CITY OF CHEFORNAK, ALASKA

2011 SCATTERED BOARDWALK AREA II IMPROVEMENTS PROJECT

Design funded by Indian Health Service Grant AN10-NQ2
Clean Water Act funds / VSW Project 11AM89

ISSUED FOR CONSTRUCTION - JAN. 2012

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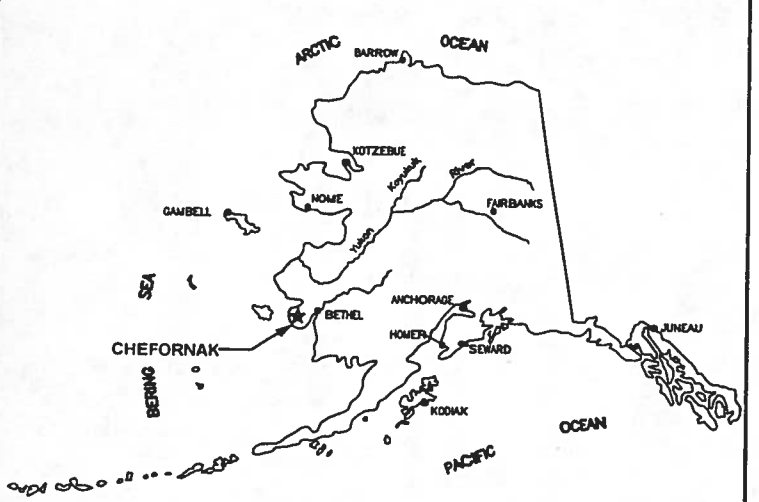


PROJECT LOCATION

Location Map

CE2 ENGINEERS, INC.
PO BOX 232946 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

STATE OF ALASKA
PAUL C. WEISNER
CE-10278
REGISTERED PROFESSIONAL ENGINEER
1-19-2012

Consultant

RECORD DRAWING CERTIFICATE

THESE DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION.
INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.

NAME DATE

Construction Foreman	–	
FINAL DESIGN	(Date) –	
ADEC APPROVAL	(Date)	
Construction Period	(From) –	(To) –
As-Builts	(Date)	

DESIGN DESIGNATIONS

ADT (2011)	<50
ADT (2031)	<250
DESIGN SPEED (V) (MPH)	10
RECOMMENDED SPEED (Vr) (MPH)	10
% TRUCKS	N/A
DIRECTIONAL SPLIT (D)	50/50
DHV (20%)	<20
MAX. GRADE (G)	1.67%
CURRENT POPULATION (2010 DCCED)	418
DESIGN POPULATION (PROJECTED 20 YEAR)	621

G:\ACAD\CHEFORNAK\2011 Boardwalk Regrade\Cfr-cover.dwg, 1/19/2012 1:46:35 PM, cmerz, \\Ce2main\LANTER MP C2050/LD520C PCL 6a

GENERAL NOTES

GENERAL:

1. All construction shall be done in a safe workmanlike manner to industry standards and in conformance with applicable local state and federal codes and regulations. High standards of workmanship showing a sense of pride by workmen shall be maintained. Workers shall be prepared to sign their individual work as if it was their own artwork.

2. All Materials shall meet or exceed the minimum quality standards specified in the drawings. Any material in contact with the well water or potable water shall be NSF 61 approved. Solder containing lead shall not be allowed.

3. The basis of vertical control is the south rim at the top of the 6" well casing for well WW-2, the location of which is shown on the Survey Control Diagram to the right. The elevation of the top of casing is 80.75 ft.

4. The basis of horizontal control is the recorded bearing between corners C1 and C2 of U.S. Survey No. 4421. The bearing is S 0°00'00" E (due South) with a recorded distance of 509.68 LF (Meas. 509.35 LF). See the Survey Control Diagram to the right.

5. Existing utilities are shown in approximate location to the best knowledge of the engineer at the time of design. Utility records may not be completely accurate. The project superintendent shall verify horizontal and vertical location of utilities within each construction reach prior to construction. All utilities are above ground unless otherwise noted.

Water and Sewer - CHEFORNAK WATER AND SEWER UTILITY	(907) 867-8301
Electric - NATERKAQ LIGHT PLANT	(907) 867-8213
Telephone - UNITED UTILITIES, Inc.	(800) 478-2020

6. The project superintendent shall be responsible for maintaining a clean set of as-built "red line" record drawings showing location and swing ties to all buried system components. All elevations shall be marked ASB (as-built) or F.C. (field changed) with the correct value inserted. Drawings shall be kept current in red pencil and updated daily in a neat and legible fashion. A copy of the as-built drawings shall be submitted to the Chefornak Utility Board and the Village Safe Water Project Engineer.

7. General Restoration - The areas impacted by construction shall be returned to preconstruction condition or better. Construction debris shall be removed from the area and disposed of in a proper manner. Due care and caution shall be taken to avoid disturbing personal property.

8. Construction in sensitive areas - Timber mats or pads shall be used to protect vegetative cover during construction. Any damage caused by construction activities shall be repaired or reseeded as necessary to return the areas affected by construction to its preconstruction state.

9. The construction site shall be adequately protected, restricted and barricaded in the best public interests of health, safety and welfare, with visible and stable BARRIERS, understandable, large-print WARNING SIGNS, and other precautionary equipment and measures as required. All safety measures shall be in conformance with applicable state of Alaska DOT and OSHA safety requirements.

10. Existing BOARD ROAD shall be removed only where indicated on the plans and in all areas where the existing BOARD ROAD conflicts with the proposed BOARD ROAD alignment. Removed BOARD ROAD material with any salvage value shall be cleaned of fasteners (nails, screws, plates, etc.) and neatly stacked at a location designated by the city. Provide stickers between every third row in the stack. Existing BOARD ROAD material with no salvage value shall be disposed of at the landfill.

DESIGN CRITERIA:

WIND:	110 MPH - EXPOSURE C
SNOW LOAD:	30 PSF
SEISMIC DESIGN:	ZONE 1
BOARD ROAD MOVABLE LOAD	7,000 LBS. PER WHEEL
BOARD ROAD MOVING LOAD	2,000 LBS. PER WHEEL
DESIGN TEMPERATURE:	13,000 HEATING DEGREE DAYS
LOOP WATER TEMPERATURE	40°F ± 2°F

BOARD ROAD:

1. All BOARD ROAD materials shall be as specified in the drawings and meet the following requirements:

A. HELICAL PIER SUPPORTS (where required): All helical pier supports shall be 2-7/8" Ø galvanized SCH 80 steel pipe with 10" helix (for permafrost areas) or 8", 10" and 12" helices (for thawed areas). Pier support shall be capable of meeting the following minimum requirements:

Torque:	10,000 Ft.-Pounds
Axial Strength (tension):	100,000 Pounds
Axial Load (compression):	40,000 Pounds
Galvanization (after fabrication):	ASTM A-153

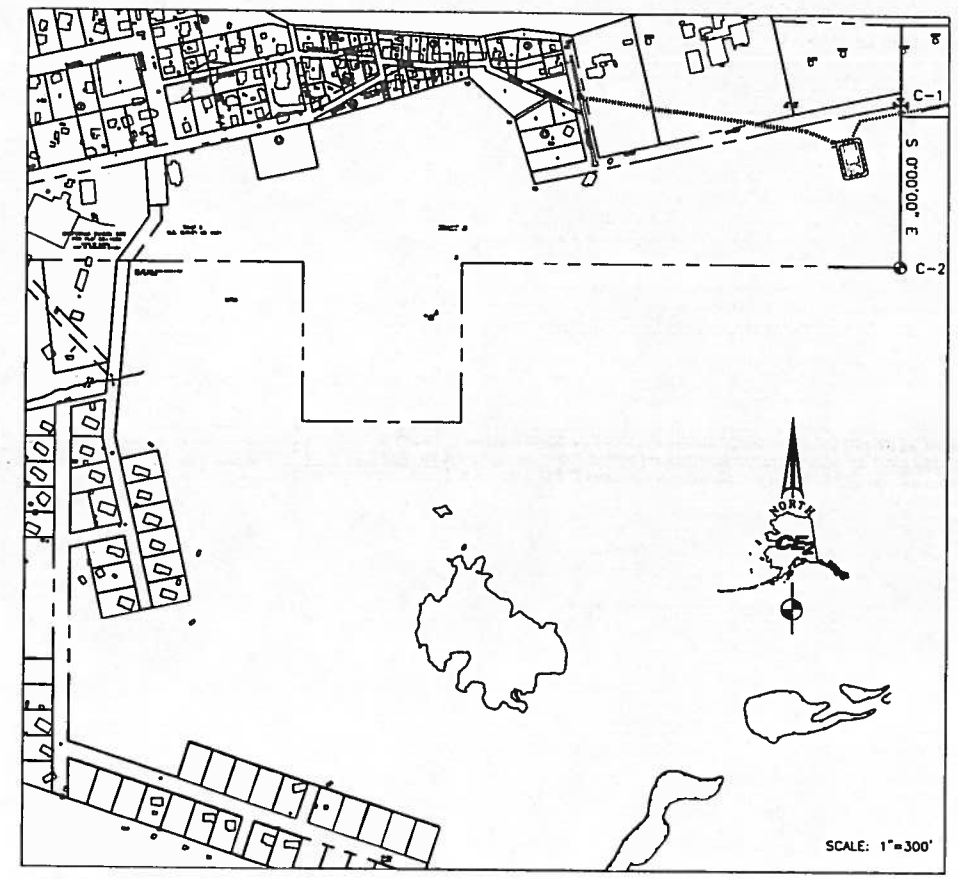
B. LUMBER: Hemlock and Douglas Fir (hem-fir) grade #2 or better. All sizes are given in nominal dimensions (i.e., 4X12 will measure 3 1/2" thick by 11 1/2" wide).

C. WOOD TREATMENT: All wood materials used shall be treated with the wood preservative CROMATED COPPER ARSENATE (CCA) or ALKALINE COPPER QUATERNARY (ACQ) at the following concentrations:

"SOIL CONTACT" (includes all sleepers) - 0.6 pounds per cubic foot
ABOVE GROUND (>6" above ground) - 0.4 pounds per cubic foot

D. HARDWARE AND FASTENERS: All structural steel plates, shapes, bars and assemblies shall, after the steel has been thoroughly cleaned of rust and scale, be galvanized in accordance with the requirements of ASTM A 123. Bolts, nuts and similar threaded fasteners shall be galvanized in accordance with the requirements of A 153. Field repairs to galvanizing shall be made using "GALVINOX", "GALVO-WELD" OR EQUAL.

SURVEY CONTROL DIAGRAM



PROJECT SCOPE

THIS PROJECT SHALL REGRADE APPROXIMATELY 750 LINEAR FEET OF BOARD WALK WHERE FOUNDATION SUPPORTS HAVE FAILED AND REPLACE AND/OR UPGRADE 1200 LINEAR FEET OF EXISTING RAILINGS THAT HAVE FAILED DUE TO EXCESSIVE SNOW DRIFTING.

REGRADING WILL ADDRESS SAFETY ISSUES ASSOCIATED WITH EXCESSIVE CROSS-SLOPE AND RESULTING SIDEWAYS SLIDING DURING ICY CONDITIONS. IN CERTAIN AREAS, THE EXISTING CROSS-SLOPE IS GREATER THAN 15 DEGREES AND IS CAUSED BY DIFFERENTIAL SETTLEMENT AS FROZEN SOILS BENEATH THE BOARD WALK HAVE THAWED. IN ALL OF THESE AREAS, NEW OR DEEPER HELICAL PIERS WILL BE INSTALLED TO SUPPORT THE BOARDWALK AS IT IS ADJUSTED BACK TO THE ORIGINAL GRADE SHOWN ON THE PLANS.

EXISTING HELICAL PIER SUPPORTED AREAS WILL BE UPGRADED WITH TWO (2) NEW HELICAL PIERS AT EACH EXISTING GIRDER (12' O.C. TYP.) WITH A HANGER ASSEMBLY ON EACH END. SLEEPER SUPPORTED AREAS WILL UPGRADED USING AN 8" CHANNEL PLACED ADJACENT TO A SLEEPER SUPPORT WITH A HELICAL PIER SUPPORT AT EACH END. IN AREAS, THE SLEEPER SUPPORT SYSTEM MAY BE JACKED OFF OF THE GROUND DURING RELEVELING THE BOARD WALK. IT IS INTENDED THAT THE SLEEPER SUPPORT BE LEFT INTACT TO PROVIDE A STRUCTURAL SPLICE FOR STAGGERED BOARDWALK DECKING BUTT JOINTS.

ANY CONCERNS WITH THE INTEGRITY OF THE SLEEPER SUPPORT SYSTEM SHOULD BE BROUGHT TO THE ENGINEERS ATTENTION AS SOON AS PRACTICAL.

RAILING SYSTEMS WILL ALSO BE UPGRADED IN SELECT AREAS TO COMPLETE UPGRADES AND/OR REPLACEMENT OF EXISTING FAILED SYSTEM COMPONENTS.

AT NO POINT DURING CONSTRUCTION SHOULD TRAFFIC BE HALTED FOR MORE THAN 10 MINUTES. IF A LONGER CLOSURE IS REQUIRED, A TEMPORARY BYPASS, EQUAL IN CONSTRUCTION TO THE BOARDWALK SHALL BE PROVIDED BY THE CONSTRUCTOR.

LEGEND

EXISTING PLAN VIEW	EXISTING PROFILE VIEW	PROPOSED PLAN VIEW	PROPOSED PROFILE VIEW	DESCRIPTION
				PROPOSED BOARD WALK IMPROVEMENTS
				EXISTING BOARD WALK
				GROUND PROFILE
W		W		WATERMAIN
		WM		FUTURE WATERMAIN
		FM		FUTURE WASTEWATER FORCEMAIN
E				OVERHEAD ELECTRIC
POL				PETROLEUM/OIL/LUBRICANTS
				UTILITY POLE AND GUY WIRE ANCHOR
X				FENCE
24				CONTOUR LINE
				SHORELINE
				EXISTING GROUND
				STRUCTURE
				EARTHWORK SLOPE
				NATURAL GROUND OR COMPACTED SOIL
				DIRECTION OF DRAINAGE
				PROPERTY LINE OR SECTION LINE
				MATCHLINE
				PERMANENT EASEMENT
		A.W.W.		ALL WEATHER WOOD
CMP (xx.xx)				CORRUGATED METAL PIPE
				EXISTING GRADE ELEV.
		TOB		TOP OF BOARD ROAD ELEV.
OR B.C.				BRASS CAP MONUMENT AS NOTED
				TEST HOLE
+ 24.5				SPOT ELEVATION
27				BLOCK NUMBER
3A				LOT NUMBER
IPS				IRON PIPE SIZE (INDUSTRY STANDARD OUTSIDE PIPE DIAMETER)
WW X				6" WELL
		M.B.		MECHANICAL BOLT
		G.R.C.		GALVANIZED RIGID CONDUIT
		ELEV.		ELEVATION

SECTION AND DETAIL DESIGNATIONS

A' / S-1 — SECTION LETTER; SECTION; NTS; SHEET ON WHICH SECTION IS SHOWN

2 / S-2 — DETAIL NUMBER; DETAIL; NTS; SHEET ON WHICH DETAIL IS SHOWN

RECORD DRAWING CERTIFICATE
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NAME / DATE

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CONSTRUCTION RECORD
FIELD BOOK
STAKING
FOREMAN
AS-BUILT
INSPECTOR

STATE OF ALASKA — PAUL E. WEBER CE-10276 — REGISTERED PROFESSIONAL ENGINEER — 1-12-2012

2011 BOARDWALK IMPROVEMENTS PROJECT

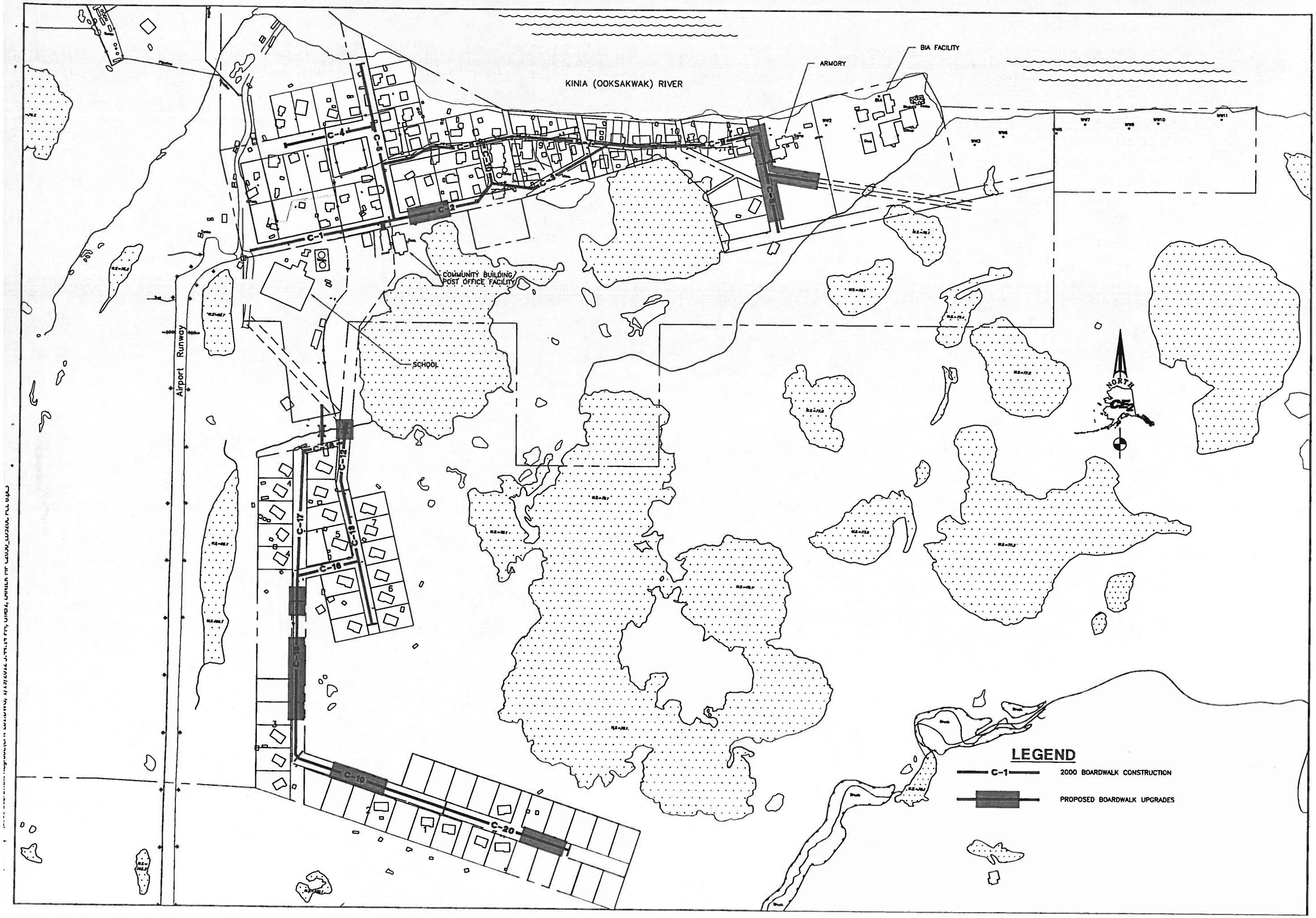
NOTES AND SURVEY CONTROL
CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.
PO BOX 230946 ANCHORAGE, AK 99523 PH: 907-349-1016 FAX: 907-349-9115

REVISION	BY	DATE

Project No. ____ Date JAN. 2012 Designed LAP Drawn LAW Approved LAP

Sheet No. G-1
SHEET ____ OF ____



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INSPECTOR

STATE OF ALASKA 49TH PAUL C. REISNER CE-10276 REGISTERED PROFESSIONAL ENGINEER

2011 BOARDWALK IMPROVEMENTS PROJECT

KEY MAP

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.

PO BOX 233946 ANCHORAGE, AK 99523 PH: 907-348-1010 FAX: 907-348-1015

REVISION	BY	DATE

Project No. ____

Date JAN. 2012

Designed LAP

Drawn LAW

Approved LAP

Sheet No. L-1

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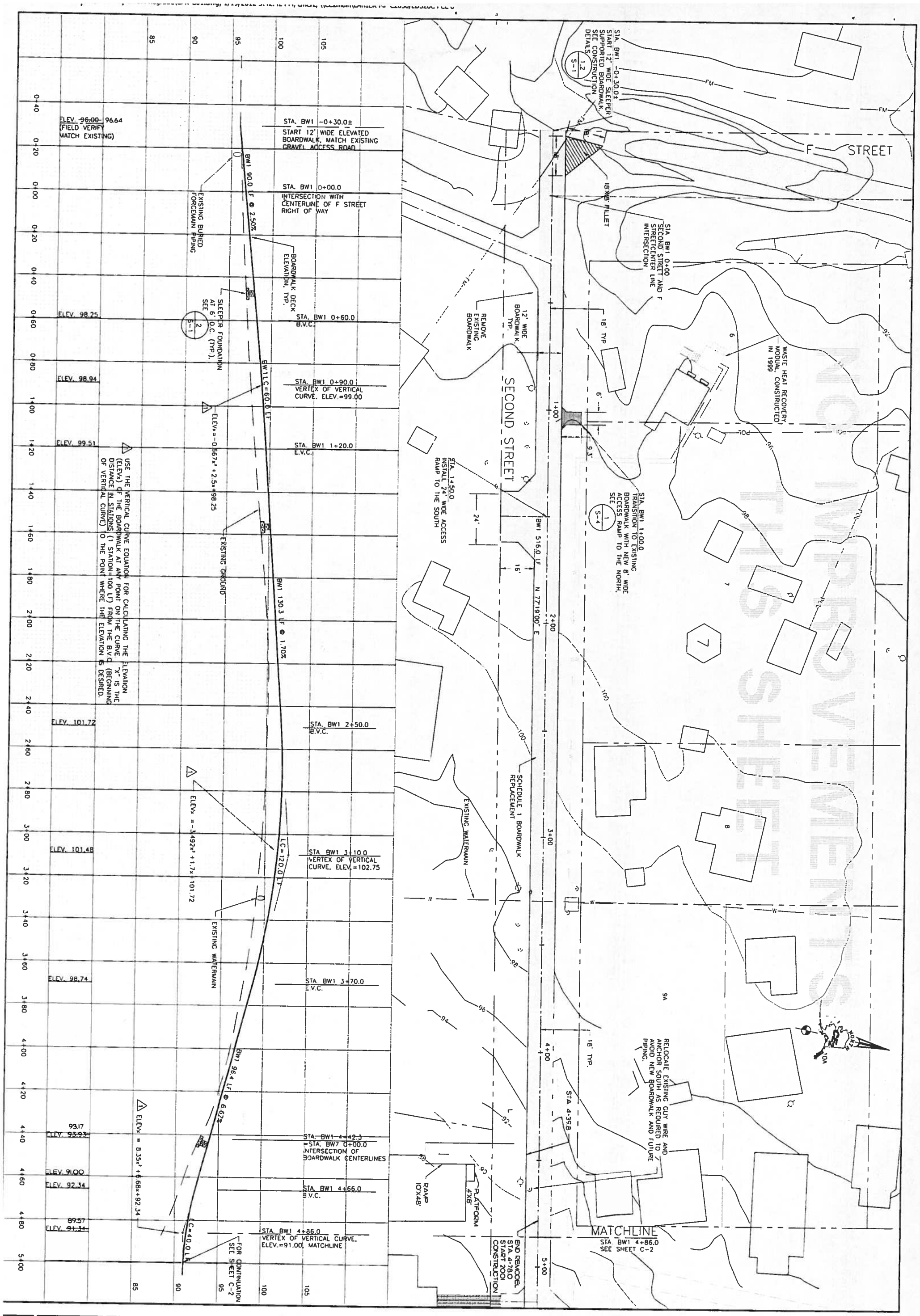

PRELIMINARY NOT FOR CONSTRUCTION

Sheet No.	C-1
SHEET	OF
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Date	JAN. 2012
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Drawn	LAW
Approved	LAP

REVISION	BY	DATE

CE2 ENGINEERS, INC.
PO BOX 232948 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

2011 BOARDWALK IMPROVEMENTS PROJECT

SECOND STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. WOSNER CE-10276 REGISTERED PROFESSIONAL ENGINEER
1-19-2012

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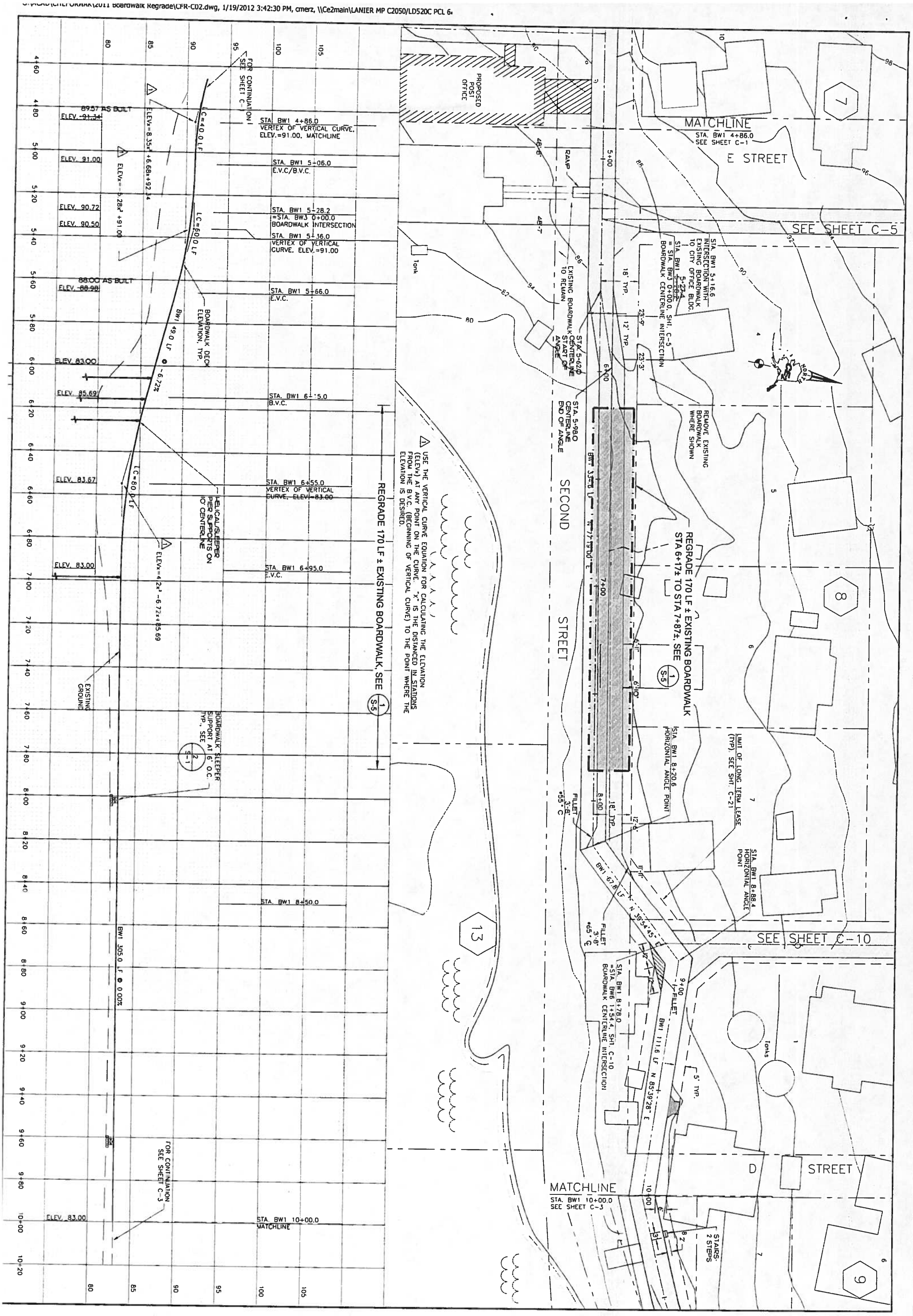

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2011 BOARDWALK IMPROVEMENTS PROJECT

SECOND STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. WIDNER CE-10276 REGISTERED PROFESSIONAL ENGINEER
1-19-2012

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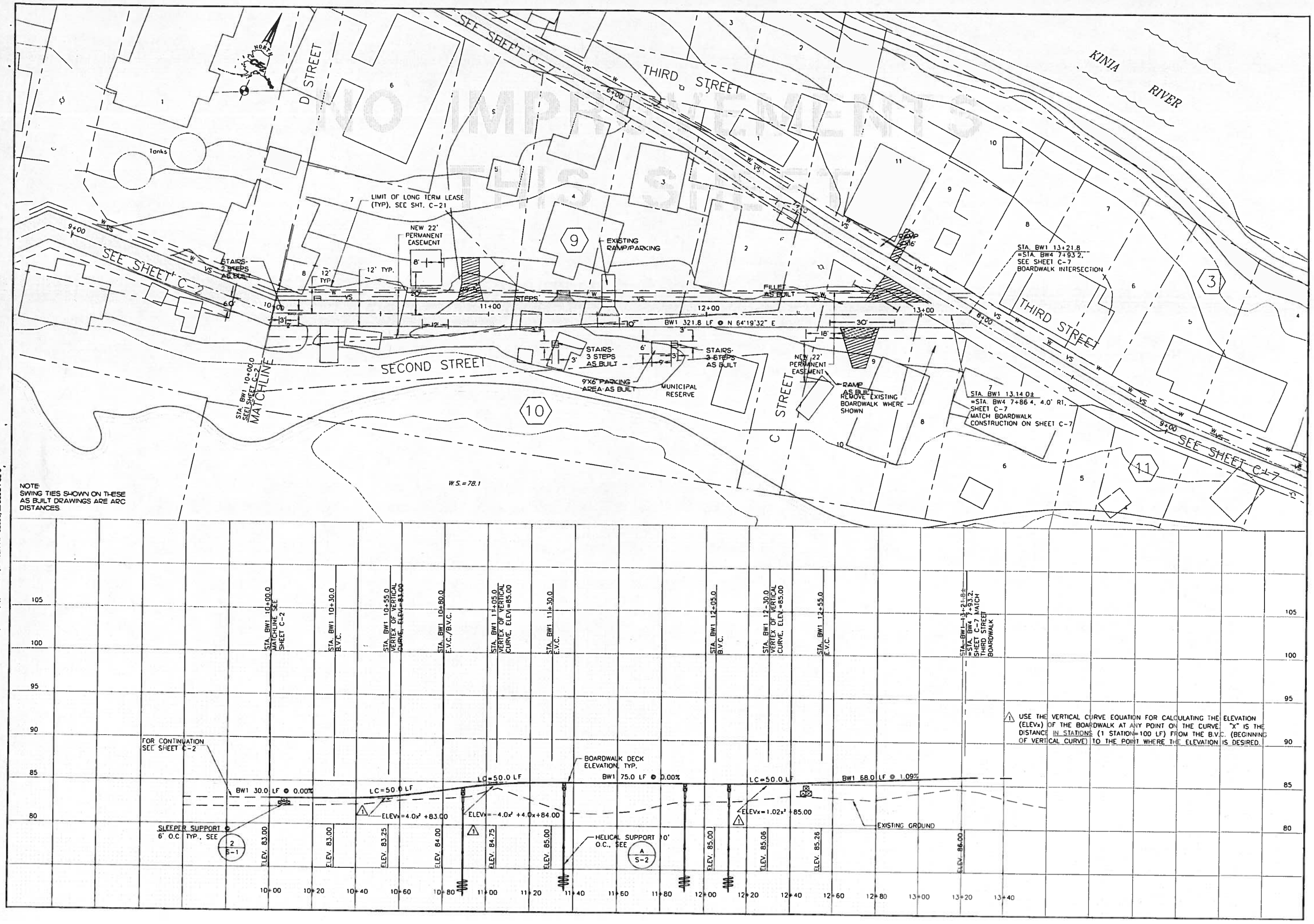

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INSPECTOR

STATE OF ALASKA 49TH PAUL C. RITCHER CE-10276 REGISTERED PROFESSIONAL ENGINEER 1-12-12

2011 BOARDWALK IMPROVEMENTS PROJECT

SECOND STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.

PO BOX 230948 ANCHORAGE, AK 99523 PH: 907-349-9310 FAX: 907-349-9315

REVISION	BY	DATE

Project No. ____ Date JAN. 2012

Designed LAP

Drawn LAW

Approved LAP

Sheet No C-3

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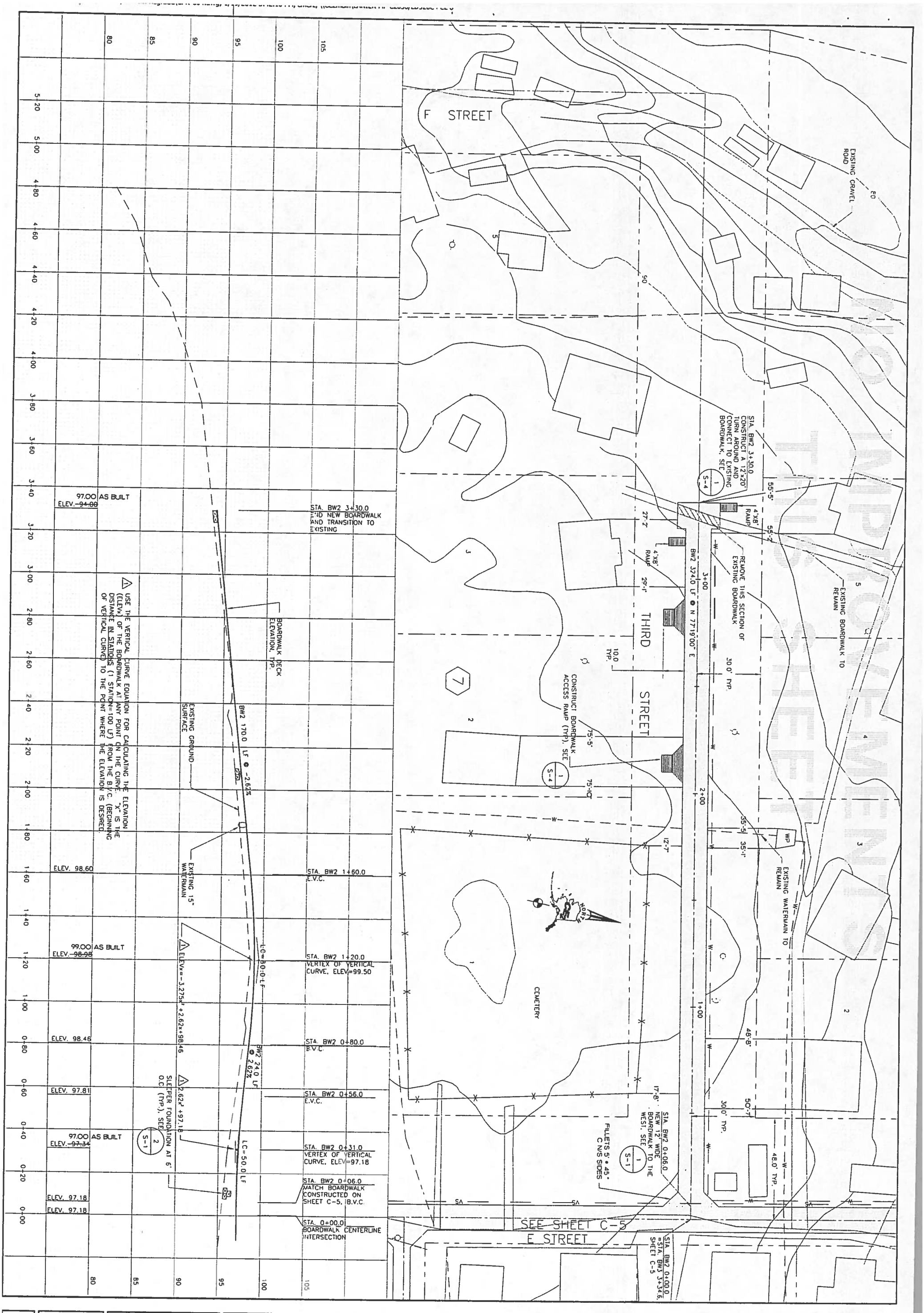

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PO BOX 232946 ANCHORAGE, AK 99523 PH: 907-348-1010 FAX: 907-348-1015

2011 BOARDWALK IMPROVEMENTS PROJECT

THIRD STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. WEISNER CE-10276 REGISTERED PROFESSIONAL ENGINEER 1-19-2012

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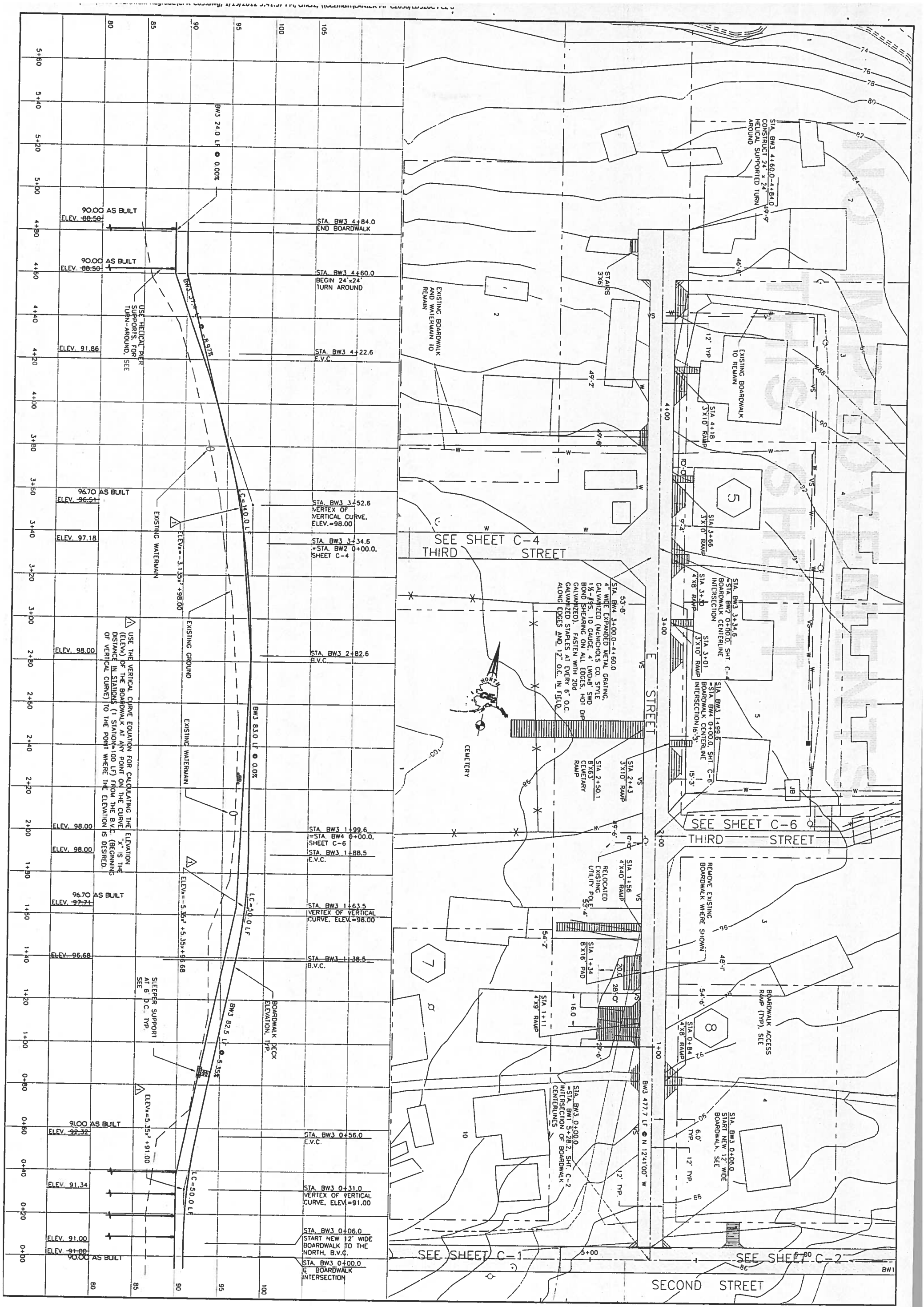

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C-5		JAN. 2012	LAP	LAW	LAP

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2011 BOARDWALK IMPROVEMENTS PROJECT

"E" STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. WOSNER CE-10276 REGISTERED PROFESSIONAL ENGINEER
1-19-2012

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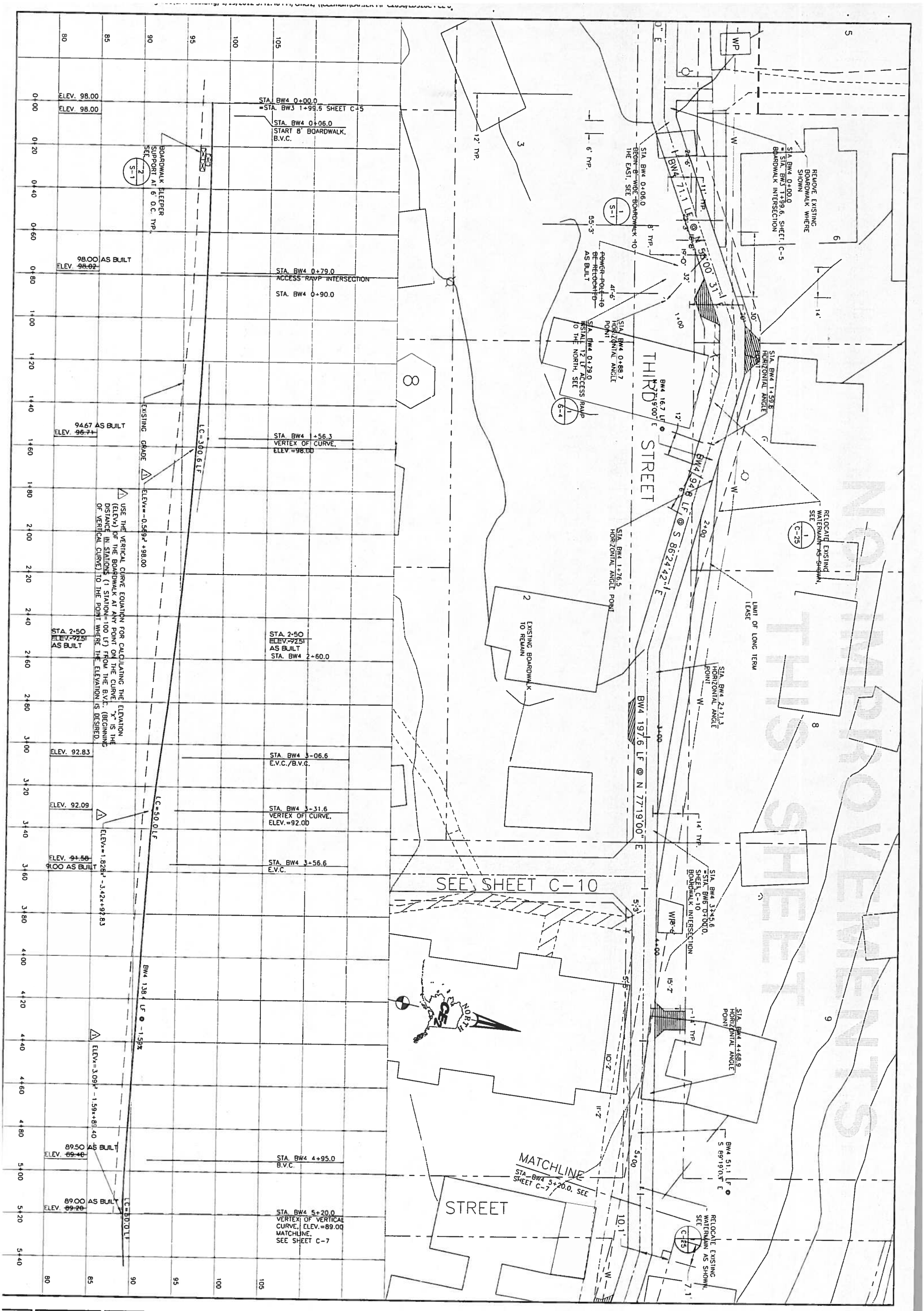

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2011 BOARDWALK IMPROVEMENTS PROJECT

THIRD STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. WEISNER CE-10276 REGISTERED PROFESSIONAL ENGINEER 1-5-2012

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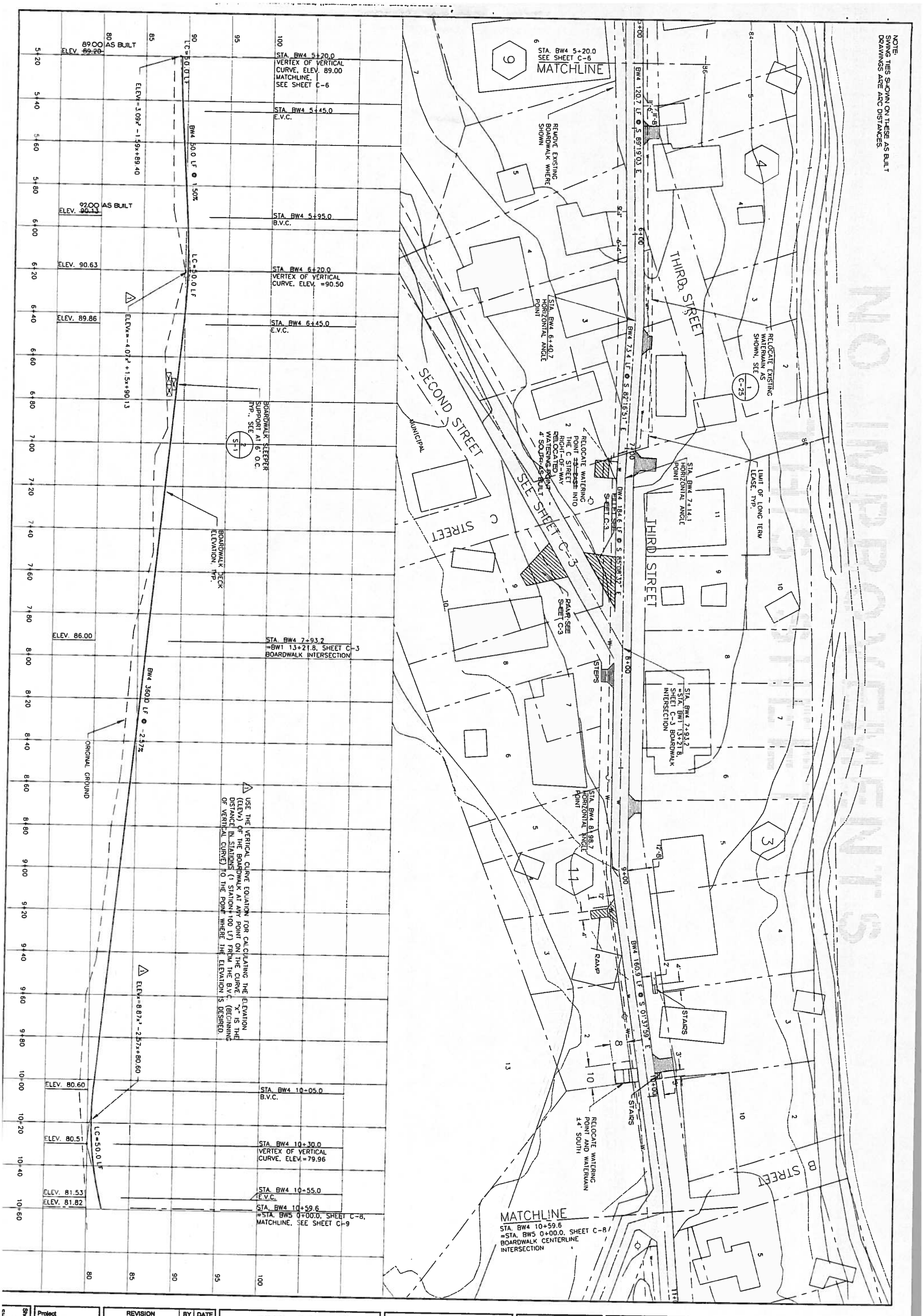
NOTE:
SWING TIES SHOWN ON THESE AS BUILT DRAWINGS ARE ARC DISTANCES.



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CE2 ENGINEERS, INC.
PO BOX 232948 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

2011 BOARDWALK IMPROVEMENTS PROJECT

THIRD STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. MEISNER CE-10276 REGISTERED PROFESSIONAL ENGINEER
1-19-2012

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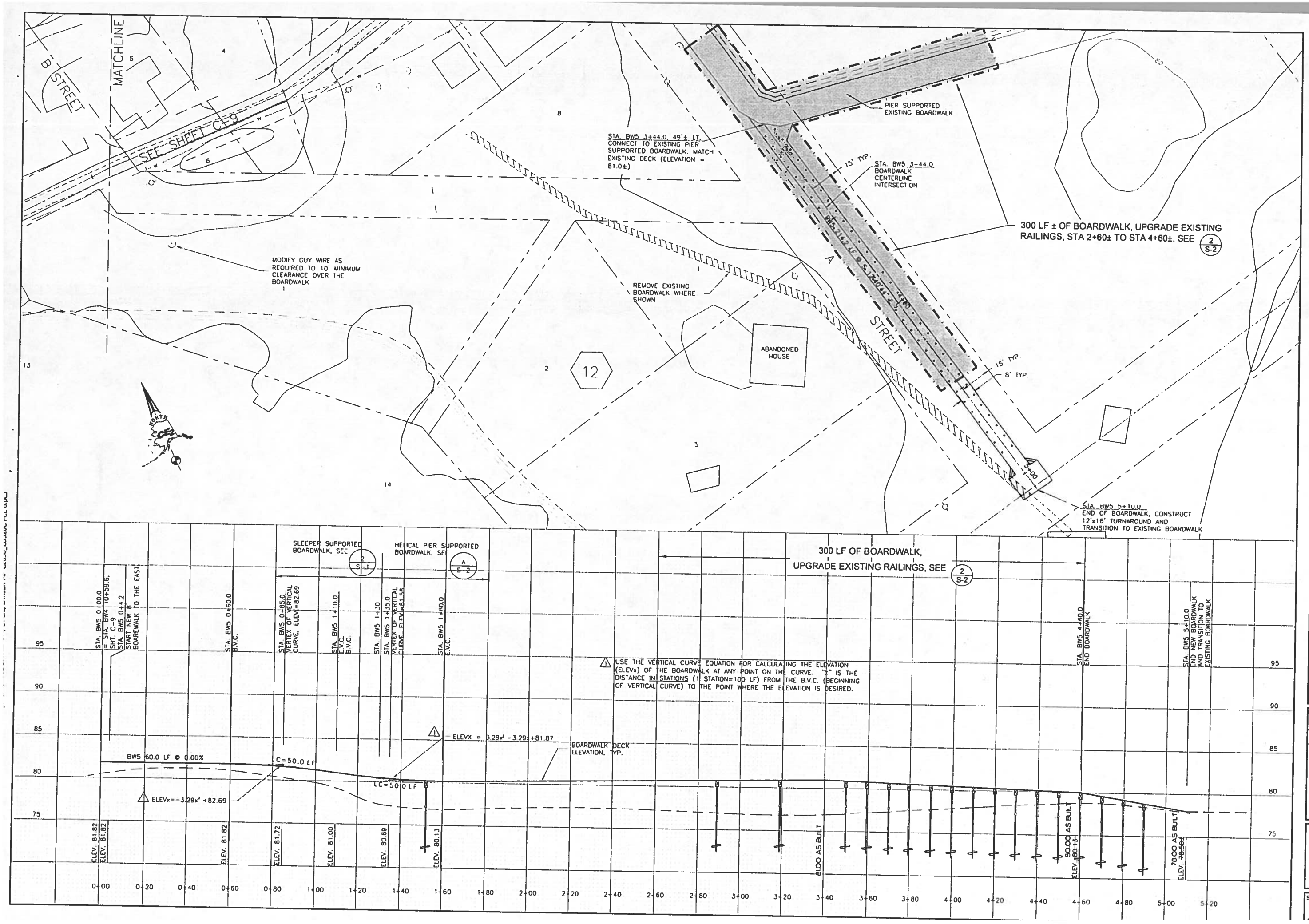

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STA/GNG

FOREMAN

AS-BUILT

INSPECTOR

STATE OF ALASKA
PAUL C. WEISNER
CE-10276
REGISTERED PROFESSIONAL ENGINEER
1-19-2012

2011 BOARDWALK IMPROVEMENTS PROJECT

"A" STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.

PO BOX 22248 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

REVISION	BY	DATE

Project No.

Date JAN. 2012

Designed LAP

Drawn LAW

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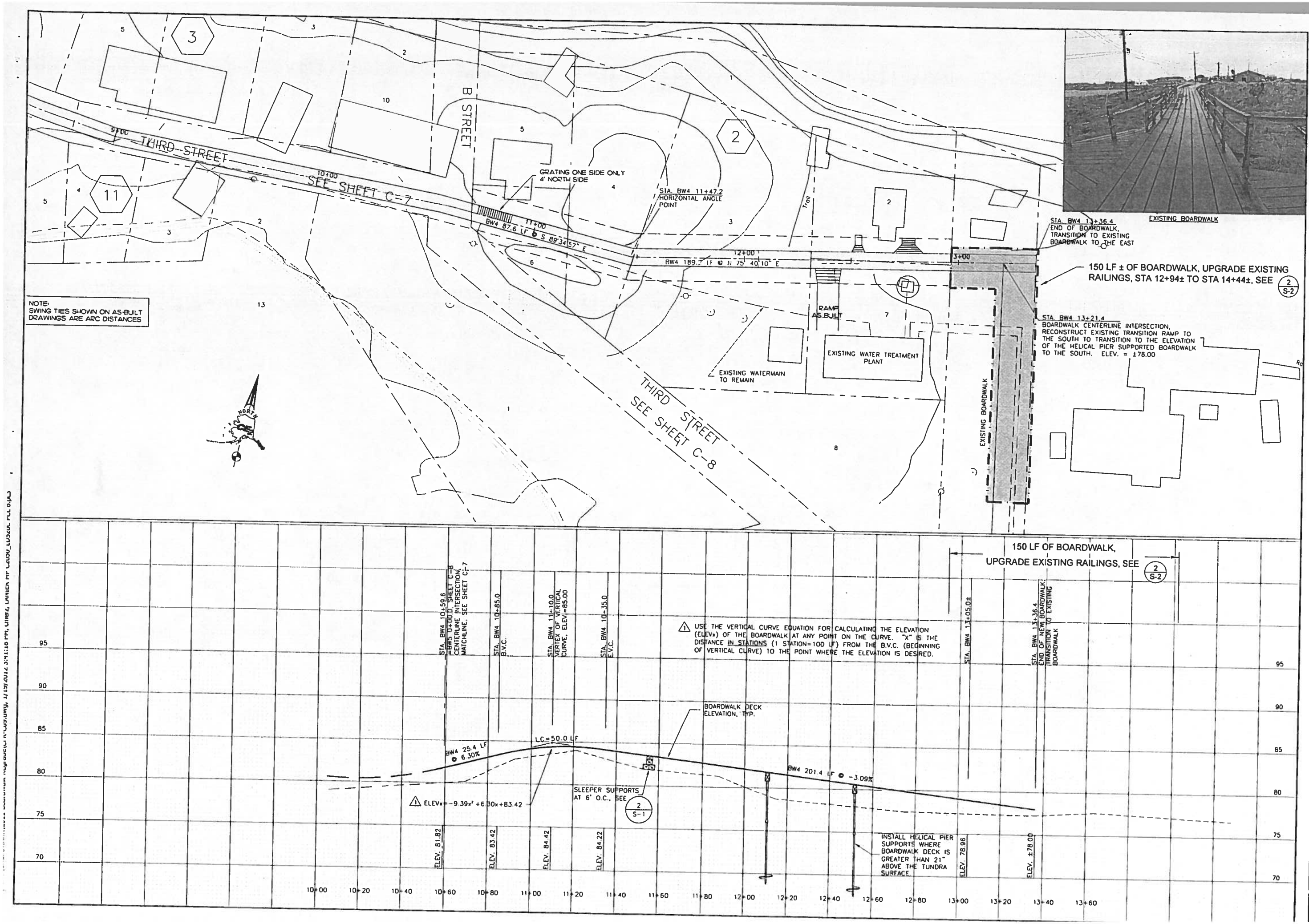

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FIELD BOOK

STAKING

FOREMAN

AS-BUILT

INSPECTOR

STATE OF ALASKA 49TH PAUL C. WEISNER CE-10276 REGISTERED PROFESSIONAL ENGINEER 1-12-2012

2011 BOARDWALK IMPROVEMENTS PROJECT

"A" STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.

PO BOX 223948 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

REVISION	BY	DATE

Project No.

Date JAN. 2012

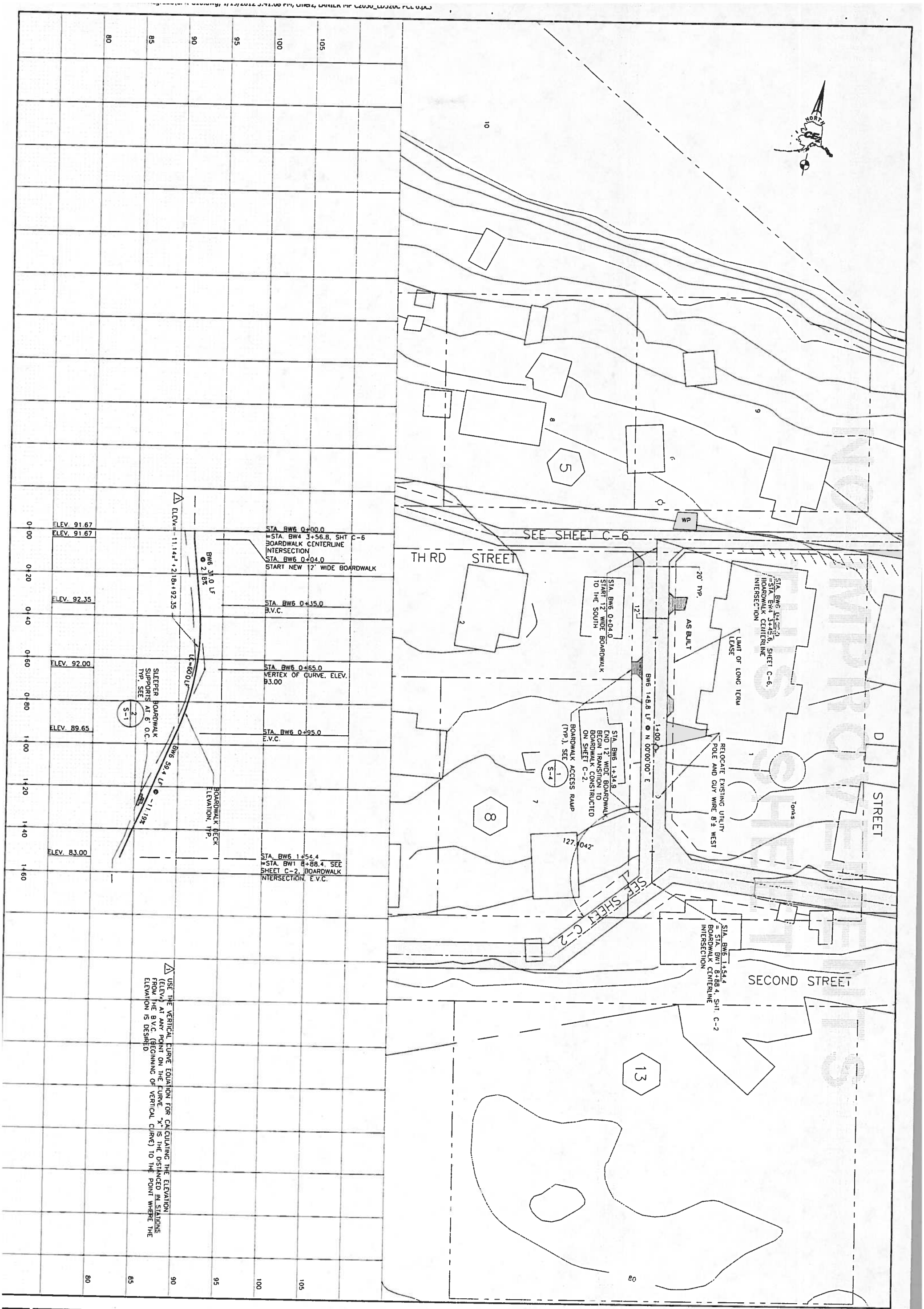
Designed LAP

Drawn LAW

Approved LAP

Sheet No. C-9

SHEET OF



Project No.	
Date	JAN. 2012
Designed	LAP
Drawn	LAW
Approved	LAP

REVISION	BY	DATE

CE2 ENGINEERS, INC.
PO BOX 232948 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK
PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA
PAUL C. WEYSNER
CE-10276
REGISTERED PROFESSIONAL ENGINEER
1-16-2012

CONSTRUCTION RECORD
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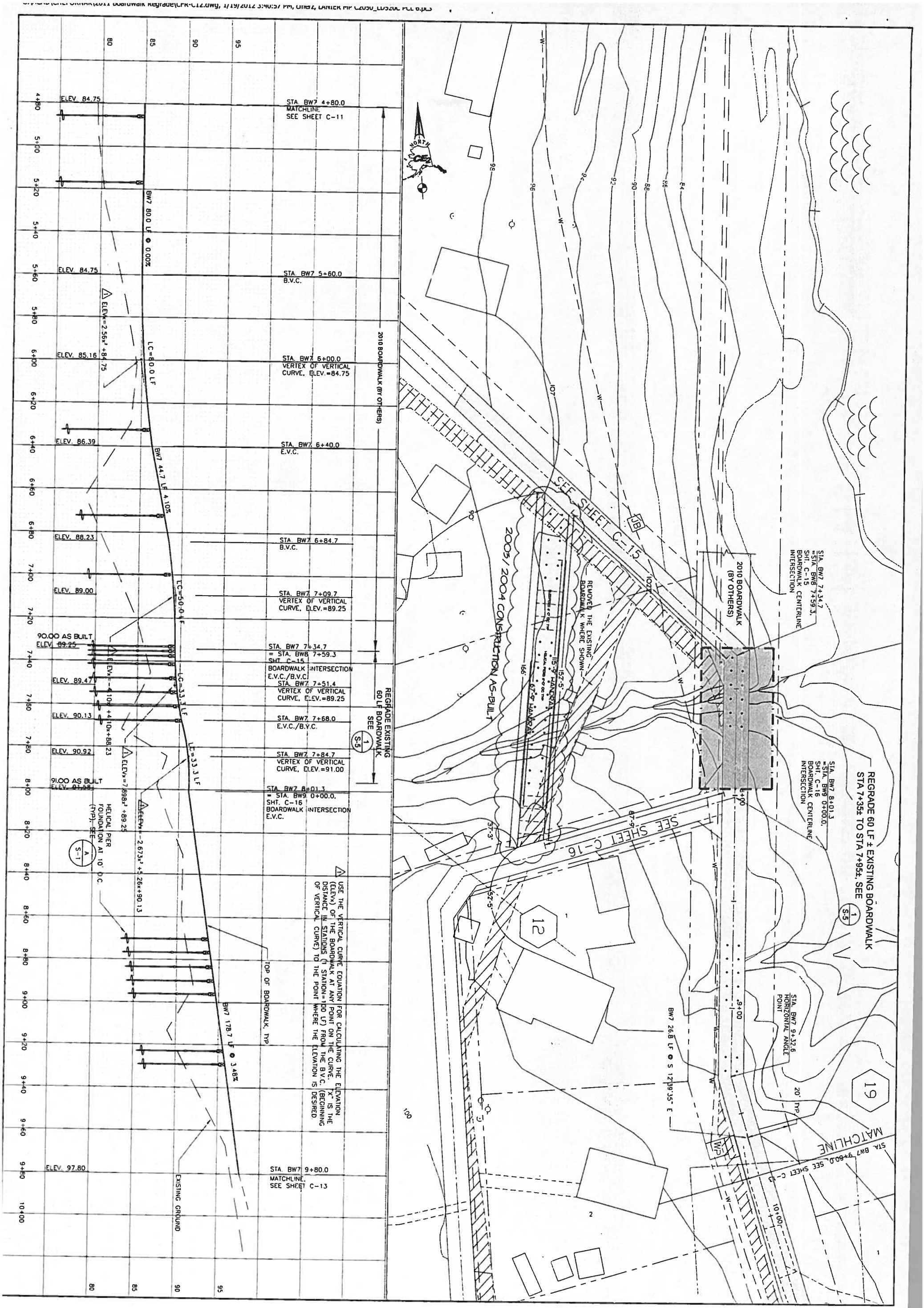

Project No.	
Date	JAN. 2012
Designed	LAP
Drawn	LAW
Approved	LAP

REVISION	BY	DATE

CE2 ENGINEERS, INC.
PO BOX 232948 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

2011 BOARDWALK IMPROVEMENTS PROJECT

"A" STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. WEISNER CE-10276 REGISTERED PROFESSIONAL ENGINEER

1-19-2012

CONSTRUCTION RECORD
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Sheet No. C-12

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INTERIM ISSUE

Sheet No.
C-13

Project No.	
Date	JAN. 2012
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Approved	LAP

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CE2 ENGINEERS, INC.
PO BOX 232948 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

2011 BOARDWALK IMPROVEMENTS PROJECT

"A" STREET BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. WOSNER CE-10276 REGISTERED PROFESSIONAL ENGINEER
1-19-2012

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INSPECTOR

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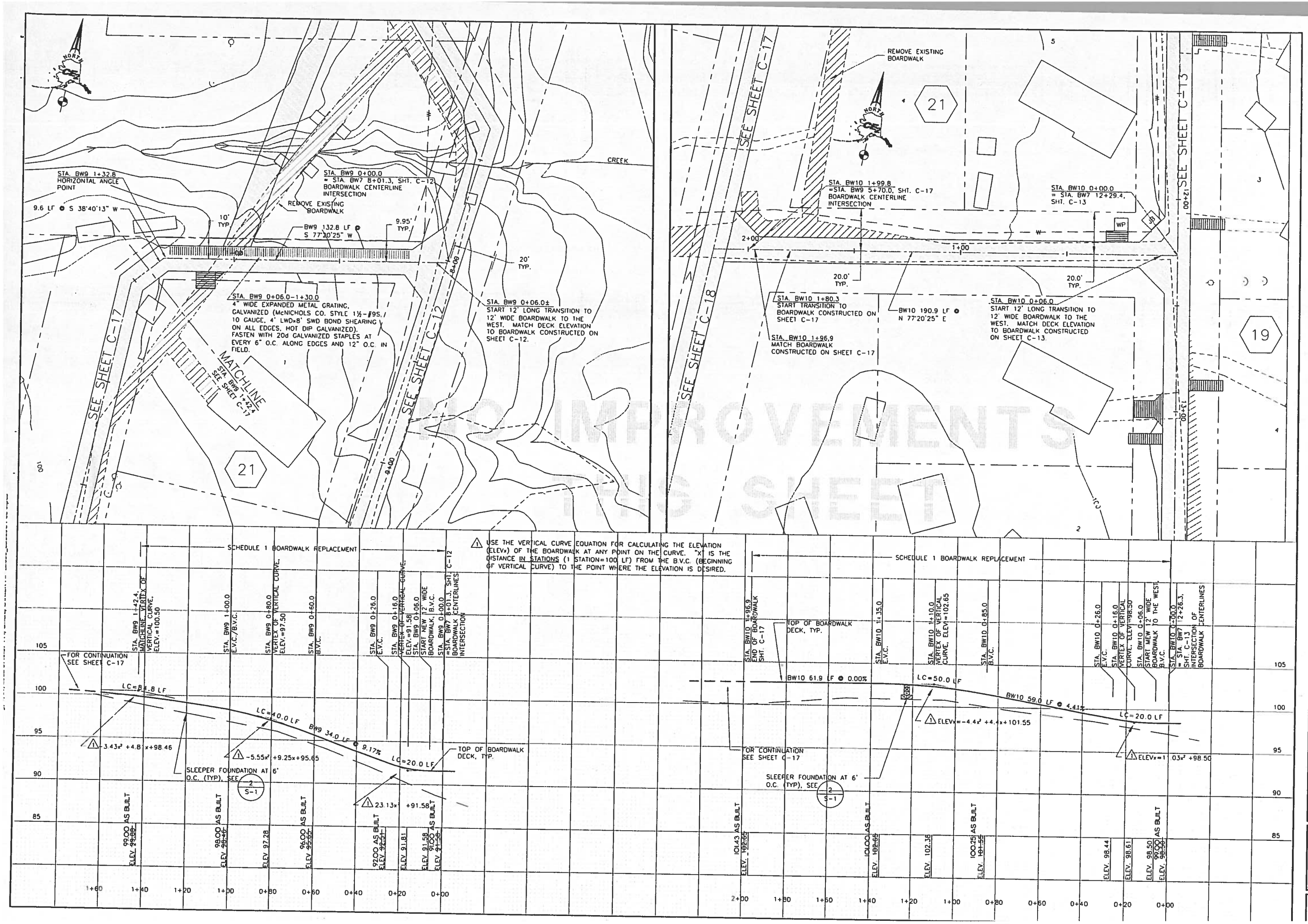

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0 1"
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BY/ADMIN
FOREMAN
AS-BUILT
INSPECTOR

STATE OF ALASKA 49TH
PAUL L. KIBBEY
CE-10276
REGISTERED PROFESSIONAL ENGINEER
1-17-2012

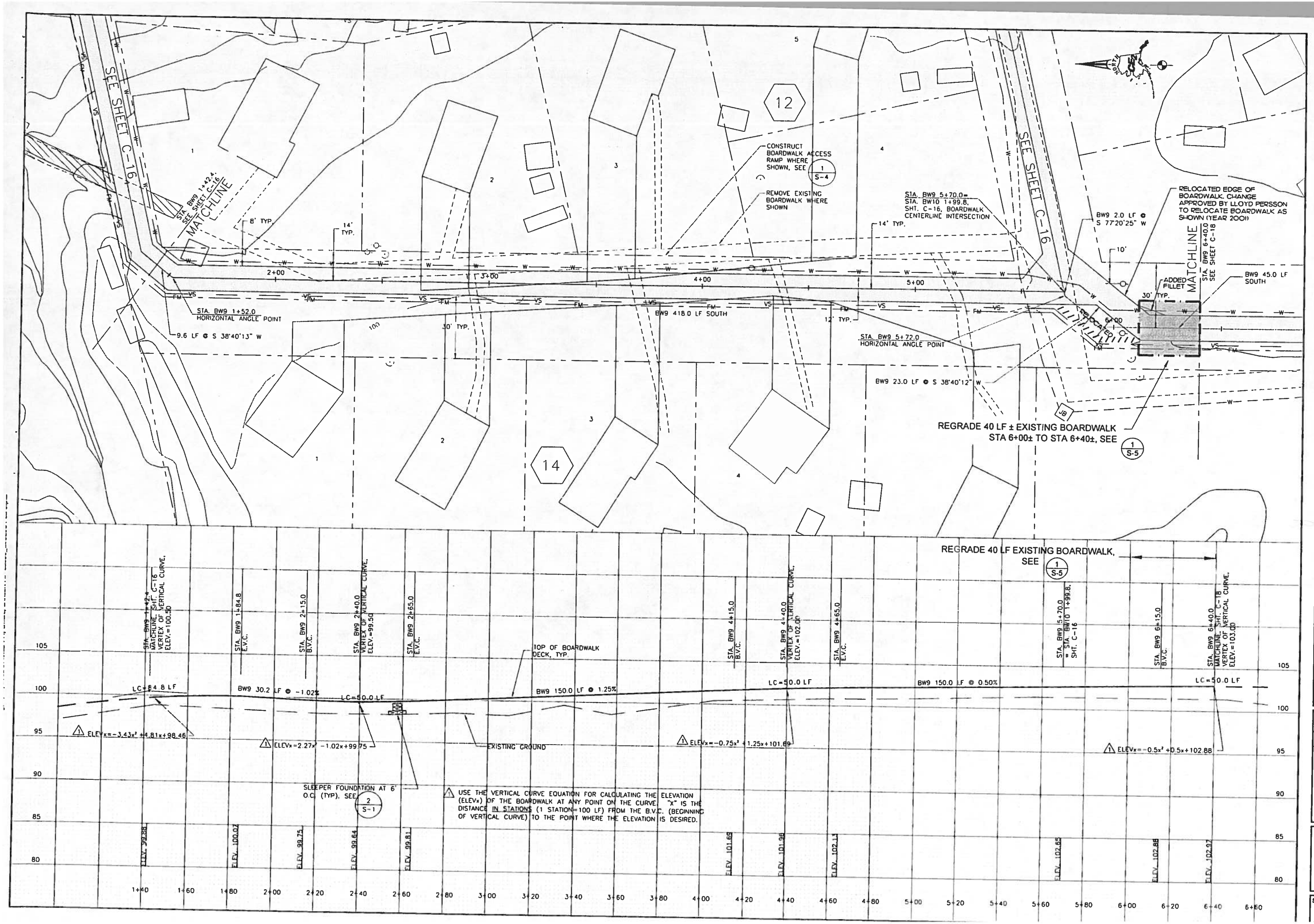
2011 BOARDWALK IMPROVEMENTS PROJECT
"A" STREET BOARDWALK PLAN AND PROFILE
CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.
PO BOX 223948 ANCHORAGE, AK 99523 PH: 907-349-9310 FAX: 907-349-9315

REVISION	BY	DATE

Project No. ____ Date JAN. 2012
Designed LAP
Drawn LAW
Approved LAP

Sheet No. C-16



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FOREMAN

AS-BUILT

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STATE OF ALASKA 49TH PAUL C. WEISNER CE-10276 REGISTERED PROFESSIONAL ENGINEER 1-19-2012

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.

PO BOX 232846 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

REVISION	BY	DATE

Project No.

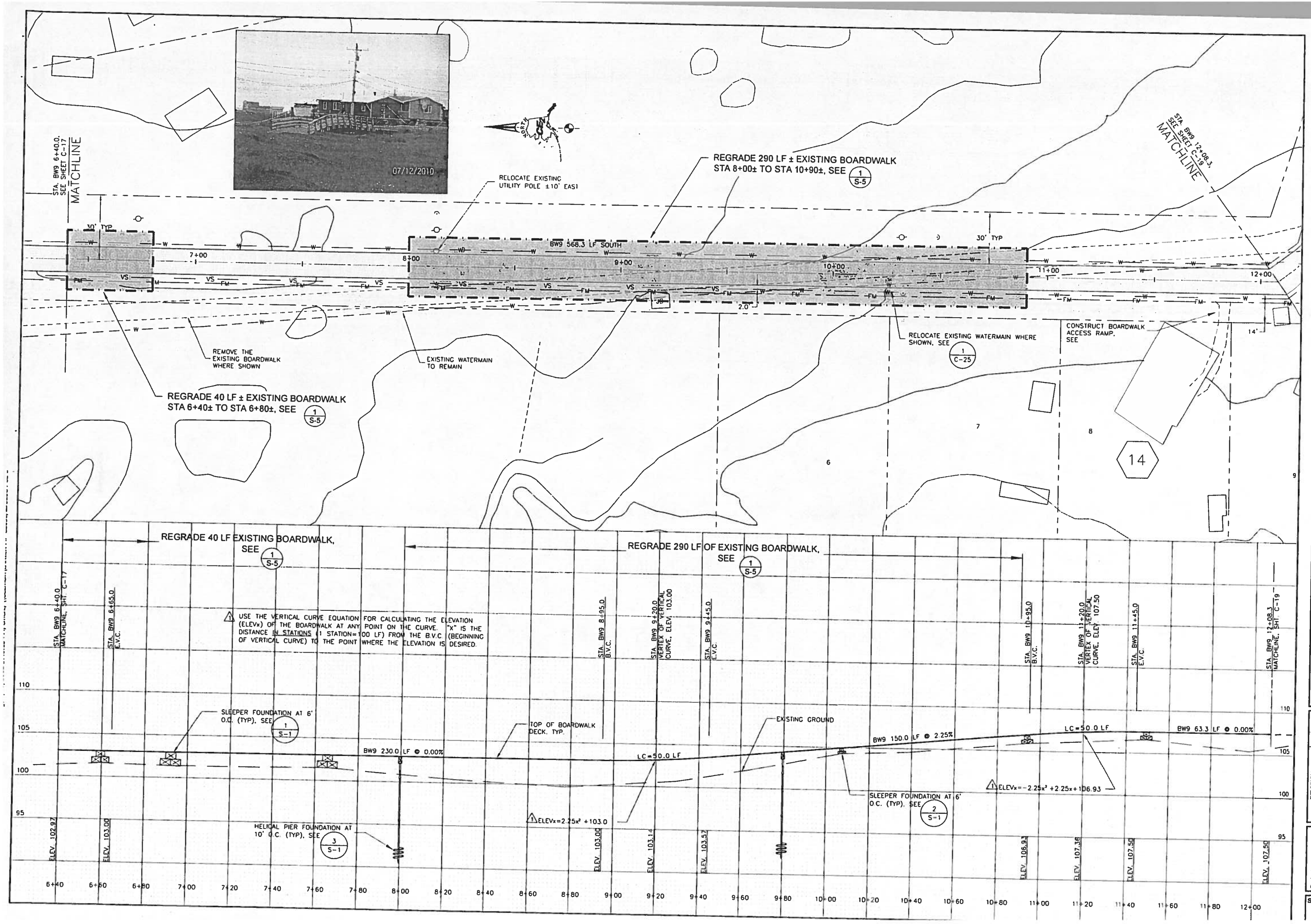
Date JAN. 2012

Designed LAP

Drawn LAW

Approved LAP

Sheet No. C-17



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FOREMAN

AS-BUILT

INSPECTOR

STATE OF ALASKA 49TH PAUL C. WEISSER CE-10278 REGISTERED PROFESSIONAL ENGINEER

1-14-2012

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.

PO BOX 223846 ANCHORAGE, AK 99523 PH: 907-348-1010 FAX: 907-348-1015

REVISION	BY	DATE

Project No.

Date JAN. 2012

Designed LAP

Drawn LAW

Approved LAP

Sheet No. C-18

RELOCATE EXISTING WATERMAIN AS SHOWN, SEE 1/C-25

STA. BW9 12+08.3, SEE SHEET C-18

MATCHLINE

BW9 19.5 LF @ S 35°51'15" E

STA. BW10 12+27.8 HORIZONTAL ANGLE POINT

RELOCATE EXISTING WATERING POINT ±20' SOUTH, SEE 1/C-25

25' TYP.

12' WIDE BOARDWALK TYP.

REGRADE 140 LF ± EXISTING BOARDWALK STA 14+00± TO STA 15+40±, SEE 1/S-5

BW10 474.6 LF @ S 90°00'00" E

13+00 14+00 15+00 16+00 17+00

25' TYP

MATCHLINE

STA. BW10 17+00.0, SEE SHEET C-20

INSTALL BOARDWALK ACCESS RAMP TO TRANSITION FROM EXISTING HANDICAP RAMP TO THE NEW BOARDWALK

EXISTING HANDICAP RAMP

REMOVE EXISTING BOARDWALK WHERE SHOWN

EXISTING WATERMAIN TO REMAIN

19'

18

15

140 LF REGRADE EXISTING BOARDWAK SEE 1/S-3

STA. BW9 12+08.3 SEE SHEET C-18

STA. BW10 12+20.0 B.V.C.

STA. BW10 12+60.0 VERTEX OF VERTICAL CURVE, ELEV.=107.50

STA. BW10 13+00.0 E.V.C.

STA. BW10 15+40.0 B.V.C.

STA. BW10 15+80.0 VERTEX OF VERTICAL CURVE, ELEV.=102.00

STA. BW10 16+20.0 E.V.C.

STA. BW10 16+75.0 B.V.C.

STA. BW10 17+00.0 VERTEX OF VERTICAL CURVE, ELEV.=103.00 MATCHLINE, SEE SHEET C-20

110 105 100 95 90

LC=80.0 LF

TOP OF BOARDWALK TYP.

EXISTING GROUND

BW9 240.0 LF @ -1.72%

BW9 11.7 LF @ 0.00%

1 ELEVx=-1.08x² +107.5

SLEEPER FOUNDATION AT 6' O.C. (TYP), SEE 2/S-1

LC=80.0 LF

BW9 55.0 LF @ 0.83%

LC=50.0 LF

1 ELEVx=1.59x² -1.72x+102.69

1 ELEVx=-2.12x² +0.83x+102.79

1 USE THE VERTICAL CURVE EQUATION FOR CALCULATING THE ELEVATION (ELEVx) OF THE BOARDWALK AT ANY POINT ON THE CURVE. "x" IS THE DISTANCE IN STATIONS (1 STATION=100 LF) FROM THE B.V.C. (BEGINNING OF VERTICAL CURVE) TO THE POINT WHERE THE ELEVATION IS DESIRED.

ELEV. 107.50 ELEV. 107.50 ELEV. 107.33 ELEV. 106.81 ELEV. 102.69 ELEV. 102.26 ELEV. 102.33 ELEV. 102.79 ELEV. 102.87

12+00 12+20 12+40 12+60 12+80 13+00 13+20 13+40 13+60 13+80 14+00 14+20 14+40 14+60 14+80 15+00 15+20 15+40 15+60 15+80 16+00 16+20 16+40 16+60 16+80 17+00 17+20

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INSPECTOR

THE STATE OF ALASKA 49th PAUL L. BOYSOR CE-10276 REGISTERED PROFESSIONAL ENGINEER 12-12-2012

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.

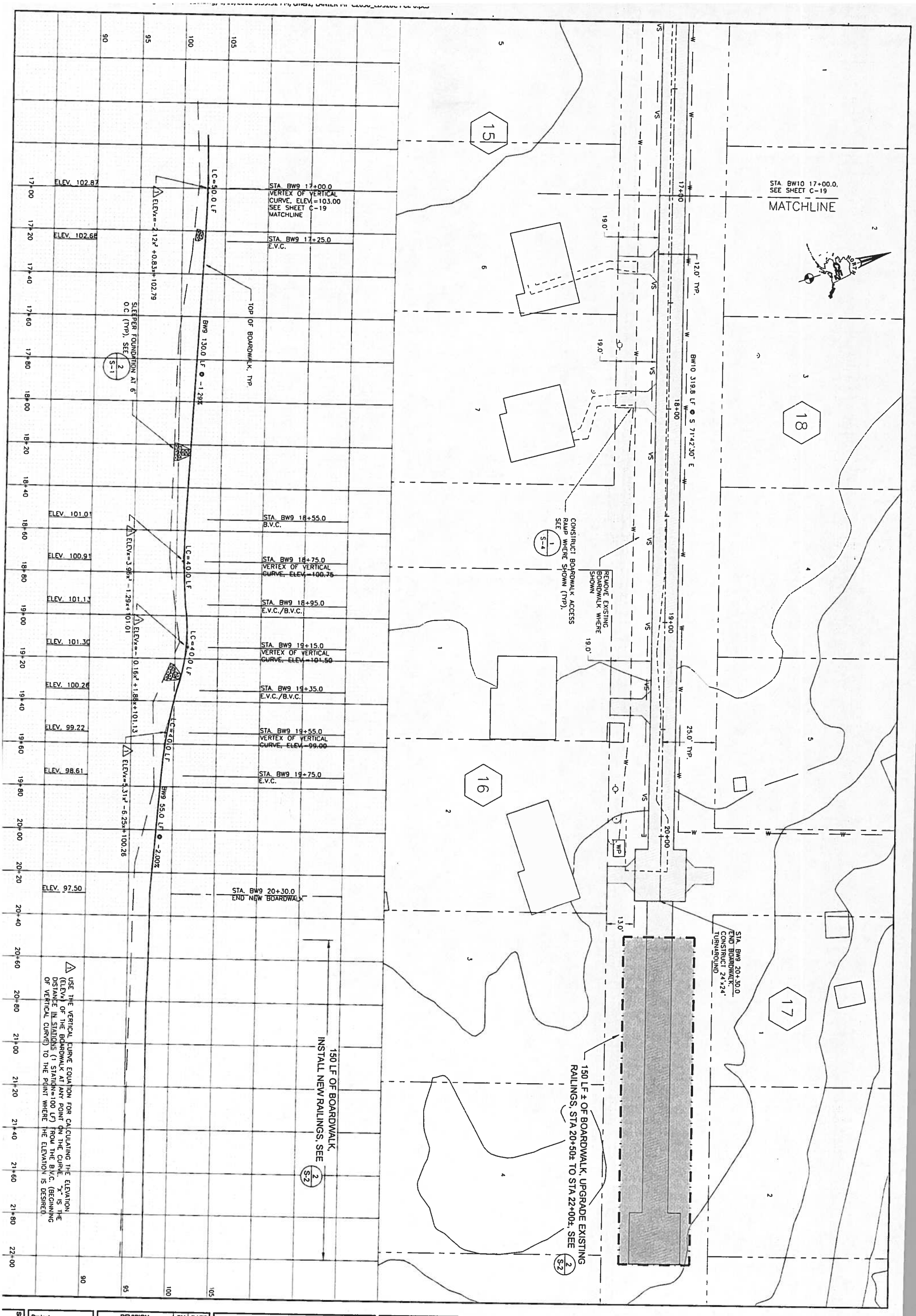
PO BOX 230948 ANCHORAGE, AK 99523 PH: 907-345-1018 FAX: 907-345-1015

REVISION	BY	DATE

Project No. ___ Date JAN. 2012 Designed LAP Drawn LAW Approved LAP

Sheet No. C-19

SHEET OF



Project No.	
Date	JAN. 2012
Designed	LAP
Drawn	LAW
Approved	LAP

REVISION	BY	DATE

CE2 ENGINEERS, INC.
PO BOX 232946 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK PLAN AND PROFILE

CHEFORNAK, ALASKA

STATE OF ALASKA 49TH PAUL C. WEISNER CE-10276 REGISTERED PROFESSIONAL ENGINEER
1-19-2012

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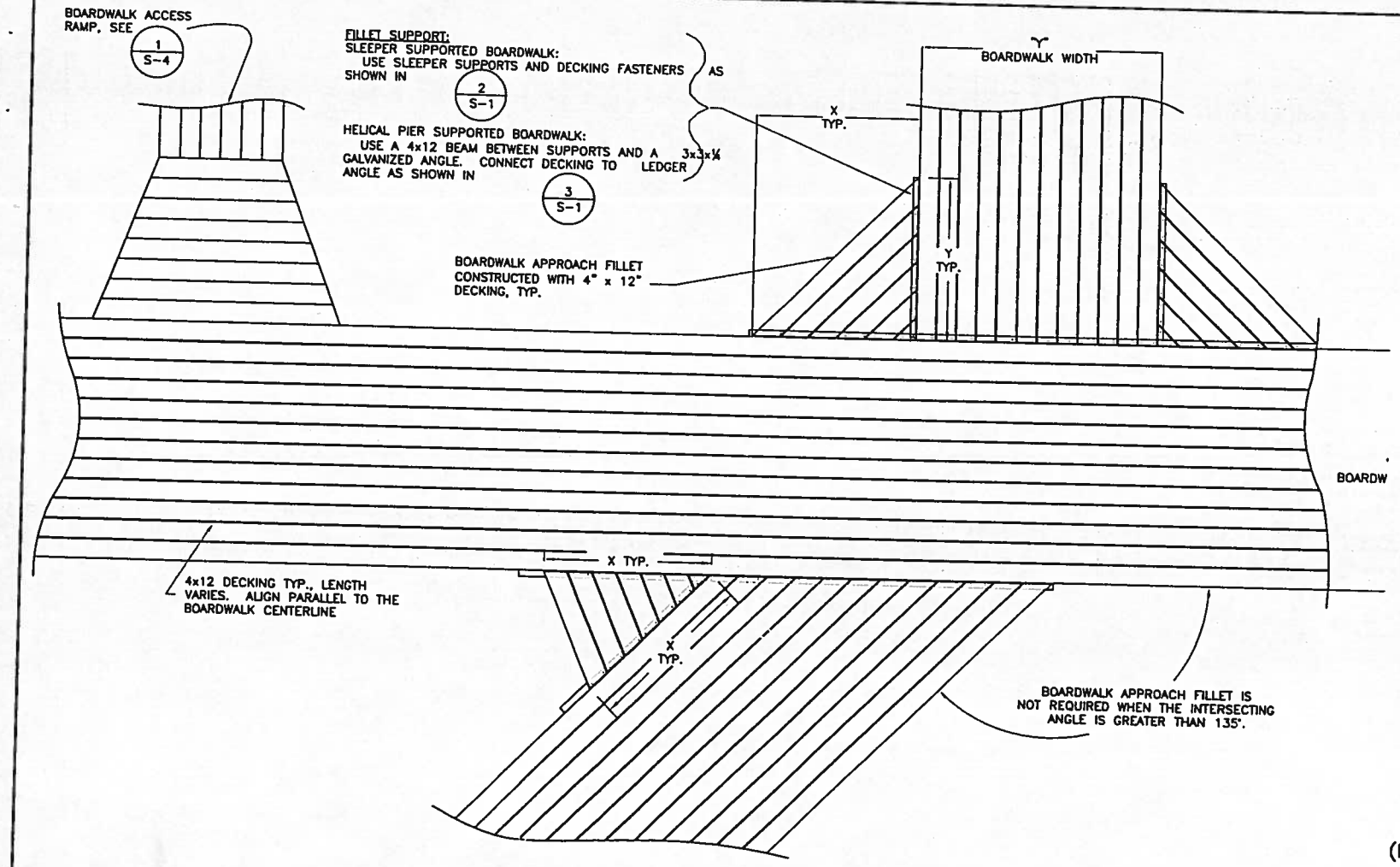
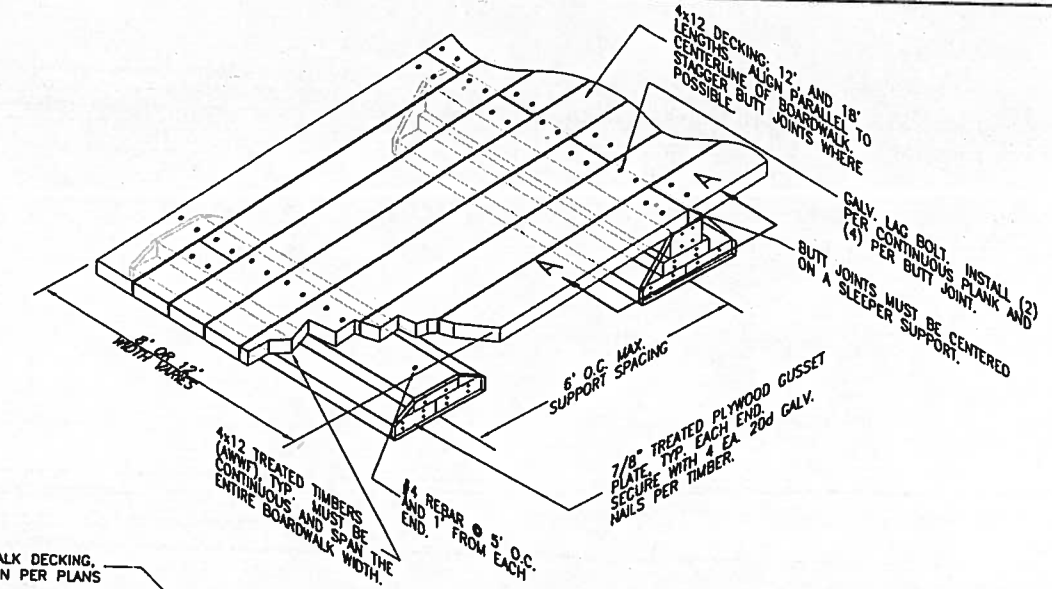
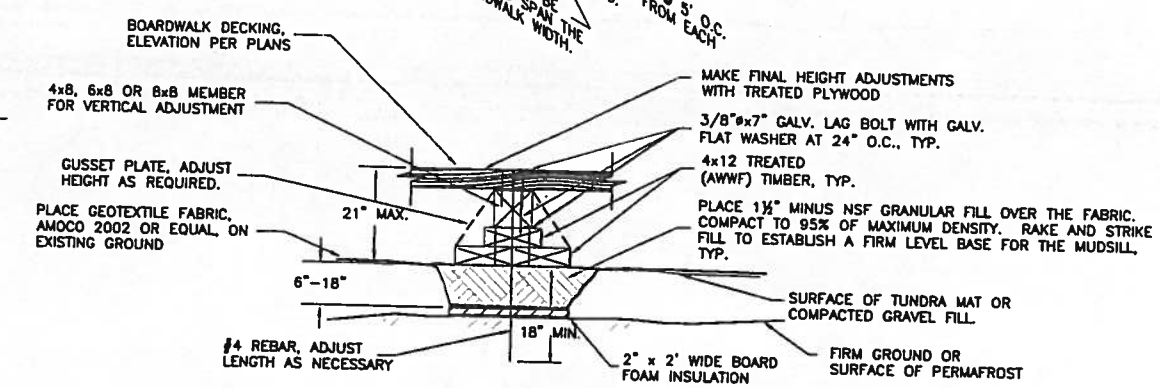


1/S-1 EXISTING BOARDWALK DECKING LAYOUT
SCALE 1/4" = 1'-0"





SECTION A-A : FOR SOFT GROUND CONDITIONS
(FOR FIRM GROUND CONDITIONS, PLACE THE MUD SILL DIRECTLY ON THE EXISTING GROUND)

2/S-1 EXISTING SLEEPER SUPPORTED BOARDWALK DETAIL
NTS

GENERAL STRUCTURAL NOTES

1. Unless noted otherwise, all construction shall conform to AASHTO Standard Specifications for Highway Bridges. In addition to dead loads, the boardwalk was designed for the following live and environmental loads:

Design Wind Speed	100 m.p.h.
Design Snow Load	30 p.s.f.
Seismic Design	Zone 1
Live Load (Vehicle)	1500 lb. ATV or Snowmobile with 2000 lb. single axle "120 gal. water" trailer

2. Boardwalk Foundation
A foundation investigation was prepared for this project by Duane Miller and Associates. Soils in the area generally consist of a pumice bolder matrix with a thin organic mat overlaying silt. Marginal temperature permafrost as well as thawed soil conditions exist in the project area.

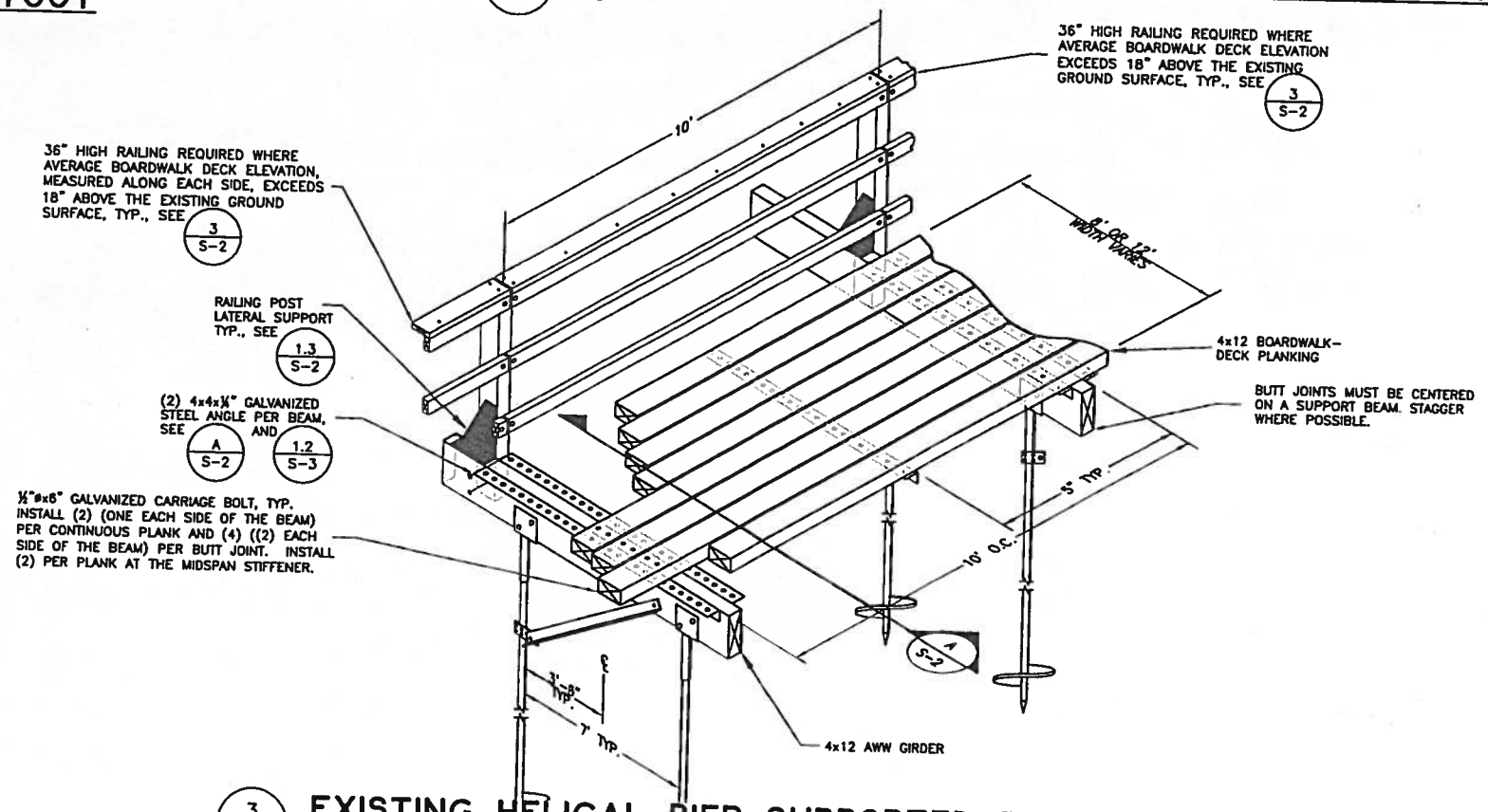
Self drilling helical pier supports (described below) were recommended for use in soft and wet areas. Pier supports will also be used in areas where the boardwalk deck elevation is greater than 18" above finished grade. Sleeper supports will be used in all other areas.

3. Helical Pier Supports shall be 1-3/4" square galvanized steel with 10" helix (for permafrost areas), and 8", 10", and 12" helices (for thawed areas). Pier supports shall be capable of meeting the following minimum requirements:

Torque:	10,000 Ft.-Pounds
Axial Tension:	100,000 Pounds
Axial Compression	40,000 Pounds
Galvanized after fabrication to ASTM A-153	

4. Lumber shall be Hem-Fir, Grade No. 2 or better. All wood members shall be treated with the wood preservative CCA, Cromated Copper Arsenate, with the following concentrations:
Soil Contact - 0.6 pounds per cubic foot
Above Grade - 0.4 pounds per cubic foot

5. Steel hardware and fasteners, including structural plates, shapes, bars, and assemblies, shall be galvanized in accordance with the requirements of ASTM A-123. Bolts, nuts and similar threaded fasteners shall be galvanized in accordance with ASTM A-153. Surfaces shall be thoroughly cleaned of rust and scale prior to galvanizing. Field repairs to galvanizing shall be made using "GALVINOX", GALVO-WELD", or equal.



3/S-1 EXISTING HELICAL PIER SUPPORTED BOARDWALK DETAIL
NTS

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CONSTRUCTION RECORD
FIELD BOOK
STAKING
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INSPECTOR

STATE OF ALASKA PAUL L. REBER CE-10276 REGISTERED PROFESSIONAL ENGINEER 1-17-12

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK FRAMING DETAILS

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.
PO BOX 220640 ANCHORAGE, AK 99522 PH: 907-345-1818 FAX: 907-345-1815

REVISION	BY	DATE

Project No. ____ Date JAN 2012
Designed LAP
Drawn LAW
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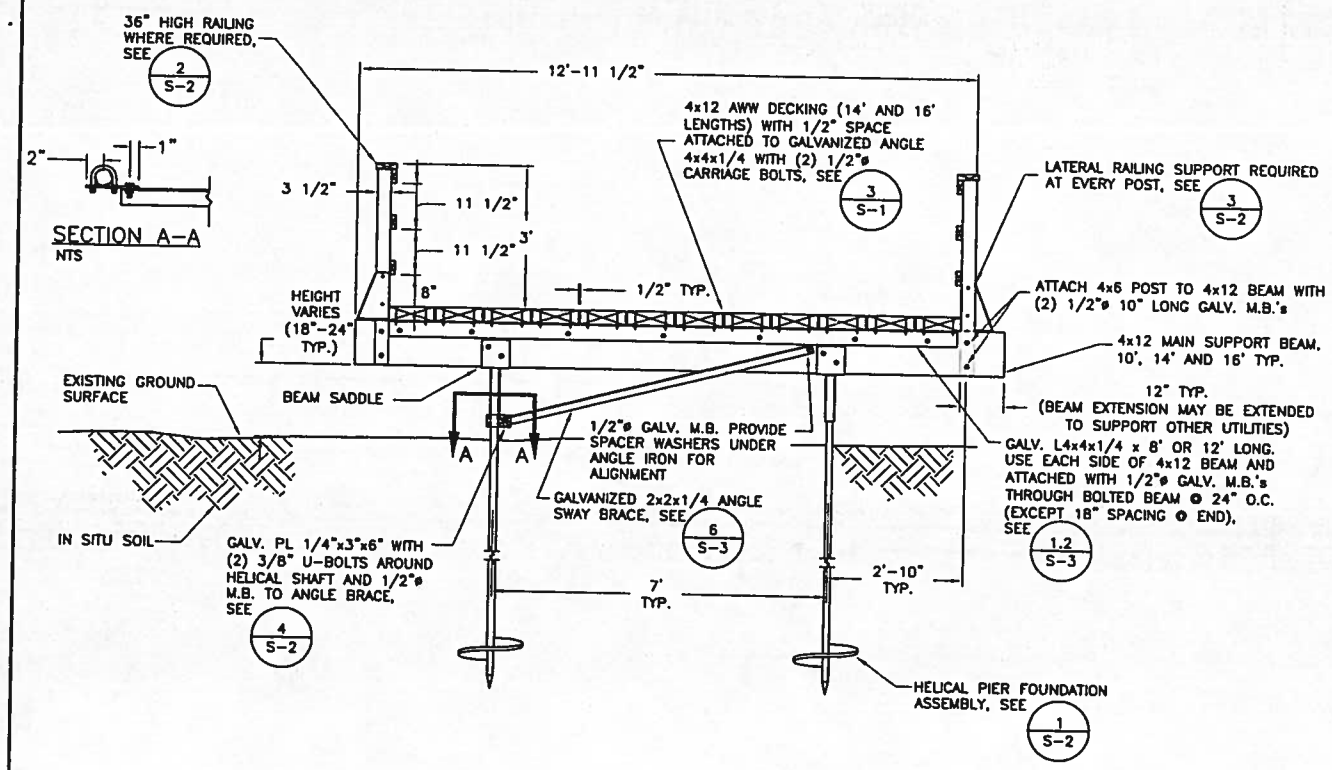
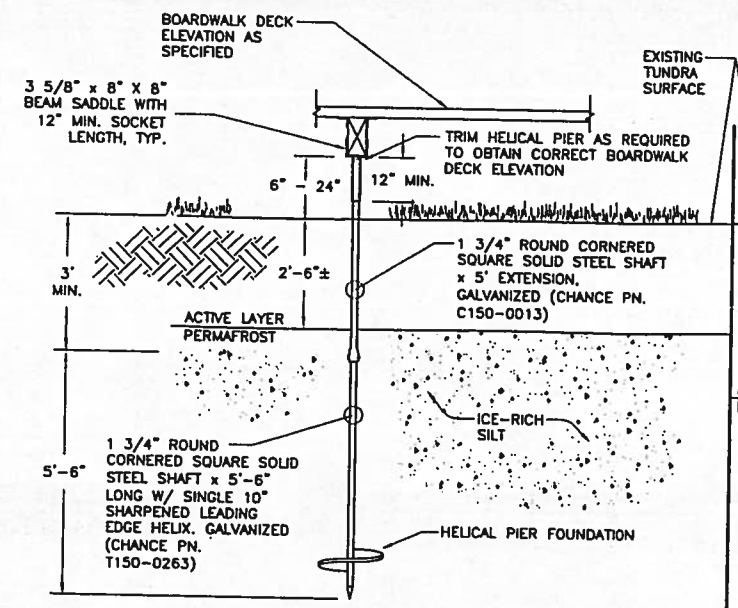
Sheet No. S-1



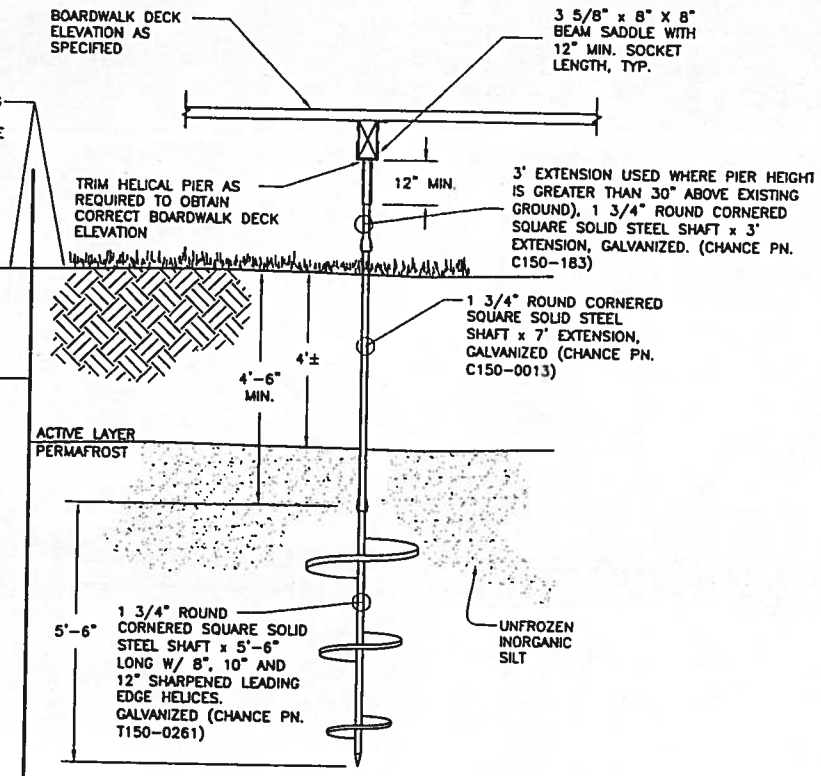
A/S-2 EXISTING HELICAL PIER SUPPORTED BOARDWALK SECTION

SCALE 1/2" = 1'-0"



FROZEN CONDITIONS:

DURING INSTALLATION THE ADVANCEMENT OF THE HELICAL PIER WILL STALL AT THE TOP OF THE PERMAFROST. IF ADVANCEMENT IS SMOOTH AND CONTINUOUS ASSUME YOU ARE DRILLING UNFROZEN SOILS. FOR UNFROZEN SOILS SEE THE DETAIL AT RIGHT.

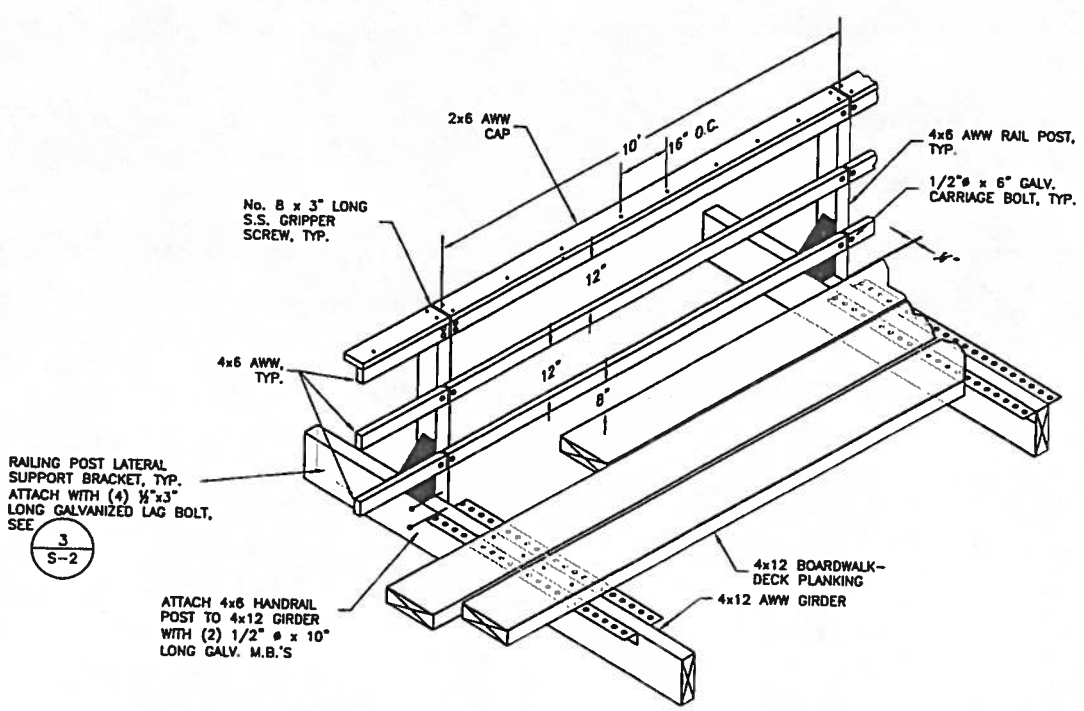


UNFROZEN CONDITIONS (INCLUDING TRANSITION ZONE):

(ANTICIPATED FROM STA. BWE X+XX TO STA. BWE X+XX, BHT. C-X & C-X, FIELD VERIFY)

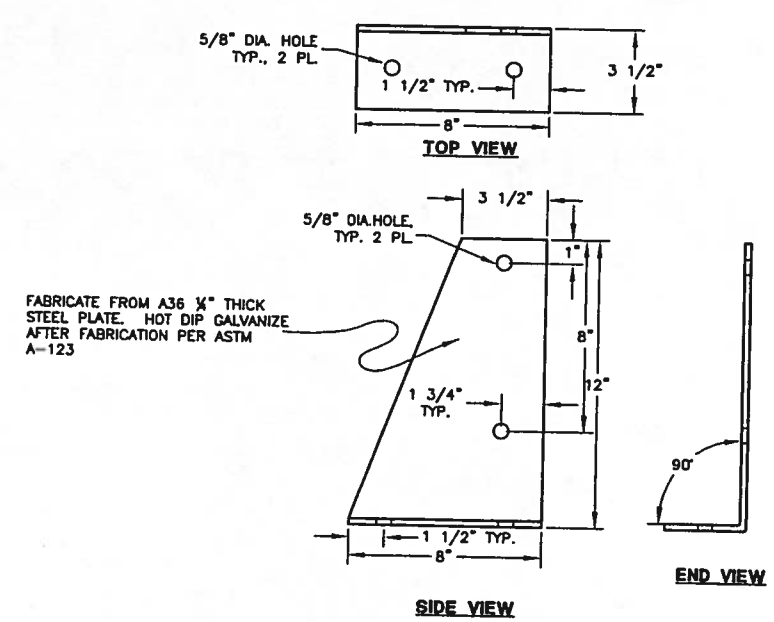
1/S-2 EXISTING HELICAL PIER FOUNDATION ASSEMBLY

NTS



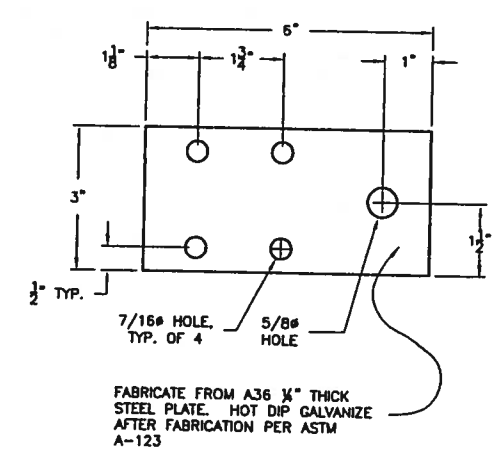
2/S-2 RAILING DETAIL

NTS (ONLY REQUIRED WHERE THE AVERAGE BOARDWALK DECK ELEVATION, MEASURED ALONG EACH SIDE, EXCEEDS 18" ABOVE THE EXISTING GROUND SURFACE)



3/S-2 RAILING POST SUPPORT BRACKET DETAIL

SCALE: 3/8" = 1"



4/S-2 CONNECTOR PLATE

SCALE: 1/2" = 1"

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CONSTRUCTION RECORD

FIELD BOOK | STAKING | FOREMAN | AS-BUILT | INSPECTOR

STATE OF ALASKA — PAUL C. KISSNER — CE-10278 — REGISTERED PROFESSIONAL ENGINEER

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK FRAMING DETAILS

CHEFORNAK, ALASKA

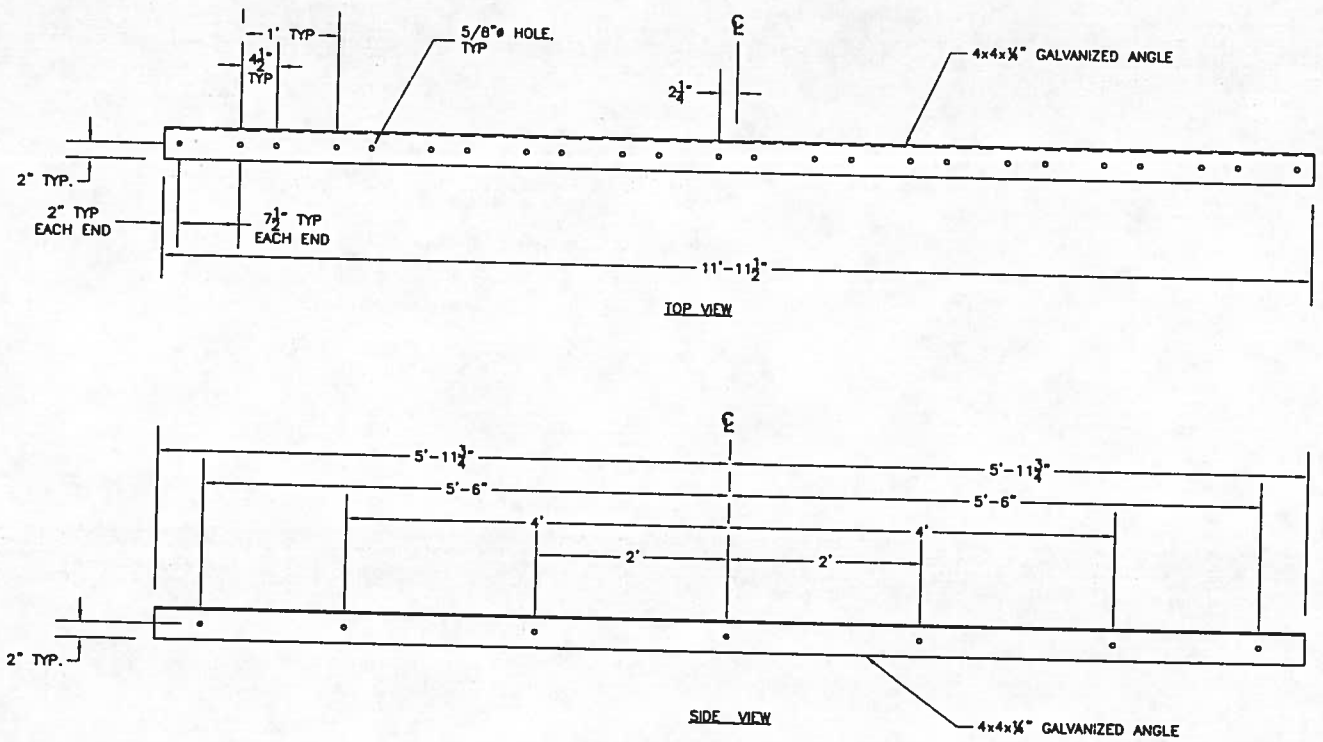
CE2 ENGINEERS, INC.

PO BOX 223948 ANCHORAGE, AK 99523 PH: 907-345-5915 FAX: 907-345-5915

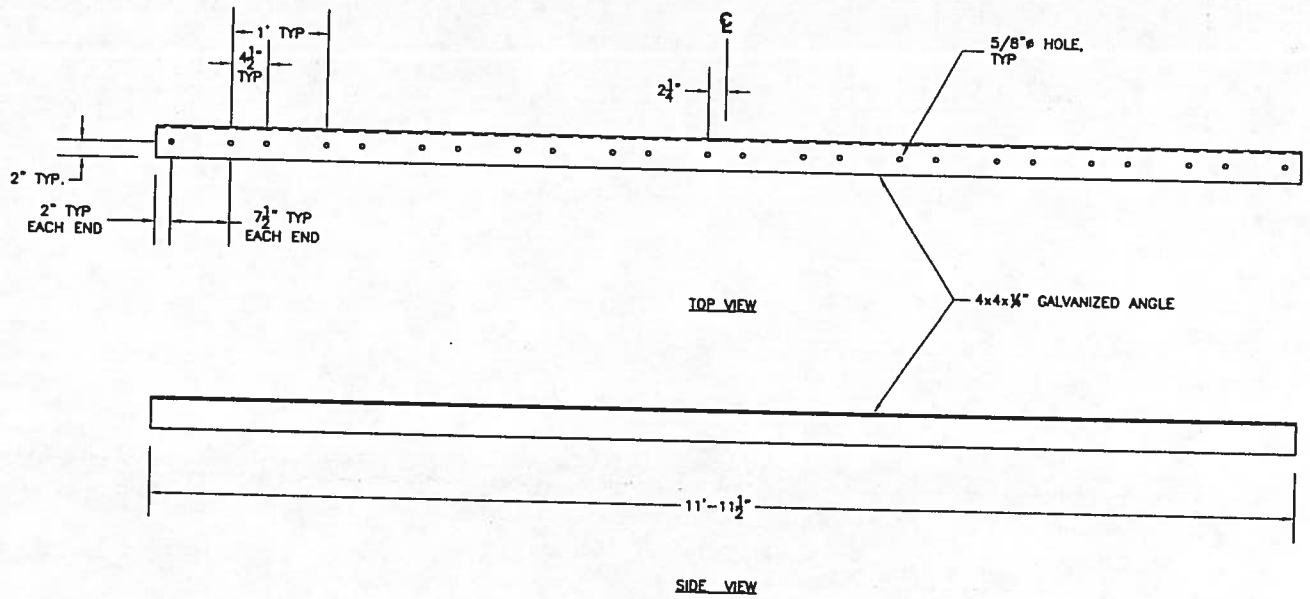
REVISION	BY	DATE

Project No. | Date JAN 2012 | Designed LAP | Drawn LAW | Approved LAP

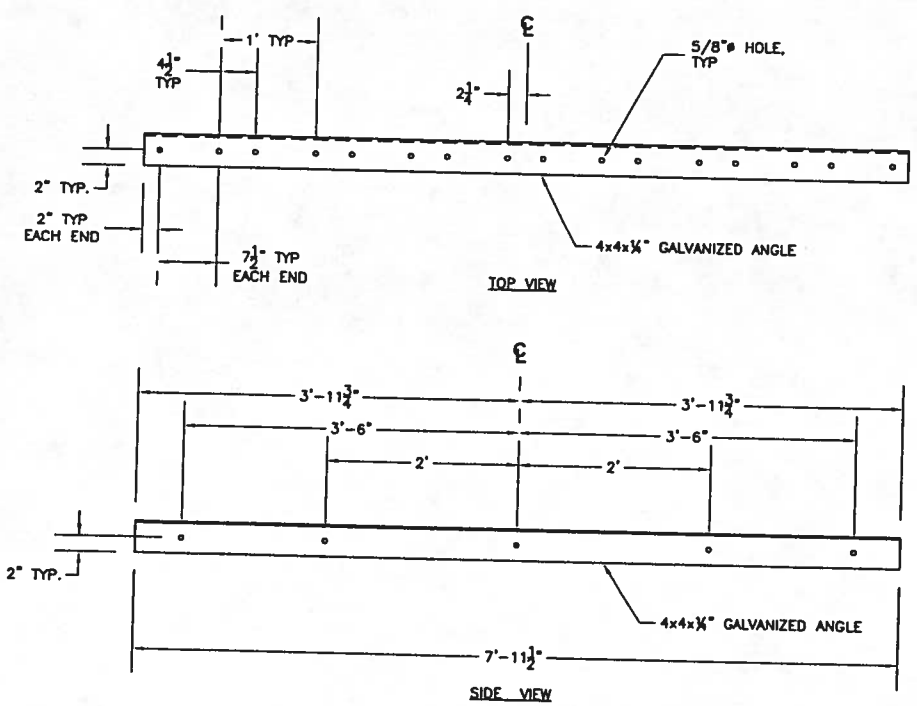
Sheet No. S-2



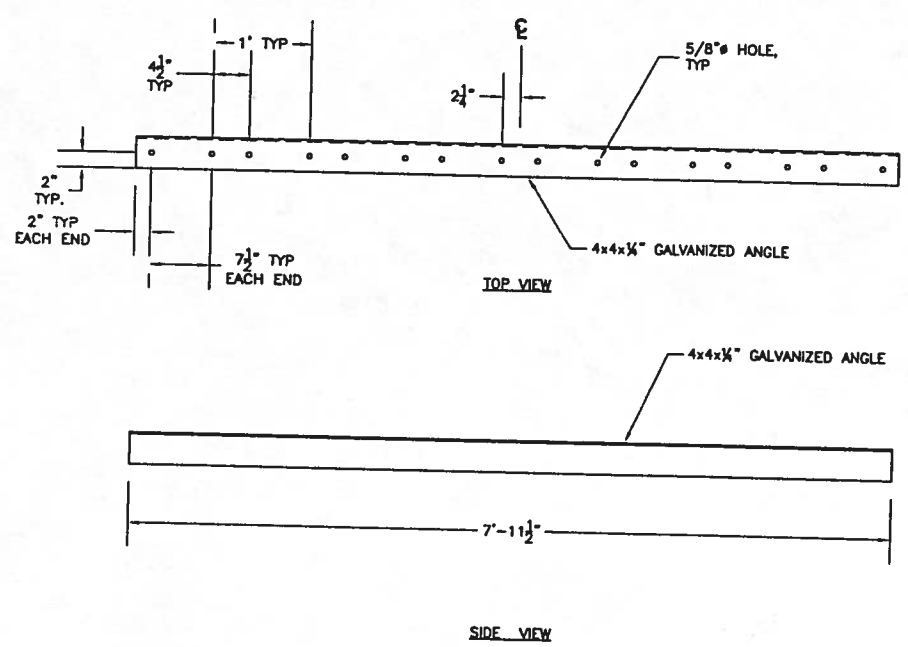
1 / S-3 **12' BEAM ANGLE**
SCALE: 1"=1'



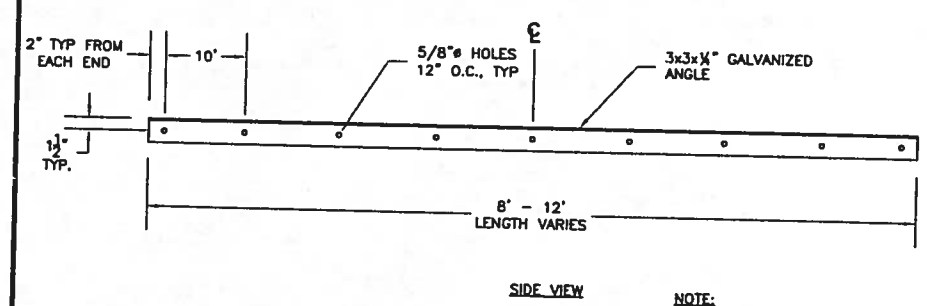
3 / S-3 **12' STIFFENER**
SCALE: 1"=1'



2 / S-3 **8' BEAM ANGLE**
SCALE: 1"=1'

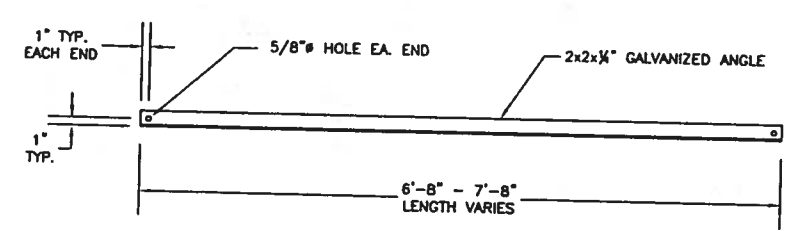


4 / S-3 **8' STIFFENER**
SCALE: 1"=1'



NOTE:
ATTACH TO 4x12 LEDGER BEAM WITH ½"ø M.B.'S @ 12" O.C.

5 / S-3 **8' LEDGER**
SCALE: 1"=1'



6 / S-3 **SWAYBRACE DETAIL**
SCALE: 1"=1'

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INSPECTOR

STATE OF ALASKA
RICHARD J. WHITTIER
CE-10276
1/13/2012

2011 BOARDWALK IMPROVEMENTS PROJECT

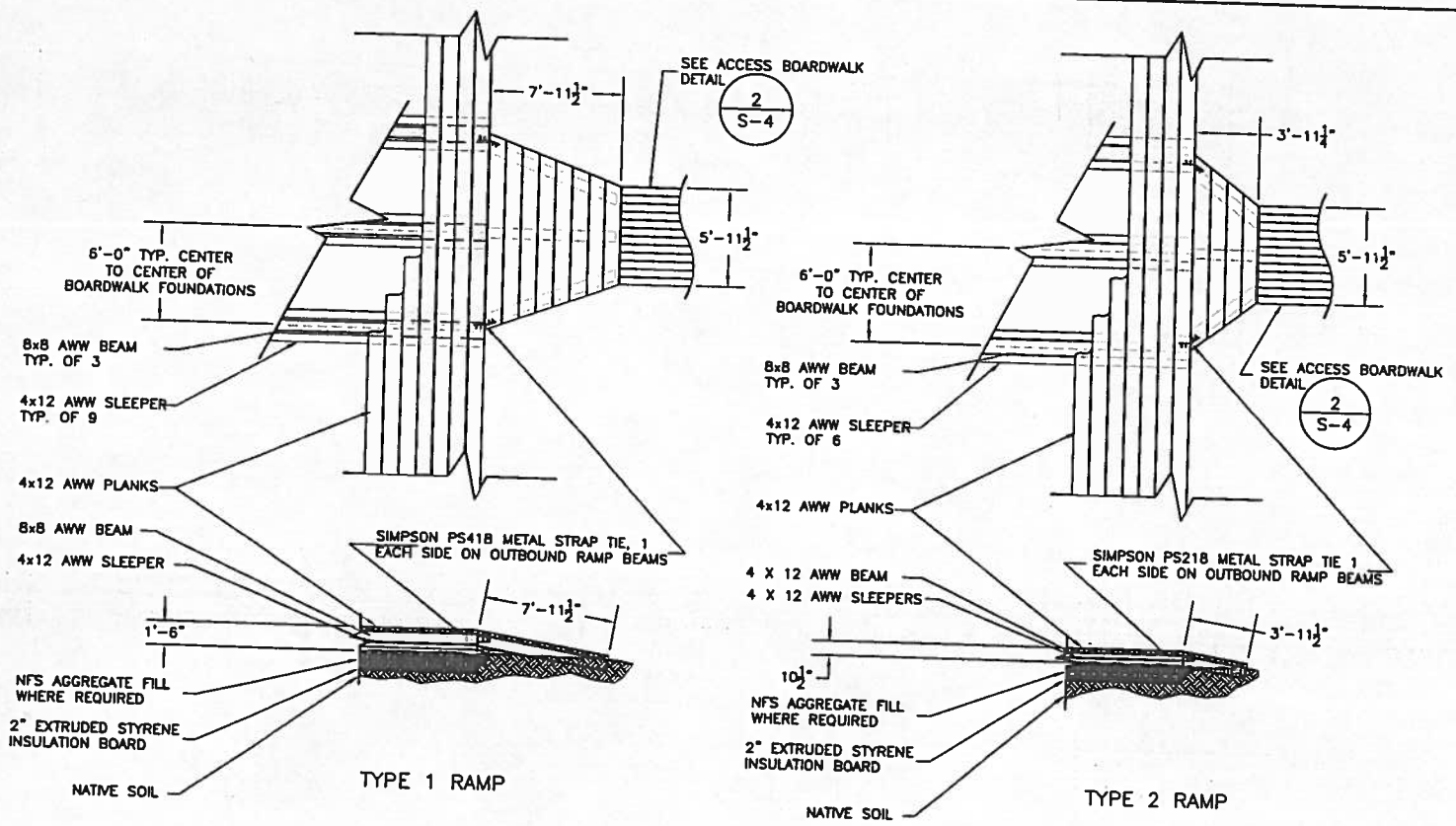
BOARDWALK STEEL FABRICATION DETAILS
CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.
PO BOX 223948 ANCHORAGE, AK 99523 PH: 907-349-9916 FAX: 907-349-9915

REVISION	BY	DATE

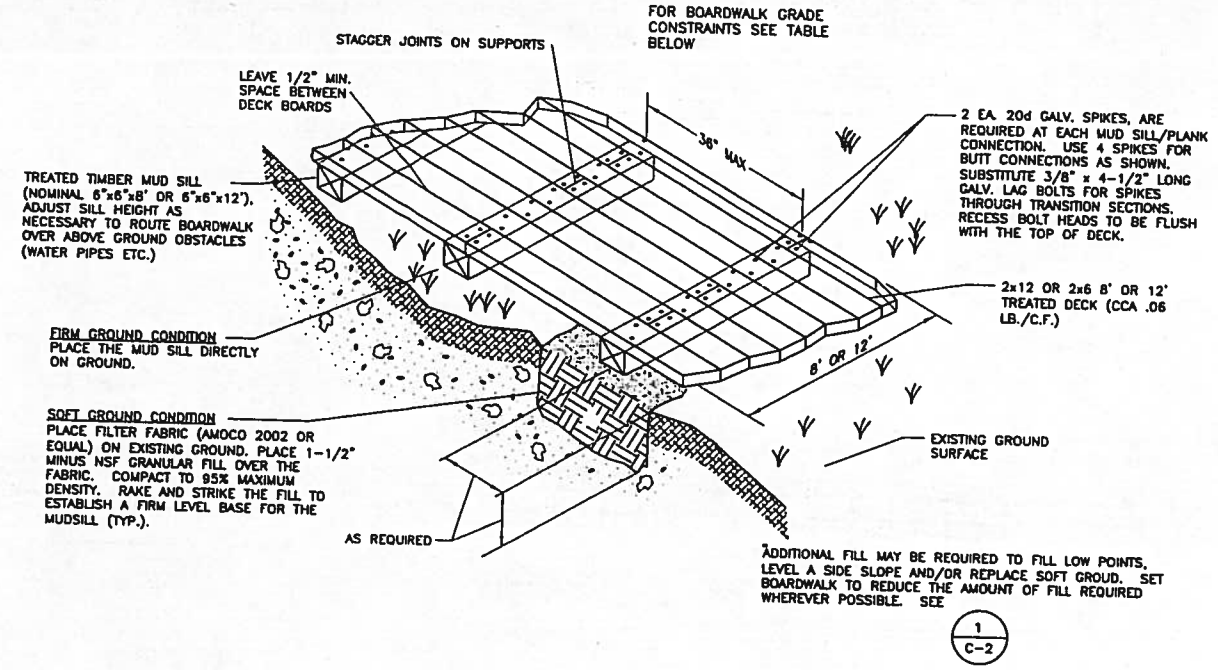
Project No. ____
Date JAN. 2012
Designed LAP
Drawn LAW
Approved LAP

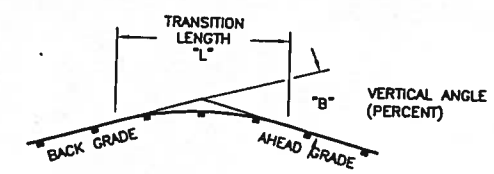
Sheet No.



1 / S-4 ACCESS RAMP DETAIL

NTS





ACCESS BOARDWALK GRADE CONSTRAINTS:
PLACE GRAVEL FILL AS REQUIRED TO HOLD THE BOARDWALK GRADE BETWEEN +4% AND −4% (5 INCHES OF RISE OR FALL PER 10 FEET OF RUN). PROVIDE A SMOOTH AND GRADUAL TRANSITION AT ALL CHANGES IN GRADE, IN ACCORDANCE WITH THE FOLLOWING TABLE:

VERTICAL ANGLE AT GRADE CHANGE IN PERCENT "B"	MINIMUM TRANSITION LENGTH IN FEET "L"
1	2.5
2	5
3	7
4	10
5	12
>5	NOT PERMITTED

NOTE:
3/4" x 4-1/2" LONG GALV. LAG BOLT DECK FASTENERS ARE REQUIRED AT ALL TRANSITION SECTIONS.

2 / S-4 ACCESS BOARDWALK CONSTRUCTION DETAIL

NTS

RECORD DRAWING CERTIFICATE
THESE DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION. INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.
NAME DATE

SCALE: AS SHOWN

CONSTRUCTION RECORD
FIELD BOOK
STARING
FOREMAN
AS-BUILT
INSPECTOR

STATE OF ALASKA PAUL C. WEDNER CE-10276 REGISTERED PROFESSIONAL ENGINEER

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK FRAMING DETAILS

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.
PO BOX 230948 ANCHORAGE, AK 99523 PH: 907-345-1018 FAX: 907-345-1015

REVISION	BY	DATE

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Date JAN. 2012
Designed LAP
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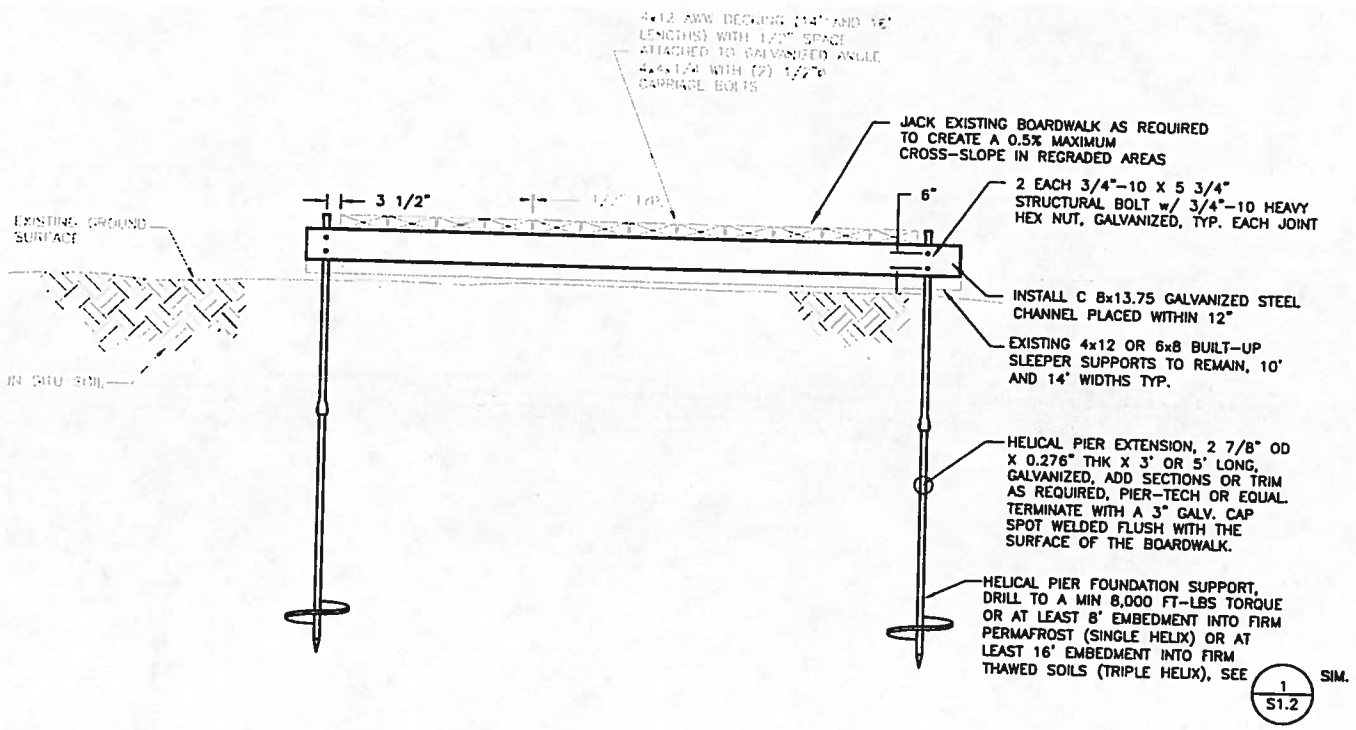
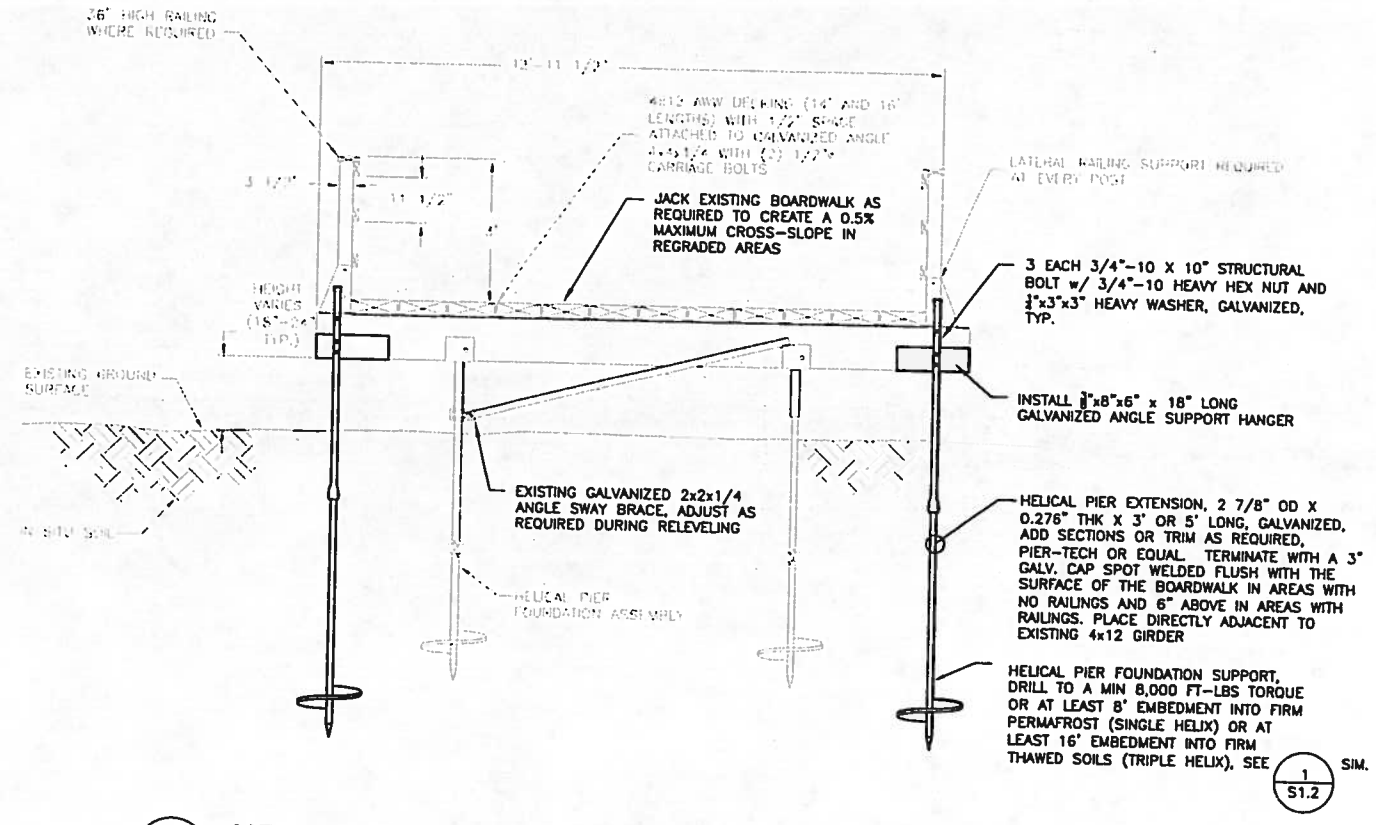


1/S-5 SLEEPER SUPPORTED BOARDWALK REGRADE DETAIL

SCALE 1/2" = 1'-0"



2/S-5 HELICAL PIER SUPPORTED BOARDWALK REGRADE DETAIL

NTS

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NAME DATE

SCALE: AS SHOWN

CONSTRUCTION RECORD
FIELD BOOK
STAKING
FOREMAN
AS-BUILT
INSPECTOR

STATE OF ALASKA
PAUL L. WEBER
CE-10278
REGISTERED PROFESSIONAL ENGINEER
1/19/12

2011 BOARDWALK IMPROVEMENTS PROJECT

BOARDWALK REGRADE DETAILS

CHEFORNAK, ALASKA

CE2 ENGINEERS, INC.
PO BOX 223048 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

REVISION	BY	DATE

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Sheet No. S-5

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