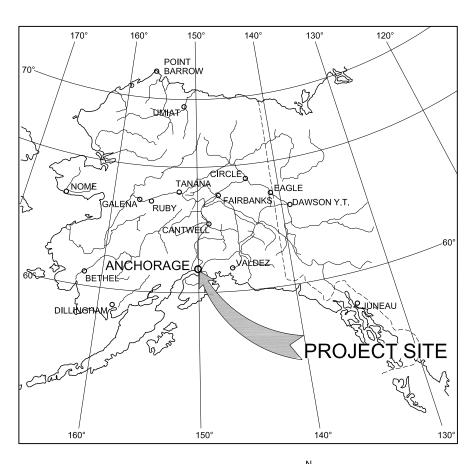
# **PORT OF ANCHORAGE** INTERMODAL EXPANSION PROJECT STUDY **OPTION No 5 HYBRID**

**ANC027 WORK PACKAGE 5** 15% CONCEPT SITE DEVELOPMENT

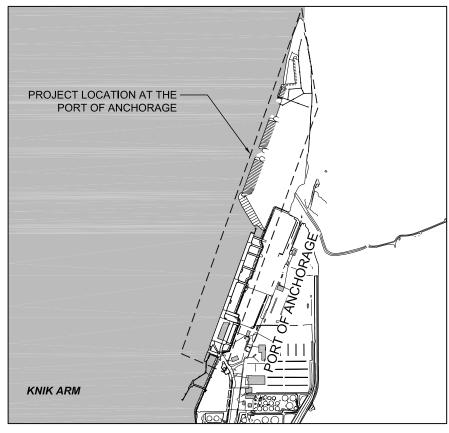
# TYPE OF CONSTRUCTION

DEMOLITION OF EXISTING WHARFS, TRESTLES AND SHEET PILE WALLS, CONSTRUCTION OF NEW WHARFS, TRESTLES, AND SHEET PILE WALLS, MASS EXCAVATION, GRADING, PAVING, DRAINAGE, AND UTILITIES



**VICINITY MAP** 

NOT TO SCALE



	IN	DEX OF DRAWINGS
SHEET NUMBER	DRAWING NUMBER	DRAWING TITLE
1 2	G-1 G-2	GENERAL TITLE SHEET / VICINITY MAP / LOCATION MAP / INDEX OF DRAWINGS LEGEND AND ABBREVIATIONS
3 4 5 6 7 8 9 10	C-1 C-2 C-3 C-4 C-5 C-6 C-7 C-8	CIVIL HAUL ROUTES, TRAFFIC CONTROL, & SURVEY CONTROL GENERAL SITE LAYOUT CONSTRUCTION STAGING & PHASING PLAN DEMOLITION PLAN PARTIAL SITE PLAN A PARTIAL SITE PLAN B TYPICAL SECTIONS CIVIL DETAILS
11 12 13 14 15 16 17 18 19 20	S-1 S-2 S-3 S-4 S-5 S-6 S-7 S-8 S-9 S-10	STRUCTURAL STRUCTURAL DESIGN CRITERIA GENERAL PLAN TYPICAL SECTIONS (1 OF 2) TYPICAL SECTIONS (2 OF 2) PILE LAYOUT (1 OF 2) PILE LAYOUT (2 OF 2) PILE DETAILS DECK DETAILS FENDER & MOORING DOLPHIN DETAILS SHEET PILE BULKHEAD DETAILS



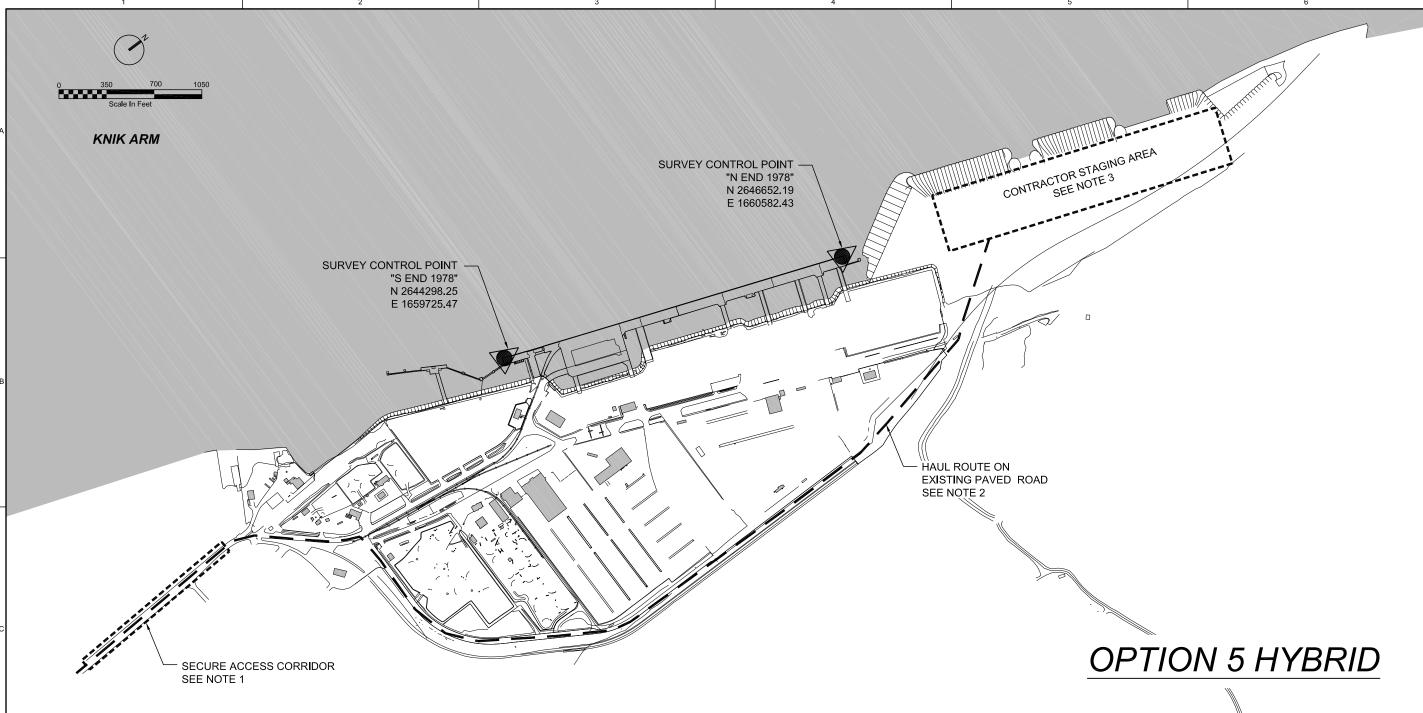
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IS O			_								
NE I L DF	PORT OF ANCHORAGE	US ARMY CORPS OF ENGINEERS									7. Z.
CAL NCH RAWIN	GENERAL	PORT OF ANCHORAGE									) <b>`</b>
ON NG. ■ 1" ARY	TITLE SHEET / VICINITY MAP /	INTERMODAL EXPANSION PROJECT STUDY	NO. DATE	ATE		REVISION		ВУ	BY APVD		
20° 6213 G-0	LOCATION MAP / INDEX OF DRAWINGS	ANCHORAGE, ALASKA	DSGN		DR	CHK	APVD				
30				J. TAYLOR		M. HAAPALA J. TAYLOR	raylor	D. PL	D. PLAYTER		
RELIMINARY	IMINARY DESIGN	OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HERBIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CHAMHILL, CHAM HILL AND IS NOT TO BE USED. IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CHAMHILL.	INCORPORAT R IN PART, FO	ED HEREIN, A	S AN INSTRUMENT OF PROFES R PROJECT WITHOUT THE WRIT	SIONAL SERVICE, IS TH TEN AUTHORIZATION	IE PROPERTY OF JF CH2MHILL		©CH2M	HILL 2011.	©CH2M HILL 2011. ALL RIGHTS

STANDARD ABBREVIATIONS CIVIL LEGEND EARTHQUAKE **EXISTING** THIS CONTRACT THIS CONTRACT AASHTO MARINE OIL TERMINAL **EXISTING** AMERICAN ASSOCIATION MOTEMS SPOT ELEVATION ⊗ 158.5 OF STATE HIGHWAY AND ENGINEERING AND  $\square$   $_{\scriptscriptstyle -}$ **ELECTRICAL MANHOLE** TRANSPORTATION MAINTENANCE STANDARDS **CONTOUR LINE** 155 **OFFICIALS** MFR MANUFACTURER, UTILITY DUCT 0 0 ASPHALT CONCRETE MANUFACTURED **EMBANKMENT AND SLOPE** ACI AMERICAN CONCRETE MG/KG MILLIGRAMS/KILOGRAM 3:1 POST OR BOLLARD INSTITUTE MANHOLE DRAINAGEWAY OR DITCH **AISC** AMERICAN INSTITUTE OF MLLW MEAN LOWER LOW WATER **GUY ANCHOR** STEEL CONSTRUCTION MPH MILES PER HOUR OR (СВ) CATCH BASIN OR INLET APPROX **APPROXIMATE** N/A NOT APPLICABLE FIRE HYDRANT **ASCE** AMERICAN SOCIETY OF NIC NOT IN CONTRACT TRENCH DRAIN CIVIL ENGINEERS NO. NUMBER **UTILITY POLE ASTM** AMERICAN SOCIETY FOR NTS NOT TO SCALE OR 🚢 SIGN **TESTING AND MATERIALS** Ν NORTH **AWS** AMERICAN WELDING OC ON CENTER **X** LIGHT POLE OR MANHOLE SOCIETY OD **OUTSIDE DIAMETER BLDG** BUILDING OG **ORIGINAL GROUND BENCH MARK** SAMPLE LOCATION ° BM BM OLE OPERATIONAL LEVEL BENCHMARK BOT BOTTOM **EARTHQUAKE** SURVEY CONTROL POINT OR CENTERLINE PERCENT  $\triangle$ ■ TP-2 POINT OF INTERSECTION TEST PIT LOCATION / NUMBER ĊВ PCC CATCH BASIN PORTLAND CEMENT CF CUBIC FOOT(FEET) CONCRETE PIEZOMETER LOCATION / NUMBER BRUSH/TREE LINE CLE CONTINGENCY LEVEL PCF POUNDS PER CUBIC FOOT PΕ POLYETHYLENE EARTHQUAKE **€ \*** € **TREE** DEMOLITION CMP CORRUGATED METAL PIPE PERF PERFORATED CO CLEANOUT PIANC WORLD ASSOCIATION FOR PROPERTY LINE CONC CONCRETE WATERBORNE TRANSPORT CONT CONTINUED, CONTINUOUS INFRASTRUCTURE CENTER LINE, BUILDING, ROAD, ETC. COR CONTRACTING OFFICER'S PIEP PORT OF ANCHORAGE OR ( OR STRUCTURE, BUILDING / FACILITY REPRESENTATIVE INTERMODAL EXPANSION STAGING OR WORK AREA LIMITS **CPEP** CORRUGATED **PROJECT** POLYETHYLENE PIPE PLF POUNDS PER LINEAR FOOT ASPHALT CONCRETE PAVEMENT N 1000.00 STRUCTURE, BUILDING OR FACILITY CTR POL CENTER PETROLEUM OIL LINE E 1000.00 **LOCATION POINT - COORDINATES** CY **CUBIC YARDS** PР POWER POLE °F DEGREES FAHRENHEIT PSF POUNDS PER SQUARE GRAVEL SURFACING / RIP RAP ● B-1 **BORING LOCATION AND NUMBER** B-1 DC **DEAD LOAD - COMPONENTS** FOOT AND ATTACHMENTS PSI POUNDS PER SQUARE INCH (**MW-66**) <del>(�)</del> MW-66 MONITORING WELL AND NUMBER DIAMETER PVC CONCRETE PAVEMENT POLYVINYL CHLORIDE DIM DIMENSION R **RADIUS** DOUBLE SWING GATE DRO DIESEL RANGE ORGANIC REQD REQUIRED ///// **CURB** DW DEAD LOAD - WEARING **ROLL-ON ROLL-OFF** RO-RO SLIDING GATE SURFACE AND UTILITIES RO/RO **ROLL-ON ROLL-OFF CURB AND GUTTER** DWG DRAWING ROW RIGHT OF WAY **GUARD RAIL** RT RIGHT SINGLE SWING GATE EACH / EACH WAY EA / EW SC SURVEY CONTROL CHAIN LINK FENCE FG **EXISTING GROUND** MONUMENT **CULVERT** EL **ELEVATION** SCHD **SCHEDULE RETAINING WALL** ROAD CLOSURE BARRICADE **ELEV ELEVATION** SD STORM DRAIN PREVIOUSLY INSTALLED BMP EOP **EDGE OF PAVEMENT** STANDARD DIMENSION SDR WIRE FENCE **ESCP EROSION AND SEDIMENT** RATIO GENERAL NOTES UTILITIES LEGEND CONTROL PLAN SI SYSTEM INTERNATIONAL **EXST EXISTING** (METRIC UNITS) THE LOCATIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES SHOULD BE STAINLESS STEEL - E-OVH OVERHEAD ELECTRICAL LINES FG **FINISH GRADE** SST CONSIDERED APPROXIMATE AND NOT NECESSARILY COMPLETE. VERIFY ACCURACY OF ALL FT FOOT (FEET) **SWPPP** STORM WATER POLLUTION UTILITY LOCATIONS AND FURTHER DISCOVER ANY OTHER UTILITIES NOT SHOWN WHICH MAY BE UNDERGROUND ELECTRICAL LINES **FLOWLINE** PREVENTION PLAN IMPACTED BY CONSTRUCTION. OBTAIN THE REQUIRED PERMITS THAT VERIFY THE TRUE AND **GRO** GASOLINE RANGE ORGANIC TOPO TOPOGRAPHY CORRECT LOCATION PRIOR TO CONSTRUCTION SO AS TO AVOID DAMAGE OR DISTURBANCE. PETROLEUM, OIL, LUBRICANT LINE **HDPE** HIGH DENSITY TYP **TYPICAL** AVOID AND PROTECT ALL UTILITIES IN USE DURING CONSTRUCTION. UFC AND, **POLYETHYLENE** UNIFIED FACILITIES SANITARY SEWER 2. IN GENERAL, EXISTING STRUCTURES AND FACILITIES ARE NOTED AS "EXISTING" AND ARE SHOWN HORIZ **HORIZONTAL CRITERIA** IN LIGHT LINE WEIGHTS, DASHED LINE TYPE OR AS SCREENED BACKGROUND. NEW FEATURES HT HEIGHT UPG **UNDERGROUND POWER** STORM DRAIN ARE SHOWN IN HEAVY LINE WEIGHTS. LEGEND **INSIDE DIAMETER** ID **USACE UNITED STATES ARMY BURIED COMMUNICATION LINE INVERT ELEVATION** CORPS OF ENGINEERS 3. MANY OF THE SYMBOLS ON THIS LEGEND ARE USED ONLY WHERE THEY PROVIDE CLARITY AND IM **IMPERIAL UNITS** USC UNITED STATES CODE ARE NOT NECESSARILY USED AT ALL APPLICATIONS. SOME DRAWINGS IN THE CONTRACT **BURIED FIBER OPTICS LINE** KLF KIPS PER LINEAR FOOT W VELOCITY DOCUMENTS HAVE ADDITIONAL LEGENDS APPLICABLE TO THOSE SPECIFIC DRAWINGS. KSI KIPS PER SQUARE INCH **VERT** VERTICAL **BURIED WATER/STEAM LINE** 4. TYPICAL DETAILS APPLY TO ALL CONDITIONS WHERE MATERIALS INDICATED CONNECT AND THAT LB POUND W WEST ARE SIMILAR UNLESS DETAILED OTHERWISE. CONTAMINATED SITE BOUNDARY LINEAR FEET WITH W/ **LRFD** LOAD AND RESISTANCE W/OUT WITHOUT NATURAL GAS LINE VERIFY SCALE GAS-5. CONTRACTOR TO PROVIDE 14 CALENDAR DAY NOTICE TO THE ENGINEER OF ANY INTERRUPTION **FACTOR DESIGN** SOUTH BAR IS ONE INCH ON TO EXISTING UTILITIES, TRAFFIC PATTERNS OR EXISTING SERVICES. UNDERGROUND ELECTRIC LIGHTING LINE – UF/I — LAND SURVEYOR STD STANDARD LEFT STEEL STL UNDERGROUND COMMUNICATION / SECURITY FEBRUARY 201 **OPTION 5 HYBRID** MAX MAXIMUM PROJ 462130 - UE/CR -UNDERGROUND ELECTRIC / CRANE RAIL MCE MAXIMUM CONSIDERED WG G-02 SHEET 2 of 20

FILENAME: Opt5H G2-POA.DWG

PLOT DATE: February 26, 2013

PLOT TIME: 10:02 AM



# **GENERAL NOTES**

- THE PORT OF ANCHORAGE IS A RESTRICTED FACILITY AND SECURITY CLEARANCE IS REQUIRED FOR PROJECT ACCESS. PORT ACCESS MAY BE LIMITED OR RESTRICTED AT ANY TIME. COORDINATE AND COMPLY WITH CONTRACTOR ACCESS AND SECURITY PROTOCOLS THROUGHOUT CONSTRUCTION.
- 2. MUNICIPAL AND STATE LOAD RESTRICTIONS APPLY. ALL LOADS ARE TO BE SECURED TO PREVENT DEBRIS FROM SCATTERING ON ROADWAYS. MANAGE FUGITIVE DUST FROM EARTH MOVING OPERATIONS ACCORDING TO THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
- 3. THE CONTRACTOR STAGING AREA IS LOCATED WITHIN THE PROJECT LIMITS AS SHOWN. DO NOT STAGE EQUIPMENT OR MATERIALS OUTSIDE OF THE DESIGNATED STAGING AREA WITHOUT OBTAINING PERMISSION SO AS NOT TO INTERRUPT EXISTING OPERATIONS.
- 4. DISPOSAL OF CONCRETE, ASPHALT AND OTHER CONSTRUCTION DEBRIS IS THE RESPONSIBILITY OF THE CONTRACTOR. THERE IS NO ONSITE DISPOSAL AVAILABLE. DISPOSE OF NON-HAZARDOUS DEBRIS AT THE LOCAL LANDFILL OR OTHER APPROVED DISPOSAL SITE.

# SURVEY CONTROL

- 1. THE SURVEY CONTROL FOR THIS PROJECT IS BASED ON THE <u>95% PS&E PORT OF ANCHORAGE NORTH EXTENSION PAVEMENT AND UTILITIES DESIGN PROJECT CONTROL</u> DEVELOPED BY DOWL HKM IN JUNE OF 2009.
- 2. THE TOPOGRAPHY AND BASE MAPPING SHOWN HAVE BEEN DEVELOPED UTILIZING MULTIPLE CONSTRUCTION, DESIGN AND AS-BUILT SURVEYS. THE ACTUAL TOPOGRAPHY AND LOCATION OF UTILITIES AND FEATURES WILL VARY FROM THOSE SHOWN IN THE PLANS.
- 3. PRESERVE FROM INJURY OR DEFACEMENT SURVEY CONTROL MONUMENTATION ENCOUNTERED DURING CONSTRUCTION.
- 4. THE COORDINATE SYSTEM IS ALASKA STATE PLANE ZONE 4, NAD83 DATUM. ALL COORDINATES AND ELEVATIONS ARE EXPRESSED IN U.S. SURVEY FEET.
- 5. "N END 1978" AND "S END 1978" ARE USACE BRASS CAP MONUMENTS. THE BASIS OF BEARINGS IS THE LINE BETWEEN "N END 1978" AND "S END 1978" HAVING A BEARING OF \$20°00'15"W. THE COORDINATE VALUE FOR "S END 1978" **SHOULD NOT BE USED** FOR ANY PURPOSE OTHER THAN LOCATING THE MONUMENT.
- 6. PROJECT ELEVATIONS ARE BASED ON MEAN LOWER LOW WATER (MLLW). ELEVATION DATA IS FROM THE NOAA/NOS TIDAL BENCH MARK SHEET 9455920 FOR ANCHORAGE, KNIK ARM, COOK INLET, ALASKA DATED 21 APRIL 2003.
- 7. THE BASIS OF ELEVATIONS IS NOAA/NOS TIDAL BENCH MARK "TIDAL 16 1966", A USACE BRASS CAP MONUMENT HAVING A VALUE OF 40.53 FEET AND TIDAL BENCHMARK "B 75 1964", A USACE BRASS CAP MONUMENT HAVING A VALUE OF 36.82 FEET.

FILENAME: Opt5H C1-POA.DWG

CHZMHILL

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.

0 1"

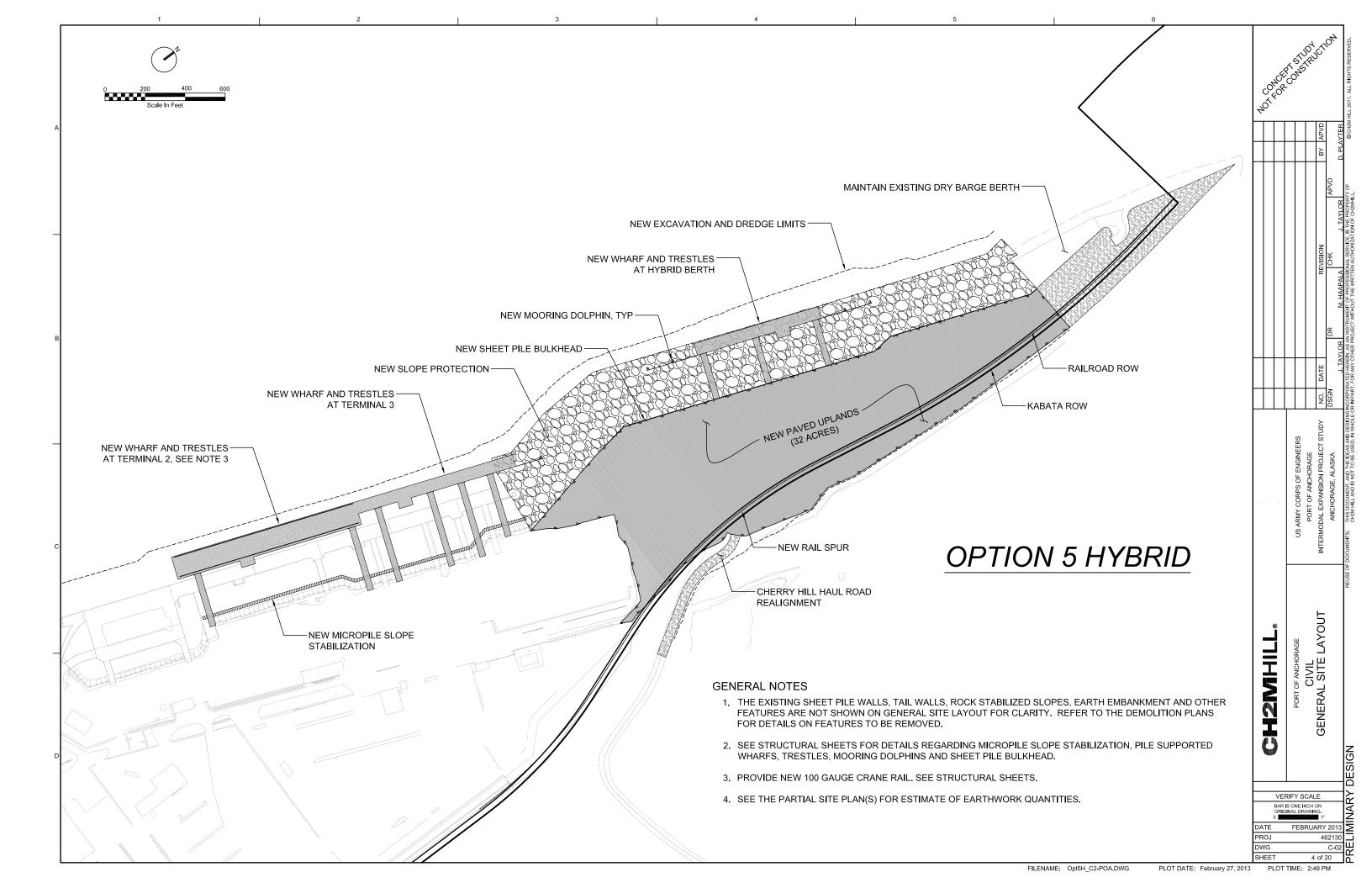
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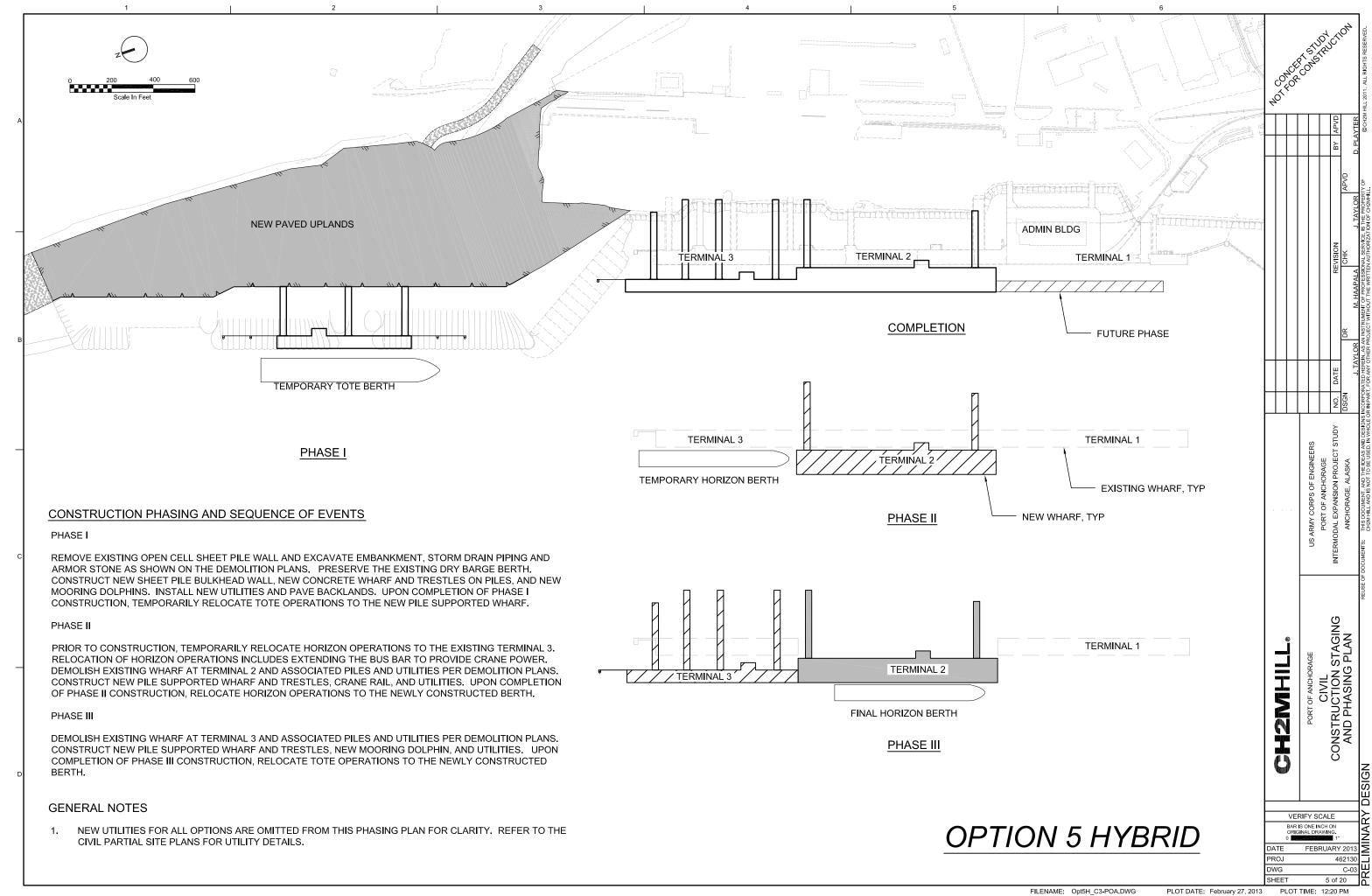
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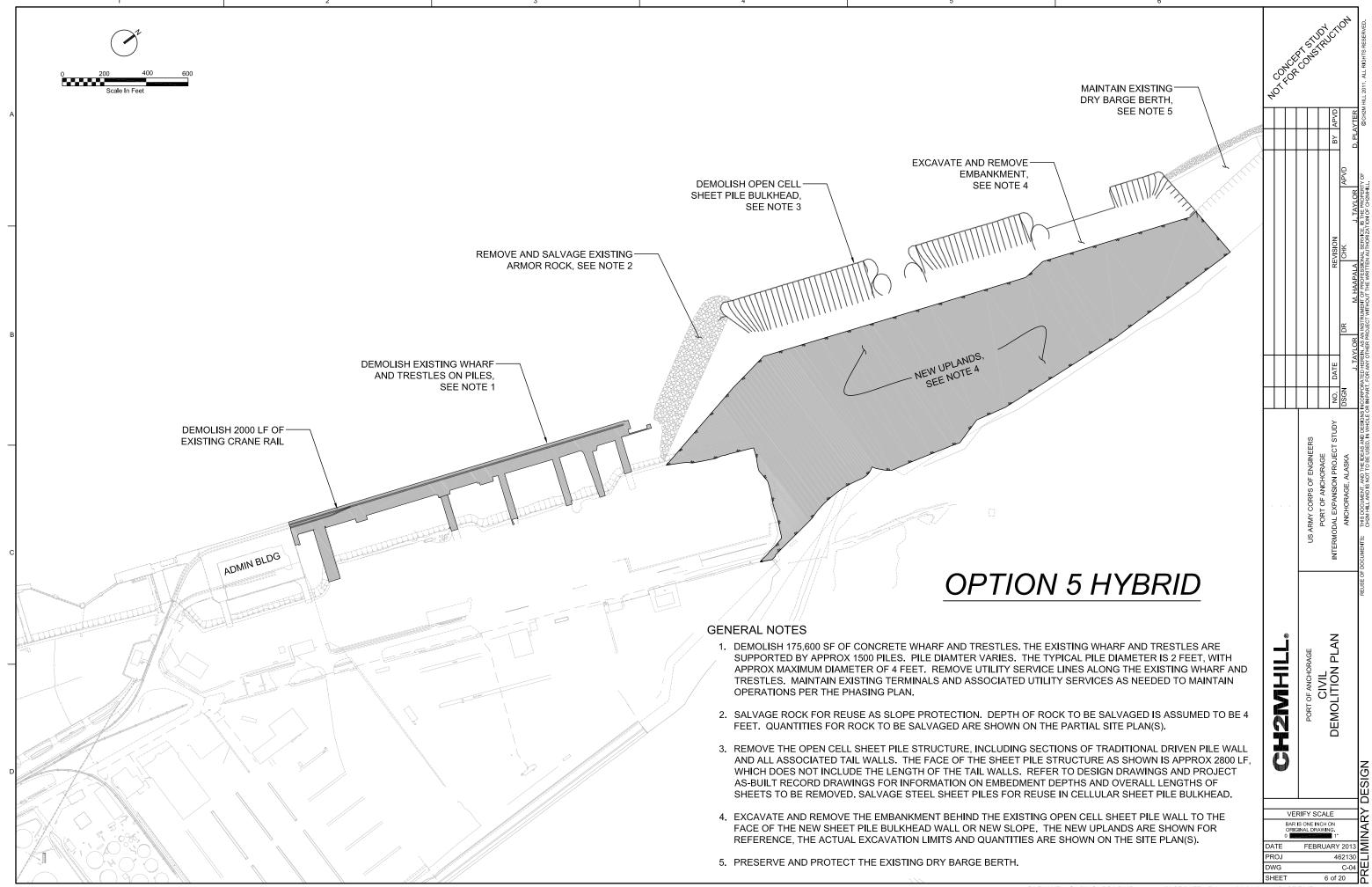
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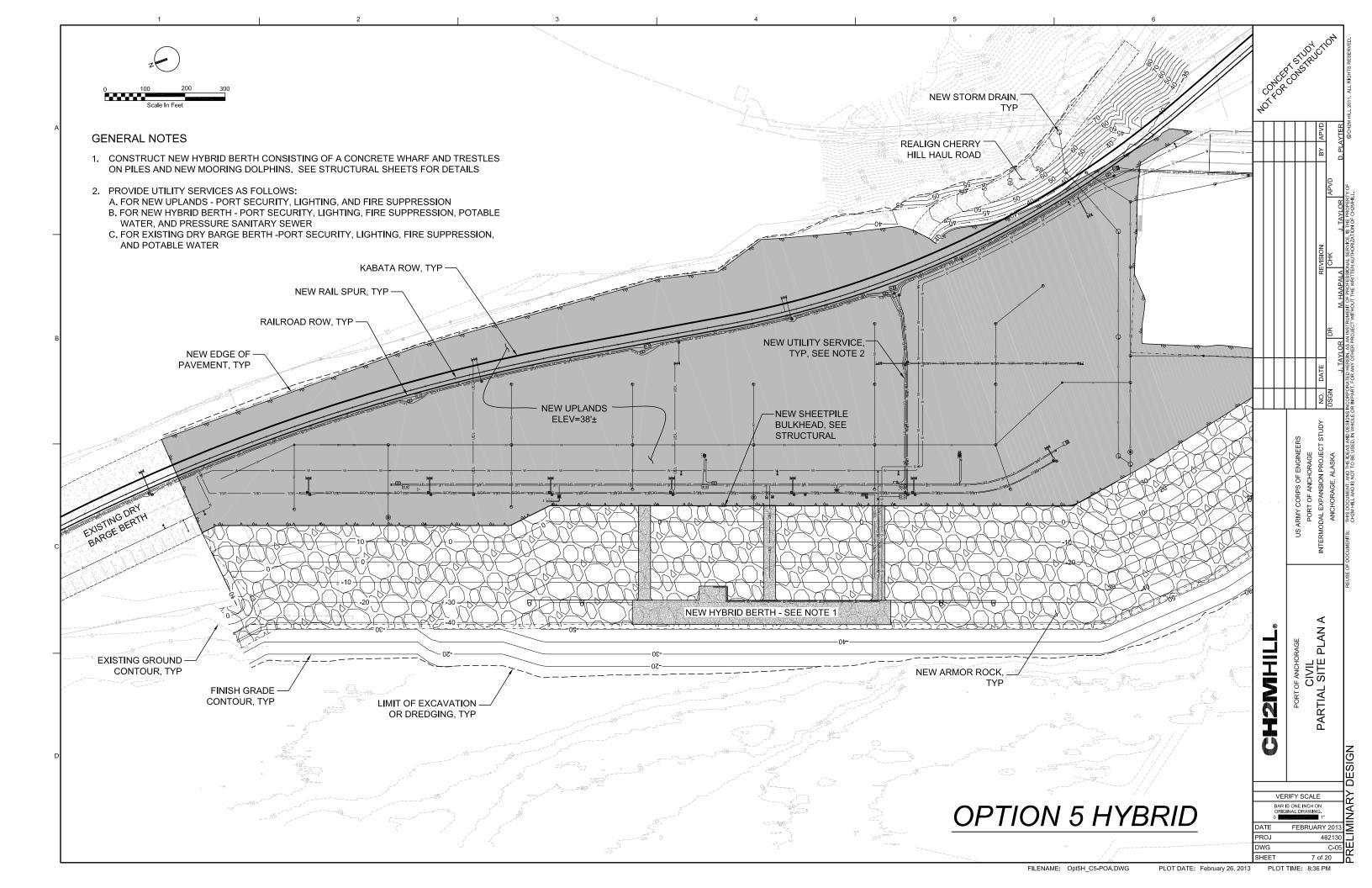
3 of 20

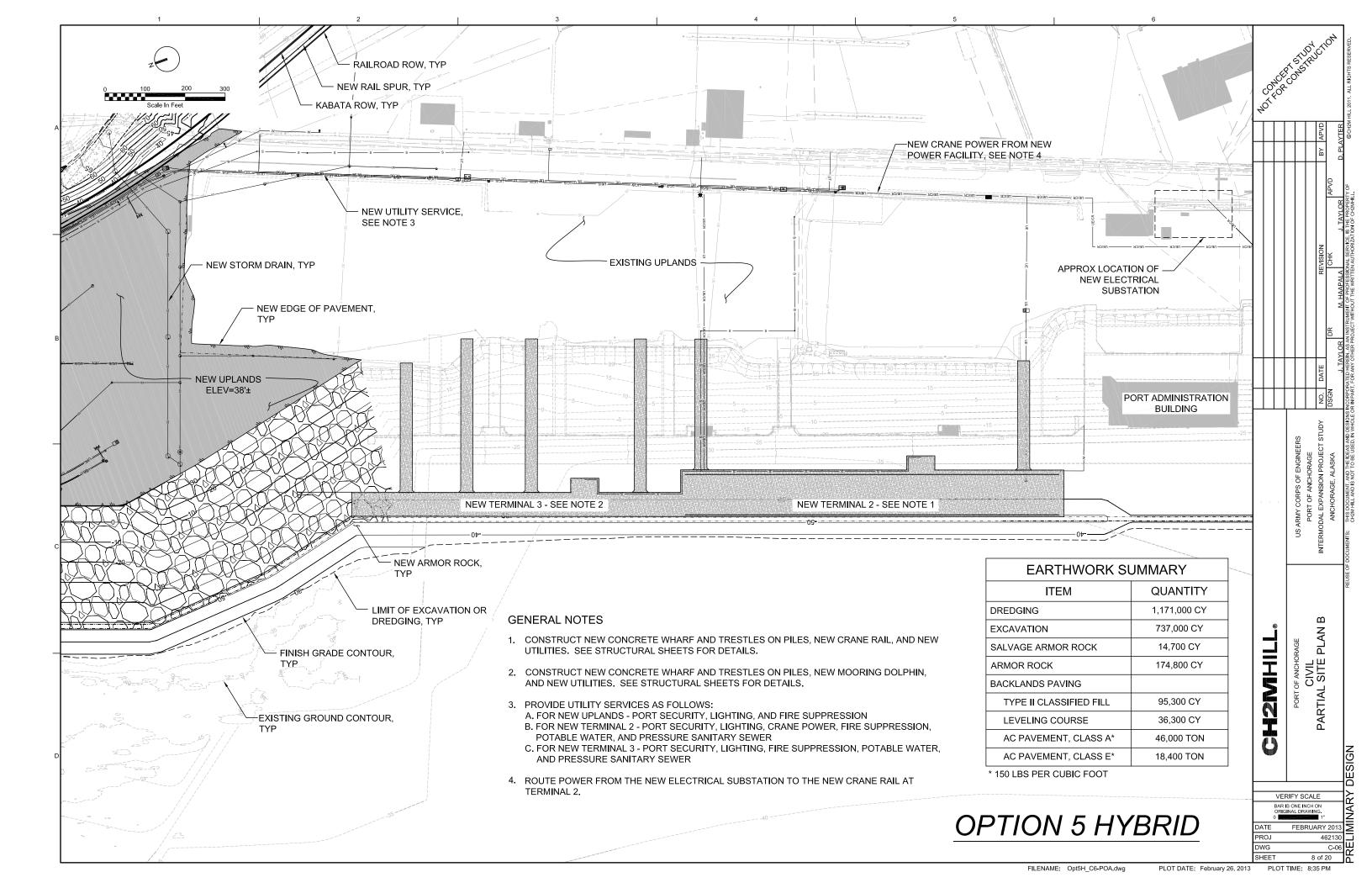
PLOT DATE: February 26, 2013 PLOT TIME: 10:04 AM

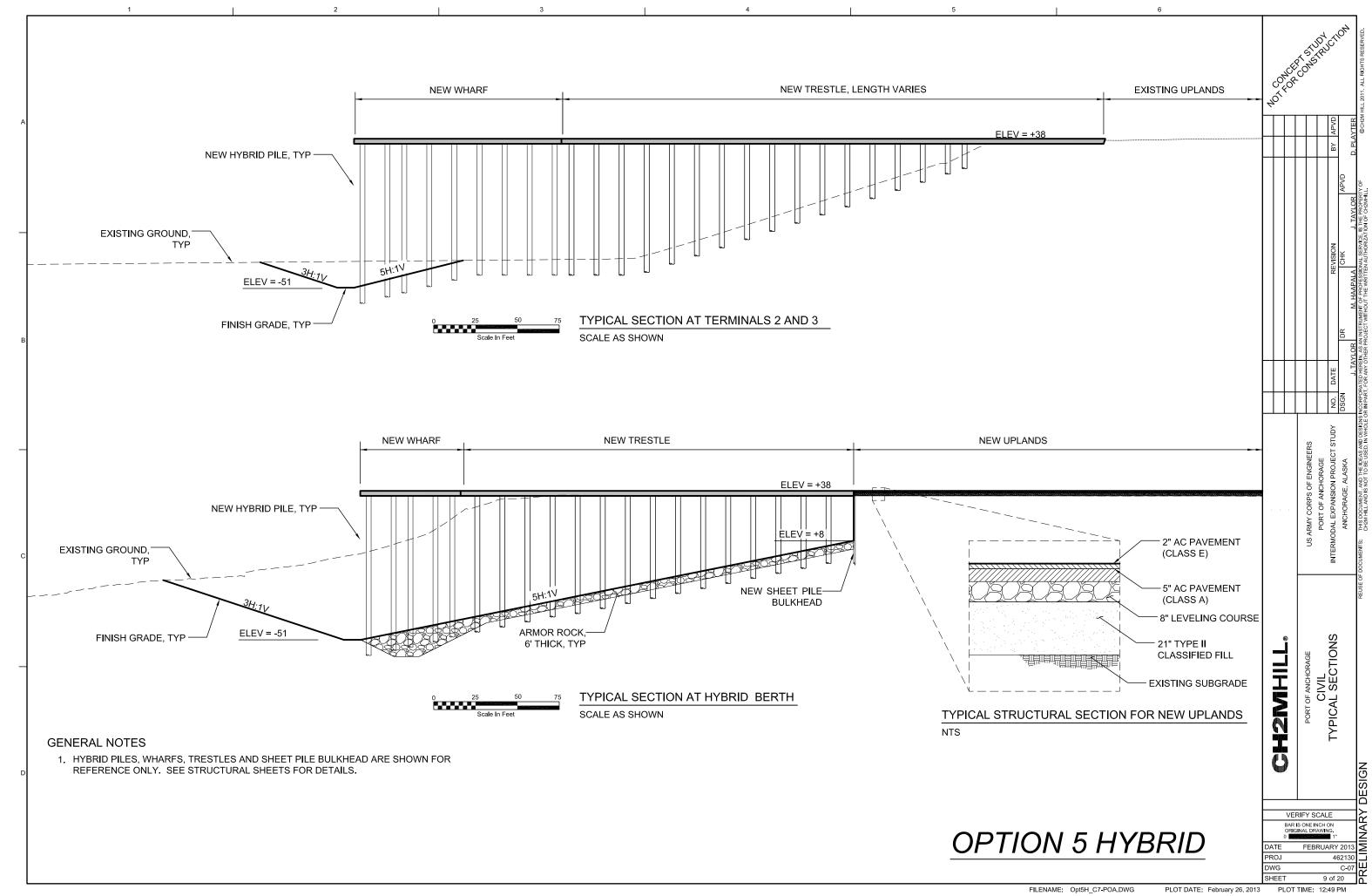












SEE NOTE 2

LANDSCAPING

AREAS

AREAS

ROAD PAVEMENT, SEE NOTE 6

SEE NOTE 4

MARKING TAPE AS SPECIFIED

150 mm (6 in)

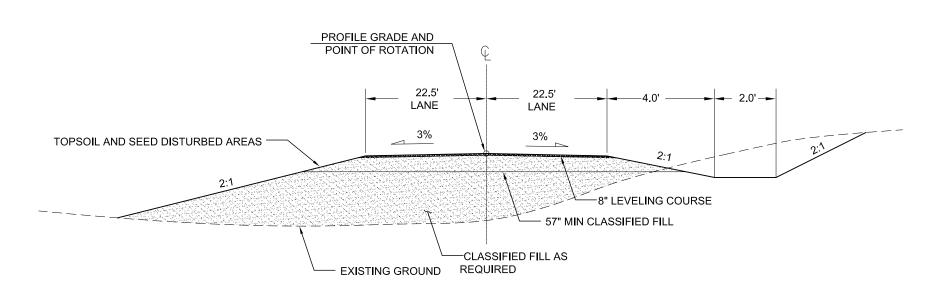
O.D.

300mm (12 in) MIN, TYP

# TYPICAL TRENCH BACKFILL DETAIL

NOTES:

- 1. CLASSIFIED NFS MATERIAL COMPACTED AS REQUIRED BY PROJECT SPECIFICATIONS.
- UNCLASSIFIED MATERIAL COMPACTED AS REQUIRED BY PROJECT SPECIFICATIONS.
- 3. WATER, SEWER, GAS, ELECTRIC, AND COMMUNICATIONS PIPE BEDDING SHALL BE COMPACTED AS REQUIRED BY PROJECT SPECIFICATIONS.
- 4. SIDE SLOPES SHALL BE CONSTRUCTED AS REQUIRED PER OSHA.
- 5. WHERE NONMETALIC PIPE IS INSTALLED, FURNISH AND INSTALL A COPPER TRACER LOOPED AROUND THE PIPE EVERY 3M (10'), AND SECURELY TAPED TO PIPE EVERY 3M (10').
- 6. SAWCUT EXISTING PAVEMENT WHERE REQUIRED. REMOVE AND REPLACE EXISTING PAVEMENT AND BASE MATERIAL IN KIND WITH MATERIAL OF THE SAME THICKNESS.
- 7. GEOTEXTILE SHALL CONFORM TO AASHTO M288 FOR SUBSURFACE DRAINAGE. OVERLAP GEOTEXTILE ENDS A MINIMUM OF 300mm (12").
- 8. GRANULAR BACKFILL SHALL CONFORM TO PROJECT SPECIFICATIONS.



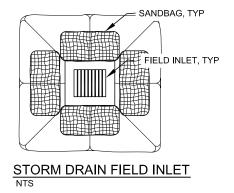
CHERRY HILL HAUL ROAD SECTION

NTS

- USE STITCHED LOOPS OVER 50mm x 100mm (2"x4") POSTS FILTER FABRIC MATERIAL NEWLY GRADED OR DISTURBED - PROVIDE BASE COURSE BACKFILL IN TRENCH SLOPE ANGLE BOTH ENDS OF FILTER FABRIC FENCE TO ASSURE SOIL IS TRAPPED **INTERLOCKED 50mm PLAN** x 100mm (2"x4") **SECTION** POSTS AND ATTACH FILTER FABRIC MATERIAL, 450mm (36") ROLLS 1.88M (6') MAXIMUM SPACING **ELEVATION** 

- 1. BURY BOTTOM OF FILTER FABRIC 150mm (6") VERTICALLY BELOW FINISHED GRADE.
- 2. 50mm x 100mm (2" x 4") DOUGLAS FIR OR STEEL FENCE POSTS.
- 3. STITCHED LOOPS TO BE INSTALLED DOWNHILL SIDE OF SLOPE.
- 4. COMPACT ALL AREAS OF FILTER FABRIC TRENCH.

 $\frac{\text{SILT FENCE DETAIL}}{\text{\tiny NTS}}$ 



**OPTION 5 HYBRID** 

BAR IS ONE INCH ON C-08 10 of 20

# STRUCTURAL DESIGN CRITERIA

# **DESIGN CODES AND REFERENCES**

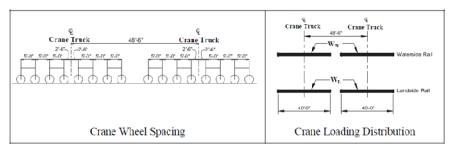
- MARINE OIL TERMINAL ENGINEERING AND MAINTENANCE STANDARDS (CALIFORNIA BUILDING CODE, CHAPTER 31F) 2011.
- 2. AASHTO LOAD AND RESISTANCE FACTOR DESIGN (LRFD) BRIDGE DESIGN SPECIFICATIONS, SIXTH EDITION WITH INTERIMS, 2012.
- 3. INTERNATIONAL BUILDING CODE (WITH ANCHORAGE LOCAL AMENDMENTS), 2009.
- 4. ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, 2010.
- 5. ACI 318-08 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, 2008.
- 6. AISC 360-10 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, 2010
- 7. AWS D1.1 STRUCTURAL WELDING CODE STEEL, 2010.
- 8. PORT OF LONG BEACH WHARF DESIGN CRITERIA, V 3.0, 2012.

# SERVICE LIFE

- 1. WHARF, TRESTLE, BULKHEAD AND RETAINING WALL.
- 1.1. ALL STRUCTURAL COMPONENTS SHALL BE DESIGNED FOR A SERVICE LIFE OF 75 YEARS.
- FENDERS
- 2.1 FENDERS SHALL BE DESIGNED FOR A SERVICE LIFE OF 25 YEARS.
- 3. ROADS, PAVEMENT
- 3.1 PAVEMENT SHALL BE DESIGNED FOR A SERVICE LIFE OF 20 YEARS.
- 4. BUILDINGS
- 4.1 BUILDINGS SHALL BE DESIGNED FOR A SERVICE LIFE OF 50 YEARS.

# **DESIGN LIVE LOADS**

- 1. UNIFORM LIVE LOAD: 1000 PSF
- 2. TRUCK LOAD: AASHTO HS25 TRUCK
- 3. MOBILE CRANE LOAD: 275-TON CRAWLER CRANE / TRUCK CRANE
- 4. LOADING / UNLOADING EQUIPMENT: 80,000 LBS TOP PICK / 100-TON FORKLIFT
- 5. 100-FT GAUGE RAIL MOUNTED CRANE: RAIL MOUNTED CRANE LOAD FOR CRANE RAIL BEAM IS BASED ON 50 KIPS PER FOOT INCLUDING IMPACT; BASED ON CRANE WHEEL SPACING BELOW.



#### WIND LOAD

- NORMAL OPERATING WIND SPEED (OWL45) = 45 MPH
- MAXIMUM MOORING WIND SPEED / CRANE TIE DOWN WIND SPEED (OWL70) = 70 MPH
- 3. MAXIMUM NON-OPERATING WIND SPEED (NOWL100) = 100 MPH

# MOORING LOADS FROM VESSELS:

- 1. WIND LOADS PER MOTEMS SUBSECTIONS 3105F.2 & 3103F.5.2 AND WIND SPEED SPECIFIED IN WIND LOAD SECTION.
- CURRENT LOADS PER MOTEMS SUBSECTION 3103F.5.3.
- 3. WAVE LOADS PER MOTEMS SUBSECTIONS 3103F.5.4 & 3104F.3.1.
- 4. PASSING VESSELS PER MOTEMS SUBSECTION 3103F.5.5.
- 5. MOORING BOLLARD LOAD: 150 TON

#### BERTHING LOAD

BERTHING LOAD IS BASED ON THE FOLLOWING SHIP CHARACTERISTICS:

- 1. SHIP LENGTH: 1000 FT
- 2. SHIP BEAM: 140 FT
- 3. SHIP DRAFT: 45 FT
- 4. SHIP DISPLACEMENT: 76,000 LONG TON
- APPROACH SPEED: 0.66 FT/SEC
- 6. APPROACH ANGLE: 10 DEGREES

# ICE LOAD

- ICE LIVE LOAD: IMPACT FOR ICE SLAB 24 INCH IN THICKNESS W/ CRUSH STRENGTH OF 300 PSI.
- 2. ICE DEAD LOAD: A MASS OF ICE 8 FT IN DIAMETER ENCIRCLING AND ADHERING TO EACH PILE.

#### EARTHQUAKE LOAD

SUMMAF	RY OF DE	SIGN EARTHQUAKE	E PARAMETERS
EARTHQUAKE	RETURN PERIOD (YEARS)	PEAK HORIZONTAL GROUND ACCELERATION - LANDWARD LOCATION (g)	PEAK HORIZONTAL GROUND ACCELERATION - SEAWARD LOCATION (g)
OLE	72	0.17	0.21
CLE	475	0.31	0.23
MCE	2,475	0.39	0.27

# DESIGN RESPONSE SPECTRA (SEASIDE)

	SE	AWARD L	OCATION		
OI	LE	CL	.E	МС	E
PERIOD (sec)	SA (g)	PERIOD (sec)	SA (g)	PERIOD (sec)	SA (g)
0.01	0.21	0.01	0.23	0.01	0.27
0.3	0.42	0.5	0.7	0.55	0.82
0.7	0.42	1.1	0.7	1.4	0.82
1	1 0.3		0.45	1.5	0.76
2	2 0.09		0.27	2	0.6
4	0.04	4	0.12	4	0.37
5	0.03	5	0.1	5	0.3
6 0.03		6	0.08	6	0.25
7	0.02	7	0.07	7	0.21
8	0.02	8	0.06	8	0.19

# DESIGN RESPONSE SPECTRA (LANDSIDE)

	LANDWA	RD (BACK	LANDS) L	OCATION	
0	LE	CL	.E	МС	Œ
PERIOD (sec)	SA (g)	PERIOD (sec)	SA (g)	PERIOD (sec)	SA (g)
0.01	0.01 0.17		0.31	0.01	0.39
0.1	0.3	0.15	0.54	0.25	0.88
0.65	0.65 0.3		0.54	1	0.88
1	1 0.18		0.45	-	-
2	2 0.06		0.15	2	0.32
4	0.03	4	80.0	4	0.15
5	5 0.02		0.06	5	0.12
6 0.02		6	0.05	6	0.1
7	0.02	7	0.05	7	0.09
8	0.015	8	0.04	8	0.08

# **MATERIALS**

- CONCRETE
- 1.1. CONCRETE USED FOR STRUCTURES SHALL CONFORM TO REQUIREMENTS OF
- 1.2. THE 90-DAY CHLORIDE PERMEABILITY FOR THE CONCRETE MIX USED IN WHARF, TRESTLE, PILE, AND OTHER MAJOR STRUCTURAL COMPONENTS SHALL NOT EXCEED 1,000 COULOMBS.

#### REINFORCING STEEL

- 2.1. DEFORMED STEEL BARS FOR CONCRETE REINFORCEMENT SHALL CONFORM TO THE FOLLOWING: ASTM A706, LOW ALLOY STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT, SHALL BE USED FOR ALL CAST-IN-PLACE CONCRETE CONSTRUCTION UNLESS OTHERWISE NOTED.
- 2.2. CONFINEMENT STEEL (SPIRALS AND HOOPS) SHALL CONFORM TO ASTM A706, LOW-ALLOY STEEL, DEFORMED BARS FOR CONCRETE REINFORCEMENT.
- 2.3. ALL REINFORCING STEEL FOR PILE, WHARF, AND TRESTLE SHALL BE EPOXY

#### 3. PRESTRESSING STEEL

- 3.1. PRESTRESSING REINFORCEMENT SHALL BE HIGH-TENSILE-STRENGTH, SEVEN WIRE LOW-RELAXATION STRANDS CONFORMING TO THE REQUIREMENTS OF AASHTO M203, GRADE 270.
- 4. STRUCTURAL STEEL AND MISCELLANEOUS METAL
- 4.1. ROLLED WIDE FLANGE SHAPES: ASTM A992.
- 4.2. HP SHAPES, CHANNELS, ANGLES, AND PLATES: ASTM A572, GRADE 50.
- 4.3. STEEL PIPE PILES: ASTM A572, GRADE 50.
- 4.4. STEEL SHEET PILES: ASTM A572, GRADE 50. STEEL SHEET PILES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A328 STEEL SHEET PILING AND ASTM A6 GENERAL REQUIREMENTS FOR ROLLED STRUCTURAL STEEL BARS, PLATES, SHAPES, AND SHEET PILING. ALL INTERLOCK GROUP TEST SHALL PROVIDE A MINIMUM OF 20,000 LBS PER LINEAR INCH ULTIMATE INTERLOCK TENSILE STRENGTH.
- 4.5. HOLLOW STRUCTURAL SHAPES: ASTM A500, GRADE B. WELDING OF HOLLOW STRUCTURAL SECTION SHALL BE PER AWS D1.1. HSS SHALL NOT BE USED FOR DYNAMIC LOADING CONDITIONS WITHOUT ADDITIONAL MINIMUM CVN REQUIREMENTS BEING SPECIFIED.
- 4.6. STRUCTURAL BOLTS: AASHTO M164 OR ASTM A325 WITH RECOMMENDED NUTS, WASHERS AND DIRECT TENSION INDICATORS
- 4.7. ANCHOR BOLTS: ASTM F1554, HOT DIPPED GALVANIZED PER ASTM A153A OR AASHTO M232 WITH RECOMMENDED NUTS AND WASHERS. BOLT GRADES WITH TENSILE STRENGTHS OVER 145 KSI SHALL BE TESTED FOR EMBRITTLEMENT IN ACCORDANCE WITH ASTM A143.
- .8. GALVANIZING: HOT DIP GALVANIZING FOR STEEL PIPE PILES, STEEL SHEET PILES AND OTHER STRUCTURAL STEEL ATTACHMENTS SHALL CONFORM TO ASTM A123 OR ASTM A153 AS APPLICABLE.

# CATHODIC PROTECTION

AN IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM SHALL BE PROVIDED TO CONTROL CORROSION OF THE SHEET PILE BULKHEAD STRUCTURE.

#### TIDAL INFORMATION

- 1. HIGHEST OBSERVED WATER: EL +34.6 MLLW
- 2. MEAN LOWER LOW WATER: EL 0' MLLW
- 3. LOWEST OBSERVED WATER: EL -6.4' MLLW

#### DESIGN LOAD FACTORS FOR LOAD COMBINATIONS

2010 CBC TABLE 31F-3-12

				2010 020 1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
LRFD LOAD FACT	ORS FO	R LOAD	COMBINAT	TIONS		
LOAD TYPE	VACANT	CONDITION	MOORING & BREASTING CONDITION	BERTHING CONDITION		IQUAKE DITION
DEAD LOAD (D)	1.2	0.9	1.2	1.2	1.2+k <sup>a</sup>	0.9-k <sup>b</sup>
LIVE LOAD (L)	1.6		1.6 <sup>b</sup>	1.0	1.0	
BUOYANCY (B)	1.2	0.9	1.2	1.2	1.2	0.9ª
WIND ON STRUCTURE (W)	1.6	1.6	1.6	1.6		
CURRENT ON STRUCTURE (C)	1.2	0.9	1.2	1.2	1.2	0.9
EARTH PRESSURE ON THE STRUCTURE (H)	1.6	1.6	1.6	1.6	1.6°	1.6°
MOORING/BREASTING LOAD (M)			1.6			
BERTHING LOAD (Be)				1.6		
EARTHQUAKE LOAD (E)					1.0	1.0
THE K ENGTOR (L. O.E. (BOA) AND BUILD	(4410) ( (5)	55 455	LIED TO THE V	EDTION DEAD		

- a. THE K FACTOR (k = 0.5 (PGA) AND BUOYANCY (B) SHALL BE APPLIED TO THE VERTICAL DEAD LOAD (D) ONLY, AND NOT TO THE INERTIAL MASS OF THE STRUCTURE.
  - THE LOAD FACTOR FOR LIVE LOAD (L) MAY BE REDUCED TO 1.3 FOR THE MAXIMUM OUTRIGGER FLOAT LOAD FROM A TRUCK CRANE.
- AN EARTH PRESSURE ON THE STRUCTURE FACTOR (H) OF 1.0 MAY BE USED FOR PILE OR BULKHEAD STRUCTURE.

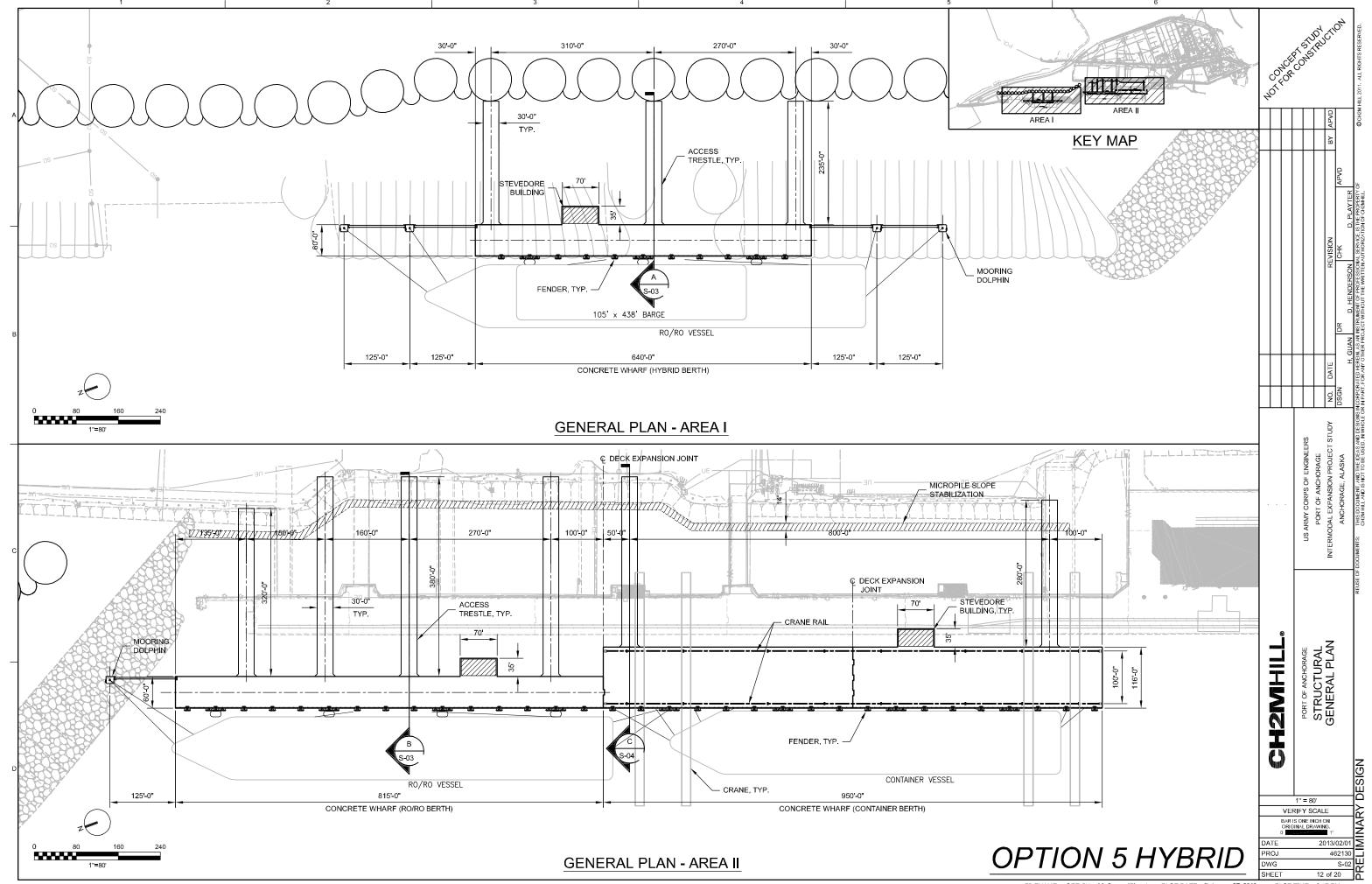
  FOR LEVEL 1 AND 2 EARTHQUAKE CONDITION WITH STRAIN LEVELS DEFINED IN DIVISION 7

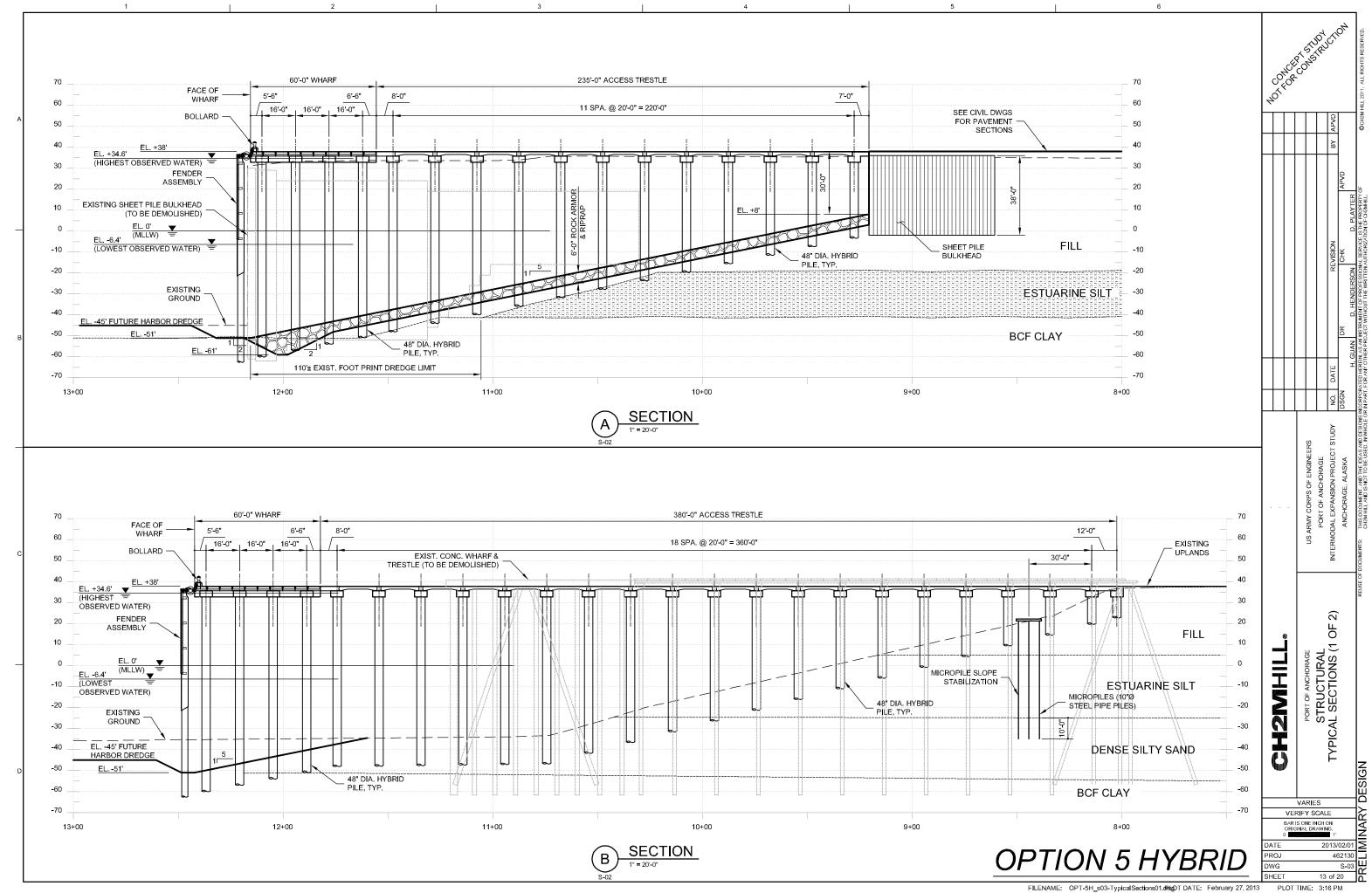
OF THE 2010 CBC CHAPTER 31F, THE CURRENT ON STRUCTURE (C) MAY NOT BE REQUIRED.

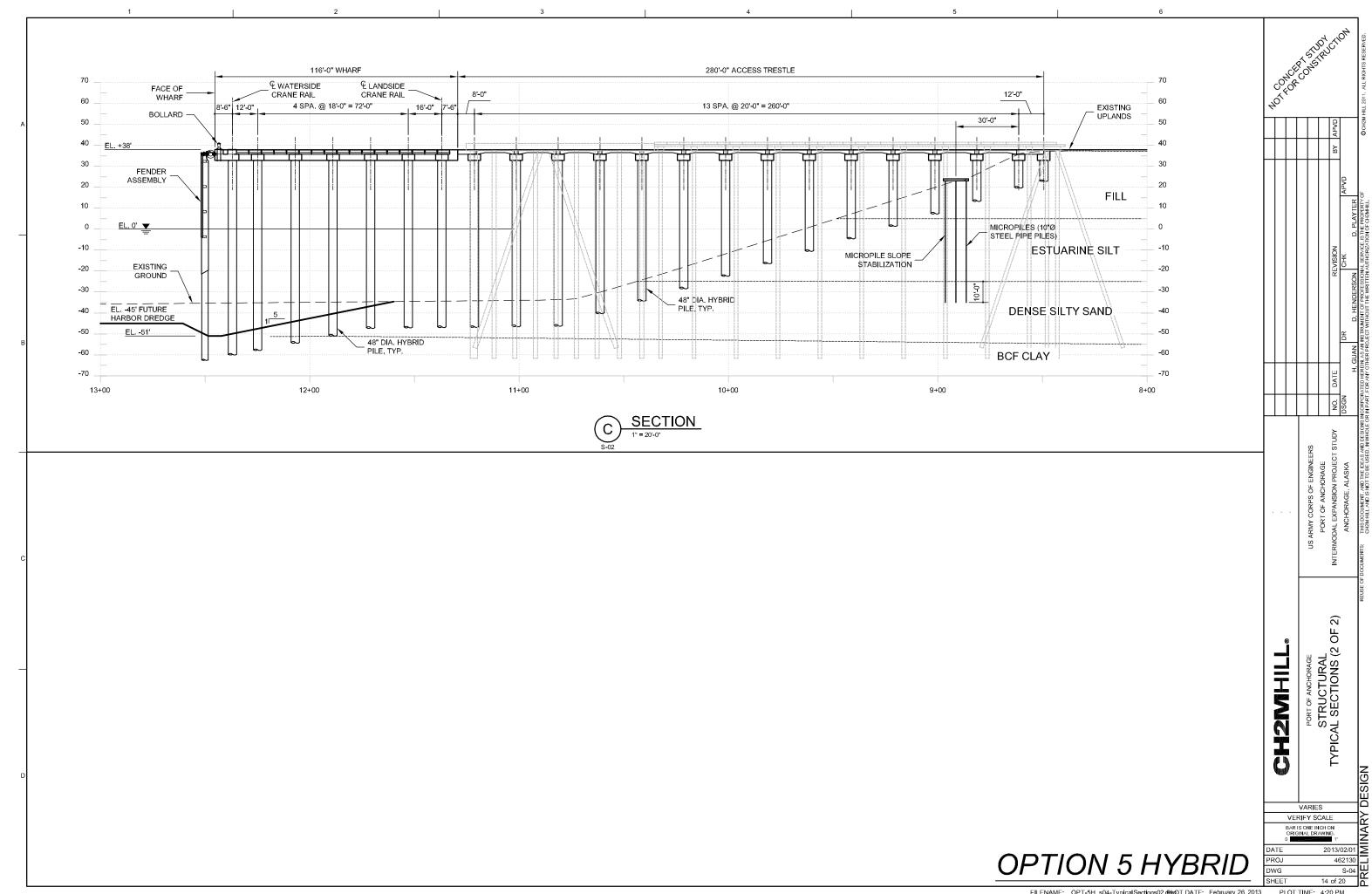
OPTION 5 HYBRID

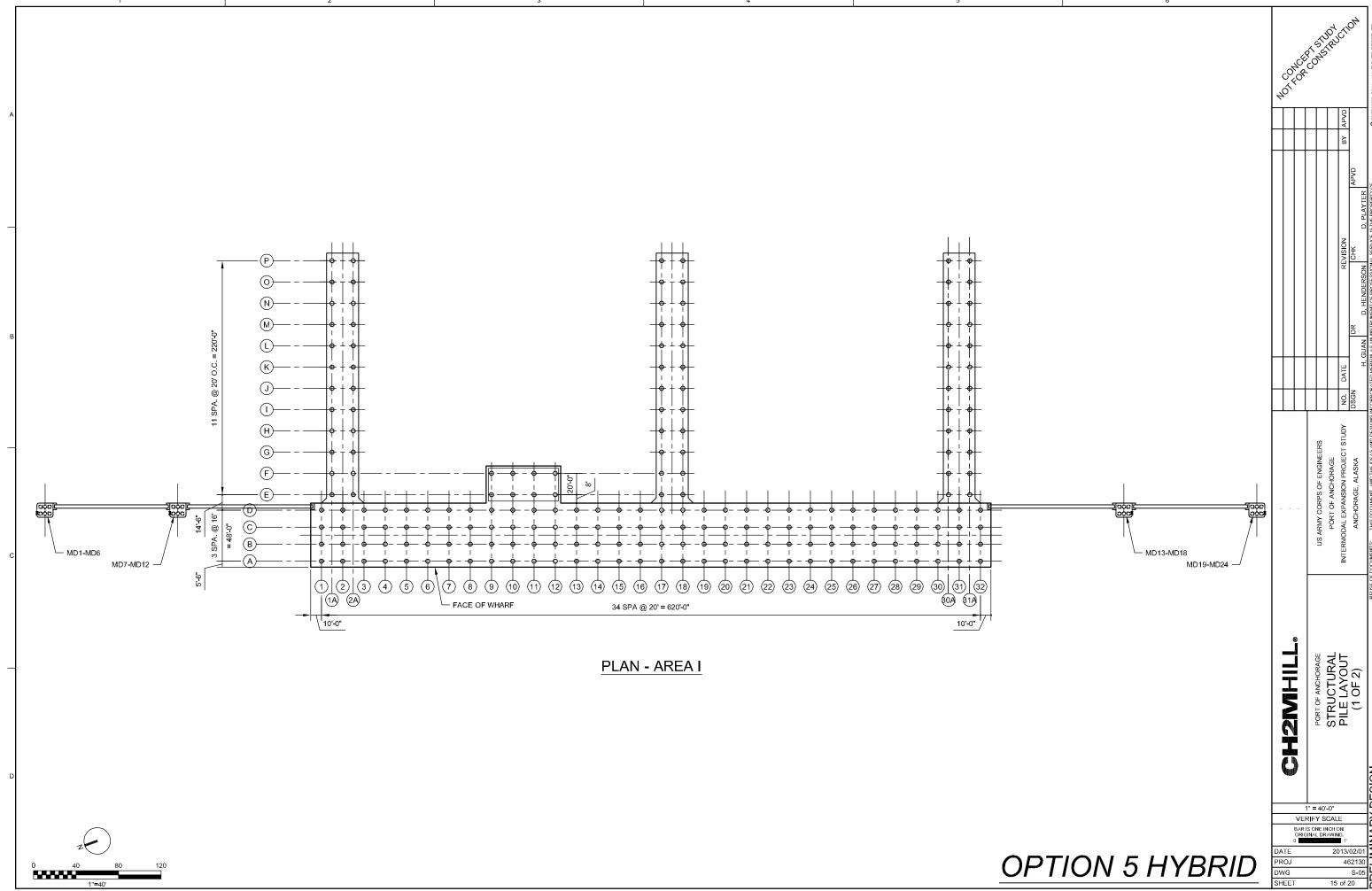
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		_					1	Т
PORT OF ANCHORAGE	US ARMY CORPS OF ENGINEERS							Г
STRUCTURAL	PORT OF ANCHORAGE							Г
DESIGN CRITERIA	INTERMODAL EXPANSION PROJECT STUDY	Š	DATE		REVISION		BY APVD	Q
	ANCHORAGE, ALASKA	DSGN		DR	CHK	APVD		Г
			H. GUA	H. GUAN D. HENDERSON	D. PLAYTER			

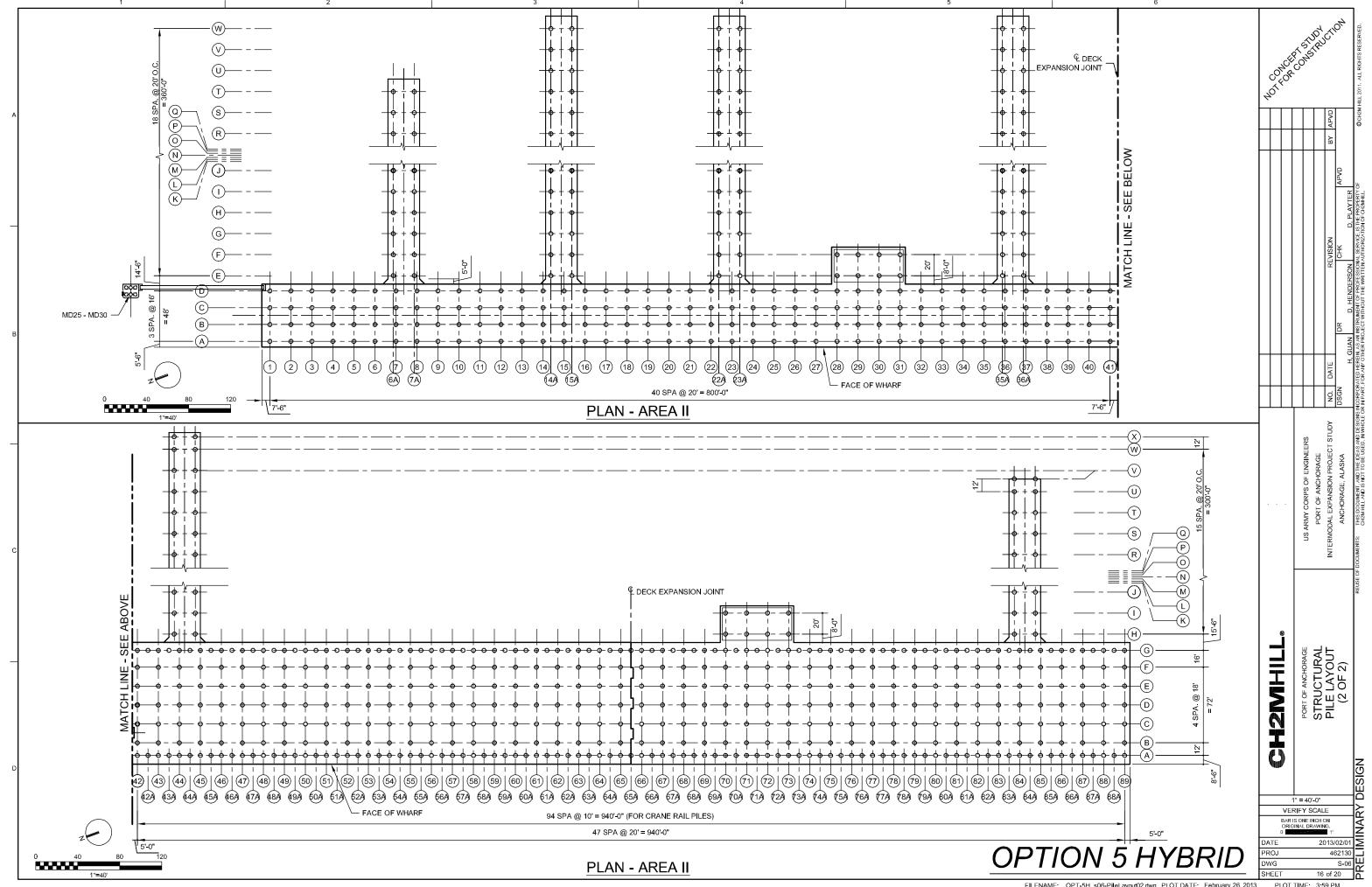
SHEET

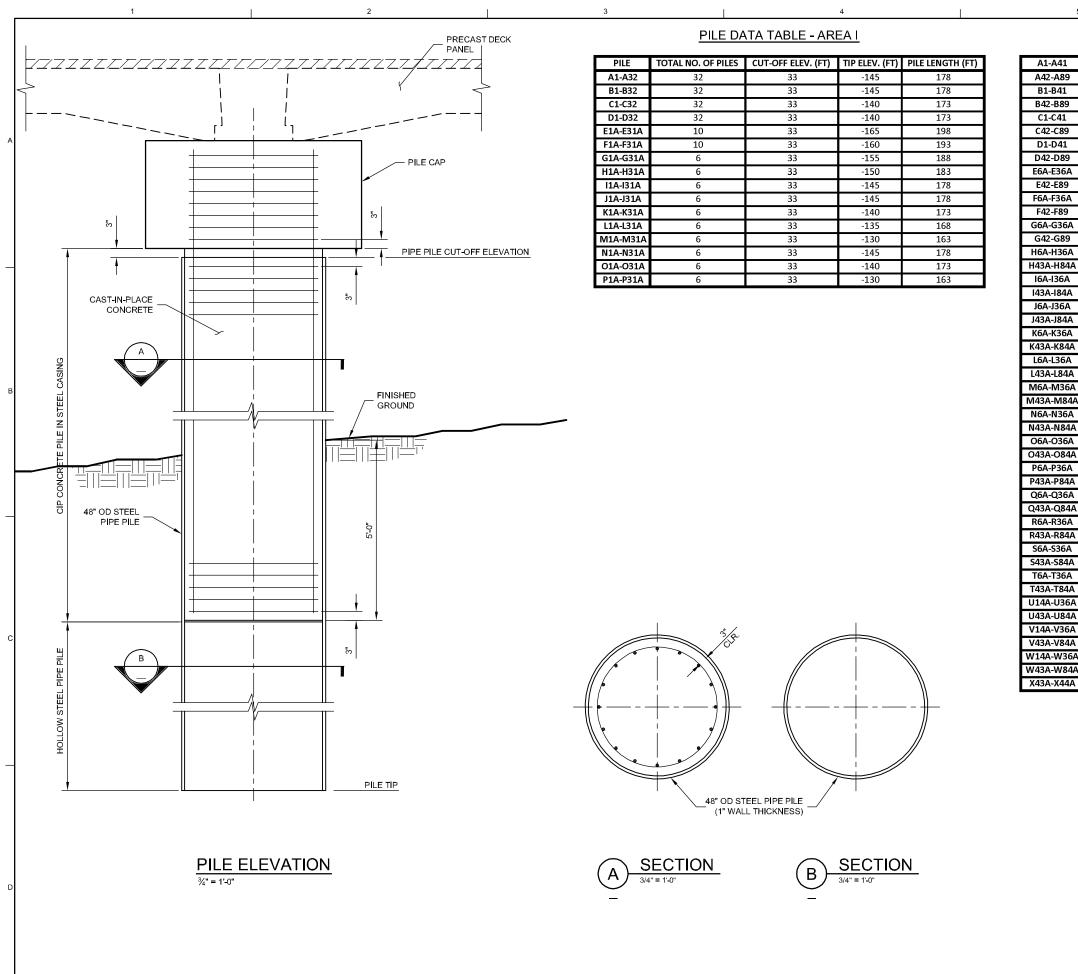












PILE DATA TABLE - AREA II

A1-A41	41	33	-170	203
A42-A89	95	33	-190	223
B1-B41	41	33	-165	198
B42-B89	48	33	-180	213
C1-C41	41	33	-165	198
C42-C89	48	33	-170	203
D1-D41	41	33	-160	193
D42-D89	48	33	-165	198
E6A-E36A	12	33	-175	208
E42-E89	48	33	-160	193
F6A-F36A	12	33	-170	203
F42-F89	48	33	-160	193
G6A-G36A	8	33	-165	198
G42-G89	95	33	-170	203
H6A-H36A	8	33	-160	193
H43A-H84A	8	33	-165	198
16A-136A	8	33	-155	188
143A-184A	8	33	-160	193
J6A-J36A	8	33	-150	183
J43A-J84A	4	33	-155	188
K6A-K36A	8	33	-145	178
K43A-K84A	4	33	-150	183
L6A-L36A	8	33	-140	173
L43A-L84A	4	33	-145	178
M6A-M36A	8	33	-135	168
M43A-M84A	4	33	-140	173
N6A-N36A	8	33	-130	163
N43A-N84A	4	33	-135	168
O6A-O36A	8	33	-125	158
O43A-O84A	4	33	-130	163
P6A-P36A	8	33	-135	168
P43A-P84A	4	33	-125	158
Q6A-Q36A	8	33	-130	163
Q43A-Q84A	4	33	-140	173
R6A-R36A	8	33	-125	158
R43A-R84A	4	33	-135	168
S6A-S36A	8	33	-120	153
S43A-S84A	4	33	-130	163
T6A-T36A	8	33	-115	148
T43A-T84A	4	33	-125	158
U14A-U36A	6	33	-110	143
U43A-U84A	4	33	-120	153
V14A-V36A	6	33	-105	138
V43A-V84A	2	33	-115	148
W14A-W36A	6	33	-105	138
W43A-W84A	2	33	-115	148
X43A-X44A	2	33	-90	123

**OPTION 5 HYBRID** 

3/4" = 1'-0" VERIFY SCALE

PORT OF ANCHORAGE STRUCTURAL PILE DETAILS

CHZMILL

