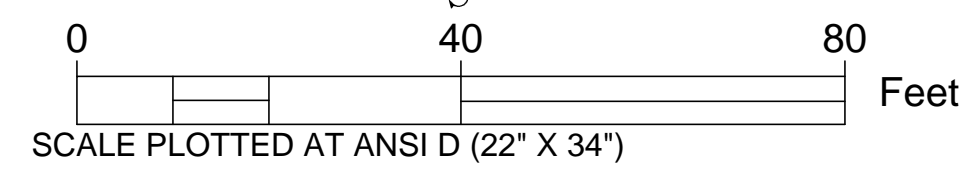
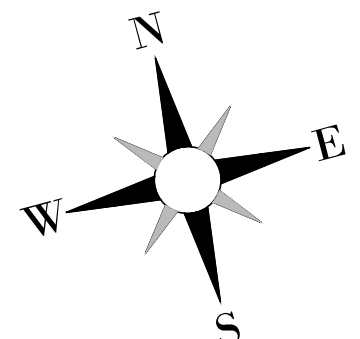
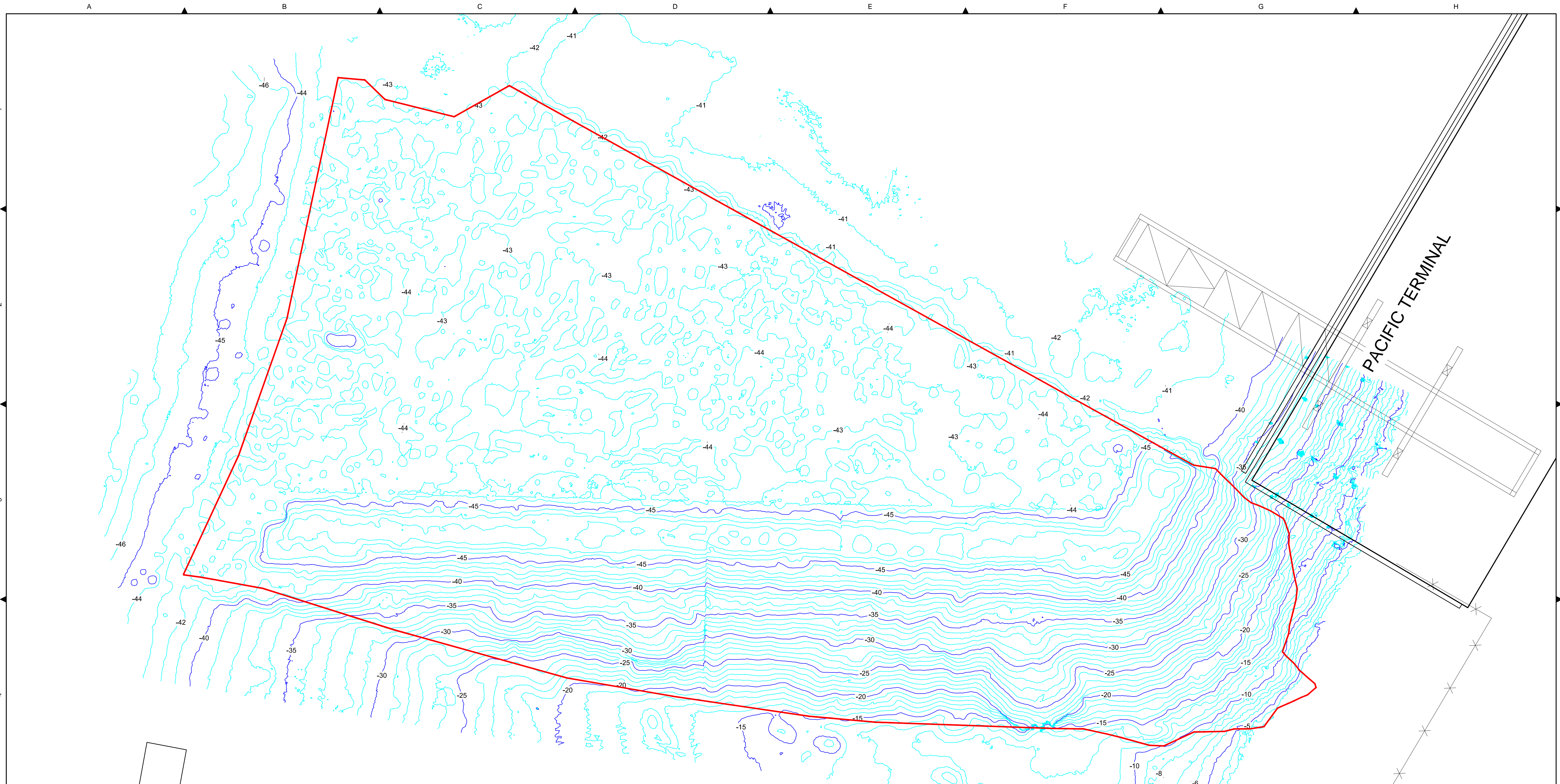


**APPENDIX K**  
**Bathymetric Surveys**

G:\PROJECTS\2016\_5872\_PORTOFEVERETT\_MILL\_A\_DREDGESURVEY\04 CAD\_GIS\02-2017\_DELIVERABLES\SHEET\_FILES\20170222\_POE\_NAD83\_SPCVAN\_USFOOT\_MLLW\_CAD\_DELIVERABLES.DWG  
PLOT DETAILS: ENRIGHT, KYLE March 28, 2017 5:55 PM



**NOTES:**

- HORIZONTAL AND VERTICAL CONTROL WERE BASED ON PACIFIC GEOMATIC SERVICES, INC. BENCHMARKS 101 AND 202 SET ON THE SOUTH TERMINAL AS PRESENTED IN DOCUMENT 1404502\_CONTROL\_081116.PDF.
- COMPOSITE POST-DREDGE SURVEY SURFACE COMPILED FROM SURVEYS ON DATES: 12/08/2016 11AM, 12/14/2016 11AM, 12/21/2016 6AM, 12/28/2016 6AM, 12/29/2016 6AM, 01/05/2017 5AM, 01/07/2017 6AM
- PACIFIC GEOMATIC SERVICES, INC., REVIEWING PROFESSIONAL LAND SURVEYOR PROVIDED DIRECTION FOR DATA COLLECTION AND PROCESSING.

SURVEY DATUM	
DATUM	DESCRIPTION
ELLIPSOID PROJECTION HORIZONTAL UNITS VERTICAL DATUM VERTICAL CORRECTION VERTICAL UNITS	WGS84 NAD83/91 WA SPCS NORTH (4601) U.S. SURVEY FEET MEAN LOW LOW WATER (MLLW) MLLW = NAVD88 + 2.03 ft U.S. SURVEY FEET

**LEGEND:**

- PORT OF EVERETT STRUCTURES
- CONTOUR LABELS MLLW FT
- CONTOURS MAJOR 5FT
- CONTOURS MINOR 1FT
- DREDGE BOUNDS

**TETRA TECH**  
www.tetrattech.com  
19803 North Creek Parkway  
Bothell, Washington 98011  
Phone: 425-482-7600 Fax: 425-482-7652



REV.	DATE	REVISION DESCRIPTION	DRW	DSG	CHK	APP
0	03/28/17	POST-CONSTRUCTION DELIVERABLE	KSE	KSE	DBH	RH

PORT OF EVERETT  
MILL-A DREDGE CLEANUP SITE  
INTERIM ACTION DREDGING  
**COMPOSITE  
POST-DREDGE SURFACE**

DWG. NO.: **1-1**

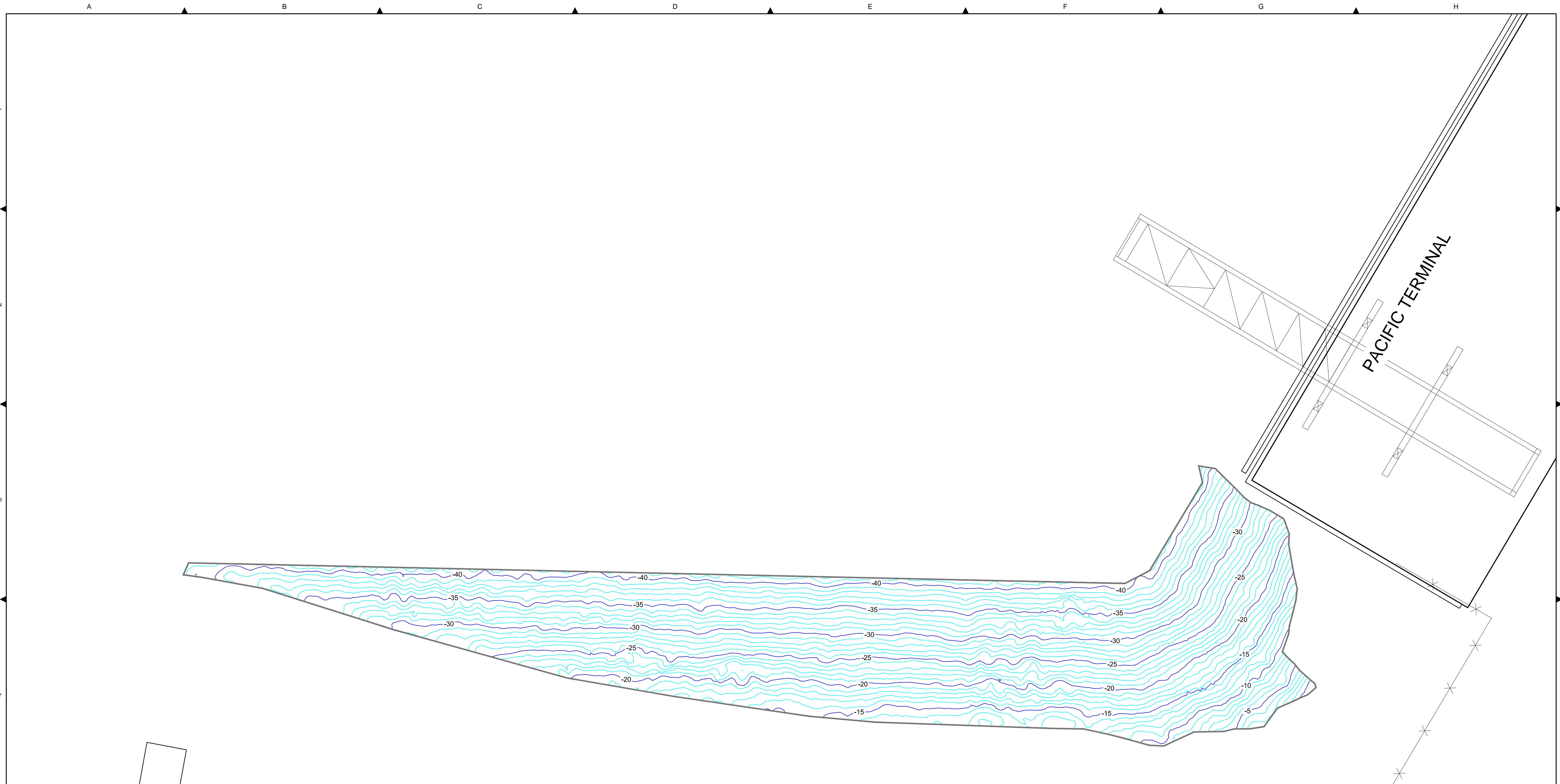
CREATED: 03/10/2017

SHEET: 1 OF 4

SCALE: 1" = 40'  
PLOTTED 22" X 34"

3-28-17

G:\PROJECTS\2016\_5872\_PORTOFEVERETT\_MILL\_A\_DREDGESURVEY\04 CAD\_GIS\02-2017\_DELIVERABLES\SHEET\_FILES\20170222\_POE\_NAD83\_SPOWAN\_USFOOT\_MLLW\_CAD\_DELIVERABLES.DWG  
PLOT DETAILS: ENRIGHT, KYLE March 28, 2017 5:55 PM



- NOTES:**
- HORIZONTAL AND VERTICAL CONTROL WERE BASED ON PACIFIC GEOMATIC SERVICES, INC. BENCHMARKS 101 AND 202 SET ON THE SOUTH TERMINAL AS PRESENTED IN DOCUMENT 1404502\_CONTROL\_081116.PDF.
  - THE POST-BEDDING SURVEY AREA INCLUDES ONLY THE AREA SURVEYED PRIOR TO ARMOR PLACEMENT ON THE 2:1 SLOPE. ARMOR ROCK WAS PLACED ON TOP OF BEDDING IN THE KEYWAY PRIOR TO THE POST-BEDDING SURVEY ON 01/18/2017 7PM.
  - PACIFIC GEOMATIC SERVICES, INC., REVIEWING PROFESSIONAL LAND SURVEYOR PROVIDED DIRECTION FOR DATA COLLECTION AND PROCESSING.

SURVEY DATUM	
DATUM	DESCRIPTION
ELLIPSOID PROJECTION HORIZONTAL UNITS VERTICAL DATUM VERTICAL CORRECTION VERTICAL UNITS	WGS84 NAD83/91 WA SPCS NORTH (4601) U.S. SURVEY FEET MEAN LOW LOW WATER (MLLW) MLLW = NAVD88 + 2.03 ft U.S. SURVEY FEET

- LEGEND:**
- PORT OF EVERETT STRUCTURES
  - CONTOUR LABELS MLLW FT
  - CONTOURS MAJOR 5FT
  - CONTOURS MINOR 1FT
  - POST-BEDDING SURVEY BOUNDS

SCALE PLOTTED AT ANSI D (22" X 34")

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3-28-17

REV.	DATE	REVISION DESCRIPTION	DRW	DSG	CHK	APP
0	03/28/17	POST-CONSTRUCTION DELIVERABLE	KSE	KSE	DBH	RH

PORT OF EVERETT  
MILL-A DREDGE CLEANUP SITE  
INTERIM ACTION DREDGING  
**POST-BEDDING  
PLACEMENT SURFACE**

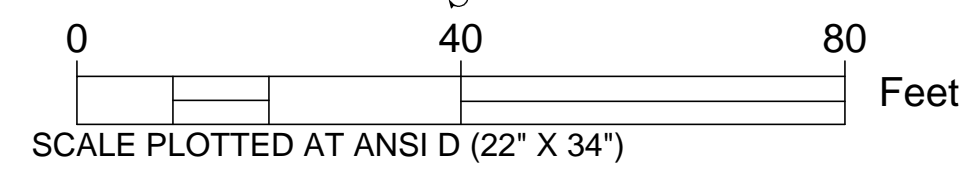
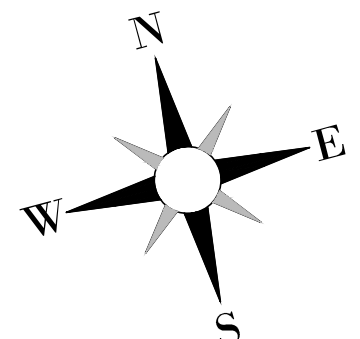
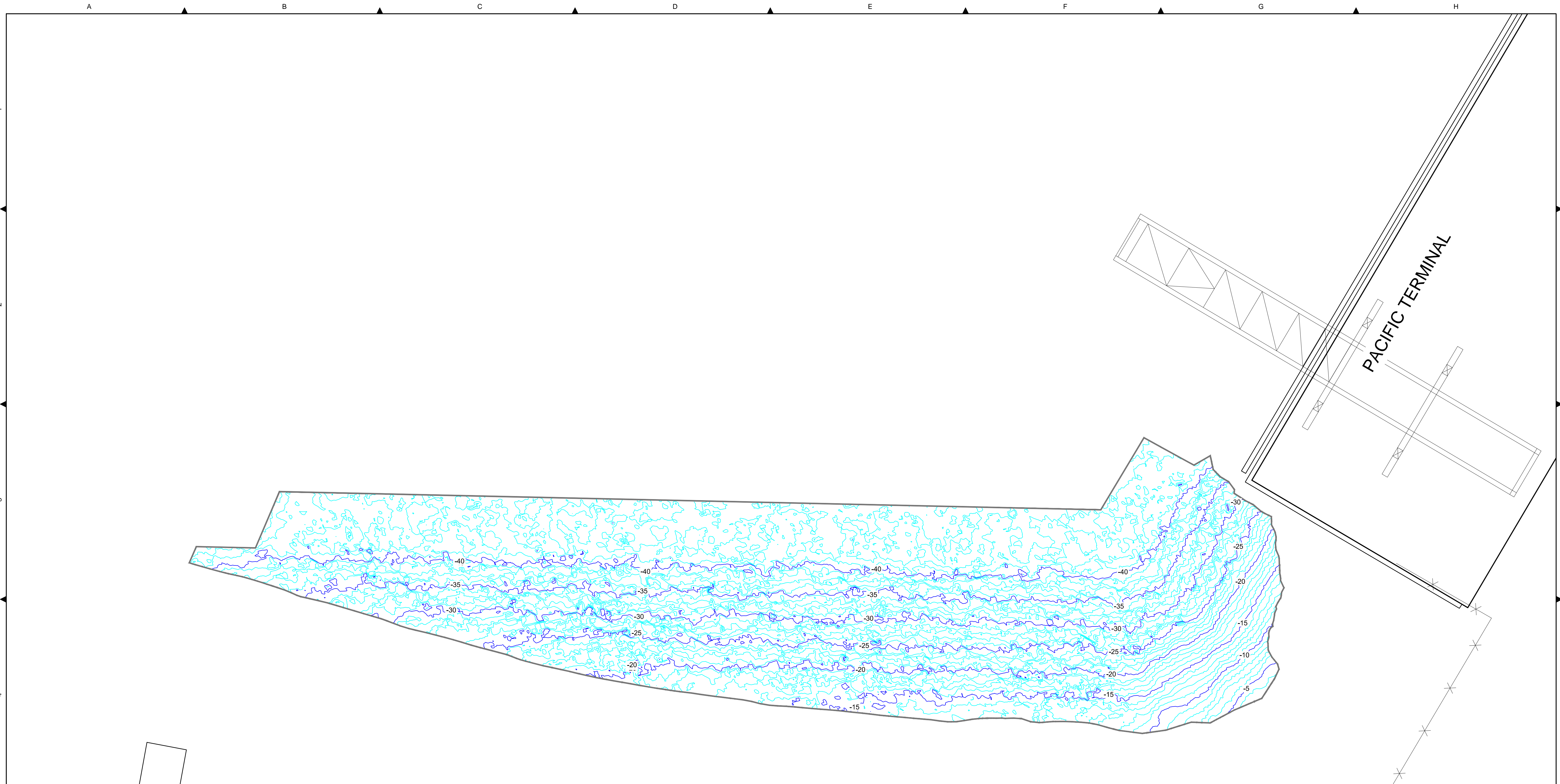
DWG. NO.: **1-2**

CREATED: 03/10/2017

SHEET: 2 OF 4

SCALE: 1" = 40'  
PLOTTED 22" X 34"

G:\PROJECTS\2016\_5872\_PORTOFEVERETT\_MILL\_A\_DREDGESURVEY\04 CAD\_GIS\02-2017\_DELIVERABLES\_SHEET\_FILES\20170222\_POE\_NAD83\_SPOWAN\_USFOOT\_MLLW\_CAD\_DELIVERABLES.DWG  
 PLOT DETAILS: ENRIGHT, KYLE March 28, 2017 5:56 PM



- NOTES:**
- HORIZONTAL AND VERTICAL CONTROL WERE BASED ON PACIFIC GEOMATIC SERVICES, INC. BENCHMARKS 101 AND 202 SET ON THE SOUTH TERMINAL AS PRESENTED IN DOCUMENT 1404502\_CONTROL\_081116.PDF.
  - POST-ARMOR PLACEMENT SURVEY COMPLETED ON 02/21/2017 AND 02/22/2017.
  - PACIFIC GEOMATIC SERVICES, INC., REVIEWING PROFESSIONAL LAND SURVEYOR PROVIDED DIRECTION FOR DATA COLLECTION AND PROCESSING.

SURVEY DATUM	
DATUM	DESCRIPTION
ELLIPSOID PROJECTION HORIZONTAL UNITS VERTICAL DATUM VERTICAL CORRECTION VERTICAL UNITS	WGS84 NAD83/91 WA SPCS NORTH (4601) U.S. SURVEY FEET MEAN LOW LOW WATER (MLLW) MLLW = NAVD88 + 2.03 ft U.S. SURVEY FEET

- LEGEND:**
- PORT OF EVERETT STRUCTURES
  - CONTOUR LABELS MLLW FT
  - CONTOURS MAJOR 5FT
  - CONTOURS MINOR 1FT
  - DESIGN BEDDING AND ARMOR PLACEMENT BOUNDS

**TETRA TECH**  
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REV.	DATE	REVISION DESCRIPTION	DRW	DSG	CHK	APP
0	03/28/17	POST-CONSTRUCTION DELIVERABLE	KSE	KSE	DBH	RH

PORT OF EVERETT  
 MILL-A DREDGE CLEANUP SITE  
 INTERIM ACTION DREDGING  
 POST-ARMOR  
 PLACEMENT SURFACE

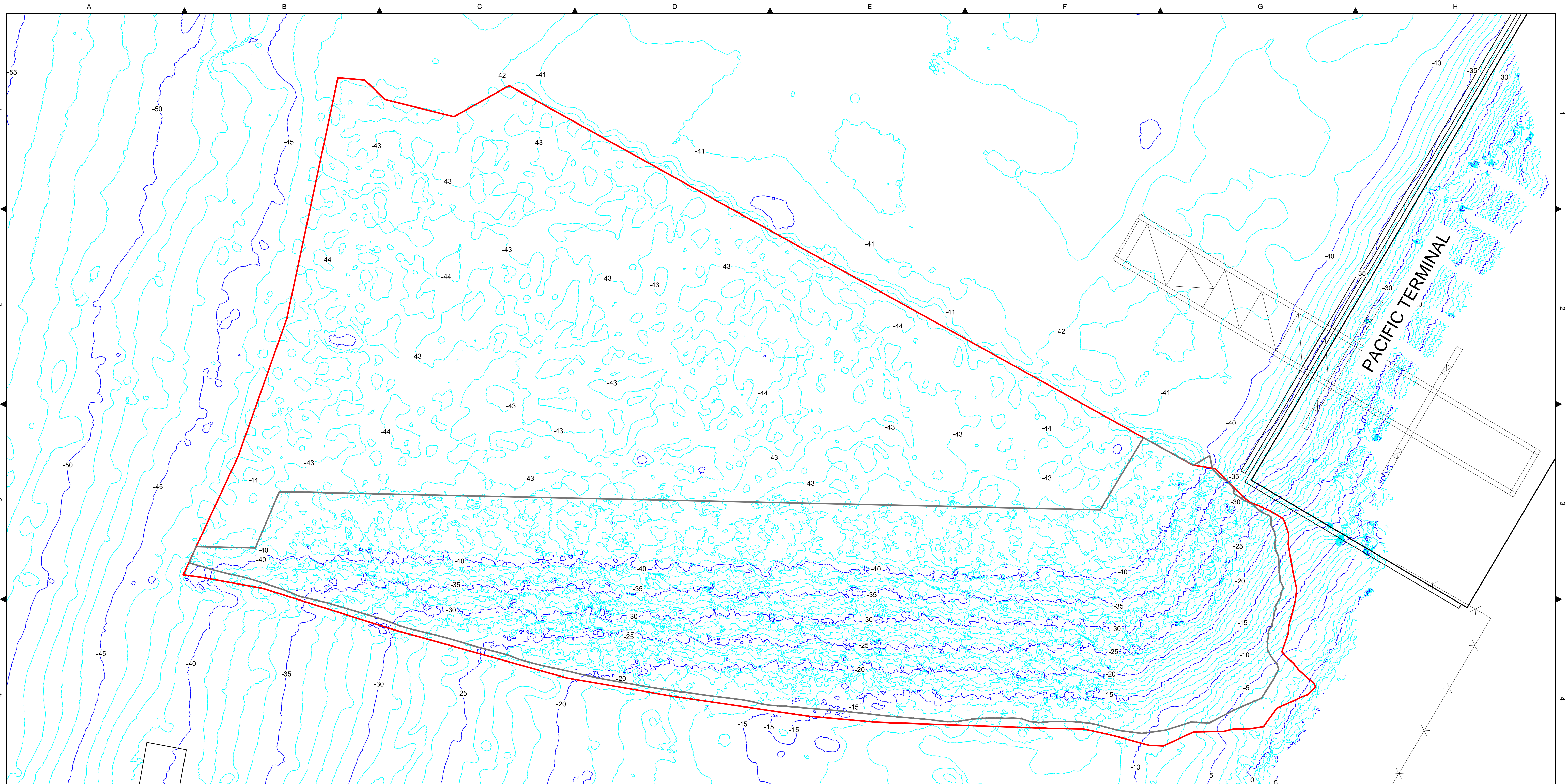
DWG. NO.: **1-3**

CREATED: 03/10/2017

SHEET: 3 OF 4

SCALE: 1" = 40'  
 PLOTTED 22" X 34"

G:\PROJECTS\2016\_5872\_PORTEVERETT\_MILL\_A\_DREDGESURVEY\04 CAD\_GIS\02-2017\_DELIVERABLES\_SHEET\_FILES\20170222\_POE\_NAD83\_SPOWAN\_USFOOT\_MLLW\_CAD\_DELIVERABLES.DWG  
March 29, 2017 12:12 PM  
PLOT DETAILS: ENRIGHT, KYLE

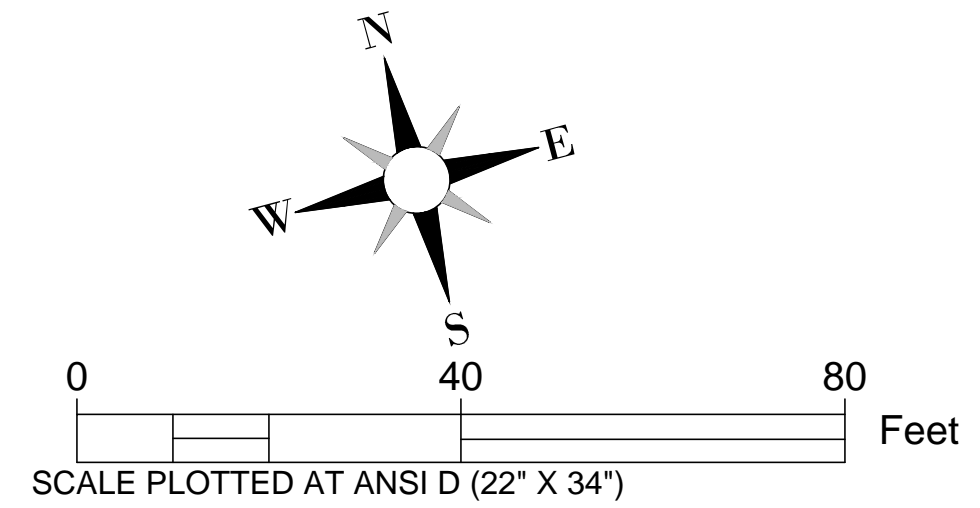


**NOTES:**  
 1. HORIZONTAL AND VERTICAL CONTROL WERE BASED ON PACIFIC GEOMATIC SERVICES, INC. BENCHMARKS 101 AND 202 SET ON THE SOUTH TERMINAL AS PRESENTED IN DOCUMENT 1404502\_CONTROL\_081116.PDF.  
 2. POST-CONSTRUCTION SURVEY COMPLETED ON 02/21/2017 AND 02/22/2017.  
 3. PACIFIC GEOMATIC SERVICES, INC., REVIEWING PROFESSIONAL LAND SURVEYOR PROVIDED DIRECTION FOR DATA COLLECTION AND PROCESSING.

SURVEY DATUM	
DATUM	DESCRIPTION
ELLIPSOID PROJECTION HORIZONTAL UNITS VERTICAL DATUM VERTICAL CORRECTION VERTICAL UNITS	WGS84 NAD83/91 WA SPCS NORTH (4601) U.S. SURVEY FEET MEAN LOW LOW WATER (MLLW) MLLW = NAVD88 + 2.03 ft U.S. SURVEY FEET

**LEGEND:**

	PORT OF EVERETT STRUCTURES
	CONTOUR LABELS MLLW FT
	CONTOURS MAJOR 5FT
	CONTOURS MINOR 1FT
	DREDGE BOUNDS
	DESIGN BEDDING AND ARMOR PLACEMENT BOUNDS



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REV.	DATE	REVISION DESCRIPTION	DRW	DSG	CHK	APP
0	03/28/17	POST-CONSTRUCTION DELIVERABLE	KSE	KSE	DBH	RH

PORT OF EVERETT  
 MILL-A DREDGE CLEANUP SITE  
 INTERIM ACTION DREDGING  
 POST-CONSTRUCTION  
 SURFACE

DWG. NO.:	<b>1-4</b>
CREATED:	03/10/2017
SHEET:	4 OF 4
SCALE:	1" = 40' PLOTTED 22" X 34"

**PRIMARY BENCHMARK:**

VERTICAL DATUM:  
MLLW (MEAN LOWER LOW WATER)  
BASED ON AN ALUMINUM DISK ON A CONCRETE MONUMENT IN CASE LOCATED IN THE PERIMETER DRIVING LANE FOR THE BOAT LAUNCH PARKING, IN THE NORTHWEST CORNER OF THE PARKING LOT; SAID POINT IS REFERENCED IN THE "PORT OF EVERETT 12TH STREET MARINA" CONSTRUCTION PLANS AS POINT NUMBER 2000/E009, SHEET 6 OF 149.  
MLLW ELEV: 17.14'

**VERTICAL DATUM:**

ELEVATION DATUM FOR THIS PROJECT IS 0.0' MEAN LOWER LOW WATER (MLLW)  
TIDAL DATA  
BASED ON NOAA'S PUBLICATION SHEET (WASHINGTON 944-7659), DATED 09-29-1988, THE RELATIONSHIP BETWEEN NAVD 29 AND MLLW DATUM FOR EVERETT, POSSESSION SOUND, FOR THE TIDAL EPOCH 1960-1978 IS AS FOLLOWS:  
THE HIGHEST RECORDED TIDE: ESTIMATED (EHW) = +14.35  
MEAN HIGHER HIGH WATER (MHHW) = +11.11  
MEAN HIGH WATER (MHW) = +10.25  
NAVD 1929 = +5.93  
MEAN LOW WATER (MLW) = +2.80  
NAVD 1988 = +2.25  
MEAN LOWER LOW WATER (MLLW) = 0.0  
LOWEST OBSERVED WATER LEVEL (6-02-77) = -3.60  
EXTREME LOW WATER (ELW) = -4.50

**HORIZONTAL DATUM:**

HORIZONTAL DATUM FOR THIS SURVEY IS NAD 83/91; REFERENCE BASELINE: 2 SURVEY CONTROL POINTS AS FOLLOWS:  
MONUMENT NO. 1 - CITY OF EVERETT CONTROL MONUMENT (E009 1991) - 3" ALUMINUM DISK IN CONCRETE MONUMENT IN CASE.  
N: 369674.1986  
E: 1300666.9227  
MONUMENT NO. 2 - CENTERLINE R/W MONUMENT AT THE INTERSECTION OF WEST MARINE VIEW DRIVE AND 14TH STREET - 4" CONCRETE MONUMENT WITH LEAD AND COPPER TACK.  
N: 367492.1087  
E: 1302456.1581

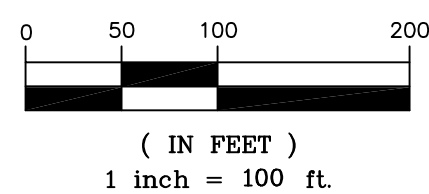
**SCALE FACTOR NOTE:**

THE COORDINATES VALUES ARE WASHINGTON STATE PLANE, NORTH ZONE, GRID COORDINATES. TO CONVERT TO PREVIOUS PROJECT GROUND COORDINATES USE A PROJECT SCALE FACTOR OF 1.0000515777 FROM ORIGIN OF NORTH 0.00, EAST 1640416.665.

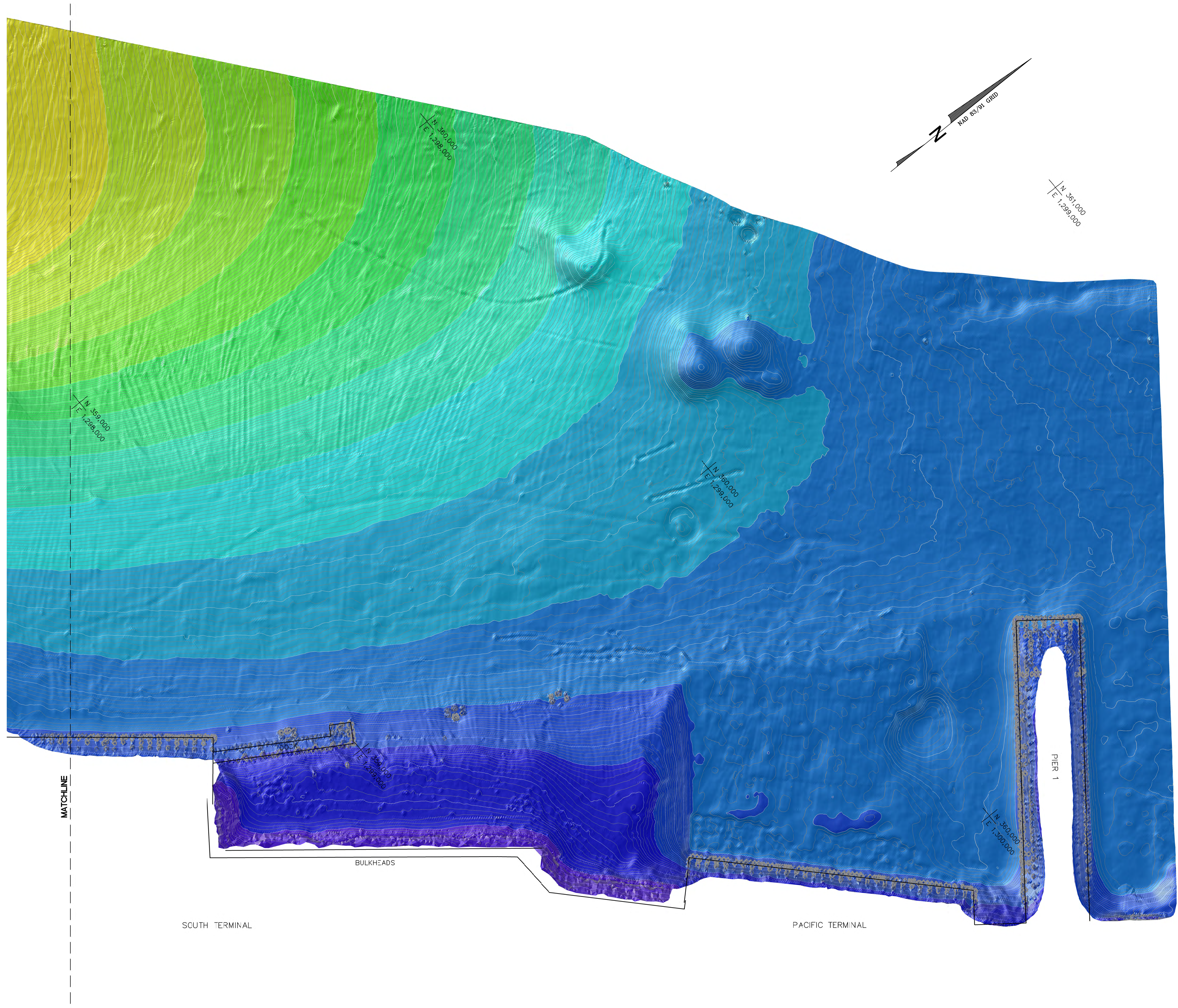
**SURVEYOR'S NOTES:**

- UNITS ARE U.S. SURVEY FEET.
- SEE THE "PORT OF EVERETT 2014 MULTIBEAM BATHYMETRIC AND VESSEL MOUNTED LIDAR SURVEY TECHNICAL MEMORANDUM" PREPARED BY TETRA TECH AND DATED SEPTEMBER 19, 2014 FOR SURVEY SYSTEM SETUP, PROCEDURES, ACCURACY AND DETAILS.
- DATA PROCESSING WAS COMPLETED USING HYPACK/HYSWEEP 2014 SOFTWARE. BATHYMETRY WAS GENERATED USING AUTOCAD CIVIL 3D 2014.
- THIS BATHYMETRIC SURVEY IS REPRESENTATIVE OF THE GENERAL CONDITION OF THE SEABED AT THE TIME OF THE FIELD SURVEY, WHICH WAS BETWEEN SEPTEMBER 8 & 11, 2013. THE CONDITION OF THE BOTTOM MAY CHANGE AT ANY TIME AFTER THE DATE OF THIS SURVEY.
- ALL BATHYMETRIC DATA WAS COLLECTED IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS HYDROGRAPHIC SURVEY MANUAL EM-112-02-1003 (JANUARY 2002). SURVEY CLASSIFICATION: NAVIGATION AND DREDGING SUPPORT SURVEYS, BOTTOM CLASSIFICATION OF SOFT.

**GRAPHIC SCALE**



Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-340.000	-320.000	Red
2	-320.000	-300.000	Dark Red
3	-300.000	-280.000	Orange
4	-280.000	-260.000	Light Orange
5	-260.000	-240.000	Yellow
6	-240.000	-220.000	Light Green
7	-220.000	-200.000	Green
8	-200.000	-180.000	Light Blue
9	-180.000	-160.000	Blue
10	-160.000	-140.000	Light Blue
11	-140.000	-120.000	Blue
12	-120.000	-100.000	Light Blue
13	-100.000	-80.000	Blue
14	-80.000	-60.000	Light Blue
15	-60.000	-40.000	Blue
16	-40.000	-20.000	Light Blue
17	-20.000	0.000	Blue
18	0.000	20.000	Light Blue
19	20.000	40.000	Blue



<b>REVISIONS</b>	<b>DESCRIPTION</b>	<b>BY</b>	<b>DATE</b>
1	CORRECTED BATHYMETRY ELEVS. BY +0.58'	JNM	12/09/2014

<b>SHEET TITLE:</b>	MILL A BATHYMETRIC AND VESSEL MOUNTED LIDAR SURVEY	<b>CHECKED BY:</b>	RGH
<b>CLIENT:</b>	PORT OF EVERETT EVERETT, WA	<b>DRAWN BY:</b>	JNM
<b>SCALE:</b>	1"=100'	<b>DATE:</b>	OCTOBER 15, 2014
<b>JOB NUMBER:</b>	14-045-01	<b>SHEET:</b>	1 OF 2

<b>PACIFIC GEOMATIC SERVICES, INC.</b> LAND SURVEYING & MAPPING SERVICES QUALITY SERVICE - CREATIVE SOLUTIONS 6608 216TH STREET SW, STE. 304 MOUNTLAKE TERRACE, WA 98043 PHONE: (425) 778-5620 FAX: (425) 775-2849 WEB: www.PacGeoInc.com	<b>PGS/INC</b> 172-08-14
--	-----------------------------

**PRIMARY BENCHMARK:**

VERTICAL DATUM:  
MLLW (MEAN LOWER LOW WATER)

BASED ON AN ALUMINUM DISK ON A CONCRETE MONUMENT IN CASE LOCATED IN THE NORTHWEST CORNER OF THE BOAT LAUNCH PARKING, IN THE NORTHWEST CORNER OF THE PARKING LOT; SAID POINT IS REFERENCED IN THE "PORT OF EVERETT 12TH STREET MARINA" CONSTRUCTION PLANS AS POINT NUMBER 2000/E009, SHEET 6 OF 149.

MLLW ELEV: 17.14'

**VERTICAL DATUM:**

ELEVATION DATUM FOR THIS PROJECT IS 0.0' MEAN LOWER LOW WATER (MLLW)

**TIDAL DATA**

BASED ON NOAA'S PUBLICATION SHEET (WASHINGTON 944-7659), DATED 09-29-1986, THE RELATIONSHIP BETWEEN NAVD 29 AND MLLW DATUM FOR EVERETT, POSSESSION SOUND, FOR THE TIDAL EPOCH 1960-1978 IS AS FOLLOWS:

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MEAN LOWER LOW WATER (MLLW) = 0.0  
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E: 1300666.9227

MONUMENT NO. 2 - CENTERLINE R/W MONUMENT AT THE INTERSECTION OF WEST MARINE VIEW DRIVE AND 14TH STREET - 4" CONCRETE MONUMENT WITH LEAD AND COPPER TACK.

N: 367492.1087  
E: 1302456.1581

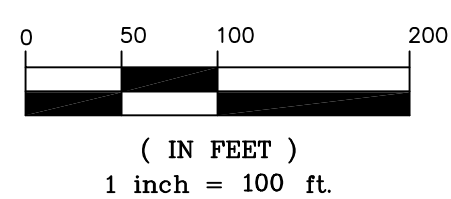
**SCALE FACTOR NOTE:**

THE COORDINATES VALUES ARE WASHINGTON STATE PLANE, NORTH ZONE, GRID COORDINATES. TO CONVERT TO PREVIOUS PROJECT GROUND COORDINATES USE A PROJECT SCALE FACTOR OF 1.0000515777 FROM ORIGIN OF NORTH 0.00, EAST 1640416.665.

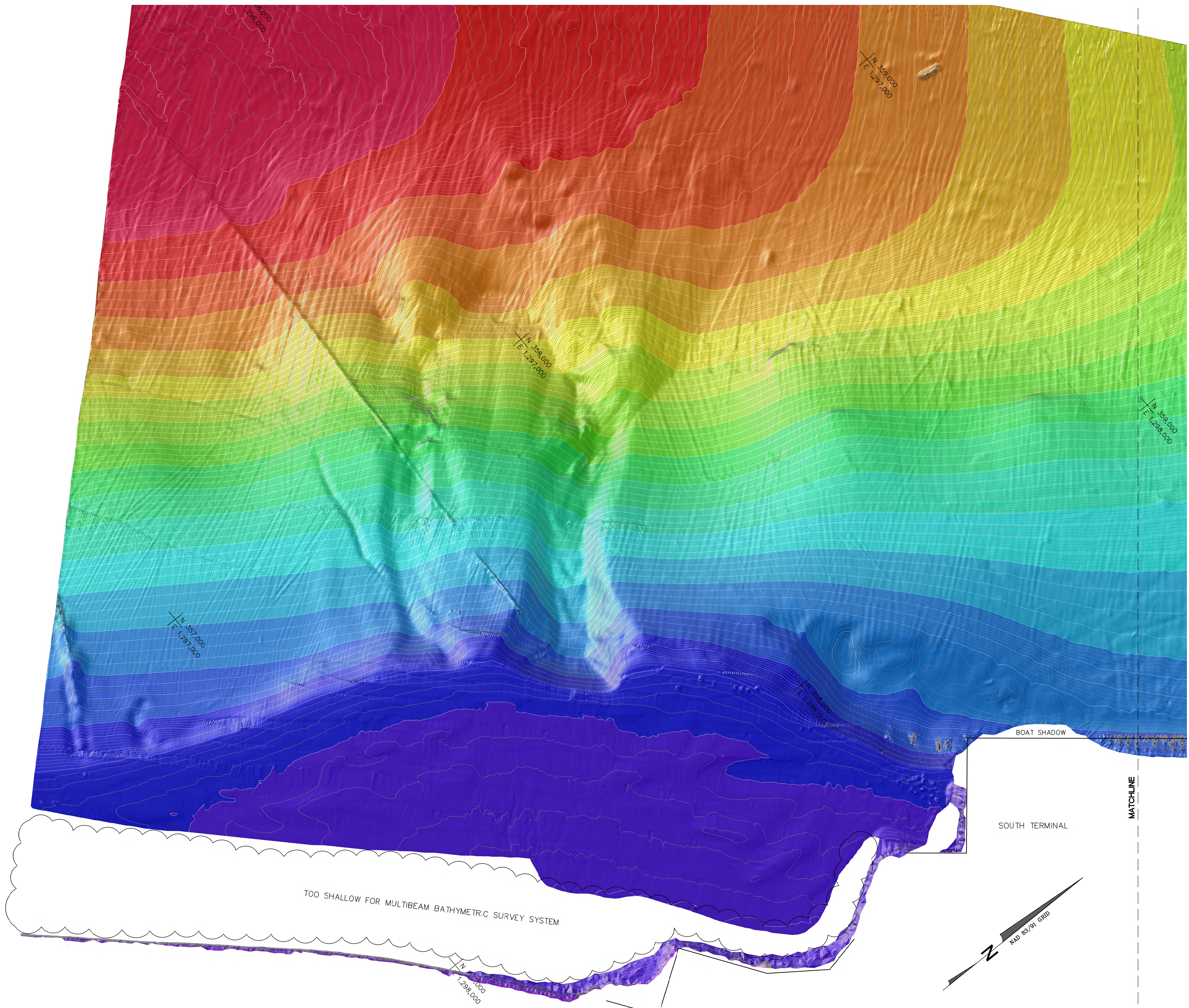
**SURVEYOR'S NOTES:**

- UNITS ARE U.S. SURVEY FEET.
- SEE THE "PORT OF EVERETT 2014 MULTIBEAM BATHYMETRIC AND VESSEL MOUNTED LIDAR SURVEY TECHNICAL MEMORANDUM" PREPARED BY TETRA TECH AND DATED SEPTEMBER 19, 2014 FOR SURVEY SYSTEM SETUP, PROCEDURES, ACCURACY AND DETAILS.
- DATA PROCESSING WAS COMPLETED USING HYPACK/HYSWEEP 2014 SOFTWARE. BATHYMETRY WAS GENERATED USING AUTOCAD CIVIL 3D 2014.
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- ALL BATHYMETRIC DATA WAS COLLECTED IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS HYDROGRAPHIC SURVEY MANUAL EM-112-02-1003 (JANUARY 2002). SURVEY CLASSIFICATION: NAVIGATION AND DREDGING SUPPORT SURVEYS, BOTTOM CLASSIFICATION OF SOFT.

**GRAPHIC SCALE**



Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-340.000	-320.000	Red
2	-320.000	-300.000	Dark Red
3	-300.000	-280.000	Orange
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6	-240.000	-220.000	Light Green
7	-220.000	-200.000	Green
8	-200.000	-180.000	Light Blue
9	-180.000	-160.000	Blue
10	-160.000	-140.000	Dark Blue
11	-140.000	-120.000	Very Dark Blue
12	-120.000	-100.000	Black
13	-100.000	-80.000	Dark Purple
14	-80.000	-60.000	Medium Purple
15	-60.000	-40.000	Light Purple
16	-40.000	-20.000	Very Light Purple
17	-20.000	0.000	White
18	0.000	20.000	Light Blue
19	20.000	40.000	Blue



<b>DRAWN BY:</b> JNM	<b>CHECKED BY:</b> RGH	<b>SCALE:</b> 1"=100'	<b>DATE:</b> OCTOBER 15, 2014
<b>SHEET TITLE:</b> MILL A BATHYMETRIC AND VESSEL MOUNTED LIDAR SURVEY		<b>JOB NUMBER:</b> 14-045-01	<b>SHEET:</b> 2 OF 2
<b>CLIENT:</b> PORT OF EVERETT EVERETT, WA			
<p><b>PACIFIC GEOMATIC SERVICES, INC.</b> LAND SURVEYING &amp; MAPPING SERVICES QUALITY SERVICE - CREATIVE SOLUTIONS 6608 216TH STREET SW, STE. 304 MOUNTLAKE TERRACE, WA 98043 PHONE: (425) 778-5620 FAX: (425) 775-2849 WEB: www.PacGeoInc.com</p>			
<b>REVISIONS</b>	<b>DESCRIPTION</b>	<b>BY</b>	<b>DATE</b>
1	CORRECTED BATHYMETRY ELEV. BY +0.58'	JNM	12/09/2014