STRUCTURAL GENERAL NOTES

1. THESE GENERAL NOTES APPLY TO PIER B, MOLE QUAYWALL, CRANE RAIL SUPPORT STRUCTURE AT THE MOLE FILL AND WEST MOLE, AND QUAYWALL 729.

2. SEE THE FOLLOWING SHEETS FOR STRUCTURAL NOTES PERTAINING TO SPECIFIC STRUCTURES:

PIER B	S101
MOLE QUAYWALL, CRANE RAIL SUPPORT AT MOLE FILL & WEST MOLE	S102
QUAYWALL 729	S103

3. VERIFY LOCATIONS OF EXISTING UTILITIES AND SUBSTRUCTURE BEFORE BEGINNING NEW CONSTRUCTION. ENGINEER SHALL BE NOTIFIED OF ANY CONFLICTS BETWEEN EXISTING CONDITIONS AND NEW CONSTRUCTION BEFORE BEGINNING RELATED WORK.

4. SUBMIT DEMOLITION PLAN, CONSTRUCTION JOINT LOCATIONS, AND CONSTRUCTION JOINT DETAILS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

5. ALL DIMENSIONS AND DETAILS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION AND CONSTRUCTION.

6. 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.

7. VERTICAL DATUM:

   VERTICAL CONTROL IS PSNS DATUM, WHICH INCLUDES THE FOLLOWING TIDE ELEVATIONS:

EXTREME HIGH WATER (EHW):	124.8 (15.4 FROM MLLW)
MEAN HIGHER HIGH WATER (MHHW):	121.1 (11.7 FROM MLLW)
MEAN LOWER LOW WATER (MLLW):	109.4 (0.0 FROM MLLW)
EXTREME LOW WATER (ELW):	105.0 (−4.4 FROM MLLW)

8. HORIZONTAL CONTROL IS THE WASHINGTON STATE PLANE COORDINATE SYSTEM.

CODES AND STANDARDS

1. STRUCTURAL
   - A. REINFORCED CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE".
   - B. STRUCTURAL AND MISCELLANEOUS STEEL FABRICATION AND ERECTION SHALL CONFORM TO THE AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" 2005.
   - C. WELDING OF STRUCTURAL AND MISCELLANEOUS STEEL SHALL CONFORM TO THE AWS D1.1, 2006.
   - D. WELDING OF REINFORCING STEEL SHALL CONFORM TO THE AWS D1.4, 2005.
   - E. AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL (LRFD) THIRTEEN EDITION.
   - F. BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE ACI318-05.
   - G. 2007 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
   - H. OCCUPATIONAL SAFETY HEALTH ADMINISTRATION REGULATIONS (STANDARDS – 29 CFR PART 1910)
   - I. NATIONAL FIRE PROTECTION AGENCY (NFPA 101, 2006 EDITION FOR HANDRAIL AND GUARDRAIL)

PILING AND PRECAST CONCRETE

1. SUBMIT PILE AND SHEET PILE LAYOUTS TO THE ENGINEER FOR APPROVAL, INCLUDING BUT NOT LIMITED TO PILE AND SHEET PILE SECTIONS, TEMPORARY GUIDES AND TEMPLATES, HOLES REQUIRED FOR HANDLING AND SHEET PILE ALIGNMENT ANGLE CAPACITY.

2. PILES SHALL BE DRIVEN TO THE MINIMUM TIP ELEVATIONS INDICATED OR REFUSAL. SEE SPECIFICATIONS FOR REFUSAL CRITERIA.

3. PILES AND SHEET PILES SHALL BE TEMPORARILY BRACED AS REQUIRED AFTER DRIVING FOR SAFETY, ALIGNMENT, AND STRUCTURAL INTEGRITY UNTIL EACH FINAL STRUCTURAL CONFIGURATION IS COMPLETE.

4. PRESTRESSING STEEL FOR PRECAST PILES SHALL BE 1/2" DIAMETER ASTM A 416, GRADE 270, SEVEN-WIRE, LOW-RELAXATION STRANDS.

5. PRESTRESSING STEEL FOR PRECAST DECK PANELS SHALL BE 0.6" DIAMETER ASTM A 416, GRADE 270, SEVEN-WIRE, LOW-RELAXATION STRANDS.

6. PRECAST CONCRETE

		MINIMUM COMPRESSIVE STRENGTH
A.	PRECAST PRESTRESSED CONCRETE PILES	8000 PSI (56 DAYS)
B.	PRECAST CONCRETE PANELS	7000 PSI (28 DAYS)
C.	PRECAST UTILIDOR LIDS ON PIER	8000 PSI (28 DAYS)
D.	PRECAST & CIP UTILIDORS	6000 PSI (28 DAYS)

REINFORCED CONCRETE

1. REINFORCING STEEL
   - A. PRESTRESSING STEEL SHALL BE UNCOATED LOW-RELAXATION SEVEN-WIRE STRAND CONFORMING TO ASTM A 416, GRADE 270.
   - B. ALL REINFORCING STEEL SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 – GRADE 60, EXCEPT AS NOTED.
     - a. ALL REINFORCING STEEL TO BE WELDED SHALL BE ASTM A 706 DEFORMED – GRADE 60.
     - b. DOWEL BARS FOR PILE TO PILE CAP CONNECTIONS SHALL BE ASTM A706 DEFORMED – GRADE 60.
     - c. SPIRAL REINFORCEMENT SHALL BE ASTM A 496 DEFORMED GRADE 70 KSI.
   - C. LAP ALL REINFORCING BARS AS NOTED ON THE DRAWINGS. PROVIDE CLASS B SPLICE LENGTH PER SCHEDULE UNLESS NOTED OTHERWISE.
   - D. MECHANICAL SPLICES SHALL DEVELOP AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF THE BAR IN TENSION.
   - E. REINFORCING SHALL BE SUPPORTED AS SPECIFIED BY THE PROJECT SPECIFICATIONS AND THE CRSI MANUAL OF STANDARD PRACTICE, (MSP). REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH "ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES," ACI 315.
   - F. ALL HORIZONTAL REINFORCEMENT AT DISCONTINUITIES AND CORNERS SHALL END WITH STANDARD 90° HOOKS IN ACCORDANCE WITH ACI 315, UNLESS SHOWN OTHERWISE.
   - G. CONCRETE COVER (UNLESS NOTED OTHERWISE ON DRAWINGS)

1.	PRECAST PANEL	2" CLEAR OVER STIRRUPS
2.	PRECAST PILES	2" CLEAR OVER SPIRALS
3.	AUGERCAST PILES (WEST MOLE)	4" CLEAR OVER SPIRALS
4.	PRECAST TRENCH LIDS	2" CLEAR
5.	PRECAST UTILIDOR (PIER B)	2" CLEAR IN MIDWALL (NOT EXPOSED TO SALTWATER) 3" CLEAR IN SLAB (EXPOSED TO SALTWATER)
6.	CAST-IN-PLACE SLABS	3" CLEAR
7.	CAST-IN-PLACE PILE CAPS	3" CLEAR
8.	CAST-IN-PLACE WALLS	3" CLEAR
9.	CRANE RAIL GRADE BEAMS (WEST MOLE)	3" CLEAR

2. CAST-IN-PLACE CONCRETE

		MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS
A.	CAST-IN-PLACE CONCRETE IN DECK	5000 PSI
B.	CAST-IN-PLACE CONCRETE PILE CAPS	5000 PSI
C.	TRENCH WALLS	5000 PSI
D.	BULLRAIL	5000 PSI
E.	AUGERCAST PILES	5000 PSI
F.	CAST-IN-PLACE CONCRETE IN PILE BUILD-UP	6000 PSI
G.	CAST-IN-PLACE CLOSURE POUR	5000 PSI
H.	EXPOSURE FACTOR γ_e = 0.6 (CRACK CONTROL)	
I.	CRANE RAIL GRADE BEAMS (WEST MOLE)	5000 PSI

3. EXPOSED CORNERS SHOWN CHAMFERED ON DRAWING SHALL BE 3/4 INCH.

4. CONSTRUCTION JOINTS SHALL BE PROVIDED ONLY AS NOTED ON THE DRAWINGS AND AS SPECIFICALLY PERMITTED BY THE ENGINEER. PROVIDE WATERSTOPS AT UTILITY TRENCHES, PITS AND VAULTS TO PREVENT INFILTRATION OF SEAWATER, GROUNDWATER AND SURFACE WATER.

5. CONCRETE MIX SHALL HAVE A MAXIMUM WATER CEMENT RATIO OF 0.40, FOR MARINE CONCRETE AND 0.35 FOR PRECAST/PRESTRESSED CONCRETE PILES, UNLESS NOTED OTHERWISE.

6. ALL CONCRETE, INCLUDING PRECAST, SHALL BE AIR ENTRAINED WITH A TARGET OF 5% ±1 1/2% UNLESS NOTED OTHERWISE IN THE SPECIFICATIONS OR DRAWINGS.

7. GROUT: SEE SPECIFICATION SECTION 03 31 29 PARAGRAPH 2.2.5 FOR TYPICAL GROUT. SEE SPECIFICATION SECTION 41 22 13.33 PARAGRAPHS 2.4.3 AND 2.4.4 AND 2.4.5 FOR ADDITIONAL REQUIREMENTS FOR CRANE RAIL GROUT. MP GROUT IS ACCEPTABLE BY "US SPEC" MANUFACTURER.

8. MAXIMUM SIZE AGGREGATE 3/4".

REINFORCEMENT SPLICE LENGTH AND DEVELOPMENT TABLE

Size	Ld	Ldt	Lb	Lbt	Ldh
#4	17	22	22	29	8
#5	21	28	28	36	11
#6	25 (38)	33 (50)	33 (50)	43 (65)	13
#7	37 (56)	48 (72)	48 (72)	63 (94)	15
#8	42 (64)	55 (83)	55 (83)	72 (108)	17
#9	48 (72)	62 (93)	62 (93)	81 (121)	19
#10	54 (81)	70 (105)	70 (105)	91 (137)	22
#11	60 (90)	78 (117)	78 (117)	101 (152)	24

f'c= 5,000 psi
fy =60,000 psi

ABBREVIATIONS

- db = BAR DIAMETER
- Ld = TENSION DEVELOPMENT LENGTH
- Ldt = TENSION DEVELOPMENT LENGTH FOR A TOP BAR
- Lb = CLASS B LAP SPLICE LENGTH, 1.3 Ld
- Lbt = CLASS B LAP SPLICE LENGTH FOR A TOP BAR, 1.3 Ldt
- Ldh = TENSION DEVELOPMENT LENGTH FOR A STANDARD HOOK

NOTES:
1. USE THE LENGTHS IN THIS SCHEDULE, UNLESS NOTED OTHERWISE.
2. USE LENGTH IN ( ) WHEN BAR COVER IS db OR LESS OR BAR CLEAR SPACING IS 2db OR LESS.
3. A TOP BAR IS A HORIZONTAL BAR WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW IT.

MISCELLANEOUS STEEL

1. ALL MISCELLANEOUS STEEL SHAPES AND PLATES, EXCEPT AS NOTED BELOW, SHALL CONFORM TO ASTM A 36, UNLESS NOTED OTHERWISE.
2. ALL BOLTS SHALL CONFORM TO ASTM A 307, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
3. ALL ANCHOR BOLTS AND RODS SHALL CONFORM TO ASTM F 1554, GRADE 36 UNLESS OTHERWISE INDICATED.
4. PROVIDE BLEED HOLES IN EMBEDDED PLATES AND SHAPES AT 24-IN. ON CENTER MAXIMUM.
5. ALL MISCELLANEOUS PIPES AND SLEEVES, INCLUDING BOLLARDS, SHALL CONFORM TO ASTM A 53, GRADE B.
6. ALL STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE 46.
7. ALL NUTS SHALL BE ASTM A 563, UNLESS NOTED OTHERWISE.
8. ALL WASHERS SHALL BE ASTM A 844, UNLESS NOTED OTHERWISE.
9. ALL STEEL ITEMS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, UNLESS NOTED OTHERWISE.

WELDING

1. ALL WELDING SHALL BE PERFORMED BY WELDERS QUALIFIED FOR THE WELD AND POSITION SHOWN IN ACCORDANCE WITH AWS.
2. ALL WELDS SHALL BE PERFORMED WITH PROCEDURES PREQUALIFIED OR QUALIFIED IN ACCORDANCE WITH AWS D1.1 AND D1.4.
3. THE WELDS SHOWN ARE FOR THE FINAL CONNECTIONS. FIELD WELD SYMBOLS ARE SHOWN WHERE FIELD WELDS ARE REQUIRED BY THE STRUCTURAL DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING IF A WELD SHOULD BE SHOP- OR FIELD-WELDED IN ORDER TO FACILITATE THE STRUCTURAL STEEL ERECTION.
4. WELDING ELECTRODES SHALL BE 70 KSI STRENGTH AND SHALL BE "LOW-HYDROGEN" ELECTRODES.

DESIGN CRITERIA

1. LOAD COMBINATIONS
   - A. VACANT (NO SHIP AT PIER)

     U1=1.2D+1.6L+1.2B+1.2C+1.6E+1.2RST+0.2Ice
     U2=1.2D+1.2B+1.2C+0.8W
     U3=1.2D+1.0L+1.2B+1.2C+1.6W+1.0Ice
     U4=1.0D+0.1L+1.0Wpc+1.0EQ (SEE RFP ATTACHMENT I SEISMIC CRITERIA)
   - B. BERTHING

     U1=1.2D+1.6L+1.2B+1.6Be+1.2C+1.6E+1.2RST+0.2Ice
     U2=1.2D+1.0L+1.2B+1.0Be+1.2C+1.6W+1.0Ice
   - C. MOORING

     U1=1.2D+1.6L+1.2B+1.2C+1.2Cs+1.6E+1.2RST+0.2Ice
     U2=1.2D+1.2B+1.2C+1.2Cs+0.8W+0.8Ws
     U3=1.2D+1.0L+1.2B+1.2C+1.2Cs+1.6W+1.6Ws+1.0Ice
     U4=1.2D+1.0L+1.0Mbol
     U5=1.2D+1.0Msto+0.1L

D	=	DEAD LOAD
L	=	LIVE LOAD + IMPACT (15%)
B	=	BUOYANCY LOAD
Be	=	BERTHING LOAD
C	=	CURRENT LOAD ON STRUCTURE
Cs	=	CURRENT LOAD ON SHIP
E	=	EARTH PRESSURE LOAD
EQ	=	EARTHQUAKE LOAD
Mbol	=	MOORING BOLLARD LOAD
Msto	=	STORM BOLLARD LOAD
W	=	WIND LOAD ON STRUCTURE
Ws	=	WIND LOAD ON SHIP
R	=	CREEP/RIB SHORTENING
S	=	SHRINKAGE
T	=	TEMPERATURE LOAD
Ice	=	ICE PRESSURE

   Wpc = PORTAL CRANE WEIGHT IN STOWED POSITION

   IN LOAD CASE U1, LIVE LOAD FACTOR COULD BE REDUCED TO 1.3 FOR OUTRIGGER LOADING IN ACCORDANCE WITH RFP.

2. AASHTO SERVICEABILITY REQUIREMENTS (CRACK CONTROL)
   - A. THE FOLLOWING STRUCTURAL ELEMENTS ARE DESIGNED IN ACCORDANCE WITH SERVICEABILITY REQUIREMENTS OF PARAGRAPH 5.7.3.4 OF 2007 AASHTO LRFD BRIDGE DESIGN SPECIFICATION EXCEPT FOR EXPOSURE FACTOR, γ_e:

     PILE CAPS
     GIRDERS
     CRANE BEAMS
     DECK SYSTEM
     NON-PRESTRESSED CONCRETE UTILITY TRENCH COVERS
   - B. EXPOSURE FACTOR, γ_e: 0.6

3. REFER TO S101, S102, AND S103 FOR ADDITIONAL DESIGN CRITERIA.

NOVA GROUP INC.
Quality and Innovation in Construction
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Tutor-Saliba CORPORATION

AS BUILT

IF SHEET IS NOT 34" x 22" SCALE ACCORDINGLY

REVISIONS

REV	DESCRIPTION	PREP. BY	DATE	APPROVED

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

kpff Consulting Engineers
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SUBMITTED BY R. JOHNSON DATE 12 NOV 2009
FIRM MEMBER (TITLE) PRINCIPAL
DSGN: MR DR: KN CHK: FSP
PWD DWG NO. 71424 REV –

DEPARTMENT OF THE NAVY NAVY REGION NORTHWEST
NAVAL BASE KITSAP
BREMERTON, WASHINGTON
P-356 CVN PIER REPLACEMENT
GENERAL NOTES
SHEET 1 – ALL STRUCTURES

CODE IDENT NO. 80091
CONSTR. CONTR. NO. N44255-08-C-6000
SPEC NO.
NAVFAC DWG. NO. 16005479
SHEET 12 OF 577
S100

CAD FILE NAME: S100.DWG 1:1