOWN ON THE USACE POST DREDGE SURVEY FOR NOME HARBOR DATED AUGUST 9-11, 2011. THESE COORDINATES WERE CONVERTED TO NAD 83 UTILIZING CORPSCON 6. HOLDING THE NAD 83 VALUES FOR THIS MONUMENT THE RTK DERIVED VALUES FOR USACE MONUMENT 'NH-2 2007' DIFFER 1.25' FROM THE CONVERTED COORDINATES FROM THE POST DREDGE SURVEY.
- 4) CONTOURS ARE IN FEET, WITH ONE FOOT INTERVALS.
- 5) FIELD SURVEY PERFORMED JUNE 24 & 25, 2013.

**PROJECT CONTROL**  
NAD 83 ALASKA STATE PLANE ZONE 8 COORDINATES

COORDINATE TABLE				
PT#	NORTHING	EASTING	ELEVATION	DESCRIPTOR
9	3837166.996	1729286.599	16.46	COE MON KMJV-1, NOAA ELEV
101	3838270.606	1731838.407	12.51	COE MON NH-2, RTK VALUE

PROJECT CONTROL POINTS, LOCATED ON THE NOME CAUSEWAY AND THE INNER HARBOR AREA ARE NOT SHOWN ON THE SEAWALL DRAWING.

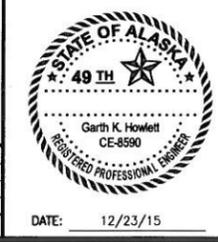
**SHEET INDEX**

1. SURVEY CONTROL, NOTES, AND SHEET INDEX
2. OVERVIEW
3. PLAN 1 OF 4
4. PLAN 2 OF 4
5. PLAN 3 OF 4
6. PLAN 4 OF 4
7. SECTIONS AND QUANTITIES

**ISSUED FOR BID**  
12/23/2015

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1	12/10/15	BID ADDENDUM #1
REV	DATE	DESCRIPTION

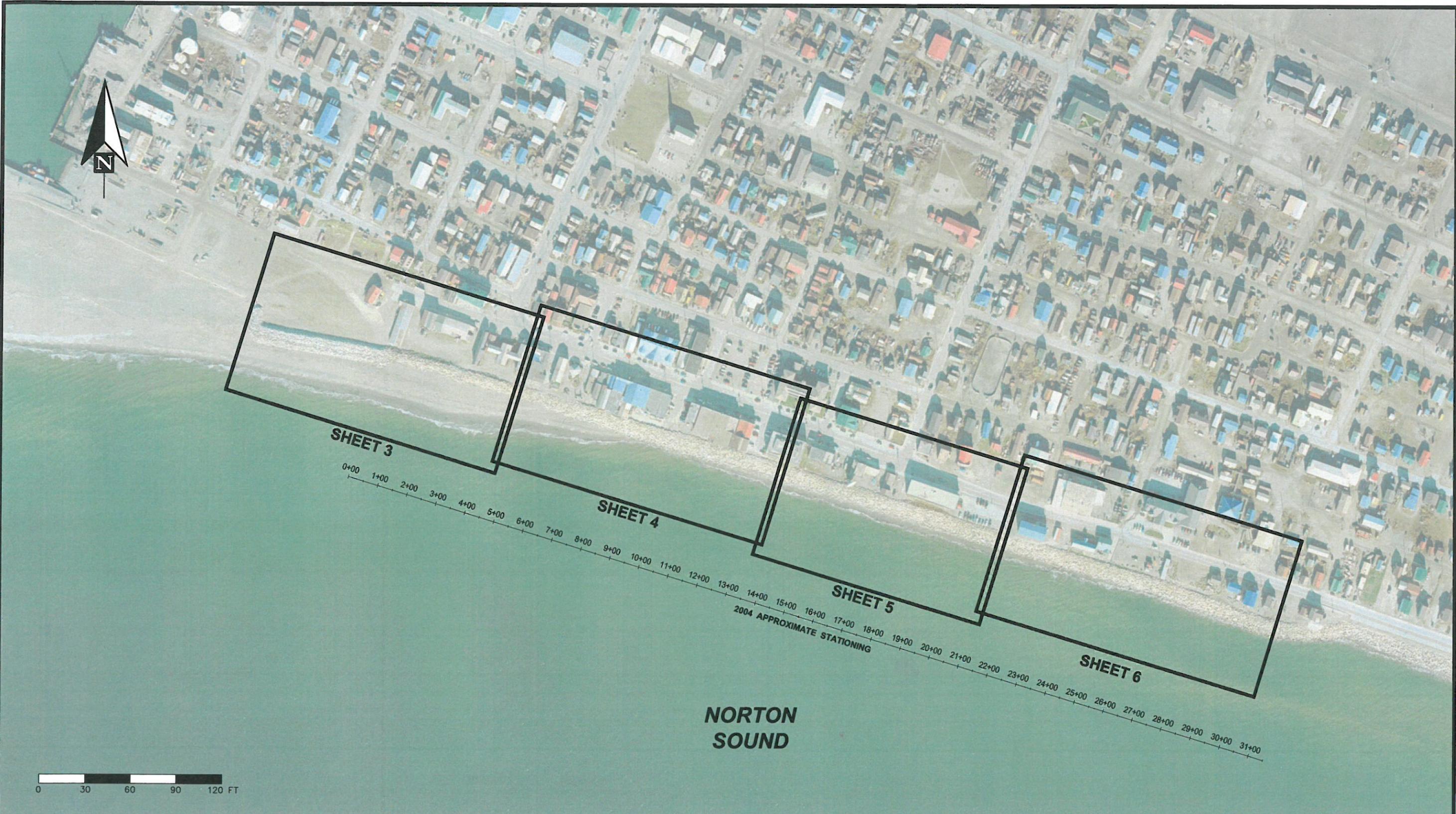


1506 West 36th Avenue  
Anchorage, Alaska 99503  
Phone: 907.561.1011  
Fax: 907.563.4220  
www.pndengineers.com



<b>NOME SEAWALL MAINTENANCE</b>			
<b>SURVEY CONTROL, NOTES, AND SHEET INDEX</b>			
DESIGNED BY:	SM	DATE:	12/23/2015
CHECKED BY:	GH	PROJECT NO.:	131043
			SHEET NO: <b>1</b> OF <b>7</b>

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SEAWALL STATIONING IS APPROXIMATE AND BASED ON INFORMATION FROM USACE REPORTS

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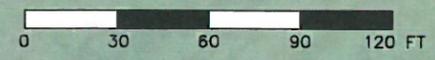


1506 West 36th Avenue  
Anchorage, Alaska 99503  
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PROJECT:		<b>NOME SEAWALL MAINTENANCE</b>	
TITLE:		<b>OVERVIEW</b>	
DESIGNED BY:	SM	DATE:	12/23/2015
CHECKED BY:	GH	PROJECT NO.:	131043
SHEET NO.:			<b>2</b> OF <b>7</b>

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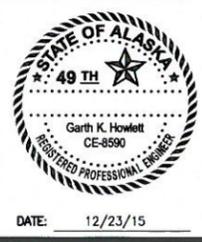
**LEGEND**

● FOUND MONUMENT	----- Z PILE
● FOUND ALCAP	— STORM DRAIN GRATE
⊙ STORM DRAIN MANHOLE	—X— CHAIN LINK FENCE
⊙ SEWER MANHOLE	▬ CONCRETE
● ISOLATED STONE REPLACEMENT LOCATION (a-z AND a1-a42 LOCATIONS FIELD MARKED)	SEAWALL STATIONING IS APPROXIMATE AND BASED ON INFORMATION FROM USACE REPORTS

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1	12/10/15	BID ADDENDUM #1

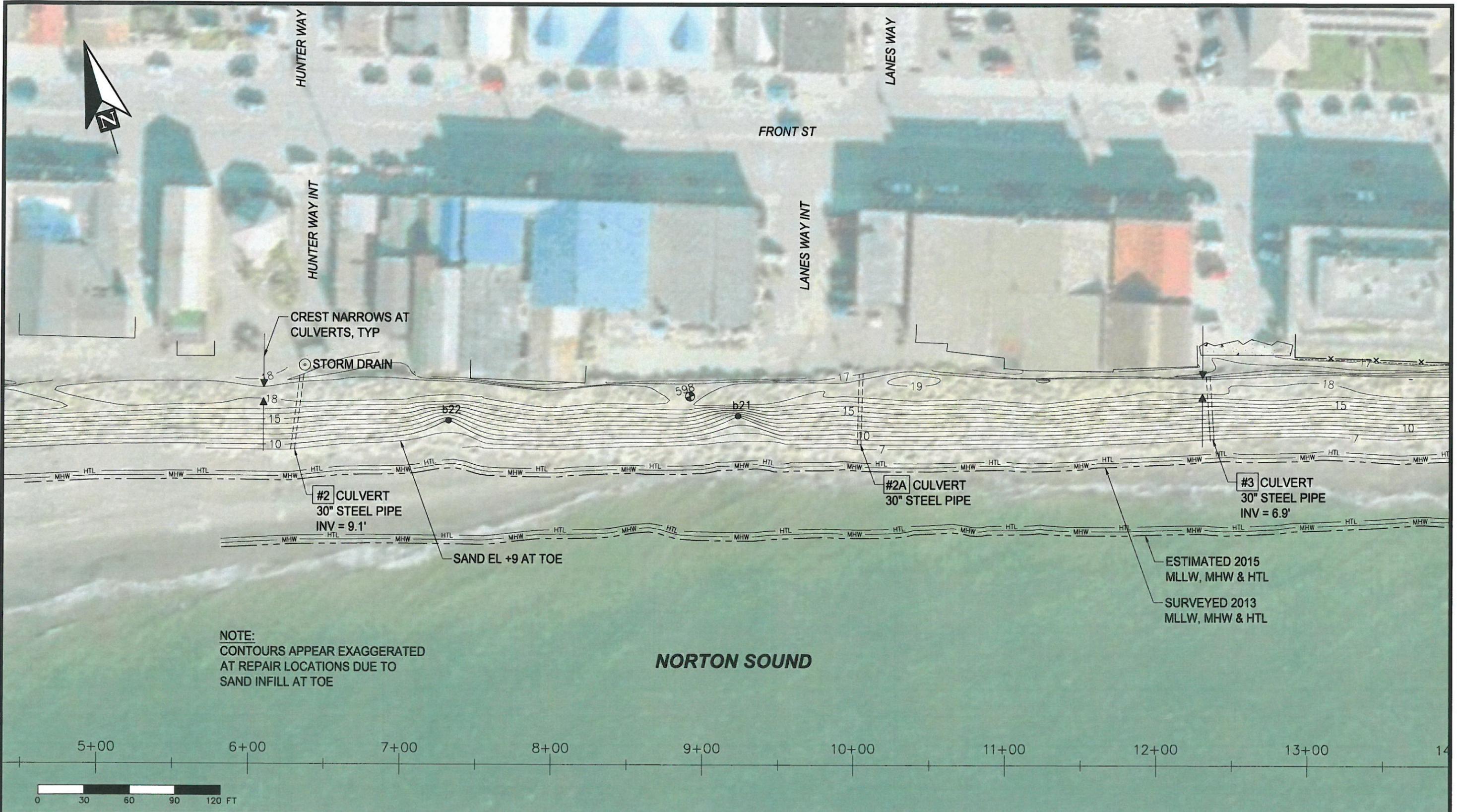


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Fax: 907.563.4220  
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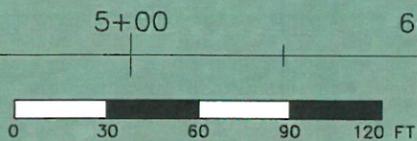
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TITLE:		<b>PLAN (1 OF 4)</b>	
DESIGNED BY:	SM	DATE:	12/23/2015
CHECKED BY:	GH	PROJECT NO:	131043
SHEET NO:			<b>3</b> OF <b>7</b>

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**NOTE:**  
 CONTOURS APPEAR EXAGGERATED  
 AT REPAIR LOCATIONS DUE TO  
 SAND INFILL AT TOE

**NORTON SOUND**



**LEGEND**

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- FOUND ALCAP
- ⊙ STORM DRAIN MANHOLE
- ⊙ SEWER MANHOLE
- ISOLATED STONE REPLACEMENT LOCATION (a-z AND a1-a42 LOCATIONS FIELD MARKED)
- Z PILE
- STORM DRAIN GRATE
- X- CHAIN LINK FENCE
- ▭ CONCRETE
- SEAWALL STATIONING IS APPROXIMATE AND BASED ON INFORMATION FROM USACE REPORTS

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REV	DATE	DESCRIPTION
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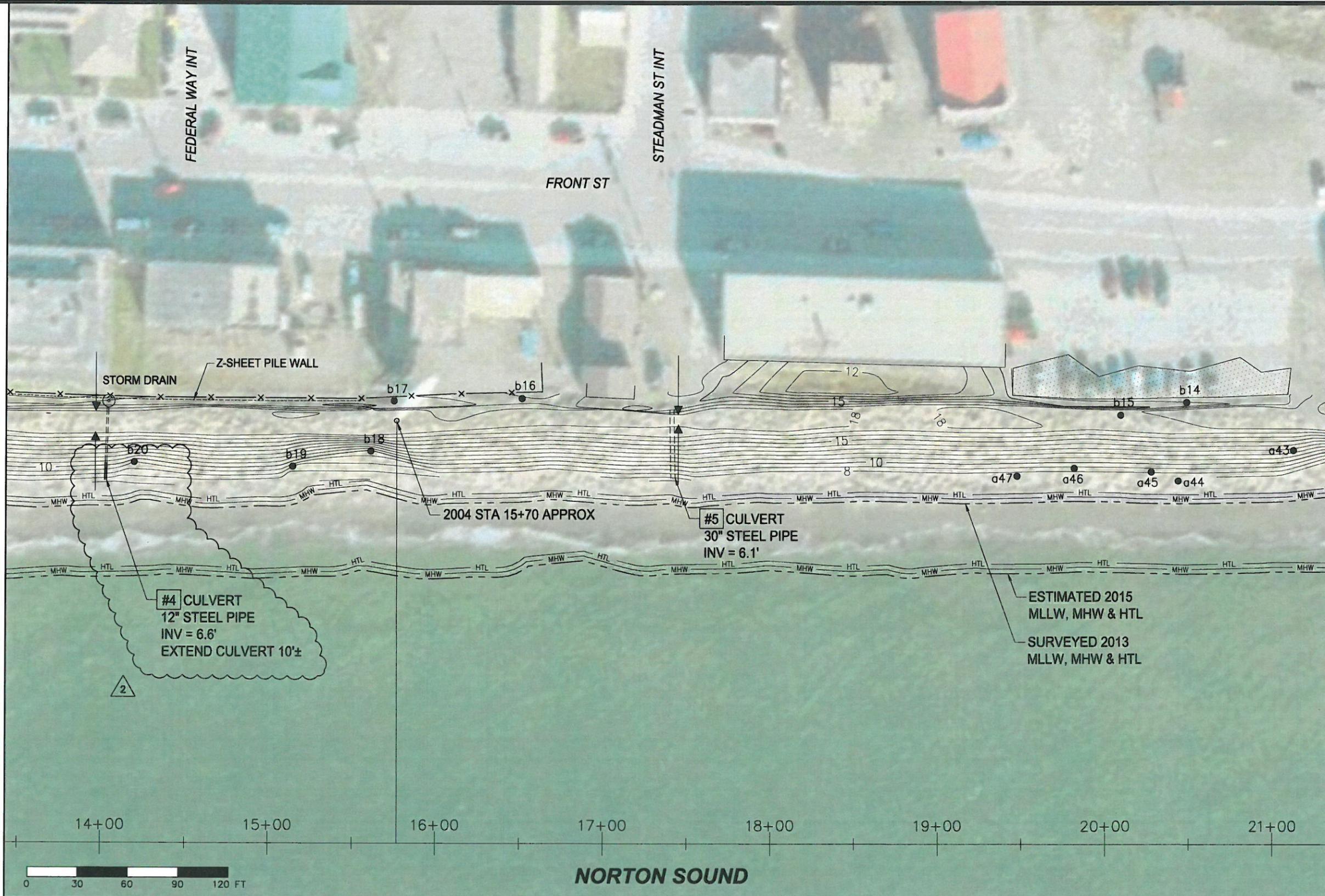
DATE: 12/23/15

1506 West 36th Avenue  
 Anchorage, Alaska 99503  
 Phone: 907.561.1011  
 Fax: 907.563.4220  
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**P | N | D**  
 ENGINEERS, INC.

<b>PROJECT:</b>		<b>NOME SEAWALL MAINTENANCE</b>	
<b>TITLE:</b>		<b>PLAN (2 OF 4)</b>	
DESIGNED BY:	SM	DATE:	12/23/2015
CHECKED BY:	GH	PROJECT NO.:	131043
SHEET NO.:			<b>4</b> OF <b>7</b>

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**LEGEND**

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- FOUND ALCAP
- ⊙ STORM DRAIN MANHOLE
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**ISSUED FOR BID**  
12/23/2015

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REV	DATE	DESCRIPTION
2	12/22/15	BID ADDENDUM #2
1	12/10/15	BID ADDENDUM #1



DATE: 12/23/15

1506 West 36th Avenue  
Anchorage, Alaska 99503  
Phone: 907.561.1011  
Fax: 907.563.4220  
www.pndengineers.com

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ENGINEERS, INC.

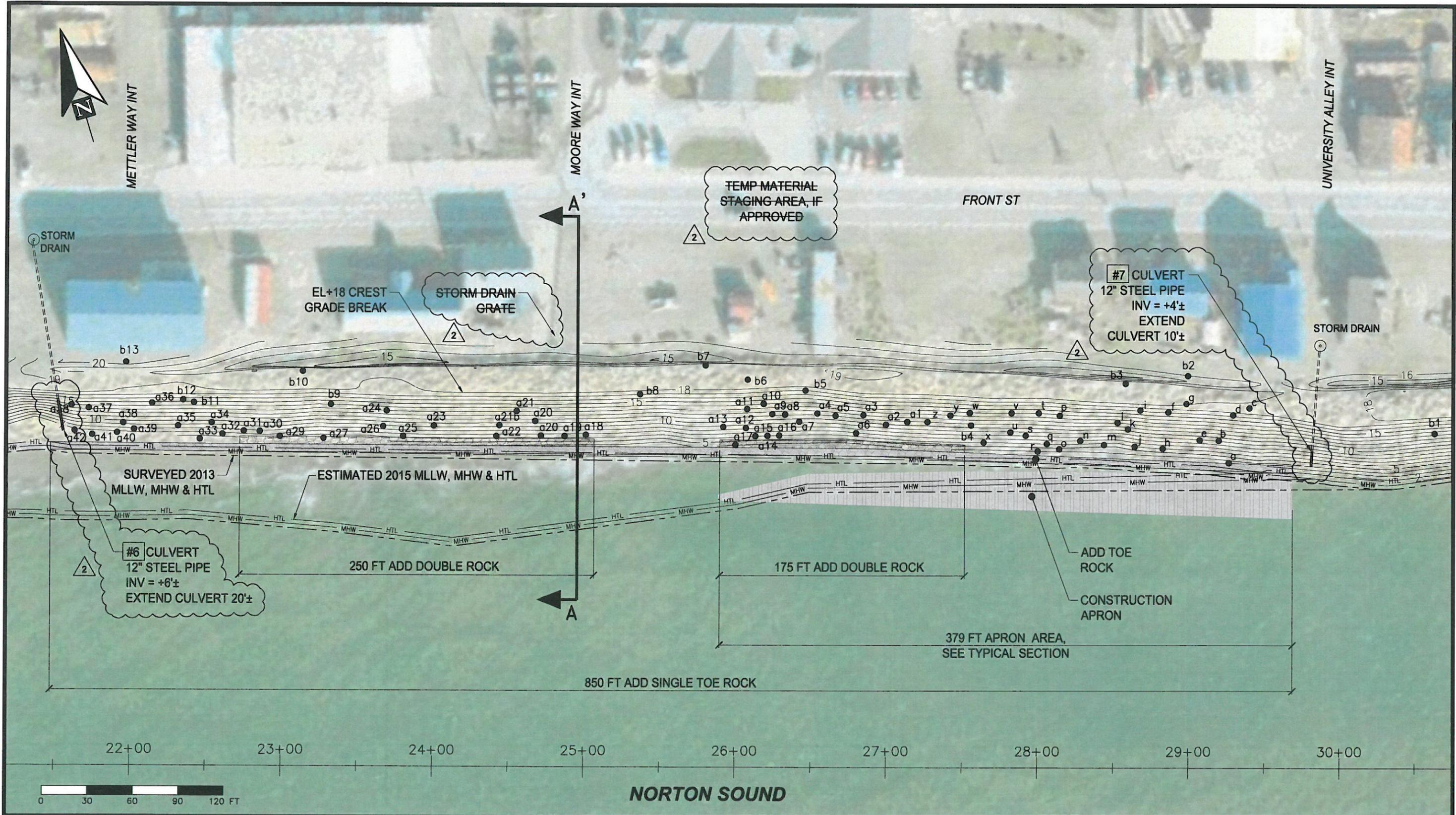
**NOME SEAWALL MAINTENANCE**

PLAN (3 OF 4)

DESIGNED BY:	SM	DATE:	12/23/2015
CHECKED BY:	GH	PROJECT NO.:	131043

SHEET NO: **5** OF 7

J:\2013\131043 Nome Seawall Survey and Repair\G. Drawings\02\_06 Nome Seawall Erosion Repair - Plans.dwg, 06, 12/23/2015 3:44:41 PM, James, 12



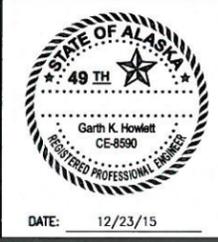
**LEGEND**

● FOUND MONUMENT	----- Z PILE
○ FOUND ALCAP	--- STORM DRAIN GRATE
⊙ STORM DRAIN MANHOLE	-X- CHAIN LINK FENCE
⊙ SEWER MANHOLE	▭ CONCRETE
● ISOLATED STONE REPLACEMENT LOCATION (a-z AND a1-a42 LOCATIONS FIELD MARKED)	SEAWALL STATIONING IS APPROXIMATE AND BASED ON INFORMATION FROM USACE REPORTS

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REV	DATE	DESCRIPTION
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1	12/10/15	BID ADDENDUM #1

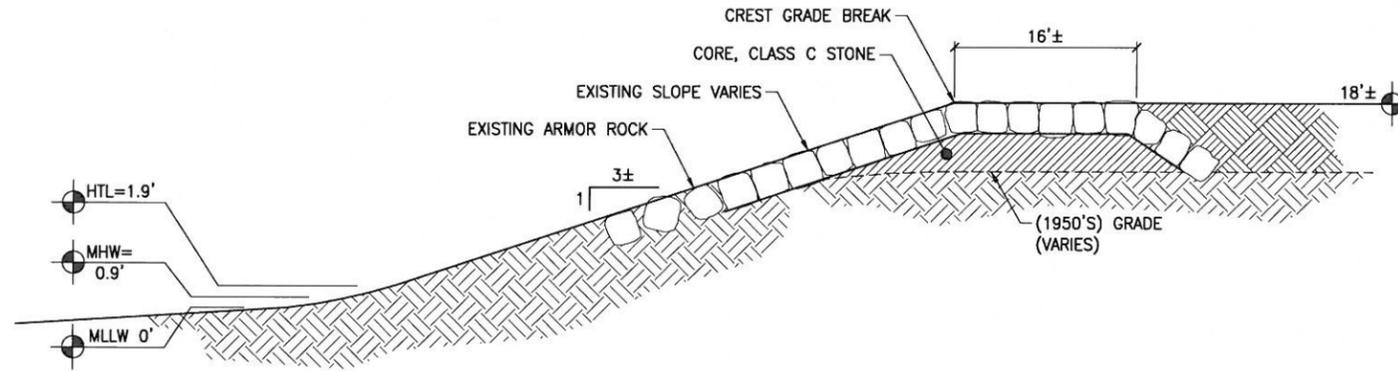


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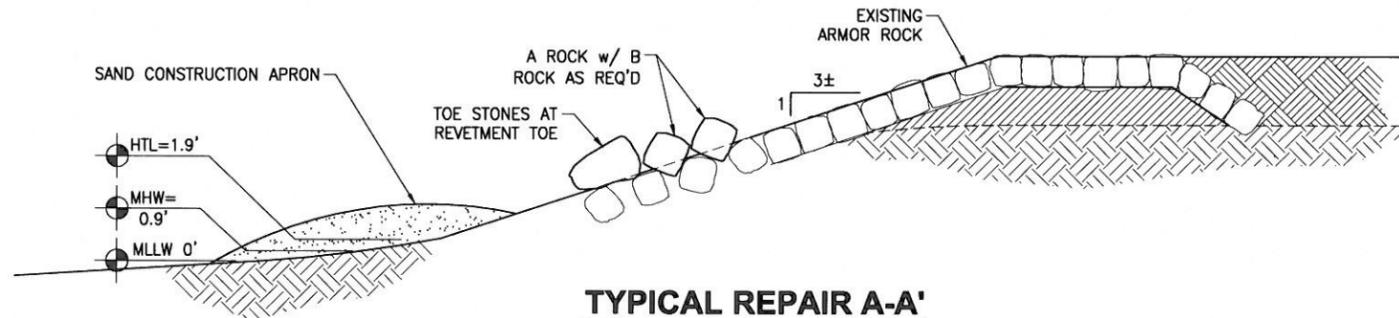


PROJECT:		<b>NOME SEAWALL MAINTENANCE</b>	
TITLE:		<b>PLAN (4 OF 4)</b>	
DESIGNED BY:	SM	DATE:	12/23/2015
CHECKED BY:	GH	PROJECT NO.:	131043
			SHEET NO. <b>6</b> OF <b>7</b>

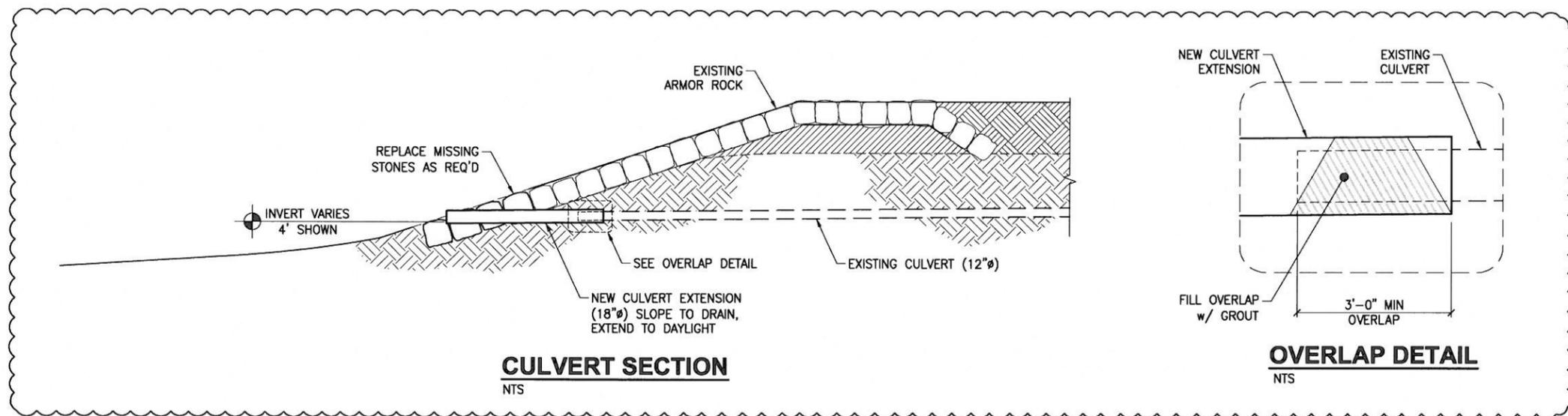
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**TYPICAL EXISTING SEAWALL**  
NTS



**TYPICAL REPAIR A-A'**  
NTS



**CULVERT SECTION**  
NTS

**OVERLAP DETAIL**  
NTS

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12/23/2015

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REV	DATE	DESCRIPTION
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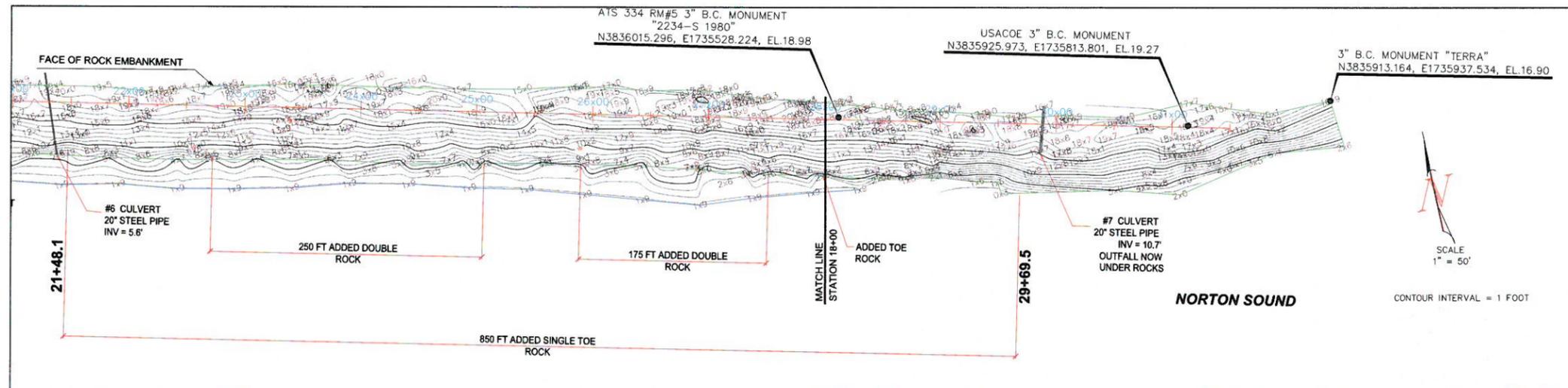
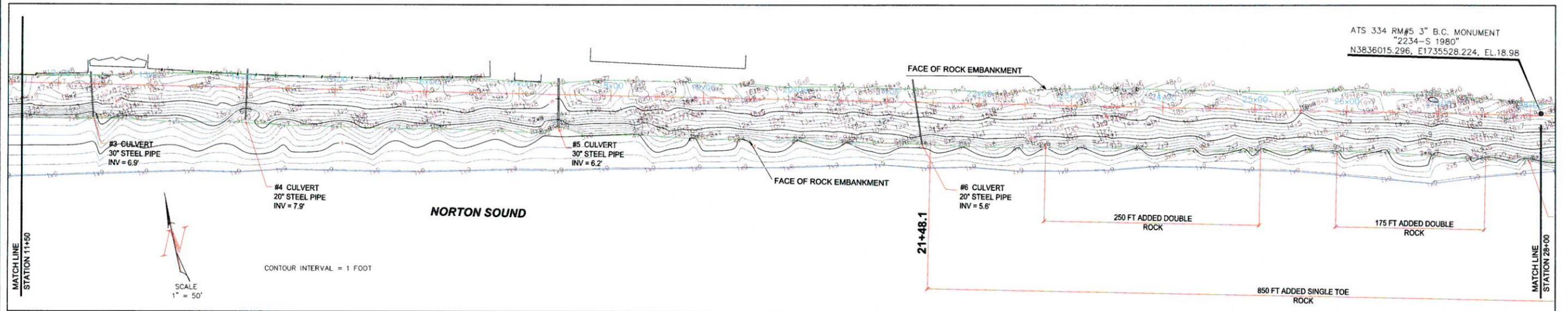
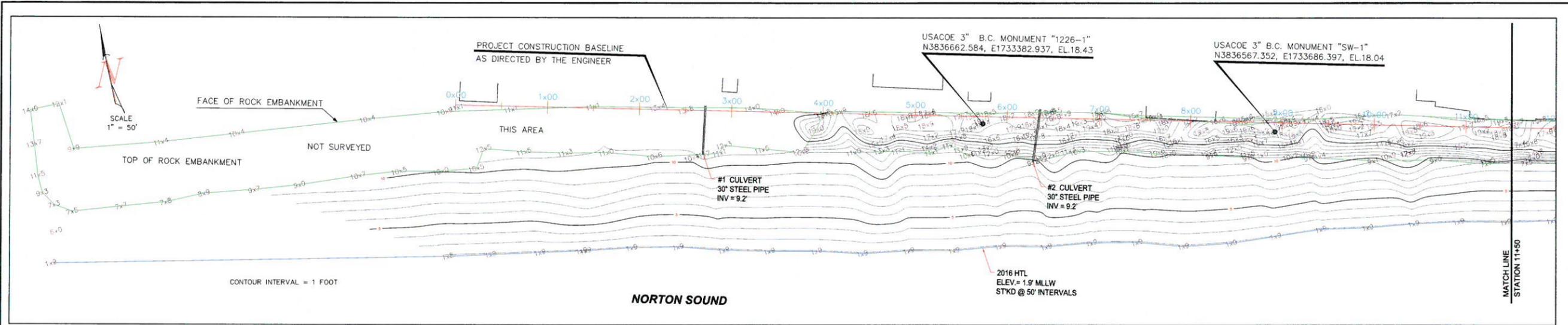


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Phone: 907.561.1011  
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ENGINEERS, INC.

PROJECT:		<b>NOME SEAWALL MAINTENANCE</b>	
TITLE:		<b>SECTIONS &amp; QUANTITIES</b>	
DESIGNED BY:	SM	DATE:	12/23/2015
CHECKED BY:	GH	PROJECT NO.:	131043
SHEET NO.:			<b>7</b> OF <b>7</b>



DATE OF SURVEY: BEGINNING 5/17/16 END 6/10/16 PROJECT No. AK16-002	SURVEYOR: ECO-LAND, LLC P.O. BOX 1444 NOME, ALASKA 99762
---	---

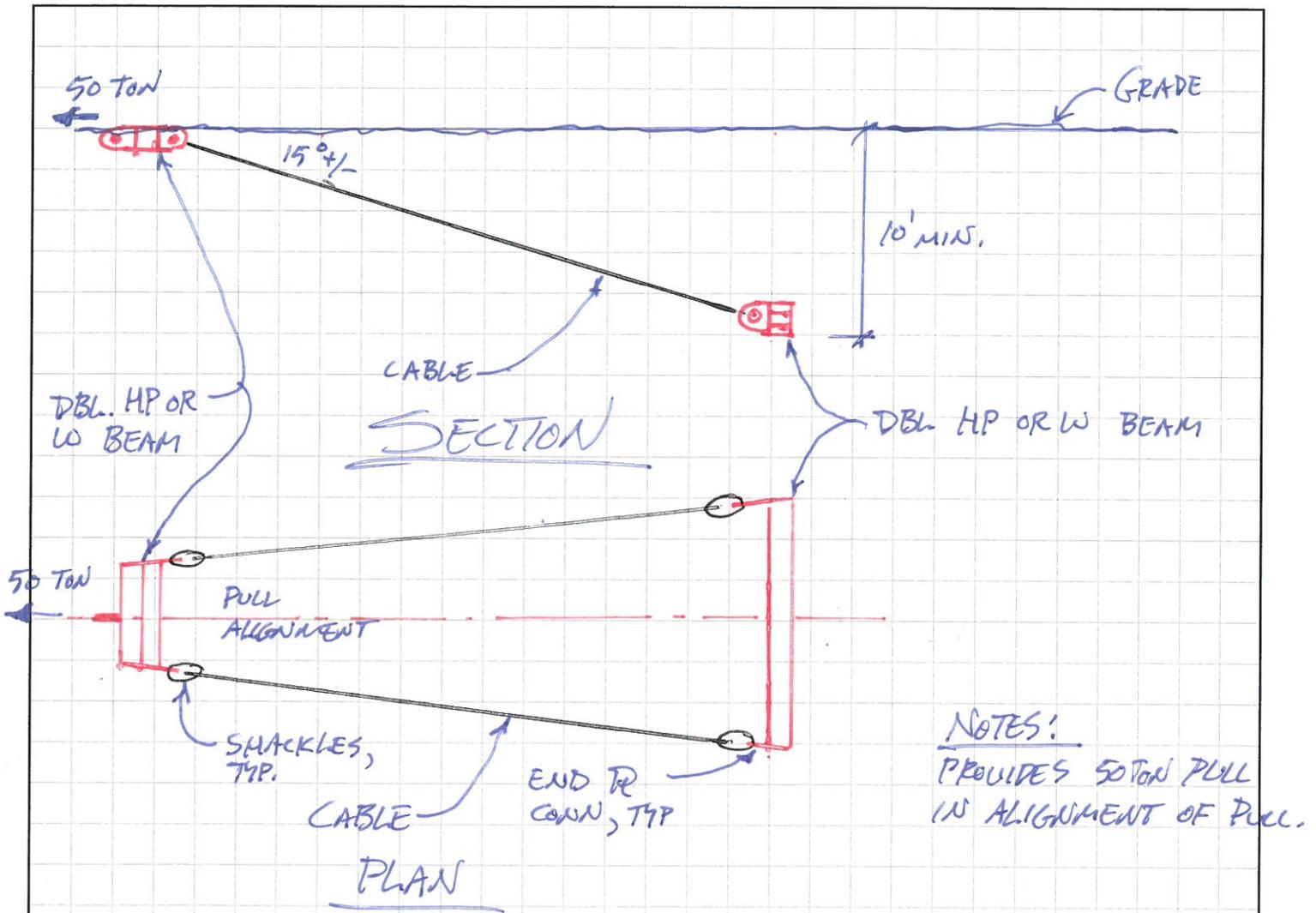
**ECO-LAND, LLC**

"AS-BUILT SURVEY DIAGRAM"

2016 NOME SEAWALL REPAIRS AND MAINTENANCE  
CONDUCTED BY ORION MARINE GROUP  
6120 A STREET ANCHORAGE, ALASKA 99518  
NOME TOWN SITE, U.S.S. 451  
TOWNSHIP 11 SOUTH, RANGE 33 WEST OF THE KATEEL RIVER MERIDIAN,  
SECOND JUDICIAL DISTRICT, CITY OF NOME, STATE OF ALASKA.

DRAWN BY: R.S.M. DATE: 6/12/16 SHT. 2 OF 15 PLAN AS-BUILT	SURVEY BY: R.S.M. (OWNER) CHECKED: R.S.M. APPROVED:	PORT AND CITY OF NOME P.O. BOX 281 NOME, ALASKA 99762
--	---	---

BASED ON FIELD SURVEYS CONDUCTED 5-16 THRU 6-10-16



Joy,

Thinking about it a little more this type of anchor is not very good with a side load. Pulling in alignment it works fine but if you get off line very far it's going to want to realign and plow up the surface.

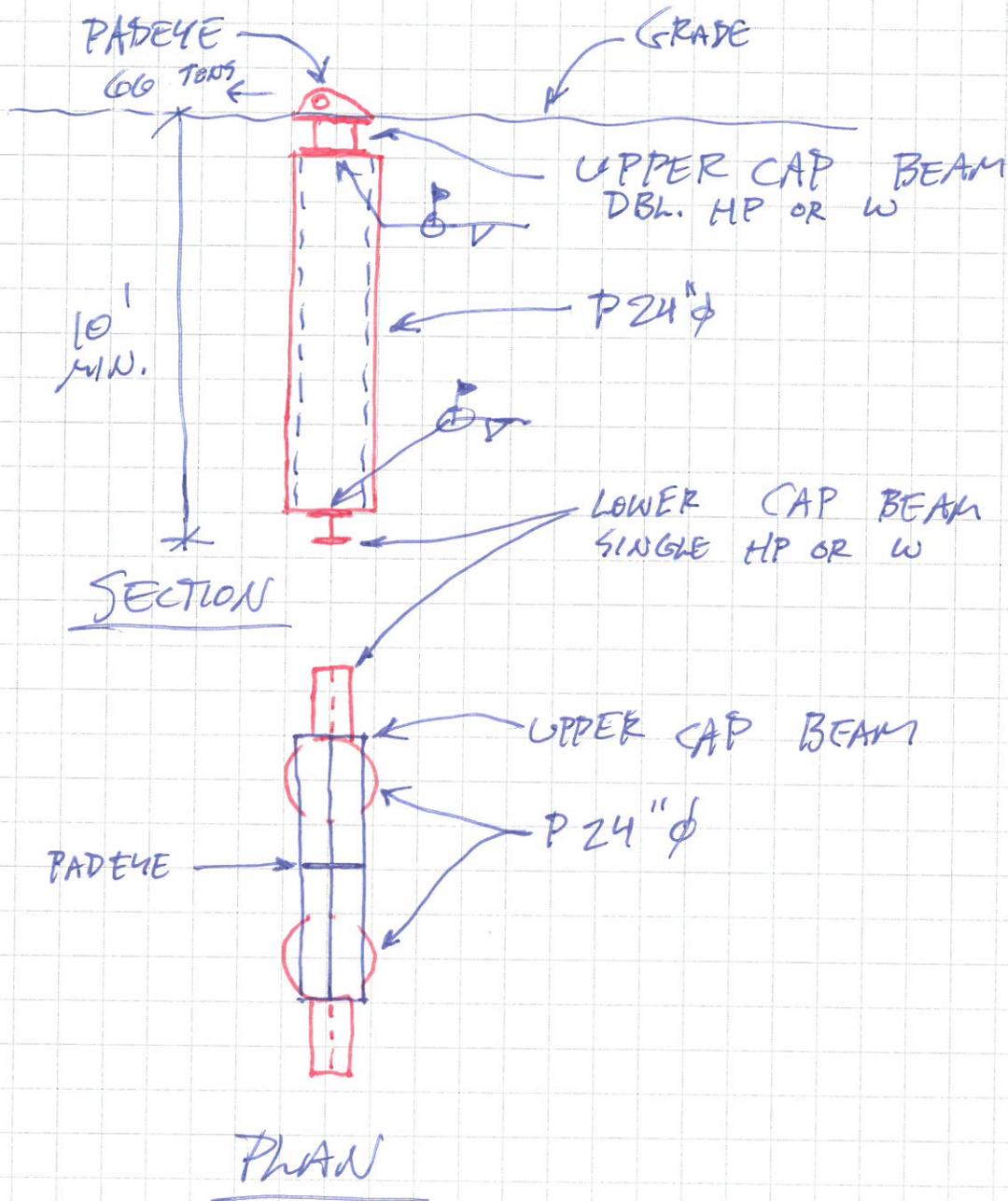
We could array several anchors to a common connector to allow side load but that will cost more in rigging and require more pieces.

I think the more economical way to approach is use the old frame HP10 and W8 as cap material for the pipes that you have in the yard.

You can put a more substantial side load on those and you would not have to fuss with a bunch of buried cables, shackles, etc.

You would probably have about the same amount of welding and digging as the buried beams. Long term I think you would be happier with the pipe and caps

Garth



Joy,  
 You can see that this concept is far simpler, has more capacity and could be side loaded up to about half its in-line capacity.  
 You also have a much easier time connecting to it at grade.  
 You don't have to worry about cables corroding out over time.  
 Garth