

**POST-TENSIONING CHARACTERISTICS ASSUMED FOR DESIGN**

- Prestressing strand
  - Friction curvature coefficient : 0.20
  - Friction wobble coefficient : 0.0007/m
  - Anchor set  : 6 mm
- Prestressing  monostrand (Tie-down cables only)
  - Friction curvature coefficient : N/A
  - Friction wobble coefficient : 0.0007/m
  - Anchor set : 6 mm
- High strength rods (where applicable)
  - Friction curvature coefficient : 0.25
  - Friction wobble coefficient : 0.0007/m
  - Anchor set : 2 mm
- High strength PT rod (75 mm)
  - Friction curvature coefficient : 0.25
  - Friction wobble coefficient : 0.0012/m
  - Anchor set : 2 mm
- Prestressing strands shall conform to ASTM A416, low relaxation, 7-wire strands, with guaranteed minimum ultimate strength of 1860 MPa.
- Prestressing  monostrands  (Tie-down cables only) shall conform to ASTM A416, low relaxation, 7-wire strands, with guaranteed minimum ultimate strength of 1860 MPa.
- High strength rods (ASTM A354 Grade BD) shall have a guaranteed minimum ultimate strength of 965 MPa.
- High strength rods (ASTM A354 Grade BC) shall have a guaranteed minimum ultimate strength of 793 MPa.
- High strength rods (ASTM A722) shall have a guaranteed minimum ultimate strength of 1030 MPa.
- High strength PT rods (75 mm) shall have a guaranteed minimum ultimate strength of 1030 MPa.

**PRETENSIONING/GROUTING SEQUENCE**

- The pretensioning and grouting sequence of the Pier W2 prestressing strand tendons and of the Pier W2 high strength anchor rods (anchor bolts) shall be included with the Contractor's erection plan. The Contractor shall submit the erection plan along with the pretensioning and grouting sequence to the Engineer for review and approval.
- The pretensioning and grouting sequence of the Pier T1 (Tower) high strength anchor rods (anchor bolts) shall be included with the Contractor's erection plan. The Contractor shall submit the erection plan along with the pretensioning and grouting sequence to the Engineer for review and approval.
- The pretensioning and grouting sequence of the Pier E2 prestressing strand tendons and of the Pier E2 Bearing and Pier E2 Shear Key high strength anchor rods (anchor bolts) shall be included with the Contractor's erection plan. The Contractor shall submit the erection plan along with the pretensioning and grouting sequence to the Engineer for review and approval.

**STRESSING FORCE LIMITS**

- All high strength anchor rods (anchor bolts) shall be pretensioned by jacking to 70% of their ultimate tensile strength, unless noted otherwise.
- Force in all permanent high strength prestressing tendons shall not exceed 70% of the guaranteed minimum ultimate strength of the tendon after seating.
- Force in all permanent high strength rods (anchor bolts) shall not exceed 70% of the guaranteed minimum ultimate strength of the bar after seating.

**CONCRETE**

- A minimum compressive strength of 36 MPa (f'ci) shall be attained in the concrete of Pier W2 and Pier E2 crossbeams prior to stressing.

**HIGH STRENGTH NONSHRINK GROUT**

- All high strength nonshrink grout shall attain a minimum compressive strength of f'ci=75% f'c (MPa) prior to being subjected to subsequent loading and before pretensioning operations.

**PT DUCTS**

- Ducts for prestressing strand tendons and high strength rods (anchor bolts) shall consist of galvanized corrugated steel ducts, unless noted otherwise.
- Prebent ducts shall be used for prestressing tendons with radius less than 10 m.
- Prestressing strand tendon suppliers shall provide and use extra strong steel pipes (ASTM A53 Type S, Grade B (fy = 240 MPa) and necessary hardware connecting the steel pipes to galvanized corrugated steel ducts where radius of PT ducts is less than 5000 mm.
-  Based on the Contractor's stressing sequence, local strengthening of PT ducts (e.g. extra strong steel pipes) at critical location's may be required.

**GROUT FOR PT DUCTS/PIPE SLEEVES**

- Tie-down cables with  monostrands shall not be grouted.
- Ducts shall be grouted with nonshrink grout (f'c=60 MPa).
- Nonshrink grout shall attain a strength of 36 MPa (f'ci) minimum before being subjected to stresses due to subsequent loading.

**BLOCKOUT CONCRETE**

- After completion of all pretensioning and grouting operations, the blockout closure reinforcement shall be bent into place over the anchors before the blockouts are filled with concrete (f'c=60 MPa).



DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	981R2	1204

REGISTERED ENGINEER - CIVIL

12-6-04

PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

T.Y. LIN / MOFFATT & NICHOL  
825 BATTERY STREET  
SAN FRANCISCO, CA 94111

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FOR REVISIONS ONLY

MARK	DATE	DESCRIPTIONS	BY	CH'D	CCO#
	02/28/07	TIE-DOWN CABLE PRESTRESSING NOTES	JD	AS	23
	07/21/06	CONCRETE STRENGTH, ISD	MN	NV	23
REVISIONS					

CONTRACT CHANGE ORDER NO. \_\_\_\_\_  
SHEET \_\_\_\_ OF \_\_\_\_

R. Valizadeh/V. Toan/Y.L./W.L./F.C.  
DESIGN OVERSIGHT  
*Roger Valizadeh / Veng Toan / Y. Liu*  
SIGN OFF DATE 02/28/07

DESIGN	BY J. Sun	CHECKED J. Duxbury
DETAILS	BY J. Sun	CHECKED J. Duxbury
QUANTITIES	BY J. Sun	CHECKED J. Duxbury

PREPARED FOR THE  
**STATE OF CALIFORNIA**  
DEPARTMENT OF TRANSPORTATION

R. Manzanarez  
PROJECT ENGINEER

BRIDGE NO. 34-0006L/R  
KILOMETER POST 13.2/13.9

**SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT**

**SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)**

**PRESTRESSING NOTES**

REVISION DATES (PRELIMINARY STAGE ONLY)

04/08/02	02/28/07	12/19/02							
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