PIER B STRUCTURAL GENERAL NOTES

GENERAL

1. THESE NOTES APPLY TO THE PIER B STRUCTURE. REFER TO SHEET S100 FOR ADDITIONAL GENERAL NOTES.
2. ALL DIMENSIONS AND DETAILS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION AND CONSTRUCTION.
3. ALL SHOP DRAWINGS FOR PRECAST CONCRETE ELEMENTS, REINFORCING STEEL, MISCELLANEOUS STEEL, AND FENDER SYSTEM SHALL BE SUBMITTED TO AND REVIEWED BY THE ENGINEER PRIOR TO FABRICATION.

DESIGN CRITERIA

PIER B:

1. UNIFORM LIVE LOADS:

   800 PSF, TYP
   80 PSF FOR LOAD COMBINATIONS WITH SEISMIC LOADS
   100 PSF UNIFORM LIVE LOAD FOR TEMPORARY CONSTRUCTION LOAD

2. CONCENTRATED LIVE LOADS:
   A. SEE LIVE LOAD DIAGRAMS THIS SHEET FOR THE FOLOWING VEHICLE LIVE LOADS:

      FORKLIFT LOAD IN ACCORDANCE WITH UFC 4-152-01
      TRUCK LOAD: AASHTO HL-93
      MOBILE CRANE: 140-TON IN ACCORDANCE WITH UFC 4-152-01

   B. IMPACT FACTORS PER LOAD DIAGRAMS ARE NOT APPLICABLE TO PILES AND OTHER SUBSTRUCTURE ELEMENTS.

3. PORTAL CRANE LOAD
   A. PORTAL CRANE - 30 K/FT PER RAIL
      APPLIED SIMULTANEOUSLY WITH 80 PSF UNIFORM LIVE LOAD WITHIN 34'-0" WIDE ZONE CENTERED ON CENTER LINE OF RAILS AND 800 PSF ELSEWHERE (SEE DIAGRAM ON THIS SHEET)
   B. IMPACT FACTORS PER LOAD DIAGRAM ARE NOT APPLICABLE TO PILES AND OTHER SUBSTRUCTURE ELEMENTS.

4. DEAD LOADS:

CONCRETE	150 PCF
PRECAST CONCRETE PILES	160 PCF
STEEL	490 PCF

5. FENDER SYSTEM DESIGN CRITERIA
   A. DESIGN VESSEL
      CVN 68 CLASS AIRCRAFT CARRIER

LENGTH OVERALL (LOA):	1115 FEET
BEAM:	134 FEET
DRAFT:	41 FEET
DISPLACEMENT:	94917 LONG TONS (MAXIMUM GROSS WEIGHT OF VESSEL, LIGHTLY LOADED)

   B. BERTHING LOAD:

APPROACH VELOCITY:	0.33 FT/SECOND
APPROACH ANGLE:	NORMAL TO THE PIER (TUG ASSISTED)

6. MOORING LOAD
   SEE DIAGRAM ON THIS SHEET

SEISMIC CRITERIA

1. THE SEISMIC DESIGN SHALL BE IN ACCORDANCE WITH P-356 CVN MAINTENANCE PIER REPLACEMENT SEISMIC CRITERIA.
2. THE LATERAL SYSTEM IN THE TRANSVERSE DIRECTION IS DESIGNED TO BE FULLY ELASTIC FOR ALL SEISMIC EVENTS (R=1). IN LONGITUDINAL DIRECTION, DISPLACEMENT BASED DESIGN IS USED TO CONSIDER PILE INELASTIC BEHAVIOR.
3. THE ANALYSIS INCLUDES DISPLACEMENT BASED DESIGN FOR SEISMIC STRUCTURAL PERFORMANCE LEVELS FOR THE THREE FOLLOWING SEISMIC EVENTS.
   (a) OPERATING LEVEL EARTHQUAKE (OLE):
   GROUND MOTION:
   50% PROBABILITY OF EXCEEDANCE IN 50 YEARS. THE PIER SHALL RESIST OLE LEVEL EARTHQUAKES - (72 YEAR RETURN PERIOD) WITHOUT SUSTAINING DAMAGE REQUIRING POST EARTHQUAKE REMEDIAL ACTION. THE AVERAGE DISPLACEMENT OF PIER DECK IN LONGITUDINAL DIRECTION IS 2 INCHES AND 1 INCH TRANSVERSE DIRECTION.

   - CONCRETE EXTREME FIBER COMPRESSION STRAIN: 0.005
   - EXTREME TENSILE STRAIN IN DOWELS: 0.010
   - PRESTRESSING STRAND INCREMENTAL TENSION STRAIN: 0.005

   (b) CONTINGENCY LEVEL EARTHQUAKE (CLE):
   GROUND MOTION:
   10% PROBABILITY OF EXCEEDENCE IN 50 YEARS. THE PIER SHALL RESIST CLE LEVEL EARTHQUAKES - (475 YEAR RETURN PERIOD) WITHOUT COLLAPSE, WITH REPAIRABLE DAMAGE. THE AVERAGE DISPLACEMENT OF THE PIER DECK IN LONGITUDINAL DIRECTION IS 12 INCHES AND 2 INCHES IN TRANSVERSE DIRECTION.

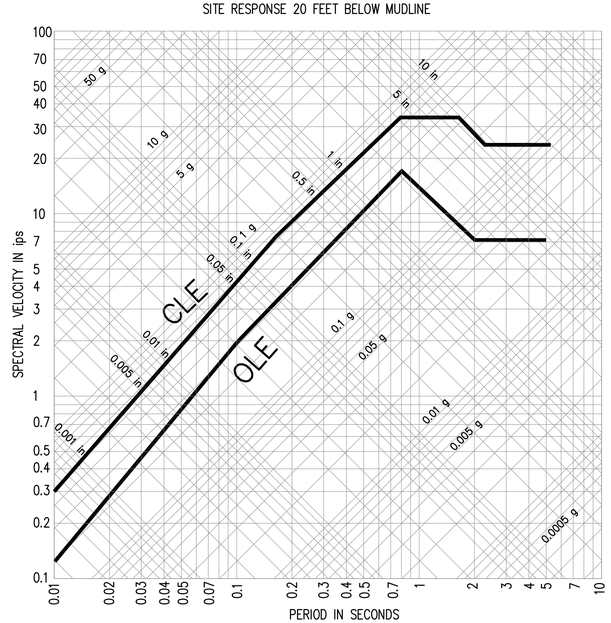
   - PILE DECK HINGE CONCRETE STRAIN: 0.020
   - PILE INGROUND HINGE STRAIN: 0.008
   - PILE INGROUND HINGE PRESTRESSING STRAND STRAIN: 0.015
   - EXTREME TENSILE STRAIN IN DOWELS STRAIN: 0.050

   (c) LIQUIFIED SOIL EVENT
   SEE RFP SEISMIC CRITERIA.
4. EFFECTS OF SIMULTANEOUS SEISMIC EXCITATION IN ORTHOGONAL HORIZONTAL DIRECTIONS ARE CONSIDERED WITH TWO CHARACTERISTIC CASES:
   100% E_L + 30% E_T
   30% E_L + 100% E_T
   WHERE E_L AND E_T ARE EARTHQUAKE ACTIONS IN LONGITUDINAL AND TRANSVERSE DIRECTIONS RESPECTIVELY.
5. SEISMIC MASS INCLUDES STRUCTURE SELF WEIGHT, 10% OF THE UNIFORM LIVE LOAD MASS OVER THE ENTIRE SURFACE OF THE PIER AND 4400 KIPS LUMPED MASS FROM PORTAL CRANES IN A STOWED POSITION - PLACED AT THE LEVEL OF THE DECK BEGINNING FROM START OF THE RAIL AT NORTH END, 200 FEET LONG SOUTH BY 20 FEET WIDE. PORTAL CRANES ARE ASSUMED STOWED NORTH OF STATION 4+00.

GEOTECHNICAL

1. SEE SOIL REPORT BY SHANNON AND WILSON, DATED 02/25/2009 AND HARTCROWSER DATED OCTOBER 23, 2007.

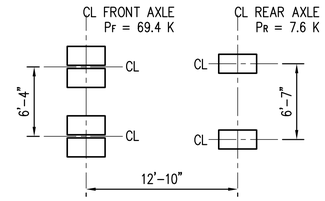
SITE RESPONSE 20 FEET BELOW MUDLINE



RECOMMENDED DESIGN RESPONSE SPECTRUM FROM HARTCROWSER REPORT DATED OCTOBER 23, 2007, AMENDMENT 0002.

LOAD DIAGRAMS

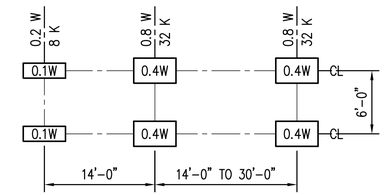
FORKLIFT



TIRE PRESSURE = 120 PSI

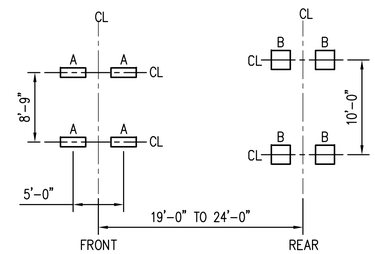
FORKLIFT
(ADD 15% IMPACT)

AASHTO HL-93 TRUCK



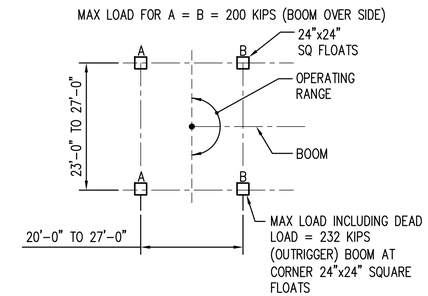
W = COMBINED WEIGHT ON THE FIRST TWO AXLES.

HL-93 TRUCK
(ADD 15% IMPACT)



A = EACH SINGLE TIRE = 16 KIPS (INCL. 15% IMPACT)
B = EACH DUAL TIRE = 41 KIPS (INCL. 15% IMPACT)

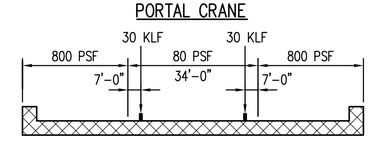
140-TON CRANE TRAVELING
(DEAD LOAD)



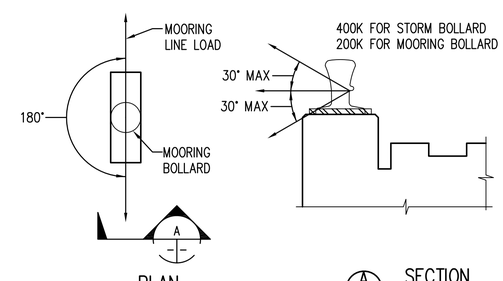
140-TON CRANE LIFTING

140-TON MOBILE TRUCK CRANE

PORTAL CRANE



PORTAL CRANE LOAD
(ADD 25% IMPACT)



PLAN

A SECTION

MOORING LOAD

NOVA
Quality and Innovation in Construction
Tutor-Saliba CORPORATION
AS BUILT

IF SHEET IS NOT 34" x 22" SCALE ACCORDINGLY
2" 1" 1/2"

REV	DESCRIPTION	PREP. BY	DATE	APPROVED

REVISIONS

WORK REQ NO. 26269
KEY DWG NO. 71413
DM DATE
SUPV DATE
SATISFACTORY TO
APPROVED FOR F&MO DATE
REV -

kpff Consulting Engineers
1111 3rd Avenue, Suite 1600
Seattle, Washington 98101
(206) 622-5822 Fax (206) 622-8130

SUBMITTED BY R. JOHNSON PRINCIPAL DATE 12 NOV 2009
FRM MEMBER (TITLE) PRINCIPAL CHK: FSP
DSGN: MR DR: KN
PWD DWG NO. 71425

DEPARTMENT OF THE NAVY
NAVY REGION NORTHWEST
NAVAL BASE KITSAP
BREMERTON, WASHINGTON

P-356 CVN PIER REPLACEMENT
GENERAL NOTES
SHEET 2 - PIER B

CODE IDENT NO. 80091
CONSTR. CONTR. NO. N44255-08-C-6000
SPEC NO.
NAVFAC DWG. NO. 16005480
SHEET 13 OF 577
S101

CAD FILE NAME: S101.DWG 1:1