Request #43 - E-Mail 11-2 NRC SIT Question Information

Enclosed in this folder in response to the above question: All requested information provided except for SP-5566, SP-5583. 11/3/09 Update. The last 2 spec's requested have been included in the file.

From: Masters, Anthony [mailto:Anthony.Masters@nrc.gov]
Sent: Monday, November 02, 2009 6:36 AM
To: Herrin, Dennis W.
Subject: RE: Responses to NRC SIT Requests/Questions

Thanks again for all your efforts and help!

I am planning to be on-site around noon today. I would like to go ahead and submit a request for some documents that I would like to review for this week, so that if time allows this morning to start collecting before I arrive they can just be put in our trailer.

Drawings: SC-400-007, 008, 009, and 015; and S-425-011 and S-425-012

Specifications: SP-5566, 5569, 5583, 5618, 5648, and 5909

Reports: VT-3C Report VT-07-106 and VT-3C Report VT-07-111

Calculations: S-07-0019 and S-07-0033

Thank you again,

Anthony D. Masters, PE

Senior Construction Inspector

Division of Construction Inspections

U.S. Nuclear Regulatory Commission

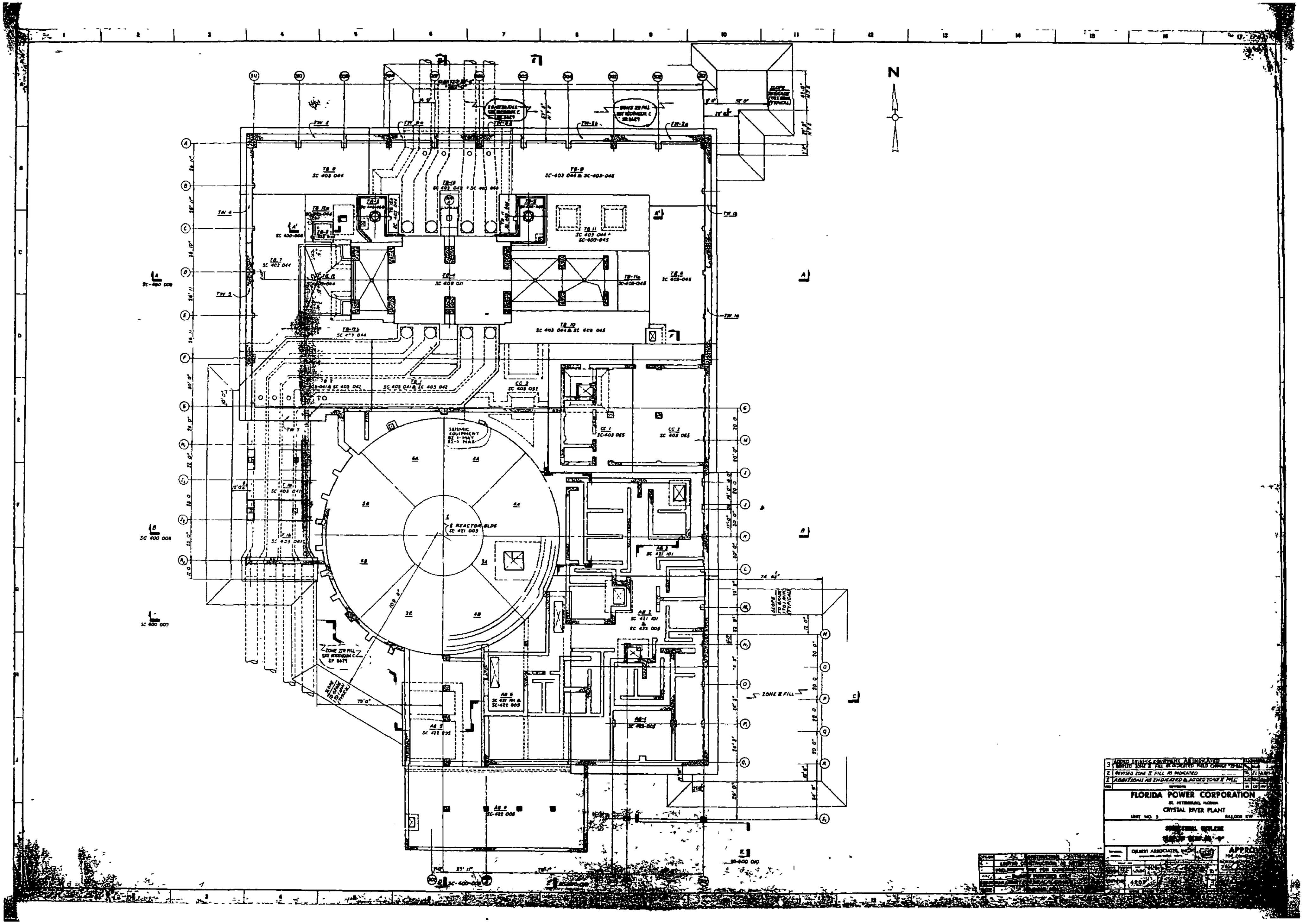
Region II - Atlanta

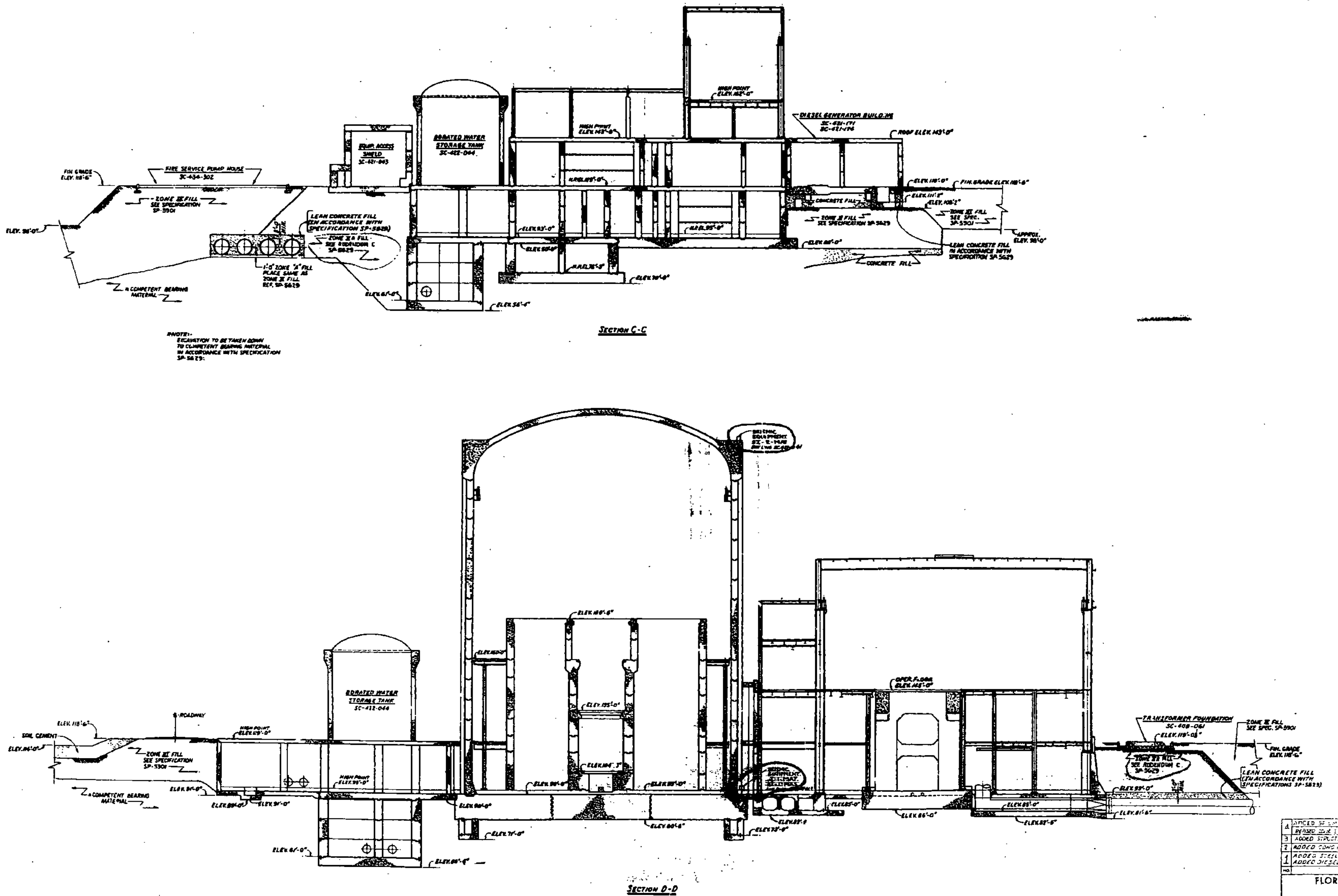
(404) 562 - 0612 (office phone)

(404) 562 - 0559 (fax)

Anthony.Masters@nrc.gov

01 18


N
TB 8 SC 403 044
TB 9 SC-403 044 & SC-403-045
TB 11 SC 403 044 A SC-403-045
TB 4 SC 403 011
TB 6 SC 403-045
TB 7 SC 403 044
TB 10 SC 403 044 & SC 403 045
TB 1 SC 403 041 & SC 403 042
CC 3 SC 403 051
CC 1 SC-403 065
CC 2 SC 403 065
SEISMIC EQUIPMENT 82-1-MAY 82-1-MAS
℄ REACTOR BLDG SC 421 003
AB 3 SC 421 101
AB 2 SC 421 101 & SC 422 005
AB 6 SC 421 101 & SC 422 005
AB 5 SC 422 005
AB 4 SC-422 005
AB-1 SC 422 005
ZONE II FILL
SLOPE TO GRADE 1 TO 1 MIN. (TYPICAL)
3 ADDED SEISMIC EQUIPMENT AS INDICATED
2 REVISED ZONE II FILL AS INDICATED
1 ADDITIONS AS INDICATED & ADDED ZONE II FILL
FLORIDA POWER CORPORATION
CRYSTAL RIVER PLANT
UNIT NO. 3
GILBERT ASSOCIATES, INC.
APPRO
4207



NO.	REVISIONS
4	ADDED SEISMIC EQUIPMENT AS INDICATED REVISED ZONE [illegible] FILL AS INDICATED [illegible]
3	ADDED STRUCTURAL FILL AS INDICATED
2	ADDED CONC FILL IN SECTS C-C & D-D AS INDICATED
1	ADDED STEEL & CONC INSIDE REACTOR BLDG. ADDED DIESEL GEN BLDG & TRANSFORMER FDNS.

FLORIDA POWER CORPORATION

ST. PETERSBURG, FLORIDA

CRYSTAL RIVER PLANT

UNIT NO. 3 855,000 KW

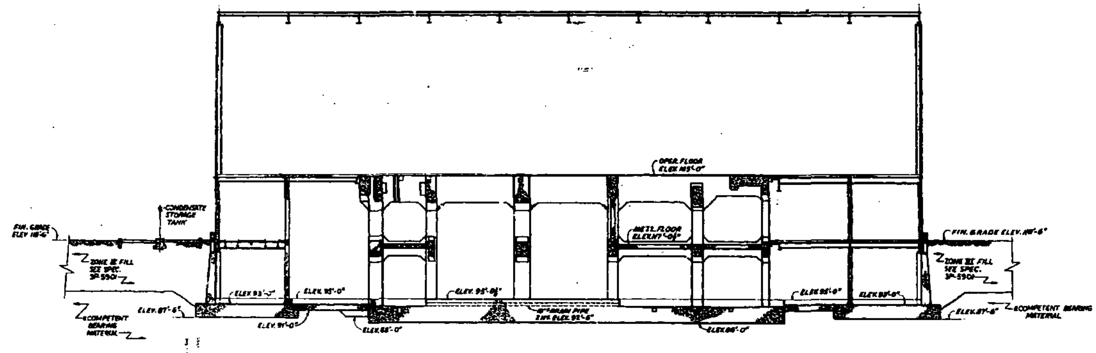
STRUCTURAL OUTLINE

SECTIONS C-C & D-D

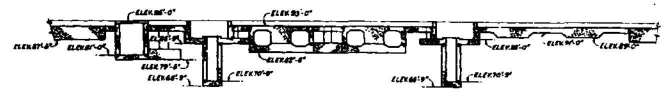
GILBERT ASSOCIATES, INC.

APPROVED FOR CONSTRUCTION BY FLORIDA POWER CORPORATION

4203

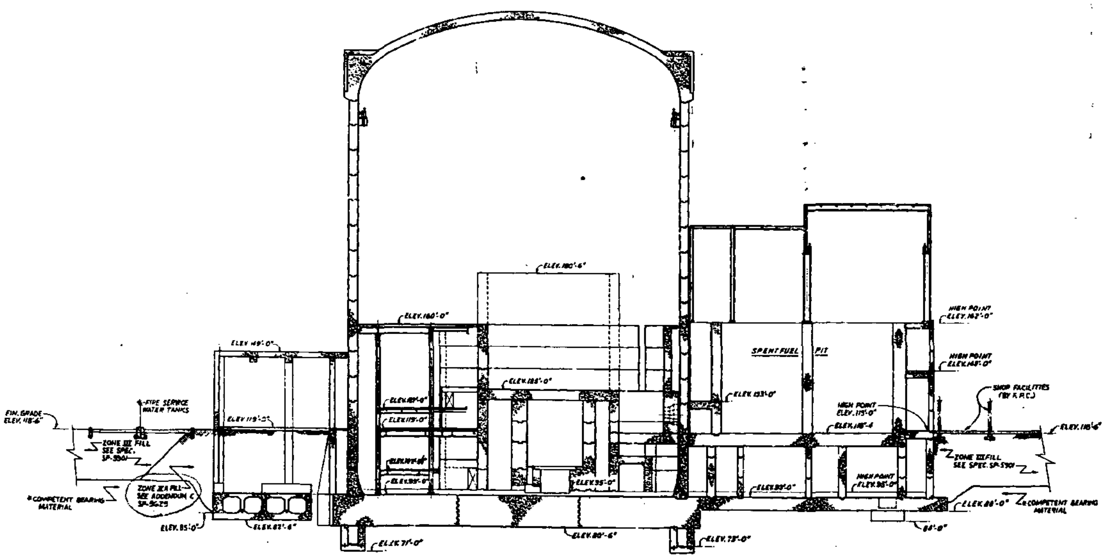


SECTION A-A



SECTION A'-A'

* NOTE
EXCAVATION TO BE TAKEN DOWN TO COMPETENT BEARING MATERIAL IN ACCORDANCE WITH SPECIFICATION SP-5625.



SECTION B-B

NO.	REVISIONS
4	REVISED ZONE I FILL AS INDICATED FIELD CHANGE
3	ADDED STRUCTURAL FILL AS INDICATED
2	ADDED ZONE II FILL IN SECT. B-B AS INDICATED
1	ADDED STEEL & CONC INSIDE REACTOR BUILDING

FLORIDA POWER CORPORATION
ST. PETERSBURG, FLORIDA
CRYSTAL RIVER PLANT
UNIT NO. 3

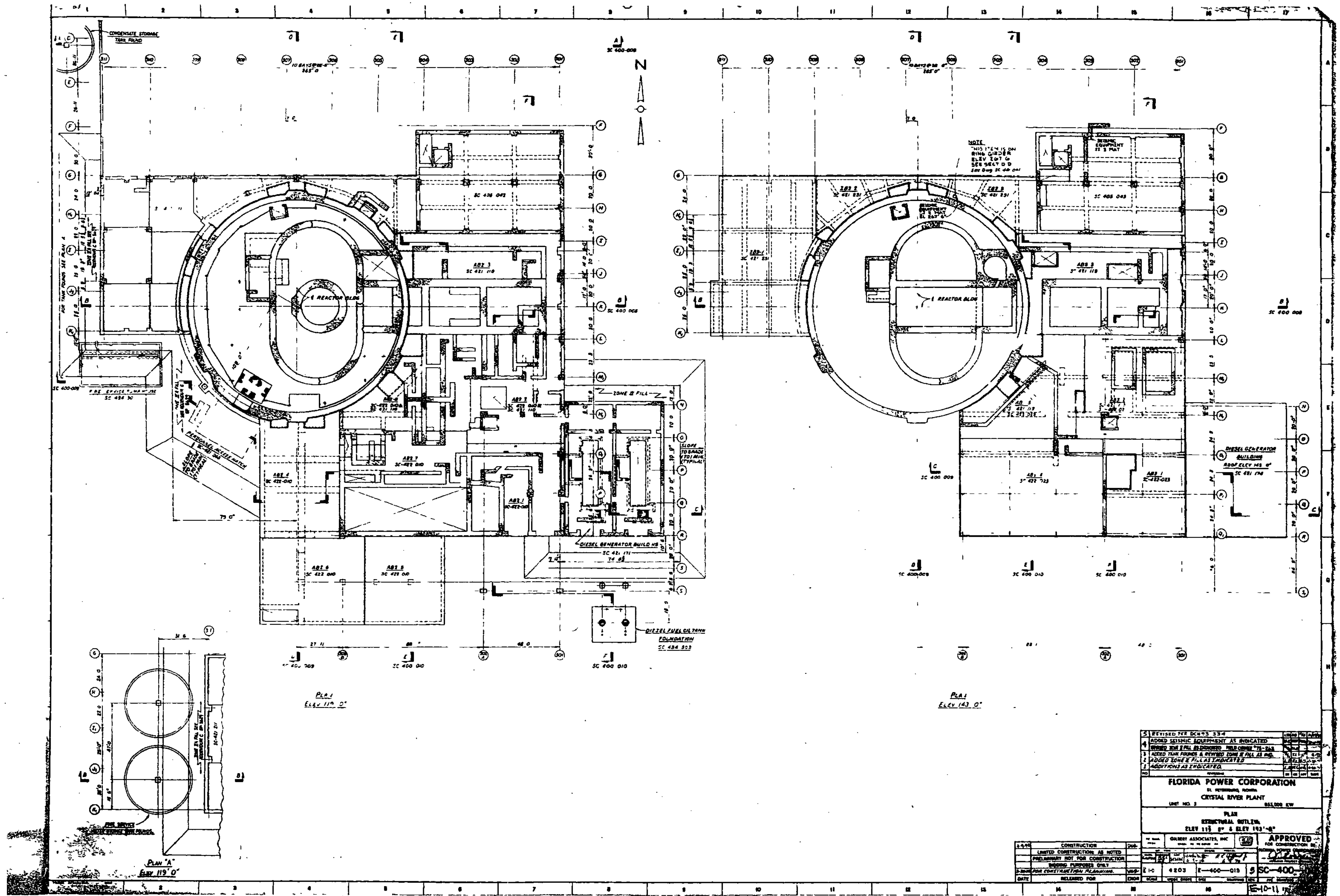
STRUCTURAL OUTLINE
SECTIONS A-A, A'-A' & B-B

GILBERT ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

APPROVED FOR CONSTRUCTION BY FLORIDA POWER CORPORATION

CONSTRUCTION
LIMITED CONSTRUCTION AS NOTED
PRELIMINARY NOT FOR CONSTRUCTION
BIDDING PURPOSES ONLY

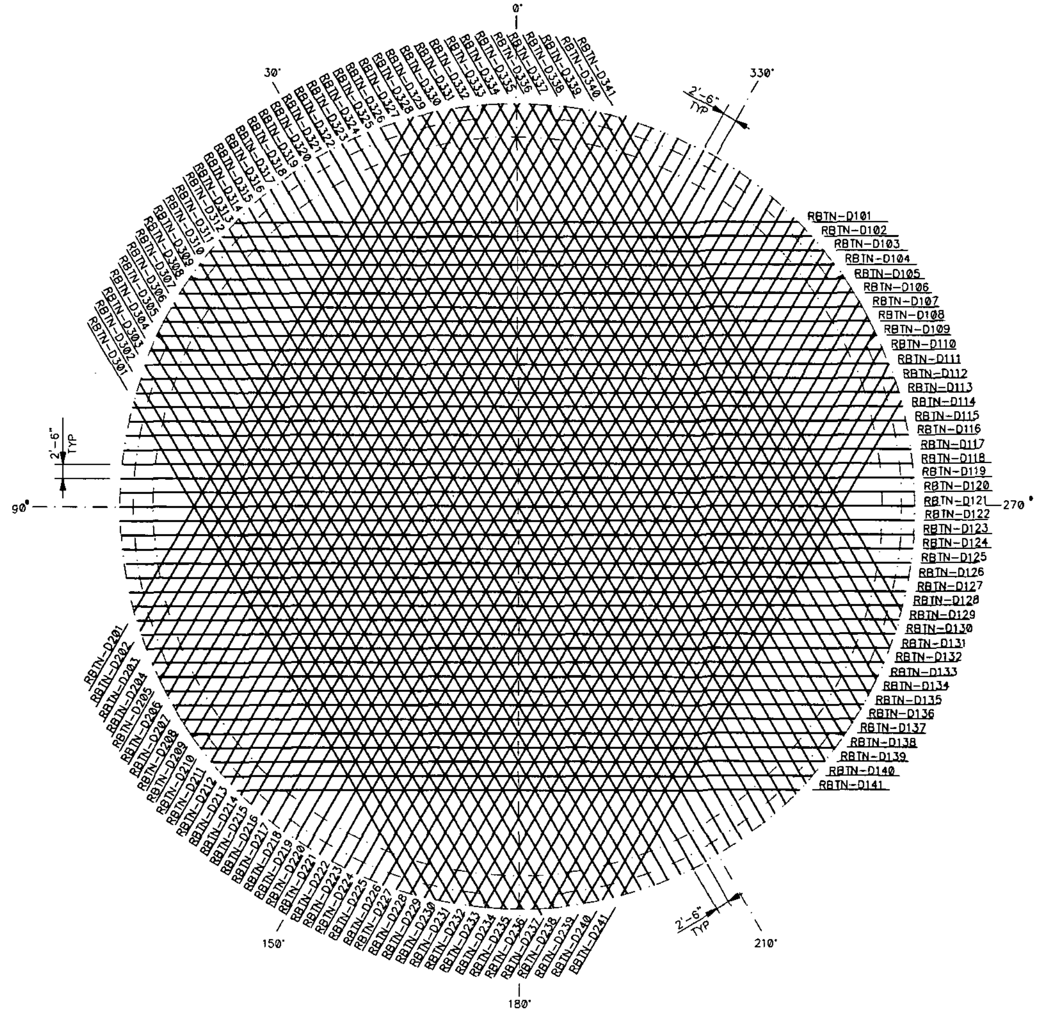
2203 E-400-008



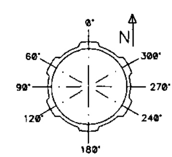
CONDENSATE STORAGE TANK FOUND
N
REACTOR BLDG
ZONE II FILL
DIESEL GENERATOR BUILDINGS SC 421 171
DIESEL FUEL OIL TANK FOUNDATION SC 434 303
PERSONNEL ACCESS HATCH
DIESEL GENERATOR BUILDING ROOF ELEV 145 0"
PLAN ELEV 119' 0"
PLAN ELEV 143' 0"
PLAN "A" ELEV 119' 0"
5 REVISED PER DCN 93 334
4 ADDED SEISMIC EQUIPMENT AS INDICATED
3 ADDED TANK FOUNDS & REVISED ZONE II FILL AS IND.
2 ADDED ZONE II FILL AS INDICATED
1 ADDITIONS AS INDICATED
FLORIDA POWER CORPORATION
CRYSTAL RIVER PLANT
UNIT NO. 3
855,000 KW
PLAN
STRUCTURAL OUTLINE
GILBERT ASSOCIATES, INC
APPROVED FOR CONSTRUCTION BY
CONSTRUCTION
LIMITED CONSTRUCTION AS NOTED
PRELIMINARY NOT FOR CONSTRUCTION
BIDDING PURPOSES ONLY
FOR CONSTRUCTION PLANNING.
RELEASED FOR
4203
E—400—015
5
SC—400
E-10-11

REFERENCE VENDOR DRAWINGS (PRESCON CORPORATION)

5EX7-003-D-8 DOME TENDON LAYOUT
5EX7-003-D-9 DOME TENDON PLACEMENT GROUP 1.
5EX7-003-D-10 DOME TENDON PLACEMENT GROUP 2.
5EX7-003-D-11 DOME TENDON PLACEMENT GROUP 3.



DOME TENDON LAYOUT PLAN



KEY PLAN

NUCLEAR SAFETY RELATED

NO	DESCRIPTION	DRAWN	CHKD	APPR.	DATE
1	ISSUED PER DCN 99-016	MAD	LSm		7/23/99

REVISIONS

FLORIDA POWER CORPORATION

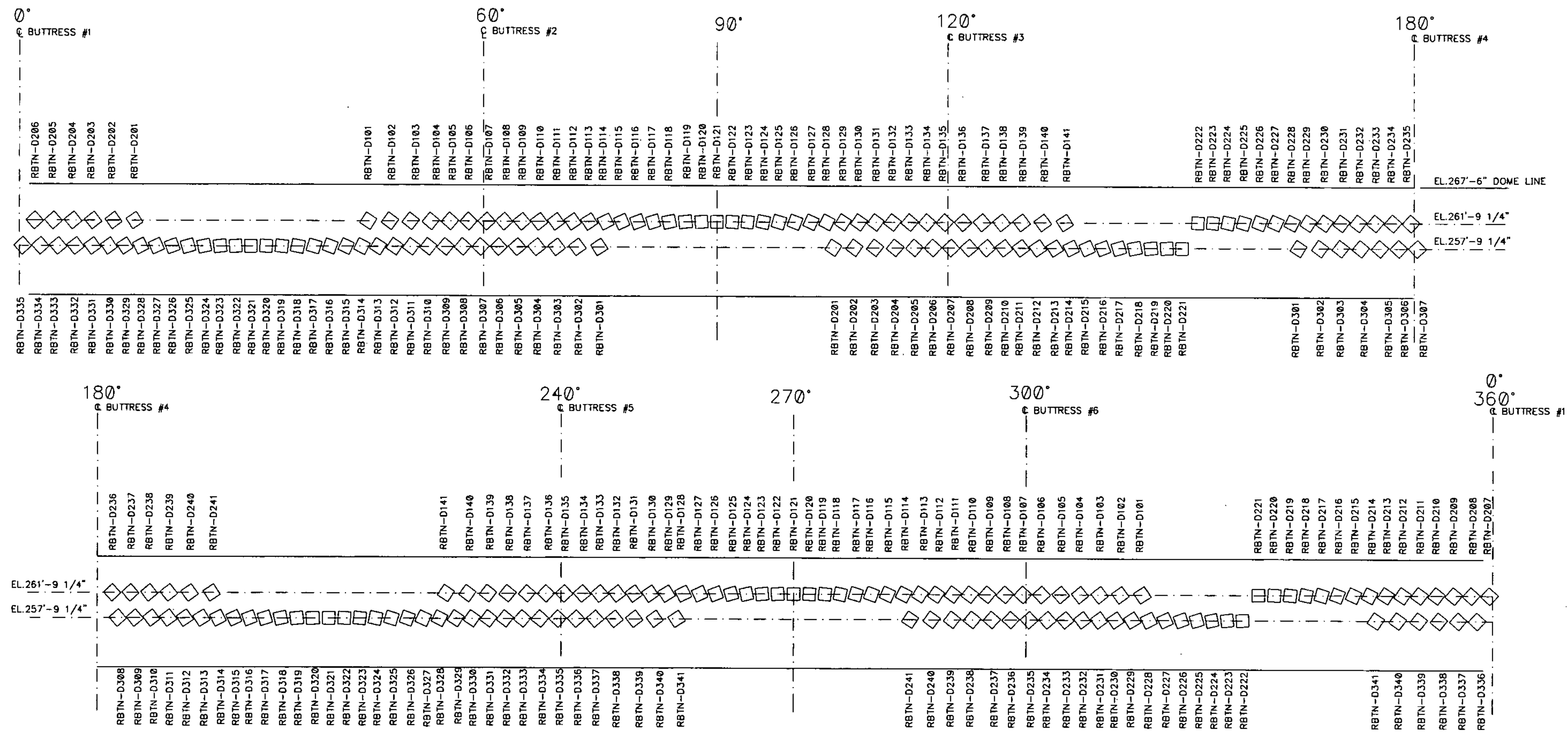
NUCLEAR ENGINEERING

CRYSTAL RIVER UNIT 3

IWE/IWL INSPECTION
DOME TENDONS LAYOUT – PLAN

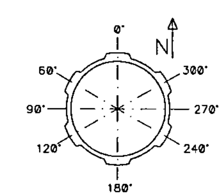
DRAWN	CHKD.	APPVD.	DATE	SCALE
D.C.	CAS	CAS	08/31/98	3/32"=1'-0"

DISCP.	SHEET	DWG.	REV
S	1	S-425-011	1



REFERENCE VENDOR DRAWINGS (PRESCON CORPORATION)

5EX7-003-D-1	DOME POCKET LAYOUT AT RING GIRDER, 0°-60°
5EX7-003-D-2	DOME POCKET LAYOUT AT RING GIRDER, 60°-120°
5EX7-003-D-3	DOME POCKET LAYOUT AT RING GIRDER, 120°-180°
5EX7-003-D-4	DOME POCKET LAYOUT AT RING GIRDER, 180°-240°
5EX7-003-D-5	DOME POCKET LAYOUT AT RING GIRDER, 240°-300°
5EX7-003-D-6	DOME POCKET LAYOUT AT RING GIRDER, 300°-0°



KEY PLAN

NUCLEAR SAFETY RELATED

NO.	DESCRIPTION	DRAWN	CHKD	APPR.	DATE
1	ISSUED PER DCN 99-016	MAD	LSM	[illegible]	3/19/99

REVISIONS

FLORIDA POWER CORPORATION

NUCLEAR ENGINEERING

CRYSTAL RIVER UNIT 3

IWE/IWL INSPECTION
DOME TENDONS LAYOUT-ELEVATION

DRAWN	CHKD.	APPRVD.	DATE	SCALE
D.C.	CAS	CAS	08/31/98	1/8"=1'-0"

DISCP.	SHEET	DWG.	REV.
S	1	S-425-012	1

FILE: S425012.DWG

From: Portmann, Rick
To: Powell, Sid; Herrin, Dennis W.
Subject: FW: Specs requested by the NRC
Date: Monday, November 02, 2009 1:29:07 PM

Sid / Dennis – Have either of you seen these 2 spec's (SP-5566, SP-5583)? Trying not to duplicate work. Thanks, Rick

---

From: Portmann, Rick
Sent: Monday, November 02, 2009 9:46 AM
To: Santonastaso, Louis J
Cc: Williams, Charles R.
Subject: Specs requested by the NRC

Lou – Do you know if these have been found / requested by others and a copy maybe available? If not could you have someone research this for us? Thanks, Rick

Historical SEEK data - CR3	
RAN:	99036-7967
DOCNO:	SPEC, SP5566
REV:	D, C, B
DATE:	08/21/1968, 03/04/1969, 10/02/1969, 03/18/1971, 07/25/1968
TITLE:	SPECIFICATION, REACTOR BUILDING LINER & PENETRATION & PERSONNEL ACCESS LOCK, ADDENDUM
VEND:	G15000, GILBERT ASSOCIATES INC, GAI, 312637
JOB:	WA420300
LOC:	03904-0946
RETEN:	LIFE OF POLICY + 10

Historical SEEK data - CR3	
RAN:	99036-7971
DOCNO:	SPEC, SP5583
REV:	B, A
DATE:	09/18/1968, 06/07/1972, 10/17/1973
TITLE:	SPECIFICATION, TENDON & ASSOCIATED CONDUIT, REACTOR BUILDING
VEND:	G15000, GILBERT ASSOCIATES INC, GAI, 312637
JOB:	WA44203000
LOC:	03904-1234
RETEN:	LIFE OF POLICY + 10

Systems	RB, MX
Calc. Sub-Type	N/A
Priority Code	4
Quality Class	Safety Related

NUCLEAR GENERATION GROUP

ANALYSIS / CALCULATION

S01-0019

Preparation of Tendon Force Curves for the 7th Tendon Surveillance at CR3

☐ BNP UNIT ______

☒ CR3 ☐ HNP ☐ RNP ☐ NES ☐ ALL

APPROVAL

Rev	Prepared By	Reviewed By	Supervisor
1	Signature	Signature	Signature
	Name Matthew F. Denny	Name Joe A. Lore	Name R.L. Miller
	Date 8/14/03	Date 8.14.03	Date 8/15/03

Vendor Precision Surveillance Corporation Vendor Document No. 750-001

Owner's Review By ______ Date 8/14/03

List Of Effective Pages

Page	Rev	Page	Rev	Page	Rev	Page	Rev
i-v	1	70-70A	1				
1-49	0	71	1				
50	1	72-77	0				
51	1	77A-77L	1				
52	0	78-83	0				
53	0	83A-83F	1				
53A	1	84-95	0				
53B	1	95A-95B	1				
54-59	0	96-101	0				

Attachments

Attach. Number	No. of Pages	Rev	Attach. Number	No. of Pages	Rev	Attach. Number	No. of Pages	Rev
A	A1-A35	0	A	A61a-A61c	1			
A	A35a	1	A	A-62-A65	0			
A	A36-A52	0	B	9	0			
A	A52a-A52h	1						
A	A53-A57	0						
A	A57a-A57c	1						
A	A58-A61	0						

Table Of Contents

Revision Summary

Revision	Revision Summary (Include brief description of revision and a list of EC's and other modifications incorporated into revision)
1	Revision 1 of S-01-0019 was performed to provide force curves for tendons that were required to be added to the surveillance packet as a result of the expansion criteria. This will not alter the current calculation, because no conflicting data will be added and the numeric order of the sheets will not be changed. New information will be added as 53A, 53B, 77A, 77B and so forth.

Document Indexing Tables

Input **Document References – Controlled Documents with Cross References**

Doc Services Action (Enter ADD, REV, DELETE, or —)	**Doc. Type** (e.g. CALC, DWG, NPAS, POM, etc)	Document **Sub-Type**	**Document** ID (e.g., Calc No., Dwg. No., Procedure No)	**Sheet** (Dwg. sheet number if Applicable)	Doc **Rev**	**Minor Rev** (for Calc Amendments)	**Ref Type** (for NPAS Docs)
---	CALC		S92-0082		1		
---	POM		SP0182		14		

Legend: ADD = New data record to be added to PassPort; REV = Change revision level of a referenced Controlled Document,
DELETE = Existing data record to be deleted; — = Existing PassPort data that is to be retained;
Bold Faced column heading = PassPort data label

Record of Lead Review

Design S01-0019 **Revision** 1

The signature below of the Lead Reviewer records that:
- the review indicated below has been performed by the Lead Reviewer;
- appropriate reviews were performed and errors/deficiencies (for all reviews performed) have been resolved and these records are included in the design package;
- the review was performed in accordance with EGR-NGGC-0003.

JAL 8.14.03

~~☒~~ **Design Verification Review** ☐ **Engineering Review** ☒ **Owner's Review**

☒ Design Review
☐ Alternate Calculation
☐ Qualification Testing

☐ **Special Engineering Review** ______

☐ YES ☒ N/A **Other Records are attached**

Joe A. Lurk [signature] STRUCTURAL 8.14.03
Lead Reviewer (print) **(sign)** **Discipline** **Date**

Item No.	Deficiency	Resolution
1)	MINOR TYPOS	INCORPORATED AS REQUESTED.
2)		
3)		
4)		
5)		
6)		
7)		
8)		

FORM EGR-NGGC-0003-2-5
This form is a QA Record when completed and included with a completed design package. Owner's Reviews may be processed as stand alone QA records when Owner's Review is completed

Record of Interdisciplinary Reviews

PART I — DESIGN ASSUMPTION / INPUT REVIEW: APPLICABLE ☐ Yes ☒ No

The following organizations have reviewed and concur with the design assumptions and inputs used in this calculation:

Organization	Name	Signature	Date
Systems Engineering	N/A		
Operations	N/A		
Other	N/A		

PART II — RESULTS REVIEW:

The following organizations are aware of the impact of the results of this calculation (on designs, programs and procedures):

Systems Engineering
☐ Yes ☒ NO — Name: N/A — Signature: — Date:
Comments:

Operations
☐ Yes ☒ NO — Name: N/A — Signature: — Date:
Comments:

Other
Name: N/A — Signature: — Date:
Comments:

Other
Name: N/A — Signature: — Date:
Comments:

Other
Name: N/A — Signature: — Date:
Comments:

PSC Precision Surveillance Corporation	CRYSTAL RIVER TENDON SURVEILLANCE 2001 25TH YEAR "PREDICTED FORCES"	DOCUMENT NO:	N750-001
		REVISION NO:	0
		SAFETY RELATED:	X
		NON-SAFETY RELATED:	
		PAGE NO:	Page i of ii

PREPARED BY: CEC	DATE: 4-19-01	REVIEWED BY: [illegible]	DATE: 4/24/01

PREPERATION OF TENDON FORCE CURVES FOR THE 7TH TENDON SURVEILLANCE AT CRYSTAL RIVER

TABLE OF CONTENTS

FOR CEC BY RPK 6-18-01

1.0 PURPOSE AND OBJECTIVE

The purpose of this calculation is to provide tendon force curves for Florida Power Corporation for the Crystal River Unit 3 facility in support of the upcoming 7th tendon surveillance period scheduled for the Fall of 2001. The following information and calculations here within are based upon FPC Calculation S-95-0082. Precision Surveillance Corporation has reviewed the calculations, including all assumptions which have been made, and concur with the entire design process for generating the tendon force curves. The same design process will be utilized for generating the tendon force curves for the current tendon surveillance. Specific tasks to be performed as part of this scope include the following:

1.1 Determine the predicted tendon losses and develop force/time curves for each of the selected tendons for the seventh surveillance period. Generate the tendon force curves for the selected tendons and the tendons adjacent to the selected tendons.

1.2 In addition to the current force curves developed, calculation N750-001 supports all tendon force calculations for any tendon.

2.0 DESIGN INPUT

Design input information has been reviewed and can be found in FPC calculation S-95-0082. These calculations have included all force losses which the surveillance tendons have incurred since original installation. The original installations cards are in Attachment "A". Data taken from these sheets include the effective wires and the original tendon force at installation.

3.0 SCOPE AND TENDON SELECTION

Tendons were selected for the seventh surveillance period in accordance with the requirements of ASME Section 11, IWL, 1992 edition with 1992 addenda and using the same methodology as was used in previous surveillance's. A random but representative sample was selected and checked at the site for accessibility. This selection was completed by Florida Power Corporation and distributed to Precision Surveillance Corporation. The tendons chosen for previous surveillance's can been seen on the proceeding page. The tendons selected for the seventh surveillance are listed below.

Dome	Vertical	Hoop
D126	12V1 (C)	46H21 (C)
D212 (C)	45V14 (D)	46H36
D339 (D)	61V8	53H16 (D)
		62H2
		62H13

Legend:
C – Common Tendon
D – Detension Tendon

Precision Surveillance Corporation (PSG)	CRYSTAL RIVER TENDON SURVEILLANCE 2001 25TH YEAR "PREDICTED FORCES"	DOCUMENT NO: N750-001 REVISION NO: 0 SAFETY RELATED: X NON-SAFETY RELATED: PAGE NO: 2 OF 101
	PREPARED BY: CFC DATE: 4-19-01	REVIEWED BY: PCC DATE: 4/20/01

SURVEILLANCE PERIOD	1ST SURVEILLANCE	2ND SURVEILLANCE	3RD SURVEILLANCE	4TH SURVEILLANCE	5TH SURVEILLANCE	6TH SURVEILLANCE	.	7TH SURVEILLANCE
	11/27/77 TO 2/9/78	3/5/80 TO 5/9/80	9/28/81 TO 12/7/81	9/15/87 TO 11/17/87	11/93 TO 1/94	10/97 TO 1/98		PLANNED 11/01
YEARS AFTER SIT (SIT 11/76)	1 YEAR	3.5 YEARS	5 YEARS	11 YEARS	17 YEARS	21 YEARS		25 YEARS
REQUIRED TO INSPECT	21 TOT-10H,6V,5D	21 TOT-10H,6V,5D	21 TOT-10H,6V,5D	11 TOT-5H,3V,3D	11 TOT-5H,3V,3D	11 TOT-5H,3V,3D		11 TOT-5H,3V,3D
ACTUALLY INSPECTED	23 TOT-10H,7V,6D	22 TOT-10H,7V,5D	21 TOT-10H,6V,5D	11 TOT-5H,3V,3D	14 TOT-8H,3V,3D	27TOT-19H, 3V, 5D		
						INCL 8 DEFERRED		
SP BASIS	SP-5583, SP-5909, SP-395, SP-6456	SP-182 REV -	SP-182 REV 4	SP-182 REV 7	SP-182 REV 10 & 11	SP-182 REV. 13		SP-182
G/C REPORT DATE	3/27/80 & 4/80	5/80	5/19/82	3/10/88	5/94	N/A		
DOME TENDONS	D139	D122	D123	D105 (D)	D215 (R,C)	D212 (R,C,E)		D212 (R,C)
123 TOTAL	D215	D140	D215 (R)	D212 (R,C)	D231 (D)	D304 (D)		D126
3 GROUPS OF 41	D221 (D)	D208 (D)	D212	D328	D224 (A)	D113		D339 (D)
D100'S, D200'S, D300'S	D228	D323	D322 (D)			D115 (E)		
	D234	D331	D329			D311 (E)		
	D340							
VERTICAL TENDONS	12V19	12V12	12V1	12V1 (R,C)	34V6 (R,C)	12V1 (R,C,E)		12V1 (R,C)
144 TOTAL	12V20	12V20 (R)	34V6 (R)	34V4	56V15 (D)	61V21 (D)		45V14 (D)
6 GROUPS OF 24	12V21	23V5	34V19 (D)	56V2 (D)	61V14	23V2		61V8
12, 34, 56, 23, 45, 61	23V15	34V1	45V16					
	34V6	45V6	56V11					
	45V3 (D)	56V20	61V5					
	56V1	56V1 (D,R)						
HORIZONTAL TENDONS	13H10	13H22	13H19 (R)	13H20	35H1	51H26 (R,C,E)		46H21 (R,C)
282 TOTAL	13H19	13H32 (D)	13H46	13H40 (D)	42H1	42H18		62H13
6 GROUPS @47 HIGH	13H37	13H43	42H20	51H26 (R)	46H21 (C(new))	42H32		46H36
13, 24, 35, 46, 51, 62	13H47	51H10	42H40	51H41	46H28 (ADJ,T)	42H44 (E)		53H16 (D)
HOOP	51H11	51H23	51H26	46H19	46H29 (R,C(old),D)	53H2		62H2
	62H9	51H37	51H45		46H30 (ADJ)	62H41 (D)		
	46H21	53H24	53H35		46H47 (D)	62H46 (E)		
	46H29	53H28	53H40		62H8	53H46 (E)		
	46H37 (D)	53H44	62H34			42H29	42H36	
	46H46	46H42	46H10 (D)			42H30	42H37	
						42H31	51H25	
						42H33	51H27	
						42H34	51H28	
TOTAL TENDONS = 549						42H35		
TOTAL INSPECTED	23	22	21	11	14	27		
LEGEND-	A, ALTERNATE; ADJ.,ADJACENT; C, CONTROL; D, DETENSIONED & RETENSIONED							
	E, EXEMPTED/DEFERRED FROM 5TH SURV.; R, REPEATED; T, RETENSIONED							

4.0 CALCULATIONS

4.1 General Background

Tendon forces curves are to be prepared for the upcoming 7th tendon surveillance period at CR3. From the basic criteria as presented in Calculation S-95-0082, the supporting work for this surveillance will be based upon those calculations.

Tendon losses have been calculated in the past per the Reference 8, 9, 10 and 11 of Calculation S-95-0082. The individual losses include the following.

- Force loss due to elastic shortening of the containment as a result of the prestressing process and the particular sequence of tendon stressing.
- Force loss due to the stress relaxation of the tendon wires.
- Loss of prestress force due to the creep characteristics of the concrete structure.
- Loss of prestress force due to the shrinkage of the concrete structure.

Based on the work previously accomplished in the prior surveillances, new spreadsheets were prepared this surveillance using Microsoft Excel for the collection of input data and for the calculation of tendon losses needed for generation for the force curves. The generation of the force curves was also automated this surveillance by using Excel to plot the graphs. The organization of most data used for this calculation was setup into Excel workbooks with subfiles built and included in each workbook. There is a separate workbook for each of the three tendon groups and each one contains the following:

- Tabulated input data.
- Original tendon stressing sequences.
- Effective wire summaries.
- "Original Stressing Data"
- Separate files including each tendon loss spreadsheet, plot data and an individual force curve.

4.2 Schedule Information

The expected timing for the seventh surveillance is Fall 2001. A date of September 1, 2001 will be used as basis for determining the predicted values of Base, 95% Base and 90% Base and labeling this information on the force curves. A vertical line will be shown on the force curves at the point of the seventh surveillance and the calculated values of Base, 95% Base and 90% Base representing points on the curves at that time will be included on each of the curves.

4.3 General Procedure for Force Curve Generation

The same procedure within the calculation for the preparation of the force curves for the fourth, fifth and sixth surveillance periods will be followed.

4.3.1 Preparation of Data Input Spreadsheets

In each of the Excel workbooks is a data input file where data from source calculations and current tendon history sheets has been tabulated. See Attachment "A" for tendon history sheets.

4.3.2 Procedure for Determination of Individual Tendon Losses

The procedure for the tendon loss calculations, as derived from the reference documentation, is as follows:

1.) Calculate original force in the tendons

The original force in the tendon is determined as follows:

$$ORIG_{FORCE} := 0.7 \times F_{ULT} \times \left(\frac{ActualLiftoffPressure}{PredictedLiftoffPressure} \right) \times WireFactor$$

Where:

f_{ult} = 240 ksi, typical for all CR3 wires.
Wire Area = 0.07685 in^2
F_{ult} (Kip Force) = Tendon Area (in^2) x f_{ult} (ksi) = 0.05985 x 240
Tendon Area (in^2) = Area/Wire (in^2) x No. of Wires. (Considered by wire factor.)

Actual and predicted original liftoff pressures are obtained from the Tendon History Sheets. Please see Attachment B for Tendon History Sheets.

The above expression was used as the basis for the calculations for all the shop and field end forces calculated on the Data Input Spreadsheets. This procedure does not apply to retensioned tendons.

Note that the wire factor as shown in the various spreadsheets is a value representing the tabulated number of effective wires over a total of 163. The number of wires is usually 163 unless cut, loose or considered ineffective. The number of effective wires as recorded from the original installation is documented on the tendon history sheets.

Note that the wire factor used is based on current information and is not based on the number of wires at the time of installation, therefore the original Force calculated may not be the "original force" in the tendon back at that time. The effect of less effective wires lowers the curve vertically. This is insignificant at the current time as the curve of interest will be correct for use at this time.

2.) Calculate Elastic Shortening Losses

The elastic shortening losses are a function of the stressing sequence number for the individual tendon. In addition, the tendon wire factors are also considered and used. The base expression used to calculate these forces is the same as used in previous calculations and is already built into the basic spreadsheet templates. All the equations for elastic shortening were confirmed as being the same as established in prior calculations. Based on the review of the procedure for calculating these losses, it is concluded that the existing templates are still appropriate and correct with the additional input of stressing sequence data and wire factors to be input for the current group of tendons for this surveillance.

See Attachment B for original stressing sequences for all tendons and see the Data Input Worksheets and Attachment A for tendon wire factor and source data.

Elastic Shortening Losses for Dome Tendons

Note there are two expressions used for elastic shortening for the dome tendons depending on the stress sequence numbers. For dome tendons in sequences 1 through 27, the Domelow template is used. For tendons in sequences 28 through 32, the Domehigh template it to be used. This is because of the two separate expressions used for the calculation.

Elastic Shortening Losses:
For Dome Tendons in Sequences 1 through 27

N = 27 Total Sequences
n = Sequence of particular tendon.

Force Loss due to elastic shortening = F_{les}

$$F_{les} := \left[\left[\frac{(N-n)}{N}\right] \times (82.7) + 75\right] \times WireFactor$$

Elastic Shortening Losses:
For Dome Tendons in Sequences 28 through 32

N = 5 (Sequences 28 through 32
n = Sequence number less 27

i.e. for sequence 28, n = 1
for sequence 29, n = 2
for sequence 30, n = 3
for sequence 31, n = 4
for sequence 32, n = 5

$$F_{les} := \left[\left[\frac{(N-n)}{N}\right] \times (47.4) - 13.7\right] \times WireFactor$$

The value for elastic shortening in kips declines as the stressing sequence increases. A review of the data for the dome group show that values for the dome group go from 154.6 kips for sequence 1 tendons down to 75 kips for sequence 27 tendons, and further going down to –13.7 kips for the last sequence, sequence 32. Note that wire factor differences between individual tendons will cause the calculated result to vary slightly for two tendons within the same stressing sequence.

Elastic Shortening Losses for Hoop Tendons:

N = 60 Total Sequences.
n = Sequence of particular tendon.

Force Loss due to elastic shortening =

$$F_{les} := \left[\frac{(N-n)}{N} \times 134.0\right] \times WireFactor$$

A review of the data for the hoop tendon group shows that the range of values for the calculated elastic shortening go from 127.3 kips sequence 3 tendons down to 0 kips for the last tendon sequence, sequence 60.

Elastic Shortening Losses for Vertical Tendons:

N = 31 Total Sequences.
n = Sequence of particular tendon.

Force Loss due to elastic shortening:

$$F_{les} := \left[\frac{(N-n)}{N} \times 73.5 \right] \times WireFactor$$

A review of the data for the vertical tendon group shows that the range of values calculated for elastic shortening go from 71.1 kips for sequence 1 tendons down to 4.7 kips for sequence 29 tendons. There are a total of 31 stressing sequences for the vertical tendons.

3.) Calculate Wire Stress Relaxation Losses

Wire stress relaxation losses and the procedure for the determination of these losses for the 4th, 5th and 6th surveillances are addressed in Calculation S-95-0082. The original wire relaxation curve, as provided by test data from the wire vendor, forms the bases for wire relaxation loss values. It was determined that the same procedures and figures as calculated in those prior calculations are still applicable for this surveillance.

Note that there were adjustments made to the original stress relaxation values from the vendor relaxation curve to allow for some conservatism and for temperature consideration of 100° F vs. 68° F. Also, per the original design the wire factor or actual number of effective wires was considered as negligible for these losses and was not included. Note that values for stress relaxation range between 40 and 50 kips for the surveillance period for all three tendon groups.

4.) Calculate Creep Losses

Original concrete creep calculations can be found in Calculation S-95-0082. The losses are based on the curve contained in the reference calculation. Creep values are different for each of the three groups of tendons. For the dome tendons in the coming surveillance period, creep values are the same and are about 152 to 158 kips, values are between 79 and 83 kips and verticals are 36 to 38 kips.

5.) Calculate Shrinkage Losses

Original losses from shrinkage were taken from Calculation S-95-0082. The straight line shrinkage losses in micro inches per inch as calculated in the previously stated calculation are still applicable for this surveillance period. Tabulated values from the references were input into the dome, hoop and vertical spreadsheets. There are no additional variables or considerations and the same values are to be used for this calculation. From a review of the output information, the dome values are constant at 8 to 9 kips, hoop values are above 5 kips and verticals are also slightly above 5 kips.

6.) Total Losses

Calculated force losses for elastic shortening, wire stress relaxation, creep and shrinkage are added for a total of all losses. Also, a percent of this total of all losses is calculated based on the original average force in the tendon.

7.) Determine Predicted Forces for Base, 95% Base and 90% Base values

The original force less the total of losses calculated yields the base predicted value for the subject period of surveillance inspection. The 95% and 90% values are then calculated based on the calculated predicted base value.

8.) Normalization Factors

Normalization factors are calculated based on the expressions and the source article contained in Attachment 1 of Calculation S-95-0082. This factor usually does not change much over the forty year time span of the calculation. The base expression for the dome normalization factor value is presented as follows:

$$(A - B) \times (1 - C) + (D - 97.7)$$

Where:

A = Average of all Domes group.
B = Original average tendon force.
C = Wire Stress Relaxation Percentage.
D = Elastic Shortening.

As an example, Dome tendon D126 calculates as follows:

Normalization Factor = $(1639 - 1634) \times (1 - 0.0257) + (D - 97.7)$

Normalization Factor = - 18 (which matches the spreadsheet calculation.)

Similar calculations are completed for the hoop and vertical tendons.

9.) Plotting of Data

Only the data from Column B, L, M, & N are tabulated on a separate area on the side of the spreadsheet. See columns R, S, T & U; Rows 40 through 50. Only these values are selected for plotting on the force curves. This is for ease of plotting and has no affect on the quality or accuracy of the plots.

The plots of all dome curves with all the data point showed the force curve plot line as slightly crooked from a true linear plot. The large scale used showed some inflection points slightly off of linear. After investigation, the condition was avoided by omitting data points at year 10 and 15 after SIT for the final plotted figures. This was done on for presentation purposes and there is no affect on the accuracy of the plot or the base values calculated and presented on each curve.

A column by column explanation of the losses calculation worksheet follows:

4.4. INDIVIDUAL TENDON LOSSES CALCULATION WORKSHEET: NOTES AND LEGEND

Individual tendon losses are calculated based on the procedure presented in the preceding section. The following notes explain the spreadsheet process, input and calculations performed for each of the columns presented. The shaded values on the losses worksheet are extracted from the data input worksheet.

Column	Description	Column	Description
A	Inspection Period after SIT	I	Shrinkage Force
B	Years after Concrete Placement	J	Total Force Loss
C	Elastic Shortening	K	Total Percent Loss
D	Stress Relaxation Percent	L	Base
E	Stress Relaxation Forces	M	95% Base
F	Creep Strain	N	90% Base
G	Creep Strain Force	O	Normalization Factor
H	Shrinkage Values		

5.0 SUMMARY OF PREDICTED FORCES

SURVEILLANCE TENDONS					
TENDON	EFFECTIVE WIRES	PREDICTED FORCES, (KIPS)			NORMALIZATION NUMBER
		BASE	95% BASE	90 % BASE	
D126	163	1345	1278	1211	-18
D212	162	1311	1246	1180	15
D339	160	1439	1367	1295	-111
12V1	163	1528	1451	1375	-9
45V14	163	1580	1501	1422	-61
61V8	163	1494	1419	1344	23
46H21	162	1446	1374	1302	-12
46H36	163	1497	1422	1348	-63
53H16	163	1496	1422	1347	-63
62H2	163	1466	1393	1319	-33
62H13	163	1447	1375	1302	-13

ADJACENT TENDONS					
TENDON	EFFECTIVE WIRES	PREDICTED FORCES, (KIPS)			NORMALIZATION NUMBER
		BASE	95% BASE	90 % BASE	
D125	163	1294	1229	1164	33
D127	163	1406	1335	1265	-78
D211	162	1310	1245	1179	18
D213	163	1317	1252	1186	10
D338	162	1304	1238	1173	24
D340	163	1396	1326	1256	-69
61V24	163	1514	1438	1362	3
12V2	163	1599	1519	1439	-80
45V13	163	1561	1483	1405	-42
45V15	163	1484	1410	1336	33
61V7	163	1544	1467	1390	-25
61V9	163	1472	1399	1325	45
46H20	160	1473	1399	1326	-39
46H22	162	1492	1417	1342	-57
46H35	163	1459	1386	1313	-25
46H37	161	1414	1343	1272	20
53H15	163	1415	1344	1273	19
53H17	163	1364	1296	1228	68
62H1	162	1370	1302	1233	62
62H3	163	1394	1324	1255	39
62H12	163	1504	1429	1353	-69
62H14	163	1431	1360	1288	1

5.1 DOME TENDONS

DOME TENDONS

TENDONS LISTING & INPUT DATA SHEET
INDIVIDUAL TENDONS LOSSES SHEET
INDIVIDUAL TENDONS FORCE CURVES

DESCRIPTION	PAGES	PREPARED BY:		REVIEWED BY:	
		INTIALS	DATE	INITIALS	DATE
DATA INPUT	13	CEC	4-19-01	PCL	4/24/01
D121	14 &15	CEC	4-19-01	PCL	4/24/01
D122	16 & 17	CEC	4-19-01	PCL	4/24/01
D123	18 & 19	CEC	4-19-01	PCL	4/24/01
D124	20 & 21	CEC	4-19-01	PCL	4/24/01
D125	22 & 23	CEC	4-19-01	PCL	4/24/01
D126	24 & 25	CEC	4-19-01	PCL	4/24/01
D127	26 & 27	CEC	4-19-01	PCL	4/24/01
D128	28 & 29	CEC	4-19-01	PCL	4/24/01
D129	30 & 31	CEC	4-19-01	PCL	4/24/01
D130	32 & 33	CEC	4-19-01	PCL	4/24/01
D131	34 & 35	CEC	4-19-01	PCL	4/24/01
D132	36 & 37	CEC	4-19-01	PCL	4/24/01
D211	38 &39	CEC	4-19-01	PCL	4/24/01
D212	40 & 41	CEC	4-19-01	PCL	4/24/01
D213	42 & 43	CEC	4-19-01	PCL	4/24/01
D338	44 & 45	CEC	4-19-01	PCL	4/24/01
D339	46 & 47	CEC	4-19-01	PCL	4/24/01
D340	48 & 49	CEC	4-19-01	PCL	4/24/01

Reference: S-95-0082

Initial Concrete Stress = 1732.0 (ksi)
Average Force = 1639.0 (kips)

For Tendons in Sequences 1 through 27 :
Total Stress Sequence (N) = 27
Total Elastic Shortening Losses = 82.7

For Tendons in Sequences 28 thru 32 :
Total Stress Sequence (N) = 5
Total Elastic Shortening Losses = 47.4

Tendon No.	Lift-off Pressure (ksi) (1)				Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips)		Remarks (3)
	Shop End		Field End					Shop End (5)	Field End (5)	
	Predicted	Actual	Predicted	Actual						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
D121	6760	6700	6800	6900	17	162	0.994	1614	1653	
D122	6800	7050	6840	6800	26	163	1.000	1699	1629	
D123	6710	6800	6640	6650	3	162	0.994	1651	1631	
D124	6800	6900	6840	6700	29	163	1.000	1663	1605	
D125	6800	6750	6840	6700	16	163	1.000	1627	1605	
D126	6800	6800	6840	6800	27	163	1.000	1639	1629	S
D127	6800	6900	6840	6700	29	163	1.000	1663	1605	
D128	6710	6800	6650	6900	2	159	0.975	1620	1659	
D129	6710	6850	6740	6600	15	161	0.988	1653	1585	
D130	6870	6850	6810	6800	1	163	1.000	1634	1637	
D131	6710	6700	6740	6600	29	161	0.988	1616	1585	
D132	6760	6700	6800	6700	27	162	0.994	1614	1605	
D211	6810	7100	6870	7000	1	162	0.994	1698	1660	
D212	6770	6600	6770	6700	27	162	0.994	1588	1612	S,C
D213	6840	6900	6800	6800	14	163	1.000	1653	1639	
D338	6770	6800	6800	6850	12	162	0.994	1636	1641	
D339	6700	6850	6700	6800	32	160	0.982	1645	1633	S
D340	6840	6900	6800	6700	28	163	1.000	1653	1615	

File: N750DOME.xls (DOMEINP)

Notes:

(1) Ref.12, 13, 14 Crystal River 3 R/B Tendon History Sheets - Dome Tendons for Original Stressing. See Attachments B&D.
(2) Ref. 11 Crystal River 3 Tendon Surveillance Loss Calculations. See Attachment C for stress sequences.
(3) S= Selected Tendons, C =Control tendon, D =Detensioned tendon, A =Alternate tendon
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacents
(4) Wire factors are calculated based on the number of effective wires divided by 163.
(5) Original forces calculated based on the expression in S-95-0082

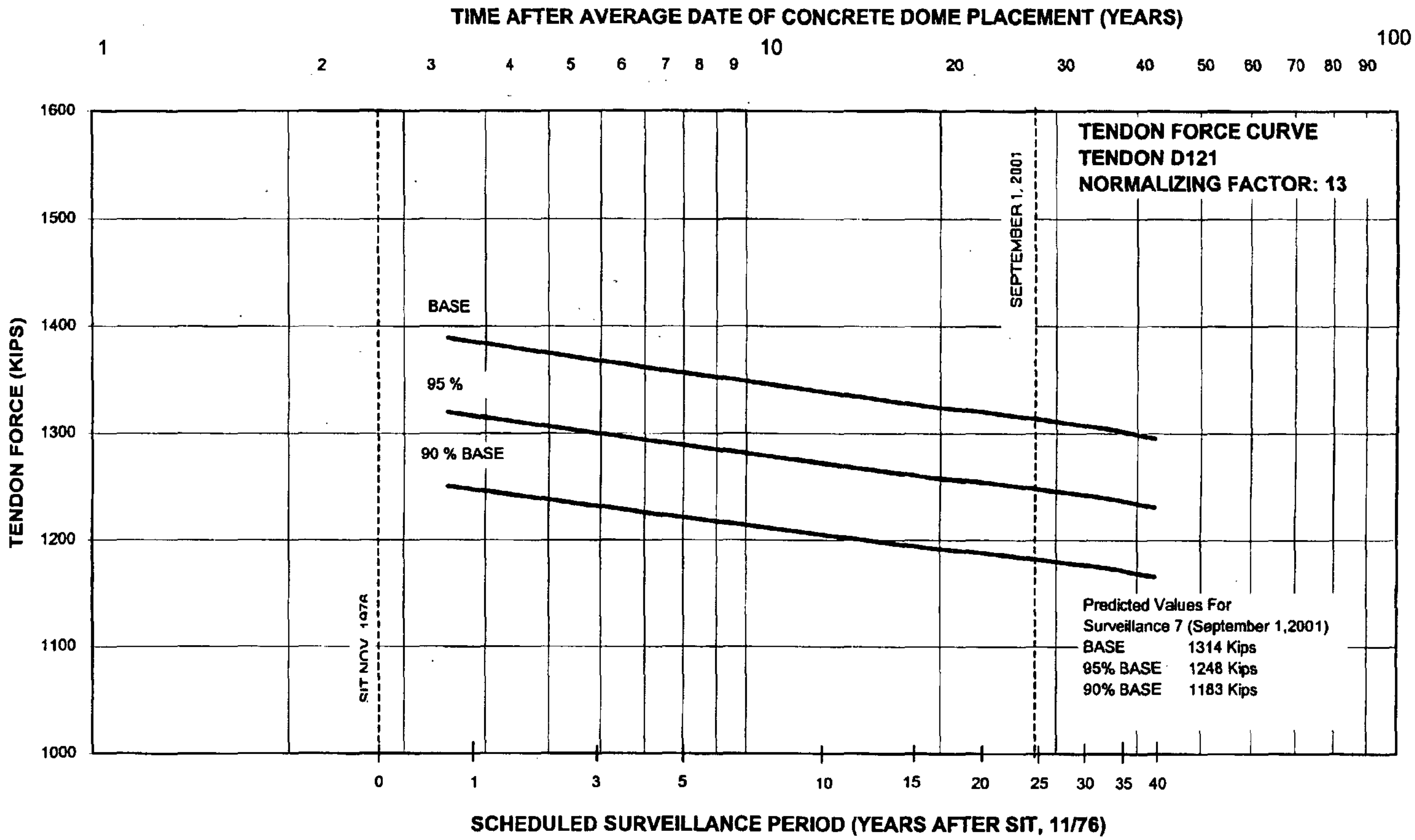
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D121 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1614 FIELD: 1653 AVERAGE: 1634 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 17 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: CR. STR. (*.0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	105.6	2.57%	42.3	3.28	92.5	15	4.0	244.4	14.96%	1389	1320	1250	13
3	5.5	105.6	2.60%	42.7	3.86	108.8	18	5.0	262.1	16.05%	1371	1303	1234	13
5	7.5	105.6	2.68%	44.1	4.21	118.7	21	6.0	274.4	16.80%	1359	1291	1223	13
10	12.5	105.6	2.76%	45.4	4.62	130.3	25	7.0	288.3	17.65%	1345	1278	1211	13
15	17.5	105.6	2.81%	46.2	5.21	146.9	27.5	8.0	306.7	18.78%	1327	1261	1194	13
17	19.5	105.6									1324	1258	1192	13
20	22.5	105.6	2.87%	47.2	5.39	152.0	29	8.0	312.8	19.15%	1321	1255	1189	13
21:3	23.75	105.6									1319	1253	1187	13
25	27.5	105.6	2.89%	47.3	5.59	157.6	30.8	9.0	319.5	19.56%	1314	1248	1183	13
30	32.5	105.6	2.91%	47.8	5.78	163.0	32	9.0	325.4	19.92%	1308	1243	1177	13
35	37.5	105.6	2.93%	48.2	5.98	168.6	33	9.0	331.4	20.29%	1302	1237	1172	13
40	42.5	105.6	2.95%	48.5	6.18	174.3	34	10.0	338.4	20.72%	1295	1230	1166	13
25	27.5										1314	1248	1183	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON D121
NORMALIZING FACTOR: 13
SEPTEMBER 1, 2001
SIT NOV. 1976
BASE
95 %
90 % BASE
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
Predicted Values For
Surveillance 7 (September 1,2001)
BASE 1314 Kips
95% BASE 1248 Kips
90% BASE 1183 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

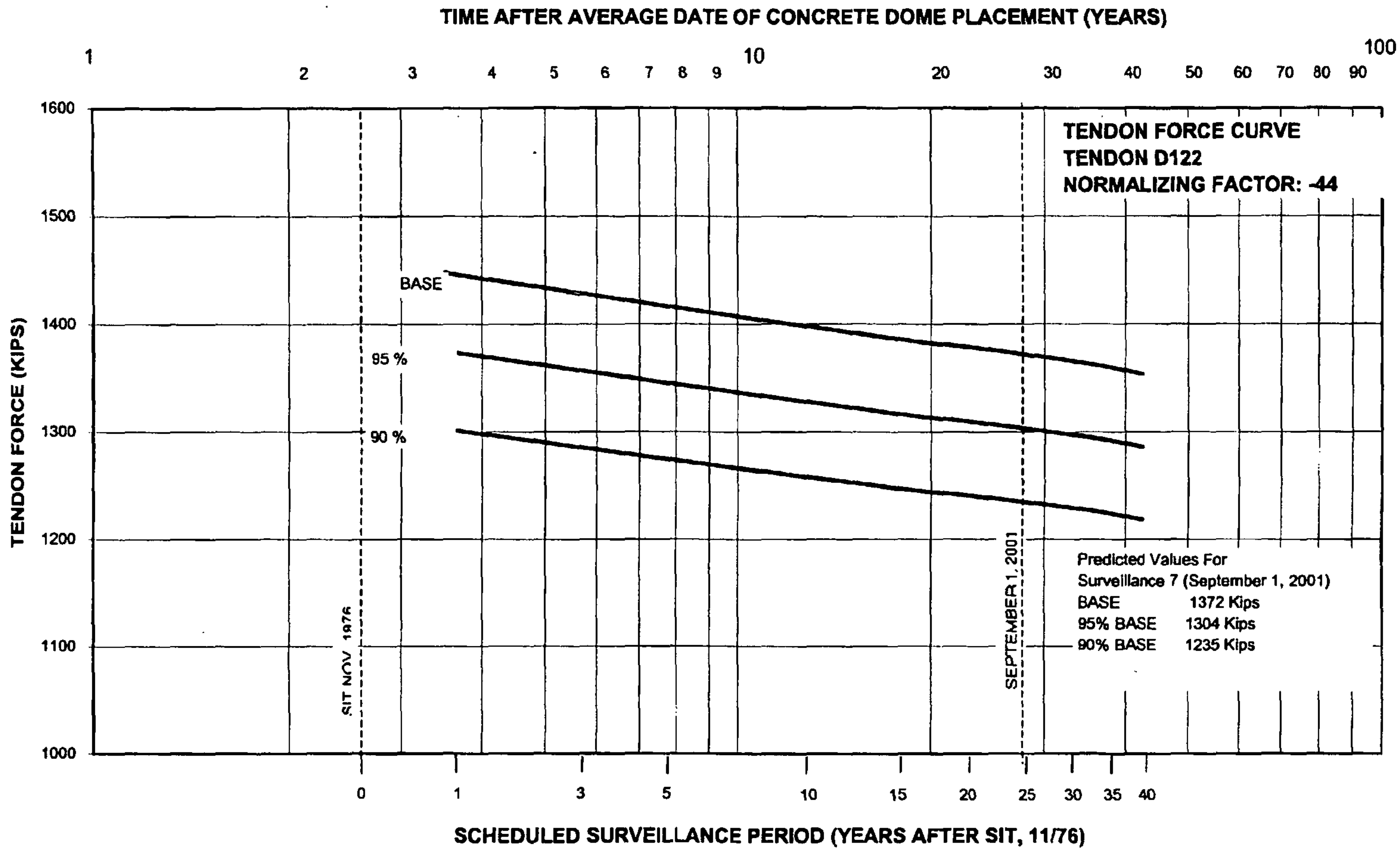
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSE7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D122 INITIAL CONCRETE STRESS (PSI NA

ORIGINAL FORCES (KIPS): SHOP: 1699 FIELD: 1629 AVERAGE: 1664 AVERAGE ALL DOME TENDONS 1639
STRESS SEQUENCE: 26 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	78.1	2.57%	42.3	3.28	92.5	15	4.0	216.9	13.03%	1447	1375	1303	-44
3	5.5	78.1	2.60%	42.7	3.86	108.8	18	5.0	234.6	14.09%	1430	1358	1287	-44
5	7.5	78.1	2.68%	44.1	4.21	118.7	21	6.0	246.9	14.83%	1417	1347	1276	-44
10	12.5	78.1	2.76%	45.4	4.62	130.3	25	7.0	260.8	15.67%	1404	1333	1263	-44
15	17.5	78.1	2.81%	46.2	5.21	146.9	27.5	8.0	279.2	16.77%	1385	1316	1247	-44
17	19.5	78.1									1383	1314	1244	-44
20	22.5	78.1	2.87%	47.2	5.39	152.0	29	8.0	285.3	17.14%	1379	1310	1241	-44
21:3	23.75	78.1									1377	1308	1240	-44
25	27.5	78.1	2.89%	47.3	5.59	157.6	30.8	9.0	292.0	17.54%	1372	1304	1235	-44
30	32.5	78.1	2.91%	47.8	5.78	163.0	32	9.0	297.9	17.90%	1366	1298	1230	-44
35	37.5	78.1	2.93%	48.2	5.98	168.6	33	9.0	303.9	18.26%	1360	1292	1224	-44
40	42.5	78.1	2.95%	48.5	6.18	174.3	34	10.0	310.9	18.68%	1353	1286	1218	-44
25	27.5										1372	1304	1235	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D122
NORMALIZING FACTOR: -44
BASE
95 %
90 %
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1372 Kips
95% BASE 1304 Kips
90% BASE 1235 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

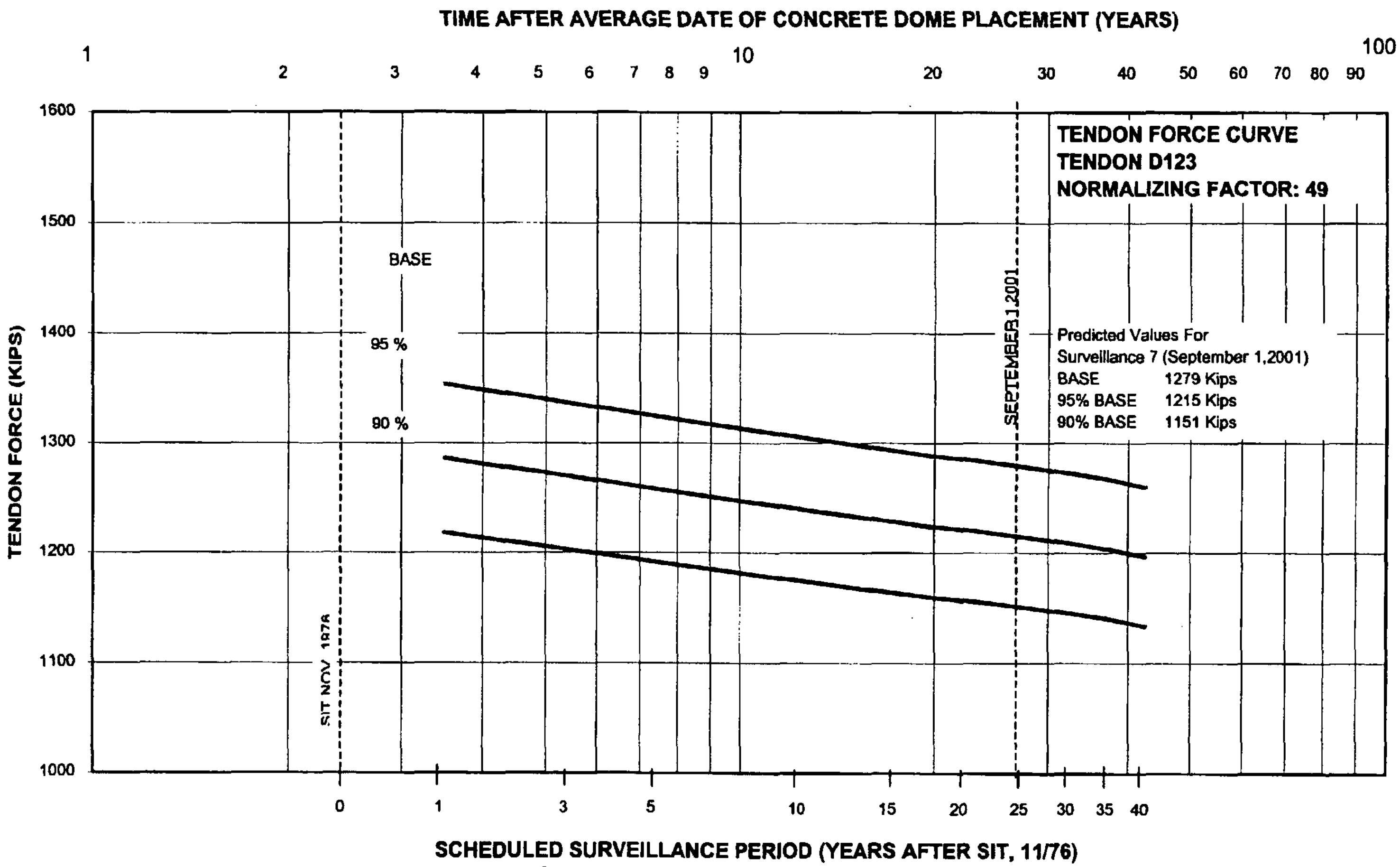
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOS 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D123 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS) SHOP: 1651 FIELD: 1631 AVERAGE: 1641 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 3 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE								
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	148.5	2.57%	42.3	3.28	92.5	15	4.0	287.3	17.51%	1354	1286	1218	49
3	5.5	148.5	2.60%	42.7	3.86	108.8	18	5.0	305.0	18.59%	1336	1269	1202	49
5	7.5	148.5	2.68%	44.1	4.21	118.7	21	6.0	317.3	19.34%	1324	1258	1191	49
10	12.5	148.5	2.76%	45.4	4.62	130.3	25	7.0	331.2	20.18%	1310	1244	1179	49
15	17.5	148.5	2.81%	46.2	5.21	146.9	27.5	8.0	349.6	21.30%	1291	1227	1162	49
17	19.5	148.5									1289	1225	1160	49
20	22.5	148.5	2.87%	47.2	5.39	152.0	29	8.0	355.7	21.68%	1285	1221	1157	49
21:3	23.75	148.5									1284	1219	1155	49
25	27.5	148.5	2.89%	47.3	5.59	157.6	30.8	9.0	362.4	22.08%	1279	1215	1151	49
30	32.5	148.5	2.91%	47.8	5.78	163.0	32	9.0	368.3	22.44%	1273	1209	1145	49
35	37.5	148.5	2.93%	48.2	5.98	168.6	33	9.0	374.3	22.81%	1267	1203	1140	49
40	42.5	148.5	2.95%	48.5	6.18	174.3	34	10.0	381.3	23.24%	1260	1197	1134	49
25	27.5										1279	1215	1151	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)
TENDON FORCE CURVE
TENDON D123
NORMALIZING FACTOR: 49
BASE
95 %
90 %
SIT NOV. 1976
SEPTEMBER 1,2001
Predicted Values For
Surveillance 7 (September 1,2001)
BASE 1279 Kips
95% BASE 1215 Kips
90% BASE 1151 Kips

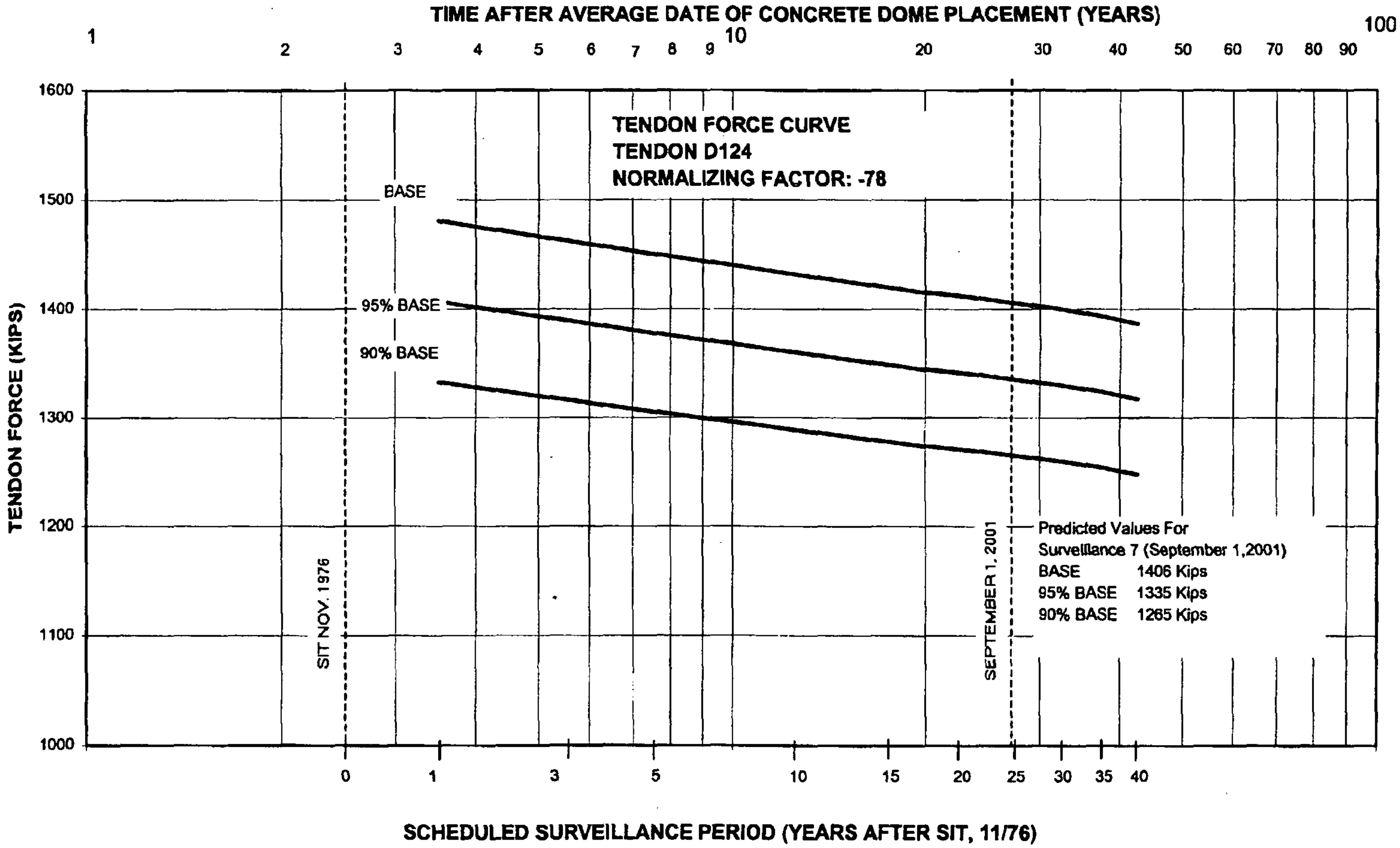
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES- 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMEHI GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

TENDON: D124 INITIAL CONCRETE STRESS (PSI NA

ORIGINAL FORCES (KIPS) SHOP: 1663 FIELD: 1605 AVERAGE: 1634 AVERAGE ALL DOME TENDONS 1639
STRESS SEQUENCE: 29 OF 5 TOTAL ELASTIC SHORT. LOS 47.4 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	CR. STR. (* .0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	14.7	2.57%	42.3	3.28	92.5	15	4.0	153.5	9.40%	1481	1407	1333	-78
3	5.5	14.7	2.60%	42.7	3.86	108.8	18	5.0	171.2	10.48%	1463	1390	1317	-78
5	7.5	14.7	2.68%	44.1	4.21	118.7	21	6.0	183.5	11.23%	1451	1378	1306	-78
10	12.5	14.7	2.76%	45.4	4.62	130.3	25	7.0	197.4	12.08%	1437	1365	1293	-78
15	17.5	14.7	2.81%	46.2	5.21	146.9	27.5	8.0	215.8	13.21%	1418	1347	1277	-78
17	19.5	14.7									1416	1345	1274	-78
20	22.5	14.7	2.87%	47.2	5.39	152.0	29	8.0	221.9	13.58%	1412	1342	1271	-78
21:3	23.75	14.7									1411	1340	1270	-78
25	27.5	14.7	2.89%	47.3	5.59	157.6	30.8	9.0	228.6	13.99%	1406	1335	1265	-78
30	32.5	14.7	2.91%	47.8	5.78	163.0	32	9.0	234.5	14.35%	1400	1330	1260	-78
35	37.5	14.7	2.93%	48.2	5.98	168.6	33	9.0	240.5	14.72%	1394	1324	1254	-78
40	42.5	14.7	2.95%	48.5	6.18	174.3	34	10.0	247.5	15.15%	1387	1317	1248	-78
25	27.5										1406	1335	1265	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D124
NORMALIZING FACTOR: -78
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1,2001)
BASE 1406 Kips
95% BASE 1335 Kips
90% BASE 1265 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

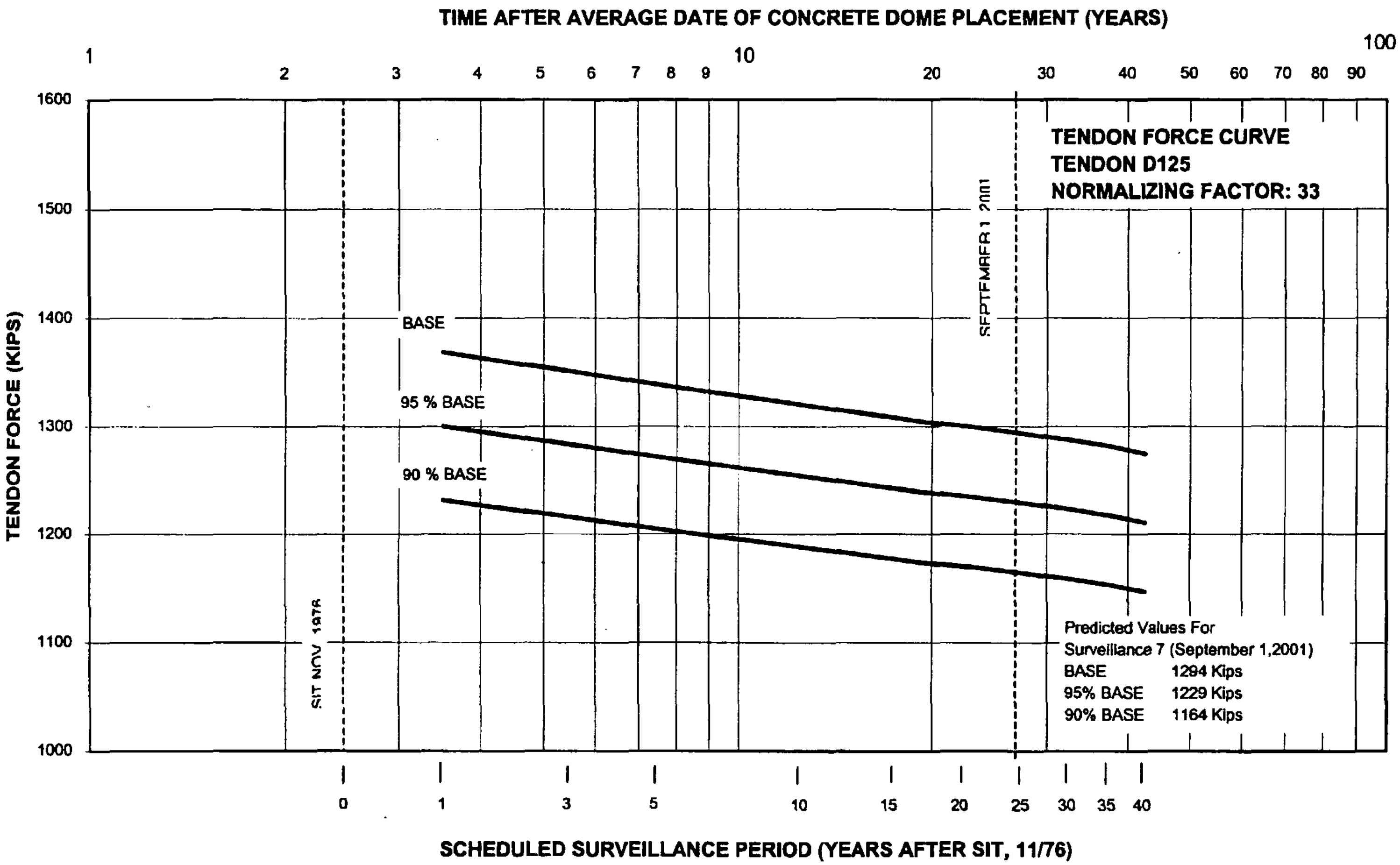
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSS7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D125 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS) SHOP: 1627 FIELD: 1605 AVERAGE: 1616 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 16 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	108.7	2.57%	42.3	3.28	92.5	15	4.0	247.5	15.31%	1369	1300	1232	33
3	5.5	108.7	2.60%	42.7	3.86	108.8	18	5.0	265.2	16.41%	1351	1283	1216	33
5	7.5	108.7	2.68%	44.1	4.21	118.7	21	6.0	277.5	17.17%	1339	1272	1205	33
10	12.5	108.7	2.76%	45.4	4.62	130.3	25	7.0	291.4	18.03%	1325	1259	1192	33
15	17.5	108.7	2.81%	46.2	5.21	146.9	27.5	8.0	309.8	19.17%	1306	1241	1176	33
17	19.5	108.7									1304	1239	1174	33
20	22.5	108.7	2.87%	47.2	5.39	152.0	29	8.0	315.9	19.55%	1300	1235	1170	33
21:3	23.75	108.7									1299	1234	1169	33
25	27.5	108.7	2.89%	47.3	5.59	157.6	30.8	9.0	322.6	19.96%	1294	1229	1164	33
30	32.5	108.7	2.91%	47.8	5.78	163.0	32	9.0	328.5	20.33%	1288	1223	1159	33
35	37.5	108.7	2.93%	48.2	5.98	168.6	33	9.0	334.5	20.70%	1282	1218	1153	33
40	42.5	108.7	2.95%	48.5	6.18	174.3	34	10.0	341.5	21.13%	1275	1211	1147	33
25	27.5										1294	1229	1164	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D125
NORMALIZING FACTOR: 33
SEPTEMBER 1 2001
SIT NOV 1976
BASE
95 % BASE
90 % BASE
TENDON FORCE (KIPS)
Predicted Values For
Surveillance 7 (September 1,2001)
BASE 1294 Kips
95% BASE 1229 Kips
90% BASE 1164 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

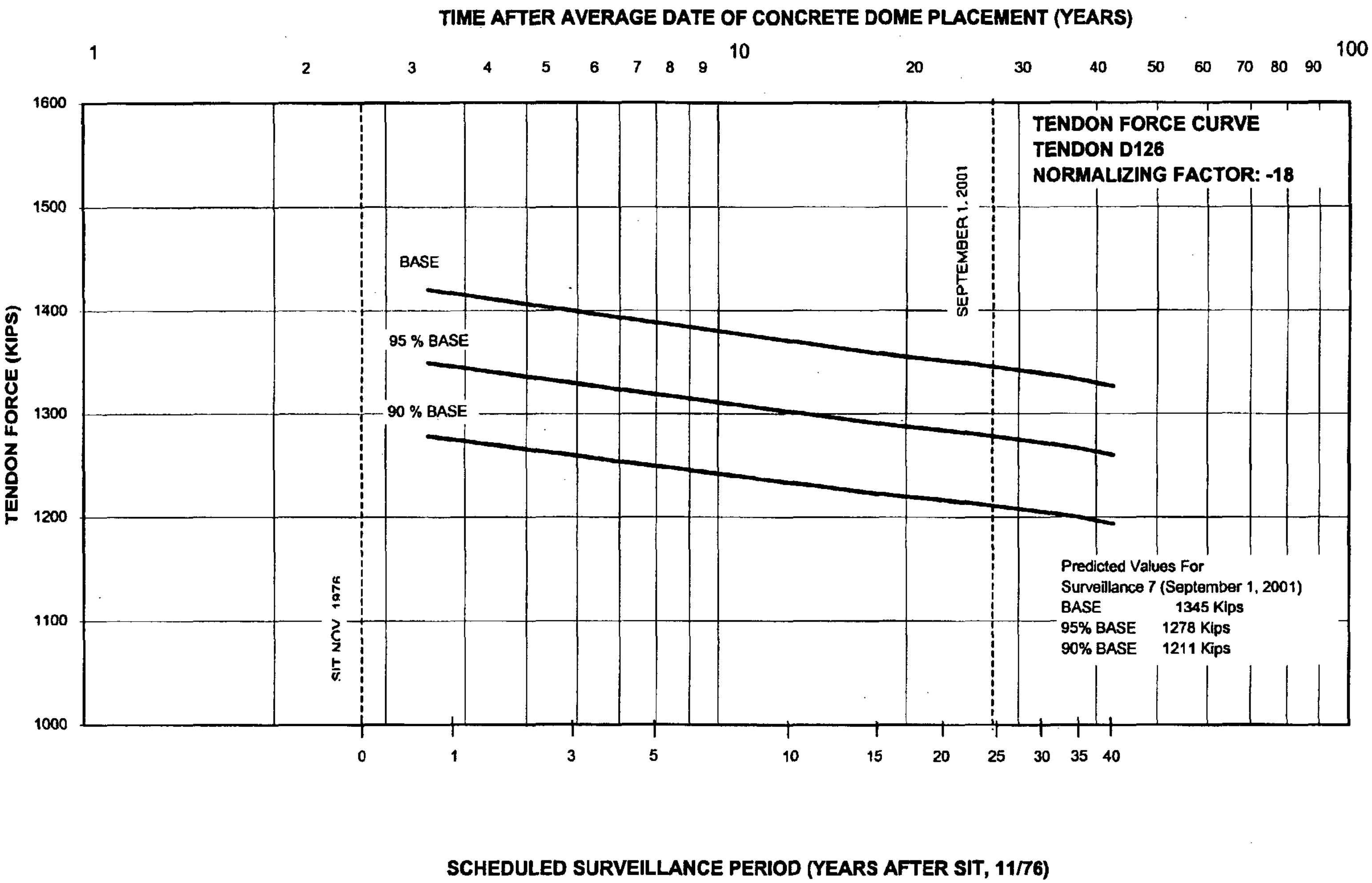
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSE 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D126 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1639 FIELD: 1629 AVERAGE: 1634 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 27 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	75.0	2.57%	42.3	3.28	92.5	15	4.0	213.8	13.08%	1420	1349	1278	-18
3	5.5	75.0	2.60%	42.7	3.86	108.8	18	5.0	231.5	14.17%	1403	1333	1262	-18
5	7.5	75.0	2.68%	44.1	4.21	118.7	21	6.0	243.8	14.92%	1390	1321	1251	-18
10	12.5	75.0	2.76%	45.4	4.62	130.3	25	7.0	257.7	15.77%	1376	1308	1239	-18
15	17.5	75.0	2.81%	46.2	5.21	146.9	27.5	8.0	276.1	16.90%	1358	1290	1222	-18
17	19.5	75.0									1356	1288	1220	-18
20	22.5	75.0	2.87%	47.2	5.39	152.0	29	8.0	282.2	17.27%	1352	1284	1217	-18
21:3	23.75	75.0									1350	1283	1215	-18
25	27.5	75.0	2.89%	47.3	5.59	157.6	30.8	9.0	288.9	17.68%	1345	1278	1211	-18
30	32.5	75.0	2.91%	47.8	5.78	163.0	32	9.0	294.8	18.04%	1339	1272	1205	-18
35	37.5	75.0	2.93%	48.2	5.98	168.6	33	9.0	300.8	18.41%	1333	1267	1200	-18
40	42.5	75.0	2.95%	48.5	6.18	174.3	34	10.0	307.8	18.84%	1326	1260	1194	-18
25	27.5										1345	1278	1211	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D126
NORMALIZING FACTOR: -18
BASE
95 % BASE
90 % BASE
SEPTEMBER 1, 2001
SIT NOV. 1976
TENDON FORCE (KIPS)
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1345 Kips
95% BASE 1278 Kips
90% BASE 1211 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

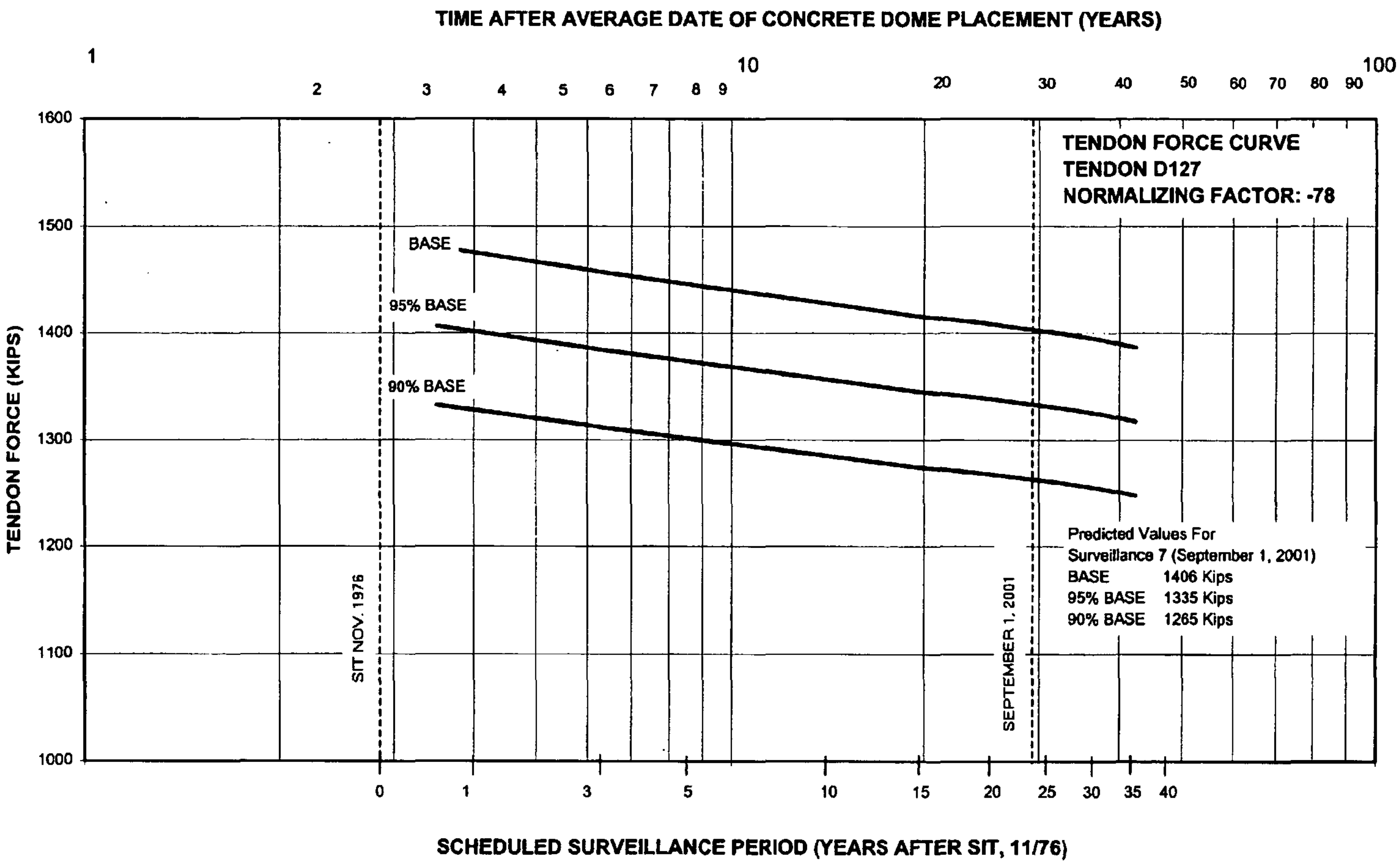
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES- 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMEHI GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

TENDON: D127 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1663 FIELD: 1605 AVERAGE: 1634 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 29 OF 5 TOTAL ELASTIC SHORT. LOSS: 47.4 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: CR. STR. (* .0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	14.7	2.57%	42.3	3.28	92.5	15	4.0	153.5	9.40%	1481	1407	1333	-78
3	5.5	14.7	2.60%	42.7	3.86	108.8	18	5.0	171.2	10.48%	1463	1390	1317	-78
5	7.5	14.7	2.68%	44.1	4.21	118.7	21	6.0	183.5	11.23%	1451	1378	1306	-78
10	12.5	14.7	2.76%	45.4	4.62	130.3	25	7.0	197.4	12.08%	1437	1365	1293	-78
15	17.5	14.7	2.81%	46.2	5.21	146.9	27.5	8.0	215.8	13.21%	1418	1347	1277	-78
17	19.5	14.7									1416	1345	1274	-78
20	22.5	14.7	2.87%	47.2	5.39	152.0	29	8.0	221.9	13.58%	1412	1342	1271	-78
21:3	23.75	14.7									1411	1340	1270	-78
25	27.5	14.7	2.89%	47.3	5.59	157.6	30.8	9.0	228.6	13.99%	1406	1335	1265	-78
30	32.5	14.7	2.91%	47.8	5.78	163.0	32	9.0	234.5	14.35%	1400	1330	1260	-78
35	37.5	14.7	2.93%	48.2	5.98	168.6	33	9.0	240.5	14.72%	1394	1324	1254	-78
40	42.5	14.7	2.95%	48.5	6.18	174.3	34	10.0	247.5	15.15%	1387	1317	1248	-78
25	27.5										1406	1335	1265	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D127
NORMALIZING FACTOR: -78
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1406 Kips
95% BASE 1335 Kips
90% BASE 1265 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

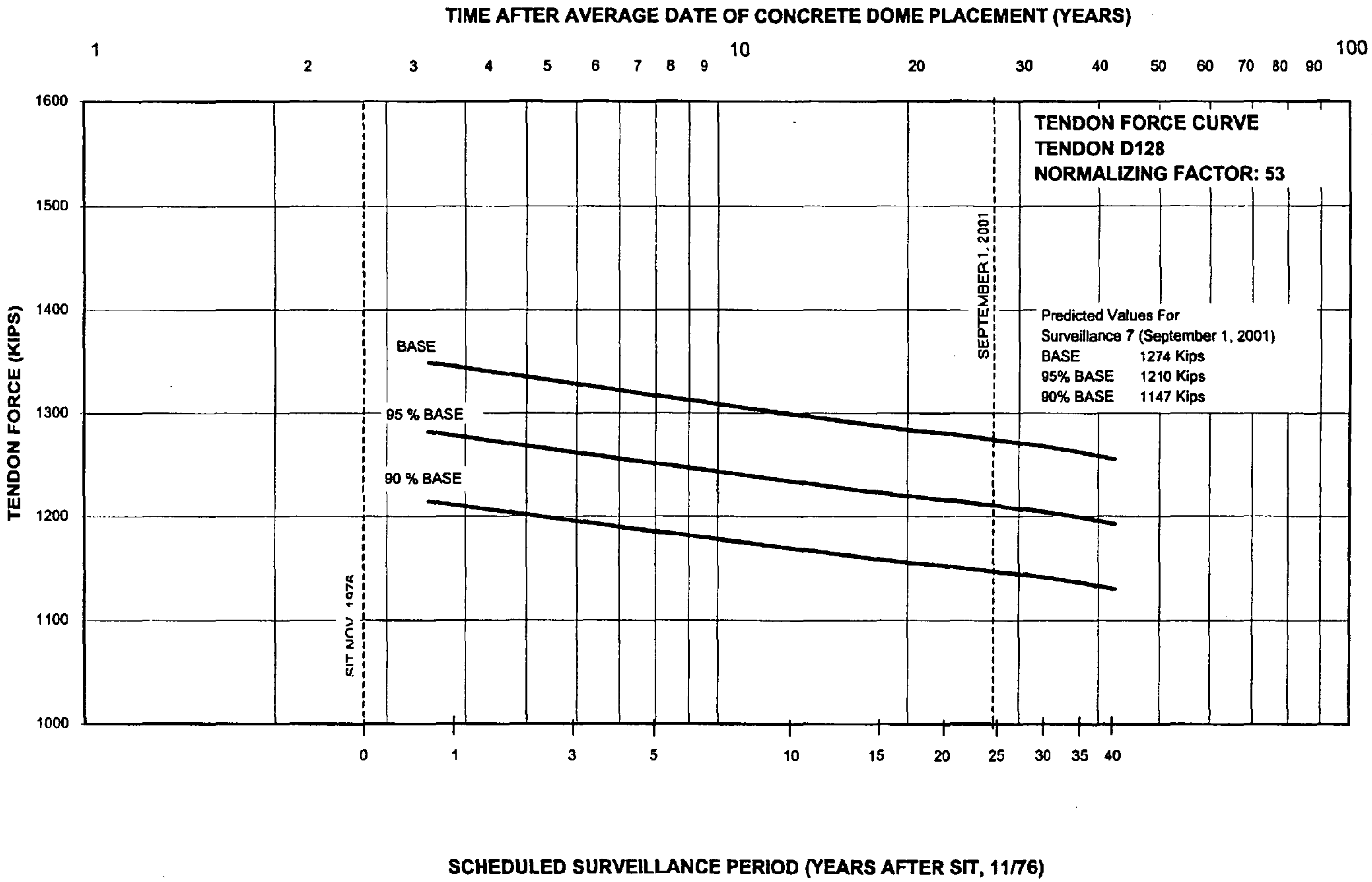
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES- 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D128 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1620 FIELD: 1659 AVERAGE: 1639 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 2 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.975

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	151.6	2.57%	42.3	3.28	92.5	15	4.0	290.4	17.71%	1349	1282	1214	53
3	5.5	151.6	2.60%	42.7	3.86	108.8	18	5.0	308.1	18.79%	1331	1265	1198	53
5	7.5	151.6	2.68%	44.1	4.21	118.7	21	6.0	320.4	19.54%	1319	1253	1187	53
10	12.5	151.6	2.76%	45.4	4.62	130.3	25	7.0	334.3	20.39%	1305	1240	1175	53
15	17.5	151.6	2.81%	46.2	5.21	146.9	27.5	8.0	352.7	21.51%	1287	1222	1158	53
17	19.5	151.6									1284	1220	1156	53
20	22.5	151.6	2.87%	47.2	5.39	152.0	29	8.0	358.8	21.88%	1281	1217	1153	53
21:3	23.75	151.6									1279	1215	1151	53
25	27.5	151.6	2.89%	47.3	5.59	157.6	30.8	9.0	365.5	22.29%	1274	1210	1147	53
30	32.5	151.6	2.91%	47.8	5.78	163.0	32	9.0	371.4	22.65%	1268	1205	1141	53
35	37.5	151.6	2.93%	48.2	5.98	168.6	33	9.0	377.4	23.02%	1262	1199	1136	53
40	42.5	151.6	2.95%	48.5	6.18	174.3	34	10.0	384.4	23.44%	1255	1192	1130	53
25	27.5										1274	1210	1147	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D128
NORMALIZING FACTOR: 53
TENDON FORCE (KIPS)
BASE
95 % BASE
90 % BASE
SIT NOV 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1274 Kips
95% BASE 1210 Kips
90% BASE 1147 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

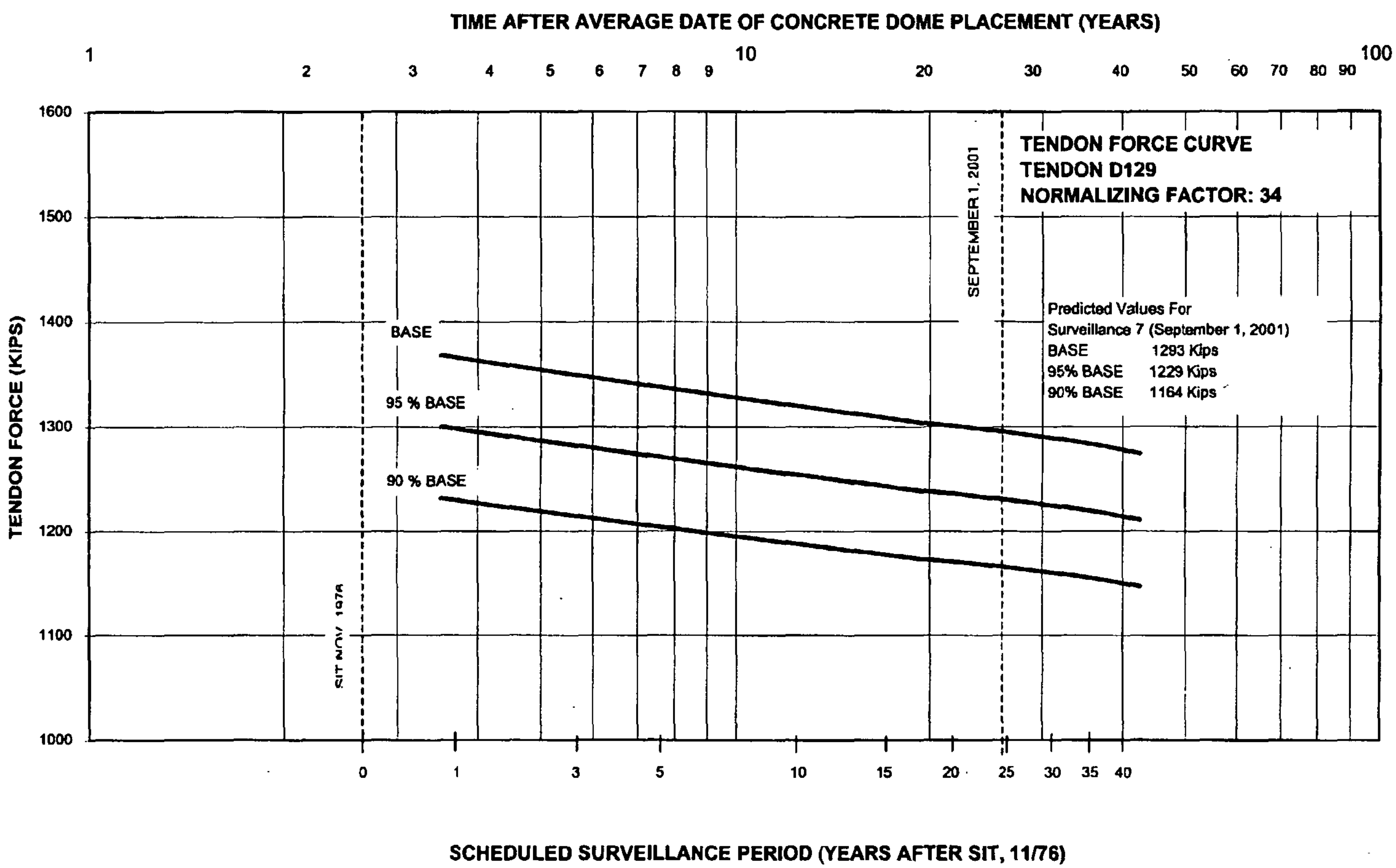
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D129 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1653 FIELD: 1585 AVERAGE: 1619 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 15 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.988

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	111.8	2.57%	42.3	3.28	92.5	15	4.0	250.6	15.48%	1368	1300	1232	34
3	5.5	111.8	2.60%	42.7	3.86	108.8	18	5.0	268.3	16.57%	1351	1283	1216	34
5	7.5	111.8	2.68%	44.1	4.21	118.7	21	6.0	280.6	17.33%	1338	1271	1205	34
10	12.5	111.8	2.76%	45.4	4.62	130.3	25	7.0	294.5	18.19%	1324	1258	1192	34
15	17.5	111.8	2.81%	46.2	5.21	146.9	27.5	8.0	312.9	19.33%	1306	1241	1175	34
17	19.5	111.8									1304	1238	1173	34
20	22.5	111.8	2.87%	47.2	5.39	152.0	29	8.0	319.0	19.70%	1300	1235	1170	34
21:3	23.75	111.8									1298	1233	1168	34
25	27.5	111.8	2.89%	47.3	5.59	157.6	30.8	9.0	325.7	20.12%	1293	1229	1164	34
30	32.5	111.8	2.91%	47.8	5.78	163.0	32	9.0	331.6	20.48%	1287	1223	1159	34
35	37.5	111.8	2.93%	48.2	5.98	168.6	33	9.0	337.6	20.85%	1281	1217	1153	34
40	42.5	111.8	2.95%	48.5	6.18	174.3	34	10.0	344.6	21.28%	1274	1211	1147	34
25	27.5										1293	1229	1164	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D129
NORMALIZING FACTOR: 34
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1293 Kips
95% BASE 1229 Kips
90% BASE 1164 Kips
BASE
95 % BASE
90 % BASE
SIT NOV. 1976
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

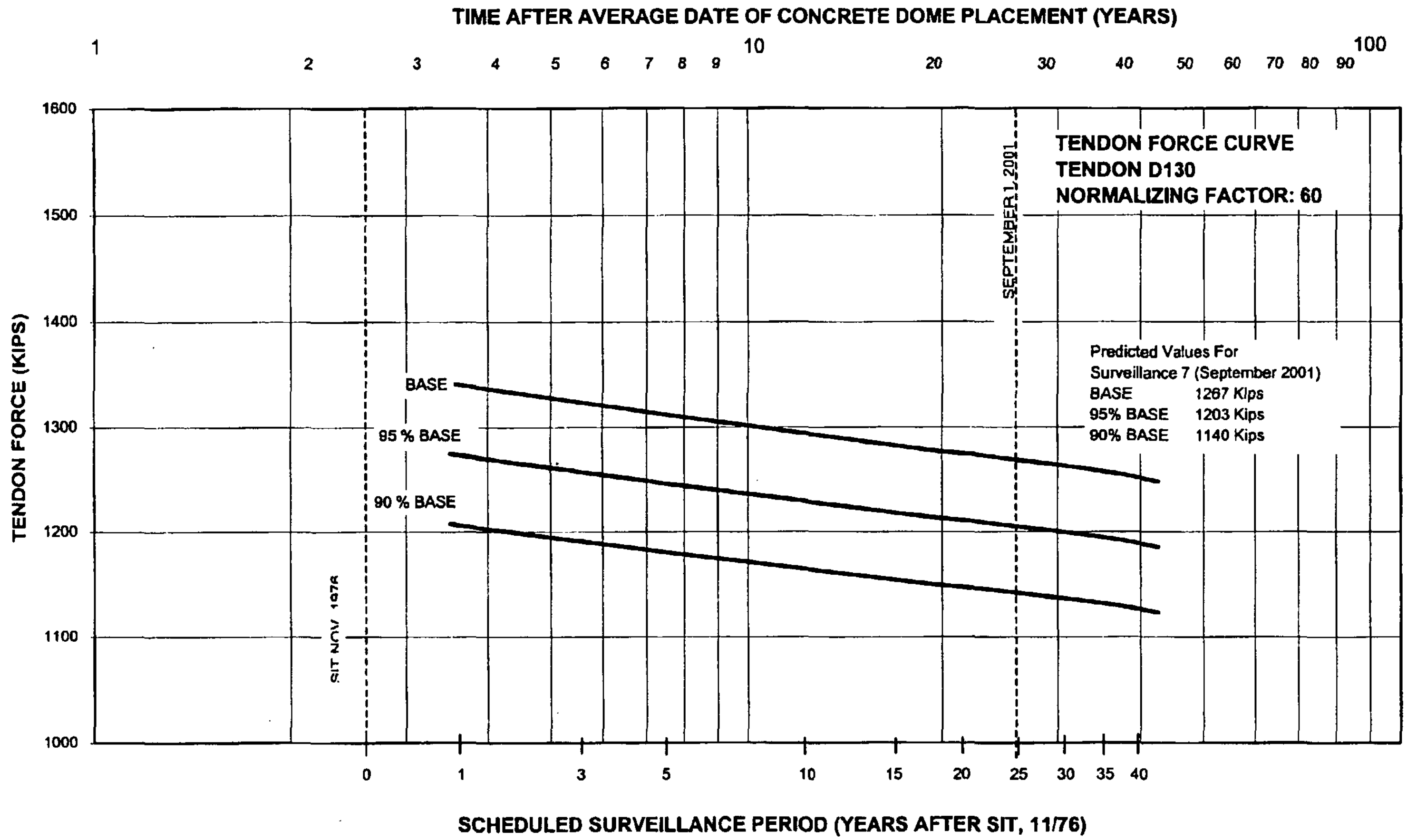
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSE 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D130 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1634 FIELD: 1637 AVERAGE: 1635 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 1 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	154.6	2.57%	42.3	3.28	92.5	15	4.0	293.4	17.94%	1342	1275	1208	60
3	5.5	154.6	2.60%	42.7	3.86	108.8	18	5.0	311.1	19.03%	1324	1258	1192	60
5	7.5	154.6	2.68%	44.1	4.21	118.7	21	6.0	323.4	19.78%	1312	1246	1181	60
10	12.5	154.6	2.76%	45.4	4.62	130.3	25	7.0	337.3	20.63%	1298	1233	1168	60
15	17.5	154.6	2.81%	46.2	5.21	146.9	27.5	8.0	355.7	21.75%	1280	1216	1152	60
17	19.5	154.6									1277	1213	1149	60
20	22.5	154.6	2.87%	47.2	5.39	152.0	29	8.0	361.8	22.13%	1274	1210	1146	60
21:3	23.75	154.6									1272	1208	1145	60
25	27.5	154.6	2.89%	47.3	5.59	157.6	30.8	9.0	368.5	22.54%	1267	1203	1140	60
30	32.5	154.6	2.91%	47.8	5.78	163.0	32	9.0	374.4	22.90%	1261	1198	1135	60
35	37.5	154.6	2.93%	48.2	5.98	168.6	33	9.0	380.4	23.26%	1255	1192	1129	60
40	42.5	154.6	2.95%	48.5	6.18	174.3	34	10.0	387.4	23.69%	1248	1186	1123	60
25	27.5										1267	1203	1140	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D130
NORMALIZING FACTOR: 60
SEPTEMBER 1, 2001
SIT NOV. 1976
BASE
95 % BASE
90 % BASE
Predicted Values For
Surveillance 7 (September 2001)
BASE 1267 Kips
95% BASE 1203 Kips
90% BASE 1140 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

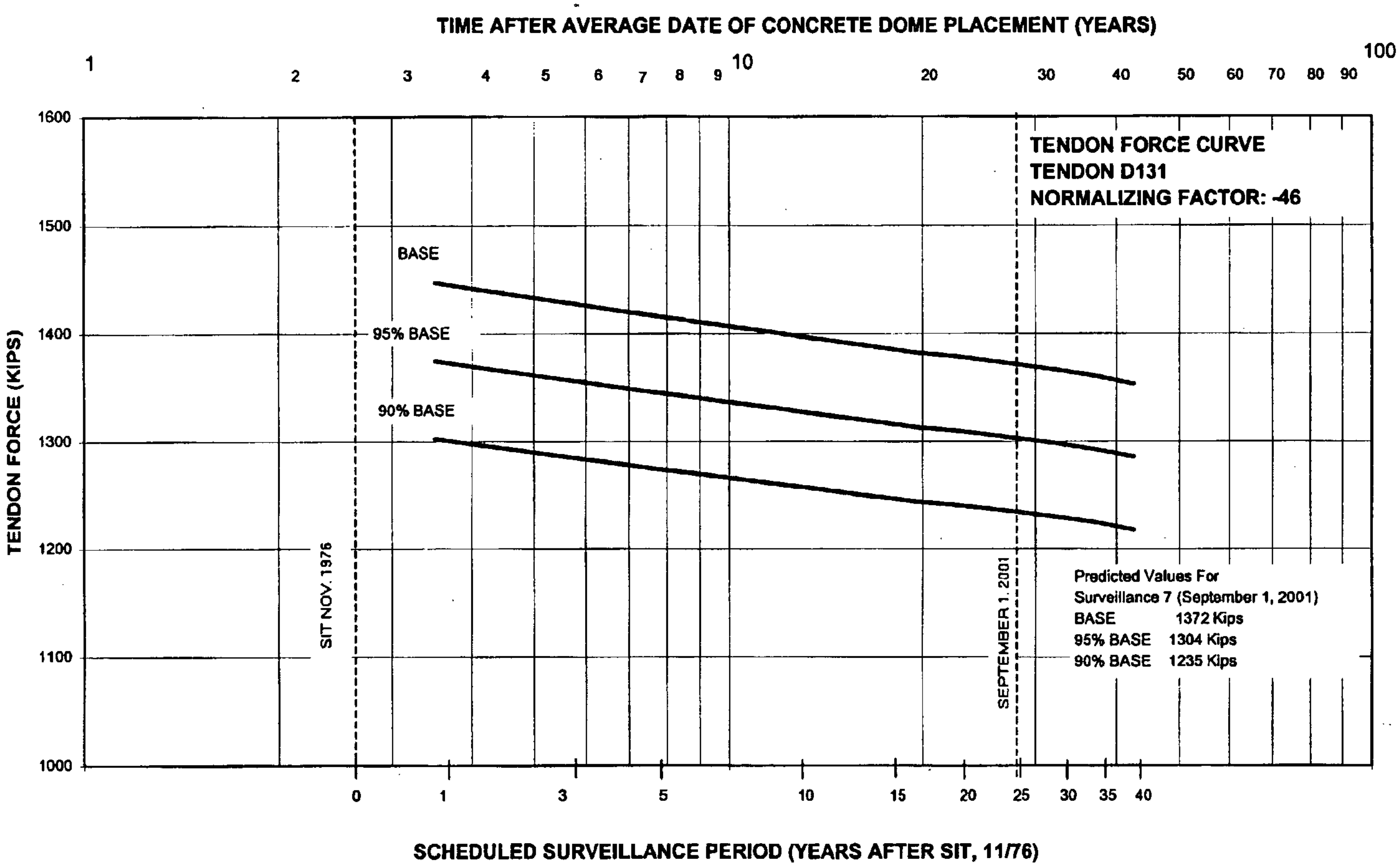
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES- 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMEHI GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

TENDON: D131 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1616 FIELD: 1585 AVERAGE: 1601 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 29 OF 5 TOTAL ELASTIC SHORT. LOSS: 47.4 WIRE FACTOR: 0.988

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (* .0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	14.7	2.57%	42.3	3.28	92.5	15	4.0	153.5	9.59%	1447	1375	1303	-46
3	5.5	14.7	2.60%	42.7	3.86	108.8	18	5.0	171.2	10.70%	1430	1358	1287	-46
5	7.5	14.7	2.68%	44.1	4.21	118.7	21	6.0	183.5	11.47%	1417	1346	1276	-46
10	12.5	14.7	2.76%	45.4	4.62	130.3	25	7.0	197.4	12.33%	1403	1333	1263	-46
15	17.5	14.7	2.81%	46.2	5.21	146.9	27.5	8.0	215.8	13.48%	1385	1316	1246	-46
17	19.5	14.7									1383	1313	1244	-46
20	22.5	14.7	2.87%	47.2	5.39	152.0	29	8.0	221.9	13.86%	1379	1310	1241	-46
21:3	23.75	14.7									1377	1308	1239	-46
25	27.5	14.7	2.89%	47.3	5.59	157.6	30.8	9.0	228.6	14.28%	1372	1304	1235	-46
30	32.5	14.7	2.91%	47.8	5.78	163.0	32	9.0	234.5	14.65%	1366	1298	1230	-46
35	37.5	14.7	2.93%	48.2	5.98	168.6	33	9.0	240.5	15.03%	1360	1292	1224	-46
40	42.5	14.7	2.95%	48.5	6.18	174.3	34	10.0	247.5	15.46%	1353	1286	1218	-46
25	27.5										1372	1304	1235	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON D131
NORMALIZING FACTOR: -46
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE (KIPS)
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1372 Kips
95% BASE 1304 Kips
90% BASE 1235 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

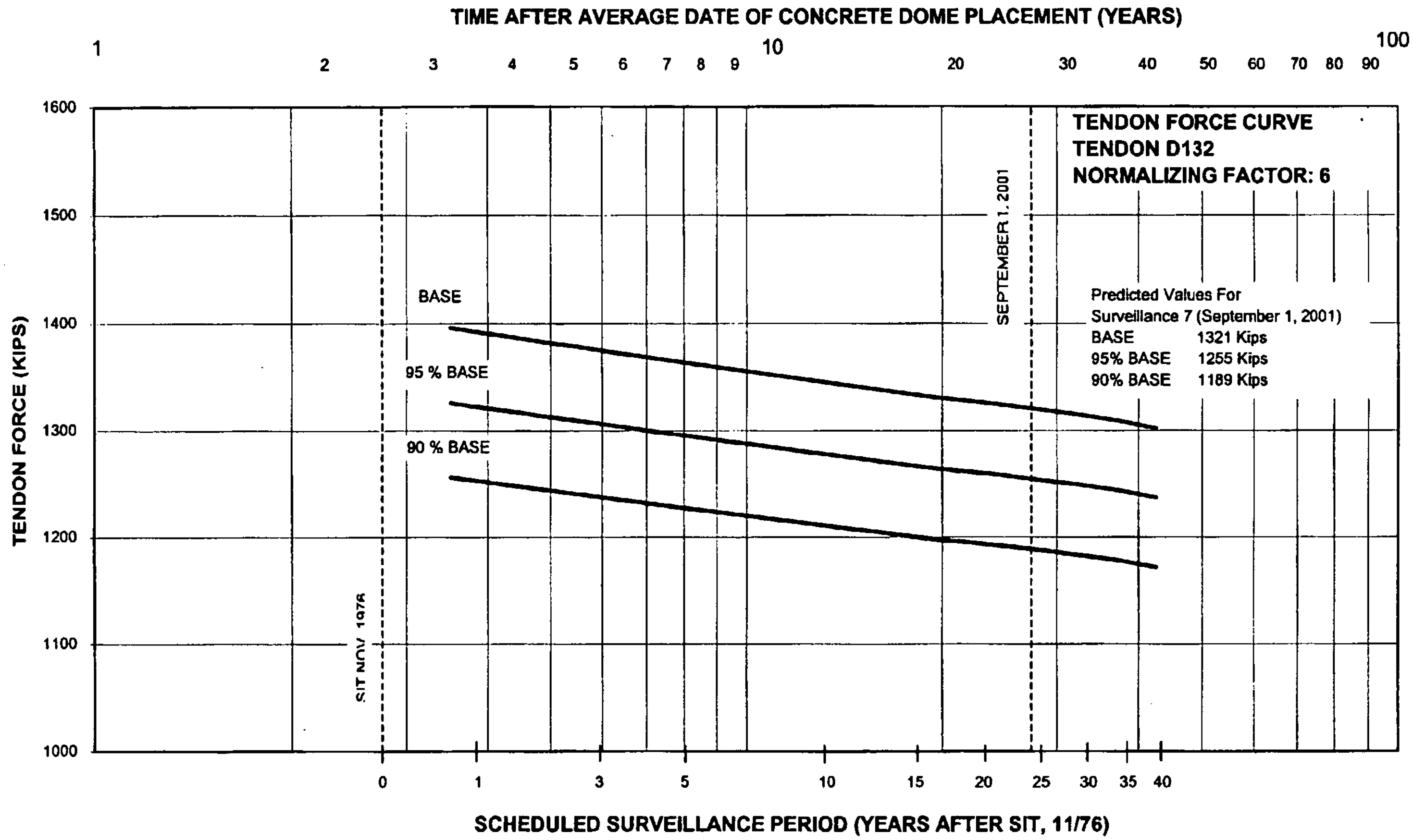
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D132 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1614 FIELD: 1605 AVERAGE: 1610 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 27 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: CR. STR. (*.0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	75.0	2.57%	42.3	3.28	92.5	15	4.0	213.8	13.28%	1396	1326	1256	6
3	5.5	75.0	2.60%	42.7	3.86	108.8	18	5.0	231.5	14.38%	1378	1309	1240	6
5	7.5	75.0	2.68%	44.1	4.21	118.7	21	6.0	243.8	15.15%	1366	1298	1229	6
10	12.5	75.0	2.76%	45.4	4.62	130.3	25	7.0	257.7	16.01%	1352	1284	1217	6
15	17.5	75.0	2.81%	46.2	5.21	146.9	27.5	8.0	276.1	17.15%	1334	1267	1200	6
17	19.5	75.0									1331	1265	1198	6
20	22.5	75.0	2.87%	47.2	5.39	152.0	29	8.0	282.2	17.53%	1327	1261	1195	6
21:3	23.75	75.0									1326	1260	1193	6
25	27.5	75.0	2.89%	47.3	5.59	157.6	30.8	9.0	288.9	17.95%	1321	1255	1189	6
30	32.5	75.0	2.91%	47.8	5.78	163.0	32	9.0	294.8	18.31%	1315	1249	1183	6
35	37.5	75.0	2.93%	48.2	5.98	168.6	33	9.0	300.8	18.69%	1309	1243	1178	6
40	42.5	75.0	2.95%	48.5	6.18	174.3	34	10.0	307.8	19.12%	1302	1237	1172	6
25	27.5										1321	1255	1189	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D132
NORMALIZING FACTOR: 6
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1321 Kips
95% BASE 1255 Kips
90% BASE 1189 Kips
BASE
95 % BASE
90 % BASE
SEPTEMBER 1, 2001
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

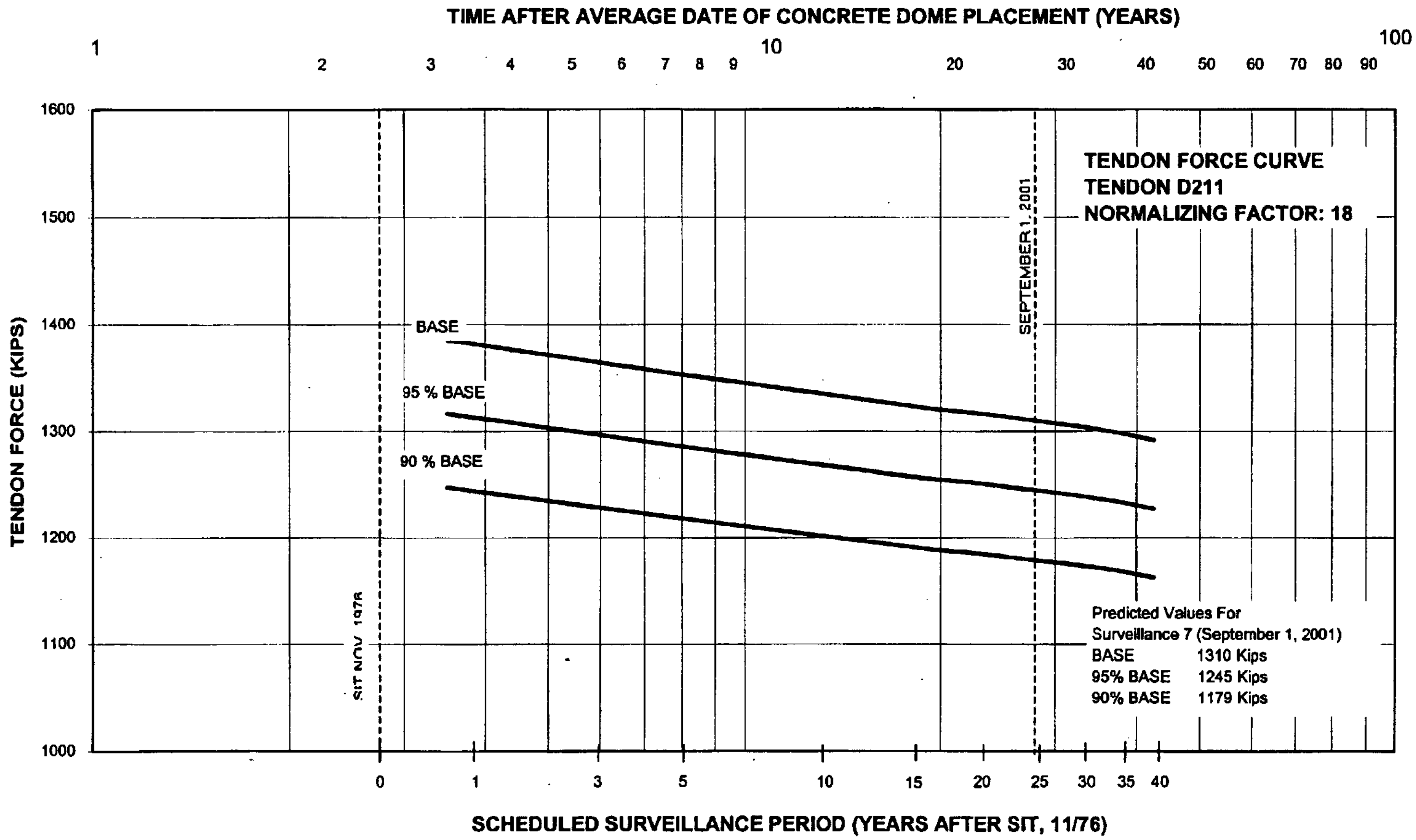
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D211 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1698 FIELD: 1660 AVERAGE: 1679 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 1 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	154.6	2.57%	42.3	3.28	92.5	15	4.0	293.4	17.48%	1386	1316	1247	18
3	5.5	154.6	2.60%	42.7	3.86	108.8	18	5.0	311.1	18.53%	1368	1299	1231	18
5	7.5	154.6	2.68%	44.1	4.21	118.7	21	6.0	323.4	19.26%	1356	1288	1220	18
10	12.5	154.6	2.76%	45.4	4.62	130.3	25	7.0	337.3	20.09%	1342	1275	1207	18
15	17.5	154.6	2.81%	46.2	5.21	146.9	27.5	8.0	355.7	21.19%	1323	1257	1191	18
17	19.5	154.6									1321	1255	1189	18
20	22.5	154.6	2.87%	47.2	5.39	152.0	29	8.0	361.8	21.55%	1317	1251	1185	18
21:3	23.75	154.6									1315	1250	1184	18
25	27.5	154.6	2.89%	47.3	5.59	157.6	30.8	9.0	368.5	21.95%	1310	1245	1179	18
30	32.5	154.6	2.91%	47.8	5.78	163.0	32	9.0	374.4	22.30%	1305	1239	1174	18
35	37.5	154.6	2.93%	48.2	5.98	168.6	33	9.0	380.4	22.66%	1299	1234	1169	18
40	42.5	154.6	2.95%	48.5	6.18	174.3	34	10.0	387.4	23.08%	1292	1227	1162	18
25	27.5										1310	1245	1179	



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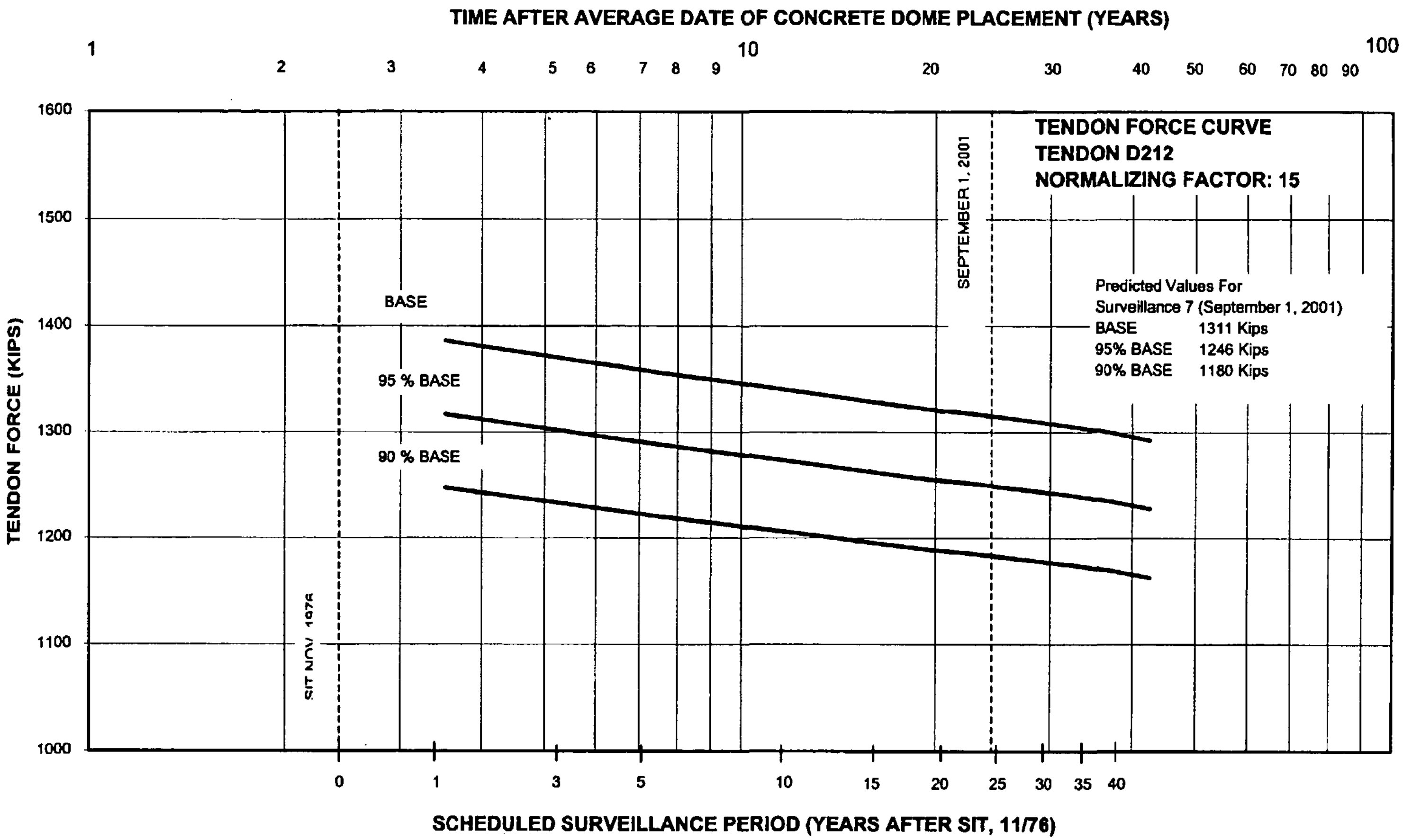
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSS7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D212 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS) SHOP: 1588 FIELD: 1612 AVERAGE: 1600 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 27 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	75.0	2.57%	42.3	3.28	92.5	15	4.0	213.8	13.36%	1386	1317	1248	15
3	5.5	75.0	2.60%	42.7	3.86	108.8	18	5.0	231.5	14.47%	1369	1300	1232	15
5	7.5	75.0	2.68%	44.1	4.21	118.7	21	6.0	243.8	15.24%	1356	1288	1221	15
10	12.5	75.0	2.76%	45.4	4.62	130.3	25	7.0	257.7	16.11%	1342	1275	1208	15
15	17.5	75.0	2.81%	46.2	5.21	146.9	27.5	8.0	276.1	17.26%	1324	1258	1192	15
17	19.5	75.0									1321	1255	1189	15
20	22.5	75.0	2.87%	47.2	5.39	152.0	29	8.0	282.2	17.64%	1318	1252	1186	15
21:3	23.75	75.0									1316	1250	1185	15
25	27.5	75.0	2.89%	47.3	5.59	157.6	30.8	9.0	288.9	18.06%	1311	1246	1180	15
30	32.5	75.0	2.91%	47.8	5.78	163.0	32	9.0	294.8	18.42%	1305	1240	1175	15
35	37.5	75.0	2.93%	48.2	5.98	168.6	33	9.0	300.8	18.80%	1299	1234	1169	15
40	42.5	75.0	2.95%	48.5	6.18	174.3	34	10.0	307.8	19.24%	1292	1228	1163	15
25	27.5										1311	1246	1180	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D212
NORMALIZING FACTOR: 15
SEPTEMBER 1, 2001
SIT NOV 1976
BASE
95 % BASE
90 % BASE
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1311 Kips
95% BASE 1246 Kips
90% BASE 1180 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

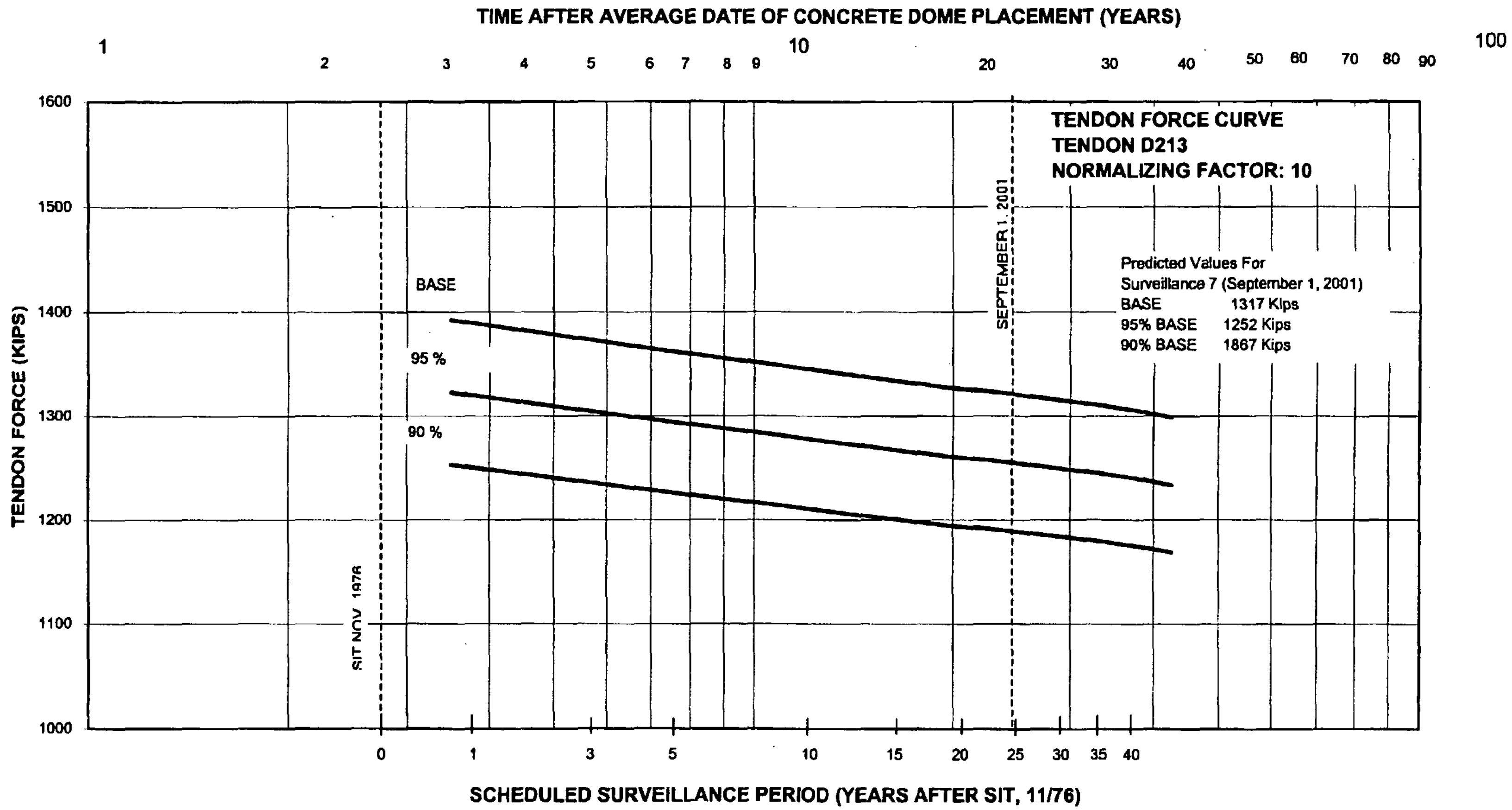
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D213 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1653 FIELD: 1639 AVERAGE: 1646 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 14 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	114.8	2.57%	42.3	3.28	92.5	15	4.0	253.6	15.41%	1393	1323	1253	10
3	5.5	114.8	2.60%	42.7	3.86	108.8	18	5.0	271.3	16.48%	1375	1306	1237	10
5	7.5	114.8	2.68%	44.1	4.21	118.7	21	6.0	283.6	17.23%	1363	1294	1226	10
10	12.5	114.8	2.76%	45.4	4.62	130.3	25	7.0	297.5	18.07%	1349	1281	1214	10
15	17.5	114.8	2.81%	46.2	5.21	146.9	27.5	8.0	315.9	19.19%	1330	1264	1197	10
17	19.5	114.8									1328	1261	1195	10
20	22.5	114.8	2.87%	47.2	5.39	152.0	29	8.0	322.0	19.56%	1324	1258	1192	10
21:3	23.75	114.8									1322	1256	1190	10
25	27.5	114.8	2.89%	47.3	5.59	157.6	30.8	9.0	328.7	19.97%	1317	1252	1186	10
30	32.5	114.8	2.91%	47.8	5.78	163.0	32	9.0	334.6	20.33%	1312	1246	1180	10
35	37.5	114.8	2.93%	48.2	5.98	168.6	33	9.0	340.6	20.69%	1306	1240	1175	10
40	42.5	114.8	2.95%	48.5	6.18	174.3	34	10.0	347.6	21.12%	1299	1234	1169	10
25	27.5										1317	1252	1186	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D213
NORMALIZING FACTOR: 10
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1317 Kips
95% BASE 1252 Kips
90% BASE 1867 Kips
BASE
95 %
90 %
SEPTEMBER 1, 2001
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

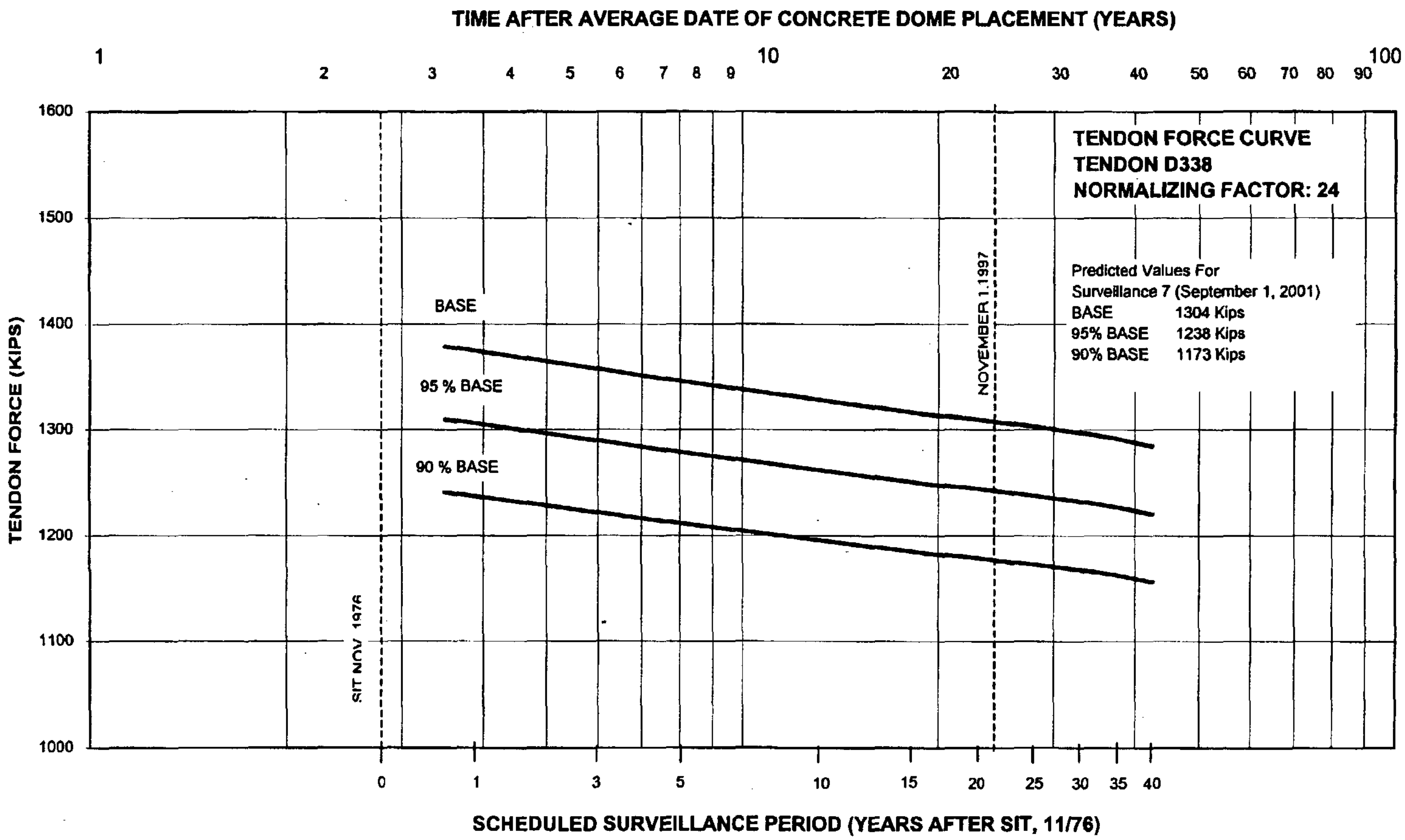
CRYSTAL RIVER UNIT 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMELOW GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D338 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1636 FIELD: 1641 AVERAGE: 1638 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 12 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	120.9	2.57%	42.3	3.28	92.5	15	4.0	259.7	15.85%	1379	1310	1241	24
3	5.5	120.9	2.60%	42.7	3.86	108.8	18	5.0	277.4	16.93%	1361	1293	1225	24
5	7.5	120.9	2.68%	44.1	4.21	118.7	21	6.0	289.7	17.68%	1349	1281	1214	24
10	12.5	120.9	2.76%	45.4	4.62	130.3	25	7.0	303.6	18.53%	1335	1268	1201	24
15	17.5	120.9	2.81%	46.2	5.21	146.9	27.5	8.0	322.0	19.66%	1316	1251	1185	24
17	19.5	120.9									1314	1248	1183	24
20	22.5	120.9	2.87%	47.2	5.39	152.0	29	8.0	328.1	20.03%	1310	1245	1179	24
21:3	23.75	120.9									1309	1243	1178	24
25	27.5	120.9	2.89%	47.3	5.59	157.6	30.8	9.0	334.8	20.44%	1304	1238	1173	24
30	32.5	120.9	2.91%	47.8	5.78	163.0	32	9.0	340.7	20.80%	1298	1233	1168	24
35	37.5	120.9	2.93%	48.2	5.98	168.6	33	9.0	346.7	21.16%	1292	1227	1163	24
40	42.5	120.9	2.95%	48.5	6.18	174.3	34	10.0	353.7	21.59%	1285	1220	1156	24
25	27.5										1304	1238	1173	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D338
NORMALIZING FACTOR: 24
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1304 Kips
95% BASE 1238 Kips
90% BASE 1173 Kips
BASE
95 % BASE
90 % BASE
NOVEMBER 1,1997
SIT NOV 1976
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

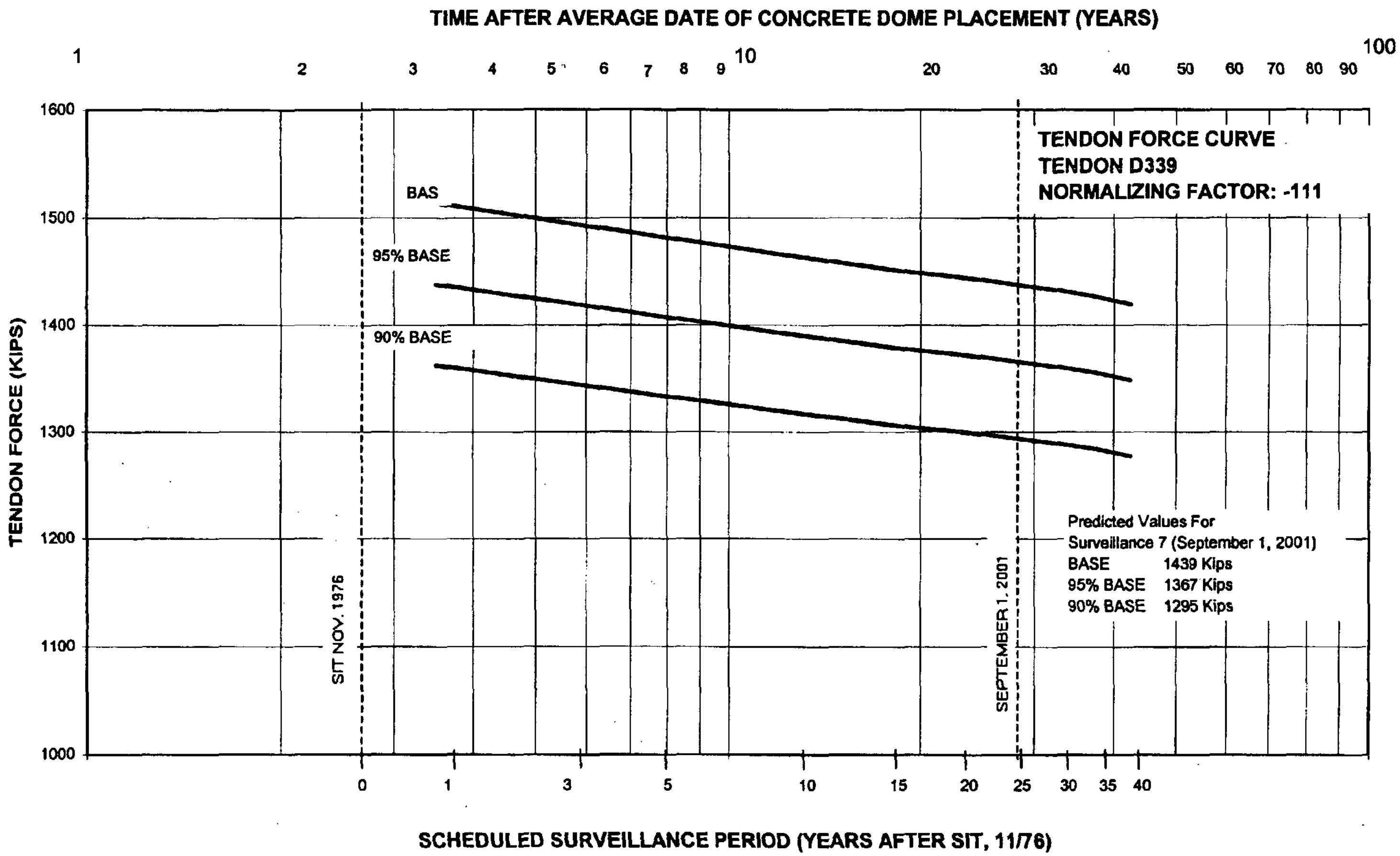
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES- 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMEHI GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

TENDON: D339 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1645 FIELD: 1633 AVERAGE: 1639 AVERAGE ALL DOME TENDONS 1639
STRESS SEQUENCE: 32 OF 5 TOTAL ELASTIC SHORT. LOSS: 47.4 WIRE FACTOR: 0.982

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	CR. STR. (* .0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	-13.7	2.57%	42.3	3.28	92.5	15	4.0	125.1	7.63%	1514	1438	1362	-111
3	5.5	-13.7	2.60%	42.7	3.86	108.8	18	5.0	142.8	8.71%	1496	1421	1346	-111
5	7.5	-13.7	2.68%	44.1	4.21	118.7	21	6.0	155.1	9.46%	1484	1409	1335	-111
10	12.5	-13.7	2.76%	45.4	4.62	130.3	25	7.0	169.0	10.31%	1470	1396	1323	-111
15	17.5	-13.7	2.81%	46.2	5.21	146.9	27.5	8.0	187.4	11.44%	1451	1379	1306	-111
17	19.5	-13.7									1449	1376	1304	-111
20	22.5	-13.7	2.87%	47.2	5.39	152.0	29	8.0	193.5	11.81%	1445	1373	1301	-111
21:3	23.75	-13.7									1444	1371	1299	-111
25	27.5	-13.7	2.89%	47.3	5.59	157.6	30.8	9.0	200.2	12.22%	1439	1367	1295	-111
30	32.5	-13.7	2.91%	47.8	5.78	163.0	32	9.0	206.1	12.58%	1433	1361	1289	-111
35	37.5	-13.7	2.93%	48.2	5.98	168.6	33	9.0	212.1	12.94%	1427	1355	1284	-111
40	42.5	-13.7	2.95%	48.5	6.18	174.3	34	10.0	219.1	13.37%	1420	1349	1278	-111
25	27.5										1439	1367	1295	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE (KIPS)
TENDON FORCE CURVE
TENDON D339
NORMALIZING FACTOR: -111
BAS
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1439 Kips
95% BASE 1367 Kips
90% BASE 1295 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

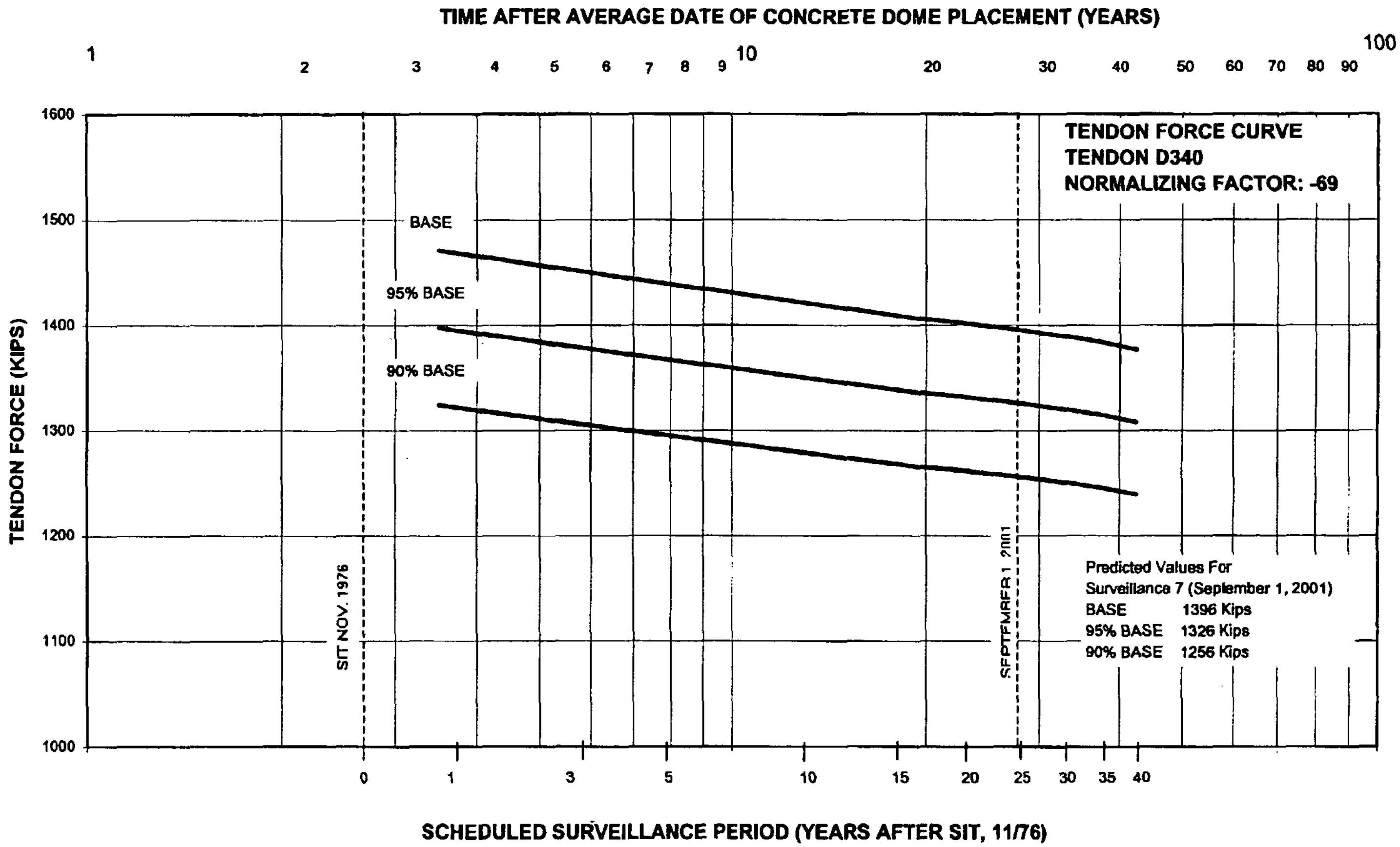
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES- 7th TENDON SURVEILLANCE
DOME TENDON LOSSES WORK SHEET (DOMEHI GROUP)
USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

TENDON: D340 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1653 FIELD: 1615 AVERAGE: 1634 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 28 OF 5 TOTAL ELASTIC SHORT. LOSS: 47.4 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	CR. STR. (* .0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	24.2	2.57%	42.3	3.28	92.5	15	4.0	163.0	9.98%	1471	1397	1324	-69
3	5.5	24.2	2.60%	42.7	3.86	108.8	18	5.0	180.7	11.06%	1453	1381	1308	-69
5	7.5	24.2	2.68%	44.1	4.21	118.7	21	6.0	193.0	11.81%	1441	1369	1297	-69
10	12.5	24.2	2.76%	45.4	4.62	130.3	25	7.0	206.9	12.66%	1427	1356	1284	-69
15	17.5	24.2	2.81%	46.2	5.21	146.9	27.5	8.0	225.3	13.79%	1409	1338	1268	-69
17	19.5	24.2									1406	1336	1266	-69
20	22.5	24.2	2.87%	47.2	5.39	152.0	29	8.0	231.4	14.16%	1403	1333	1262	-69
21:3	23.75	24.2									1401	1331	1261	-69
25	27.5	24.2	2.89%	47.3	5.59	157.6	30.8	9.0	238.1	14.57%	1396	1326	1256	-69
30	32.5	24.2	2.91%	47.8	5.78	163.0	32	9.0	244.0	14.93%	1390	1321	1251	-69
35	37.5	24.2	2.93%	48.2	5.98	168.6	33	9.0	250.0	15.30%	1384	1315	1246	-69
40	42.5	24.2	2.95%	48.5	6.18	174.3	34	10.0	257.0	15.73%	1377	1308	1239	-69
25	27.5										1396	1326	1256	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D340
NORMALIZING FACTOR: -69
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1396 Kips
95% BASE 1326 Kips
90% BASE 1256 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

5.2 VERTICAL TENDONS

VERTICAL TENDONS

TENDONS LISTING & INPUT DATA SHEET
INDIVIDUAL TENDONS LOSSES SHEET
INDIVIDUAL TENDONS FORCE CURVES

DESCRIPTION	PAGES	PREPARED BY:		REVIEWED BY:	
		INTIALS	DATE	INITIALS	DATE
DATA INPUT	51	CEC	4-19-01	PCF	4/19/01
61V24	52 & 53	CEC	4-19-01	PCF	4/19/01
12V1	54 & 55	CEC	4-19-01	PCF	4/19/01
12V2	56 & 57	CEC	4-19-01	PCF	4/19/01
45V13	58 & 59	CEC	4-19-01	PCF	4/19/01
45V14	60 & 61	CEC	4-19-01	PCF	4/19/01
45V15	62 & 63	CEC	4-19-01	PCF	4/19/01
61V7	64 & 65	CEC	4-19-01	PCF	4/19/01
61V8	66 & 67	CEC	4-19-01	PCF	4/19/01
61V9	68 & 69	CEC	4-19-01	PCF	4/19/01

REVISION 1

DESCRIPTION	PAGES	PREPARED BY:		REVIEWED BY:	
		INTIALS	DATE	INITIALS	DATE
DATA INPUT	51	PCF	12/31/01	CEC	12-31-01
23V24	53A & 53B	PCF	4/13/01	CEC	12-31-01

CRYSTAL RIVER UNIT 3 - 7th TENDON SURVEILLANCE
VERTICAL TENDONS DATA INPUT

DOC ID:750-001
REVISION 1
PAGE ~~420~~ 53A

			Ref.
Initial Concrete Stress =	867.0	(ksi)	(2) Page 7A, 7B, 7C
Average Force =	1644.0	(kips)	(2) Page 15
Total Stress Sequence (N) =	31		
Total Elastic Shortening =	73.5		See (2) & Attachment E

Tendon No.	Lift-off Pressure (ksi) (1)				Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips)		Remarks (3)
	Shop End		Field End							
	Predicted	Actual	Predicted	Actual				Shop End (5)	Field End (5)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
61V24	6870	6775	N/A	N/A	26	163	1.000	1616	N/A	
23V24	6870	6850	N/A	N/A	24	163	1.000	1634	N/A	
12V1	6800	6950	N/A	N/A	7	163	1.000	1675	N/A	R,C,E,S
12V2	6800	7050	N/A	N/A	27	163	1.000	1699	N/A	
45V13	6810	6950	N/A	N/A	22	163	1.000	1673	N/A	
45V14	6810	7050	N/A	N/A	20	163	1.000	1697	N/A	S
45V15	6810	6750	N/A	N/A	10	163	1.000	1624	N/A	
61V7	6800	6950	N/A	N/A	14	163	1.000	1675	N/A	
61V8	6870	6700	N/A	N/A	25	163	1.000	1598	N/A	C(on-line)
61V9	6860	6800	N/A	N/A	5	163	1.000	1625	N/A	
										A
										D,S

File: VERTR2.XLW (VERTI

Notes:

(1) Ref. Crystal River 3 R/B Tendon History Sheets - Vertical Tendons for Original Stressing
(2) Ref. Crystal River 3 Tendon Surveillance Loss Calculations, Tendon Stress Sequence, Pages 28 and 28a
(3) S =Selected Tendons, C =Control tendon, D =Detensioned tendon, A =Alternate tendon
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacents
(4) Wire factors are calculated based on the number of effective wires divided by 163.
(5) Original forces calculated based on the expression in Section 6.2.2.

31-Dec-01
10:05 AM

⚠ Tendons Added 12/31/01 [illegible]

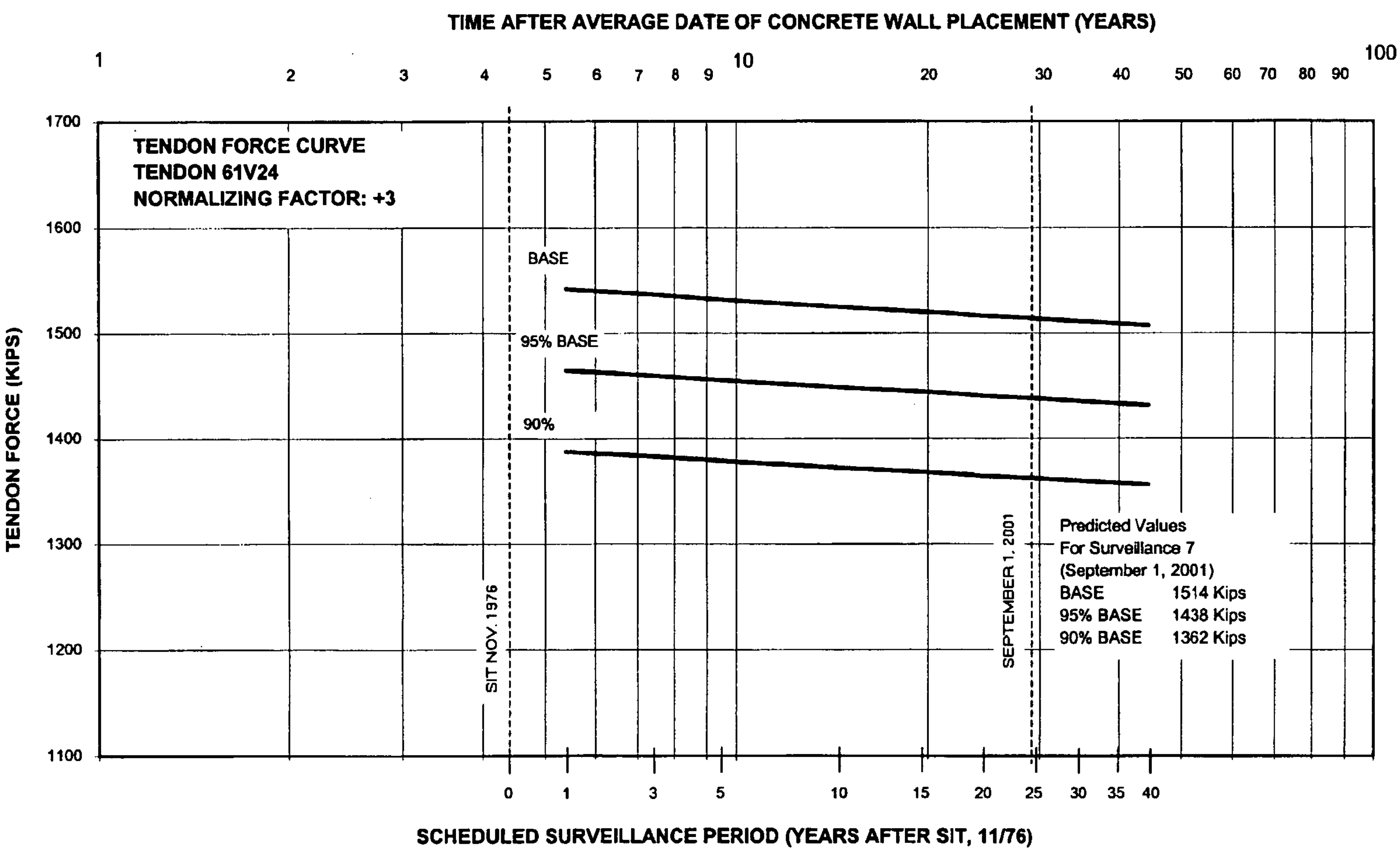
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 61V24 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1616 FIELD: 1616 AVERAGE: 1616 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 26 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	11.9	2.57%	42.3	0.096	18.6	6.0	1.7	74.5	4.61%	1542	1465	1388	3
3	7.4	11.9	2.60%	42.7	0.117	22.6	8.5	2.4	79.6	4.92%	1537	1460	1383	3
5	9.4	11.9	2.68%	44.1	0.130	25.4	10.0	2.8	84.2	5.21%	1532	1456	1379	3
10	14.4	11.9	2.76%	45.4	0.157	30.5	13.5	3.8	91.6	5.66%	1525	1448	1372	3
15	19.4	11.9	2.81%	46.2	0.173	33.3	15.5	4.4	95.8	5.92%	1521	1444	1368	3
17	21.4	11.9									1519	1443	1367	
20	24.4	11.9	2.87%	47.2	0.188	36.1	17.5	4.9	100.1	6.19%	1516	1440	1365	3
21:3	25.65	11.9									1516	1440	1364	
25	29.4	11.9	2.89%	47.3	0.197	37.8	19.5	5.5	102.5	6.34%	1514	1438	1362	3
30	34.4	11.9	2.91%	47.8	0.207	39.8	20.4	5.8	105.3	6.51%	1511	1435	1360	3
35	39.4	11.9	2.93%	48.2	0.216	41.5	21.5	6.1	107.7	6.66%	1509	1433	1358	3
40	44.4	11.9	2.95%	48.5	0.221	42.6	22.5	6.4	109.4	6.77%	1507	1432	1356	3
25	29.4										1514	1438	1362	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 61V24
NORMALIZING FACTOR: +3
TENDON FORCE (KIPS)
1700 1600 1500 1400 1300 1200 1100
BASE
95% BASE
90%
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values
For Surveillance 7
(September 1, 2001)
BASE 1514 Kips
95% BASE 1438 Kips
90% BASE 1362 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE

VERTICAL TENDON LOSSES WORK SHEET

FILE: VERTR2.XLW (23V24)

TENDON: 23V24 INITIAL CONCRETE STRESS (PSI) : 967

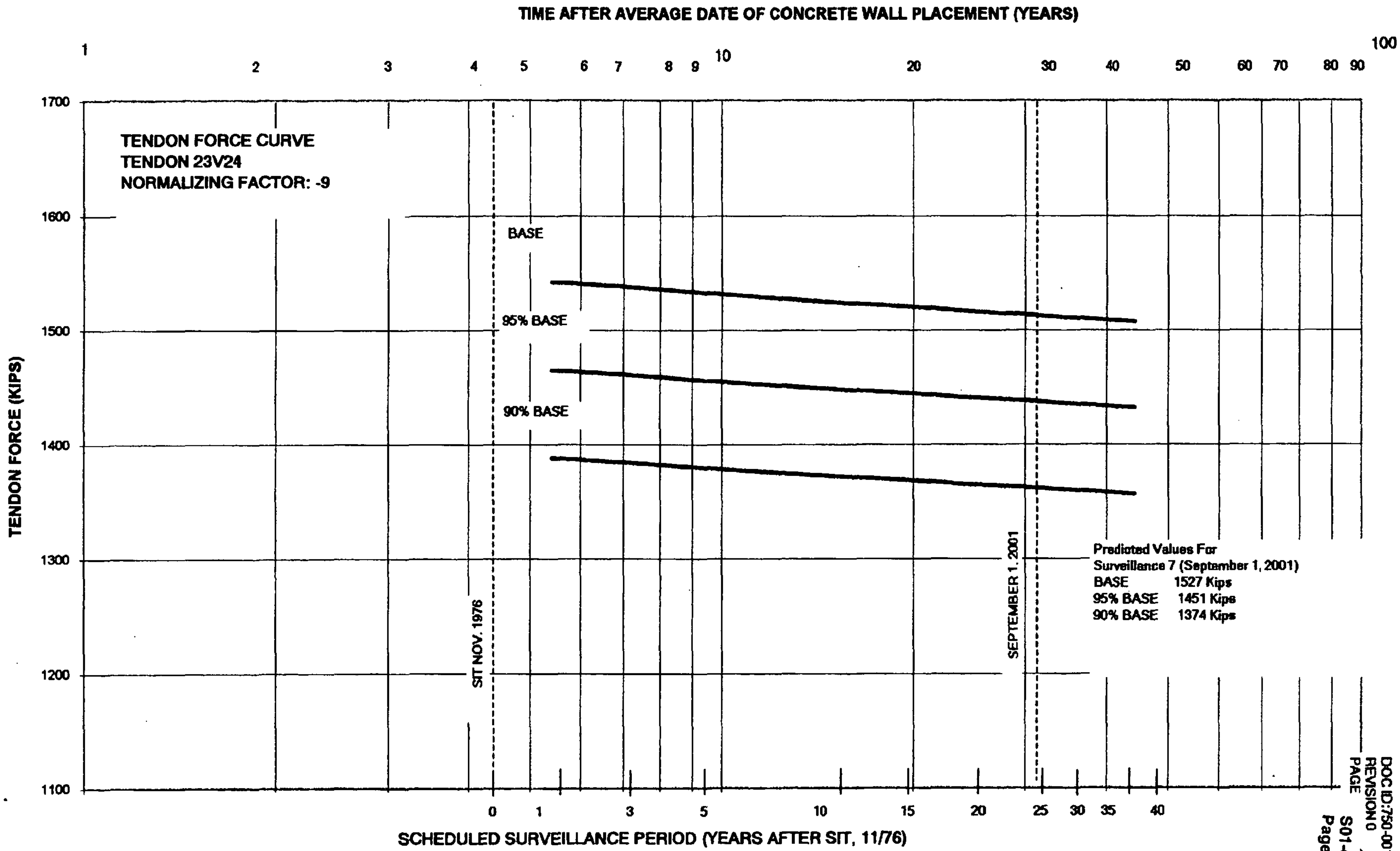
ORIGINAL FORCES (KIPS): SHOP: 1634 FIELD: 1634 AVERAGE: 1634 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 24 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION PERCENT	STRESS RELAXATION FORCE (KIPS)	CREEP SP. CR. (*.0001)	CREEP FORCE (KIPS)	SHRINKAGE m in/in	SHRINKAGE FORCE (KIPS)	TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	16.6	2.57%	42.3	0.096	18.6	8.0	1.7	79.2	4.85%	1555	1477	1399	-9
3	7.4	16.6	2.60%	42.7	0.117	22.6	8.5	2.4	84.3	5.16%	1550	1472	1395	-9
5	9.4	16.6	2.68%	44.1	0.130	25.4	10.0	2.8	88.9	5.44%	1545	1468	1391	-9
10	14.4	16.6	2.76%	45.4	0.157	30.5	13.5	3.8	96.3	5.89%	1538	1461	1384	-9
15	19.4	16.6	2.81%	46.2	0.173	33.3	15.5	4.4	100.5	6.15%	1534	1457	1380	-9
17	21.4	16.6									1532	1455	1379	
20	24.4	16.6	2.87%	47.2	0.188	36.1	17.5	4.9	104.8	6.41%	1529	1453	1376	-9
21:3	25.65	16.6									1529	1452	1376	
25	29.4	16.6	2.89%	47.3	0.197	37.8	19.5	5.5	107.2	6.56%	1527	1451	1374	-9
30	34.4	16.6	2.91%	47.8	0.207	39.8	20.4	5.8	110.0	6.73%	1524	1448	1372	-9
35	39.4	16.6	2.93%	48.2	0.216	41.5	21.5	6.1	112.4	6.88%	1522	1446	1370	-9
40	44.4	16.6	2.95%	48.5	0.221	42.6	22.5	6.4	114.1	6.98%	1520	1444	1368	-9
25	29.4										1527	1451	1374	

28-Jan-02



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 23V24
NORMALIZING FACTOR: -9
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1527 Kips
95% BASE 1451 Kips
90% BASE 1374 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

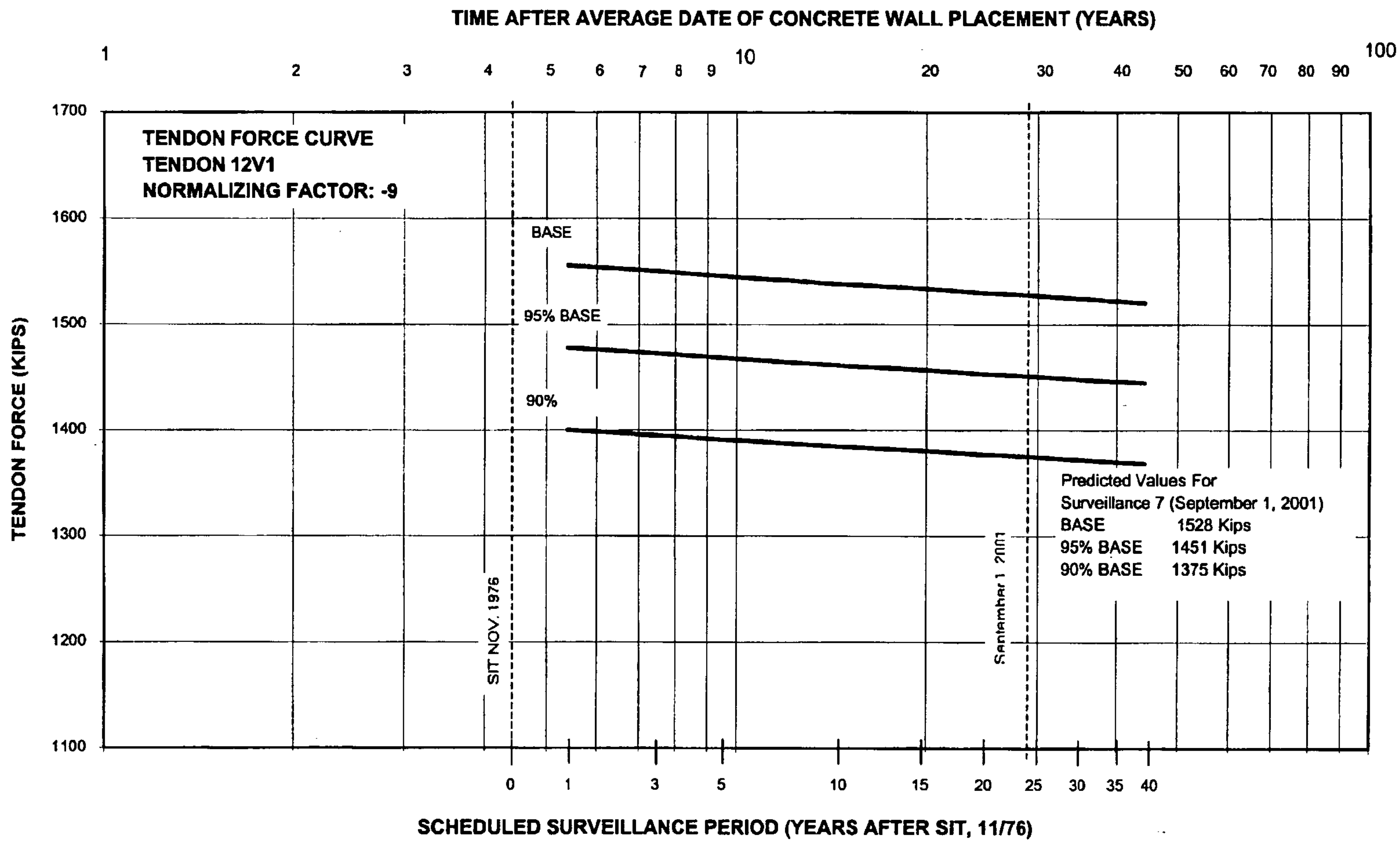
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 12V1 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1675 FIELD: 1675 AVERAGE: 1675 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 7 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	56.9	2.57%	42.3	0.096	18.6	6.0	1.7	119.5	7.13%	1556	1478	1400	-9
3	7.4	56.9	2.60%	42.7	0.117	22.6	8.5	2.4	124.6	7.44%	1550	1473	1395	-9
5	9.4	56.9	2.68%	44.1	0.130	25.4	10.0	2.8	129.2	7.71%	1546	1469	1391	-9
10	14.4	56.9	2.76%	45.4	0.157	30.5	13.5	3.8	136.6	8.16%	1538	1462	1385	-9
15	19.4	56.9	2.81%	46.2	0.173	33.3	15.5	4.4	140.8	8.41%	1534	1458	1381	-9
17	21.4	56.9									1533	1456	1379	
20	24.4	56.9	2.87%	47.2	0.188	36.1	17.5	4.9	145.1	8.66%	1530	1453	1377	-9
21:3	25.65	56.9									1529	1453	1376	
25	29.4	56.9	2.89%	47.3	0.197	37.8	19.5	5.5	147.5	8.81%	1528	1451	1375	-9
30	34.4	56.9	2.91%	47.8	0.207	39.8	20.4	5.8	150.3	8.97%	1525	1449	1372	-9
35	39.4	56.9	2.93%	48.2	0.216	41.5	21.5	6.1	152.7	9.12%	1522	1446	1370	-9
40	44.4	56.9	2.95%	48.5	0.221	42.6	22.5	6.4	154.4	9.22%	1521	1445	1369	-9
25	29.4										1528	1451	1375	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 12V1
NORMALIZING FACTOR: -9
BASE
95% BASE
90%
SIT NOV. 1976
September 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1528 Kips
95% BASE 1451 Kips
90% BASE 1375 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

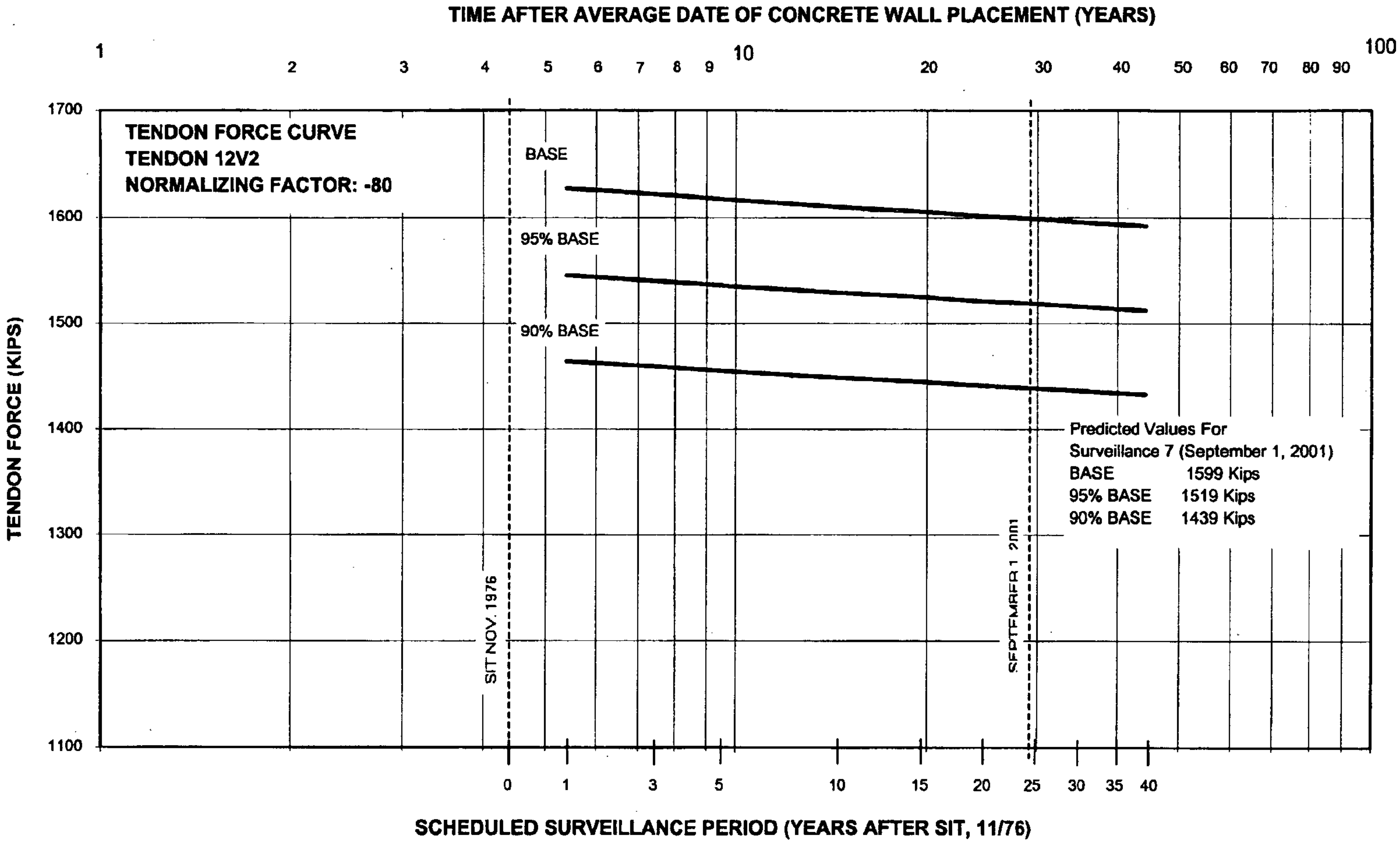
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 12V2 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1699 FIELD: 1699 AVERAGE: 1699 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 27 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	9.5	2.57%	42.3	0.096	18.6	6.0	1.7	72.1	4.24%	1627	1546	1464	-80
3	7.4	9.5	2.60%	42.7	0.117	22.6	8.5	2.4	77.2	4.54%	1622	1541	1460	-80
5	9.4	9.5	2.68%	44.1	0.130	25.4	10.0	2.8	81.8	4.81%	1617	1537	1456	-80
10	14.4	9.5	2.76%	45.4	0.157	30.5	13.5	3.8	89.2	5.25%	1610	1530	1449	-80
15	19.4	9.5	2.81%	46.2	0.173	33.3	15.5	4.4	93.4	5.50%	1606	1526	1445	-80
17	21.4	9.5									1604	1524	1444	
20	24.4	9.5	2.87%	47.2	0.188	36.1	17.5	4.9	97.7	5.75%	1602	1521	1441	-80
21:3	25.65	9.5									1601	1521	1441	
25	29.4	9.5	2.89%	47.3	0.197	37.8	19.5	5.5	100.1	5.89%	1599	1519	1439	-80
30	34.4	9.5	2.91%	47.8	0.207	39.8	20.4	5.8	102.9	6.05%	1596	1516	1437	-80
35	39.4	9.5	2.93%	48.2	0.216	41.5	21.5	6.1	105.3	6.20%	1594	1514	1435	-80
40	44.4	9.5	2.95%	48.5	0.221	42.6	22.5	6.4	107.0	6.30%	1592	1513	1433	-80
25	29.4										1599	1519	1439	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 12V2
NORMALIZING FACTOR: -80
BASE
95% BASE
90% BASE
SIT NOV. 1976
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1599 Kips
95% BASE 1519 Kips
90% BASE 1439 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

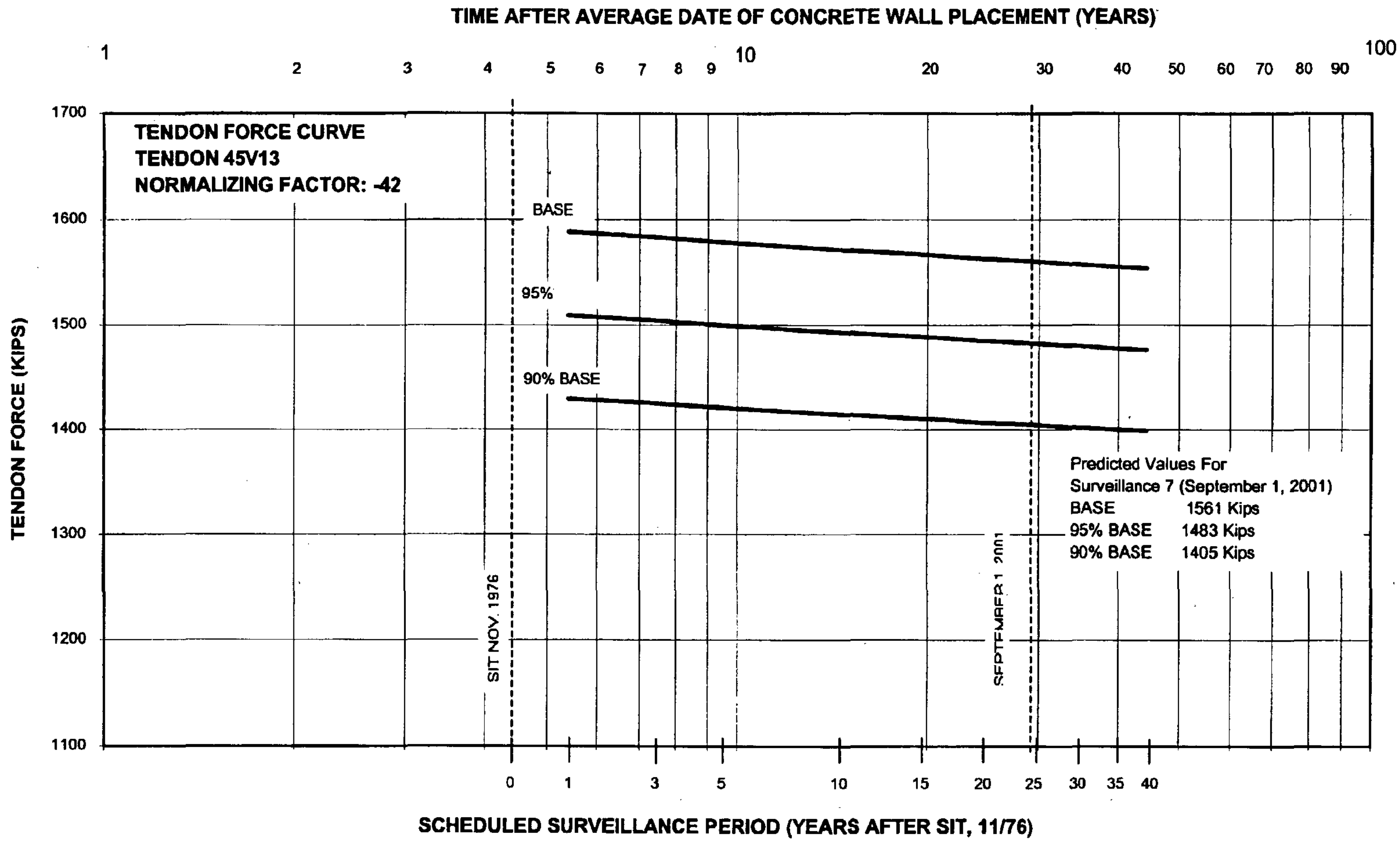
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 45V13 INITIAL CONCRETE STRESS (PSI) : 987

ORIGINAL FORCES (KIPS): SHOP: 1673 FIELD: 1673 AVERAGE: 1673 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 22 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	21.3	2.57%	42.3	0.096	18.6	6.0	1.7	83.9	5.02%	1589	1509	1430	-42
3	7.4	21.3	2.60%	42.7	0.117	22.6	8.5	2.4	89.0	5.32%	1584	1504	1425	-42
5	9.4	21.3	2.68%	44.1	0.130	25.4	10.0	2.8	93.6	5.60%	1579	1500	1421	-42
10	14.4	21.3	2.76%	45.4	0.157	30.5	13.5	3.8	101.0	6.04%	1572	1493	1414	-42
15	19.4	21.3	2.81%	46.2	0.173	33.3	15.5	4.4	105.2	6.29%	1567	1489	1411	-42
17	21.4	21.3									1566	1487	1409	
20	24.4	21.3	2.87%	47.2	0.188	36.1	17.5	4.9	109.5	6.55%	1563	1485	1407	-42
21:3	25.65	21.3									1562	1484	1406	
25	29.4	21.3	2.89%	47.3	0.197	37.8	19.5	5.5	111.9	6.69%	1561	1483	1405	-42
30	34.4	21.3	2.91%	47.8	0.207	39.8	20.4	5.8	114.7	6.86%	1558	1480	1402	-42
35	39.4	21.3	2.93%	48.2	0.216	41.5	21.5	6.1	117.1	7.00%	1555	1478	1400	-42
40	44.4	21.3	2.95%	48.5	0.221	42.6	22.5	6.4	118.8	7.10%	1554	1476	1398	-42
25	29.4										1561	1483	1405	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 45V13
NORMALIZING FACTOR: -42
BASE
95%
90% BASE
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1561 Kips
95% BASE 1483 Kips
90% BASE 1405 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

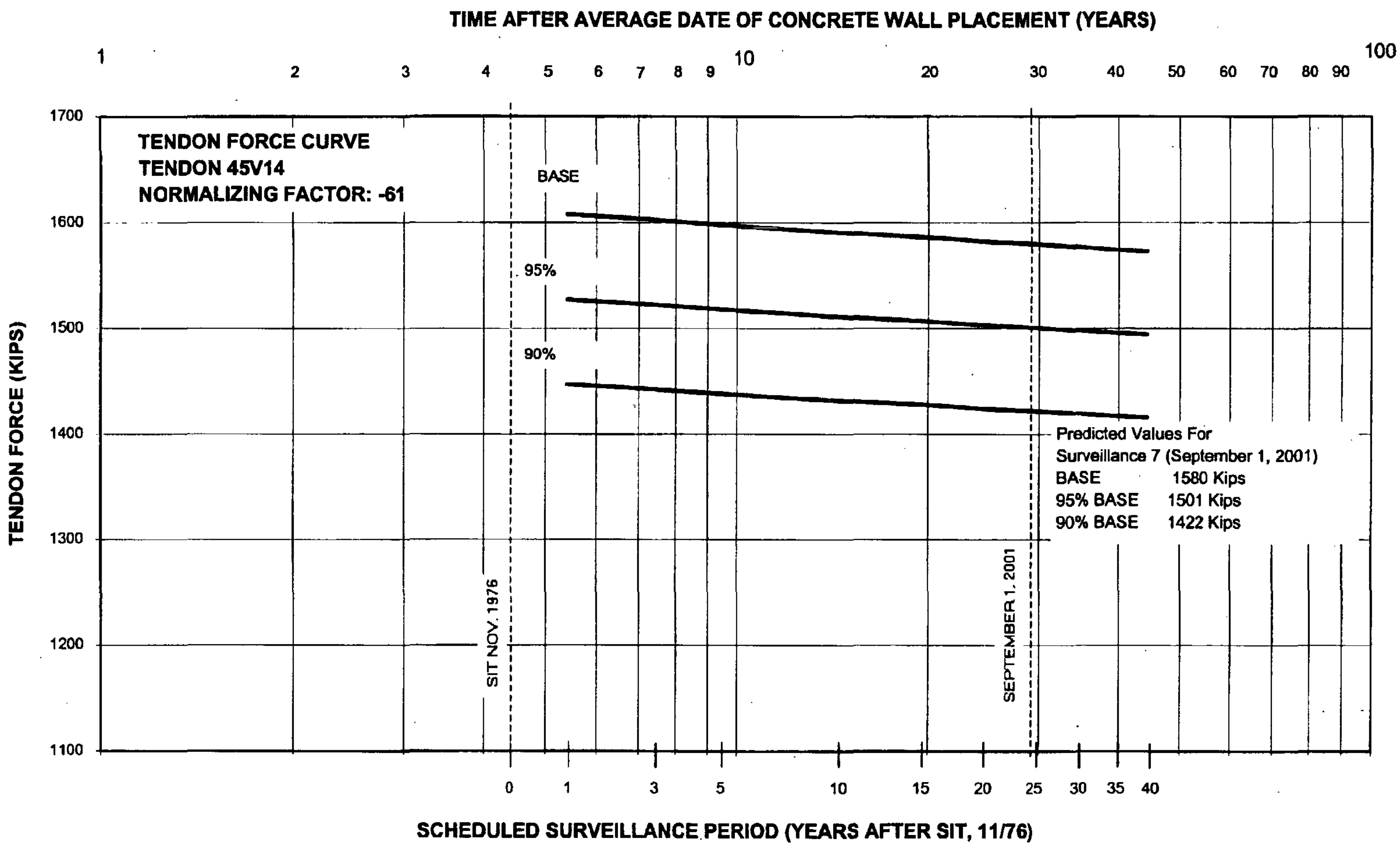
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 45V14   INITIAL CONCRETE STRESS (PSI)*: 967

ORIGINAL FORCES (KIPS): SHOP: 1697 FIELD: 1697   AVERAGE: 1697   AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 20 OF 31   TOTAL ELASTIC SHORT. LOSS: 73.5   WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	26.1	2.57%	42.3	0.096	18.6	6.0	1.7	88.7	5.23%	1608	1528	1447	-61
3	7.4	26.1	2.60%	42.7	0.117	22.6	8.5	2.4	93.8	5.53%	1603	1523	1443	-61
5	9.4	26.1	2.68%	44.1	0.130	25.4	10.0	2.8	98.4	5.80%	1598	1518	1438	-61
10	14.4	26.1	2.76%	45.4	0.157	30.5	13.5	3.8	105.8	6.23%	1591	1511	1432	-61
15	19.4	26.1	2.81%	46.2	0.173	33.3	15.5	4.4	110.0	6.48%	1587	1507	1428	-61
17	21.4	26.1									1585	1506	1426	
20	24.4	26.1	2.87%	47.2	0.188	36.1	17.5	4.9	114.3	6.74%	1582	1503	1424	-61
21:3	25.65	26.1									1582	1503	1424	
25	29.4	26.1	2.89%	47.3	0.197	37.8	19.5	5.5	116.7	6.88%	1580	1501	1422	-61
30	34.4	26.1	2.91%	47.8	0.207	39.8	20.4	5.8	119.5	7.04%	1577	1498	1419	-61
35	39.4	26.1	2.93%	48.2	0.216	41.5	21.5	6.1	121.9	7.18%	1575	1496	1417	-61
40	44.4	26.1	2.95%	48.5	0.221	42.6	22.5	6.4	123.6	7.28%	1573	1494	1416	-61
25	29.4										1580	1501	1422	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 45V14
NORMALIZING FACTOR: -61
BASE
95%
90%
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1580 Kips
95% BASE 1501 Kips
90% BASE 1422 Kips
SIT NOV. 1976
SEPTEMBER 1, 2001
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

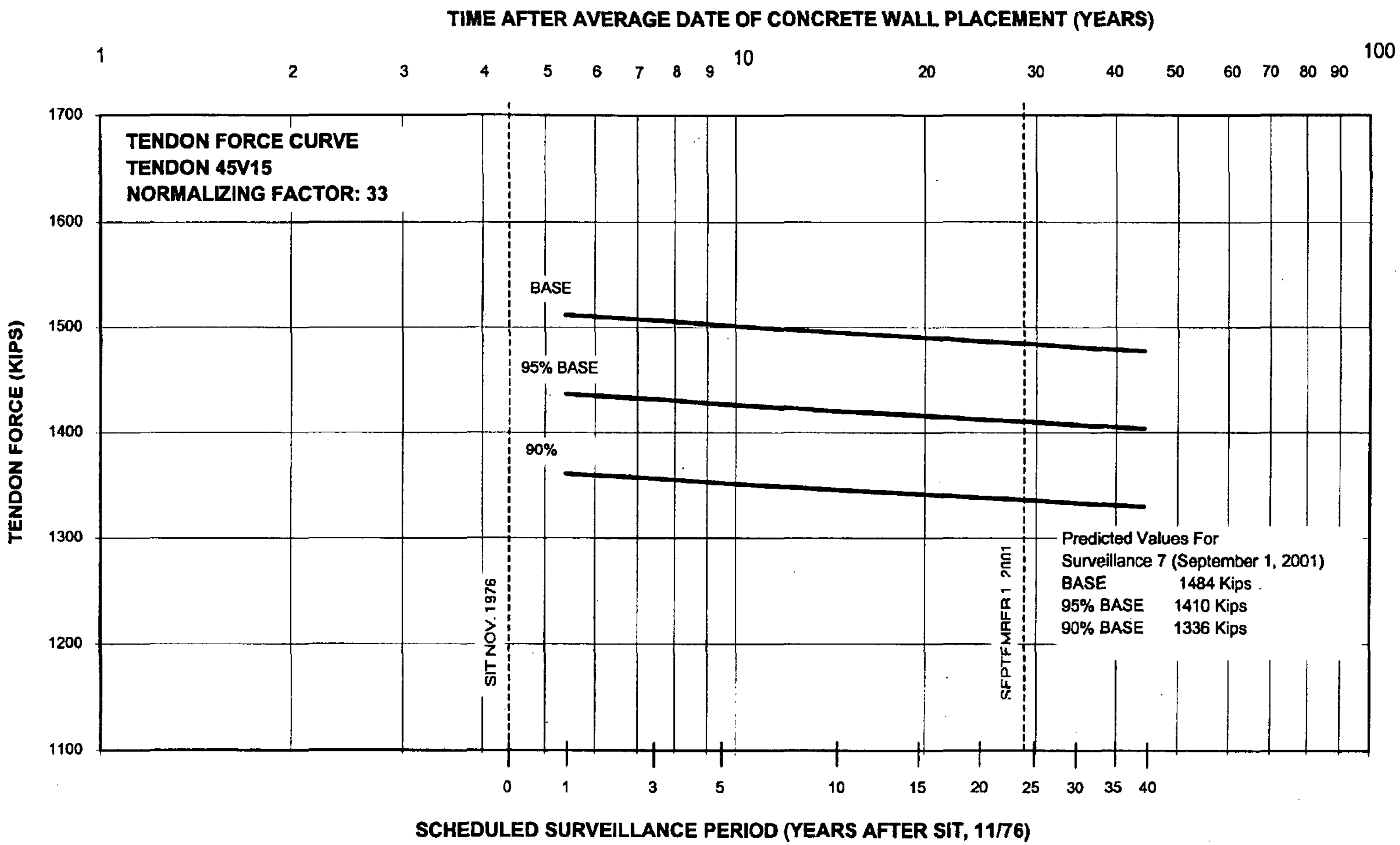
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 45V15 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1624 AVERAGE: 1624 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 10 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE							
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	49.8	2.57%	42.3	0.096	18.6	6.0	1.7	112.4	6.92%	1512	1436	1361	33
3	7.4	49.8	2.60%	42.7	0.117	22.6	8.5	2.4	117.5	7.23%	1507	1432	1356	33
5	9.4	49.8	2.68%	44.1	0.130	25.4	10.0	2.8	122.1	7.52%	1502	1427	1352	33
10	14.4	49.8	2.76%	45.4	0.157	30.5	13.5	3.8	129.5	7.97%	1495	1420	1346	33
15	19.4	49.8	2.81%	46.2	0.173	33.3	15.5	4.4	133.7	8.23%	1491	1416	1342	33
17	21.4	49.8									1489	1415	1340	
20	24.4	49.8	2.87%	47.2	0.188	36.1	17.5	4.9	138.0	8.49%	1487	1412	1338	33
21:3	25.65	49.8									1486	1412	1337	
25	29.4	49.8	2.89%	47.3	0.197	37.8	19.5	5.5	140.4	8.64%	1484	1410	1336	33
30	34.4	49.8	2.91%	47.8	0.207	39.8	20.4	5.8	143.2	8.81%	1481	1407	1333	33
35	39.4	49.8	2.93%	48.2	0.216	41.5	21.5	6.1	145.6	8.96%	1479	1405	1331	33
40	44.4	49.8	2.95%	48.5	0.221	42.6	22.5	6.4	147.3	9.07%	1477	1403	1329	33
25	29.4										1484	1410	1336	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 45V15
NORMALIZING FACTOR: 33
TENDON FORCE (KIPS)
BASE
95% BASE
90%
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1484 Kips
95% BASE 1410 Kips
90% BASE 1336 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

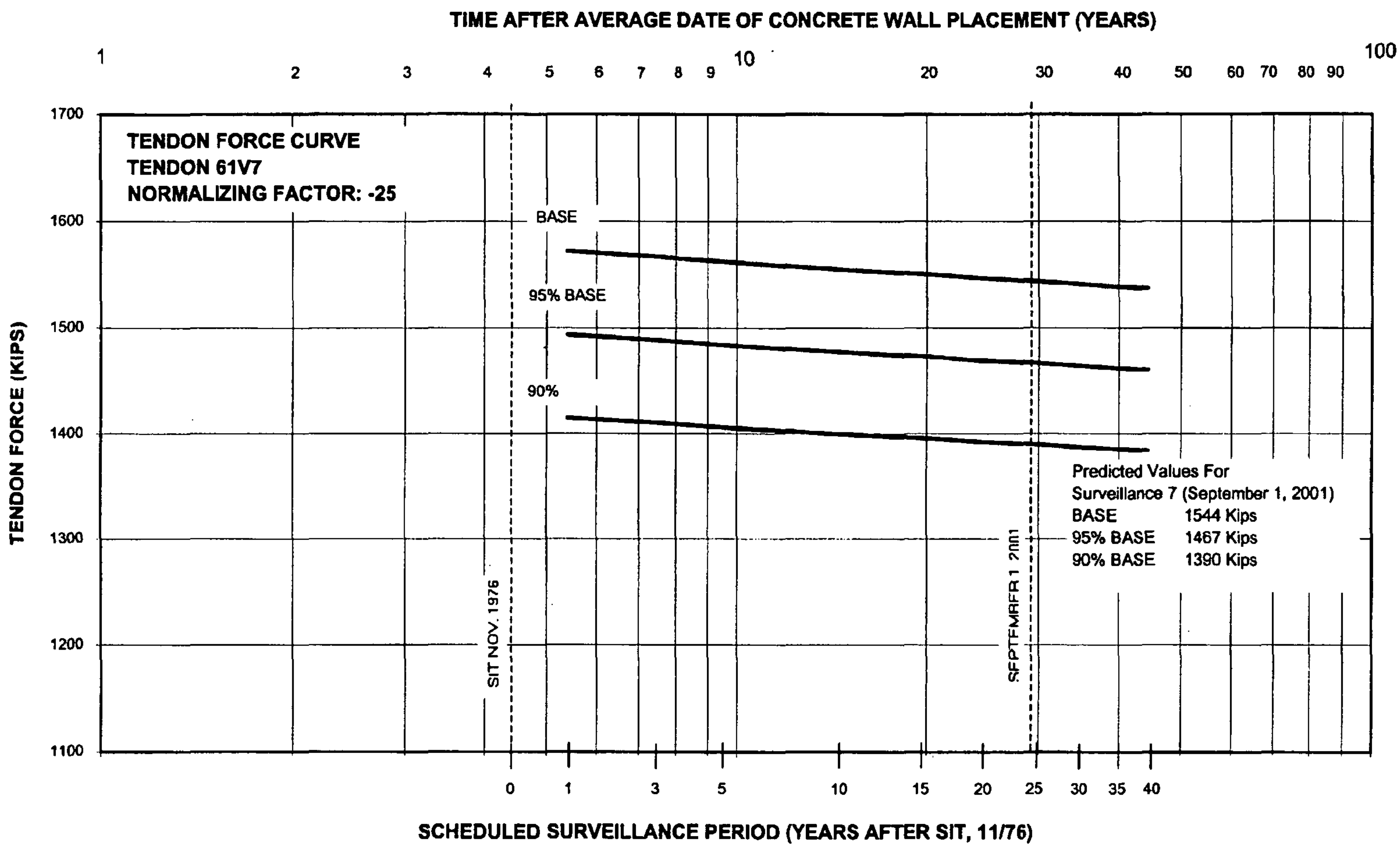
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 61V7 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1675 FIELD: 1675 AVERAGE: 1675 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 14 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	40.3	2.57%	42.3	0.096	18.6	6.0	1.7	102.9	6.14%	1572	1494	1415	-26
3	7.4	40.3	2.60%	42.7	0.117	22.6	8.5	2.4	108.0	6.45%	1567	1489	1410	-26
5	9.4	40.3	2.68%	44.1	0.130	25.4	10.0	2.8	112.6	6.72%	1562	1484	1406	-26
10	14.4	40.3	2.76%	45.4	0.157	30.5	13.5	3.8	120.0	7.16%	1555	1477	1400	-25
15	19.4	40.3	2.81%	46.2	0.173	33.3	15.5	4.4	124.2	7.41%	1551	1473	1396	-25
17	21.4	40.3									1549	1472	1394	
20	24.4	40.3	2.87%	47.2	0.188	36.1	17.5	4.9	128.5	7.67%	1547	1469	1392	-25
21:3	25.65	40.3									1546	1469	1391	
25	29.4	40.3	2.89%	47.3	0.197	37.8	19.5	5.5	130.9	7.81%	1544	1467	1390	-25
30	34.4	40.3	2.91%	47.8	0.207	39.8	20.4	5.8	133.7	7.98%	1541	1464	1387	-25
35	39.4	40.3	2.93%	48.2	0.216	41.5	21.5	6.1	136.1	8.13%	1539	1462	1385	-25
40	44.4	40.3	2.95%	48.5	0.221	42.6	22.5	6.4	137.8	8.23%	1537	1460	1384	-25
25	29.4										1544	1467	1390	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 61V7
NORMALIZING FACTOR: -25
BASE
95% BASE
90%
SIT NOV. 1976
SEPTEMBER 1 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1544 Kips
95% BASE 1467 Kips
90% BASE 1390 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

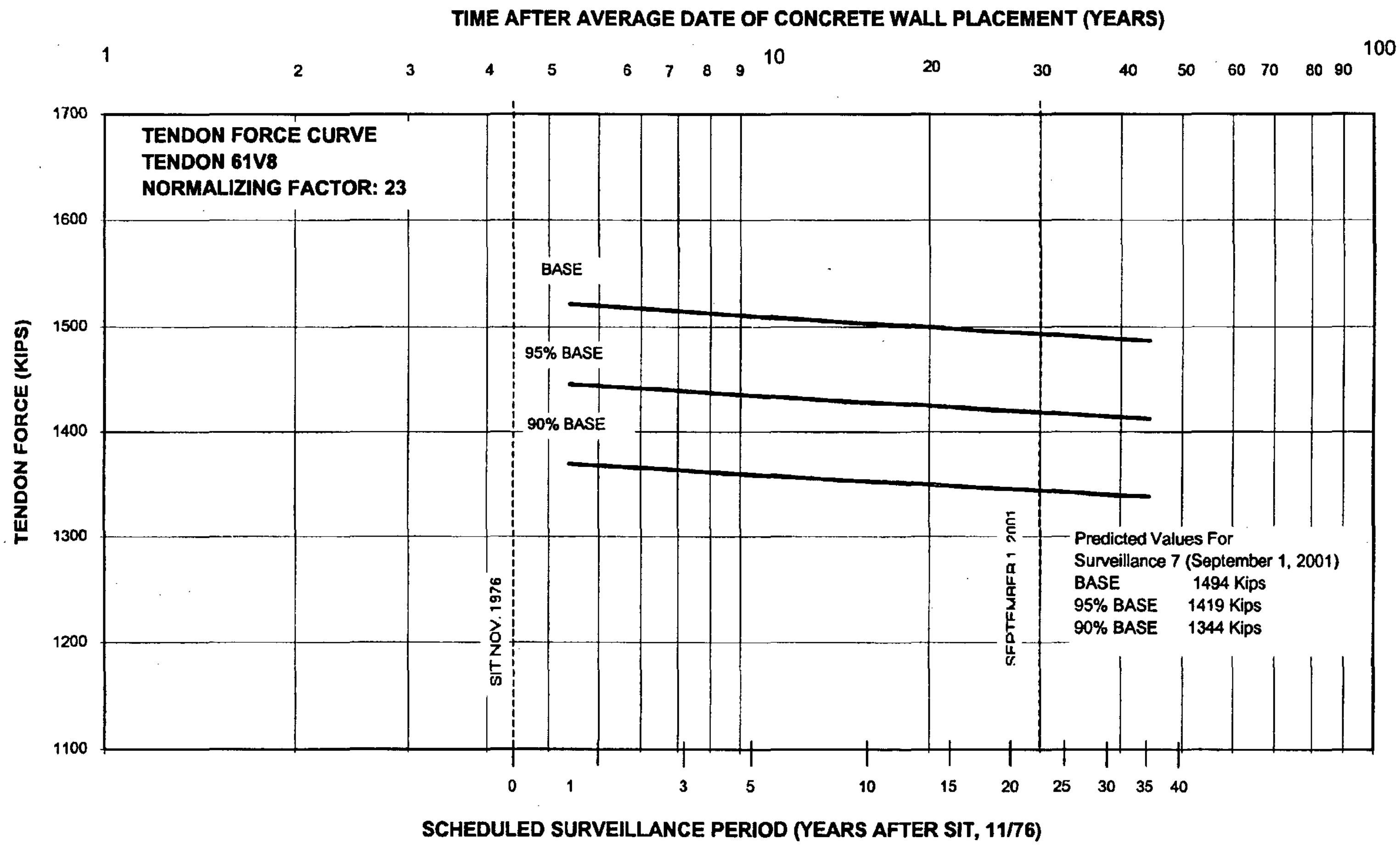
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 61V8 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1598 FIELD: 1598 AVERAGE: 1598 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 25 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	14.2	2.57%	42.3	0.096	18.6	6.0	1.7	76.8	4.81%	1522	1445	1369	23
3	7.4	14.2	2.60%	42.7	0.117	22.6	8.5	2.4	81.9	5.13%	1516	1441	1365	23
5	9.4	14.2	2.68%	44.1	0.130	25.4	10.0	2.8	86.5	5.41%	1512	1436	1361	23
10	14.4	14.2	2.76%	45.4	0.157	30.5	13.5	3.8	93.9	5.88%	1504	1429	1354	23
15	19.4	14.2	2.81%	46.2	0.173	33.3	15.5	4.4	98.1	6.14%	1500	1425	1350	23
17	21.4	14.2									1499	1424	1349	
20	24.4	14.2	2.87%	47.2	0.188	36.1	17.5	4.9	102.4	6.41%	1496	1421	1346	23
21:3	25.65	14.2									1495	1421	1346	
25	29.4	14.2	2.89%	47.3	0.197	37.8	19.5	5.5	104.8	6.56%	1494	1419	1344	23
30	34.4	14.2	2.91%	47.8	0.207	39.8	20.4	5.8	107.6	6.73%	1491	1416	1342	23
35	39.4	14.2	2.93%	48.2	0.216	41.5	21.5	6.1	110.0	6.88%	1488	1414	1340	23
40	44.4	14.2	2.95%	48.5	0.221	42.6	22.5	6.4	111.7	6.99%	1487	1412	1338	23
25	29.4										1494	1419	1344	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 61V8
NORMALIZING FACTOR: 23
BASE
95% BASE
90% BASE
SIT NOV. 1976
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1494 Kips
95% BASE 1419 Kips
90% BASE 1344 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

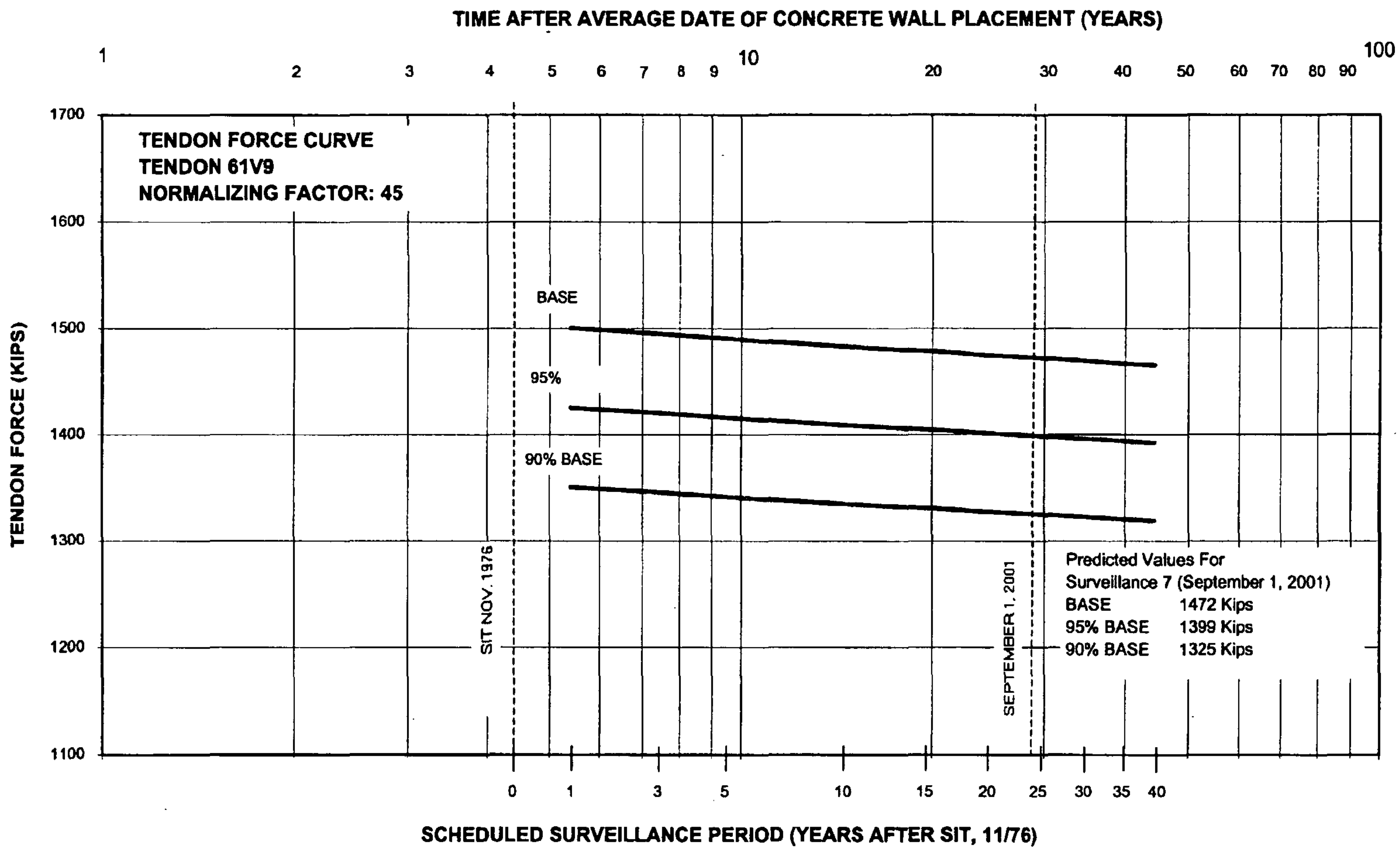
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
VERTICAL TENDON LOSSES WORK SHEET

TENDON: 61V9 INITIAL CONCRETE STRESS (PSI): 967

ORIGINAL FORCES (KIPS): SHOP: 1625 FIELD: 1625 AVERAGE: 1625 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 5 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	61.6	2.57%	42.3	0.096	18.6	6.0	1.7	124.2	7.65%	1500	1425	1350	45
3	7.4	61.6	2.60%	42.7	0.117	22.6	8.5	2.4	129.3	7.96%	1495	1420	1346	45
5	9.4	61.6	2.68%	44.1	0.130	25.4	10.0	2.8	133.9	8.24%	1491	1416	1342	45
10	14.4	61.6	2.76%	45.4	0.157	30.5	13.5	3.8	141.3	8.70%	1483	1409	1335	45
15	19.4	61.6	2.81%	46.2	0.173	33.3	15.5	4.4	145.5	8.96%	1479	1405	1331	45
17	21.4	61.6									1477	1403	1330	
20	24.4	61.6	2.87%	47.2	0.188	36.1	17.5	4.9	149.8	9.22%	1475	1401	1327	45
21:3	25.65	61.6									1474	1400	1327	
25	29.4	61.6	2.89%	47.3	0.197	37.8	19.5	5.5	152.2	9.37%	1472	1399	1325	45
30	34.4	61.6	2.91%	47.8	0.207	39.8	20.4	5.8	155.0	9.54%	1470	1396	1323	45
35	39.4	61.6	2.93%	48.2	0.216	41.5	21.5	6.1	157.4	9.69%	1467	1394	1320	45
40	44.4	61.6	2.95%	48.5	0.221	42.6	22.5	6.4	159.1	9.80%	1465	1392	1319	45
25	29.4										1472	1399	1325	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 61V9
NORMALIZING FACTOR: 45
BASE
95%
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1472 Kips
95% BASE 1399 Kips
90% BASE 1325 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

5.3 HORIZONTAL TENDONS

HORIZONTAL TENDONS

TENDONS LISTING & INPUT DATA SHEET
INDIVIDUAL TENDONS LOSSES SHEET
INDIVIDUAL TENDONS FORCE CURVES

DESCRIPTION	PAGES	PREPARED BY:		REVIEWED BY:	
		INTIALS	DATE	INITIALS	DATE
DATA INPUT	71	CEC	4-19-01	PCS	4/24/01
46H20	72 & 73	CEC	4-19-01	PCS	4/24/01
46H21	74 & 75	CEC	4-19-01	PCS	4/24/01
46H22	76 & 77	CEC	4-19-01	PCS	4/24/01
46H35	78 & 79	CEC	4-19-01	PCS	4/24/01
46H36	80 & 81	CEC	4-19-01	PCS	4/24/01
46H37	82 & 83	CEC	4-19-01	PCS	4/24/01
53H15	84 & 85	CEC	4-19-01	PCS	4/24/01
53H16	86 & 87	CEC	4-19-01	PCS	4/24/01
53H17	88 & 89	CEC	4-19-01	PCS	4/24/01
62H1	90 & 91	CEC	4-19-01	PCS	4/24/01
62H2	92 & 93	CEC	4-19-01	PCS	4/24/01
62H3	94 & 95	CEC	4-19-01	PCS	4/24/01
62H12	96 & 97	CEC	4-19-01	PCS	4/24/01
62H13	98 & 99	CEC	4-19-01	PCS	4/24/01
62H14	100 & 101	CEC	4-19-01	PCS	4/24/01

REVISION 1 TENDONS △1 TENDONS ADDED 10/10/01

DATA INPUT	71	PCS	10/10/01	RDK	10/10/01
46H32	77A & 77B	PCS	10/10/01	RDK	10/10/01
46H33	77C & 77D	PCS	10/10/01	RDK	10/10/01
46H34	77E & 77F	PCS	10/10/01	RDK	10/10/01
46H38	83A & 83B	PCS	10/10/01	RDK	10/10/01
46H39	83C & 83D	PCS	10/10/01	RDK	10/10/01
46H41	83E & 83F	PCS	10/10/01	RDK	10/10/01

5.3 HORIZONTAL TENDONS

HORIZONTAL TENDONS

TENDONS LISTING & INPUT DATA SHEET
INDIVIDUAL TENDONS LOSSES SHEET
INDIVIDUAL TENDONS FORCE CURVES

REVISION 2 TENDONS △ Tendons Added

DATA INPUT	71	PS	12/31/01	OEC	12-31-01
46H29	77AA & 77AB	PS	12/31/01	OEC	12-31-01
46H30	77AC & 77AD	PS	12/31/01	OEC	12-31-01
46H31	77AE & 77AF	PS	12/31/01	OEC	12-31-01
		PS			
62H09	95A & 95B	PS	12/31/01	OEC	12-31-01

CRYSTAL RIVER UNIT 3 - 7th TENDON SURVEILLANCE
HOOP TENDONS DATA INPUT

Initial Concrete Stress = 1732.0 (ksi)
Average Force = 1635.0 (kips)
Total Stress Sequence (N) = 60
Total Elastic Shortening Losses = 134

Reference: S-95-0082

Tendon No.	Lift-off Pressure (ksi) (1) Shop End Predicted	Shop End Actual	Field End Predicted	Field End Actual	Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips) Shop End (5)	Field End (5)	Remarks (3)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
46H20	6640	6930	6600	6600	44	160	0.982	1679	1609	
46H21	6720	6700	6730	6950	28	162	0.994	1624	1682	S,C
46H22	6720	6750	6730	7000	43	162	0.994	1636	1694	
46H29	6760	6900	6710	6800	31	159	0.975	1632	1620	
46H30	6720	6930	6670	6650	31	161	0.988	1669	1614	
46H31	6760	6950	6710	6650	32	163	1.000	1685	1624	
46H32	6760	6800	6770	6700	40	163	1.000	1649	1622	
46H33	6760	6950	6710	6600	32	163	1.000	1685	1612	
46H34	6760	7000	6770	7050	40	163	1.000	1697	1707	
46H35	6760	6700	6710	6900	33	163	1.000	1624	1685	
46H36	6760	6950	6770	6900	40	163	1.000	1685	1670	S
46H37	6720	6750	6730	6600	34	161	0.988	1626	1588	
46H38	6720	6800	6730	6700	39	162	0.994	1648	1622	
46H39	6720	7000	6730	6750	35	162	0.994	1590	1612	
46H40										
46H41	6760	6600	6770	6700	35	163	1.000	1651	1651	
53H15	6750	6800	6800	6850	15	163	1.000	1651	1651	
53H16	6840	6950	6810	6700	57	163	1.000	1665	1612	S
53H17	6750	6650	6800	6600	14	163	1.000	1615	1591	
62H1	6800	6650	6750	6600	21	162	0.994	1593	1593	
62H2	6800	6700	6750	6800	46	163	1.000	1615	1651	S
62H3	6800	6700	6750	6650	22	163	1.000	1615	1615	
62H09	6800	6800	6750	6750	23	163	1.000	1639	1639	
62H12	6800	6850	6750	7000	44	163	1.000	1651	1700	
62H13	6800	6700	6750	7050	24	163	1.000	1615	1712	S
62H14	6800	6650	6750	6600	44	163	1.000	1603	1603	

Note:
(1) Ref. Crystal River 3 R/B Tendon History Sheets - Hoop Tendons for Original Stressing
(2) Ref. Crystal River 3 Tendon Surveillance Loss Calculations, Tendon Stress Sequence, Pages 29, 29a and 29b.
(3) S =Selected tensons, C =Control tendon, D =Detensioned tendon, A =Alternate tendon
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacents
(4) Wire factors are calculated based on the number of effective wires divided by 163.

2 Tendons Added 12/31/01 PJ - 12-31-01 CEC
1 Tendons Added 10/10/01 PJ

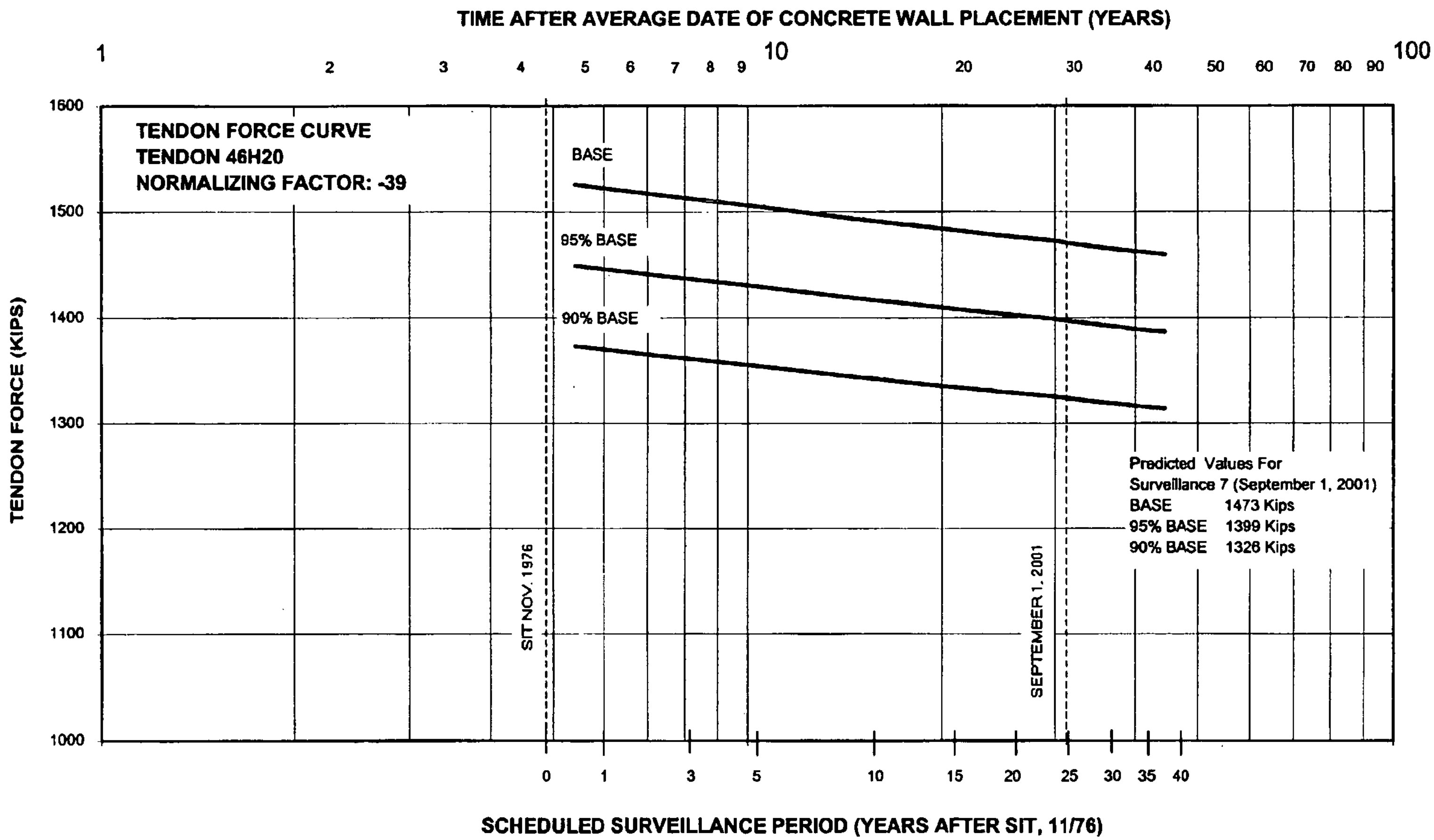
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 46H20 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1679 FIELD: 1609 AVERAGE: 1644 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 44 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.982

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	35.1	2.57%	42.0	0.090	39.5	6.0	1.7	118.3	7.19%	1526	1449	1373	-39
3	7.4	35.1	2.60%	42.5	0.110	48.5	8.5	2.4	128.5	7.82%	1515	1440	1364	-39
5	9.4	35.1	2.68%	43.8	0.123	54.1	10.0	2.8	135.8	8.26%	1508	1433	1357	-39
10	14.4	35.1	2.76%	45.1	0.150	66.0	13.5	3.8	150.0	9.12%	1494	1419	1345	-39
15	19.4	35.1	2.81%	45.9	0.167	73.6	15.5	4.4	158.9	9.67%	1485	1411	1336	-39
17	21.4	35.1									1482	1408	1334	
20	24.4	35.1	2.87%	46.9	0.181	79.0	17.5	4.9	165.9	10.09%	1478	1404	1330	-39
21:3	25.65	35.1									1477	1403	1329	
25	29.4	35.1	2.88%	47.1	0.190	83.2	19.5	5.5	170.9	10.39%	1473	1399	1326	-39
30	34.4	35.1	2.91%	47.6	0.200	88.0	20.4	5.8	176.4	10.73%	1467	1394	1321	-39
35	39.4	35.1	2.93%	47.9	0.209	91.9	21.5	6.1	180.9	11.01%	1463	1390	1317	-39
40	44.4	35.1	2.95%	48.2	0.215	94.7	22.5	6.4	184.3	11.21%	1460	1387	1314	-39
25	29.4										1473	1399	1326	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H20
NORMALIZING FACTOR: -39
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1473 Kips
95% BASE 1399 Kips
90% BASE 1326 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

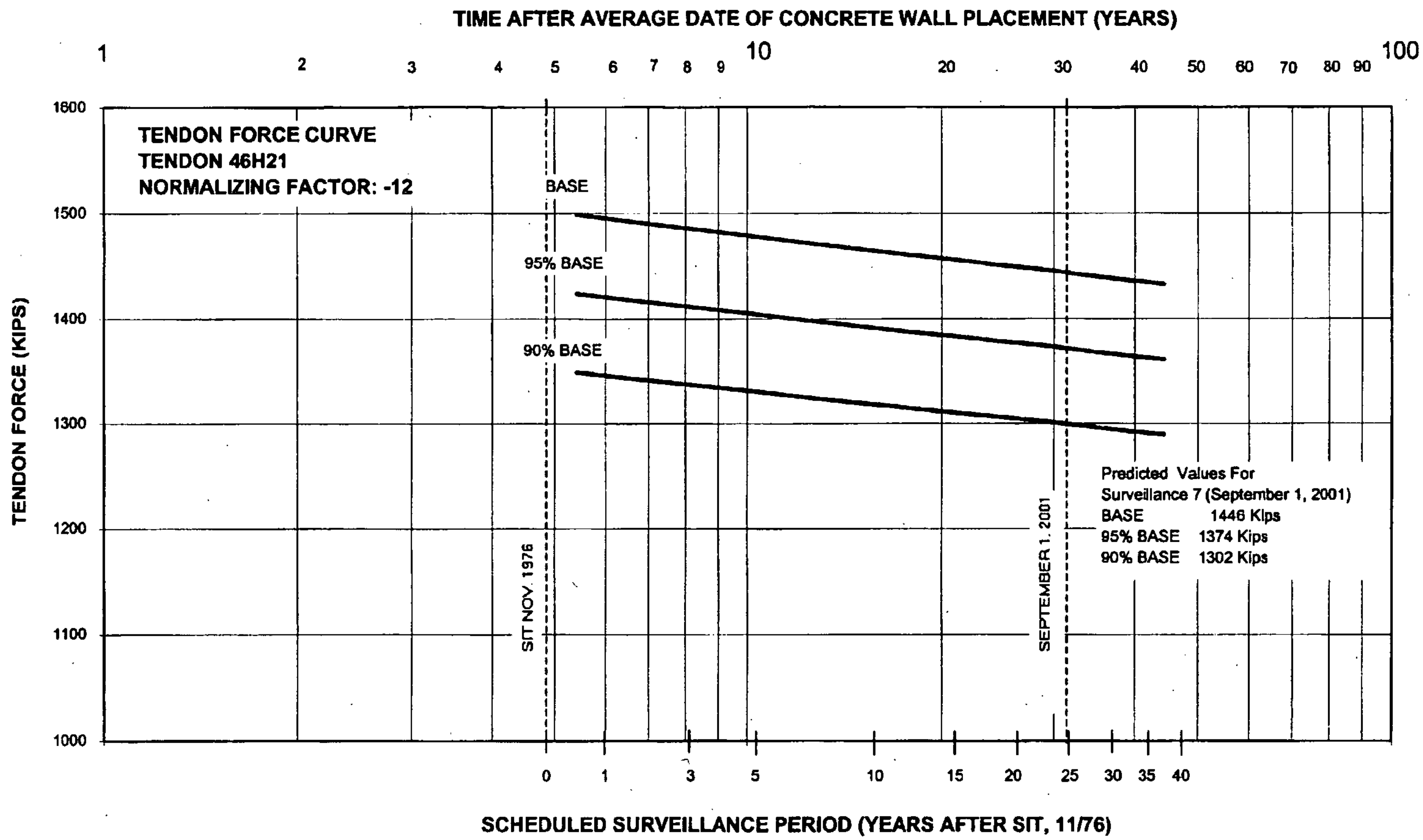
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 46H21 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1682 AVERAGE: 1653 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 28 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	71.0	2.57%	42.0	0.090	39.5	6.0	1.7	154.2	9.33%	1499	1424	1349	-12
3	7.4	71.0	2.60%	42.5	0.110	48.5	8.5	2.4	164.4	9.95%	1489	1414	1340	-12
5	9.4	71.0	2.68%	43.8	0.123	54.1	10.0	2.8	171.7	10.39%	1481	1407	1333	-12
10	14.4	71.0	2.76%	45.1	0.150	66.0	13.5	3.8	185.9	11.25%	1467	1394	1320	-12
15	19.4	71.0	2.81%	45.9	0.167	73.6	15.5	4.4	194.9	11.79%	1458	1385	1312	-12
17	21.4	71.0									1455	1383	1310	
20	24.4	71.0	2.87%	46.9	0.181	79.0	17.5	4.9	201.9	12.21%	1451	1379	1306	-12
21:3	25.65	71.0									1450	1377	1305	
25	29.4	71.0	2.88%	47.1	0.190	83.2	19.5	5.5	206.8	12.51%	1446	1374	1302	-12
30	34.4	71.0	2.91%	47.6	0.200	88.0	20.4	5.8	212.4	12.85%	1441	1369	1297	-12
35	39.4	71.0	2.93%	47.9	0.209	91.9	21.5	6.1	216.9	13.12%	1436	1364	1293	-12
40	44.4	71.0	2.95%	48.2	0.215	94.7	22.5	6.4	220.3	13.33%	1433	1361	1290	-12
25	29.4										1446	1374	1302	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H21
NORMALIZING FACTOR: -12
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1446 Kips
95% BASE 1374 Kips
90% BASE 1302 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

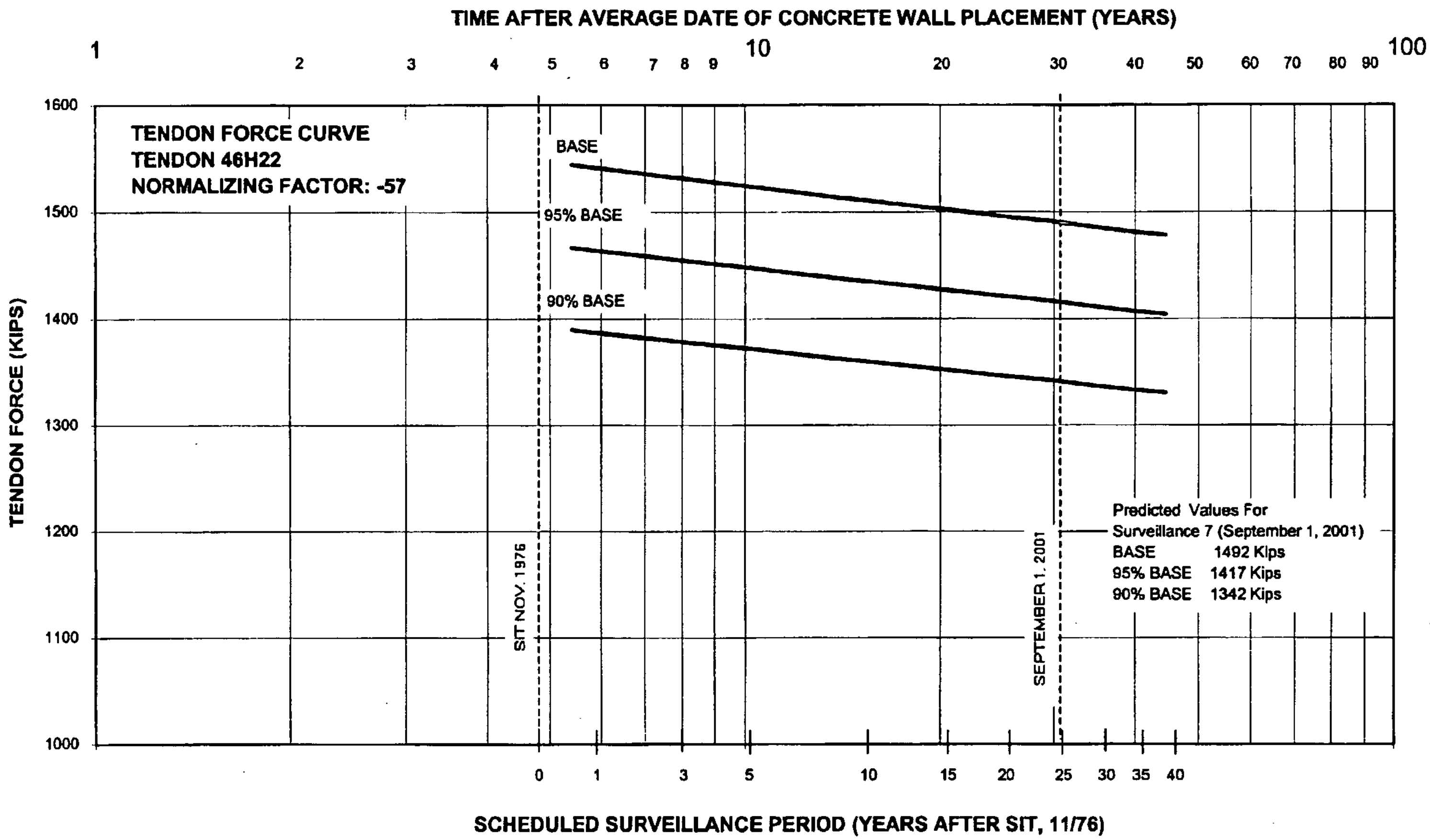
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 46H22 INITIAL CONCRETE STRESS (PSI 1732

ORIGINAL FORCES (KIPS): SHOP: 1636 FIELD: 1694 AVERAGE: 1665 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 43 OF 60 TOTAL ELASTIC SHORT. LOSS 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	37.7	2.57%	42.0	0.090	39.5	6.0	1.7	120.9	7.26%	1544	1467	1390	-57
3	7.4	37.7	2.60%	42.5	0.110	48.5	8.5	2.4	131.1	7.88%	1534	1457	1381	-57
5	9.4	37.7	2.68%	43.8	0.123	54.1	10.0	2.8	138.4	8.31%	1527	1450	1374	-57
10	14.4	37.7	2.76%	45.1	0.150	66.0	13.5	3.8	152.6	9.17%	1513	1437	1361	-57
15	19.4	37.7	2.81%	45.9	0.167	73.6	15.5	4.4	161.6	9.70%	1504	1428	1353	-57
17	21.4	37.7									1501	1426	1351	
20	24.4	37.7	2.87%	46.9	0.181	79.0	17.5	4.9	168.6	10.12%	1497	1422	1347	-57
21:3	25.65	37.7									1495	1421	1346	
25	29.4	37.7	2.88%	47.1	0.190	83.2	19.5	5.5	173.5	10.42%	1492	1417	1342	-57
30	34.4	37.7	2.91%	47.6	0.200	88.0	20.4	5.8	179.1	10.75%	1486	1412	1337	-57
35	39.4	37.7	2.93%	47.9	0.209	91.9	21.5	6.1	183.6	11.03%	1482	1408	1333	-57
40	44.4	37.7	2.95%	48.2	0.215	94.7	22.5	6.4	187.0	11.23%	1478	1404	1330	-57
25	29.4										1492	1417	1342	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 46H22
NORMALIZING FACTOR: -57
BASE
95% BASE
90% BASE
1600 1500 1400 1300 1200 1100 1000
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1492 Kips
95% BASE 1417 Kips
90% BASE 1342 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

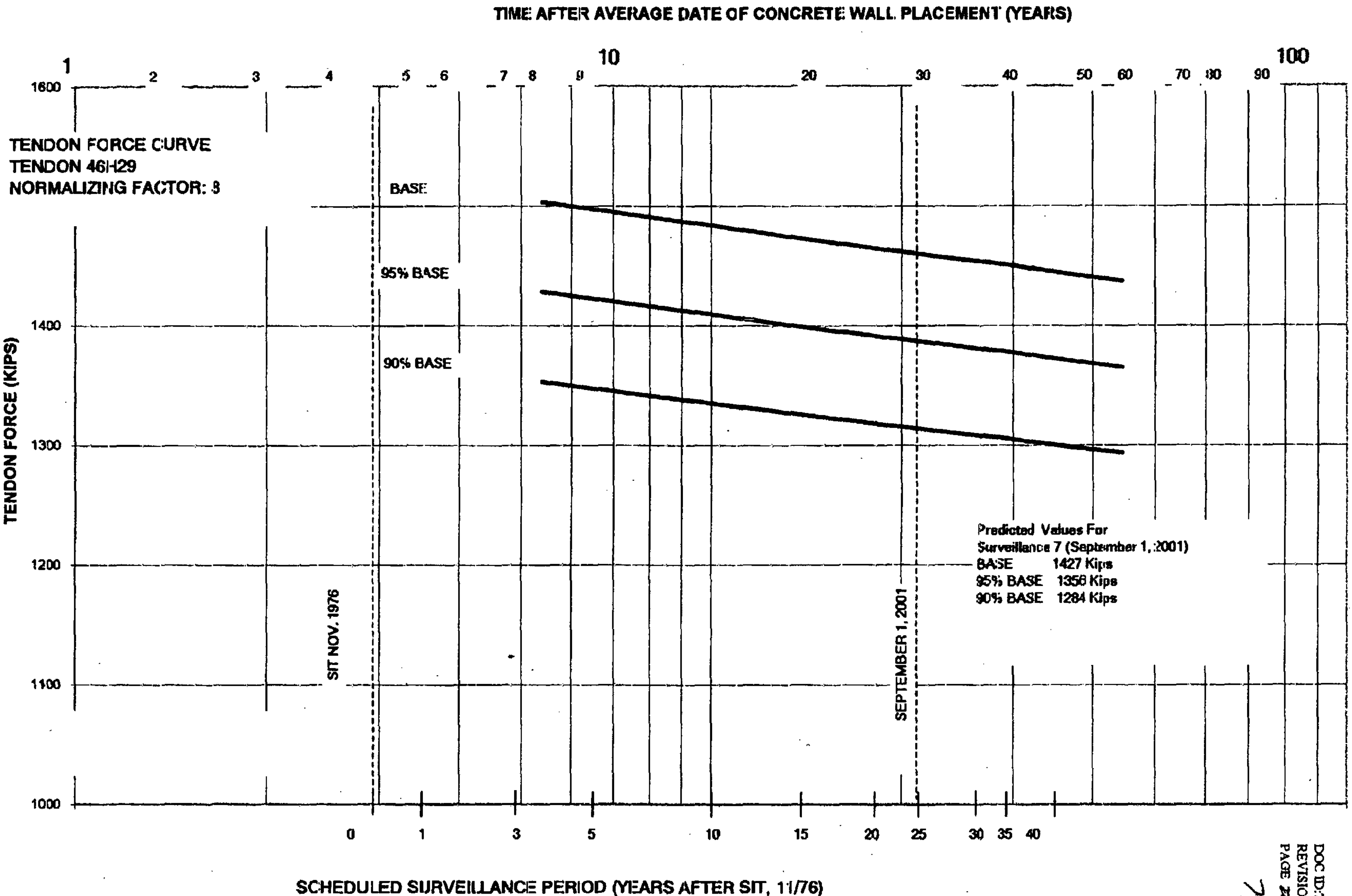
TENDON: 46H29 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1632 FIELD: 1620 AVERAGE: 1626 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 31 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.975

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	63.2	2.57%	42.0	0.090	39.5	6.0	1.7	146.4	9.00%	1480	1406	1332	8
3	7.4	63.2	2.60%	42.5	0.110	48.5	8.5	2.4	156.6	9.63%	1469	1396	1322	8
5	9.4	63.2	2.68%	43.8	0.123	54.1	10.0	2.8	163.9	10.08%	1462	1389	1316	8
10	14.4	63.2	2.76%	45.1	0.150	66.0	13.5	3.8	178.1	10.95%	1448	1376	1303	8
15	19.4	63.2	2.81%	45.9	0.167	73.6	15.5	4.4	187.0	11.50%	1439	1367	1295	8
17	21.4	63.2									1436	1364	1293	
20	24.4	63.2	2.87%	46.9	0.181	79.0	17.5	4.9	194.0	11.93%	1432	1360	1289	8
21:3	25.65	63.2									1431	1359	1288	
25	29.4	63.2	2.88%	47.1	0.190	83.2	19.5	5.5	199.0	12.24%	1427	1356	1284	8
30	34.4	63.2	2.91%	47.6	0.200	88.0	20.4	5.8	204.5	12.58%	1421	1350	1279	8
35	39.4	63.2	2.93%	47.9	0.209	91.9	21.5	6.1	209.0	12.86%	1417	1346	1275	8
40	44.4	63.2	2.95%	48.2	0.215	94.7	22.5	6.4	212.4	13.06%	1414	1343	1272	8
25	29.4										1427	1356	1284	



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CRYSTAL RIVER TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE

HOOP TENDON LOSSES WORK SHEET

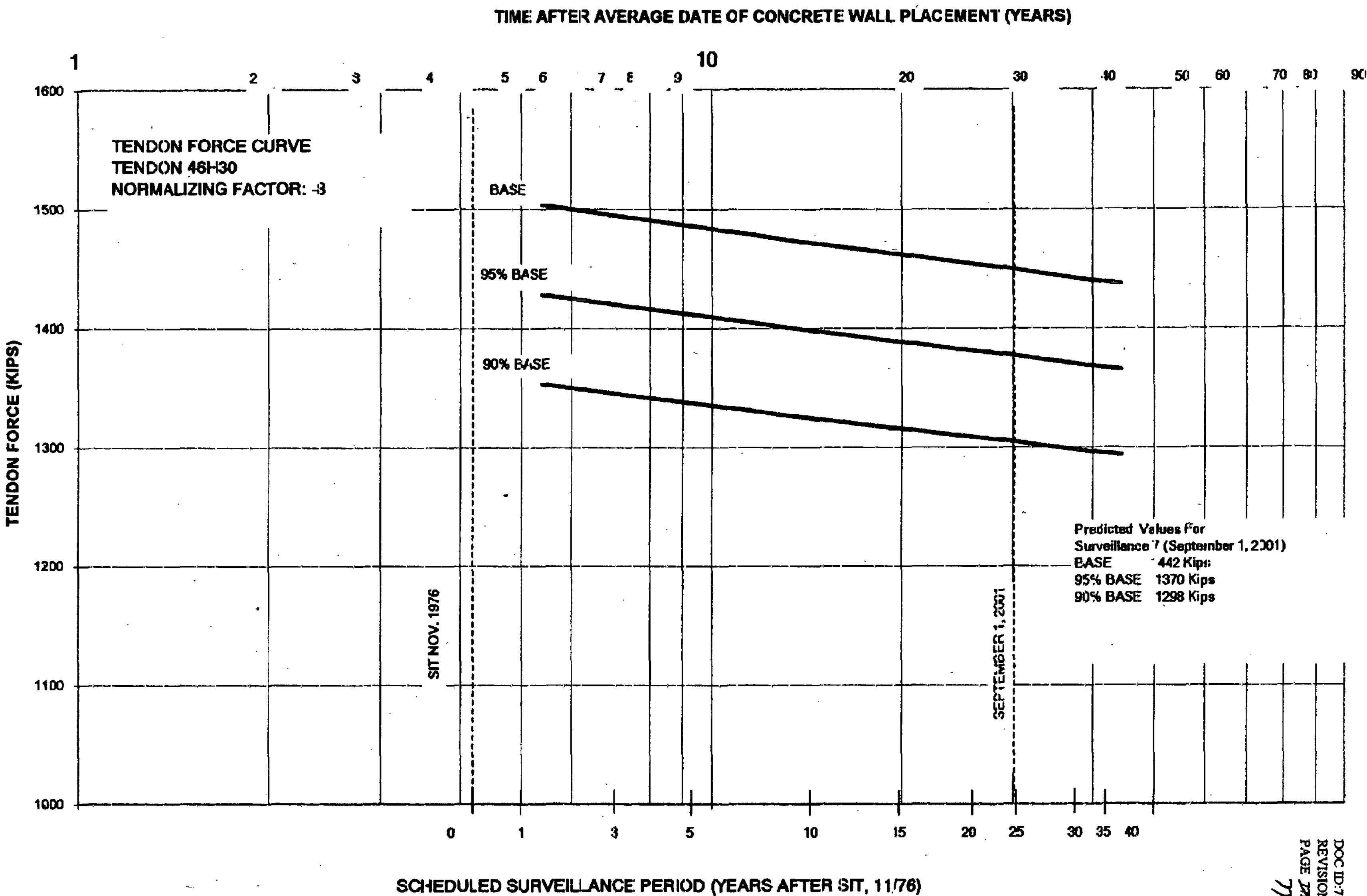
TENDON: 46H30 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1669 FIELD: 1614 AVERAGE: 1642 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 31 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.988

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: SP. CR. (*.0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	64.0	2.57%	42.0	0.090	39.5	6.0	1.7	147.2	8.96%	1495	1420	1345	-8
3	7.4	64.0	2.60%	42.5	0.110	48.5	8.5	2.4	157.4	9.59%	1484	1410	1336	-8
5	9.4	64.0	2.68%	43.8	0.123	54.1	10.0	2.8	164.7	10.03%	1477	1403	1329	-8
10	14.4	64.0	2.76%	45.1	0.150	66.0	13.5	3.8	178.9	10.90%	1463	1390	1317	-8
15	19.4	64.0	2.81%	45.9	0.167	73.6	15.5	4.4	187.8	11.44%	1454	1381	1308	-8
17	21.4	64.0									1451	1379	1306	
20	24.4	64.0	2.87%	46.9	0.181	79.0	17.5	4.9	194.8	11.87%	1447	1375	1302	-8
21:3	25.65	64.0									1446	1373	1301	
25	29.4	64.0	2.88%	47.1	0.190	83.2	19.5	5.5	199.8	12.17%	1442	1370	1298	-8
30	34.4	64.0	2.91%	47.6	0.200	88.0	20.4	5.8	205.3	12.51%	1436	1365	1293	-8
35	39.4	64.0	2.93%	47.9	0.209	91.9	21.5	6.1	209.8	12.78%	1432	1360	1289	-8
40	44.4	64.0	2.95%	48.2	0.215	94.7	22.5	6.4	213.2	12.98%	1428	1357	1286	-8
25	29.4										1442	1370	1298	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H30
NORMALIZING FACTOR: -3
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1442 Kips
95% BASE 1370 Kips
90% BASE 1298 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

CRYSTAL RIVER TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 46H31 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1685 FIELD: 1624 AVERAGE: 1655 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 32 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	62.5	2.57%	42.0	0.090	39.5	6.0	1.7	145.7	8.81%	1509	1433	1358	-22
3	7.4	62.5	2.60%	42.5	0.110	48.5	8.5	2.4	155.9	9.42%	1499	1424	1349	-22
5	9.4	62.5	2.68%	43.8	0.123	54.1	10.0	2.8	163.2	9.87%	1491	1417	1342	-22
10	14.4	62.5	2.76%	45.1	0.150	66.0	13.5	3.8	177.4	10.72%	1477	1403	1329	-22
15	19.4	62.5	2.81%	45.9	0.167	73.6	15.5	4.4	186.4	11.27%	1468	1395	1321	-22
17	21.4	62.5									1465	1392	1319	
20	24.4	62.5	2.87%	46.9	0.181	79.0	17.5	4.9	193.4	11.69%	1461	1388	1315	-22
21:3	25.65	62.5									1460	1387	1314	
25	29.4	62.5	2.88%	47.1	0.190	83.2	19.5	5.5	198.3	11.99%	1456	1383	1311	-22
30	34.4	62.5	2.91%	47.6	0.200	88.0	20.4	5.8	203.9	12.32%	1451	1378	1306	-22
35	39.4	62.5	2.93%	47.9	0.209	91.9	21.5	6.1	208.4	12.59%	1446	1374	1302	-22
40	44.4	62.5	2.95%	48.2	0.215	94.7	22.5	6.4	211.8	12.80%	1443	1371	1299	-22
25	29.4										1456	1383	1311	

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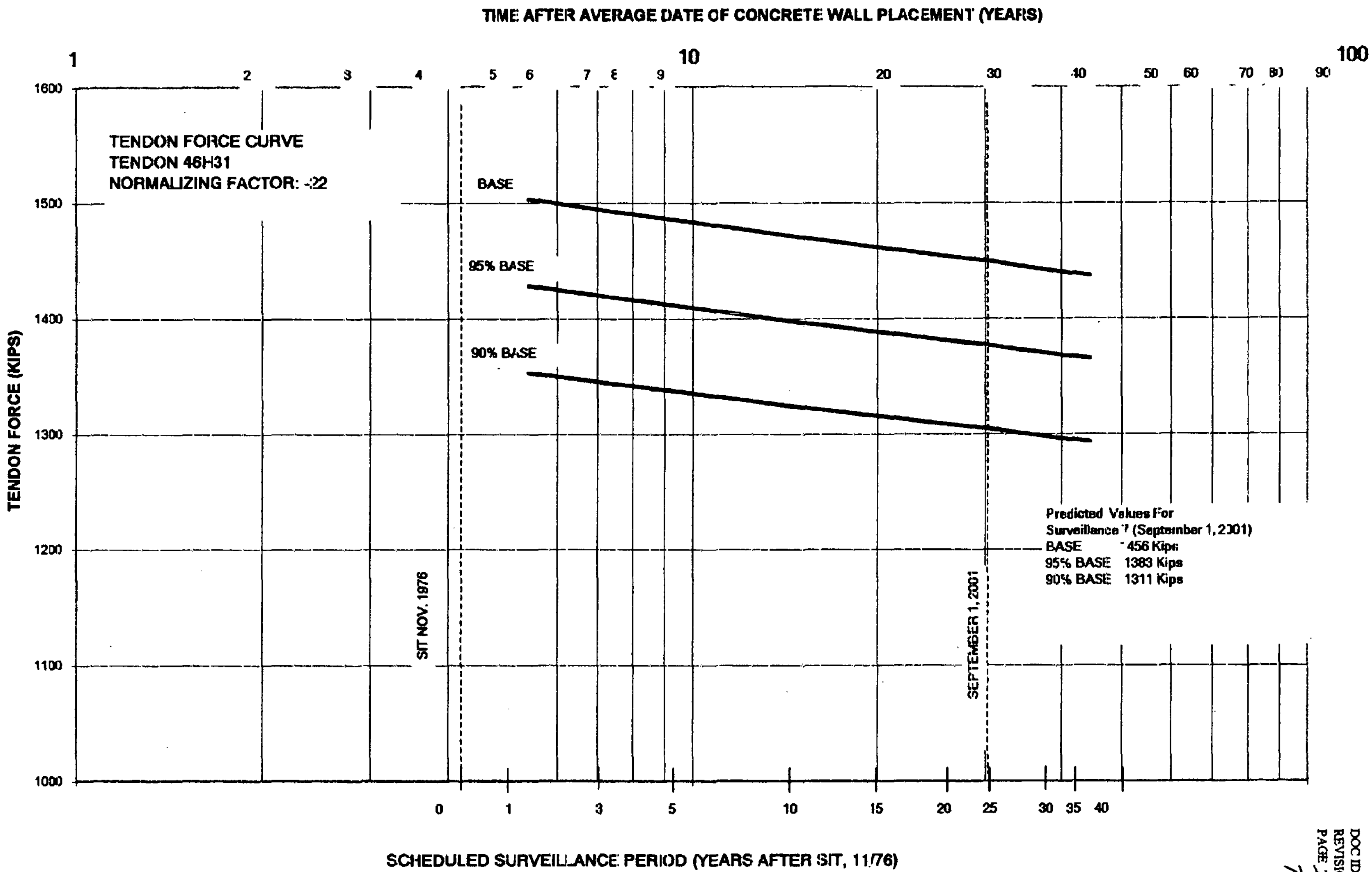


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
10
100
TENDON FORCE CURVE
TENDON 46H31
NORMALIZING FACTOR: -22
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1456 Kips
95% BASE 1383 Kips
90% BASE 1311 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

DAF

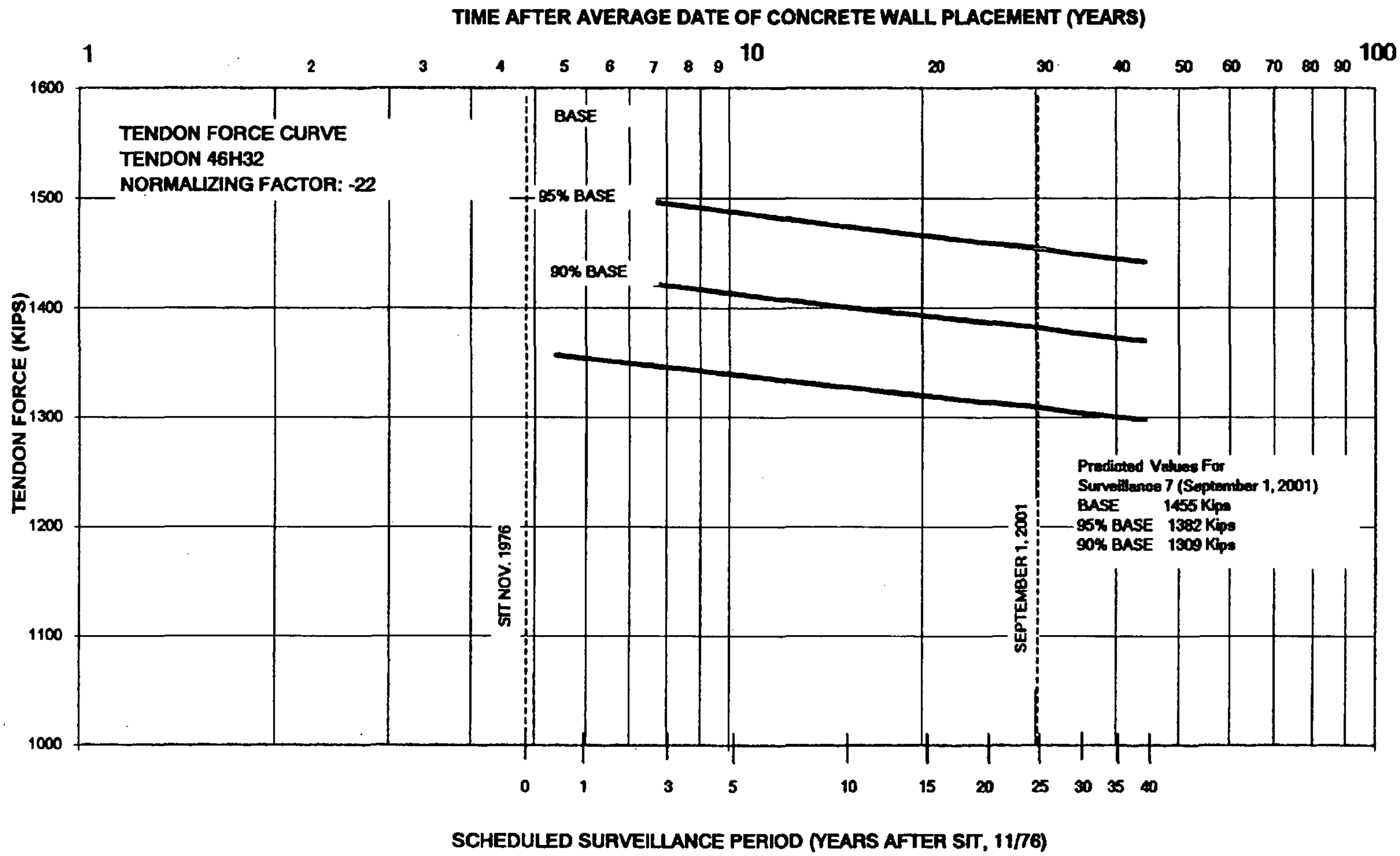
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET
FILE: HOOPR3.XLW (42H30)

TENDON: 46H32 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1649 FIELD: 1622 AVERAGE: 1635 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 40 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: SP. CR. (*.0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	44.7	2.57%	42.0	0.090	39.5	6.0	1.7	127.9	7.82%	1507	1432	1357	-22
3	7.4	44.7	2.60%	42.5	0.110	48.5	8.5	2.4	138.1	8.44%	1497	1422	1348	-22
5	9.4	44.7	2.68%	43.8	0.123	54.1	10.0	2.8	145.4	8.89%	1490	1415	1341	-22
10	14.4	44.7	2.76%	45.1	0.150	66.0	13.5	3.8	159.6	9.76%	1476	1402	1328	-22
15	19.4	44.7	2.81%	45.9	0.167	73.6	15.5	4.4	168.5	10.31%	1467	1393	1320	-22
17	21.4	44.7									1464	1391	1318	
20	24.4	44.7	2.87%	46.9	0.181	79.0	17.5	4.9	175.5	10.73%	1460	1387	1314	-22
21:3	25.65	44.7									1459	1386	1313	
25	29.4	44.7	2.88%	47.1	0.190	83.2	19.5	5.5	180.5	11.04%	1455	1382	1309	-22
30	34.4	44.7	2.91%	47.6	0.200	88.0	20.4	5.8	186.0	11.38%	1449	1377	1304	-22
35	39.4	44.7	2.93%	47.9	0.209	91.9	21.5	6.1	190.5	11.65%	1445	1373	1300	-22
40	44.4	44.7	2.95%	48.2	0.215	94.7	22.5	6.4	193.9	11.86%	1441	1369	1297	-22
25	29.4										1455	1382	1309	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 46H32
NORMALIZING FACTOR: -22
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
1600
1500
1400
1300
1200
1100
1000
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1455 Kips
95% BASE 1382 Kips
90% BASE 1309 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

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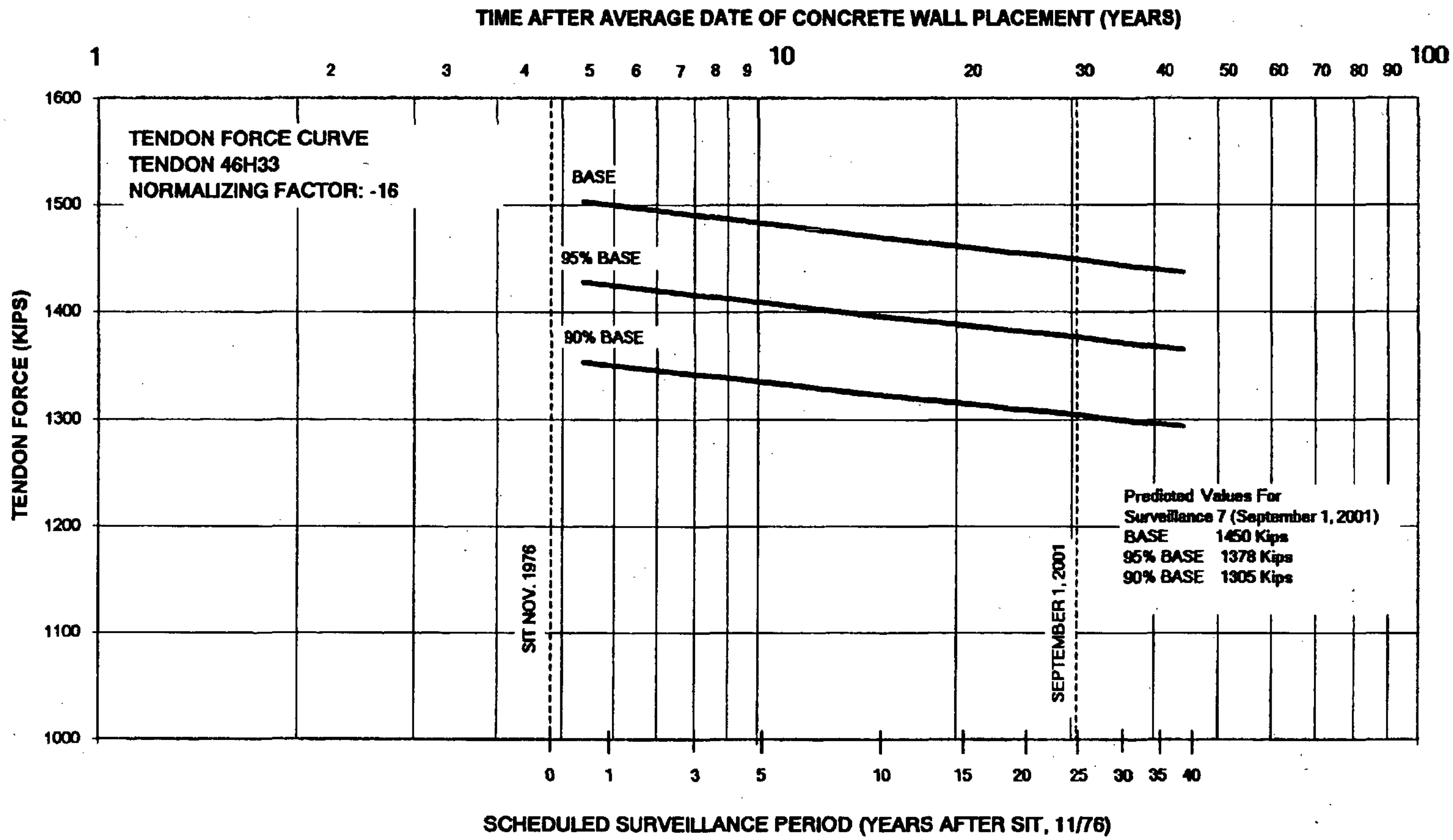
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 46H33 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1685 FIELD: 1612 AVERAGE: 1649 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 32 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: SP. CR. (*.0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	62.5	2.57%	42.0	0.090	39.5	6.0	1.7	145.7	8.84%	1503	1428	1353	-17
3	7.4	62.5	2.60%	42.5	0.110	48.5	8.5	2.4	155.9	9.46%	1493	1418	1343	-17
5	9.4	62.5	2.68%	43.8	0.123	54.1	10.0	2.8	163.2	9.90%	1485	1411	1337	-17
10	14.4	62.5	2.76%	45.1	0.150	66.0	13.5	3.8	177.4	10.76%	1471	1398	1324	-17
15	19.4	62.5	2.81%	45.9	0.167	73.6	15.5	4.4	186.4	11.31%	1462	1389	1316	-17
17	21.4	62.5									1459	1386	1313	
20	24.4	62.5	2.87%	46.9	0.181	79.0	17.5	4.9	193.4	11.73%	1455	1382	1310	-16
21:3	25.65	62.5									1454	1381	1309	
25	29.4	62.5	2.88%	47.1	0.190	83.2	19.5	5.5	198.3	12.03%	1450	1378	1305	-16
30	34.4	62.5	2.91%	47.6	0.200	88.0	20.4	5.8	203.9	12.37%	1445	1372	1300	-16
35	39.4	62.5	2.93%	47.9	0.209	91.9	21.5	6.1	208.4	12.64%	1440	1368	1296	-16
40	44.4	62.5	2.95%	48.2	0.215	94.7	22.5	6.4	211.8	12.85%	1437	1365	1293	-16
25	29.4										1450	1378	1305	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H33
NORMALIZING FACTOR: -16
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1450 Kips
95% BASE 1378 Kips
90% BASE 1305 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

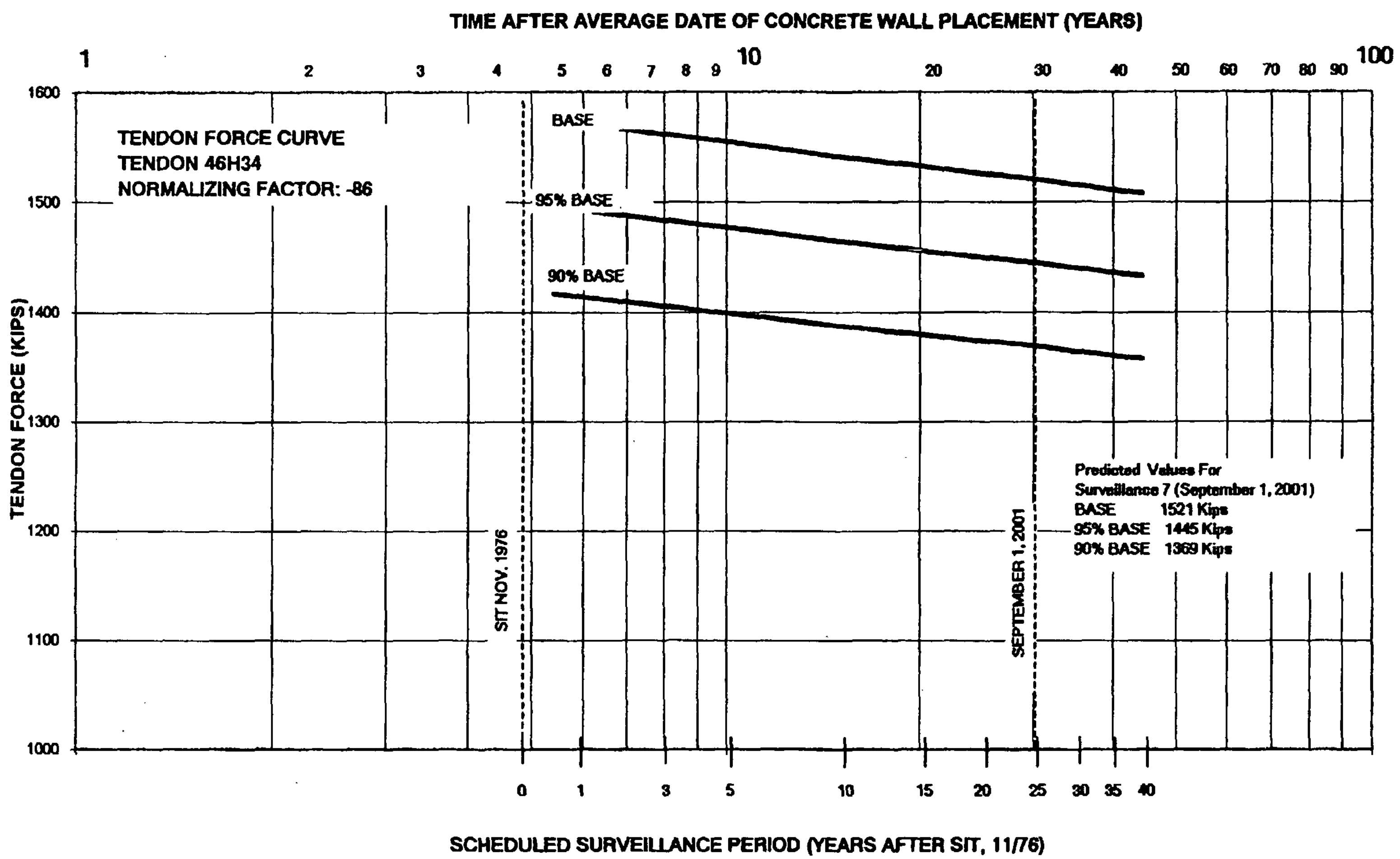
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET
FILE: HOOPR3.XLW (42H30)

TENDON: 46H34 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1697 FIELD: 1707 AVERAGE: 1702 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 40 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	44.7	2.57%	42.0	0.090	39.5	6.0	1.7	127.9	7.51%	1574	1495	1417	-86
3	7.4	44.7	2.60%	42.5	0.110	48.5	8.5	2.4	138.1	8.11%	1564	1486	1407	-86
5	9.4	44.7	2.68%	43.8	0.123	54.1	10.0	2.8	145.4	8.54%	1557	1479	1401	-86
10	14.4	44.7	2.76%	45.1	0.150	66.0	13.5	3.8	159.6	9.38%	1542	1465	1388	-86
15	19.4	44.7	2.81%	45.9	0.167	73.6	15.5	4.4	168.5	9.90%	1533	1457	1380	-86
17	21.4	44.7									1531	1454	1378	
20	24.4	44.7	2.87%	46.9	0.181	79.0	17.5	4.9	175.5	10.31%	1526	1450	1374	-86
21:3	25.65	44.7									1525	1449	1373	
25	29.4	44.7	2.88%	47.1	0.190	83.2	19.5	5.5	180.5	10.60%	1521	1445	1369	-86
30	34.4	44.7	2.91%	47.6	0.200	88.0	20.4	5.8	186.0	10.93%	1516	1440	1364	-86
35	39.4	44.7	2.93%	47.9	0.209	91.9	21.5	6.1	190.5	11.19%	1511	1436	1360	-86
40	44.4	44.7	2.95%	48.2	0.215	94.7	22.5	6.4	193.9	11.39%	1508	1433	1357	-86
25	29.4										1521	1445	1369	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H34
NORMALIZING FACTOR: -86
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1521 Kips
95% BASE 1445 Kips
90% BASE 1369 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

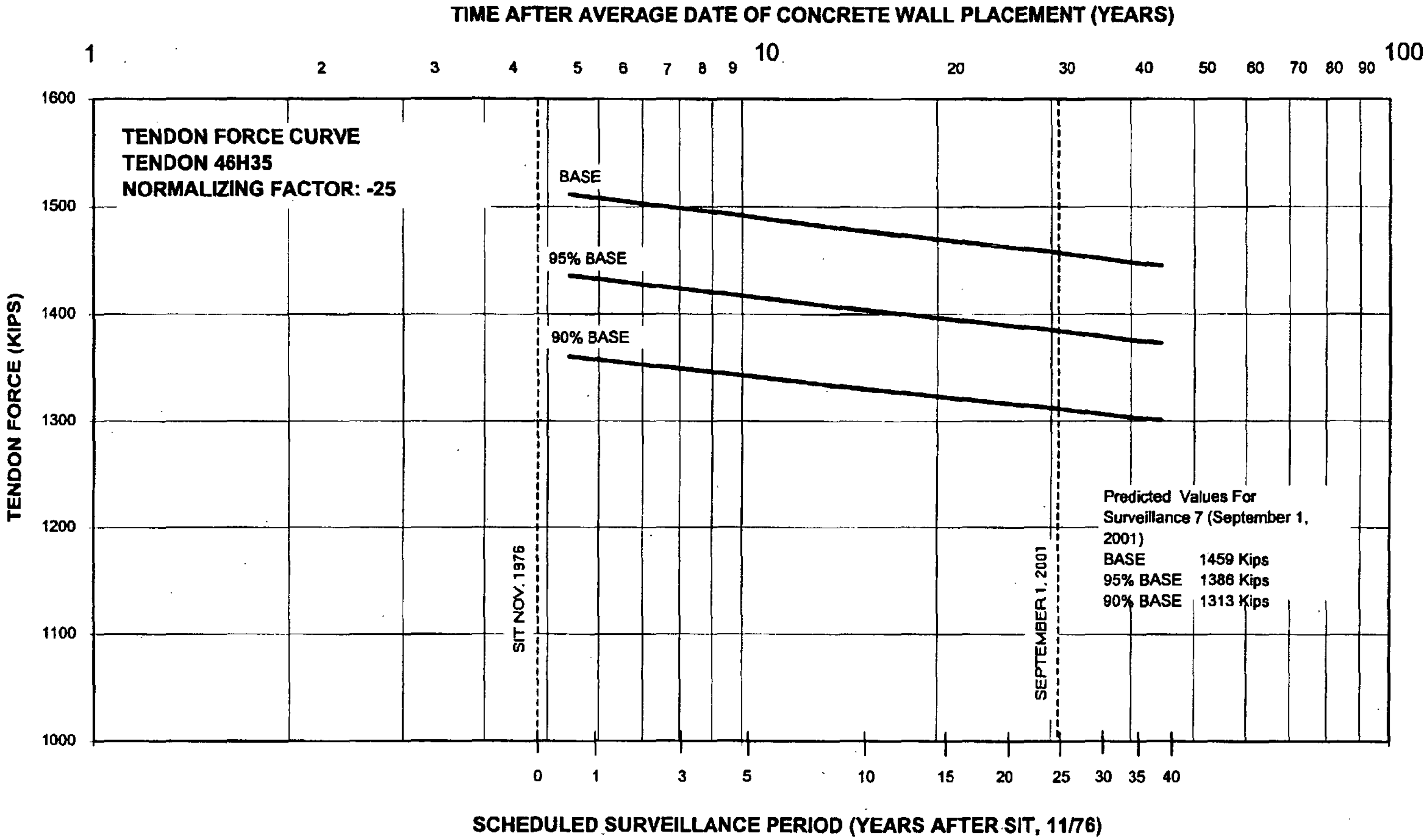
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 46H35 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1685 AVERAGE: 1655 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 33 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	60.3	2.57%	42.0	0.090	39.5	6.0	1.7	143.5	8.67%	1511	1436	1360	-25
3	7.4	60.3	2.60%	42.5	0.110	48.5	8.5	2.4	153.7	9.29%	1501	1426	1351	-25
5	9.4	60.3	2.68%	43.8	0.123	54.1	10.0	2.8	161.0	9.73%	1494	1419	1344	-25
10	14.4	60.3	2.76%	45.1	0.150	66.0	13.5	3.8	175.2	10.59%	1480	1406	1332	-25
15	19.4	60.3	2.81%	45.9	0.167	73.6	15.5	4.4	184.2	11.13%	1471	1397	1324	-25
17	21.4	60.3									1468	1395	1321	
20	24.4	60.3	2.87%	46.9	0.181	79.0	17.5	4.9	191.1	11.55%	1464	1391	1317	-25
21:3	25.65	60.3									1462	1389	1316	
25	29.4	60.3	2.88%	47.1	0.190	83.2	19.5	5.5	196.1	11.85%	1459	1386	1313	-25
30	34.4	60.3	2.91%	47.6	0.200	88.0	20.4	5.8	201.7	12.19%	1453	1381	1308	-25
35	39.4	60.3	2.93%	47.9	0.209	91.9	21.5	6.1	206.2	12.46%	1449	1376	1304	-25
40	44.4	60.3	2.95%	48.2	0.215	94.7	22.5	6.4	209.6	12.66%	1445	1373	1301	-25
25	29.4										1459	1386	1313	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H35
NORMALIZING FACTOR: -25
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For Surveillance 7 (September 1, 2001)
BASE 1459 Kips
95% BASE 1386 Kips
90% BASE 1313 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

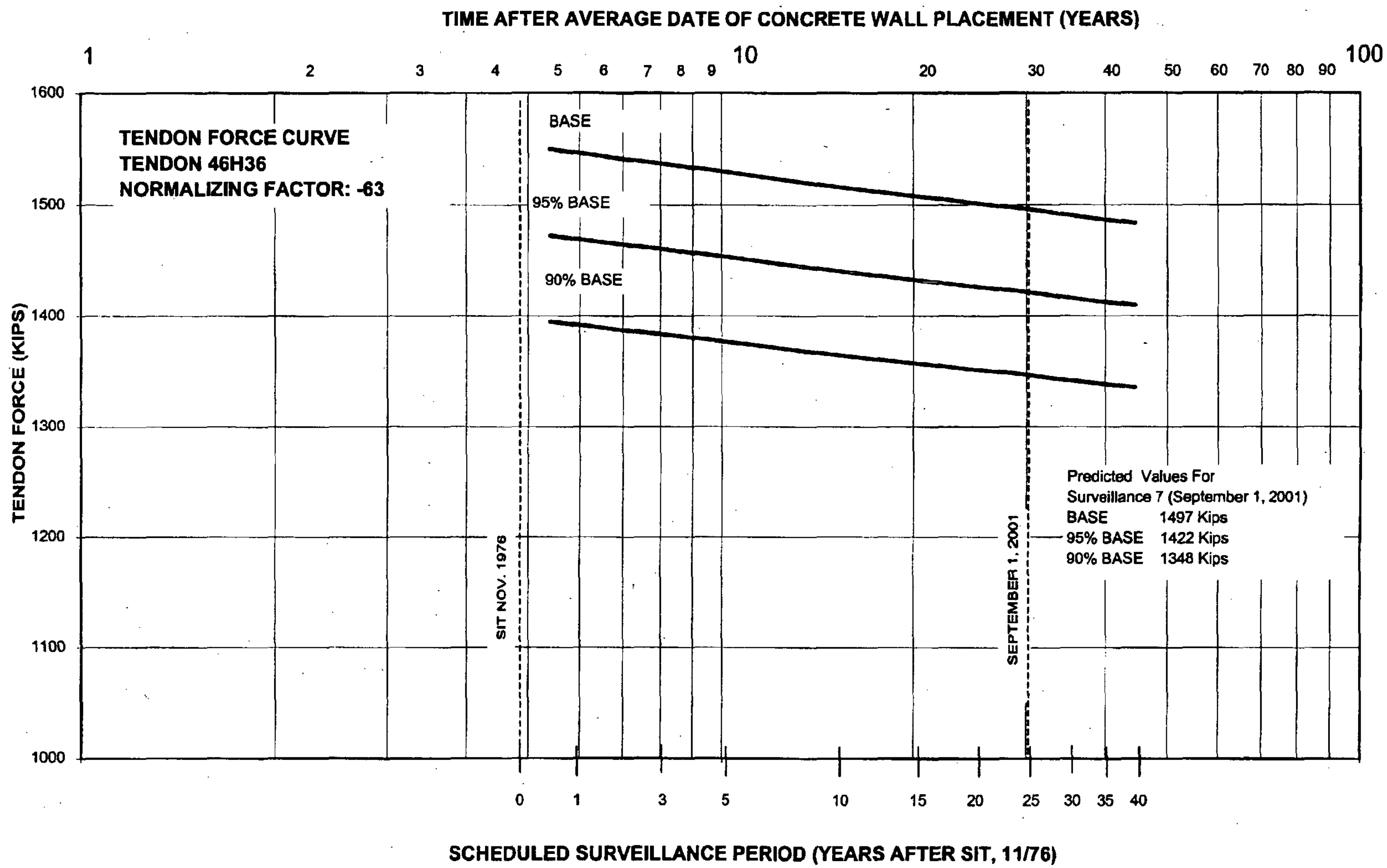
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET
FILE: HOOPR3.XLW (42H30)

TENDON: 46H36 INITIAL CONCRETE STRESS (PSI 1732

ORIGINAL FORCES (KIPS): SHOP: 1685 FIELD: 1670 AVERAGE: 1678 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 40 OF 60 TOTAL ELASTIC SHORT. LOSS 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	44.7	2.57%	42.0	0.090	39.5	6.0	1.7	127.9	7.62%	1550	1472	1395	-63
3	7.4	44.7	2.60%	42.5	0.110	48.5	8.5	2.4	138.1	8.23%	1540	1463	1386	-63
5	9.4	44.7	2.68%	43.8	0.123	54.1	10.0	2.8	145.4	8.66%	1532	1456	1379	-63
10	14.4	44.7	2.76%	45.1	0.150	66.0	13.5	3.8	159.6	9.51%	1518	1442	1366	-63
15	19.4	44.7	2.81%	45.9	0.167	73.6	15.5	4.4	168.5	10.05%	1509	1434	1358	-63
17	21.4	44.7									1506	1431	1356	
20	24.4	44.7	2.87%	46.9	0.181	79.0	17.5	4.9	175.5	10.46%	1502	1427	1352	-63
21:3	25.65	44.7									1501	1426	1351	
25	29.4	44.7	2.88%	47.1	0.190	83.2	19.5	5.5	180.5	10.76%	1497	1422	1348	-63
30	34.4	44.7	2.91%	47.6	0.200	88.0	20.4	5.8	186.0	11.09%	1492	1417	1343	-63
35	39.4	44.7	2.93%	47.9	0.209	91.9	21.5	6.1	190.5	11.36%	1487	1413	1338	-63
40	44.4	44.7	2.95%	48.2	0.215	94.7	22.5	6.4	193.9	11.56%	1484	1410	1335	-63
25	29.4										1497	1422	1348	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 46H36
NORMALIZING FACTOR: -63
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1497 Kips
95% BASE 1422 Kips
90% BASE 1348 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

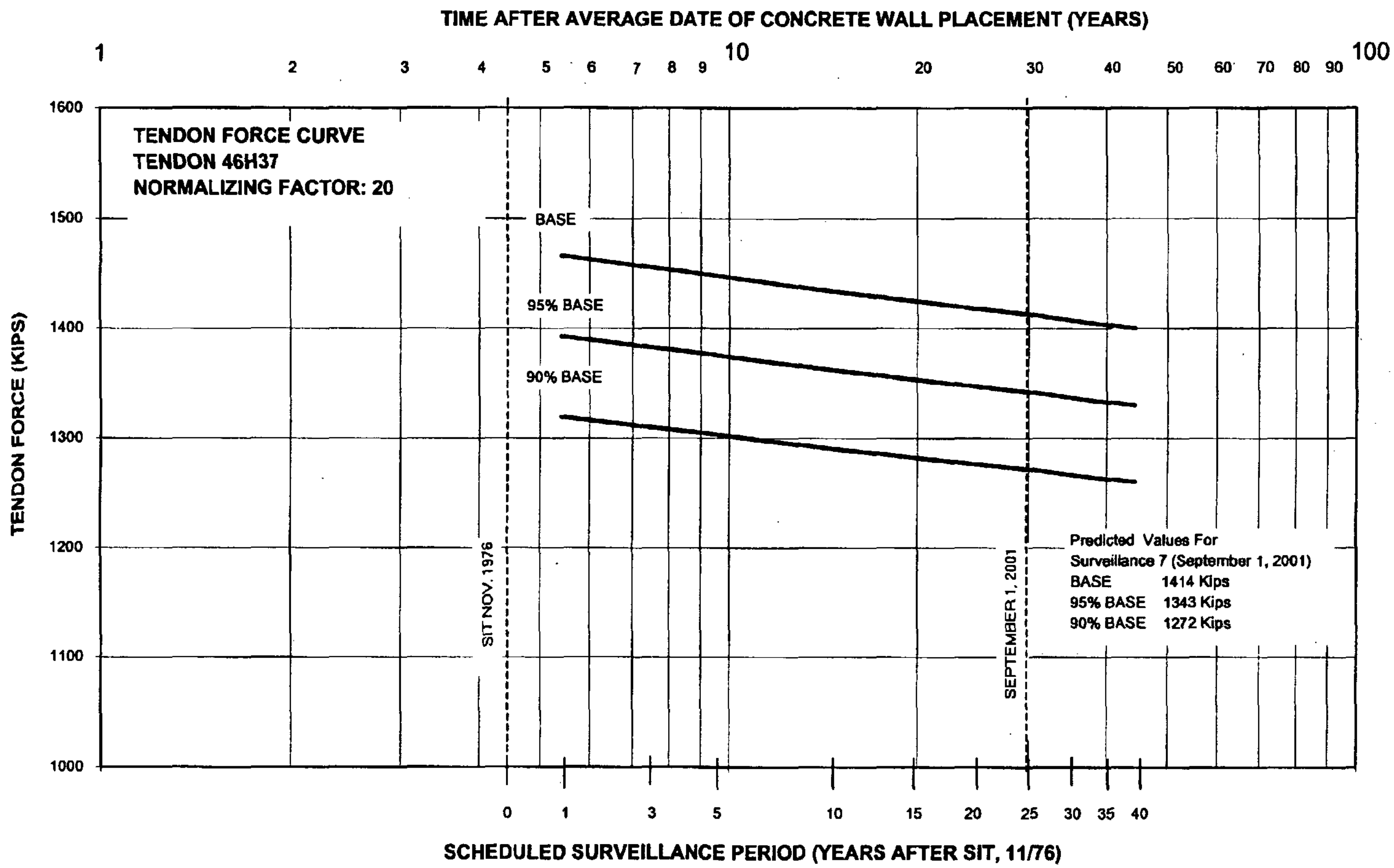
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 46H37 INITIAL CONCRETE STRESS (PSI) 1732

ORIGINAL FORCES (KIPS) SHOP: 1626 FIELD: 1588 AVERAGE: 1607 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 34 OF 60 TOTAL ELASTIC SHORT. LOSS 134.0 WIRE FACTOR: 0.988

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	57.4	2.57%	42.0	0.090	39.5	6.0	1.7	140.5	8.75%	1466	1393	1320	20
3	7.4	57.4	2.60%	42.5	0.110	48.5	8.5	2.4	150.8	9.38%	1456	1383	1310	20
5	9.4	57.4	2.68%	43.8	0.123	54.1	10.0	2.8	158.1	9.84%	1449	1376	1304	20
10	14.4	57.4	2.76%	45.1	0.150	66.0	13.5	3.8	172.3	10.72%	1435	1363	1291	20
15	19.4	57.4	2.81%	45.9	0.167	73.6	15.5	4.4	181.2	11.28%	1426	1354	1283	20
17	21.4	57.4									1423	1352	1281	
20	24.4	57.4	2.87%	46.9	0.181	79.0	17.5	4.9	188.2	11.71%	1419	1348	1277	20
21:3	25.65	57.4									1417	1346	1276	
25	29.4	57.4	2.88%	47.1	0.190	83.2	19.5	5.5	193.2	12.02%	1414	1343	1272	20
30	34.4	57.4	2.91%	47.6	0.200	88.0	20.4	5.8	198.7	12.37%	1408	1338	1267	20
35	39.4	57.4	2.93%	47.9	0.209	91.9	21.5	6.1	203.2	12.65%	1404	1333	1263	20
40	44.4	57.4	2.95%	48.2	0.215	94.7	22.5	6.4	206.6	12.86%	1400	1330	1260	20
25	29.4										1414	1343	1272	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H37
NORMALIZING FACTOR: 20
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1414 Kips
95% BASE 1343 Kips
90% BASE 1272 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

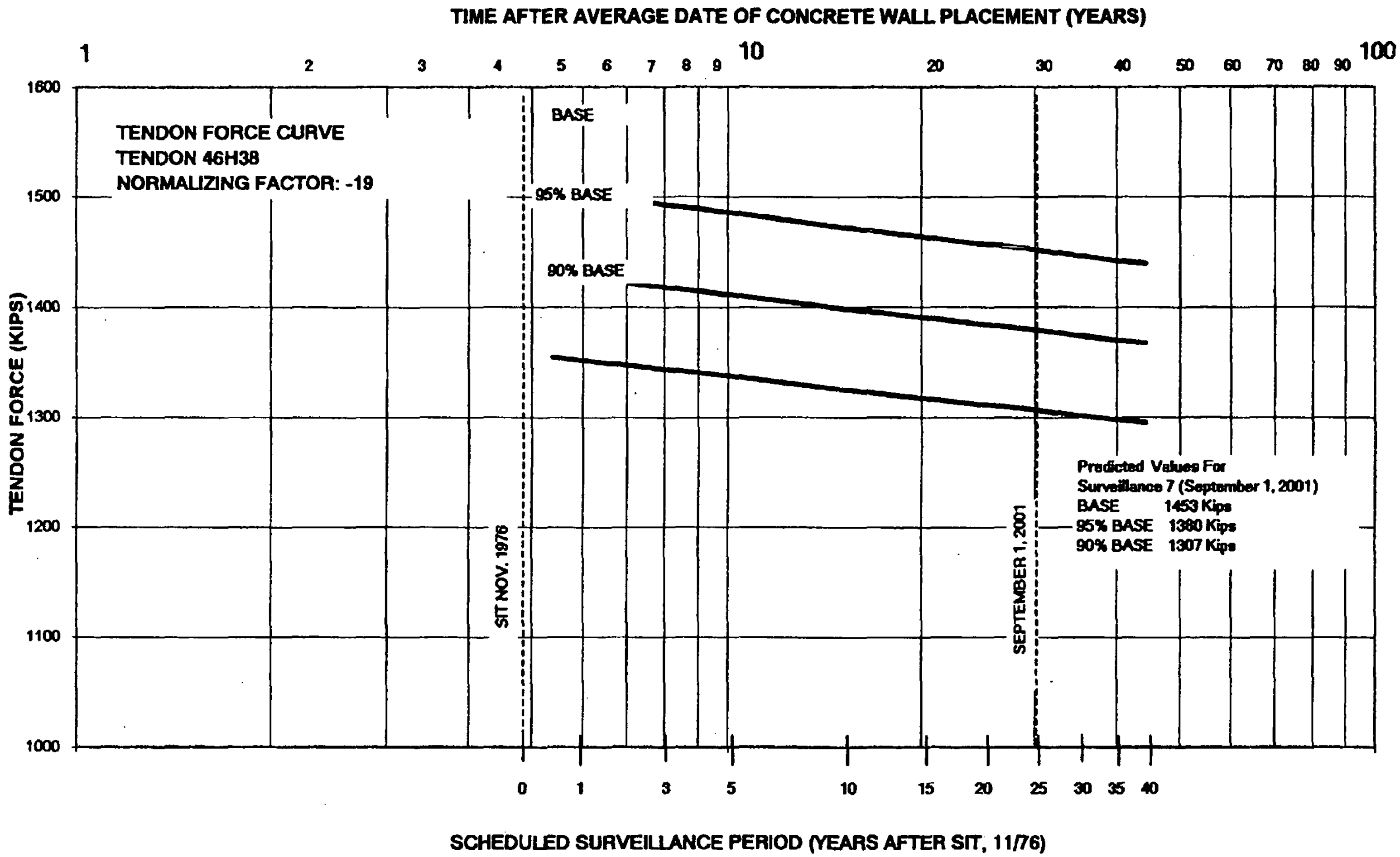
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET
FILE: HOOPR3.XLW (42H30)

TENDON: 46H39 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1648 FIELD: 1622 AVERAGE: 1635 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 39 OF 60 TOTAL ELASTIC SHORT. LOSS: 194.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE			TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)							
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)		(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	46.6	2.57%	42.0	0.090	39.5	6.0	1.7		129.8	7.94%	1505	1430	1355	-19
3	7.4	46.6	2.60%	42.5	0.110	48.5	8.5	2.4		140.0	8.56%	1495	1420	1345	-19
5	9.4	46.6	2.68%	43.8	0.123	54.1	10.0	2.8		147.3	9.01%	1488	1413	1339	-19
10	14.4	46.6	2.76%	45.1	0.150	66.0	13.5	3.8		161.5	9.88%	1473	1400	1326	-19
15	19.4	46.6	2.81%	45.9	0.167	73.6	15.5	4.4		170.5	10.43%	1464	1391	1318	-19
17	21.4	46.6										1462	1389	1316	
20	24.4	46.6	2.87%	46.9	0.181	79.0	17.5	4.9		177.5	10.85%	1457	1385	1312	-19
21.3	25.65	46.6										1456	1383	1311	
25	29.4	46.6	2.88%	47.1	0.190	83.2	19.5	5.5		182.4	11.16%	1453	1380	1307	-19
30	34.4	46.6	2.91%	47.6	0.200	88.0	20.4	5.8		188.0	11.50%	1447	1375	1302	-19
35	39.4	46.6	2.93%	47.9	0.209	91.9	21.5	6.1		192.5	11.77%	1442	1370	1298	-19
40	44.4	46.6	2.95%	48.2	0.215	94.7	22.5	6.4		195.9	11.98%	1439	1367	1295	-19
25	29.4											1453	1380	1307	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H38
NORMALIZING FACTOR: -19
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1453 Kips
95% BASE 1380 Kips
90% BASE 1307 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

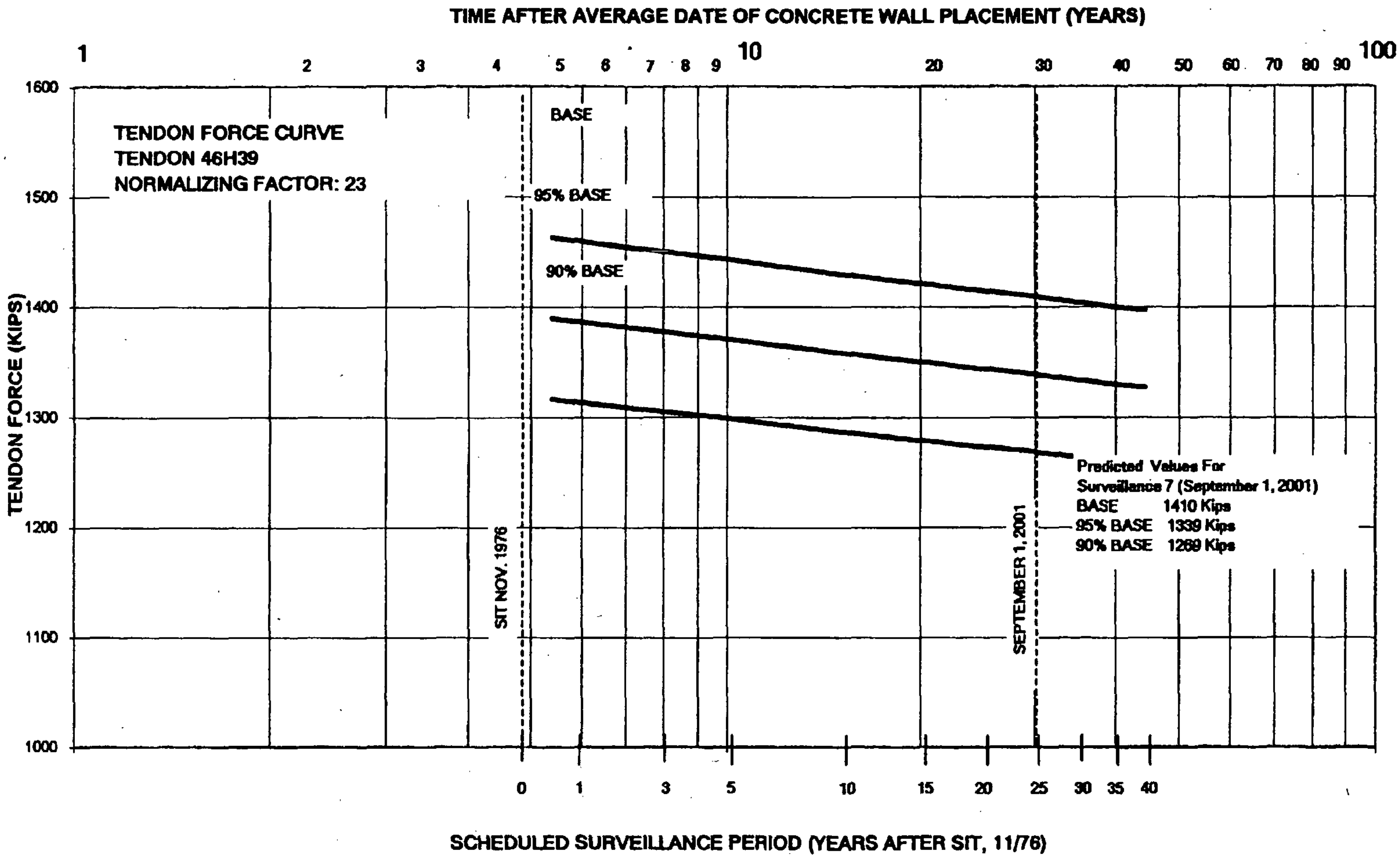
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET
FILE: HOOPR3.XLW (42H30)

TENDON: 46H39 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1590 FIELD: 1612 AVERAGE: 1601 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 35 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	55.5	2.57%	42.0	0.090	39.5	6.0	1.7	138.7	8.66%	1462	1389	1316	23
3	7.4	55.5	2.60%	42.5	0.110	48.5	8.5	2.4	148.9	9.30%	1452	1380	1307	23
5	9.4	55.5	2.68%	43.8	0.123	54.1	10.0	2.8	156.2	9.75%	1445	1373	1300	23
10	14.4	55.5	2.76%	45.1	0.150	66.0	13.5	3.8	170.4	10.64%	1431	1359	1288	23
15	19.4	55.5	2.81%	45.9	0.167	73.6	15.5	4.4	179.4	11.20%	1422	1351	1280	23
17	21.4	55.5									1419	1348	1277	
20	24.4	55.5	2.87%	46.9	0.181	79.0	17.5	4.9	186.3	11.64%	1415	1344	1273	23
21.3	25.65	55.5									1414	1343	1272	
25	29.4	55.5	2.88%	47.1	0.190	83.2	19.5	5.5	191.3	11.95%	1410	1339	1269	23
30	34.4	55.5	2.91%	47.6	0.200	88.0	20.4	5.8	196.8	12.29%	1404	1334	1264	23
35	39.4	55.5	2.93%	47.9	0.209	91.9	21.5	6.1	201.4	12.58%	1400	1330	1260	23
40	44.4	55.5	2.95%	48.2	0.215	94.7	22.5	6.4	204.7	12.79%	1396	1327	1257	23
25	29.4										1410	1339	1269	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H39
NORMALIZING FACTOR: 23
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1410 Kips
95% BASE 1339 Kips
90% BASE 1269 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

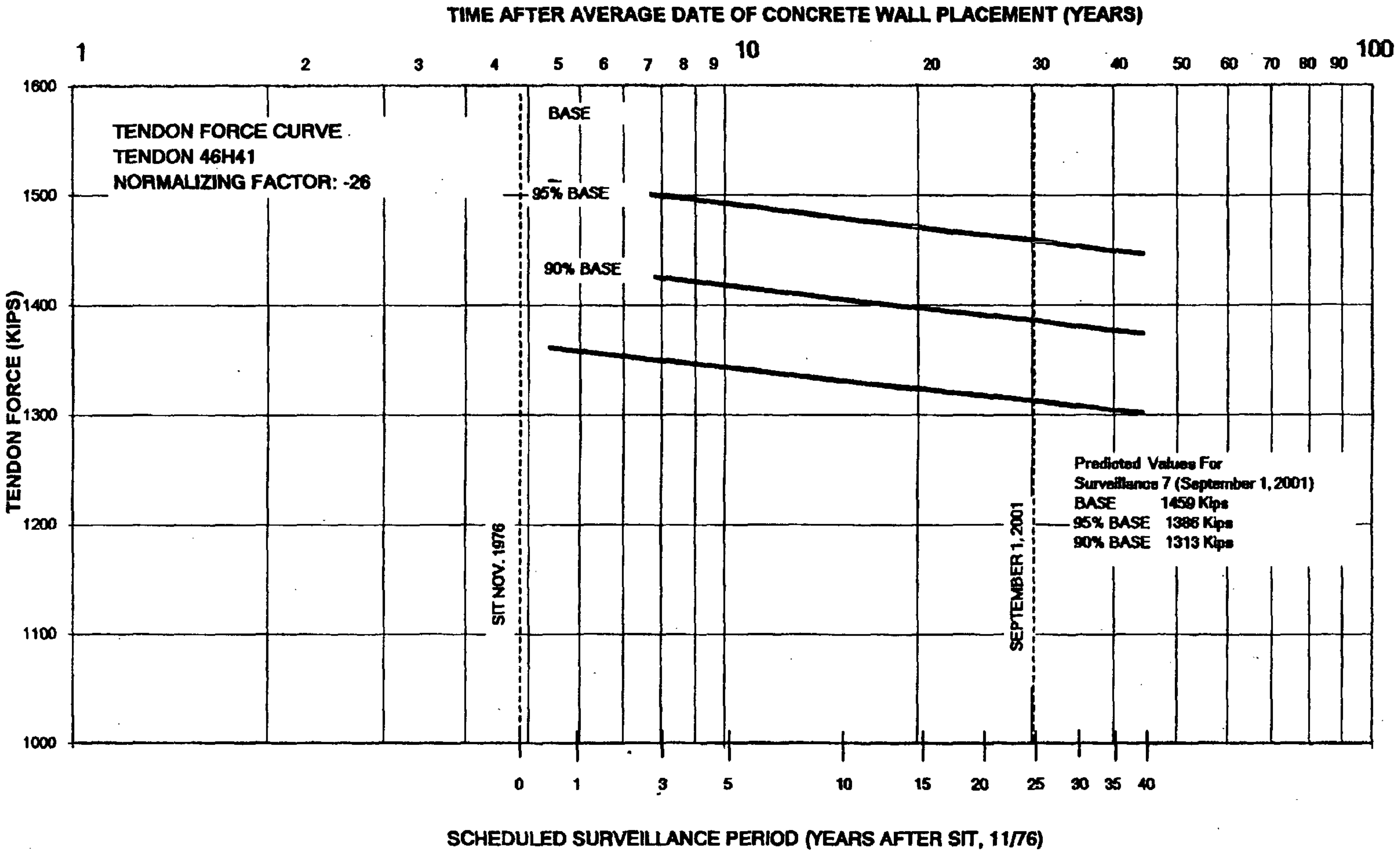
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET
FILE: HOOPR3.XLW (42H30)

TENDON: 46H41 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1651 FIELD: 1651 AVERAGE: 1651 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 35 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	in in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	55.8	2.57%	42.0	0.090	39.5	6.0	1.7	139.0	8.42%	1512	1436	1361	-26
3	7.4	55.8	2.60%	42.5	0.110	48.5	8.5	2.4	149.2	9.04%	1502	1427	1352	-26
5	9.4	55.8	2.68%	43.8	0.123	54.1	10.0	2.8	156.5	9.48%	1494	1420	1345	-26
10	14.4	55.8	2.76%	45.1	0.150	66.0	13.5	3.8	170.7	10.34%	1480	1406	1332	-26
15	19.4	55.8	2.81%	45.9	0.167	73.6	15.5	4.4	179.7	10.88%	1471	1398	1324	-26
17	21.4	55.8									1469	1395	1322	
20	24.4	55.8	2.87%	46.9	0.181	79.0	17.5	4.9	186.7	11.31%	1464	1391	1318	-26
21:3	25.65	55.8									1463	1390	1317	
25	29.4	55.8	2.88%	47.1	0.190	83.2	19.5	5.5	191.6	11.61%	1459	1386	1313	-26
30	34.4	55.8	2.91%	47.6	0.200	88.0	20.4	5.8	197.2	11.94%	1454	1381	1308	-26
35	39.4	55.8	2.93%	47.9	0.209	91.9	21.5	6.1	201.7	12.22%	1449	1377	1304	-26
40	44.4	55.8	2.95%	48.2	0.215	94.7	22.5	6.4	205.1	12.42%	1446	1374	1301	-26
25	29.4										1459	1386	1313	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H41
NORMALIZING FACTOR: -26
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1459 Kips
95% BASE 1386 Kips
90% BASE 1313 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

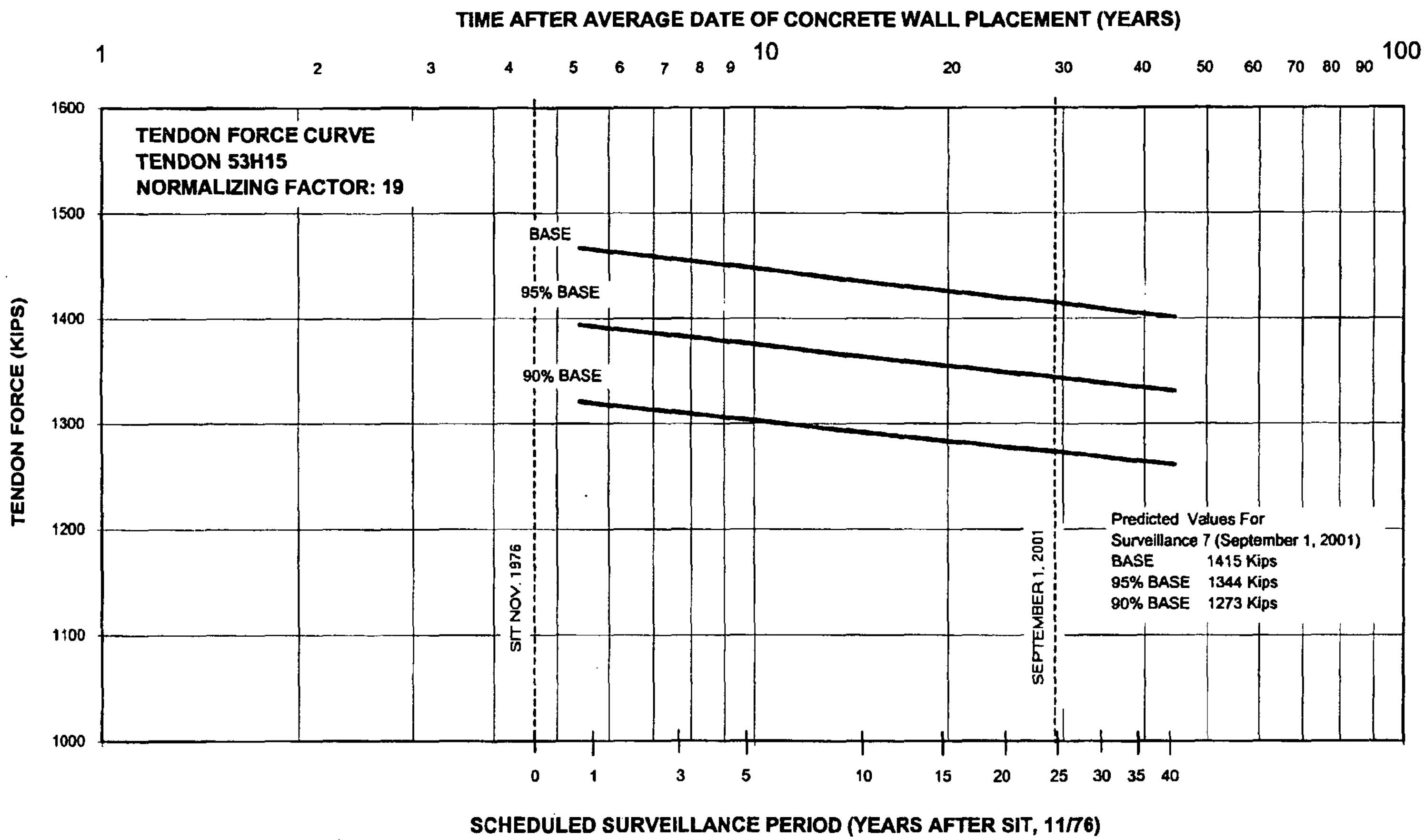
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 53H15 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1651 FIELD: 1651 AVERAGE: 1651 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 15 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	100.5	2.57%	42.0	0.090	39.5	6.0	1.7	183.7	11.13%	1467	1394	1321	19
3	7.4	100.5	2.60%	42.5	0.110	48.5	8.5	2.4	193.9	11.74%	1457	1384	1311	19
5	9.4	100.5	2.68%	43.8	0.123	54.1	10.0	2.8	201.2	12.19%	1450	1377	1305	19
10	14.4	100.5	2.76%	45.1	0.150	66.0	13.5	3.8	215.4	13.05%	1436	1364	1292	19
15	19.4	100.5	2.81%	45.9	0.167	73.6	15.5	4.4	224.4	13.59%	1427	1355	1284	19
17	21.4	100.5									1424	1353	1281	
20	24.4	100.5	2.87%	46.9	0.181	79.0	17.5	4.9	231.3	14.01%	1420	1349	1278	19
21:3	25.65	100.5									1418	1348	1277	
25	29.4	100.5	2.88%	47.1	0.190	83.2	19.5	5.5	236.3	14.31%	1415	1344	1273	19
30	34.4	100.5	2.91%	47.6	0.200	88.0	20.4	5.8	241.9	14.65%	1409	1339	1268	19
35	39.4	100.5	2.93%	47.9	0.209	91.9	21.5	6.1	246.4	14.92%	1405	1334	1264	19
40	44.4	100.5	2.95%	48.2	0.215	94.7	22.5	6.4	249.8	15.13%	1401	1331	1261	19
25	29.4										1415	1344	1273	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 53H15
NORMALIZING FACTOR: 19
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1415 Kips
95% BASE 1344 Kips
90% BASE 1273 Kips
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

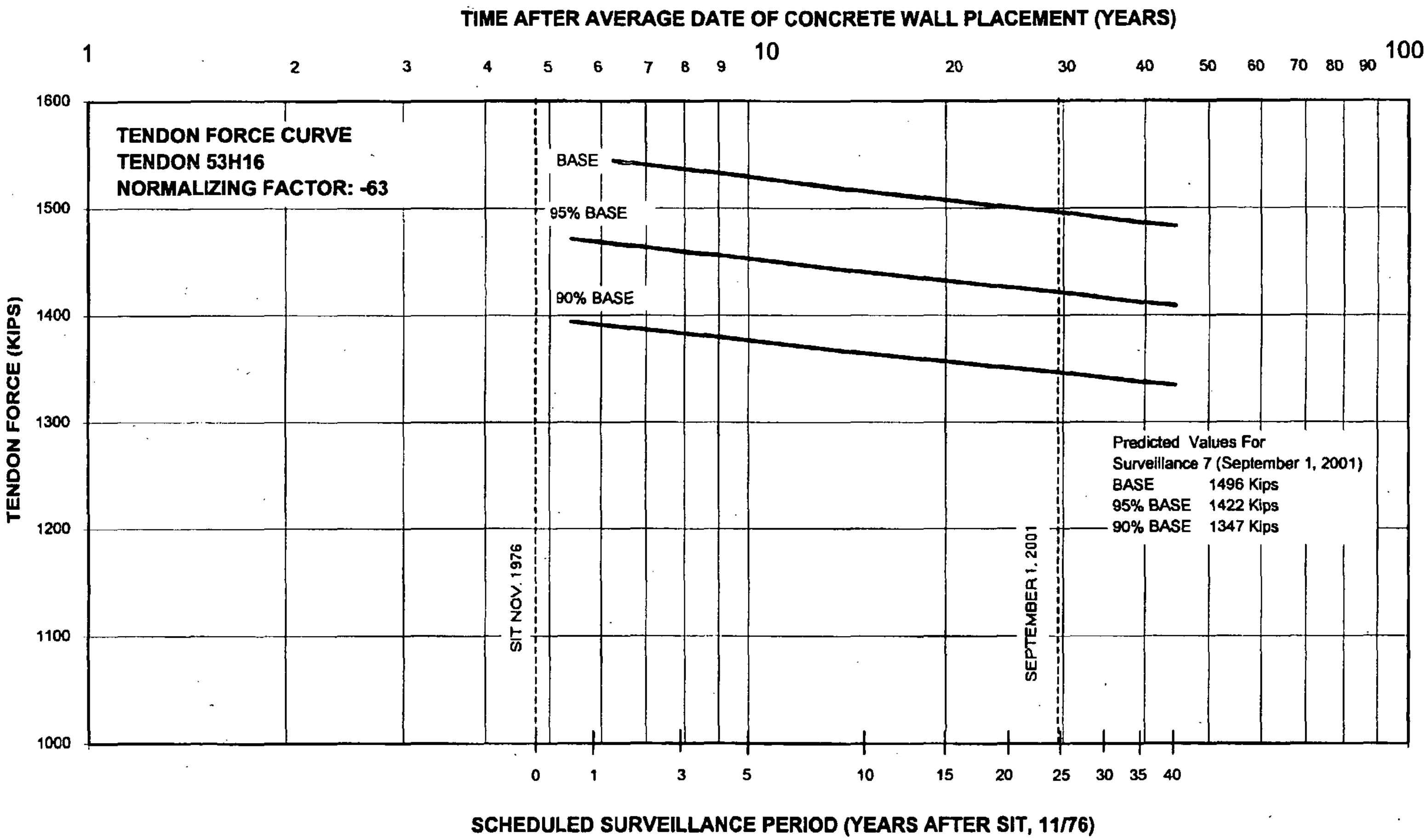
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 53H16 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1665 FIELD: 1612 AVERAGE: 1639 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 57 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	6.7	2.57%	42.0	0.090	39.5	6.0	1.7	89.9	5.48%	1549	1472	1394	-63
3	7.4	6.7	2.60%	42.5	0.110	48.5	8.5	2.4	100.1	6.11%	1539	1462	1385	-63
5	9.4	6.7	2.68%	43.8	0.123	54.1	10.0	2.8	107.4	6.55%	1531	1455	1378	-63
10	14.4	6.7	2.76%	45.1	0.150	66.0	13.5	3.8	121.6	7.42%	1517	1441	1366	-63
15	19.4	6.7	2.81%	45.9	0.167	73.6	15.5	4.4	130.6	7.97%	1508	1433	1357	-63
17	21.4	6.7									1506	1430	1355	
20	24.4	6.7	2.87%	46.9	0.181	79.0	17.5	4.9	137.5	8.39%	1501	1426	1351	-63
21:3	25.65	6.7									1500	1425	1350	
25	29.4	6.7	2.88%	47.1	0.190	83.2	19.5	5.5	142.5	8.69%	1496	1422	1347	-63
30	34.4	6.7	2.91%	47.6	0.200	88.0	20.4	5.8	148.1	9.03%	1491	1416	1342	-63
35	39.4	6.7	2.93%	47.9	0.209	91.9	21.5	6.1	152.6	9.31%	1486	1412	1338	-63
40	44.4	6.7	2.95%	48.2	0.215	94.7	22.5	6.4	156.0	9.52%	1483	1409	1335	-63
25	29.4										1496	1422	1347	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 53H16
NORMALIZING FACTOR: -63
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1496 Kips
95% BASE 1422 Kips
90% BASE 1347 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

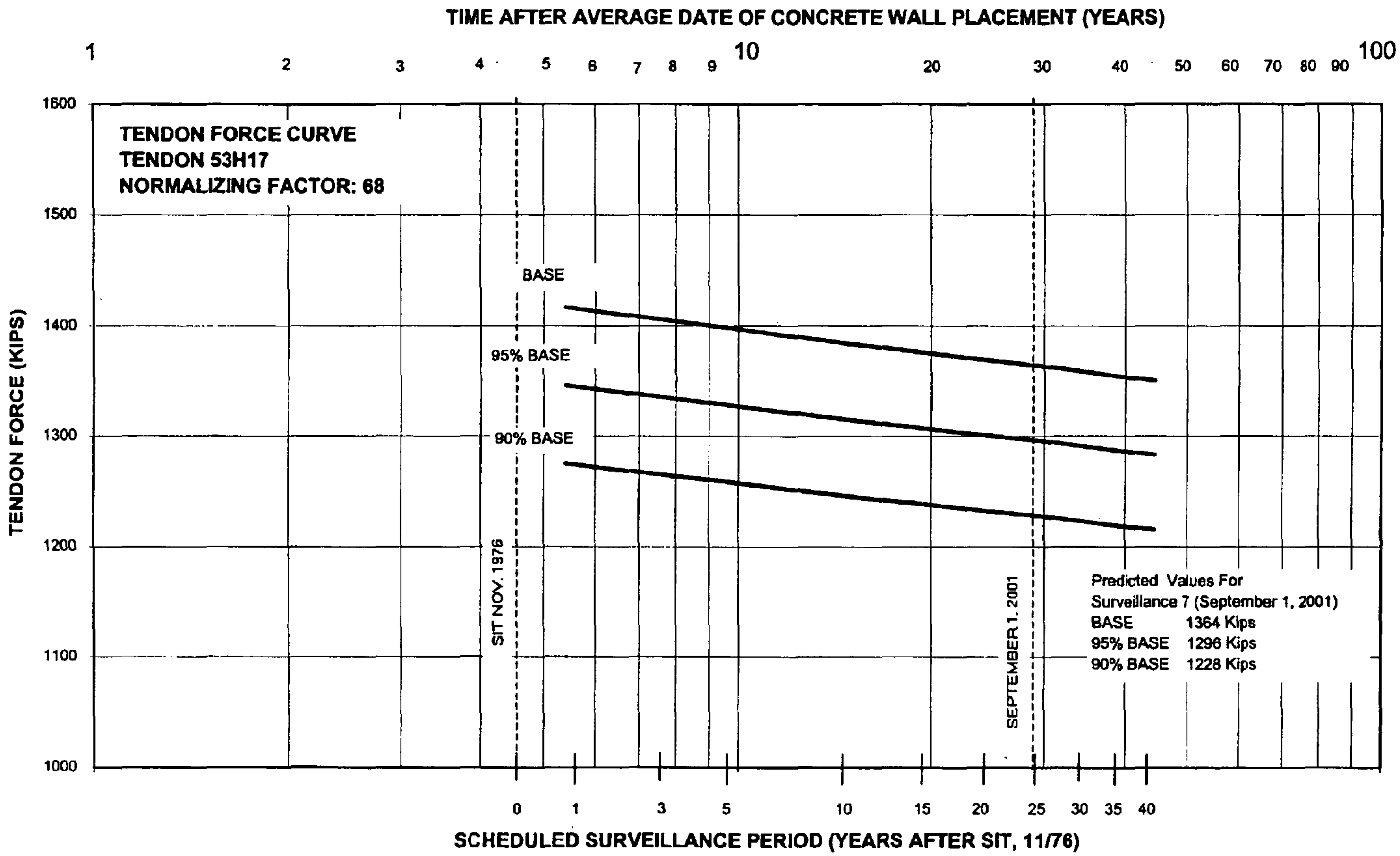
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 53H17 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1615 FIELD: 1591 AVERAGE: 1603 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 14 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT. (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	102.7	2.57%	42.0	0.090	39.5	6.0	1.7	185.9	11.60%	1417	1346	1275	68
3	7.4	102.7	2.60%	42.5	0.110	48.5	8.5	2.4	196.1	12.24%	1407	1336	1266	68
5	9.4	102.7	2.68%	43.8	0.123	54.1	10.0	2.8	203.4	12.69%	1399	1329	1259	68
10	14.4	102.7	2.76%	45.1	0.150	66.0	13.5	3.8	217.6	13.58%	1385	1316	1247	68
15	19.4	102.7	2.81%	45.9	0.167	73.6	15.5	4.4	226.6	14.14%	1376	1307	1238	68
17	21.4	102.7									1373	1305	1236	
20	24.4	102.7	2.87%	46.9	0.181	79.0	17.5	4.9	233.6	14.57%	1369	1301	1232	68
21:3	25.65	102.7									1368	1299	1231	
25	29.4	102.7	2.88%	47.1	0.190	83.2	19.5	5.5	238.5	14.88%	1364	1296	1228	68
30	34.4	102.7	2.91%	47.6	0.200	88.0	20.4	5.8	244.1	15.23%	1359	1291	1223	68
35	39.4	102.7	2.93%	47.9	0.209	91.9	21.5	6.1	248.6	15.51%	1354	1286	1219	68
40	44.4	102.7	2.95%	48.2	0.215	94.7	22.5	6.4	252.0	15.72%	1351	1283	1216	68
25	29.4										1364	1296	1228	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 53H17
NORMALIZING FACTOR: 68
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1364 Kips
95% BASE 1296 Kips
90% BASE 1228 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

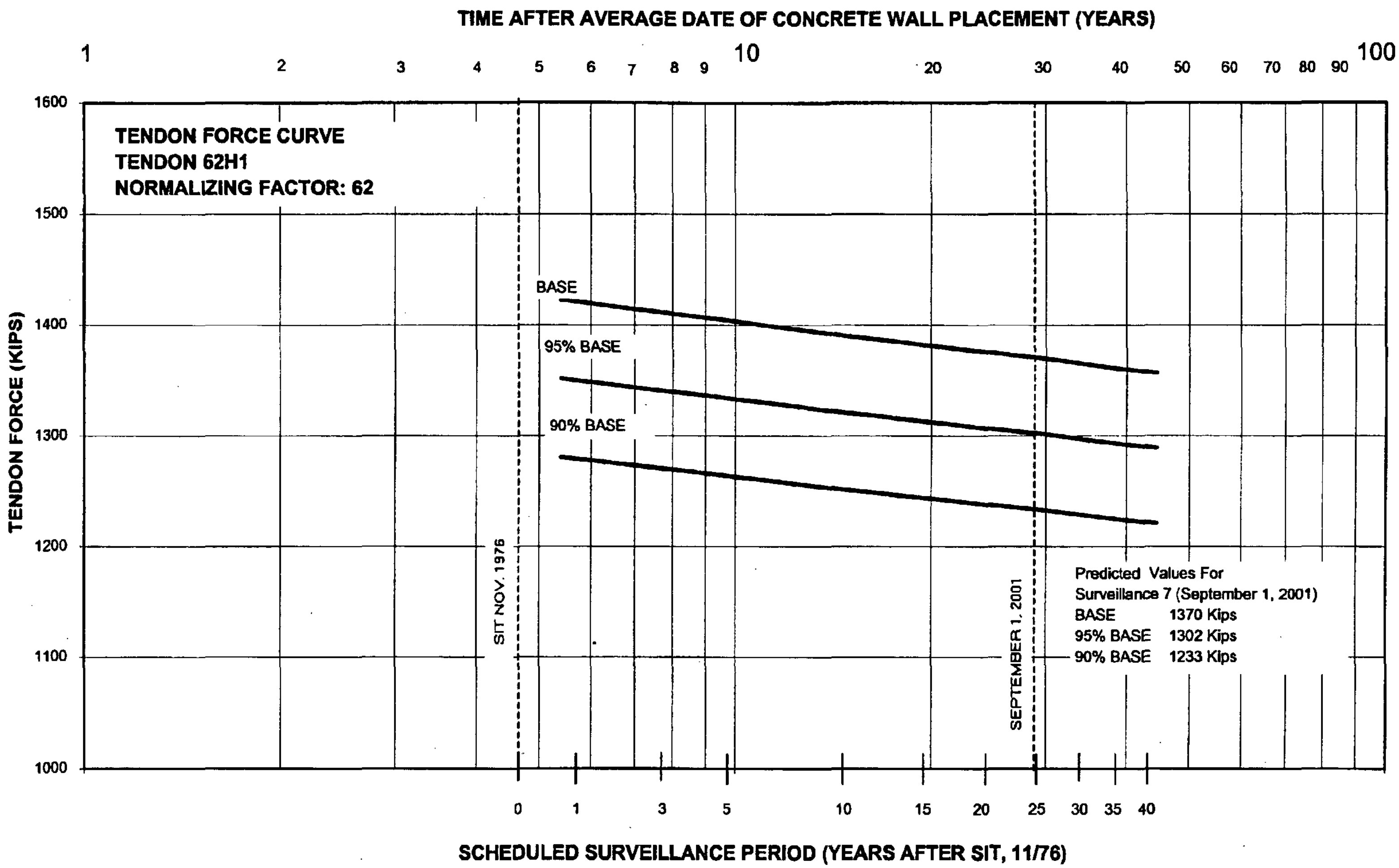
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 62H1 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1593 FIELD: 1593 AVERAGE: 1593 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 21 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	86.6	2.57%	42.0	0.090	39.5	6.0	1.7	169.8	10.66%	1423	1352	1281	62
3	7.4	86.6	2.60%	42.5	0.110	48.5	8.5	2.4	180.0	11.30%	1413	1342	1272	62
5	9.4	86.6	2.68%	43.8	0.123	54.1	10.0	2.8	187.3	11.76%	1406	1335	1265	62
10	14.4	86.6	2.76%	45.1	0.150	66.0	13.5	3.8	201.5	12.65%	1391	1322	1252	62
15	19.4	86.6	2.81%	45.9	0.167	73.6	15.5	4.4	210.4	13.21%	1382	1313	1244	62
17	21.4	86.6									1380	1311	1242	
20	24.4	86.6	2.87%	46.9	0.181	79.0	17.5	4.9	217.4	13.65%	1375	1307	1238	62
21:3	25.65	86.6									1374	1305	1237	
25	29.4	86.6	2.88%	47.1	0.190	83.2	19.5	5.5	222.4	13.96%	1370	1302	1233	62
30	34.4	86.6	2.91%	47.6	0.200	88.0	20.4	5.8	227.9	14.31%	1365	1297	1228	62
35	39.4	86.6	2.93%	47.9	0.209	91.9	21.5	6.1	232.4	14.59%	1360	1292	1224	62
40	44.4	86.6	2.95%	48.2	0.215	94.7	22.5	6.4	235.8	14.80%	1357	1289	1221	62
25	29.4										1370	1302	1233	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H1
NORMALIZING FACTOR: 62
TENDON FORCE (KIPS)
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1370 Kips
95% BASE 1302 Kips
90% BASE 1233 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

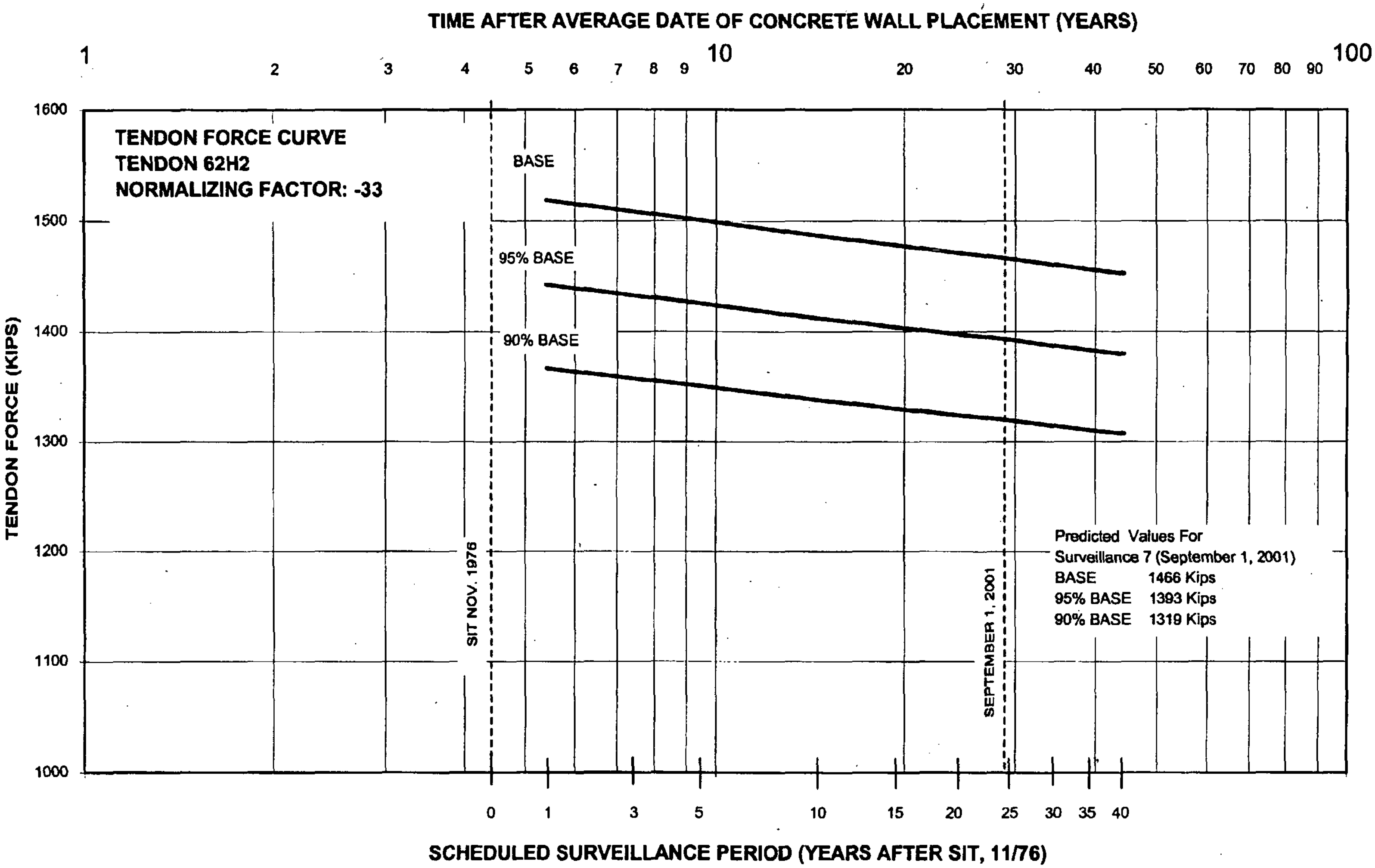
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 62H2 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1615 FIELD: 1651 AVERAGE: 1633 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 46 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	STRESS RELAXATION FORCE (KIPS)	CREEP SP. CR. (*.0001)	CREEP FORCE (KIPS)	SHRINKAGE m in/in	SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	31.3	2.57%	42.0	0.090	39.5	6.0	1.7	114.5	7.01%	1518	1443	1367	-33
3	7.4	31.3	2.60%	42.5	0.110	48.5	8.5	2.4	124.7	7.63%	1508	1433	1357	-33
5	9.4	31.3	2.68%	43.8	0.123	54.1	10.0	2.8	132.0	8.08%	1501	1426	1351	-33
10	14.4	31.3	2.76%	45.1	0.150	66.0	13.5	3.8	146.2	8.95%	1487	1412	1338	-33
15	19.4	31.3	2.81%	45.9	0.167	73.6	15.5	4.4	155.1	9.50%	1478	1404	1330	-33
17	21.4	31.3									1475	1401	1328	
20	24.4	31.3	2.87%	46.9	0.181	79.0	17.5	4.9	162.1	9.93%	1471	1397	1324	-33
21:3	25.65	31.3									1470	1396	1323	
25	29.4	31.3	2.88%	47.1	0.190	83.2	19.5	5.5	167.1	10.23%	1466	1393	1319	-33
30	34.4	31.3	2.91%	47.6	0.200	88.0	20.4	5.8	172.6	10.57%	1460	1387	1314	-33
35	39.4	31.3	2.93%	47.9	0.209	91.9	21.5	6.1	177.1	10.85%	1456	1383	1310	-33
40	44.4	31.3	2.95%	48.2	0.215	94.7	22.5	6.4	180.5	11.05%	1452	1380	1307	-33
25	29.4										1466	1393	1319	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H2
NORMALIZING FACTOR: -33
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1466 Kips
95% BASE 1393 Kips
90% BASE 1319 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

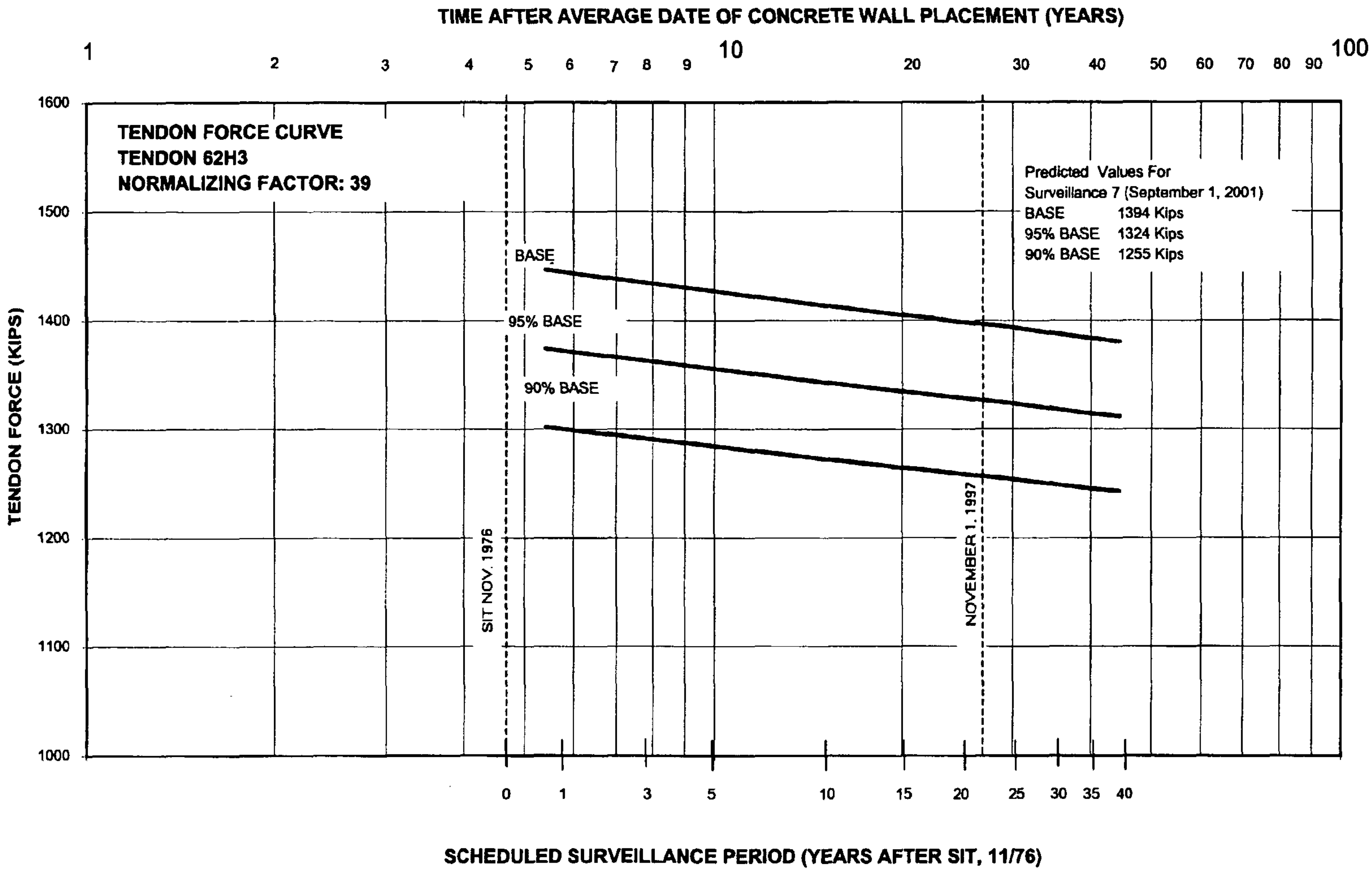
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 62H3 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1615 FIELD: 1615 AVERAGE: 1615 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 22 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE			TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)							
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	84.9	2.57%	42.0	0.090	39.5	6.0	1.7	168.1	10.41%	1447	1374	1302	39
3	7.4	84.9	2.60%	42.5	0.110	48.5	8.5	2.4	178.3	11.04%	1436	1365	1293	39
5	9.4	84.9	2.68%	43.8	0.123	54.1	10.0	2.8	185.6	11.49%	1429	1358	1286	39
10	14.4	84.9	2.76%	45.1	0.150	66.0	13.5	3.8	199.8	12.37%	1415	1344	1273	39
15	19.4	84.9	2.81%	45.9	0.167	73.6	15.5	4.4	208.7	12.93%	1406	1336	1265	39
17	21.4	84.9									1403	1333	1263	
20	24.4	84.9	2.87%	46.9	0.181	79.0	17.5	4.9	215.7	13.36%	1399	1329	1259	39
21:3	25.65	84.9									1398	1328	1258	
25	29.4	84.9	2.88%	47.1	0.190	83.2	19.5	5.5	220.7	13.67%	1394	1324	1255	39
30	34.4	84.9	2.91%	47.6	0.200	88.0	20.4	5.8	226.2	14.01%	1389	1319	1250	39
35	39.4	84.9	2.93%	47.9	0.209	91.9	21.5	6.1	230.7	14.29%	1384	1315	1246	39
40	44.4	84.9	2.95%	48.2	0.215	94.7	22.5	6.4	234.1	14.50%	1381	1312	1243	39
25	29.4										1394	1324	1255	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H3
NORMALIZING FACTOR: 39
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1394 Kips
95% BASE 1324 Kips
90% BASE 1255 Kips
BASE
95% BASE
90% BASE
SIT NOV. 1976
NOVEMBER 1, 1997
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

)))

CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE

HOOP TENDON LOSSES WORK SHEET

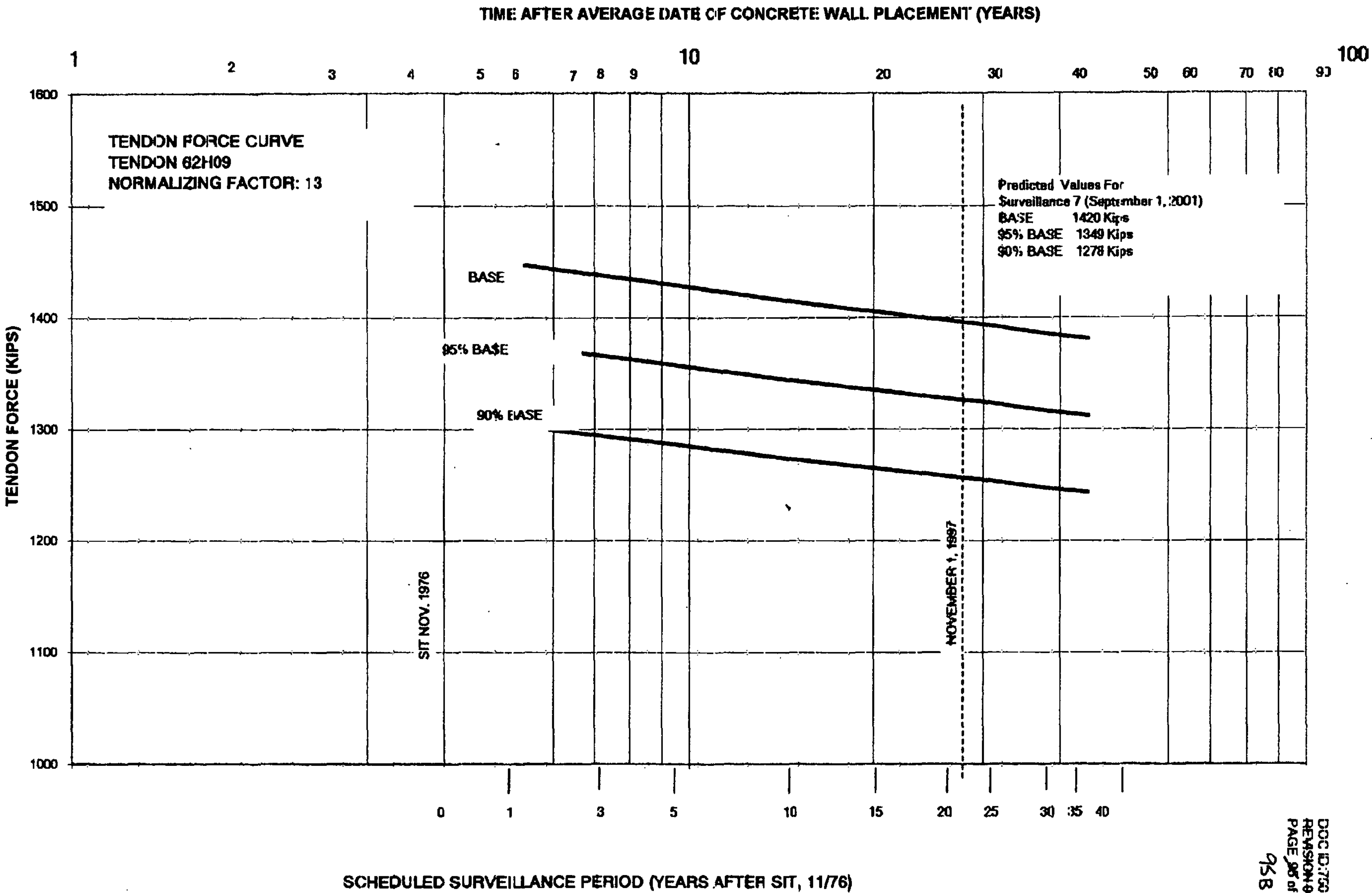
TENDON: 62H09 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1639 FIELD: 1639 AVERAGE: 1639 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 23 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	82.6	2.57%	42.0	0.090	39.5	6.0	1.7	165.8	10.12%	1473	1399	1326	13
3	7.4	82.6	2.60%	42.5	0.110	48.5	8.5	2.4	176.0	10.74%	1463	1390	1317	13
5	9.4	82.6	2.68%	43.8	0.123	54.1	10.0	2.8	183.3	11.19%	1456	1383	1310	13
10	14.4	82.6	2.76%	45.1	0.150	66.0	13.5	3.8	197.5	12.05%	1441	1369	1297	13
15	19.4	82.6	2.81%	45.9	0.167	73.6	15.5	4.4	206.5	12.60%	1432	1361	1289	13
17	21.4	82.6									1430	1358	1287	
20	24.4	82.6	2.87%	46.9	0.181	79.0	17.5	4.9	213.5	13.03%	1425	1354	1283	13
21:3	25.65	82.6									1424	1353	1282	
25	29.4	82.6	2.88%	47.1	0.190	83.2	19.5	5.5	218.4	13.33%	1420	1349	1278	13
30	34.4	82.6	2.91%	47.6	0.200	88.0	20.4	5.8	224.0	13.67%	1415	1344	1273	13
35	39.4	82.6	2.93%	47.9	0.209	91.9	21.5	6.1	228.5	13.94%	1410	1340	1269	13
40	44.4	82.6	2.95%	48.2	0.215	94.7	22.5	6.4	231.9	14.15%	1407	1337	1266	13
25	29.4										1420	1349	1278	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H09
NORMALIZING FACTOR: 13
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1420 Kips
95% BASE 1349 Kips
90% BASE 1278 Kips
BASE
95% BASE
90% BASE
SIT NOV. 1976
NOVEMBER 1, 1997
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

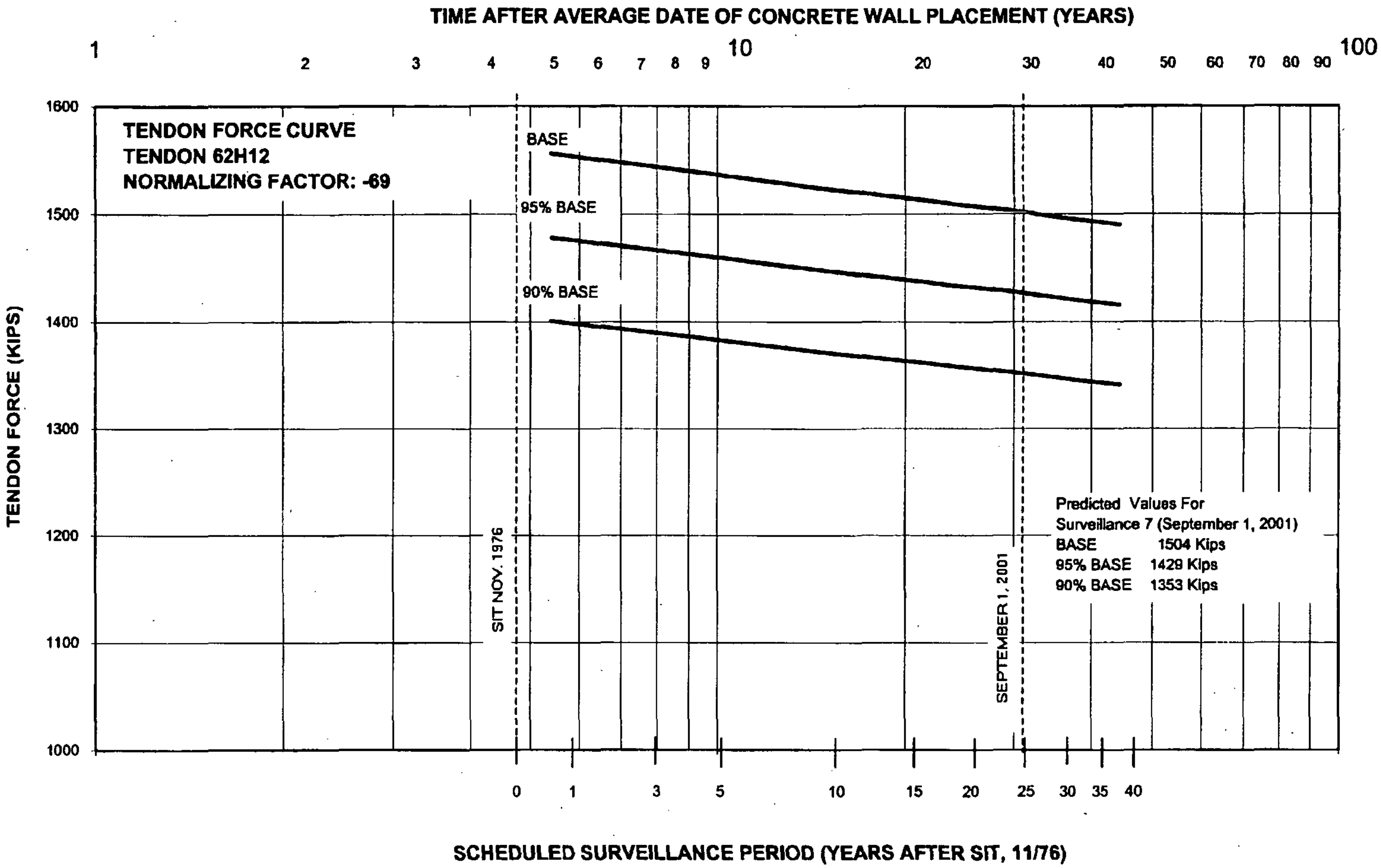
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 62H12 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1651 FIELD: 1700 AVERAGE: 1675 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 44 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	35.7	2.57%	42.0	0.090	39.5	6.0	1.7	118.9	7.10%	1556	1479	1401	-69
3	7.4	35.7	2.60%	42.5	0.110	48.5	8.5	2.4	129.1	7.71%	1546	1469	1392	-69
5	9.4	35.7	2.68%	43.8	0.123	54.1	10.0	2.8	136.4	8.14%	1539	1462	1385	-69
10	14.4	35.7	2.76%	45.1	0.150	66.0	13.5	3.8	150.6	8.99%	1525	1448	1372	-69
15	19.4	35.7	2.81%	45.9	0.167	73.6	15.5	4.4	159.6	9.53%	1516	1440	1364	-69
17	21.4	35.7									1513	1437	1362	
20	24.4	35.7	2.87%	46.9	0.181	79.0	17.5	4.9	166.6	9.94%	1509	1433	1358	-69
21:3	25.65	35.7									1507	1432	1357	
25	29.4	35.7	2.88%	47.1	0.190	83.2	19.5	5.5	171.5	10.24%	1504	1429	1353	-69
30	34.4	35.7	2.91%	47.6	0.200	88.0	20.4	5.8	177.1	10.57%	1498	1423	1348	-69
35	39.4	35.7	2.93%	47.9	0.209	91.9	21.5	6.1	181.6	10.84%	1494	1419	1344	-69
40	44.4	35.7	2.95%	48.2	0.215	94.7	22.5	6.4	185.0	11.04%	1490	1416	1341	-69
25	29.4										1504	1429	1353	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 62H12
NORMALIZING FACTOR: -69
BASE
95% BASE
90% BASE
1600 1500 1400 1300 1200 1100 1000
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1504 Kips
95% BASE 1429 Kips
90% BASE 1353 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

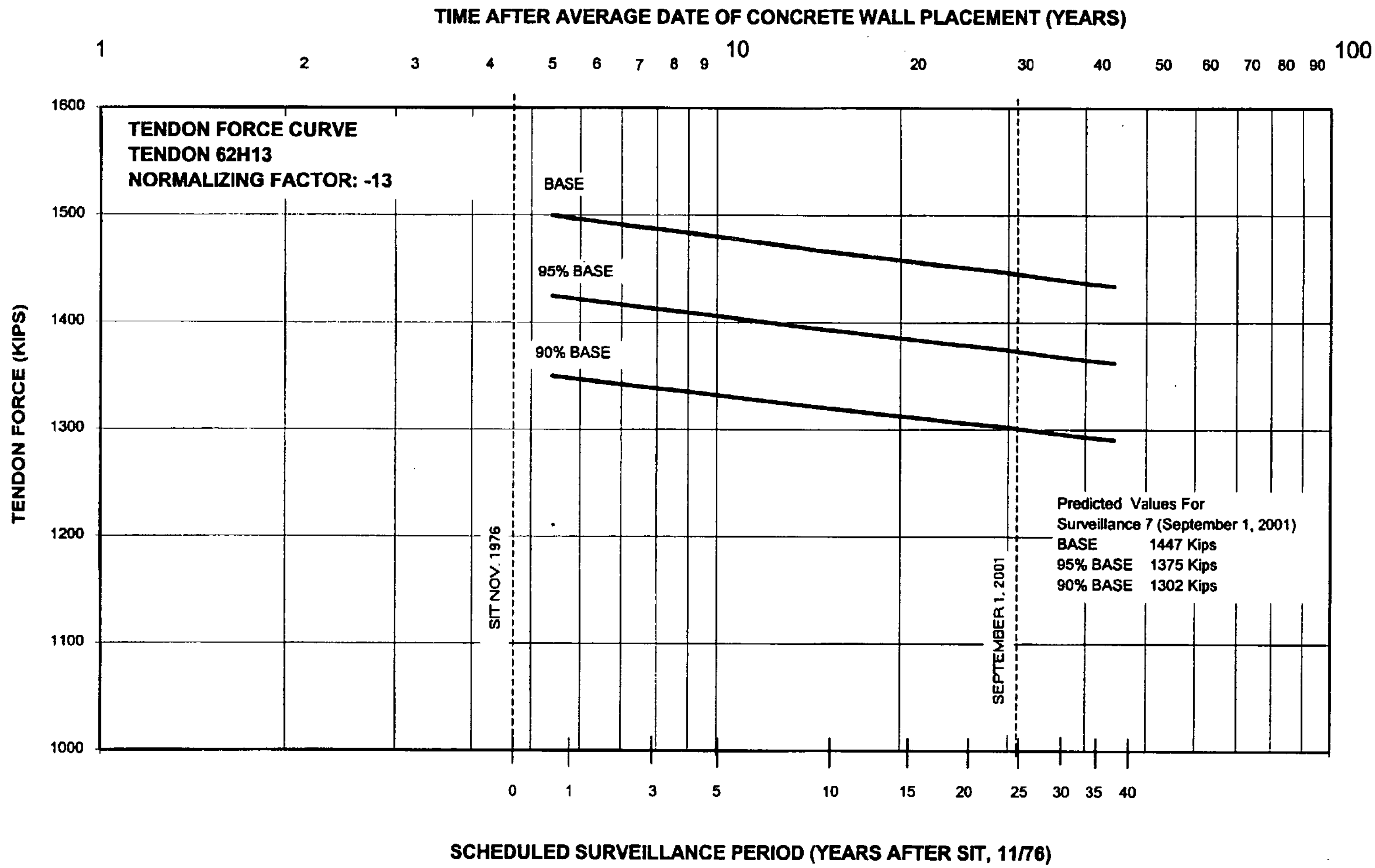
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 62H13 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1615 FIELD: 1712 AVERAGE: 1663 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 24 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	80.4	2.57%	42.0	0.090	39.5	6.0	1.7	163.6	9.84%	1500	1425	1350	-13
3	7.4	80.4	2.60%	42.5	0.110	48.5	8.5	2.4	173.8	10.45%	1490	1415	1341	-13
5	9.4	80.4	2.68%	43.8	0.123	54.1	10.0	2.8	181.1	10.89%	1482	1408	1334	-13
10	14.4	80.4	2.76%	45.1	0.150	66.0	13.5	3.8	195.3	11.74%	1468	1395	1321	-13
15	19.4	80.4	2.81%	45.9	0.167	73.6	15.5	4.4	204.3	12.28%	1459	1386	1313	-13
17	21.4	80.4									1456	1383	1311	
20	24.4	80.4	2.87%	46.9	0.181	79.0	17.5	4.9	211.2	12.70%	1452	1379	1307	-13
21:3	25.65	80.4									1451	1378	1306	
25	29.4	80.4	2.88%	47.1	0.190	83.2	19.5	5.5	216.2	13.00%	1447	1375	1302	-13
30	34.4	80.4	2.91%	47.6	0.200	88.0	20.4	5.8	221.8	13.33%	1442	1369	1297	-13
35	39.4	80.4	2.93%	47.9	0.209	91.9	21.5	6.1	226.3	13.60%	1437	1365	1293	-13
40	44.4	80.4	2.95%	48.2	0.215	94.7	22.5	6.4	229.7	13.81%	1434	1362	1290	-13
25	29.4										1447	1375	1302	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H13
NORMALIZING FACTOR: -13
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (September 1, 2001)
BASE 1447 Kips
95% BASE 1375 Kips
90% BASE 1302 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

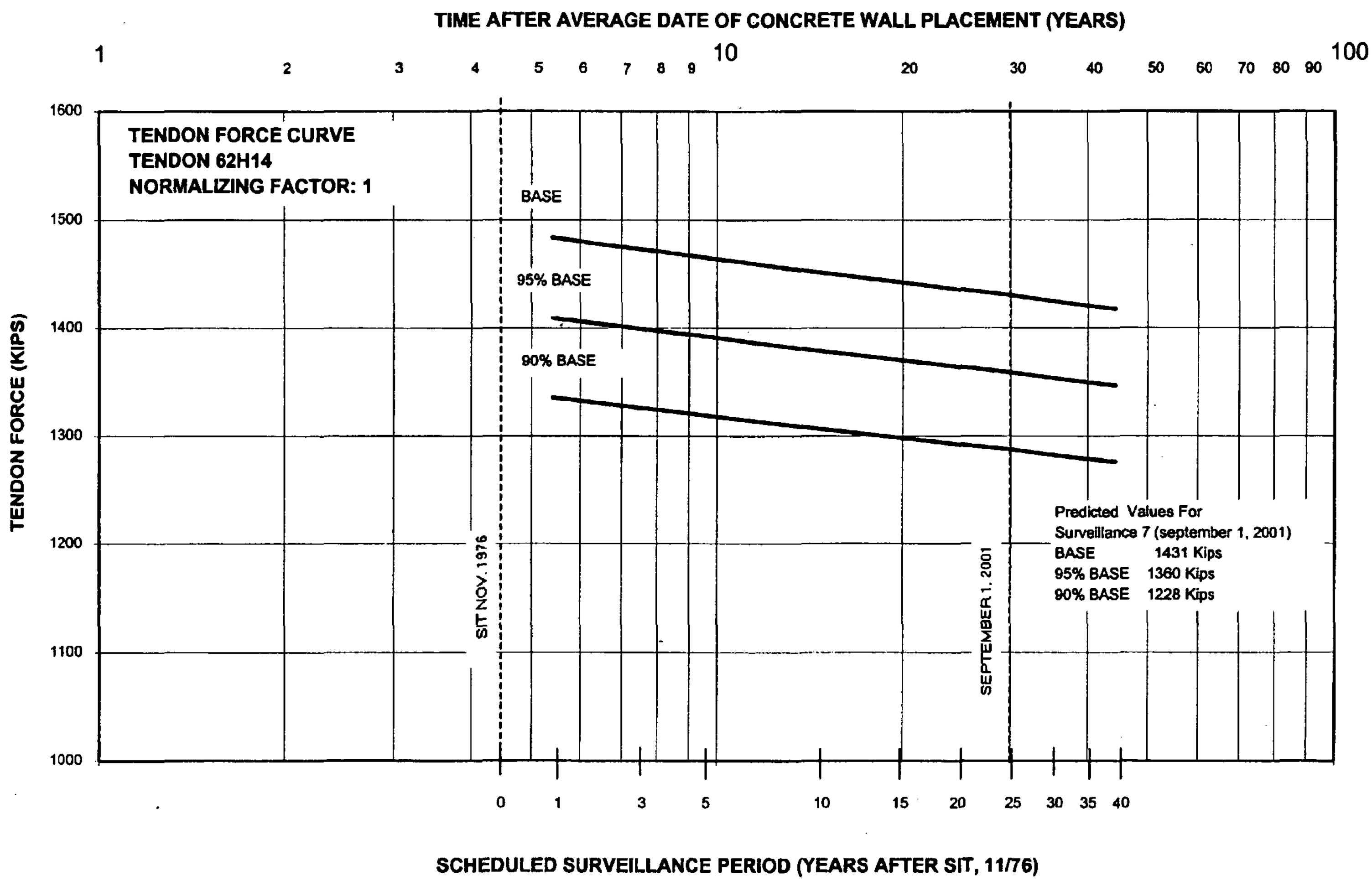
CRYSTAL RIVER 3 TENDON FORCE PREDICTION / NON INTERACTION LOSSES - 7th TENDON SURVEILLANCE
HOOP TENDON LOSSES WORK SHEET

TENDON: 62H14 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1603 FIELD: 1603 AVERAGE: 1603 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 44 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	35.7	2.57%	42.0	0.090	39.5	6.0	1.7	118.9	7.42%	1484	1410	1335	1
3	7.4	35.7	2.60%	42.5	0.110	48.5	8.5	2.4	129.1	8.06%	1474	1400	1326	1
5	9.4	35.7	2.68%	43.8	0.123	54.1	10.0	2.8	136.4	8.51%	1466	1393	1320	1
10	14.4	35.7	2.76%	45.1	0.150	66.0	13.5	3.8	150.6	9.40%	1452	1379	1307	1
15	19.4	35.7	2.81%	45.9	0.167	73.6	15.5	4.4	159.6	9.96%	1443	1371	1299	1
17	21.4	35.7									1440	1368	1296	
20	24.4	35.7	2.87%	46.9	0.181	79.0	17.5	4.9	166.6	10.39%	1436	1364	1292	1
21:3	25.65	35.7									1435	1363	1291	
25	29.4	35.7	2.88%	47.1	0.190	83.2	19.5	5.5	171.5	10.70%	1431	1360	1288	1
30	34.4	35.7	2.91%	47.6	0.200	88.0	20.4	5.8	177.1	11.05%	1426	1354	1283	1
35	39.4	35.7	2.93%	47.9	0.209	91.9	21.5	6.1	181.6	11.33%	1421	1350	1279	1
40	44.4	35.7	2.95%	48.2	0.215	94.7	22.5	6.4	185.0	11.54%	1418	1347	1276	1
25	29.4										1431	1360	1288	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H14
NORMALIZING FACTOR: 1
BASE
95% BASE
90% BASE
SIT NOV. 1976
SEPTEMBER 1, 2001
Predicted Values For
Surveillance 7 (september 1, 2001)
BASE 1431 Kips
95% BASE 1360 Kips
90% BASE 1228 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

ATTACHMENT A

TENDON HISTORY DATA SHEETS FOR THE 7TH SURVEILLANCE

DOCUMENT NO: N750-001
PAGE A2 OF A65

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D 120 CUT LENGTH ____

SHOP WASHER ID: PC ____ CR ____ FIELD WASHER ID: PC ____ CR ____

1. GAI/QA vendor inspection cover letter number-FPC # ____ DATE ____

2. Date tendon received on-site ____ RMR Number ____

3. Date installed in conduit ____ Installation NCR's ____

   Wires removed ____ Wires replaced ____ Total Ineffective wires ____

4. Date buttonheaded ____ Buttonheading NCR's ____

   Bad wires ____ Accept. Reheads ____ Total Ineffective wires ____

5. Date stressed ____ Stressing NCR's ____

   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ____ Total effective wires after stressing ____

6. Date Bulk-filled ____ Bulk-Filling NCR's ____

   Time since installation ____ Inlet Pressure ____ Outlet Temp. ____

   Date end caps refilled: Shop ____ Field ____

7. Data compiled by D. Walls Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair -

Degreasing - Shop End (7/16/76) Field End (7/17/76)

~~Detensioning~~ Lift off Pressure - Shop 6350 Field 5700 (7/17/76)

Regreasing - (11/24/76) 200 PSIG NCR 2582, 175° NCR 2581

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

DOCUMENT NO: N750-001
PAGE A3 OF A65

TENDON IDENTIFICATION NUMBER D121 CUT LENGTH 151'-5 7/8

SHOP WASHER ID: PC 121 CR 476 FIELD WASHER ID: PC 121 CR 613

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-20-74 RMR Number 38009

3. Date installed in conduit 5-7-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-26-74 Buttonheading NCR's

   Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 11-19-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8"/5 1/4"	5"/5"	10 1/8"/10 1/4"
Lift-Off Pressure - Predicted/Actual	6760 psi/6700 psi	6800 psi/6900 psi	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8"/7720	6 1/4"/7750	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's

   Time since installation 10 1/2 months Inlet Pressure 50 psi Outlet Temp. 138°

   Date end caps refilled: Shop 11-24-76 Field 11-24-76

7. Data compiled by D. Waller Organization Salem

   Date 7/30/77

8. Additional Comments:

SHEET 21A OF ______

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

DOCUMENT NO: N750-001
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TENDON IDENTIFICATION NUMBER D121 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Waller Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair –

Degreasing - Shop End (7/10/76) (7/27/76) Field End (7/10/76) (7/17/76)

~~Restressing~~ Lift off Pressure – Shop 5300 (7/10/76) 5200 (7/17/76) Field 6100 (7/17/76) 5900 (7/11/76)

Regreasing (11/24/76) 200 PSIG NCR 2582, 186° NCR 2581

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

DOCUMENT NO: N750-001
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TENDON IDENTIFICATION NUMBER D122 CUT LENGTH 151'-4¼

SHOP WASHER ID: PC 121 CR 990 FIELD WASHER ID: PC 122 CR 1185

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-20-74 RMR Number 38009

3. Date installed in conduit 5-7-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-26-74 Buttonheading NCR's

Bad wires 6 Accept. Reheads 6 Total Ineffective wires 0

5. Date stressed 12-2-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5⅛"/5⅛"	5⅛"/5⅜"	10¼"/10½"
Lift-Off Pressure - Predicted/Actual	6800 psi/7050 psi	6840 psi/6800 psi	N/A
Shim Thickness/80% Ultimate Pressure	7¼"/7770	7"/7790	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's 01870

Time since installation 10½ months Inlet Pressure 95# Outlet Temp. 122°

Date end caps refilled: Shop 11-24-76 Field 11-24-76

7. Data compiled by D. Waller Organization Salem

Date 3/30/77

8. Additional Comments: Lift off taken Simultaneously

DOCUMENT NO: N750-001
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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D122 CUT LENGTH ____

SHOP WASHER ID: PC ____ CR ____ FIELD WASHER ID: PC ____ CR ____

1. GAI/QA vendor inspection cover letter number-FPC # ____ DATE ____

2. Date tendon received on-site ____ RMR Number ____

3. Date installed in conduit ____ Installation NCR's ____

   Wires removed ____ Wires replaced ____ Total Ineffective wires ____

4. Date buttonheaded ____ Buttonheading NCR's ____

   Bad wires ____ Accept. Reheads ____ Total Ineffective wires ____

5. Date stressed ____ Stressing NCR's ____

   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ____ Total effective wires after stressing ____

6. Date Bulk-filled ____ Bulk-Filling NCR's ____

   Time since installation ____ Inlet Pressure ____ Outlet Temp. ____

   Date end caps refilled: Shop ____ Field ____

7. Data compiled by D. Waller Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair —

Degreasing - Shop End (7/16/76) Field End (7/17/76)

~~Detensioning~~ Lift off Pressure — Shop 6600 (7/16/76) Field 5900 (7/17/76)

Regreasing - (11/24/76) Shop 55 PSIG, 190° - 190° NCR # 2581

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. D122

Inspection Period and Date	Location	LIFT OFF CONDITION Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	RETENSIONING Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S	1699		7¼"	5 1/8"		N/A		N/A	N/A				
12/2/74	F	1629	1664	7"	5 3/8"	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Lift-Off	S	1580		N/A	N/A		N/A		N/A	N/A				1. Dome repair
7/16/76	F	1415	1498	N/A	N/A	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2nd	S	1628		7¼"	N/A		N/A		N/A	N/A				1. Lift-off only
5/2/80	F	1665	1647	7"	N/A	163	N/A	N/A	N/A	N/A	N/A	71	82	

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRE TRESSING SYSTEM
TENDON HISTORY

DOCUMENT NO: N750-001
PAGE A8 OF A65

TENDON IDENTIFICATION NUMBER D 123 CUT LENGTH 151'-0 3/8

SHOP WASHER ID: PC 131 CR 1008 FIELD WASHER ID: PC 131 CR 1109

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-20-74 RMR Number 38009

3. Date installed in conduit 5-7-74 Installation NCR's ______

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-26-74 Buttonheading NCR's 2144

Bad wires 10 Accept. Reheads 6 Total Ineffective wires 4

5. Date stressed 11-8-74 Stressing NCR's ______

Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5" / 5"	5" / 5 1/4	10" / 10 1/4"
Lift-Off Pressure - Predicted/Actual	6710 psi / 6800 psi	6640 psi / 6650 psi	N/A
Shim Thickness/80% Ultimate Pressure	6" / 7620 psi	6 1/4" / 7570 psi	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 159 162

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's ______

Time since installation 10 1/2 months Inlet Pressure 40 psi Outlet Temp. 125°

Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Waller Organization Salem

Date 3/30/77

8. Additional Comments: ______

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. D123

		LIFT OFF CONDITION					RETENSIONING							
Inspection Period and Date	Location	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S	1620		6"	5"		N/A		N/A	N/A				
11/8/74	F	1601	1611	6¼"	5¼"	159	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3rd	S	1358		6"	N/A		N/A		6"	N/A				1. 3 ineffective wires still holding
11/4/81	F	1249	1304	6¼"	N/A	162	N/A	N/A	6¼"	N/A	162	77	78	2. Lift-off only

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRE STRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D124 CUT LENGTH 150'-6 1/2

SHOP WASHER ID: PC 121 CR 993 FIELD WASHER ID: PC 114 CR 1

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-20-74 RMR Number 38009

3. Date installed in conduit 5-7-74 Installation NCR's ____

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-25-74 Buttonheading NCR's ____

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 12-5-74 Stressing NCR's ____

   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5"/5 1/8"	5"/5 1/8"	10"/10 1/4"
Lift-Off Pressure - Predicted/Actual	6800psi/6900psi	6840psi/6700psi	N/A
Shim Thickness/80% Ultimate Pressure	7"/7770	6 1/4"/7790	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's ____

   Time since installation 10 1/2 months Inlet Pressure 50 psi Outlet Temp. 125°

   Date end caps refilled: Shop ____ Field ____

7. Data compiled by D. Waller Organization Salem

   Date 3/30/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D 125 CUT LENGTH 149'-9 3/4

SHOP WASHER ID: PC 121 CR 968 FIELD WASHER ID: PC 121 CR 985

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38029

3. Date installed in conduit 5-8-74 Installation NCR's ____

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-25-74 Buttonheading NCR's ____

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 11-19-74 Stressing NCR's ____

Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 / 5 1/4	5 / 5 1/8	10 / 10 3/8
Lift-Off Pressure - Predicted/Actual	6800 / 6,750	6840 / 6,700	N/A
Shim Thickness/80% Ultimate Pressure	6 3/4 / 7,770	6 3/8 / 7,790	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3 25 75 Bulk-Filling NCR's ____

Time since installation 10 1/2 mnths Inlet Pressure 50 psi Outlet Temp. 123°

Date end caps refilled: Shop 11-19-76 Field 11-19-76

7. Data compiled by D. Waller Organization Salem

Date 3/30/77

8. Additional Comments:

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Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D125 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Waller Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair -

Degreasing - Shop End (7/23/76) Field End (7/23/76)

Detensioning Lift off Pressure - Shop 5550 Field 5900 (7/23/76)

Retensioning " " " - Shop 2700 Field 2700 (10/24/76)

Shims - Shop 4 1/2 Field 4 5/8

Effective wires after lift-off - 163

Regreasing - 30 PSIG, 150° - 140° (11/19/76)

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D 126 CUT LENGTH 148'-9 3/4

SHOP WASHER ID: PC 121 CR 965 FIELD WASHER ID: PC 121 CR 898

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38020

3. Date installed in conduit 5-9-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-24-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 12-3-74 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5"/4 3/4"	5"/5	10"/9 3/4"
Lift-Off Pressure - Predicted/Actual	6800/6800	6840/6800	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8"/7770	6 3/8"/7790	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's ______

   Time since installation 10 1/2 months Inlet Pressure 53 psi Outlet Temp. 130°

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Waller Organization Salem

   Date 3/30/77

8. Additional Comments: ______

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRE STRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D127 CUT LENGTH 147'-7 3/8

SHOP WASHER ID: PC 121 CR 1003 FIELD WASHER ID: PC 123 CR 1358

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38020

3. Date installed in conduit 5-9-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-23-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 12-5-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5"/4 7/8"	5"/5 1/4"	10"/10 1/8"
Lift-Off Pressure - Predicted/Actual	6800/6900	6840/6700	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4"/7770	6 5/8/7790	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's

   Time since installation 10 1/2 months Inlet Pressure 55 psi Outlet Temp. 128°

   Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salem

   Date 3/30/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D 127 CUT LENGTH ____

SHOP WASHER ID: PC ____ CR ____ FIELD WASHER ID: PC ____ CR ____

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74
2. Date tendon received on-site ____ RMR Number ____
3. Date installed in conduit ____ Installation NCR's ____

   Wires removed ____ Wires replaced ____ Total Ineffective wires ____
4. Date buttonheaded ____ Buttonheading NCR's ____

   Bad wires ____ Accept. Reheads ____ Total Ineffective wires ____
5. Date stressed ____ Stressing NCR's ____

   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ____ Total effective wires after stressing ____
6. Date Bulk-filled ____ Bulk-Filling NCR's ____

   Time since installation ____ Inlet Pressure ____ Outlet Temp. ____

   Date end caps refilled: Shop ____ Field ____
7. Data compiled by D. Walle Organization Salm

   Date 4/11/77
8. Additional Comments: Dome Repair -

Degreasing - Shop End (7/16/76) Field End (7/16/76)

~~Detensioning~~ Lift off Pressure - Shop 6500, Field 5700 (7/16/76)

Regreasing - (11/24/76) 200 PSIG NCR 2582, 186° NCR 2581

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D128 CUT LENGTH 146'-2½"

SHOP WASHER ID: PC 121 CR 637 FIELD WASHER ID: PC 121 CR 894

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74
2. Date tendon received on-site 3-22-74 RMR Number 38020
3. Date installed in conduit 5-10-74 Installation NCR's 1368
   Wires removed 2 Wires replaced 0 Total Ineffective wires 2
4. Date buttonheaded 10-22-74 Buttonheading NCR's
   Bad wires 4 Accept. Reheads 4 Total Ineffective wires 0
5. Date stressed 11-5-74 Stressing NCR's
   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4⅞"/4⅝"	4⅞"/4⅞"	9¾"/9½"
Lift-Off Pressure - Predicted/Actual	6710/6800	6650/6900	N/A
Shim Thickness/80% Ultimate Pressure	6"/7620	6/7600	N/A

   Unseated/Broken Wires 2 Total effective wires after stressing 159
6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's
   Time since installation 10½ months Inlet Pressure 55 psi Outlet Temp. 120°
   Date end caps refilled: Shop Field
7. Data compiled by D Waller Organization Salem
   Date 3/30/77
8. Additional Comments:

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Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D128 CUT LENGTH ____

SHOP WASHER ID: PC ____ CR ____ FIELD WASHER ID: PC ____ CR ____

1. GAI/QA vendor inspection cover letter number-FPC # ____ DATE ____
2. Date tendon received on-site ____ RMR Number ____
3. Date installed in conduit ____ Installation NCR's ____

   Wires removed ____ Wires replaced ____ Total Ineffective wires ____
4. Date buttonheaded ____ Buttonheading NCR's ____

   Bad wires ____ Accept. Reheads ____ Total Ineffective wires ____
5. Date stressed ____ Stressing NCR's ____

   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ____ Total effective wires after stressing ____
6. Date Bulk-filled ____ Bulk-Filling NCR's ____

   Time since installation ____ Inlet Pressure ____ Outlet Temp. ____

   Date end caps refilled: Shop ____ Field ____
7. Data compiled by D. Muller Organization Salem

   Date 4/11/77
8. Additional Comments: Dome Repairs –

   Degreasing – Shop End (7/9/76) Field End (7/10/76)

   Lift-Off reading – Shop 5100 (7/9/76) Field 6200 (7/11/76) 5800 (7/17/76)

   Detensioning – Shop 4600 Field 6200 (7/17/76)

   Regreasing – (12/1/76) 200 PSIG NCR #2582, 172° - 162° NCR #2581

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CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D129 CUT LENGTH 144'-6 1/4"

SHOP WASHER ID: PC 121 CR 996 FIELD WASHER ID: PC 121 CR 866

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38020 4/1/74

3. Date installed in conduit 5-13-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-23-74 Buttonheading NCR's

   Bad wires 8 Accept. Reheads 7 Total Ineffective wires 1

5. Date stressed 11-19-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 7/8"/14 5/8"	4 7/8"/15	9 3/4"/19 5/8"
Lift-Off Pressure - Predicted/Actual	6710/6850	6740/6600	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4"/7660	6 /7700	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 161

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's

   Time since installation 10 1/2 months Inlet Pressure 55 psi Outlet Temp. 118°

   Date end caps refilled: Shop Field

7. Data compiled by D. Wells Organization Salem

   Date 3/30/77

8. Additional Comments: One (1) wire apparently pulled thru buttonhead on field End. Washer after stressing.

One (1) wire missing from Tendon

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D 129 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Waller Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair -

Degreasing - Shop End (7/16/76) Field End (7/16/76)

Lift-off Readings - Shop 6200 (7/15/76) Field 6000 (7/16/76)

Regreasing - 12/1/76 200 PSIG NCR# 2582, 180° NCR# 2581

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRE STRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D130 CUT LENGTH 142'-7½"

SHOP WASHER ID: PC 121 CR 921 FIELD WASHER ID: PC 122 CR 1260

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38020

3. Date installed in conduit 5-13-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-20-74 Buttonheading NCR's

   Bad wires 8 Accept. Reheads 8 Total Ineffective wires 0

5. Date stressed 10-31-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4¾"/5"	4¾"/5"	9½"/10"
Lift-Off Pressure - Predicted/Actual	6870/6850	6810/6800	N/A
Shim Thickness/80% Ultimate Pressure	5⅝"/17810	5⅜"/17780	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 4-4-75 Bulk-Filling NCR's

   Time since installation 10¾ months Inlet Pressure 55 psi Outlet Temp. 140°

   Date end caps refilled: Shop Field

7. Data compiled by D. Muller Organization Salem

   Date 3/30/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRE TRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D131 CUT LENGTH 140'-4 7/8

SHOP WASHER ID: PC 121 CR 1002 FIELD WASHER ID: PC 121 CR 470

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38020

3. Date installed in conduit 5-13-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-20-74 Buttonheading NCR's 1616

Bad wires 11 Accept. Reheads 9 Total Ineffective wires 2

5. Date stressed 12-5-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 3/4"/4 1/2"	4 3/4"/4 7/8"	9 1/2"/9 3/8"
Lift-Off Pressure - Predicted/Actual	6710/6700	6740/6600	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4"/7660	6 1/4"/7700	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 161

6. Date Bulk-filled 4-4-75 Bulk-Filling NCR's

Time since installation 10 3/4 months Inlet Pressure 31 psi Outlet Temp. 160°

Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salem

Date 3/30/77

8. Additional Comments:

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D131 CUT LENGTH ____

SHOP WASHER ID: PC ____ CR ____ FIELD WASHER ID: PC ____ CR ____

1. GAI/QA vendor inspection cover letter number-FPC # ____ DATE ____

2. Date tendon received on-site ____ RMR Number ____

3. Date installed in conduit ____ Installation NCR's ____

   Wires removed ____ Wires replaced ____ Total Ineffective wires ____

4. Date buttonheaded ____ Buttonheading NCR's ____

   Bad wires ____ Accept. Reheads ____ Total Ineffective wires ____

5. Date stressed ____ Stressing NCR's ____

   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ____ Total effective wires after stressing ____

6. Date Bulk-filled ____ Bulk-Filling NCR's ____

   Time since installation ____ Inlet Pressure ____ Outlet Temp. ____

   Date end caps refilled: Shop ____ Field ____

7. Data compiled by D Walls Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair -

Degreasing - Shop (7/19/76) Field (7/19/76)

Regreasing - (12/1/76) 225 PSIG NCR # 2582, 180° NCR # 2581

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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1. TENDON IDENTIFICATION NUMBER D 132 CUT LENGTH 137'-11"

SHOP WASHER ID: PC 121 CR 938 FIELD WASHER ID: PC 121 CR 955

2. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

3. Date tendon received on-site 3-22-74 RMR Number 38020

4. Date installed in conduit 5-13-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

5. Date buttonheaded 9-20-74 Buttonheading NCR's

Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 12-3-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 3/4 / 4 1/2	4 5/8 / 4 7/8	9 3/8 / 9 3/8
Lift-Off Pressure - Predicted/Actual	6760 / 6700	6800 / 6700	N/A
Shim Thickness/80% Ultimate Pressure	6" / 7720	6 5/8" / 7750	N/A

Unseated/broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 1-4-75 Bulk-Filling NCR's

Time since installation 10 months Inlet Pressure 20 psi Outlet Temp. 160°

Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salem

Date 3/30/77

8. Additional Comments:

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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IDENTIFICATION NUMBER D211 CUT LENGTH 142'-0 1/2"

SHOP WASHER ID: PC 121 CR 487 FIELD WASHER ID: PC 122 CR 1268

GAI/QA vendor inspection cover letter number-FPC # 10245 DATE 4/10/74

Date tendon received on-site 3-29-74 RMR Number 38246

Date installed in conduit 5-30-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

Date buttonheaded 10-17-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

Date stressed 10-30-74 Stressing NCR's 1681, 1683

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 3/8" / 5 1/4"	5" / 5 1/2"	9 3/8" / 10 3/4"
Lift-Off Pressure - Predicted/Actual	6,810 / 7,100 psi	6,870 / 7,000 psi	N/A
Shim Thickness/80% Ultimate Pressure	5 1/2" / 7,780	6" / 7,810	N/A

Unseated/Broken Wires 1 Total effective wires after stressing 162

Date Bulk-filled 3-26-75 Bulk-Filling NCR's

Time since installation 9 3/4 months Inlet Pressure 50 psi Outlet Temp. 132°

Date end caps refilled: Shop Field

Data compiled by D Walle Organization Salem

Date 3/29/77

Additional Comments: One wire not seated on washer.

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D211 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______
2. Date tendon received on-site ______ RMR Number ______
3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______
4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______
5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______
6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______
7. Data compiled by D Walker Organization Salem

   Date 4/11/77
8. Additional Comments: Dome Repair — Degreasing — Shop (7/15/76)

Florida Power
CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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N IDENTIFICATION NUMBER D212 CUT LENGTH 144'-3"

HOP WASHER ID: PC 121 CR 1032 FIELD WASHER ID: PC 122 CR 1214

. GAI/QA vendor inspection cover letter number-FPC # 10245 DATE 4/10/74

2. Date tendon received on-site 3-29-74 RMR Number 38246

3. Date installed in conduit 6-4-74 Installation NCR's 1410

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

. Date buttonheaded 10-17-74 Buttonheading NCR's

Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 12-3-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
ongation (1500 psi to 80% ult.)-Pred./Act.	4 3/8" / 4 5/8"	5 1/8" / 4 7/8"	9 1/2" / 9 1/2"
ift-Off Pressure - Predicted/Actual	6,770 / 6,600 psi	6,770 / 6,700 psi	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8" / 7,730	6 3/8" / 7,720	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 162

5. Date Bulk-filled 3-26-75 Bulk-Filling NCR's

Time since installation 9 3/4 months Inlet Pressure 47 psi Outlet Temp. 124°

Date end caps refilled: Shop Field

7. Data compiled by D Waller Organization Salem

Date 3/29/77

8. Additional Comments:

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. D212

Inspection Period and Date	Location	LIFT OFF CONDITION Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	RETENSIONING Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S	1588		6 3/8"	4 5/8"		N/A		N/A	N/A				
12/3/74	F	1612	1600	6 3/8"	4 7/8"	162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3rd	S	1392		6 3/8"	N/A		N/A		N/A	N/A				1. Lift-off only
10/26/81	F	1285	1338	6 3/8"	N/A	162	N/A	N/A	N/A	N/A	162	82	83	
4TH	S-1	1292		6 5/8	N/A		N/A		N/A	N/A		85° TO	S 67°F	1. 12 GAL OF GREASE NET ADDED
10/26/87	F-3	1260	1276	6 1/2	N/A	162	N/A	N/A	N/A	N/A	N/A	90°F	F 72°F	

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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D213 CUT LENGTH 146'-2 1/4"

SHOP WASHER ID: PC 121 CR 984 FIELD WASHER ID: PC 121 CR 878

- GAI/QA vendor inspection cover letter number-FPC # 10245 DATE 4/10/74
- Date tendon received on-site 3-29-74 RMR Number 38246
- Date installed in conduit 6-10-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

- Date buttonheaded 10-16-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

- Date stressed 11-18-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8" / 4 3/4"	4 3/8" / 4 3/4"	9 1/2" / 9 1/2"
Lift-Off Pressure - Predicted/Actual	6840 / 6,900 psi	6,800 / 6,800 psi	N/A
Shim Thickness/80% Ultimate Pressure	6 5/8" / 7,790	6 3/8 / 7,770	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

- Date Bulk-filled 3-26-75 Bulk-Filling NCR's

Time since installation 9 1/2 months Inlet Pressure 51 PSI Outlet Temp. 122°

Date end caps refilled: Shop Field

- Data compiled by D Waller Organization Salem

Date 3/29/77

- Additional Comments: Yellow shims

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER D 213 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D Walker Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair —
Degreasing - Shop - (7/15/76)

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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DON IDENTIFICATION NUMBER D338 CUT LENGTH 120'-2½"

SHOP WASHER ID: PC 121 CR 1105 FIELD WASHER ID: PC 121 CR 994

1. GAI/QA vendor inspection cover letter number-FPC # 10917 DATE 6/26/74

2. Date tendon received on-site 5-3-74 RMR Number 39132

3. Date installed in conduit 5-14-74 Installation NCR's 1371

   Wires removed 1 Wires replaced 0 Total Ineffective wires 1

4. Date buttonheaded 10-2-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 11-18-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	3 7/8 / 4 1/4	3 7/8 / 3 3/4	7 3/4 / 8
Lift-Off Pressure - Predicted/Actual	6770/6800	6800/6850	N/A
Shim Thickness/80% Ultimate Pressure	6 3/4 / 7700	6 / 7750	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 3-28-75 Bulk-Filling NCR's

   Time since installation 10½ months Inlet Pressure 53 psi Outlet Temp. 130°

   Date end caps refilled: Shop Field

7. Data compiled by D. Muller Organization Salem

   Date 4/1/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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IDENTIFICATION NUMBER D339 CUT LENGTH 115'-7"

SHOP WASHER ID: PC 121 CR 1109 FIELD WASHER ID: PC 121 CR 970

GAI/QA vendor inspection cover letter number-FPC # 10917 DATE 6/26/74

Date tendon received on-site 5-3-74 RMR Number 39132

Date installed in conduit 5-14-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

Date buttonheaded 10-3-74 Buttonheading NCR's

Bad wires 3 Accept. Reheads 0 Total Ineffective wires 3

Date stressed 11-15-74 Stressing NCR's 1706

Date restressed 3-31-75 Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	3¾ / 4	3¾ / 3⅝	7½ / 7⅝
Lift-Off Pressure - Predicted/Actual	6700 / 6850	6700 / 6800	N/A
Shim Thickness/80% Ultimate Pressure	6⅝ / 7650	5½ / 7630	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 160

Date Bulk-filled 3-31-75 Bulk-Filling NCR's

Time since installation 10½ months Inlet Pressure 20 psi Outlet Temp. 145°

Date end caps refilled: Shop Field

Data compiled by D. Waller Organization Salem

Date 4/1/77

Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

T. N IDENTIFICATION NUMBER D340 CUT LENGTH 110'-4 1/4"

SHOP WASHER ID: PC 121 CR 922 FIELD WASHER ID: PC 121 CR 962

1. GAI/QA vendor inspection cover letter number-FPC # 10917 DATE 6/26/74

2. Date tendon received on-site 5-3-74 RMR Number 39132

3. Date installed in conduit 5-8-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-3-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 12-4-74 Stressing NCR's 1731

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	3 5/8 / 4	3 5/8 / 3 7/8	7 1/4 / 7 7/8
Lift-Off Pressure - Predicted/Actual	6840/6900	6800/6700	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4 / 7790	6 3/16 / 7770	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-28-75 Bulk-Filling NCR's

Time since installation 10 3/4 months Inlet Pressure 35 psi Outlet Temp. 130°

Date end caps refilled: Shop Field

7. Data compiled by D Waller Organization Salem

Date 4/1/77

8. Additional Comments:

1st ~~SURVEILLANCE~~

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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D-340 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______
2. Date tendon received on-site ______ RMR Number ______
3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off ~~Pressure~~ FORCE - Predicted/Actual (KIPS) LOCK-OFF FORCE BELOW	1336.6 / 1622	1336.6 / 1502	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop 2-9-78 Field 2-9-78

7. Data compiled by D.J. Giffin Organization FPC

   Date 5-15-78

8. Additional Comments: INSPECTED FIRST SURVEILLANCE (1-13-78)

   1) NO RUST-CORROSION INDICATION
   2) LOCK-OFF FORCE (SHOP - 1611 K ; FIELD - SAME AS LIFT-OFF)
   3) NO CRACKING AT ANCHORAGE

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. D340

Inspection Period and Date	Location	LIFT OFF CONDITION: Force (kips)	LIFT OFF CONDITION: Avg. Force (kips)	LIFT OFF CONDITION: Shim Thickness (in)	LIFT OFF CONDITION: Elong-ation (in)	LIFT OFF CONDITION: Total Effective Wires	RETENSIONING: Force (kips)	RETENSIONING: Avg. Force (kips)	RETENSIONING: Shim Thickness (in)	RETENSIONING: Elong-ation (in)	RETENSIONING: Total Effective Wires	Reactor Bldg. Temperature °F Int.	Reactor Bldg. Temperature °F Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S	1563		6¼"	4"		N/A		N/A	N/A				
12/4/74	F	1615	1634	6 3/16"	3 7/8"	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1st	S	1622		6¼"	N/A		1611		6¼"	N/A				
1/13/78	F	1502	1562	6 3/16"	N/A	163	1602	1607	6 3/16"	N/A	163	110	63	

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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IDENTIFICATION NUMBER 61V24 CUT LENGTH 188'-6½"

SHOP WASHER ID: PC 121 CR 480 FIELD WASHER ID: PC 120 CR 203

GAI/QA vendor inspection cover letter number-FPC # 10142 DATE 3/22/74

Date tendon received on-site 3-11-74 RMR Number 37552

Date installed in conduit 7-17-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

Date buttonheaded 9-9-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

Date stressed 10-11-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12¼, 11⅞	NA, NA	12¼, 11⅞
Lift-Off Pressure - Predicted/Actual	6870, 6775	", "	N/A
Shim Thickness/80% Ultimate Pressure	13", 7810	4", "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

Date Bulk-filled 11-8-74 Bulk-Filling NCR's

Time since installation 4 months Inlet Pressure 123 PSI Outlet Temp. 124°

Date end caps refilled: Shop Field

Data compiled by D. Muller Organization Salem

Date 4/4/77

Additional Comments:

907 215

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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(24)

IDENTIFICATION NUMBER Z3 V24 CUT LENGTH 188'-6"

SHOP WASHER ID: PC 121 CR 806 FIELD WASHER ID: PC 120 CR 213

1. CAI/QA vendor inspection cover letter number-FPC # 9953 DATE 2/25/74

2. Date tendon received on-site 2-1-74 RMR Number 36593

3. Date installed in conduit 7-3-74 Installation NCR's 1489

   Wires removed 1 Wires replaced 0 Total Ineffective wires 1

4. Date buttonheaded 8-26-74 Buttonheading NCR's ______

   Bad wires 5 Accept. Reheads 5 Total Ineffective wires 0

5. Date stressed 10-9-74 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/8 / 12 7/8	NA / NA	12 1/8 / 12 7/8
Lift-Off Pressure - Predicted/Actual	6870 / 6850	" / "	N/A
Shim Thickness/80% Ultimate Pressure	14" / 7810	4 / "	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 10-23-74 Bulk-Filling NCR's ______

   Time since installation 3 1/2 months Inlet Pressure 114 PSI Outlet Temp. 130°

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Walker Organization Salem

   Date 4/1/77

8. Additional Comments: ______

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Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 12V1 CUT LENGTH 188'-6 1/4

SHOP WASHER ID: PC 121 CR 650 FIELD WASHER ID: PC 120 CR 230

1. GAI/QA vendor inspection cover letter number-FPC # 9957 DATE 2/25/74

2. Date tendon received on-site 1-16-74 RMR Number 36036

3. Date installed in conduit 7-3-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-23-74 Buttonheading NCR's

   Bad wires 4 Accept. Reheads 4 Total Ineffective wires 0

5. Date stressed 9-13-74 Stressing NCR's

   Date restressed N/A Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/8 / 12 1/2	N/A / N/A	12 1/8 / 12 1/2
Lift-Off Pressure - Predicted/Actual	~~[illegible]~~ 6800 / 16950 PSI	" / "	N/A
Shim Thickness/80% Ultimate Pressure	13 1/4 / 17770	4 / "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 10-23-74 Bulk-Filling NCR's

   Time since installation 3 1/4 months Inlet Pressure 125 PSI Outlet Temp. 118°

   Date end caps refilled: Shop Field

7. Data compiled by [signature] Organization Salem

   Date 4/1/77

8. Additional Comments:

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 12V1

		LIFT OFF CONDITION					RETENSIONING					Reactor Bldg. Temperature °F		
Inspection Period and Date	Location	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	T	1675		13½"	12½"		N/A		N/A	N/A				
9/13/74	B	N/A	N/A	4"	N/A	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3rd	T	1315		13½"	N/A		N/A		13½"	N/A				1. Lift-off only
10/9/81	B	N/A	N/A	4"	N/A	163	N/A	N/A	4"	N/A	163	83	83	
4TH	S (TOP)	1535		13 5/8	N/A		N/A		N/A	N/A		85°F	T-70°F	. 4.1 GAL. GREASE NET ADDED
10/30/87	F (BOT.)	N/A	N/A	4	N/A	163	N/A	N/A	N/A	N/A	N/A	TO 90°F	B-N/A	. NOTE - IT WAS CONCLUDED 3RD SURV. LIFTOFF WAS IN ERROR SEE G/C 4TH REPORT.

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Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING POST-TENSIONING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 12V2 CUT LENGTH 188'-6 1/2

SHOP WASHER ID: PC 121 CR 557 FIELD WASHER ID: PC 120 CR 232

1. GAI/QA vendor inspection cover letter number-FPC # 9957 DATE 2/25/74

2. Date tendon received on-site 1-16-74 RMR Number 36036

3. Date installed in conduit 7-3-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 8-27-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 10-14-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/8 / 12 1/2	N/A / N/A	12 1/8 / 12 1/2
Lift-Off Pressure - Predicted/Actual	6800 / 7050 PSI	" / "	N/A
Shim Thickness/80% Ultimate Pressure	13" / 7790	4 / "	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 10-23-74 Bulk-Filling NCR's

   Time since installation 3 3/4 months Inlet Pressure 112 PSI Outlet Temp. 126°

   Date end caps refilled: Shop Field

7. Data compiled by D. Vinla Organization Salem

   Date 4/1/77

8. Additional Comments:

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Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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1. IDENTIFICATION NUMBER 45V13 CUT LENGTH 188'-7½"

SHOP WASHER ID: PC 121 CR 783 FIELD WASHER ID: PC 120 CR 266

2. GAI/QA vendor inspection cover letter number-FPC # 10043 DATE 3/8/74

3. Date tendon received on-site 2-15-74 RMR Number 36993

4. Date installed in conduit 7-24-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

5. Date buttonheaded 9-5-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

6. Date stressed 10-7-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12¼, 12⅜	NA, NA	12¼, 12⅜
Lift-Off Pressure - Predicted/Actual	6810, 6950	", "	N/A
Shim Thickness/80% Ultimate Pressure	12⅜, 7780	", "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

7. Date Bulk-filled 11-7-74 Bulk-Filling NCR's 1687

Time since installation 4 months Inlet Pressure 140 LBS Outlet Temp. 130°

Date end caps refilled: Shop Field

8. Data compiled by D Miller Organization Salem

Date 4/1/77

9. Additional Comments:

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Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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IDENTIFICATION NUMBER 45V14 CUT LENGTH 188'-7 1/2"

SHOP WASHER ID: PC 120 CR 342 FIELD WASHER ID: PC 120 CR 212

1. GAI/CA vendor inspection cover letter number-FPC # 10043 DATE 3/8/74
2. Date tendon received on-site 2-15-74 RMR Number 36993
3. Date installed in conduit 7-24-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0
4. Date buttonheaded 9-5-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0
5. Date stressed 10-3-74 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 3/8 / 12	NA / NA	12 3/8 / 12
Lift-Off Pressure - Predicted/Actual	6810 / 7050	" / "	N/A
Shim Thickness/80% Ultimate Pressure	12 / 7780	4" / "	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163
6. Date Bulk-filled 11-7-74 Bulk-Filling NCR's 1687

   Time since installation 4 months Inlet Pressure 140 LBS Outlet Temp. 133°

   Date end caps refilled: Shop ______ Field ______
7. Data compiled by D. Miller Organization Salem

   Date 4/1/77
8. Additional Comments: ______

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Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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I IDENTIFICATION NUMBER 45V15 CUT LENGTH 188'-6"

SHOP WASHER ID: PC 121 CR 824 FIELD WASHER ID: PC 120 CR 207

1. GAI/QA vendor inspection cover letter number-FPC # 10043 DATE 3/8/74

2. Date tendon received on-site 2-16-74 RMR Number 36993

3. Date installed in conduit 7-24-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 8-12-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 9-19-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/4, 12 1/4	NA, NA	12 1/4, 12 1/4
Lift-Off Pressure - Predicted/Actual	6810, 6750	", "	N/A
Shim Thickness/80% Ultimate Pressure	13 3/8, 7780	4", "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-7-74 Bulk-Filling NCR's 1687

Time since installation 4 months Inlet Pressure 140 LBS Outlet Temp. 135°

Date end caps refilled: Shop Field

7. Data compiled by D. Miller Organization Salem

Date 4/1/77

8. Additional Comments:

907 716

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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IDENTIFICATION NUMBER 61V7 CUT LENGTH 188'-5 3/4

IOP WASHER ID: PC 121 CR 780 FIELD WASHER ID: PC 120 CR 338

GAI/QA vendor inspection cover letter number-FPC # 10069 DATE 3/12/74

Date tendon received on-site 3-1-74 RMR Number 37499

Date installed in conduit 7-11-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

Date buttonheaded 8-7-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

Date stressed 9-23-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 3/8 / 12 1/2	NA / NA	12 3/8 / 12 1/2
Lift-Off Pressure - Predicted/Actual	6800 / 6950 PSI	" / "	N/A
Shim Thickness/80% Ultimate Pressure	13" / 7770	4 / "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

Date Bulk-filled 10-25-74 Bulk-Filling NCR's

Time since installation 3 months Inlet Pressure 112 PSI Outlet Temp. 115°

Date end caps refilled: Shop Field

Data compiled by D. Miller Organization Salem

Date 4/4/77

Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING POSTTENSIONING SYSTEM
TENDON HISTORY

DOCUMENT NO: N750-001
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IDENTIFICATION NUMBER 61V8 CUT LENGTH 188'-7½

SHOP WASHER ID: PC 121 CR 693 FIELD WASHER ID: PC 120 CR 300

GAI/QA vendor inspection cover letter number-FPC # 10069 DATE 3/12/74

Date tendon received on-site 3-1-74 RMR Number 37499

Date installed in conduit 7-11-74 Installation NCR's 1495

Wires removed 1 Wires replaced 0 Total Ineffective wires 1

Date buttonheaded 9-5-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

Date stressed 10-10-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12" / 11 5/8	NA / NA	12" / 11 5/8
Lift-Off Pressure - Predicted/Actual	6870 / 6700 PSI	" / "	N/A
Shim Thickness/80% Ultimate Pressure	13" / 7810	4" / "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

Date Bulk-filled 10-25-74 Bulk-Filling NCR's

Time since installation 3 months Inlet Pressure 106 PSI Outlet Temp. 122°

Date end caps refilled: Shop Field

Data compiled by D. Miller Organization Salem

Date 4/4/77

Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING POST-TENSIONING SYSTEM
TENDON HISTORY

DOCUMENT NO: N750-001
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IDENTIFICATION NUMBER 61V9 CUT LENGTH 188'-6½

OP WASHER ID: PC 121 CR 892 FIELD WASHER ID: PC 120 CR 228

GAI/QA vendor inspection cover letter number-FPC # 10069 DATE 3/12/74

Date tendon received on-site 3-4-74 RMR Number 37500

Date installed in conduit 7-11-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

Date buttonheaded 8-6-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

Date stressed 9-12-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/8, 12 5/16	NA, NA	12 1/8, 12 5/16
Lift-Off Pressure - Predicted/Actual	6860, 6800	", "	N/A
Shim Thickness/80% Ultimate Pressure	13", 7840	4", "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

Date Bulk-filled 10-25-74 Bulk-Filling NCR's

Time since installation 3 months Inlet Pressure 115 PSI Outlet Temp. 120°

Date end caps refilled: Shop Field

Data compiled by D. McCl[illegible] Organization Salem[illegible]

Date 4/4/77

Additional Comments:

Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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I IDENTIFICATION NUMBER 35H15 CUT LENGTH 156'-10"

SHOP WASHER ID: PC 120 CR 169 FIELD WASHER ID: PC 121 CR 969

1. GAI/QA vendor inspection cover letter number-FPC # 9462 DATE 12/4/73

2. Date tendon received on-site 11-14-73 RMR Number 34348

3. Date installed in conduit 3-6-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-17-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 1-17-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	6 3/4 / 5 1/4	3 1/4 / 4 3/4	10 / 10
Lift-Off Pressure - Predicted/Actual	6750 / 6800	6800 / 6850	N/A
Shim Thickness/80% Ultimate Pressure	7 / 7700	6 3/16 / 7770	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 7-29-74 Bulk-Filling NCR's

Time since installation 3 1/2 months Inlet Pressure 20 psi Outlet Temp. 140°

Date end caps refilled: Shop 4-17-75 Field 4-14-75

7. Data compiled by D. Muller Organization Salem

Date 4/4/77

8. Additional Comments:

907 716

Florida Power
CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

DOCUMENT NO: N750-001
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TENDON IDENTIFICATION NUMBER 35H16 CUT LENGTH 156'-7 1/2"

SHOP WASHER ID: PC 121 CR 4125 FIELD WASHER ID: PC 122 CR 1145

1. GAI/QA vendor inspection cover letter number-FPC # 9462 DATE 12/4/73

2. Date tendon received on-site 11-14-73 RMR Number 34323

3. Date installed in conduit 3-5-74 Installation NCR's ____

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-18-74 Buttonheading NCR's ____

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 3-25-75 Stressing NCR's ____

   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 7/8 / 5	5 1/8 / 4 7/8	10 / 9 7/8
Lift-Off Pressure - Predicted/Actual	6840 / 6950	6810 / 6700	N/A
Shim Thickness/80% Ultimate Pressure	7 3/8 / 7790	6 1/4 / 7780	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 7-29-74 Bulk-Filling NCR's ____

   Time since installation 3 3/4 months Inlet Pressure 55 psi Outlet Temp. 131°

   Date end caps refilled: Shop 4-17-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments: ____

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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[TEND]ON IDENTIFICATION NUMBER 35H17 CUT LENGTH 155'-9"

SHOP WASHER ID: PC 120 CR 357 FIELD WASHER ID: PC 121 CR 920

1. GAI/QA vendor inspection cover letter number-FPC # 9462 DATE 12/4/73

2. Date tendon received on-site 11-14-73 RMR Number 34395

3. Date installed in conduit 3-5-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-18-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 1-16-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 5/8 / 5	5 5/8 / 5 1/8	10 1/4 / 10 1/8
Lift-Off Pressure - Predicted/Actual	6750 / 6650	6800 / 6600	N/A
Shim Thickness/80% Ultimate Pressure	5 1/4 / 7700	6 1/4 / 7770	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 7-30-74 Bulk-Filling NCR's

   Time since installation 33 month Inlet Pressure 15 psi Outlet Temp. 146

   Date end caps refilled: Shop 4-17-75 Field 4-14-75

7. Data compiled by D Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 46H20 CUT LENGTH 155'-11 1/4

SHOP WASHER ID: PC 120 CR 78 FIELD WASHER ID: PC 122 CR 1138

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 1-17-73 RMR Number 32681

3. Date installed in conduit 4-15-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-19-74 Buttonheading NCR's

Bad wires 13 Accept. Reheads 12 Total Ineffective wires 1

5. Date stressed 3-5-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5, 5 1/4	5 1/4, 5 1/8	10 1/4, 10 3/8
Lift-Off Pressure - Predicted/Actual	6640, 6930	6600, 6600	N/A
Shim Thickness/80% Ultimate Pressure	7 3/8, 7700	6 5/8, 7610	N/A

Unseated/Broken Wires 2 Total effective wires after stressing 160

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's

Time since installation 6 1/2 month Inlet Pressure 50 psi Outlet Temp. 130°

Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Miller Organization Salem

Date 4/4/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 46H21 CUT LENGTH 154'-4

SHOP WASHER ID: PC 120 CR 167 FIELD WASHER ID: PC 122 CR 1141

1. GAI/QA vendor inspection cover letter number-FPC # N/A DATE

2. Date tendon received on-site 10-13-73 RMR Number 33610

3. Date installed in conduit 4-23-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-19-74 Buttonheading NCR's

Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 2-7-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/8	5 1/8 / 5 1/4	10 1/4 / 10 3/8
Lift-Off Pressure - Predicted/Actual	6720 / 6700	6730 / 6950	N/A
Shim Thickness/80% Ultimate Pressure	5 5/8 / 7700	5 9/16 / 7640	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's

Time since installation 6 1/2 months Inlet Pressure 50 psi Outlet Temp. 130°

Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

Date 4/4/77

8. Additional Comments:

907 716

1ST SURVEILLANCE

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46 H 21 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off ~~Pressure~~ FORCE - Predicted/Actual (KIPS)	1425.6 / 1457.5	1425.6 / 1546	N/A
LOCK-OFF FORCE Shim Thickness/80% Ultimate Pressure	5 3/4" /	/	N/A

Unseated/Broken Wires 1- BAD PREV. 0- AT SURV. Total effective wires after stressing /162

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. J. Griffin Organization FPC

   Date 5-16-78

8. Additional Comments: INSPECTED FIRST SURVEILLANCE (1-10-78)

1) NO INDICATION OF RUST - CORROSION

2) LOCK-OFF FORCE (SHOP - SAME AS LIFT-OFF; FIELD - 1524 K)

3) NO INDICATION OF CRACKING AT ANCHORAGES

4) SHOP END SHIM - RECORDS SHOW (5 5/8") - ACTUAL (5 3/4")

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 46H21

Inspection Period and Date	Location	LIFT OFF CONDITION Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	RETENSIONING Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S-6	1624		5 5/8	5 1/8		N/A		N/A	N/A				
2-7-75	F-4	1682	1653	5 9/16	5 1/4	162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1st	S-6	1458		5 3/4	N/A		1458		5 3/4	N/A				
1-10-78	F-4	1546	1502	5 9/16	N/A	163	1514	1536	5 9/16	N/A	~~165~~ 162	106	41	
5TH	S-6	1423		5 7/8	N/A		N/A		N/A	N/A				15 GALLONS OF GREASE ADDED OVER REMOVED.
12/7/93	E-4	1427	1425	5 11/16	N/A	162	N/A	N/A	N/A	N/A	N/A	130°	68°	

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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 46H22 CUT LENGTH 155'-9 1/2

SHOP WASHER ID: PC 120 CR 41 FIELD WASHER ID: PC 122 CR 1140

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-17-73 RMR Number 32681

3. Date installed in conduit 4-23-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-19-74 Buttonheading NCR's ______

   Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 3-4-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8, 5 5/8	5 1/8, 5 1/4	10 1/4, 10 7/8
Lift-Off Pressure - Predicted/Actual	6720, 6750	6730, 7000	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8, 7700	5 9/16, 7640	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's ______

   Time since installation 6 1/2 months Inlet Pressure 55 psi Outlet Temp. 130°

   Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments: ______

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H29 CUT LENGTH 155'-8"

SHOP WASHER ID: PC 120 CR 349 FIELD WASHER ID: PC 121 CR 659

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73
2. Date tendon received on-site 9-20-73 RMR Number 32858
3. Date installed in conduit 4-24-74 Installation NCR's ______
   Wires removed 0 Wires replaced 0 Total Ineffective wires 0
4. Date buttonheaded 10-22-74 Buttonheading NCR's ______
   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0
5. Date stressed 2-12-75 Stressing NCR's ______
   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/2	5 1/8 / 4 7/8	10 1/4 / 10 3/8
Lift-Off Pressure - Predicted/Actual	6760 / 6900	6710 / 6800	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4 / 7750	6 / 7660	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163
6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's ______
   Time since installation 6 1/2 months Inlet Pressure 53 psi Outlet Temp. 140°
   Date end caps refilled: Shop 4-10-75 Field 4-14-75
7. Data compiled by D. Walker Organization Salem
   Date 4/4/77
8. Additional Comments: ______

1ST SURVEILLANCE

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 46 H 29 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______
2. Date tendon received on-site ______ RMR Number ______
3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______
4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______
5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off ~~Pressure~~ FORCE - Predicted/Actual (KIPS) LOCK-OFF FORCE BELOW	1434.4 / 1491	1434.4 / 1435	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop 2-9-78 Field 2-9-78
7. Data compiled by D. J. Giffin Organization FPC

   Date 5-16-78
8. Additional Comments: INSPECTED FIRST SURVEILLANCE (1-10-78)

   1) NO INDICATION OF RUST-CORROSION

   2) LOCK-OFF FORCE (SHOP-1457.5K, FIELD-SAME AS LIFT-OFF)

   3) NO INDICATION OF FIELD CRACKING AT ANCHORAGES

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 46H29

Inspection Period and Date	Location	LIFT OFF CONDITION: Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	RETENSIONING: Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Streesing	S-6	1673		6 1/4	5 1/2		N/A		N/A	N/A				
2-12-75	F-4	1661	1667	6	4 7/8	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1st	S-6	1491		6 1/4	N/A		1458		6 1/4	N/A				
1-10-78	F-6	1435	1463	6	N/A	163	1435	1447	6	N/A	163	104	39	
5TH	S-6	1321	(88% BASE)	6 3/8	N/A		1466		6 15/16	N/A				• 15 GALLONS OF GREASE ADDED OVER REMOVED
11/19/93 L.O.	F-4	1280	* 1300	6 1/8	N/A	163	1466	1466	7	N/A	159	130°F	67°F	• DETENSIONED, 3 BROKEN WIRES + 1 SAMPLE REMOVED (4 TOTAL)
12/14/93 RET.														• RETENSIONED TO BASE

* SELECTED AS VALID LIFTOFF FROM SEVERAL, SEE G/C 5TH SURV. REPORT.

Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

IDENTIFICATION NUMBER 46H30 CUT LENGTH 155'-11¼"

SHOP WASHER ID: PC 121 CR 1037 FIELD WASHER ID: PC 121 CR 1037

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-20-73 RMR Number 32858

3. Date installed in conduit 4-24-74 Installation NCR's 1349

   Wires removed 1 Wires replaced 0 Total Ineffective wires 1

4. Date buttonheaded 10-22-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-12-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 , 5 5/8	5 1/8 , 5 1/8	10 1/4 , 10 3/4
Lift-Off Pressure - Predicted/Actual	6720 / 6930	6670 , 6650	N/A
Shim Thickness/80% Ultimate Pressure	6 9/16 , 7700	6 1/4 , 7640	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 161 see comm

6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's

   Time since installation 6½ months Inlet Pressure 54 psi Outlet Temp. 140°

   Date end caps refilled: Shop 4-10-75 Field 4-14-75

7. Data compiled by D. Weller Organization Salem

   Date 4/4/77

8. Additional Comments: 1 missing wire

907 716

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H31 CUT LENGTH 155'-8 1/4

SHOP WASHER ID: PC 120 CR 94 FIELD WASHER ID: PC 121 CR 729

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-26-73 RMR Number 32558

3. Date installed in conduit 4-24-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-21-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-13-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/8	5 1/8 / 5 1/8	10 1/4 / 10 1/4
Lift-Off Pressure - Predicted/Actual	6760 / 6950	6710 / 6650	N/A
Shim Thickness/80% Ultimate Pressure	7 / 7750	6 5/8 / 7660	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's

   Time since installation 6 1/2 months Inlet Pressure 51 psi Outlet Temp. 141°

   Date end caps refilled: Shop 4-10-75 Field 4-14-75

7. Data compiled by D. Walker Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power Corporation

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H32 CUT LENGTH 155'-8 1/2

SHOP WASHER ID: PC 121 CR 364 FIELD WASHER ID: PC 121 CR 909

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73
2. Date tendon received on-site 9-20-73 RMR Number 32858
3. Date installed in conduit 4-25-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0
4. Date buttonheaded 10-21-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0
5. Date stressed 2-27-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 3/4	5 1/8 / 5	10 1/4 / 10 3/4
Lift-Off Pressure - Predicted/Actual	6760 / 6800	6770 / 6700	N/A
Shim Thickness/80% Ultimate Pressure	6 5/8 / 7750	5 / 7680	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's 1685

   Time since installation 6 1/2 months Inlet Pressure 80 lbs Outlet Temp. 115°

   Date end caps refilled: Shop 4-10-75 Field 4-14-75
7. Data compiled by D. Miller Organization Salem

   Date 4/4/77
8. Additional Comments: First gasket leaked grease and was replaced and did not leak 80 lbs pressure 25 lbs over spec.

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Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

IDENTIFICATION NUMBER 46H33 CUT LENGTH 155'-9 1/2

SHOP WASHER ID: PC 120 CR 117 FIELD WASHER ID: PC 121 CR 608

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-20-73 RMR Number 32868

3. Date installed in conduit 4-25-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-21-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-13-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 3/8	5 1/8 / 5 1/8	10 1/4 / 10 1/2
Lift-Off Pressure - Predicted/Actual	6760 / 6950	6710 / 6600	N/A
Shim Thickness/80% Ultimate Pressure	7 9/16 / 7750	6 3/8 / 7660	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's

   Time since installation 6 1/2 months Inlet Pressure 50 psi Outlet Temp. 120°

   Date end caps refilled: Shop 4-10-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H34 CUT LENGTH 155'-8 1/2

SHOP WASHER ID: PC 120 CR 79 FIELD WASHER ID: PC 121 CR 1001

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-24-73 RMR Number 32864

3. Date installed in conduit 4-25-74 Installation NCR's ____

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-21-74 Buttonheading NCR's ____

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-27-75 Stressing NCR's ____

Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/2	5 1/8 / 5 1/8	10 1/4 / 10 5/8
Lift-Off Pressure - Predicted/Actual	6760 / 7000	6770 / 7050	N/A
Shim Thickness/80% Ultimate Pressure	6 / 7750	5 9/16 / 7680	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's ____

Time since installation 6 1/2 months Inlet Pressure 49 psi Outlet Temp. 130°

Date end caps refilled: Shop 4-10-75 Field 4-14-75

7. Data compiled by D. Walls Organization Salem

Date 4/4/77

8. Additional Comments: ____

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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 46H35 CUT LENGTH 155'-8 1/2

SHOP WASHER ID: PC 120 CR 37 FIELD WASHER ID: PC 121 CR 840

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-24-73 RMR Number 32864

3. Date installed in conduit 4-25-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-18-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-14-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 3/8	5 1/8 / 5 3/8	10 1/4 / 10 3/4
Lift-Off Pressure - Predicted/Actual	6760 / 6700	6710 / 6900	N/A
Shim Thickness/80% Ultimate Pressure	7 / 7750	6 5/8 / 7660	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's ______

   Time since installation 6 1/2 months Inlet Pressure 51 psi Outlet Temp. 140°

   Date end caps refilled: Shop 4-10-75 Field 4-11-75

7. Data compiled by D. Walls Organization Salem

   Date 4/4/77

8. Additional Comments: ______

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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 46H36 CUT LENGTH 155'-7 3/4

SHOP WASHER ID: PC 121 CR 387 FIELD WASHER ID: PC 120 CR 92

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-24-73 RMR Number 32864

3. Date installed in conduit 4-25-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-18-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-27-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/4	5 1/8 / 5 1/8	10 1/8 / 10 3/8
Lift-Off Pressure - Predicted/Actual	6760 / 6950	6770 / 6900	N/A
Shim Thickness/80% Ultimate Pressure	7 / 17750	6 1/4 / 17680	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's

   Time since installation 6½ months Inlet Pressure 53 psi Outlet Temp. 132°

   Date end caps refilled: Shop 4-10-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 46H37 CUT LENGTH 155'-8'

SHOP WASHER ID: PC 120 CR 58 FIELD WASHER ID: PC 121 CR 448

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-24-73 RMR Number 32864

3. Date installed in conduit 4-26-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-18-74 Buttonheading NCR's

Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 2-17-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8, 5 3/8	5 1/8, 4 1/2	10 1/4 9 7/8
Lift-Off Pressure - Predicted/Actual	6720 / 6750	6730, 6600	N/A
Shim Thickness/80% Ultimate Pressure	7 / 7700	6 3/8, 7640	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 11-5-74 Bulk-Filling NCR's

Time since installation 6 1/2 months Inlet Pressure 50 psi Outlet Temp. 134°

Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

Date 4/4/77

8. Additional Comments:

1st SURVEILLANCE
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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46 H 37 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______
2. Date tendon received on-site ______ RMR Number ______
3. Date installed in conduit ______ Installation NCR's ______
   Wires removed ______ Wires replaced ______ Total Ineffective wires ______
4. Date buttonheaded ______ Buttonheading NCR's ______
   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______
5. Date stressed ______ Stressing NCR's ______
   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off ~~Pressure~~ FORCE - Predicted/Actual (KIPS)	1425.6 / 1412.5	1425.6 / 1502	N/A
LOCK-OFF FORCE BELOW Shim Thickness/80% Ultimate Pressure	/	6¾" /	N/A

Unseated/Broken Wires 1 R/M (1 - BAD PREV.) Total effective wires after stressing 161

6. Date Bulk-filled ______ Bulk-Filling NCR's ______
   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______
   Date end caps refilled: Shop 2-9-78 Field 2-9-78
7. Data compiled by D. J. Giffin Organization FPC
   Date 5-16-78
8. Additional Comments: INSPECT FIRST SURVEILLANCE (1-6-78)
   1) NO INDICATION OF RUST-CORROSION
   2) LOCK-OFF FORCE (SHOP END - SAME AS LIFT-OFF; FIELD - 1469K)
   3) NO INDICATION OF CRACKING AT ANCHORAGES
   4) FIELD END SHIM - RECORDS SHOW (6⅜") - ACTUAL (6¾")

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 46H37

Inspection Period and Date	Location	LIFT OFF CONDITION Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	RETENSIONING Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Streasing	S-6	1636		7	5 3/8		N/A		N/A	N/A				
2-17-75	F-4	1598	1617	6 3/8	4 1/2	162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1st	S-6	1413		7	N/A		1413		7	N/A				One wire removed for testing.
1-6-78	F-4	1502	1457	6 3/4	N/A	162	1469	1441	6 3/4	N/A	161	109	62	

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H38 CUT LENGTH 155'-6 1/2

SHOP WASHER ID: PC 121 CR 394 FIELD WASHER ID: PC 121 CR 803

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-24-73 RMR Number 33364

3. Date installed in conduit 4-26-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-17-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-26-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 3/8	5 1/8 / 4 3/4	10 1/4 / 10 1/8
Lift-Off Pressure - Predicted/Actual	6720 / 6800	6730 / 6700	N/A
Shim Thickness/80% Ultimate Pressure	7 1/4 / 7750	6 3/8 / 7680	N/A

   Unseated/Broken Wires 1 Total effective wires after stressing 162

6. Date Bulk-filled 2-28-75 Bulk-Filling NCR's ______

   Time since installation 10 months Inlet Pressure 47 lbs Outlet Temp. 120°

   Date end caps refilled: Shop —— Field ——

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments: ______

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H39 CUT LENGTH 155'-7"

SHOP WASHER ID: PC 120 CR 154 FIELD WASHER ID: PC 121 CR 895

1. GAI/QA vendor inspection cover letter number-FPC # 9286 DATE 11/5/73

2. Date tendon received on-site 10-11-73 RMR Number 33528

3. Date installed in conduit 4-26-74 Installation NCR's ____

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-17-74 Buttonheading NCR's ____

   Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 2-18-75 Stressing NCR's ____

   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/2	5 1/8 / 5	10 1/4 / 10 1/2
Lift-Off Pressure - Predicted/Actual	6720 / 7000	6730 / 6750	N/A
Shim Thickness/80% Ultimate Pressure	6 9/16 / 7700	6 1/4 / 7640	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 2-23-75 Bulk-Filling NCR's ____

   Time since installation 10 months Inlet Pressure ____ Outlet Temp. ____

   Date end caps refilled: Shop — Field —

7. Data compiled by D. Walls Organization Salem

   Date 4/4/77

8. Additional Comments: After Stressing

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 46H41 CUT LENGTH 155'-6 3/4

SHOP WASHER ID: PC 120 CR 13 FIELD WASHER ID: PC 121 CR 1027

1. GAI/QA vendor inspection cover letter number-FPC # 9263 DATE 11/1/73

2. Date tendon received on-site 9-27-73 RMR Number 32911

3. Date installed in conduit 4-29-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-15-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-13-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 7/8	5 1/8 / 5	10 1/4 / 10 7/8
Lift-Off Pressure ~ Predicted/Actual	6760 / 6600	6710 / 6700	N/A
Shim Thickness/80% Ultimate Pressure	6 9/16 / 7150	5 3/8 / 7680	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 2-28-75 Bulk-Filling NCR's 1824

Time since installation 10 months Inlet Pressure 50 lbs Outlet Temp. 118°

Date end caps refilled: Shop — Field —

7. Data compiled by D. Waller Organization Salem

Date 4/4/77

8. Additional Comments: After Stressing

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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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DON IDENTIFICATION NUMBER 62H1 CUT LENGTH 155'-10¼"

SHOP WASHER ID: PC 114 CR 4 FIELD WASHER ID: PC 121 CR 370

1. GAI/QA vendor inspection cover letter number-FPC # 5668 DATE 4/11/72
2. Date tendon received on-site 5-30-74 RMR Number 39836
3. Date installed in conduit 8-9-74 Installation NCR's
   Wires removed 0 Wires replaced 0 Total Ineffective wires 0
4. Date buttonheaded 10-25-74 Buttonheading NCR's
   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0
5. Date stressed 1-29-75 Stressing NCR's
   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5⅛ / 5¾	5¼ / 4 15/16	10⅜ / 10 11/16
Lift-Off Pressure - Predicted/Actual	6800 / 6650	6750 / 6600	N/A
Shim Thickness/80% Ultimate Pressure	6⅜ / 7770	5¼ / 7000	N/A

Unseated/Broken Wires 1 Total effective wires after stressing 162

6. Date Bulk-filled 4-8-75 Bulk-Filling NCR's 01895
   Time since installation 8 months Inlet Pressure * Outlet Temp. 140°
   Date end caps refilled: Shop 0 Field 0
7. Data compiled by D. Mullin Organization Salem
   Date 4/4/77
8. Additional Comments: After Stressing * gauge broken during Bulk-Filling NCR-01895

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 62H2 CUT LENGTH 156'-2 1/2"

SHOP WASHER ID: PC 121 CR 421 FIELD WASHER ID: PC NA CR 421

1. GAI/QA vendor inspection cover letter number-FPC # 5668 DATE 4/11/72

2. Date tendon received on-site 7-23-74 RMR Number 41027

3. Date installed in conduit 8-9-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-25-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 3-7-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	7 / 5 5/8	3 / 4 5/8	10 / 10 1/4
Lift-Off Pressure - Predicted/Actual	NA / 6700	6750 / 6800	N/A
Shim Thickness/80% Ultimate Pressure	7 1/4 / 7770	6 3/8 / 7700	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 4-8-75 Bulk-Filling NCR's

   Time since installation 8 1/2 months Inlet Pressure 20 PSI Outlet Temp. 139°

   Date end caps refilled: Shop 0 Field 0

7. Data compiled by D. Walker Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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DON IDENTIFICATION NUMBER 62 H 2 CUT LENGTH ______

SHOP WASHER ID: PC 114 CR 6 FIELD WASHER ID: PC 121 CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. J. Giffin Organization FPC

   Date 9-30-77

8. Additional Comments: IN PREPARATION FOR 1ST SURVEILLANCE

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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…DON IDENTIFICATION NUMBER 62H3 CUT LENGTH 156'-10 1/2

SHOP WASHER ID: PC 121 CR 1106 FIELD WASHER ID: PC 120 CR 353

1. GAI/QA vendor inspection cover letter number-FPC # ~~[illegible]~~ 5668 DATE ~~[illegible]~~ 4/11/7[illegible]

2. Date tendon received on-site 5-30-74 RMR Number 39836

3. Date installed in conduit 8-9-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-31-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 1-30-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	6 1/8 / 4 1/2	3 1/2 / 4 3/4	9 5/8 / 9 1/4
Lift-Off Pressure - Predicted/Actual	6800 / 6700	6750 / 6650	N/A
Shim Thickness/80% Ultimate Pressure	5 / 7770	4 5/8 / 7700	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 4-8-75 Bulk-Filling NCR's

   Time since installation 8 1/2 months Inlet Pressure 15 psi Outlet Temp. 145°

   Date end caps refilled: Shop 0 Field 0

7. Data compiled by D Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power
CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

163

TENDON IDENTIFICATION NUMBER 62H9 CUT LENGTH 156'-6"

SHOP WASHER ID: PC 121 CR 1079 FIELD WASHER ID: PC 121 CR 1079

1. GAI/QA vendor inspection cover letter number-FPC # 8867 DATE 9/6/73

2. Date tendon received on-site 10-22-73 RMR Number 33888

3. Date installed in conduit 11-29-73 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 4-25-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 1-31-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 3/4 / 5 1/4	4 1/4 / 4	9 / 9 1/4
Lift-Off Pressure - Predicted/Actual	6800 / 6800	6750 / 6750	N/A
Shim Thickness/80% Ultimate Pressure	7 / 7770	5 1/4 / 7700	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 6-27-74 Bulk-Filling NCR's

   Time since installation 8 months Inlet Pressure 54 psi Outlet Temp. 115°

   Date end caps refilled: Shop 3-17-75 Field 4-16-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments: Pieces of wood used to hold washer in place.

1ST SURVEILLANCE

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 62H9 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off ~~Pressure~~ FORCE - Predicted/Actual (KIPS)	1434.4 / 1590	1434.4 / 1557	N/A
LOCK-OFF FORCE BELOW Shim Thickness/80% Ultimate Pressure	/	5 3/4" /	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

Date end caps refilled: Shop 1-16-78 Field 1-16-78

7. Data compiled by D.J. Giff[illegible] Organization FPC

Date 5-16-78

8. Additional Comments: INSPECTED FIRST SURVEILLANCE (12-16-78)

1) NO INDICATION OF RUST-CORROSION

2) LOCK-OFF FORCE (SHOP - 1546K; FIELD - 1546.5K)

3) HAIRLINE CRACKING (LESS THAN 0.004") AT FIELD END ANCHORAGE - BUTTRESS #6

4) FIELD END SHIMS - RECORDS SHOW (5 1/4") - ACTUAL (5 3/4")

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 62H9

Inspection Period and Date	Location	LIFT OFF CONDITION Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	RETENSIONING Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S	1639		7	5 1/4		N/A		N/A	N/A				
1-31-75	F	1639	1639	5 1/4	4	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1st	S	1590		7	N/A		1546		7	N/A				
12-16-77	F	1557	1574	5 3/4	N/A	163	1546	1546	5 3/4	N/A	163	105	59	

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 62H12 CUT LENGTH 156'-1"

SHOP WASHER ID: PC 120 CR 132 FIELD WASHER ID: PC 121 CR 1004

1. GAI/QA vendor inspection cover letter number-FPC # 8867 DATE 9/6/73

2. Date tendon received on-site 10-26-73 RMR Number 33939

3. Date installed in conduit 11-27-73 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 4-29-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 3-5-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	3 / 14 5/8	7 / 15 3/4	10 / 10 3/8
Lift-Off Pressure - Predicted/Actual	6800 / 6850	6750 / 7000	N/A
Shim Thickness/80% Ultimate Pressure	5 3/8 / 7770	6 3/8 / 7700	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 6-27-74 Bulk-Filling NCR's ______

   Time since installation 8 months Inlet Pressure 26# Outlet Temp. 120°

   Date end caps refilled: Shop 3-14-75 Field 4-16-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments: Two (2) wooden wedges were inserted between the washer and the casing to hold the washer in place.

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 62 H 12 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR 1064

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. J. Giffin Organization FPC

   Date 9-30-77

8. Additional Comments: IN PREPARATION FOR 1ST SURVEILLANCE

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

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TENDON IDENTIFICATION NUMBER 62H13 CUT LENGTH 156'-1 3/4"

SHOP WASHER ID: PC 120 CR 36 FIELD WASHER ID: PC 121 CR 1057

1. GAI/QA vendor inspection cover letter number-FPC # 8867 DATE 9/6/73

2. Date tendon received on-site 10-26-73 RMR Number 33939

3. Date installed in conduit 11-27-73 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 4-30-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-3-75 Stressing NCR's

   Date restressed ___ Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	3 / 3 3/4	6 7/8 / 6	9 7/8 / 9 3/4
Lift-Off Pressure - Predicted/Actual	6800 / 6700	6750 / 7050	N/A
Shim Thickness/80% Ultimate Pressure	5 / 7770	6 3/16 / 7700	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 6-27-74 Bulk-Filling NCR's

   Time since installation 8 months Inlet Pressure 15 # Outlet Temp. 140°

   Date end caps refilled: Shop 3-14-75 Field 4-16-75

7. Data compiled by D. Wells Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

DOCUMENT NO: N750-001
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TENDON IDENTIFICATION NUMBER 62H14 CUT LENGTH 155'-9 3/4"

SHOP WASHER ID: PC 120 CR 153 FIELD WASHER ID: PC 121 CR 1048

1. GAI/QA vendor inspection cover letter number-FPC # 8867 DATE 9/6/73
2. Date tendon received on-site 10-26-73 RMR Number 33934
3. Date installed in conduit 11-27-73 Installation NCR's ______
   Wires removed 0 Wires replaced 0 Total Ineffective wires 0
4. Date buttonheaded 5-1-74 Buttonheading NCR's ______
   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0
5. Date stressed 3-5-75 Stressing NCR's ______
   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	3 / 5 1/2	6 5/8 / 4 3/8	9 5/8 / 9 7/8
Lift-Off Pressure - Predicted/Actual	6800 / 6650	6750 / 6600	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4 / 7770	6 1/4 / 7700	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163
6. Date Bulk-filled 6-21-74 Bulk-Filling NCR's ______
   Time since installation 8 months Inlet Pressure 32 lb. Outlet Temp. 121°
   Date end caps refilled: Shop 3-14-75 Field 4-16-75
7. Data compiled by D. Waller Organization Salem
   Date 4/4/77
8. Additional Comments: Inserted two (2) wooden wedges between the washer and the casing to hold the washer up.

ATTACHMENT B

ORIGINAL TENDON STRESSING SEQUENCES

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
D101	23	D201	32	D301	21
D102	32	D202	30	D302	22
D103	32	D203	11	D303	8
D104	22	D204	12	D304	30
D105	21	D205	28	D305	20
D106	24	D206	30	D306	23
D107	7	D207	9	D307	7
D108	31	D208	28	D308	30
D109	20	D209	29	D309	19
D110	25	D210	13	D310	24
D111	5	D211	1	D311	6
D112	31	D212	27	D312	30
D113	19	D213	14	D313	18
D114	32	D214	30	D314	25
D115	4	D215	2	D315	5
D116	29	D216	27	D316	30
D117	18	D217	15	D317	17
D118	26	D218	30	D318	26
D119	6	D219	3	D319	4
D120	29	D220	27	D320	30
D121	17	D221	32	D321	16
D122	26	D222	28	D322	26
D123	3	D223	4	D323	3
D124	29	D224	27	D324	30
D125	16	D225	17	D325	15
D126	27	D226	28	D326	26
D127	29	D227	5	D327	2
D128	2	D228	26	D328	29
D129	15	D229	18	D329	14
D130	1	D230	29	D330	27
D131	29	D231	6	D331	1
D132	27	D232	24	D332	29
D133	14	D233	19	D333	13
D134	27	D234	29	D334	28
D135	10	D235	7	D335	9
D136	29	D236	23	D336	28
D137	32	D237	29	D337	28
D138	28	D238	20	D338	12
D139	11	D239	32	D339	32
D140	28	D240	22	D340	28
D141	12	D241	32	D341	11

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	D130	D211	D331				
2	D128	D215	D327				
3	D123	D219	D323				
4	D115	D223	D319				
5	D111	D227	D315				
6	D119	D231	D311				
7	D107	D235	D307				
8	D303						
9	D207	D335					
10	D135						
11	D139	D203	D341				
12	D141	D204	D338				
13	D210	D333					
14	D133	D213	D329				
15	D129	D217	D325				
16	D125	D321					
17	D121	D225	D317				
18	D117	D229	D313				
19	D113	D233	D309				
20	D109	D238	D305				
21	D105	D301					
22	D104	D240	D302				
23	D101	D236	D306				
24	D106	D232	D310				
25	D110	D314					
26	D118	D122	D228	D318	D322	D326	
27	D126	D132	D134	D212	D216	D220	D224
27	D330						
28	D138	D140	D205	D208	D222	D226	D334
28	D336	D337	D340				
29	D116	D120	D124	D127	D131	D136	D209
29	D230	D234	D237	D328	D332		
30	D202	D206	D214	D218	D304	D308	D312
30	D316	D320	D324				
31	D108	D112					
32	D102	D103	D114	D137	D201	D221	D239
32	D241	D339					

Note:
Data extracted from Reference 11 of Calculation S-95-0082

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
12V01	7	34V01	4	56V01	1
12V02	27	34V02	21	56V02	27
12V03	16	34V03	13	56V03	10
12V04	27	34V04	23	56V04	27
12V05	8	34V05	5	56V05	2
12V06	25	34V06	26	56V06	27
12V07	9	34V07	14	56V07	11
12V08	28	34V08	30	56V08	27
12V09	17	34V09	30	56V09	3
12V10	28	34V10	23	56V10	28
12V11	28	34V11	31	56V11	12
12V12	28	34V12	25	56V12	27
12V13	1	34V13	16	56V13	4
12V14	20	34V14	28	56V14	24
12V15	10	34V15	7	56V15	13
12V16	23	34V16	28	56V16	24
12V17	11	34V17	26	56V17	29
12V18	21	34V18	8	56V18	24
12V19	2	34V19	17	56V19	14
12V20	31	34V20	26	56V20	24
12V21	3	34V21	9	56V21	5
12V22	21	34V22	25	56V22	23
12V23	12	34V23	18	56V23	15
12V24	21	34V24	25	56V24	23
23V01	1	45V01	7	61V01	4
23V02	19	45V02	20	61V02	22
23V03	10	45V03	16	61V03	13
23V04	19	45V04	30	61V04	22
23V05	2	45V05	8	61V05	6
23V06	20	45V06	19	61V06	25
23V07	11	45V07	30	61V07	14
23V08	20	45V08	17	61V08	25
23V09	3	45V09	9	61V09	5
23V10	23	45V10	18	61V10	26
23V11	12	45V11	1	61V11	15
23V12	23	45V12	19	61V12	26
23V13	4	45V13	22	61V13	7
23V14	24	45V14	20	61V14	26
23V15	13	45V15	10	61V15	16
23V16	23	45V16	20	61V16	26
23V17	5	45V17	2	61V17	8
23V18	24	45V18	20	61V18	26
23V19	14	45V19	11	61V19	17
23V20	24	45V20	21	61V20	29
23V21	6	45V21	30	61V21	9
23V22	24	45V22	21	61V22	26
23V23	24	45V23	12	61V23	18
23V24	24	45V24	22	61V24	26

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	12V13	23V01	45V11	56V01			
2	12V19	23V05	45V17	56V05			
3	12V21	23V09	56V09				
4	23V13	34V01	56V13	61V01			
5	23V17	34V05	56V21	61V09			
6	23V21	61V05					
7	12V01	34V15	45V01	61V13			
8	12V05	34V18	45V05	61V17			
9	12V07	34V21	45V09	61V21			
10	12V15	23V03	45V15	56V03			
11	12V17	23V07	45V19	56V07			
12	12V23	23V11	45V23	56V11			
13	23V15	34V03	56V15	61V03			
14	23V19	34V07	56V19	61V07			
15	56V23	61V11					
16	12V03	34V13	45V03	61V15			
17	12V09	34V19	45V08	61V19			
18	34V23	45V10	61V23				
19	23V02	23V04	45V06	45V12			
20	12V14	23V06	23V08	45V02	45V14	45V16	45V18
21	12V18	12V22	12V24	34V02	45V20	45V22	
22	45V13	45V24	61V02	61V04			
23	12V16	23V10	23V12	23V16	34V04	34V10	56V22
23	56V24						
24	23V14	23V18	23V20	23V22	23V23	23V24	56V14
24	56V16	56V18	56V20				
25	12V06	34V12	34V22	34V24	61V06	61V08	
26	34V06	34V17	34V20	61V10	61V12	61V14	61V16
26	61V18	61V22	61V24				
27	12V02	12V04	56V02	56V04	56V06	56V08	56V12
28	12V08	12V10	12V11	12V12	34V14	34V16	56V10
29	56V17	61V20					
30	34V08	34V09	45V04	45V07	45V21		
31	12V20	34V11					

Note:
Data extracted from Reference 11 of Calculation S-95-0082.

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
13H01	20	35H01	20	42H01	21
13H02	55	35H02	59	42H02	46
13H03	20	35H03	20	42H03	22
13H04	55	35H04	59	42H04	45
13H05	19	35H05	19	42H05	22
13H06	55	35H06	58	42H06	60
13H07	19	35H07	19	42H07	23
13H08	55	35H08	58	42H08	45
13H09	17	35H09	19	42H09	24
13H10	54	35H10	58	42H10	44
13H11	17	35H11	17	42H11	24
13H12	54	35H12	57	42H12	44
13H13	16	35H13	16	42H13	25
13H14	54	35H14	57	42H14	44
13H15	60	35H15	15	42H15	26
13H16	53	35H16	57	42H16	43
13H17	15	35H17	14	42H17	27
13H18	53	35H18	56	42H18	43
13H19	15	35H19	13	42H19	27
13H20	53	35H20	56	42H20	42
13H21	13	35H21	13	42H21	29
13H22	52	35H22	56	42H22	42
13H23	12	35H23	12	42H23	29
13H24	51	35H24	55	42H24	42
13H25	11	35H25	11	42H25	30
13H26	51	35H26	55	42H26	42
13H27	10	35H27	11	42H27	30
13H28	51	35H28	55	42H28	42
13H29	9	35H29	11	42H29	31
13H30	51	35H30	54	42H30	41
13H31	9	35H31	9	42H31	32
13H32	49	35H32	54	42H32	41
13H33	8	35H33	9	42H33	33
13H34	49	35H34	54	42H34	41
13H35	7	35H35	8	42H35	33
13H36	49	35H36	51	42H36	40
13H37	6	35H37	7	42H37	34
13H38	48	35H38	51	42H38	40
13H39	6	35H39	6	42H39	35
13H40	48	35H40	50	42H40	39
13H41	4	35H41	5	42H41	36
13H42	48	35H42	49	42H42	39
13H43	4	35H43	4	42H43	36
13H44	47	35H44	49	42H44	39
13H45	47	35H45	3	42H45	37
13H46	47	35H46	49	42H46	39
13H47	2	35H47	3	42H47	38

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
46H01	21	51H01	20	62H01	21
46H02	47	51H02	60	62H02	46
46H03	21	51H03	19	62H03	22
46H04	47	51H04	59	62H04	45
46H05	22	51H05	1	62H05	23
46H06	46	51H06	59	62H06	45
46H07	23	51H07	18	62H07	23
46H08	46	51H08	59	62H08	45
46H09	23	51H09	17	62H09	23
46H10	46	51H10	58	62H10	45
46H11	24	51H11	16	62H11	24
46H12	45	51H12	58	62H12	44
46H13	24	51H13	16	62H13	24
46H14	45	51H14	58	62H14	44
46H15	25	51H15	15	62H15	25
46H16	45	51H16	57	62H16	44
46H17	26	51H17	14	62H17	25
46H18	44	51H18	57	62H18	43
46H19	27	51H19	14	62H19	26
46H20	44	51H20	56	62H20	43
46H21	28	51H21	13	62H21	27
46H22	43	51H22	56	62H22	42
46H23	28	51H23	13	62H23	28
46H24	42	51H24	56	62H24	42
46H25	29	51H25	12	62H25	29
46H26	41	51H26	53	62H26	42
46H27	31	51H27	9	62H27	30
46H28	41	51H28	52	62H28	41
46H29	31	51H29	9	62H29	30
46H30	31	51H30	52	62H30	41
46H31	32	51H31	8	62H31	31
46H32	40	51H32	50	62H32	41
46H33	32	51H33	8	62H33	32
46H34	40	51H34	50	62H34	41
46H35	33	51H35	7	62H35	33
46H36	40	51H36	50	62H36	40
46H37	34	51H37	7	62H37	34
46H38	39	51H38	49	62H38	39
46H39	35	51H39	6	62H39	35
46H40	38	51H40	49	62H40	39
46H41	35	51H41	6	62H41	35
46H42	38	51H42	49	62H42	39
46H43	36	51H43	5	62H43	36
46H44	38	51H44	48	62H44	38
46H45	36	51H45	4	62H45	37
46H46	38	51H46	48	62H46	38
46H47	37	51H47	2	62H47	38

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	51H05						
2	13H47	51H47					
3	35H45	35H47					
4	13H41	13H43	35H43	51H45			
5	35H41	51H43					
6	13H37	13H39	35H39	51H39	51H41		
7	13H35	35H37	51H35	51H37			
8	13H33	35H35	51H31	51H33			
9	13H29	13H31	35H31	35H33	51H27	51H29	
10	13H27						
11	13H25	35H25	35H27	35H29			
12	13H23	35H23	51H25				
13	13H21	35H19	35H21	51H21	51H23		
14	35H17	51H17	51H19				
15	13H17	13H19	35H15	51H15			
16	13H13	35H13	51H11	51H13			
17	13H09	13H11	35H11	51H09			
18	51H07						
19	13H05	13H07	35H05	35H07	35H09	51H03	
20	13H01	13H03	35H01	35H03	51H01		
21	42H01	46H01	46H03	62H01			
22	42H03	42H05	46H05	62H03			
23	42H07	46H07	46H09	62H05	62H07	62H09	
24	42H09	42H11	46H11	46H13	62H11	62H13	
25	42H13	46H15	62H15	62H17			
26	42H15	46H17	62H19				
27	42H17	42H19	46H19	62H21			
28	46H21	46H23	62H23				
29	42H21	42H23	46H25	62H25			
30	42H25	42H27	62H27	62H29			
31	42H29	46H27	46H29	46H30	62H31		
32	42H31	46H31	46H33	62H33			
33	42H33	42H35	46H35	62H35			
34	42H37	46H37	62H37				
35	42H39	46H39	46H41	62H39	62H41		
36	42H41	42H43	46H43	46H45	62H43		
37	42H45	46H47	62H45				
38	42H47	46H40	46H42	46H44	46H46	62H44	62H46
38	62H47						
39	42H40	42H42	42H44	42H46	46H38	62H38	62H40
39	62H42						
40	42H36	42H38	46H32	46H34	46H36	62H36	

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
41	42H30	42H32	42H34	46H26	46H28	62H28	62H30
41	62H32	62H34					
42	42H20	42H22	42H24	42H26	42H28	46H24	62H22
42	62H24	62H26					
43	42H16	42H18	46H22	62H18	62H20		
44	42H10	42H12	42H14	46H18	46H20	62H12	62H14
44	62H16						
45	42H04	42H08	46H12	46H14	46H16	62H04	62H06
45	62H08	62H10					
46	42H02	46H06	46H08	46H10	62H02		
47	13H44	13H45	13H46	46H02	46H04		
48	13H38	13H40	13H42	51H44	51H46		
49	13H32	13H34	13H36	35H42	35H44	35H46	51H38
49	51H40	51H42					
50	35H40	51H32	51H34	51H36			
51	13H24	13H26	13H28	13H30	35H36	35H38	
52	13H22	51H28	51H30				
53	13H16	13H18	13H20	51H26			
54	13H10	13H12	13H14	35H30	35H32	35H34	
55	13H02	13H04	13H06	13H08	35H24	35H26	35H28
56	35H18	35H20	35H22	51H20	51H22	51H24	
57	35H12	35H14	35H16	51H16	51H18		
58	35H06	35H08	35H10	51H10	51H12	51H14	
59	35H02	35H04	51H04	51H06	51H08		
60	13H15	42H06	51H02				

Note:
Data extracted from Reference 11 of Calculation S-95-0082.

Previous Revision History

Florida Power CORPORATION

INTEROFFICE CORRESPONDENCE

A-C-XMTL.FRM

Office	MAC	Telephone
Nuclear Engineering	PA3A	240-3873

SUBJECT: Crystal River Unit 3
Quality Record Transmittal - Analysis/Calculation

TO: Records Management – SA2A

The following analysis/calculation package is submitted as the QA Record copy:

DOCNO (FPC DOCUMENT IDENTIFICATION NUMBER)	REV.	SYSTEM(S)	TOTAL PAGES TRANSMITTED
S-01-0019	0	RB, MX	180

TITLE
Preparation of Tendon Force Curves for the 7Th Tendon Surveillance at Crystal River

KWDS (IDENTIFY KEYWORDS FOR LATER RETRIEVAL)
Tendon, Force Curves, ASME Section XI Subsection IWL

DXREF (REFERENCES OR FILES - LIST PRIMARY FILE FIRST)

Vendor Calc. # N750-001 Rev. 0	
SP-182	S-95-0082
7th Tendon Surveillance	

VEND (VENDOR NAME)	VENDOR DOCUMENT NUMBER (DXREF)	SUPERSEDED DOCUMENTS (DXREF)
Precision Surveillance Corp (PSC)	N750-001 Rev. 0	N/A

TAG

N/A		

PART NO.

N/A		

COMMENTS (USAGE RESTRICTIONS, PROPRIETARY, ETC.)
This is a vendor calculation which provides the force curves for the tendons for the 7th tendon surveillance. [illegible]

NOTE:
Use Tag number only for valid tag numbers (i.e., RCV-8, SWV-34, DCH-99); otherwise, use Part number field (i.e., CSC14599, AC1459). If more space is required, write "See Attachment" and list on separate sheet.

FOR RECORDS MANAGEMENT USE ONLY
Quality Record Transmittal received and information entered into SEEK.
Entered by: ____________ Date

(Return copy of Quality Record Transmittal to DE Support Specialist.)

ENTERED 7-9-01

DESIGN ENGINEER	DATE	VERIFICATION ENGINEER	DATE	SUPERVISOR, DESIGN ENG.	DATE
Matthew Denny	6/6/01	Joe P. Cole	6.12.01	Walt Pike	6/18/01

cc: Nuclear Projects (If MAR/EMAR/CGWR/PEERE Return to Service Related) ☐ Yes ☒ No
Supervisor, Config. Mgt. Info.
Mgr., Design Control (Original) w/attach
Mgr., Radiological Emergency Planning w/attach ☐ Yes ☒ No

Calculation Review form Part III or IV actions required ☐ Yes ☒ No
(If Yes, send copy of the Calculation to the Responsible Organization(s) identified in Part III on the Calculation Review form.)

Rev. 6/00

Florida Power CORPORATION

CALCULATION REVIEW

CALC-REV.FRM

CALCULATION NO./REV.

S-01-0019, Revision #0

PART I - DESIGN ASSUMPTION/INPUT REVIEW: APPLICABLE ☐ Yes ☒ No

The following organizations have reviewed and concur with the design assumptions and inputs identified for this calculation:

Systems Engineering ______________________ Signature/Date

Nuclear Plant Operations ______________________ Signature/Date

OTHER(S)

______________________ ______________________ Signature/Date

______________________ ______________________ Signature/Date

PART II - RESULTS REVIEW: APPLICABLE ☐ Yes ☒ No

The following organizations have reviewed and concur with the results of this calculation and understand the actions which the organizations must take to implement the results.

System Engineering ______________________ Signature/Date

Comments: ______________________

Nuclear Plant Operations ______________________ Signature/Date

Comments: ______________________

Safety Analysis Group ☐ Yes ☒ N/A ______________________ Signature/Date

Comments: ______________________

Nuclear Plant Maintenance ☐ Yes ☒ N/A ______________________ Signature/Date

Comments: ______________________

Nuclear Licensed Operator Training ☐ Yes ☒ N/A ______________________ Signature/Date

Comments: ______________________

Manager, Nuclear Reg. Compliance ☐ Yes ☒ N/A ______________________ Signature/Date

Comments: ______________________

Sr. Radiation Protection Engineer ☐ Yes ☒ N/A ______________________ Signature/Date

Comments: ______________________

Nuclear Plant EOP Group ☐ Yes ☒ N/A ______________________ Signature/Date

Comments: ______________________

Design Engineering ☐ Yes ☒ N/A ______________________ Signature/Date

Comments: ______________________

OTHER: ☐ Yes ☒ N/A ______________________ Signature/Date

Florida Power Corporation

CALCULATION REVIEW

CALCULATION NO./REV.
S-01-0019, Revision #0

PART III - CONFIGURATION CONTROL: APPLICABLE ☐ **Yes** ☒ **No PC #** ______________ *

The following is a list of Plant procedures/lesson plans/other documents and Nuclear Engineering calculations which require updating based on calculation results review:

Document	Date Required	Responsible Organization

*** Generate a Precursor Card in accordance with CP-111 for tracking items not identified in other tracking mechanisms (e.g., MAR, EMAR,REA, etc.) . If calculations are listed, a copy shall be sent to the original file and eCalc updated to reflect this impact.**

PART IV - NUCLEAR ENGINEERING DOCUMENTATION REVIEW

The responsible Design Engineer must thoroughly review the below listed documents to assess if the calculation requires revision to these documents. If "Yes," the change authorization number must be listed below. If the change will not be done concurrently with the Analysis/Calculation, a tracking PC shall be generated in accordance with CP-111 to track disposition of the changes.

Document	Yes/No	Reference	Document	Yes/No	Reference
Enhanced Design Basis Document	☐ Yes ☒ No	(TC#)	Vendor Qualification Package		(VQP#)
FSAR	☐ Yes ☒ No	(FSAR CHANGE NUMBER)	Topical Design Basis Doc.	☐ Yes ☒ No	(TC#)
Improved Tech. Specification	☐ Yes ☒ No	(Letter#)	E&SQPM	☐ Yes ☒ No	(TC#)
Improved Tech. Spec. Bases	☐ Yes ☒ No	(Letter#)	Other Documents reviewed:		
Config. Mgmt. Info. System	☐ Yes ☒ No	(CIDP#)		☐ Yes ☐ No	(CHANGE DOC. REFERENCE)
Design Basis Document	☐ Yes ☒ No	(TC#)		☐ Yes ☐ No	(CHANGE DOC. REFERENCE)
Appendix R Fire Study	☐ Yes ☒ No	(TC#)		☐ Yes ☐ No	(CHANGE DOC. REFERENCE)
Fire Hazardous Analysis	☐ Yes ☒ No	(TC#)		☐ Yes ☐ No	(CHANGE DOC. REFERENCE)
NFPA Code Conformance Document		(TC#)		☐ Yes ☐ No	(CHANGE DOC. REFERENCE)

PART V - PLANT REVIEWS/APPROVALS FOR INSTRUMENT SETPOINT CHANGE

PGM approval is required if a setpoint is to be physically changed in the plant through the NEP-213 process.

PGM Review Required ☐ Yes ☒ No

PGM ______________________ /Date

DESIGN ENGINEER/DATE	DESIGN ENGINEER - PRINTED NAME
Matt Denny 6/12/01	MATTHEW DENNY

Systems	RB, MX
Calc. Sub-Type	-
Priority Code	3
Quality Class	Safety Related

NUCLEAR GENERATION GROUP

ANALYSIS / CALCULATION

S07-0033

(Calculation #)

8th Tendon Surveillance Vendor Technical Information

(Title including structures, systems, components)

☐ BNP UNIT ______

☒ CR3 ☐ HNP ☐ RNP ☐ NES ☐ ALL

APPROVAL ☒ Electronically Approved

Rev #	Prepared By	Reviewed By	Supervisor
0	Signature	Signature	Signature
	Name Donald Vaccaro	Name Joe A. Lese	Name Emin Ortalan
	Date 08/28/2007	Date 10/10/2007	Date 10/10/2007

(For Vendor Calculations)

Vendor Precision Surveillance Corporation Vendor Document No. Various-See Attachments

Owner's Review By Joseph Lese Date 10/10/2007

List Of Effective Pages

Page	Rev	Page	Rev	Page	Rev	Page	Rev
i	0	ii	0	iii	0	iv	0
v	0	vi	0				

Attachments

Attach. Number	Rev	Number of Pages	Attach. Number	Rev	Number of Pages	Attach. Number	Rev	Number of Pages
1	2	142	2	0	325	3	1	11
4	0	1						

Amendments

Rev & Letter	No of Pages	Rev & Letter	No of Pages	Rev & Letter	No of Pages	Rev & Letter	No of Pages

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Note: This calculation issues into the CR3 document control system a vendor calculation by Precision Surveillance Corporation. Since the vendor calculation is not formatted to the guidelines of EGR-NGGC-0017, it is issued as an attachment to this calculation.

Legend: ADD = New data record to be added to PassPort; REV = Change revision level of a referenced Controlled Document, DELETE = Existing data record to be deleted; — = Existing PassPort data that is to be retained; Bold Faced column heading = PassPort data label

Revision Summary

Revision #	Revision Summary (Include brief description of revision and a list of EC's and other modifications incorporated into revision)
0	Original Issue.

Document Indexing Tables

Document Management System Data (For update of PassPort Controlled Document information — Document Service is to delete roll over data only if shown for DELETE in the following tables)

Notes - General

Doc Services Action (Enter ADD, DELETE, or —)	**Text of General Notes**

Reference Numbers – Reference Systems

Doc Services Action (Enter ADD, DELETE, or —)	**System** (Two letter code for systems affected by results)
ADD	RB
ADD	MX

Reference Numbers – Other References (references to PassPort products)

Doc Services Action (Enter ADD, DELETE, or —)	**Type** (e.g. AR, EC, WO, etc)	**Reference** (e.g. AR No, EC No, WO No, etc)	**Sub** (AR Assign No, WO Task No, etc.)	**Title**

Legend: ADD = New data record to be added to PassPort; REV = Change revision level of a referenced Controlled Document, DELETE = Existing data record to be deleted; — = Existing PassPort data that is to be retained; Bold Faced column heading = PassPort data label

Input **Document References – Controlled Documents with Cross References**

Doc Services Action (Enter ADD, REV, DELETE, or —)	**Doc. Type** (e.g. CALC, DWG, NPAS, POM, etc)	Document **Sub-Type**	**Document** ID (e.g., Calc No., Dwg. No., Procedure No)	**Sheet** (Dwg. sheet number if Applicable)	Doc **Rev**	**Minor Rev** (for Calc Amendments)	**Ref Type** (for NPAS Docs)

Description Codes (Key Words)

Doc Services Action (Enter ADD, DELETE, or —)	**Code** (Codes for Key Words) (To be recorded as document description codes in PassPort)
Add	Tendon Force Curves ASME Section XI Subsection IWL

Output **Document References** (Doc Service is to open listed documents and add or delete this Calc as a reference)

Doc Services Action (Enter ADD, DELETE, or —)	**Document Type** (e.g. CALC, DWG, TAG, PROCEDURE, SOFTWARE)	Document **Sub-Type**	**Document** ID (e.g., Calc No., Dwg. No., Procedure No., Software name and version)	**Revision**	Action Tracking (AR number or EC number that will track revision of affected document for the results of this calculation)
ADD	Procedure		SP-182	14	

Equipment Database Data (For update of PassPort Equipment Database information)

Equipment Document References

Config Mgt Action (Enter ADD, DELETE, or —)	**Equipment Tag**	**Equipment Type** (includes SFTAPL for analysis software)	Relationship to Calc. (e.g. equipment operation affected by results, equipment design affected by results, analysis software)
ADD	5011	TEN	Equipment force curves

Legend: ADD = New data record to be added to PassPort; REV = Change revision level of a referenced Controlled Document,
DELETE = Existing data record to be deleted; — = Existing PassPort data that is to be retained;
Bold Faced column heading = PassPort data label

Record of Lead Review

Document **S07-0033** **Revision** **0**

The signature below of the Lead Reviewer records that:

- the review indicated below has been performed by the Lead Reviewer;
- appropriate reviews were performed and errors/deficiencies (for all reviews performed) have been resolved and these records are included in the design package;
- the review was performed in accordance with EGR-NGGC-0003.

☒ **Design Verification Review** ☐ **Engineering Review** ☒ **Owner's Review**

☒ Design Review
☐ Alternate Calculation
☐ Qualification Testing

☐ **Special Engineering Review**________________

☐ YES ☒ N/A **Other Records are attached.**

Joe A. Lese (electronically)	**Structural**	**10/10/2007**
Lead Reviewer (print/sign)	**Discipline**	**Date**

Item No.	Deficiency	Resolution
1)	Calculation package has been reviewed and discussed with vendor (Precision Surveillance Corporation). Miscellaneous comments have been incorporated to the satisfaction of the reviewer.	Comments incorporated.
2)		
3)		
4)		
5)		
6)		
7)		
8)		

This form is a QA Record when completed and included with a completed design package. Owner's Reviews may be processed as stand alone QA records when Owner's Review is completed.

Record of Interdisciplinary Reviews

PART I — DESIGN ASSUMPTION / INPUT REVIEW: APPLICABLE ☐ **Yes** ☒ **No**

The following organizations have reviewed and concur with the design assumptions and inputs used in this calculation:

Organization	Name	Signature	Date
Systems Engineering			
Operations			
Other			

PART II — RESULTS REVIEW:

The following organizations are aware of the impact of the results of this calculation (on designs, programs and procedures):

Organization	Name	Signature	Date
Systems Engineering ☐ Yes ☒ NO			
Comments:			
Operations ☐ Yes ☒ NO			
Comments:			
Other			
Comments:			
Other			
Comments:			
Other			
Comments:			

DOCUMENT COVER SHEET

Document No: CR-N991-001

Title: PREDICTED BASE FORCES FOR THE 30TH YEAR CONTAINMENT IWL INSPECTION

PSC
MASTER COPY
INITIAL CEC DATE 8/8/07

No.	Description	Prepared By	Date	Reviewed By	Date
2	Addition of Write-Up	B.A. GIOMETTI	08/08/07	C.E. COX	08/08/07
1	Format Revision	B.A. GIOMETTI	07/02/07	C.E. COX	07/02/07
0	Original Issue	B.A. GIOMETTI	01/10/07	P.C. Smith	01/10/07
		PSC SIGN OFF			
REVISIONS					

TABLE OF CONTENTS

1.0 PURPOSE AND OBJECTIVE

The purpose of this calculation is to provide tendon force curves for Florida Power Corporation for the Crystal River Unit 3 facility in support of the upcoming 8TH tendon surveillance period scheduled for the Fall of 2007. The following information and calculations here within are based upon FPC Calculation S-95-0082 and PSC Calculation N750-001. The same design process will be utilized for generating the tendon force curves for the current tendon surveillance. Specific tasks to be performed as part of this scope include the following:

1.1 Determine the predicted tendon losses and develop force/time curves for each of the selected tendons for the eighth surveillance period. Generate the tendon force curves for the selected tendons and the tendons adjacent to the selected tendons.

1.2 In addition to the current force curves developed, calculation CR-N991-001 supports all tendon force calculations for any period for the selected individual tendon.

2.0 DESIGN INPUT

Design input information has been reviewed and can be found in FPC calculation S-95-0082. These calculations have included all force losses, which the surveillance tendons have incurred since original installation. The original installations cards are in Appendix-A. Data taken from these sheets include the effective wires and the original tendon force at installation.

3.0 SCOPE AND TENDON SELECTION

Tendons were selected for the eighth surveillance period by Florida Power Corporation and distributed to Precision Surveillance Corporation. The tendons selected for the eighth surveillance are listed below.

UNIT 3 – CRYSTAL RIVER 30TH YEAR SURVEILLANCE SCOPE OF WORK		
VERTICALS	**HOOPS**	**DOMES**
12V01(C)	**13H36**	**D129**
45V20	**42H46**	**D212(C)**
61V17	**46H21(C)**	**D238(D)**
34V17(A)	**51H34(D)**	**D337(A)**
	62H30	
	46H07(A)	
(C) – COMMON	(D) – DETENSION	(A) - ALTERNATE

4.0 CALCULATIONS

4.1 General Background

Tendon forces curves are to be prepared for the upcoming 8th tendon surveillance period at CR3. From the basic criteria as presented in Calculation S-95-0082, the supporting work for this surveillance will be based upon those calculations.

4.1.1 Tendon losses have been calculated in the past per the Reference 8, 9, 10 and 11 of Calculation S-95-0082. The individual losses include the following.

4.1.1.1 Force loss due to elastic shortening of the containment as a result of the prestressing process and the particular sequence of tendon stressing.

4.1.1.2 Force loss due to the stress relaxation of the tendon wires.

4.1.1.3 Loss of prestress force due to the creep characteristics of the concrete structure.

4.1.1.4 Loss of prestress force due to the shrinkage of the concrete structure.

4.1.2 Based on the work previously accomplished in the prior surveillances, new spreadsheets were prepared this surveillance using Microsoft Excel for the collection of input data and for the calculation of tendon losses needed for generation for the force curves. The generation of the force curves was also automated this surveillance by using Excel to plot the graphs. The organization of most data used for this calculation was setup into Excel workbooks with subfiles built and included in each workbook. There is a separate workbook for each of the three tendon groups and each one contains the following:

4.1.2.1 Tabulated input data.

4.1.2.2 Original tendon stressing sequences.

4.1.2.3 Effective wire summaries.

4.1.2.4 *Original Stressing Data*

4.1.2.5 Separate sheets including each tendon loss spreadsheet, plot data and an individual force curve.

4.2 Schedule Information

4.2.1 The expected timing for the eighth surveillance is Fall 2007. A date of October 1, 2007 will be used as basis for determining the predicted values of Base, 95% Base and 90% Base and labeling this information on the force curves. A vertical line will be shown on the force curves at the point of the eighth surveillance and the calculated values of Base, 95% Base and 90% Base representing points on the curves at that time will be included on each of the curves.

4.3 General Procedure for Force Curve Generation

The same procedure within the calculation for the preparation of the force curves for the fourth, fifth, sixth and seventh surveillance periods will be followed.

4.3.1 Preparation of Data Input Spreadsheets

4.3.1.1 In each of the Excel workbooks is a data input file where data from source calculations and current tendon history sheets has been tabulated. See Appendix-A for tendon history sheets.

4.3.2 Procedure for Determination of Individual Tendon Losses

The procedure for the tendon loss calculations, as derived from the reference documentation, is as follows:

4.3.2.1 Calculate original force in the tendons.

$$ORIG_{FORCE} = 0.7xF_{ULT}x\left(\frac{ActualLiftoffpressure}{PredictedLiftoffpressure}\right)xWireFactor$$

Where: F_{ult} (Kip Force) = Tendon Area (in^2) x f_{ult} (ksi) = 0.05985 x 240

f_{ult} = 240 ksi, typical for all CR3 wires.

Wire Area = 0.07685 in^2

Tendon Area (in^2) = Area/Wire (in^2) x No. of Wires. (Considered by wire factor.)

4.3.2.1.1 Actual and predicted original liftoff pressures are obtained from the Tendon History Sheets. See Appendix-A for Tendon History Sheets.

4.3.2.1.2 The above expression was used as the basis for the calculations for all of the shop and field end forces calculated on the Data Input Spreadsheets. This procedure does not apply to retensioned tendons.

4.3.2.1.3 Note that the wire factor as shown in the various spreadsheets is a value representing the tabulated number of effective wires over a total of 163. The number of wires is usually 163 unless cut, loose or considered ineffective. The number of effective wires as recorded from the original installation is documented on the tendon history sheets.

4.3.2.1.4 Note that the wire factor used is based on current information and is not based on the number of wires at the time of installation, therefore the original Force calculated may not be the "original force" in the tendon back at that time. The effect of less effective wires lowers the curve vertically. This is insignificant at the current time as the curve of interest will be correct for use at this time.

4.3.2.2 Calculate Elastic Shortening Losses

4.3.2.2.1 The elastic shortening losses are a function of the stressing sequence number for the individual tendon. In addition, the tendon wire factors are also considered and used. The base expression used to calculate these forces is the same as used in previous calculations and is already built into the basic spreadsheet templates. All the equations for elastic shortening were confirmed as being the same as established in prior calculations. Based on the review of the procedure for calculating these losses, it is concluded that the existing templates are still appropriate and correct with the additional input of stressing sequence data and wire factors to be input for the current group of tendons for this surveillance.

4.3.2.2.2 The original stressing sequences and data input worksheets for all tendons are at the beginning of each design input/output of the three types of tendons. See Appendix-A for tendon wire factor and source data.

4.3.2.2.3 Elastic Shortening Losses for Dome Tendons

4.3.2.2.3.1 There are two expressions used for elastic shortening for the dome tendons depending on the stress sequence numbers. For dome tendons in sequences 1 through 27, the Domelow template is used. For tendons in sequences 28 through 32, the Domehigh template is to be used. This is because of the two separate expressions used for the calculation.

Elastic Shortening Losses:

For Dome Tendons in Sequences 1 through 27
N = 27 Total Sequences
n = Sequence of particular tendon.

Force Loss due to elastic shortening = F_{les}

$$F_{les} = \left[\left[\frac{(N-n)}{N}\right]x(82.7) + 75\right]xWireFactor$$

Elastic Shortening Losses:

For Dome Tendons in Sequences 28 through 32
N = 5 (Sequences 28 through 32)
n = Sequence number less 27

i.e. for sequence 28, n = 1
for sequence 29, n = 2
for sequence 30, n = 3
for sequence 31, n = 4
for sequence 32, n = 5

$$F_{les} = \left[\left[\frac{(N-n)}{N}\right]x(47.4) - 13.7\right]xWireFactor$$

4.3.2.2.3.2 The value for elastic shortening in kips declines as the stressing sequence increases. A review of the data for the dome group show that values for the dome group goes from 154.6 kips for sequence 1 tendons down to 75 kips for sequence 27 tendons, and further going down to –13.7 kips for the last sequence, sequence 32. Note that wire factor differences between individual tendons will cause the calculated result to vary slightly for two tendons within the same stressing sequence.

4.3.2.2.4 Elastic Shortening Losses for Hoop Tendons:

N = 60 Total Sequences.
n = Sequence of particular tendon.
Force Loss due to elastic shortening =

$$F_{les} = \left[\frac{(N-n))}{N}x134.0\right]xWireFactor$$

4.3.2.2.4.1 A review of the data for the hoop tendon group shows that the range of values for the calculated elastic shortening goes from 127.3 kips for sequence 3 tendons down to 0 kips for the last tendon sequence, sequence 60.

4.3.2.2.5 Elastic Shortening Losses for Vertical Tendons:

N = 31 Total Sequences.
n = Sequence of particular tendon.
Force Loss due to elastic shortening:

$$F_{les} = \left[\frac{(N-n))}{N}x134.0\right]xWireFactor$$

4.3.2.2.5.1 A review of the data for the vertical tendon group shows that the range of values calculated for elastic shortening goes from 71.1 kips for sequence 1 tendons down to 4.7 kips for sequence 29 tendons. There are a total of 31 stressing sequences for the vertical tendons.

4.3.2.3 Calculate Wire Stress Relaxation Losses

4.3.2.3.1 Wire stress relaxation losses and the procedure for the determination of these losses for the 4th, 5th, 6th and 7th surveillances are addressed in previous calculations. The original wire relaxation curve, as provided by test data from the wire vendor, forms the bases for wire relaxation loss values. It was determined that the same procedures and figures as calculated in those prior calculations are still applicable for this surveillance.

4.3.2.3.2 Note that there were adjustments made to the original stress relaxation values from the vendor relaxation curve to allow for some conservatism and for temperature consideration of 100° F vs. 68° F. Also, per the original design, the wire factor or actual number of effective wires was considered as negligible for these losses and was not included. Note that values for stress relaxation range between 40 and 50 kips for the surveillance period for all three tendon groups.

4.3.2.4 Calculate Creep Losses

4.3.2.4.1 Original concrete creep calculations can be found in Calculation 2-95-0082. The losses are based on the curve contained in the reference calculation. Creep values are different for each of the three groups of tendons. For the dome tendons in the coming surveillance period, creep values are the same and are approximately 152 to 158 kips. Hoop values are between 79 and 83 kips and verticals are 36 to 38 kips.

4.3.2.5 Calculate Shrinkage Losses

4.3.2.5.1 Original losses from shrinkage were taken from Calculation S-95-0082. The straight line shrinkage losses in micro inches per inch as calculated in the previously stated calculation are still applicable for this surveillance period. Tabulated values from the references were input into the dome, hoop and vertical spreadsheets. There are no additional variables or considerations, and the same values are to be used for this calculation. From a review of the output information, the dome values are constant at 8 to 9 kips, hoop values are above 5 kips and verticals are also slightly above 5 kips.

4.3.2.6 Total Losses

4.3.2.6.1 Calculated force losses for elastic shortening, wire stress relaxation, creep and shrinkage are added for a total of all losses. Also, a percent of this total of all losses is calculated based on the original average force in the tendon.

4.3.2.7 Determine Predicted Forces for Base, 95% Base and 90% Base values

4.3.2.7.1 The original force, less the total of losses calculated yields the base predicted value for the subject period of surveillance inspection. The 95% and 90% values are then calculated based on the calculated predicted base value.

4.3.2.8 Normalization Factors

4.3.2.8.1 Normalization factors are calculated based on the expressions and the source article contained in Attachment 1 of Calculation S-95-0082. This factor usually does not change much over the forty-year time span of the calculation. The base expression for the dome normalization factor value is presented as follows:

$$(A - B) \times (1 - C) + (D - 97.7)$$

Where:
A = Average of all Domes group.
B = Original average tendon force.
C = Wire Stress Relaxation Percentage.
D = Elastic Shortening.

As an example, Dome tendon D212 calculates as follows:

Normalization Factor = $(1639 - 1600) \times (1 - 0.0291) + (75 - 97.7)$

Normalization Factor = +15 (which matches the spreadsheet calculation.)
Similar calculations are completed for the hoop and vertical tendons.

4.3.2.9 Plotting of Data

4.3.2.9.1 Only the data from Column B, L, M, & N are tabulated on a separate area on the side of the spreadsheet. *See columns R, S, T & U; Rows 40 through 50. Only these values are selected for* plotting on the force curves. This is for ease of plotting and has no affect on the quality or accuracy of the plots.

4.3.2.9.2 The plots of all dome curves with all the data point showed the force curve plot line as slightly crooked from a true linear plot. The large scale used showed some inflection points slightly off of linear. After investigation, the condition was avoided by omitting data points at year 10 and 15 after SIT for the final plotted figures. This was done on for presentation purposes and there is no affect on the accuracy of the plot or the base values calculated and presented on each curve.

4.4 INDIVIDUAL TENDON LOSSES CALCULATION WORKSHEET: NOTES AND LEGEND

4.4.1 Individual tendon losses are calculated based on the procedure presented in the preceding section. The following notes explain the spreadsheet process, input and calculations performed for each of the columns presented. The shaded values on the losses worksheet are extracted from the data input worksheet.

CALCULATION LEGEND			
COLUMN	**DESCRIPTION**	**COLUMN**	**DESCRIPTION**
A	Inspection Period after SIT	I	Shrinkage Force
B	Years after Concrete Placement	J	Total Force Loss
C	Elastic Shortening	K	Total Percent Loss
D	Stress Relaxation Percent	L	Base
E	Stress Relaxation Forces	M	95% Base
F	Creep Strain	N	90% Base
G	Creep Strain Force	O	Normalization Factor
H	Shrinkage Values		

5.0 SUMMARY OF PREDICTED FORCES

PREDICTED FORCES				
TENDON	PREDICTED BASE (KIPS)	95% PREDICTED BASE (KIPS)	90% PREDICTED BASE (KIPS)	NORMALIZATION FACTORS
61V24	1529	1452	1376	-14
12V01	1525	1449	1372	-9
12V02	1596	1516	1437	-80
45V19	1484	1409	1335	+31
45V20	1507	1432	1357	+7
45V21	1533	1456	1380	-19
61V16	1523	1447	1371	-8
61V17	1498	1423	1348	+17
61V18	1493	1418	1344	+21
46H20	1467	1394	1321	-39
46H21	1441	1369	1297	-12
46H22	1486	1412	1337	-57
51H33	1392	1323	1253	+36
51H34	1487	1413	1339	-59
51H35	1348	1281	1213	+79
42H45	1473	1399	1325	-44
42H46	1456	1383	1310	-28
42H47	1425	1354	1283	+3
13H35	1373	1304	1235	+56
13H36	1484	1410	1336	-56
13H37	1368	1299	1231	+61
62H29	1421	1350	1279	+7
62H30	1413	1342	1272	+14
62H31	1475	1401	1328	-46
D128	1268	1205	1141	+53
D129	1287	1223	1159	+34
D130	1261	1198	1135	+60
D211	1305	1239	1174	+18
D212	1305	1240	1175	+15
D213	1312	1246	1180	+10
D237	1426	1335	1283	-104
D238	1348	1281	1213	-26
D239	1409	1338	1268	-88

(shaded) = Surveillance Tendon
(unshaded) = Adjacent Tendon

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
12V01	7	34V01	4	56V01	1
12V02	27	34V02	21	56V02	27
12V03	16	34V03	13	56V03	10
12V04	27	34V04	23	56V04	27
12V05	8	34V05	5	56V05	2
12V06	25	34V06	26	56V06	27
12V07	9	34V07	14	56V07	11
12V08	28	34V08	30	56V08	27
12V09	17	34V09	30	56V09	3
12V10	28	34V10	23	56V10	28
12V11	28	34V11	31	56V11	12
12V12	28	34V12	25	56V12	27
12V13	1	34V13	16	56V13	4
12V14	20	34V14	28	56V14	24
12V15	10	34V15	7	56V15	13
12V16	23	34V16	28	56V16	24
12V17	11	34V17	26	56V17	29
12V18	21	34V18	8	56V18	24
12V19	2	34V19	17	56V19	14
12V20	31	34V20	26	56V20	24
12V21	3	34V21	9	56V21	5
12V22	21	34V22	25	56V22	23
12V23	12	34V23	18	56V23	15
12V24	21	34V24	25	56V24	23
23V01	1	45V01	7	61V01	4
23V02	19	45V02	20	61V02	22
23V03	10	45V03	16	61V03	13
23V04	19	45V04	30	61V04	22
23V05	2	45V05	8	61V05	6
23V06	20	45V06	19	61V06	25
23V07	11	45V07	30	61V07	14
23V08	20	45V08	17	61V08	25
23V09	3	45V09	9	61V09	5
23V10	23	45V10	18	61V10	26
23V11	12	45V11	1	61V11	15
23V12	23	45V12	19	61V12	26
23V13	4	45V13	22	61V13	7
23V14	24	45V14	20	61V14	26
23V15	13	45V15	10	61V15	16
23V16	23	45V16	20	61V16	26
23V17	5	45V17	2	61V17	8
23V18	24	45V18	20	61V18	26
23V19	14	45V19	11	61V19	17
23V20	24	45V20	21	61V20	29
23V21	6	45V21	30	61V21	9
23V22	24	45V22	21	61V22	26
23V23	24	45V23	12	61V23	18
23V24	24	45V24	22	61V24	26

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	12V13	23V01	45V11	56V01			
2	12V19	23V05	45V17	56V05			
3	12V21	23V09	56V09				
4	23V13	34V01	56V13	61V01			
5	23V17	34V05	56V21	61V09			
6	23V21	61V05					
7	12V01	34V15	45V01	61V13			
8	12V05	34V18	45V05	61V17			
9	12V07	34V21	45V09	61V21			
10	12V15	23V03	45V15	56V03			
11	12V17	23V07	45V19	56V07			
12	12V23	23V11	45V23	56V11			
13	23V15	34V03	56V15	61V03			
14	23V19	34V07	56V19	61V07			
15	56V23	61V11					
16	12V03	34V13	45V03	61V15			
17	12V09	34V19	45V08	61V19			
18	34V23	45V10	61V23				
19	23V02	23V04	45V06	45V12			
20	12V14	23V06	23V08	45V02	45V14	45V16	45V18
21	12V18	12V22	12V24	34V02	45V20	45V22	
22	45V13	45V24	61V02	61V04			
23	12V16	23V10	23V12	23V16	34V04	34V10	56V22
23	56V24						
24	23V14	23V18	23V20	23V22	23V23	23V24	56V14
24	56V16	56V18	56V20				
25	12V06	34V12	34V22	34V24	61V06	61V08	
26	34V06	34V17	34V20	61V10	61V12	61V14	61V16
26	61V18	61V22	61V24				
27	12V02	12V04	56V02	56V04	56V06	56V08	56V12
28	12V08	12V10	12V11	12V12	34V14	34V16	56V10
29	56V17	61V20					
30	34V08	34V09	45V04	45V07	45V21		
31	12V20	34V11					

Note:
Data extracted from Reference 11 of Calculation S-95-0082.

VERTICAL TENDONS DATA INPUT

Ref.: CALCULATION S-95-0082

Initial Concrete Stress = 967.0 (ksi)
Average Force = 1644.0 (kips)
Total Stress Sequence (N) = 31
Total Elastic Shortening = 73.5

Tendon No.	Lift-off Pressure (ksi) (1) Shop End Predicted	Shop End Actual	Field End Predicted	Field End Actual	Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips) Shop End (5)	Field End (5)	Remarks (3)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
61V24	6870	6775	N/A	N/A	26	163	1.000	1634	N/A	
12V1	6800	6950	N/A	N/A	7	163	1.000	1675	N/A	S,C
12V2	6800	7050	N/A	N/A	27	163	1.000	1699	N/A	
45V19	6810	6750	N/A	N/A	11	163	1.000	1624	N/A	
45V20	6810	6750	N/A	N/A	21	163	1.000	1624	N/A	S
45V21	6800	6800	N/A	N/A	30	162	0.994	1629	N/A	
61V16	6870	6825	N/A	N/A	26	163	1.000	1628	N/A	
61V17	6870	6900	N/A	N/A	8	163	1.000	1646	N/A	S,D
61V18	6870	6700	N/A	N/A	26	163	1.000	1598	N/A	

Notes:
(1) Ref. Crystal River 3 R/B Tendon History Sheets - Vertical Tendons for Original Stressir
(2) Ref. Crystal River 3 Tendon Surveillance Loss Calculations, Tendon Stress Sequence, Pages 28 and 2
(3) S =Selected Tendons, C =Control tendon, D =Detensioned tendon, A =Alternate tend
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacen
(4) Wire factors are calculated based on the number of effective wires divided by 163.
(5) Original forces calculated based on the expression in S-95-008

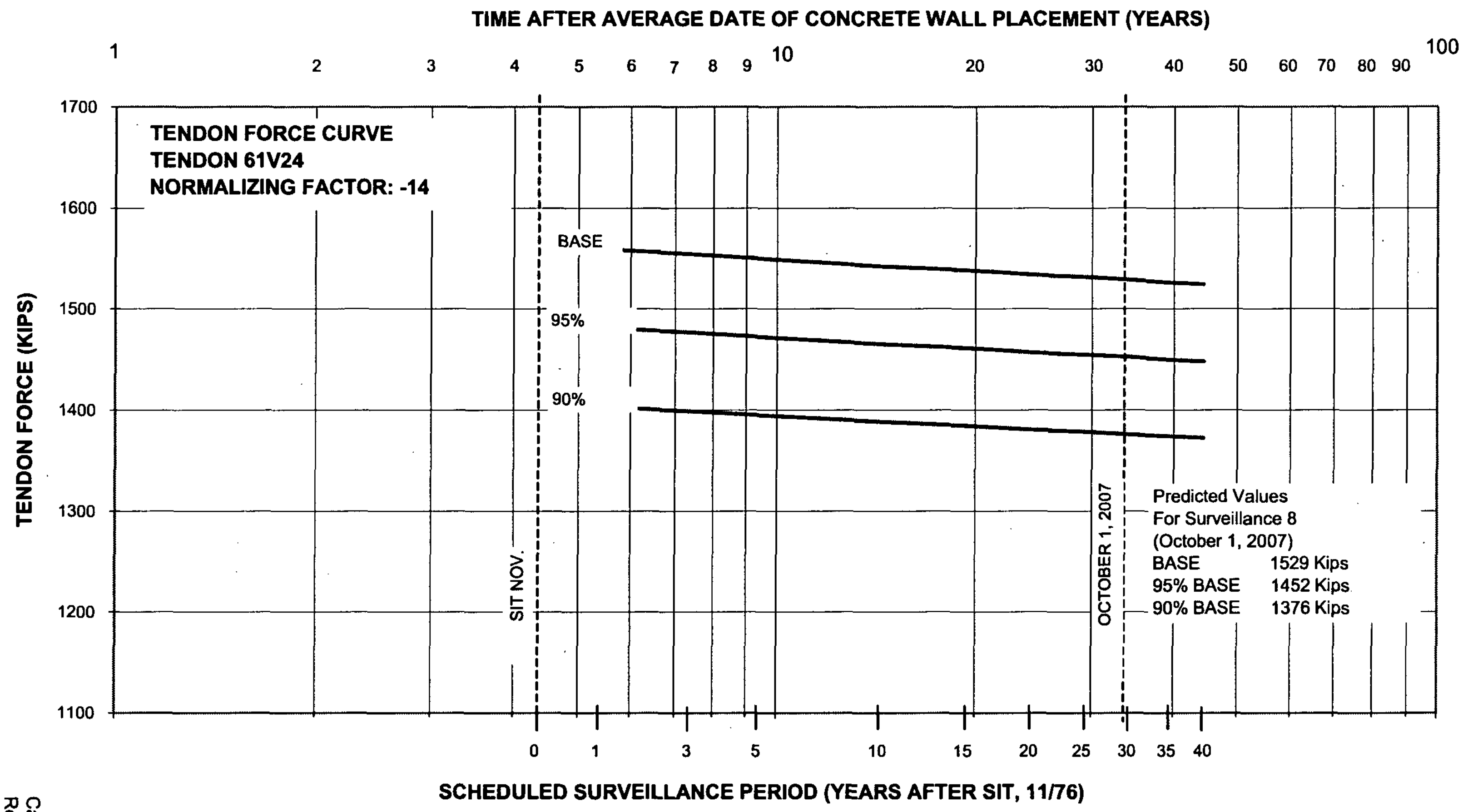
TENDON: 61V24 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1634 FIELD: 1634 AVERAGE: 1634 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 26 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	11.9	2.57%	42.3	0.096	18.6	6.0	1.7	74.5	4.56%	1560	1482	1404	-14
3	7.4	11.9	2.60%	42.7	0.117	22.6	8.5	2.4	79.6	4.87%	1554	1477	1399	-14
5	9.4	11.9	2.68%	44.1	0.130	25.4	10.0	2.8	84.2	5.15%	1550	1472	1395	-14
10	14.4	11.9	2.76%	45.4	0.157	30.5	13.5	3.8	91.6	5.60%	1542	1465	1388	-14
15	19.4	11.9	2.81%	46.2	0.173	33.3	15.5	4.4	95.8	5.86%	1538	1461	1384	-14
17	21.4	11.9									1537	1460	1383	
20	24.4	11.9	2.87%	47.2	0.188	36.1	17.5	4.9	100.1	6.12%	1534	1457	1381	-14
21:3	25.65	11.9									1533	1457	1380	
25	29.4	11.9	2.89%	47.3	0.197	37.8	19.5	5.5	102.5	6.27%	1532	1455	1378	-14
30	34.4	11.9	2.91%	47.8	0.207	39.8	20.4	5.8	105.3	6.44%	1529	1452	1376	-14
35	39.4	11.9	2.93%	48.2	0.216	41.5	21.5	6.1	107.7	6.59%	1526	1450	1374	-14
40	44.4	11.9	2.95%	48.5	0.221	42.6	22.5	6.4	109.4	6.69%	1525	1448	1372	-14
25	29.4										1532	1455	1378	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 61V24
NORMALIZING FACTOR: -14
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE (KIPS)
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values
For Surveillance 8
(October 1, 2007)
BASE 1529 Kips
95% BASE 1452 Kips
90% BASE 1376 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

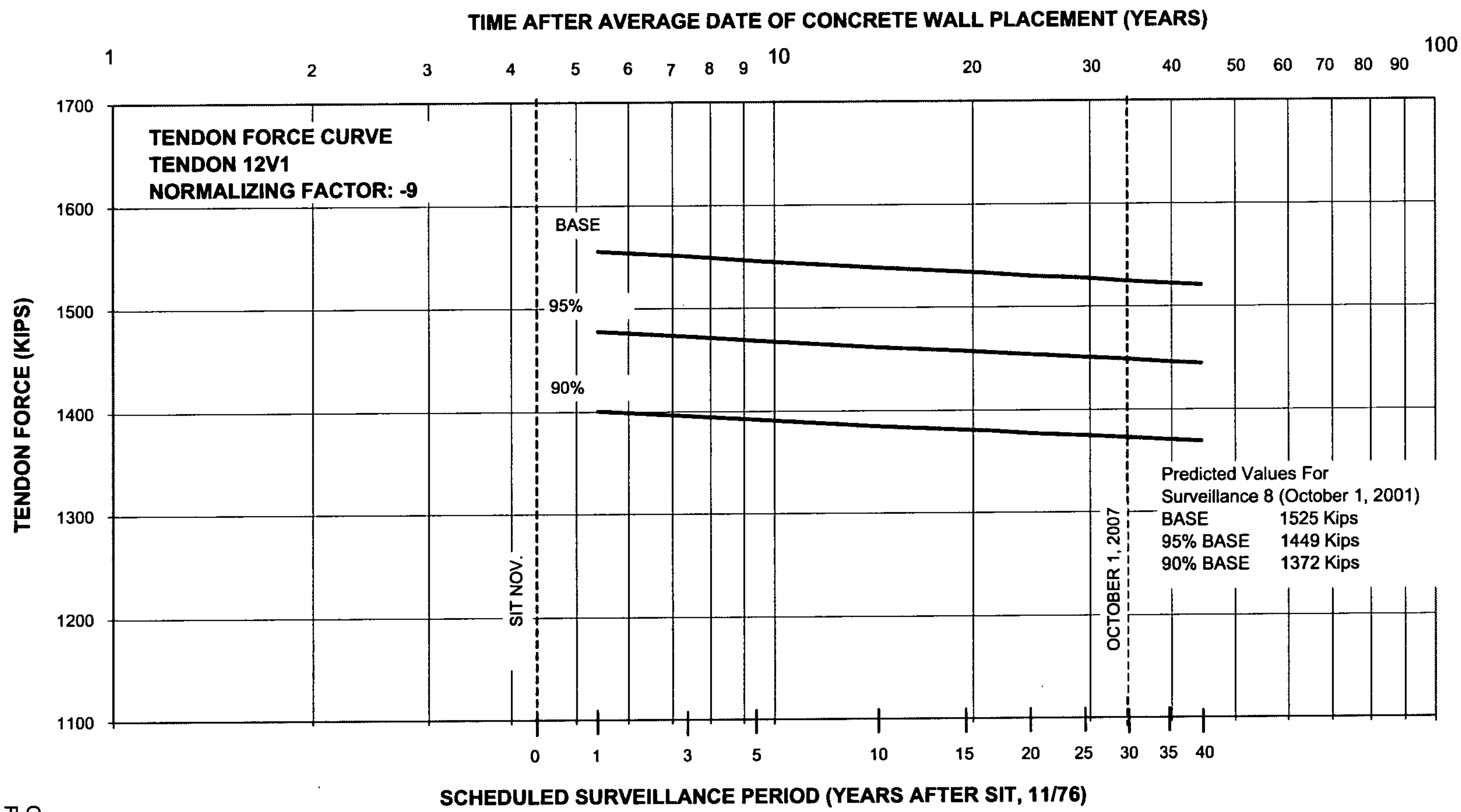
TENDON: 12V1 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1675 FIELD: 1675 AVERAGE: 1675 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 7 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	56.9	2.57%	42.3	0.096	18.6	6.0	1.7	119.5	7.13%	1556	1478	1400	-9
3	7.4	56.9	2.60%	42.7	0.117	22.6	8.5	2.4	124.6	7.44%	1550	1473	1395	-9
5	9.4	56.9	2.68%	44.1	0.130	25.4	10.0	2.8	129.2	7.71%	1546	1469	1391	-9
10	14.4	56.9	2.76%	45.4	0.157	30.5	13.5	3.8	136.6	8.16%	1538	1462	1385	-9
15	19.4	56.9	2.81%	46.2	0.173	33.3	15.5	4.4	140.8	8.41%	1534	1458	1381	-9
17	21.4	56.9									1533	1456	1379	
20	24.4	56.9	2.87%	47.2	0.188	36.1	17.5	4.9	145.1	8.66%	1530	1453	1377	-9
21:3	25.65	56.9									1529	1453	1376	
25	29.4	56.9	2.89%	47.3	0.197	37.8	19.5	5.5	147.5	8.81%	1528	1451	1375	-9
30	34.4	56.9	2.91%	47.8	0.207	39.8	20.4	5.8	150.3	8.97%	1525	1449	1372	-9
35	39.4	56.9	2.93%	48.2	0.216	41.5	21.5	6.1	152.7	9.12%	1522	1446	1370	-9
40	44.4	56.9	2.95%	48.5	0.221	42.6	22.5	6.4	154.4	9.22%	1521	1445	1369	-9
25	29.4										1528	1451	1375	

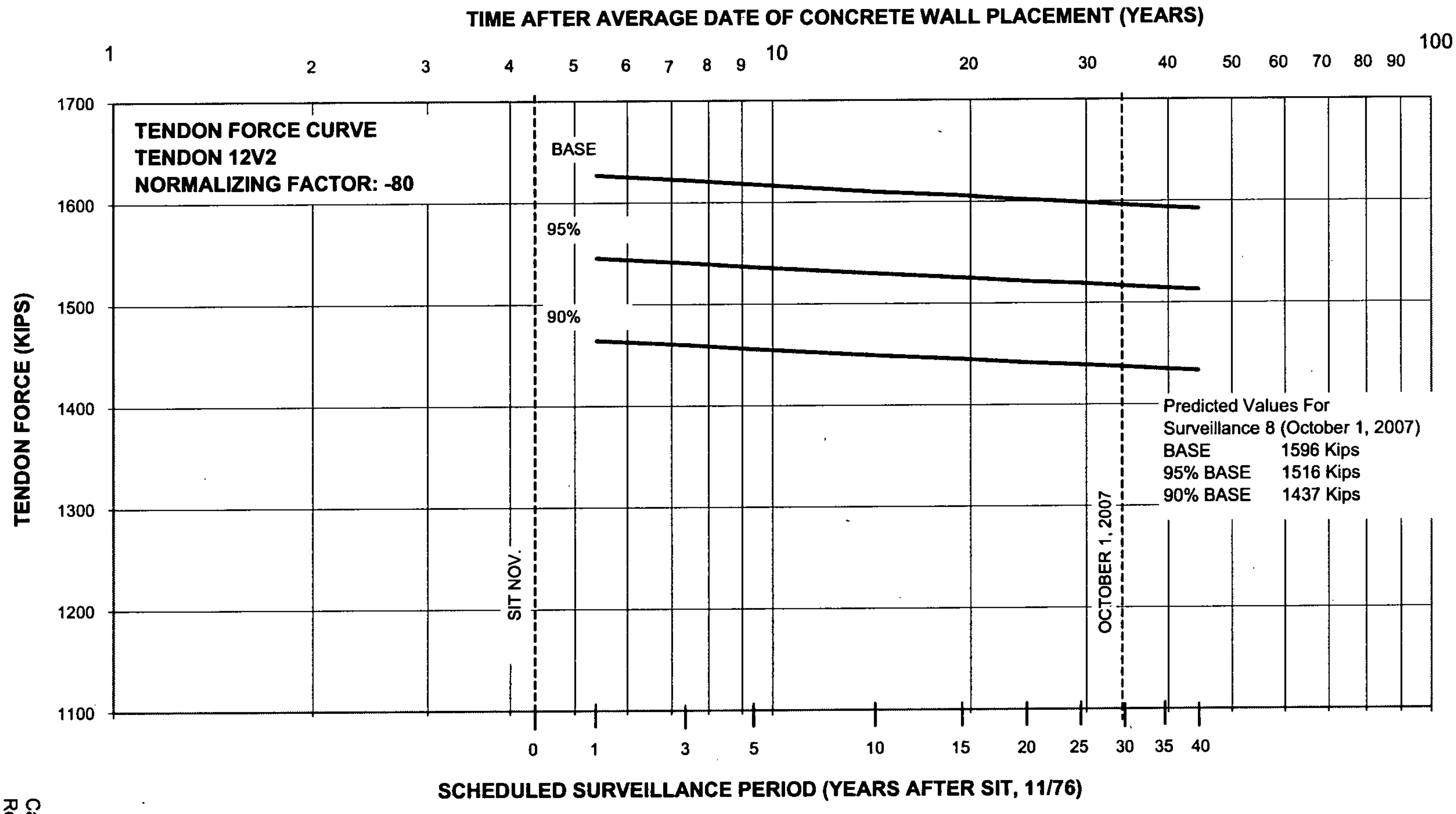

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 12V1
NORMALIZING FACTOR: -9
TENDON FORCE (KIPS)
1700
1600
1500
1400
1300
1200
1100
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2001)
BASE 1525 Kips
95% BASE 1449 Kips
90% BASE 1372 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 12V2 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1699 FIELD: 1699 AVERAGE: 1699 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 27 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	9.5	2.57%	42.3	0.096	18.6	6.0	1.7	72.1	4.24%	1627	1546	1464	-80
3	7.4	9.5	2.60%	42.7	0.117	22.6	8.5	2.4	77.2	4.54%	1622	1541	1460	-80
5	9.4	9.5	2.68%	44.1	0.130	25.4	10.0	2.8	81.8	4.81%	1617	1537	1456	-80
10	14.4	9.5	2.76%	45.4	0.157	30.5	13.5	3.8	89.2	5.25%	1610	1530	1449	-80
15	19.4	9.5	2.81%	46.2	0.173	33.3	15.5	4.4	93.4	5.50%	1606	1526	1445	-80
17	21.4	9.5									1604	1524	1444	
20	24.4	9.5	2.87%	47.2	0.188	36.1	17.5	4.9	97.7	5.75%	1602	1521	1441	-80
21:3	25.65	9.5									1601	1521	1441	
25	29.4	9.5	2.89%	47.3	0.197	37.8	19.5	5.5	100.1	5.89%	1599	1519	1439	-80
30	34.4	9.5	2.91%	47.8	0.207	39.8	20.4	5.8	102.9	6.05%	1596	1516	1437	-80
35	39.4	9.5	2.93%	48.2	0.216	41.5	21.5	6.1	105.3	6.20%	1594	1514	1435	-80
40	44.4	9.5	2.95%	48.5	0.221	42.6	22.5	6.4	107.0	6.30%	1592	1513	1433	-80
25	29.4										1599	1519	1439	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 12V2
NORMALIZING FACTOR: -80
BASE
95%
90%
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE (KIPS)
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1596 Kips
95% BASE 1516 Kips
90% BASE 1437 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

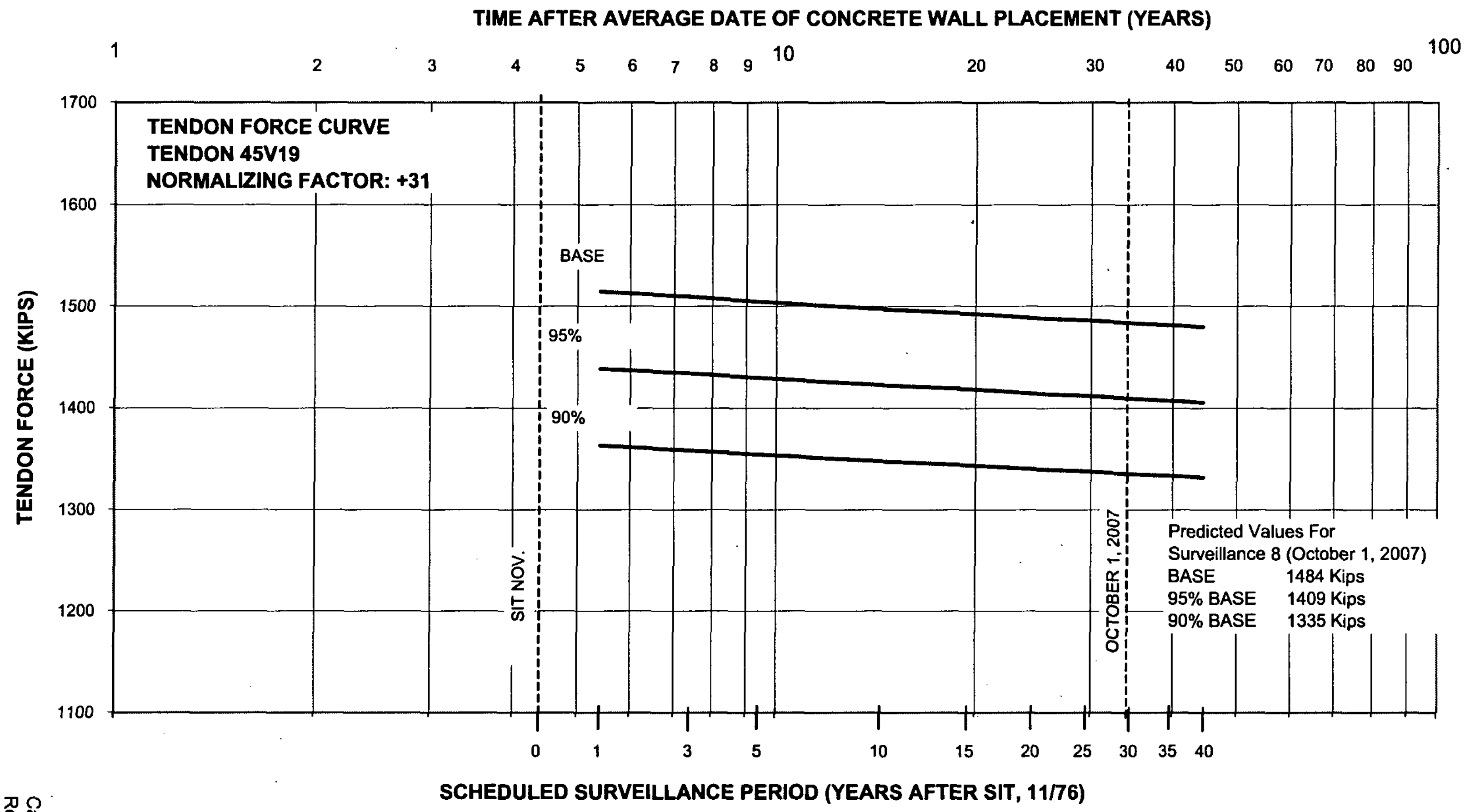
TENDON: 45V19 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1624 AVERAGE: 1624 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 11 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	47.4	2.57%	42.3	0.096	18.6	6.0	1.7	110.0	6.77%	1514	1439	1363	31
3	7.4	47.4	2.60%	42.7	0.117	22.6	8.5	2.4	115.1	7.09%	1509	1434	1358	31
5	9.4	47.4	2.68%	44.1	0.130	25.4	10.0	2.8	119.7	7.37%	1505	1430	1354	31
10	14.4	47.4	2.76%	45.4	0.157	30.5	13.5	3.8	127.1	7.83%	1497	1423	1348	31
15	19.4	47.4	2.81%	46.2	0.173	33.3	15.5	4.4	131.3	8.08%	1493	1419	1344	31
17	21.4	47.4									1491	1417	1342	
20	24.4	47.4	2.87%	47.2	0.188	36.1	17.5	4.9	135.6	8.35%	1489	1414	1340	31
21:3	25.65	47.4									1488	1414	1339	
25	29.4	47.4	2.89%	47.3	0.197	37.8	19.5	5.5	138.0	8.50%	1486	1412	1338	31
30	34.4	47.4	2.91%	47.8	0.207	39.8	20.4	5.8	140.8	8.67%	1484	1409	1335	31
35	39.4	47.4	2.93%	48.2	0.216	41.5	21.5	6.1	143.2	8.82%	1481	1407	1333	31
40	44.4	47.4	2.95%	48.5	0.221	42.6	22.5	6.4	144.9	8.92%	1480	1406	1332	31
25	29.4										1486	1412	1338	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE (KIPS)
TENDON FORCE CURVE
TENDON 45V19
NORMALIZING FACTOR: +31
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1484 Kips
95% BASE 1409 Kips
90% BASE 1335 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

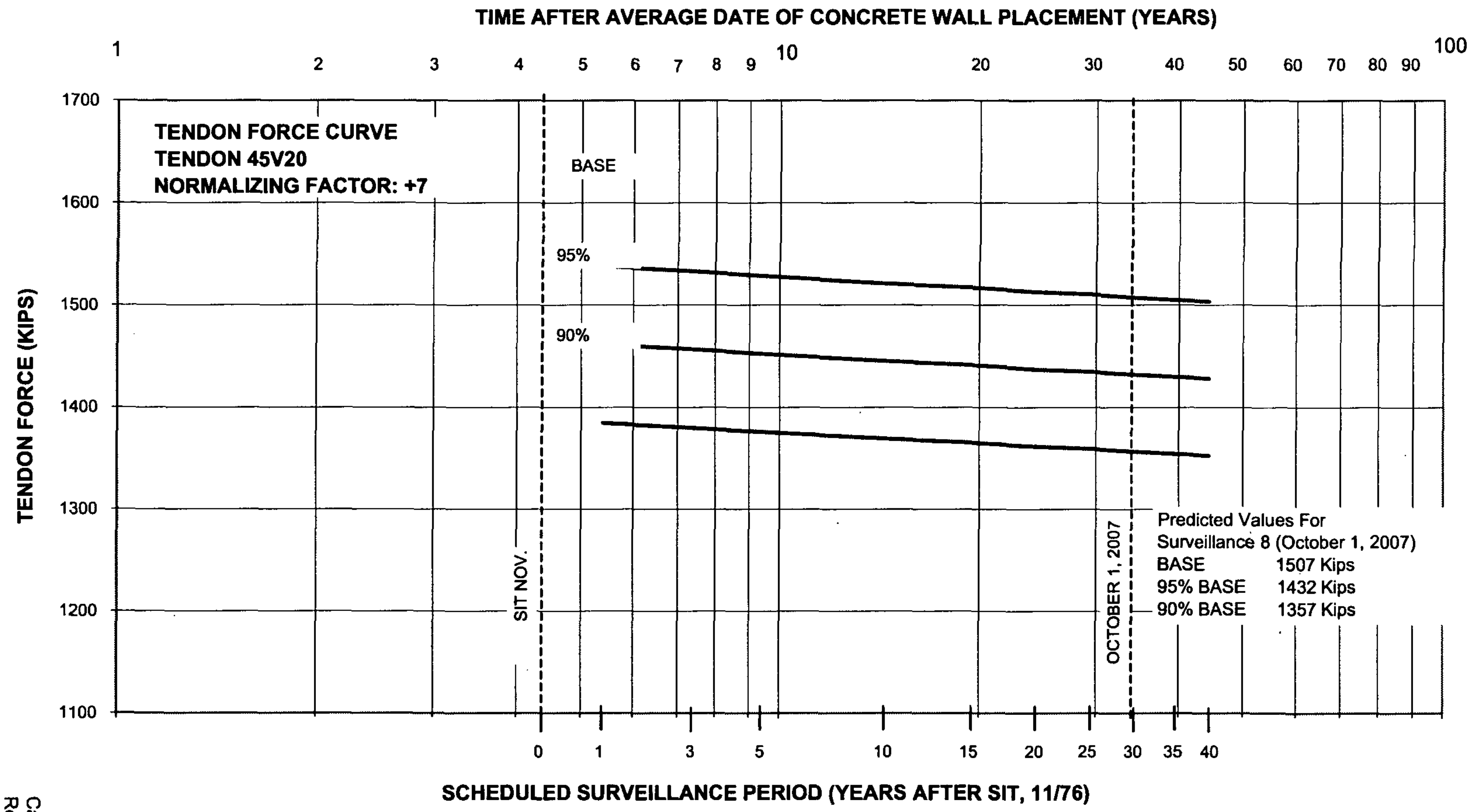
TENDON: 45V20 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1624 AVERAGE: 1624 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 21 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	23.7	2.57%	42.3	0.096	18.6	6.0	1.7	86.3	5.31%	1538	1461	1384	7
3	7.4	23.7	2.60%	42.7	0.117	22.6	8.5	2.4	91.4	5.63%	1533	1456	1380	7
5	9.4	23.7	2.68%	44.1	0.130	25.4	10.0	2.8	96.0	5.91%	1528	1452	1376	7
10	14.4	23.7	2.76%	45.4	0.157	30.5	13.5	3.8	103.4	6.37%	1521	1445	1369	7
15	19.4	23.7	2.81%	46.2	0.173	33.3	15.5	4.4	107.6	6.62%	1517	1441	1365	7
17	21.4	23.7									1515	1439	1364	
20	24.4	23.7	2.87%	47.2	0.188	36.1	17.5	4.9	111.9	6.89%	1513	1437	1361	7
21:3	25.65	23.7									1512	1436	1361	
25	29.4	23.7	2.89%	47.3	0.197	37.8	19.5	5.5	114.3	7.04%	1510	1435	1359	7
30	34.4	23.7	2.91%	47.8	0.207	39.8	20.4	5.8	117.1	7.21%	1507	1432	1357	7
35	39.4	23.7	2.93%	48.2	0.216	41.5	21.5	6.1	119.5	7.36%	1505	1430	1354	7
40	44.4	23.7	2.95%	48.5	0.221	42.6	22.5	6.4	121.2	7.46%	1503	1428	1353	7
25	29.4										1510	1435	1359	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 45V20
NORMALIZING FACTOR: +7
BASE
95%
90%
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE (KIPS)
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1507 Kips
95% BASE 1432 Kips
90% BASE 1357 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

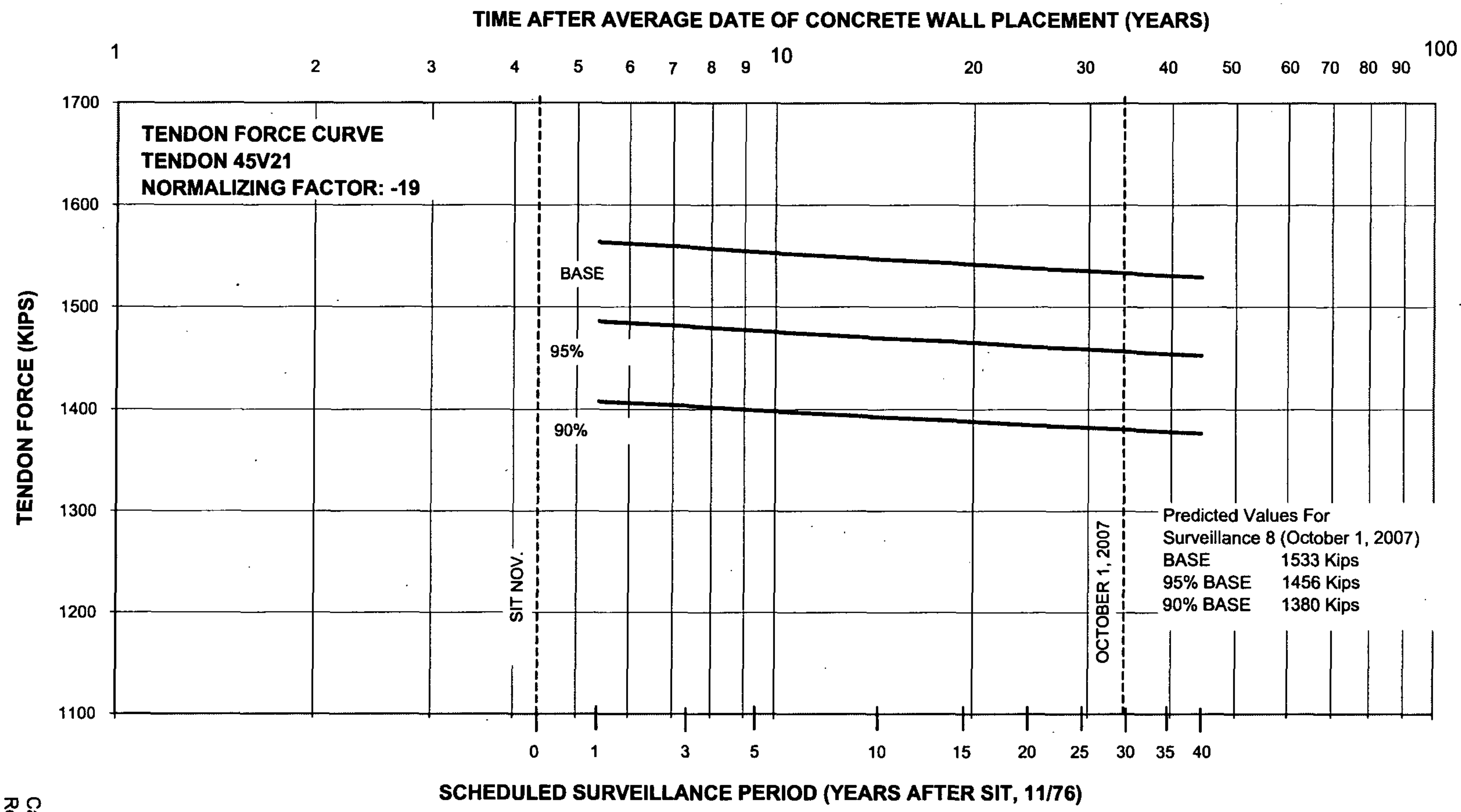
TENDON: 45V21 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1629 FIELD: 1629 AVERAGE: 1629 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 30 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	2.4	2.57%	42.3	0.096	18.6	6.0	1.7	65.0	3.99%	1564	1486	1408	-18
3	7.4	2.4	2.60%	42.7	0.117	22.6	8.5	2.4	70.1	4.30%	1559	1481	1403	-18
5	9.4	2.4	2.68%	44.1	0.130	25.4	10.0	2.8	74.7	4.58%	1554	1477	1399	-18
10	14.4	2.4	2.76%	45.4	0.157	30.5	13.5	3.8	82.1	5.04%	1547	1469	1392	-18
15	19.4	2.4	2.81%	46.2	0.173	33.3	15.5	4.4	86.3	5.30%	1543	1465	1388	-18
17	21.4	2.4									1541	1464	1387	
20	24.4	2.4	2.87%	47.2	0.188	36.1	17.5	4.9	90.6	5.56%	1538	1461	1384	-19
21:3	25.65	2.4									1538	1461	1384	
25	29.4	2.4	2.89%	47.3	0.197	37.8	19.5	5.5	93.0	5.71%	1536	1459	1382	-19
30	34.4	2.4	2.91%	47.8	0.207	39.8	20.4	5.8	95.8	5.88%	1533	1456	1380	-19
35	39.4	2.4	2.93%	48.2	0.216	41.5	21.5	6.1	98.2	6.03%	1531	1454	1378	-19
40	44.4	2.4	2.95%	48.5	0.221	42.6	22.5	6.4	99.9	6.13%	1529	1453	1376	-19
25	29.4										1536	1459	1382	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
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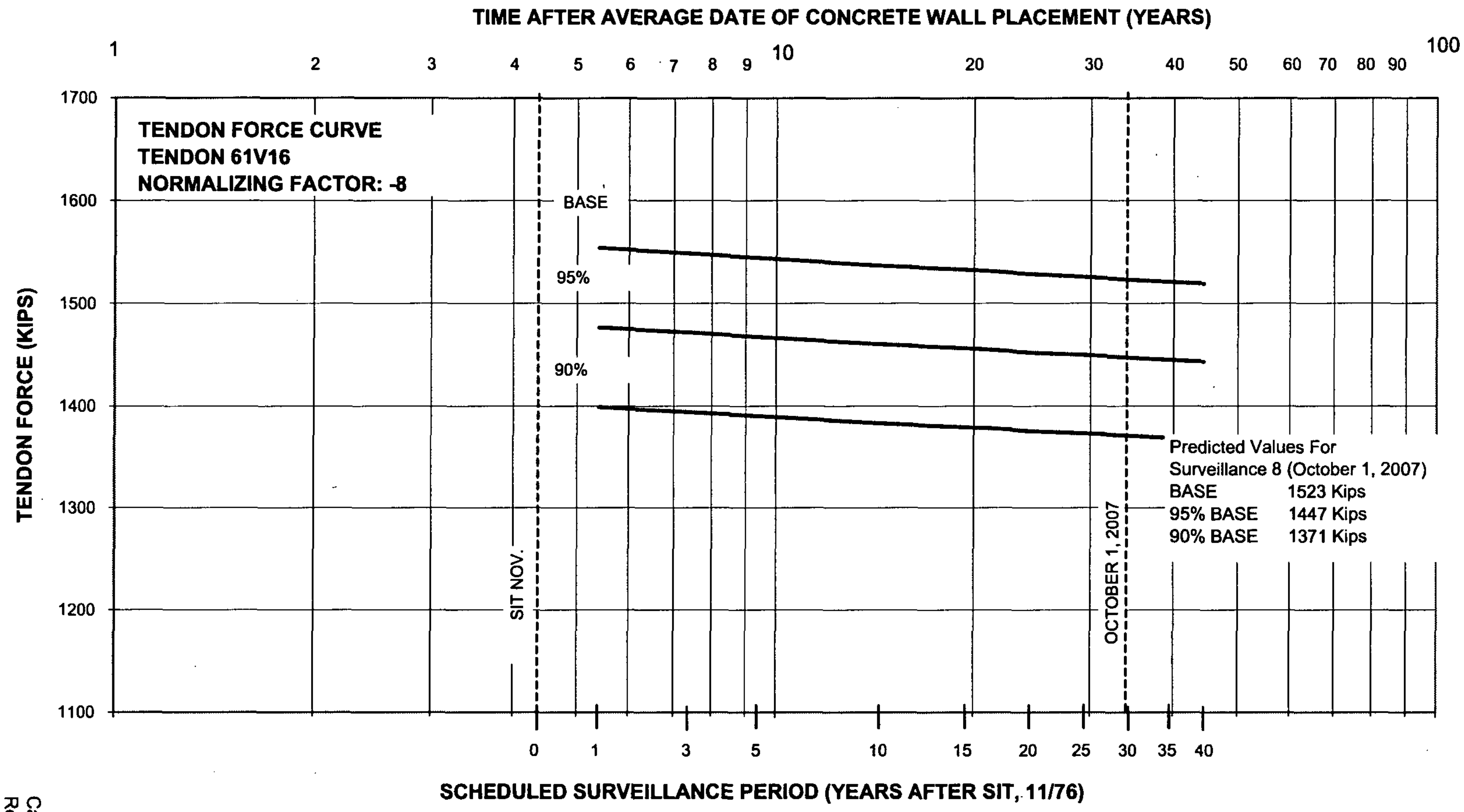
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 45V21
NORMALIZING FACTOR: -19
TENDON FORCE (KIPS)
1700
1600
1500
1400
1300
1200
1100
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1533 Kips
95% BASE 1456 Kips
90% BASE 1380 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 61V16 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1628 FIELD: 1628 AVERAGE: 1628 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 26 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	11.9	2.57%	42.3	0.096	18.6	6.0	1.7	74.5	4.57%	1554	1476	1398	-8
3	7.4	11.9	2.60%	42.7	0.117	22.6	8.5	2.4	79.6	4.89%	1549	1471	1394	-8
5	9.4	11.9	2.68%	44.1	0.130	25.4	10.0	2.8	84.2	5.17%	1544	1467	1390	-8
10	14.4	11.9	2.76%	45.4	0.157	30.5	13.5	3.8	91.6	5.62%	1537	1460	1383	-8
15	19.4	11.9	2.81%	46.2	0.173	33.3	15.5	4.4	95.8	5.88%	1532	1456	1379	-8
17	21.4	11.9									1531	1454	1378	
20	24.4	11.9	2.87%	47.2	0.188	36.1	17.5	4.9	100.1	6.15%	1528	1452	1375	-8
21:3	25.65	11.9									1528	1451	1375	
25	29.4	11.9	2.89%	47.3	0.197	37.8	19.5	5.5	102.5	6.29%	1526	1449	1373	-8
30	34.4	11.9	2.91%	47.8	0.207	39.8	20.4	5.8	105.3	6.46%	1523	1447	1371	-8
35	39.4	11.9	2.93%	48.2	0.216	41.5	21.5	6.1	107.7	6.61%	1521	1445	1368	-8
40	44.4	11.9	2.95%	48.5	0.221	42.6	22.5	6.4	109.4	6.72%	1519	1443	1367	-8
25	29.4										1526	1449	1373	

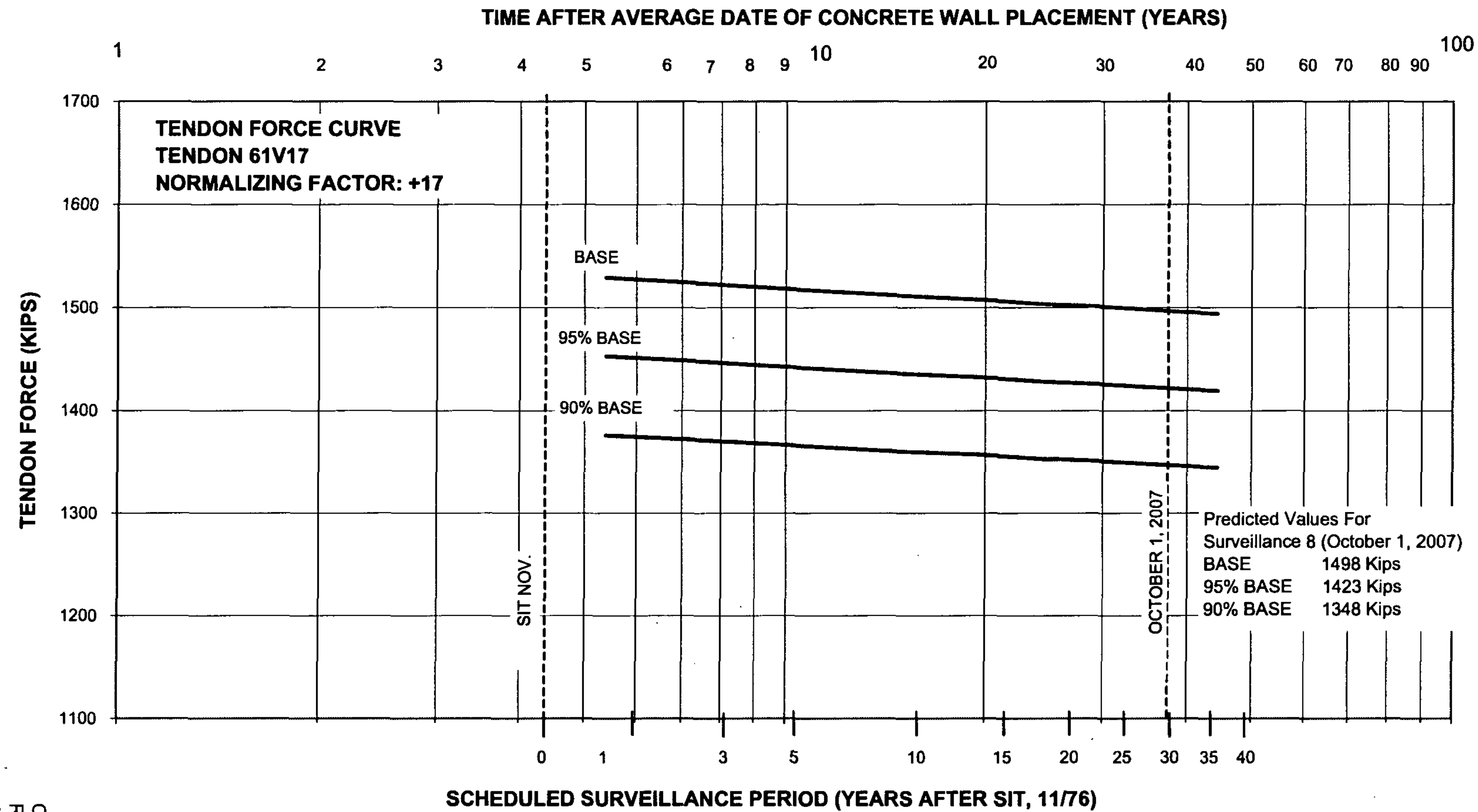

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 61V16
NORMALIZING FACTOR: -8
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1523 Kips
95% BASE 1447 Kips
90% BASE 1371 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 61V17 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1646 FIELD: 1646 AVERAGE: 1646 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 8 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	54.5	2.57%	42.3	0.096	18.6	6.0	1.7	117.1	7.12%	1529	1453	1376	17
3	7.4	54.5	2.60%	42.7	0.117	22.6	8.5	2.4	122.2	7.43%	1524	1448	1371	17
5	9.4	54.5	2.68%	44.1	0.130	25.4	10.0	2.8	126.8	7.71%	1519	1443	1367	17
10	14.4	54.5	2.76%	45.4	0.157	30.5	13.5	3.8	134.2	8.15%	1512	1436	1361	17
15	19.4	54.5	2.81%	46.2	0.173	33.3	15.5	4.4	138.4	8.41%	1508	1432	1357	17
17	21.4	54.5									1506	1431	1355	
20	24.4	54.5	2.87%	47.2	0.188	36.1	17.5	4.9	142.7	8.67%	1503	1428	1353	17
21:3	25.65	54.5									1503	1428	1352	
25	29.4	54.5	2.89%	47.3	0.197	37.8	19.5	5.5	145.1	8.82%	1501	1426	1351	17
30	34.4	54.5	2.91%	47.8	0.207	39.8	20.4	5.8	147.9	8.99%	1498	1423	1348	17
35	39.4	54.5	2.93%	48.2	0.216	41.5	21.5	6.1	150.3	9.13%	1496	1421	1346	17
40	44.4	54.5	2.95%	48.5	0.221	42.6	22.5	6.4	152.0	9.24%	1494	1419	1345	17
25	29.4										1501	1426	1351	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
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10
20
30
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50
60
70
80
90
100
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE (KIPS)
TENDON FORCE CURVE
TENDON 61V17
NORMALIZING FACTOR: +17
BASE
95% BASE
90% BASE
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1498 Kips
95% BASE 1423 Kips
90% BASE 1348 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

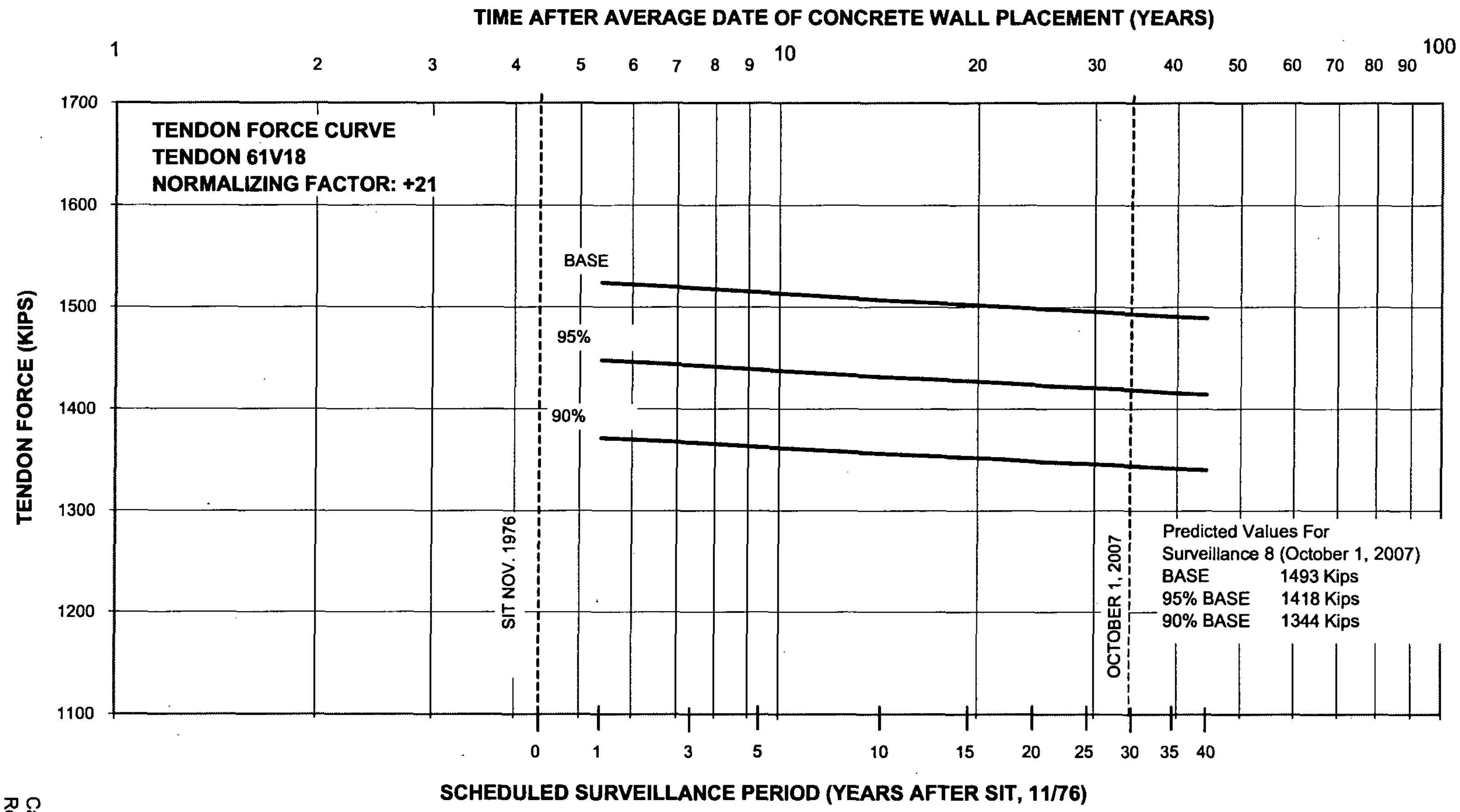
TENDON: 61V18 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1598 FIELD: 1598 AVERAGE: 1598 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 26 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	11.9	2.57%	42.3	0.096	18.6	6.0	1.7	74.5	4.66%	1524	1448	1372	21
3	7.4	11.9	2.60%	42.7	0.117	22.6	8.5	2.4	79.6	4.98%	1519	1443	1367	21
5	9.4	11.9	2.68%	44.1	0.130	25.4	10.0	2.8	84.2	5.27%	1514	1439	1363	21
10	14.4	11.9	2.76%	45.4	0.157	30.5	13.5	3.8	91.6	5.73%	1507	1431	1356	21
15	19.4	11.9	2.81%	46.2	0.173	33.3	15.5	4.4	95.8	5.99%	1503	1427	1352	21
17	21.4	11.9									1501	1426	1351	
20	24.4	11.9	2.87%	47.2	0.188	36.1	17.5	4.9	100.1	6.26%	1498	1423	1348	21
21:3	25.65	11.9									1498	1423	1348	
25	29.4	11.9	2.89%	47.3	0.197	37.8	19.5	5.5	102.5	6.41%	1496	1421	1346	21
30	34.4	11.9	2.91%	47.8	0.207	39.8	20.4	5.8	105.3	6.59%	1493	1418	1344	21
35	39.4	11.9	2.93%	48.2	0.216	41.5	21.5	6.1	107.7	6.74%	1491	1416	1342	21
40	44.4	11.9	2.95%	48.5	0.221	42.6	22.5	6.4	109.4	6.84%	1489	1415	1340	21
25	29.4										1496	1421	1346	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
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9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 61V18
NORMALIZING FACTOR: +21
TENDON FORCE (KIPS)
1700
1600
1500
1400
1300
1200
1100
BASE
95%
90%
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1493 Kips
95% BASE 1418 Kips
90% BASE 1344 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

Stress Sequence Sorted by Tendon Numbei

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
13H01	20	35H01	20	42H01	21
13H02	55	35H02	59	42H02	46
13H03	20	35H03	20	42H03	22
13H04	55	35H04	59	42H04	45
13H05	19	35H05	19	42H05	22
13H06	55	35H06	58	42H06	60
13H07	19	35H07	19	42H07	23
13H08	55	35H08	58	42H08	45
13H09	17	35H09	19	42H09	24
13H10	54	35H10	58	42H10	44
13H11	17	35H11	17	42H11	24
13H12	54	35H12	57	42H12	44
13H13	16	35H13	16	42H13	25
13H14	54	35H14	57	42H14	44
13H15	60	35H15	15	42H15	26
13H16	53	35H16	57	42H16	43
13H17	15	35H17	14	42H17	27
13H18	53	35H18	56	42H18	43
13H19	15	35H19	13	42H19	27
13H20	53	35H20	56	42H20	42
13H21	13	35H21	13	42H21	29
13H22	52	35H22	56	42H22	42
13H23	12	35H23	12	42H23	29
13H24	51	35H24	55	42H24	42
13H25	11	35H25	11	42H25	30
13H26	51	35H26	55	42H26	42
13H27	10	35H27	11	42H27	30
13H28	51	35H28	55	42H28	42
13H29	9	35H29	11	42H29	31
13H30	51	35H30	54	42H30	41
13H31	9	35H31	9	42H31	32
13H32	49	35H32	54	42H32	41
13H33	8	35H33	9	42H33	33
13H34	49	35H34	54	42H34	41
13H35	7	35H35	8	42H35	33
13H36	49	35H36	51	42H36	40
13H37	6	35H37	7	42H37	34
13H38	48	35H38	51	42H38	40
13H39	6	35H39	6	42H39	35
13H40	48	35H40	50	42H40	39
13H41	4	35H41	5	42H41	36
13H42	48	35H42	49	42H42	39
13H43	4	35H43	4	42H43	36
13H44	47	35H44	49	42H44	39
13H45	47	35H45	3	42H45	37
13H46	47	35H46	49	42H46	39
13H47	2	35H47	3	42H47	38

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
46H01	21	51H01	20	62H01	21
46H02	47	51H02	60	62H02	46
46H03	21	51H03	19	62H03	22
46H04	47	51H04	59	62H04	45
46H05	22	51H05	1	62H05	23
46H06	46	51H06	59	62H06	45
46H07	23	51H07	18	62H07	23
46H08	46	51H08	59	62H08	45
46H09	23	51H09	17	62H09	23
46H10	46	51H10	58	62H10	45
46H11	24	51H11	16	62H11	24
46H12	45	51H12	58	62H12	44
46H13	24	51H13	16	62H13	24
46H14	45	51H14	58	62H14	44
46H15	25	51H15	15	62H15	25
46H16	45	51H16	57	62H16	44
46H17	26	51H17	14	62H17	25
46H18	44	51H18	57	62H18	43
46H19	27	51H19	14	62H19	26
46H20	44	51H20	56	62H20	43
46H21	28	51H21	13	62H21	27
46H22	43	51H22	56	62H22	42
46H23	28	51H23	13	62H23	28
46H24	42	51H24	56	62H24	42
46H25	29	51H25	12	62H25	29
46H26	41	51H26	53	62H26	42
46H27	31	51H27	9	62H27	30
46H28	41	51H28	52	62H28	41
46H29	31	51H29	9	62H29	30
46H30	31	51H30	52	62H30	41
46H31	32	51H31	8	62H31	31
46H32	40	51H32	50	62H32	41
46H33	32	51H33	8	62H33	32
46H34	40	51H34	50	62H34	41
46H35	33	51H35	7	62H35	33
46H36	40	51H36	50	62H36	40
46H37	34	51H37	7	62H37	34
46H38	39	51H38	49	62H38	39
46H39	35	51H39	6	62H39	35
46H40	38	51H40	49	62H40	39
46H41	35	51H41	6	62H41	35
46H42	38	51H42	49	62H42	39
46H43	36	51H43	5	62H43	36
46H44	38	51H44	48	62H44	38
46H45	36	51H45	4	62H45	37
46H46	38	51H46	48	62H46	38
46H47	37	51H47	2	62H47	38

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	51H05						
2	13H47	51H47					
3	35H45	35H47					
4	13H41	13H43	35H43	51H45			
5	35H41	51H43					
6	13H37	13H39	35H39	51H39	51H41		
7	13H35	35H37	51H35	51H37			
8	13H33	35H35	51H31	51H33			
9	13H29	13H31	35H31	35H33	51H27	51H29	
10	13H27						
11	13H25	35H25	35H27	35H29			
12	13H23	35H23	51H25				
13	13H21	35H19	35H21	51H21	51H23		
14	35H17	51H17	51H19				
15	13H17	13H19	35H15	51H15			
16	13H13	35H13	51H11	51H13			
17	13H09	13H11	35H11	51H09			
18	51H07						
19	13H05	13H07	35H05	35H07	35H09	51H03	
20	13H01	13H03	35H01	35H03	51H01		
21	42H01	46H01	46H03	62H01			
22	42H03	42H05	46H05	62H03			
23	42H07	46H07	46H09	62H05	62H07	62H09	
24	42H09	42H11	46H11	46H13	62H11	62H13	
25	42H13	46H15	62H15	62H17			
26	42H15	46H17	62H19				
27	42H17	42H19	46H19	62H21			
28	46H21	46H23	62H23				
29	42H21	42H23	46H25	62H25			
30	42H25	42H27	62H27	62H29			
31	42H29	46H27	46H29	46H30	62H31		
32	42H31	46H31	46H33	62H33			
33	42H33	42H35	46H35	62H35			
34	42H37	46H37	62H37				
35	42H39	46H39	46H41	62H39	62H41		
36	42H41	42H43	46H43	46H45	62H43		
37	42H45	46H47	62H45				
38	42H47	46H40	46H42	46H44	46H46	62H44	62H46
38	62H47						
39	42H40	42H42	42H44	42H46	46H38	62H38	62H40
39	62H42						
40	42H36	42H38	46H32	46H34	46H36	62H36	

Stress Sequence Sorted by Sequence Numbei

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
41	42H30	42H32	42H34	46H26	46H28	62H28	62H30
41	62H32	62H34					
42	42H20	42H22	42H24	42H26	42H28	46H24	62H22
42	62H24	62H26					
43	42H16	42H18	46H22	62H18	62H20		
44	42H10	42H12	42H14	46H18	46H20	62H12	62H14
44	62H16						
45	42H04	42H08	46H12	46H14	46H16	62H04	62H06
45	62H08	62H10					
46	42H02	46H06	46H08	46H10	62H02		
47	13H44	13H45	13H46	46H02	46H04		
48	13H38	13H40	13H42	51H44	51H46		
49	13H32	13H34	13H36	35H42	35H44	35H46	51H38
49	51H40	51H42					
50	35H40	51H32	51H34	51H36			
51	13H24	13H26	13H28	13H30	35H36	35H38	
52	13H22	51H28	51H30				
53	13H16	13H18	13H20	51H26			
54	13H10	13H12	13H14	35H30	35H32	35H34	
55	13H02	13H04	13H06	13H08	35H24	35H26	35H28
56	35H18	35H20	35H22	51H20	51H22	51H24	
57	35H12	35H14	35H16	51H16	51H18		
58	35H06	35H08	35H10	51H10	51H12	51H14	
59	35H02	35H04	51H04	51H06	51H08		
60	13H15	42H06	51H02				

Note:
Data extracted from Reference 11 of Calculation S-95-0082.

Initial Concrete Stress = 1732.0 (ksi)
Average Force = 1635.0 (kips)
Total Stress Sequence (N) = 60
Total Elastic Shortening Losses = 134

Reference: S-95-0082

Tendon No.	Lift-off Pressure (ksi) (1)				Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips)		Remarks (3)
	Shop End		Field End					Shop End (5)	Field End (5)	
	Predicted	Actual	Predicted	Actual						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
46H20	6640	6930	6600	6600	44	160	0.982	1679	1609	
46H21	6720	6700	6730	6950	28	162	0.994	1624	1682	S,C
46H22	6720	6750	6730	7000	43	162	0.994	1636	1694	
51H33	6810	6850	6750	6800	8	163	1.000	1649	1651	
51H34	6800	6800	6750	6850	50	163	1.000	1639	1663	S,D
51H35	6810	6500	6750	6800	7	163	1.000	1564	1651	
42H45	6870	7000	6810	6900	37	163	1.000	1670	1661	
42H46	6870	6850	6790	6850	39	163	1.000	1634	1653	S
42H47	6750	6700	6700	6800	38	160	0.982	1597	1633	
13H35	6680	6650	6670	6800	7	161	0.988	1612	1650	
13H36	6660	6700	6700	7000	49	160	0.982	1618	1681	S
13H37	6720	6700	6730	6750	6	162	0.994	1624	1634	
62H29	6800	6750	6700	6750	30	162	0.994	1617	1641	
62H30	6800	6600	6750	6600	41	163	1.000	1591	1603	S
62H31	6800	7000	6750	6900	31	163	1.000	1687	1675	

Note:

(1) Ref. Crystal River 3 R/B Tendon History Sheets - Hoop Tendons for Original Stressin

(2) Ref. Crystal River 3 Tendon Surveillance Loss Calculations, Tendon Stress Sequence, Pages 29, 29a and 29t

(3) S =Selected tensons, C =Control tendon, D =Detension tendon, A =Alternate tendo
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacent

(4) Wire factors are calculated based on the number of effective wires divided by 163.

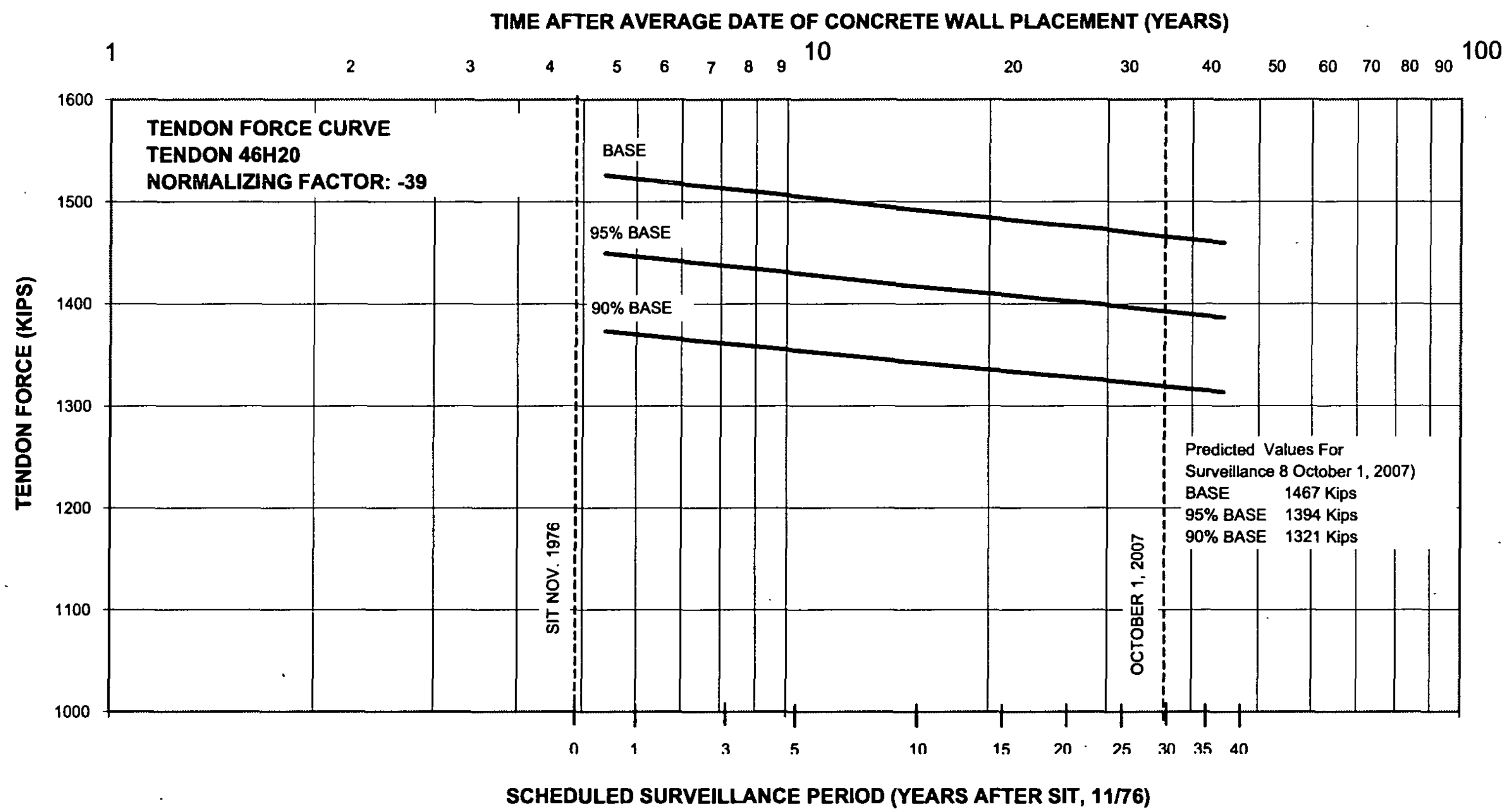
TENDON: 46H20 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1679 FIELD: 1609 AVERAGE: 1644 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 44 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.982

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	35.1	2.57%	42.0	0.090	39.5	6.0	1.7	118.3	7.19%	1526	1449	1373	-39
3	7.4	35.1	2.60%	42.5	0.110	48.5	8.5	2.4	128.5	7.82%	1515	1440	1364	-39
5	9.4	35.1	2.68%	43.8	0.123	54.1	10.0	2.8	135.8	8.26%	1508	1433	1357	-39
10	14.4	35.1	2.76%	45.1	0.150	66.0	13.5	3.8	150.0	9.12%	1494	1419	1345	-39
15	19.4	35.1	2.81%	45.9	0.167	73.6	15.5	4.4	158.9	9.67%	1485	1411	1336	-39
17	21.4	35.1									1482	1408	1334	
20	24.4	35.1	2.87%	46.9	0.181	79.0	17.5	4.9	165.9	10.09%	1478	1404	1330	-39
21:3	25.65	35.1									1477	1403	1329	
25	29.4	35.1	2.88%	47.1	0.190	83.2	19.5	5.5	170.9	10.39%	1473	1399	1326	-39
30	34.4	35.1	2.91%	47.6	0.200	88.0	20.4	5.8	176.4	10.73%	1467	1394	1321	-39
35	39.4	35.1	2.93%	47.9	0.209	91.9	21.5	6.1	180.9	11.01%	1463	1390	1317	-39
40	44.4	35.1	2.95%	48.2	0.215	94.7	22.5	6.4	184.3	11.21%	1460	1387	1314	-39
25	29.4										1473	1399	1326	

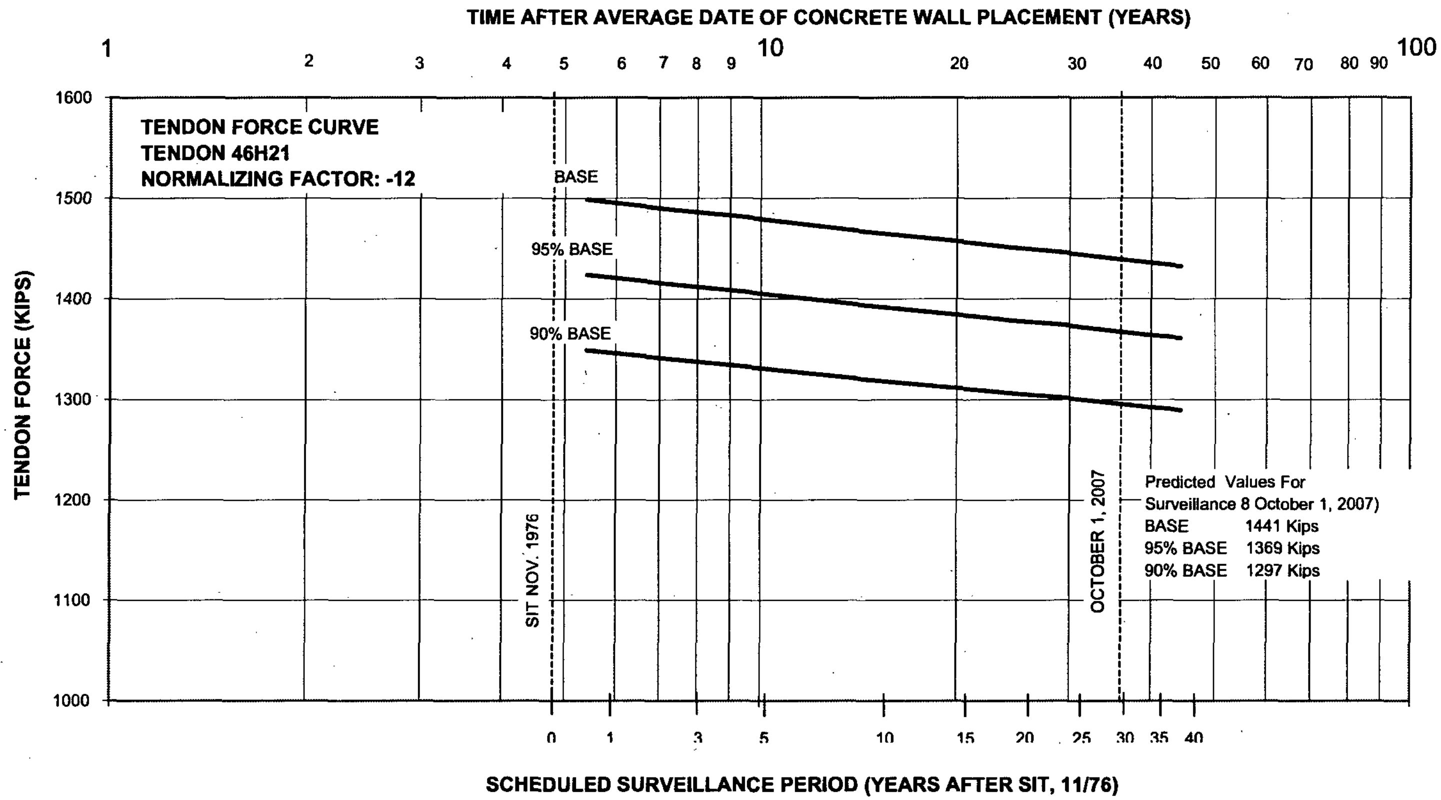

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H20
NORMALIZING FACTOR: -39
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 October 1, 2007)
BASE 1467 Kips
95% BASE 1394 Kips
90% BASE 1321 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 46H21 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1682 AVERAGE: 1653 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 28 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	71.0	2.57%	42.0	0.090	39.5	6.0	1.7	154.2	9.33%	1499	1424	1349	-12
3	7.4	71.0	2.60%	42.5	0.110	48.5	8.5	2.4	164.4	9.95%	1489	1414	1340	-12
5	9.4	71.0	2.68%	43.8	0.123	54.1	10.0	2.8	171.7	10.39%	1481	1407	1333	-12
10	14.4	71.0	2.76%	45.1	0.150	66.0	13.5	3.8	185.9	11.25%	1467	1394	1320	-12
15	19.4	71.0	2.81%	45.9	0.167	73.6	15.5	4.4	194.9	11.79%	1458	1385	1312	-12
17	21.4	71.0									1455	1383	1310	
20	24.4	71.0	2.87%	46.9	0.181	79.0	17.5	4.9	201.9	12.21%	1451	1379	1306	-12
21:3	25.65	71.0									1450	1377	1305	
25	29.4	71.0	2.88%	47.1	0.190	83.2	19.5	5.5	206.8	12.51%	1446	1374	1302	-12
30	34.4	71.0	2.91%	47.6	0.200	88.0	20.4	5.8	212.4	12.85%	1441	1369	1297	-12
35	39.4	71.0	2.93%	47.9	0.209	91.9	21.5	6.1	216.9	13.12%	1436	1364	1293	-12
40	44.4	71.0	2.95%	48.2	0.215	94.7	22.5	6.4	220.3	13.33%	1433	1361	1290	-12
25	29.4										1446	1374	1302	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 46H21
NORMALIZING FACTOR: -12
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 October 1, 2007)
BASE 1441 Kips
95% BASE 1369 Kips
90% BASE 1297 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

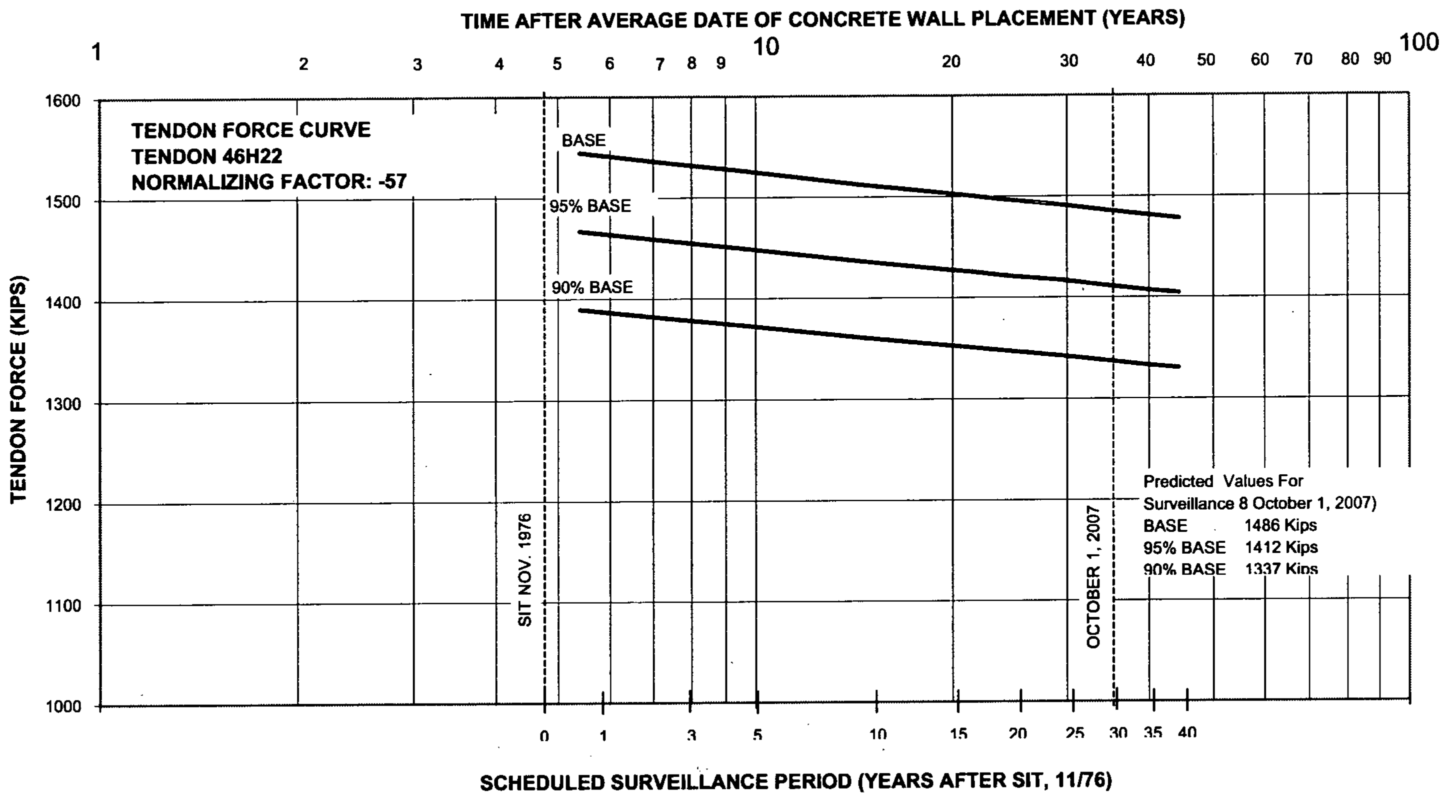
TENDON: 46H22 INITIAL CONCRETE STRESS (PSI 1732

ORIGINAL FORCES (KIPS): SHOP: 1636 FIELD: 1694 AVERAGE: 1665 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 43 OF 60 TOTAL ELASTIC SHORT. LOS 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	37.7	2.57%	42.0	0.090	39.5	6.0	1.7	120.9	7.26%	1544	1467	1390	-57
3	7.4	37.7	2.60%	42.5	0.110	48.5	8.5	2.4	131.1	7.88%	1534	1457	1381	-57
5	9.4	37.7	2.68%	43.8	0.123	54.1	10.0	2.8	138.4	8.31%	1527	1450	1374	-57
10	14.4	37.7	2.76%	45.1	0.150	66.0	13.5	3.8	152.6	9.17%	1513	1437	1361	-57
15	19.4	37.7	2.81%	45.9	0.167	73.6	15.5	4.4	161.6	9.70%	1504	1428	1353	-57
17	21.4	37.7									1501	1426	1351	
20	24.4	37.7	2.87%	46.9	0.181	79.0	17.5	4.9	168.6	10.12%	1497	1422	1347	-57
21:3	25.65	37.7									1495	1421	1346	
25	29.4	37.7	2.88%	47.1	0.190	83.2	19.5	5.5	173.5	10.42%	1492	1417	1342	-57
30	34.4	37.7	2.91%	47.6	0.200	88.0	20.4	5.8	179.1	10.75%	1486	1412	1337	-57
35	39.4	37.7	2.93%	47.9	0.209	91.9	21.5	6.1	183.6	11.03%	1482	1408	1333	-57
40	44.4	37.7	2.95%	48.2	0.215	94.7	22.5	6.4	187.0	11.23%	1478	1404	1330	-57
25	29.4										1492	1417	1342	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H22
NORMALIZING FACTOR: -57
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 October 1, 2007)
BASE 1486 Kips
95% BASE 1412 Kips
90% BASE 1337 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

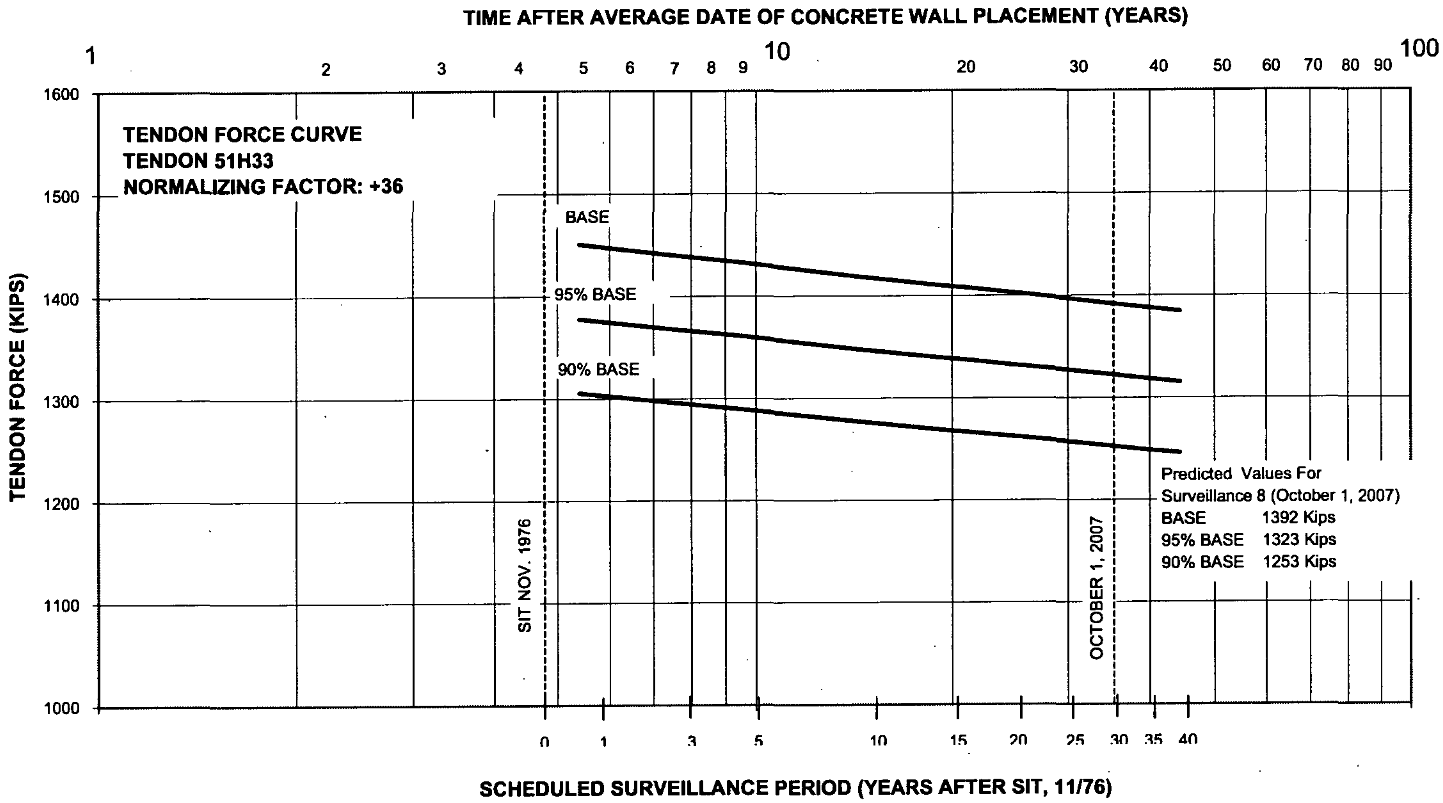
TENDON: 51H33 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1649 FIELD: 1651 AVERAGE: 1650 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 8 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	116.1	2.57%	42.0	0.090	39.5	6.0	1.7	199.3	12.08%	1450	1378	1305	36
3	7.4	116.1	2.60%	42.5	0.110	48.5	8.5	2.4	209.5	12.70%	1440	1368	1296	36
5	9.4	116.1	2.68%	43.8	0.123	54.1	10.0	2.8	216.8	13.14%	1433	1361	1290	36
10	14.4	116.1	2.76%	45.1	0.150	66.0	13.5	3.8	231.0	14.00%	1419	1348	1277	36
15	19.4	116.1	2.81%	45.9	0.167	73.6	15.5	4.4	240.0	14.55%	1410	1339	1269	36
17	21.4	116.1									1407	1337	1266	
20	24.4	116.1	2.87%	46.9	0.181	79.0	17.5	4.9	247.0	14.97%	1403	1333	1263	36
21:3	25.65	116.1									1402	1332	1261	
25	29.4	116.1	2.88%	47.1	0.190	83.2	19.5	5.5	251.9	15.27%	1398	1328	1258	36
30	34.4	116.1	2.91%	47.6	0.200	88.0	20.4	5.8	257.5	15.61%	1392	1323	1253	36
35	39.4	116.1	2.93%	47.9	0.209	91.9	21.5	6.1	262.0	15.88%	1388	1318	1249	36
40	44.4	116.1	2.95%	48.2	0.215	94.7	22.5	6.4	265.4	16.09%	1384	1315	1246	36
25	29.4										1398	1328	1258	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 51H33
NORMALIZING FACTOR: +36
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE (KIPS)
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1392 Kips
95% BASE 1323 Kips
90% BASE 1253 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

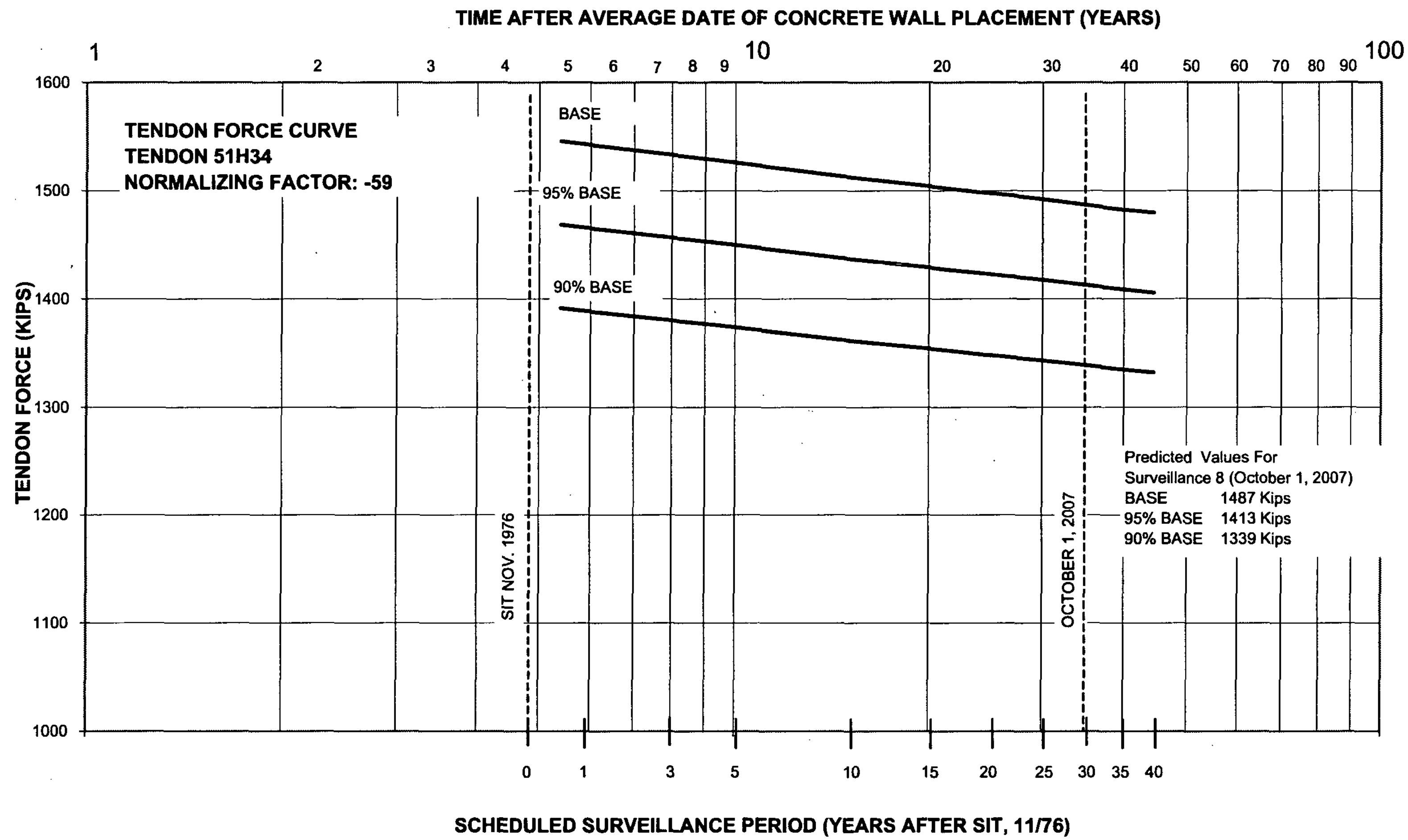
TENDON: 51H34 INITIAL CONCRETE STRESS (PS 1732

ORIGINAL FORCES (KIPS): SHOP: 1639 FIELD: 1663 AVERAGE: 1651 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 50 OF 60 TOTAL ELASTIC SHORT. LOS 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	22.3	2.57%	42.0	0.090	39.5	6.0	1.7	105.5	6.39%	1546	1468	1391	-59
3	7.4	22.3	2.60%	42.5	0.110	48.5	8.5	2.4	115.7	7.01%	1535	1459	1382	-59
5	9.4	22.3	2.68%	43.8	0.123	54.1	10.0	2.8	123.0	7.45%	1528	1452	1375	-59
10	14.4	22.3	2.76%	45.1	0.150	66.0	13.5	3.8	137.2	8.31%	1514	1438	1362	-59
15	19.4	22.3	2.81%	45.9	0.167	73.6	15.5	4.4	146.2	8.86%	1505	1430	1354	-59
17	21.4	22.3									1502	1427	1352	
20	24.4	22.3	2.87%	46.9	0.181	79.0	17.5	4.9	153.2	9.28%	1498	1423	1348	-59
21:3	25.65	22.3									1497	1422	1347	
25	29.4	22.3	2.88%	47.1	0.190	83.2	19.5	5.5	158.1	9.58%	1493	1418	1344	-59
30	34.4	22.3	2.91%	47.6	0.200	88.0	20.4	5.8	163.7	9.91%	1487	1413	1339	-59
35	39.4	22.3	2.93%	47.9	0.209	91.9	21.5	6.1	168.2	10.19%	1483	1409	1335	-59
40	44.4	22.3	2.95%	48.2	0.215	94.7	22.5	6.4	171.6	10.39%	1479	1406	1332	-59
25	29.4										1493	1418	1344	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 51H34
NORMALIZING FACTOR: -59
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1487 Kips
95% BASE 1413 Kips
90% BASE 1339 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

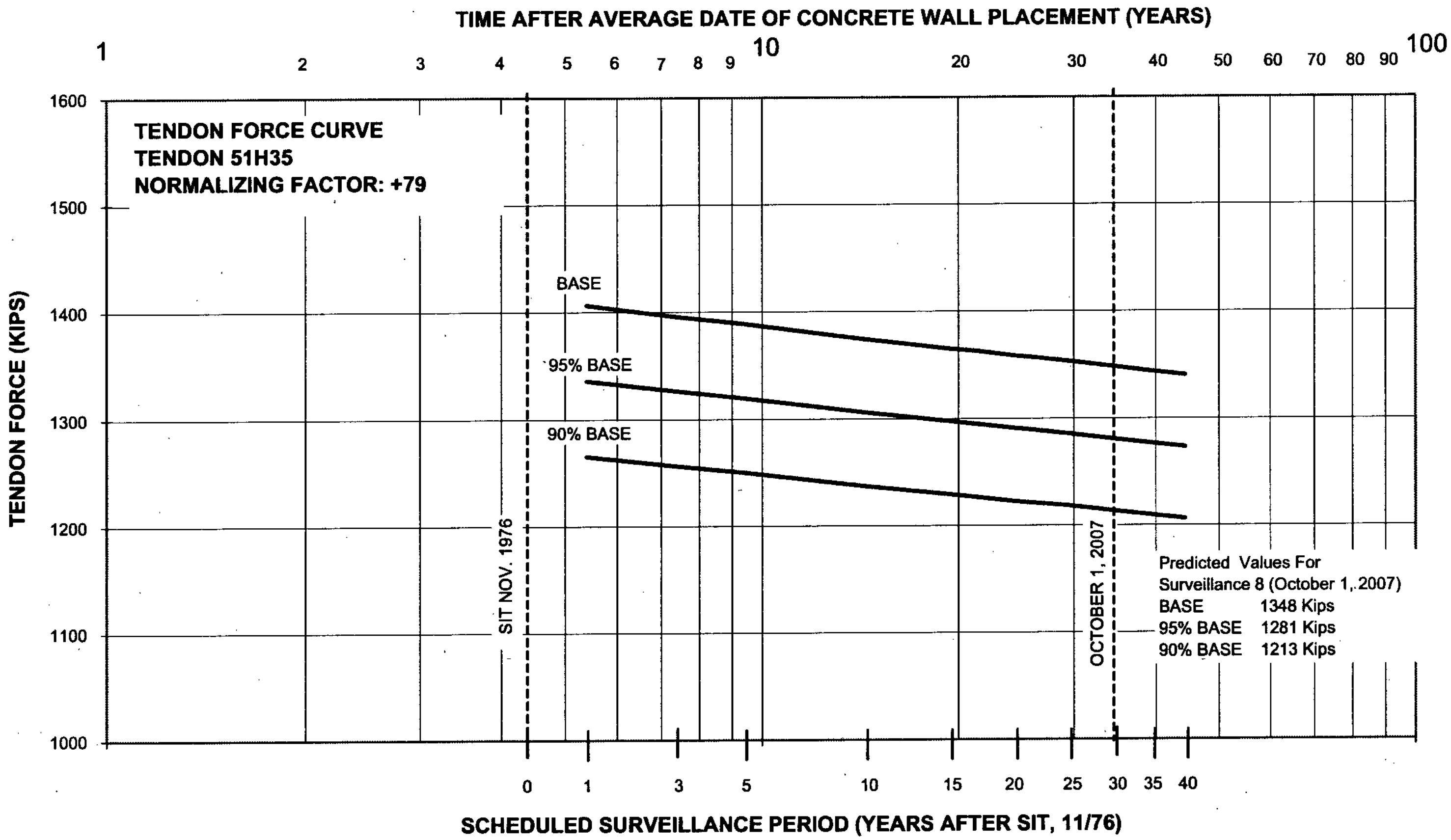
TENDON: 51H35 INITIAL CONCRETE STRESS (PSI) 1732

ORIGINAL FORCES (KIPS) SHOP: 1564 FIELD: 1651 AVERAGE: 1608 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 7 OF 60 TOTAL ELASTIC SHORT. LOSS 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	118.4	2.57%	42.0	0.090	39.5	6.0	1.7	201.6	12.54%	1406	1336	1266	79
3	7.4	118.4	2.60%	42.5	0.110	48.5	8.5	2.4	211.8	13.17%	1396	1326	1256	79
5	9.4	118.4	2.68%	43.8	0.123	54.1	10.0	2.8	219.1	13.63%	1389	1319	1250	79
10	14.4	118.4	2.76%	45.1	0.150	66.0	13.5	3.8	233.3	14.51%	1374	1306	1237	79
15	19.4	118.4	2.81%	45.9	0.167	73.6	15.5	4.4	242.2	15.07%	1365	1297	1229	79
17	21.4	118.4									1363	1295	1226	
20	24.4	118.4	2.87%	46.9	0.181	79.0	17.5	4.9	249.2	15.50%	1358	1291	1223	79
21:3	25.65	118.4									1357	1289	1222	
25	29.4	118.4	2.88%	47.1	0.190	83.2	19.5	5.5	254.2	15.81%	1354	1286	1218	79
30	34.4	118.4	2.91%	47.6	0.200	88.0	20.4	5.8	259.7	16.15%	1348	1281	1213	79
35	39.4	118.4	2.93%	47.9	0.209	91.9	21.5	6.1	264.2	16.44%	1343	1276	1209	79
40	44.4	118.4	2.95%	48.2	0.215	94.7	22.5	6.4	267.6	16.65%	1340	1273	1206	79
25	29.4										1354	1286	1218	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 51H35
NORMALIZING FACTOR: +79
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1348 Kips
95% BASE 1281 Kips
90% BASE 1213 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

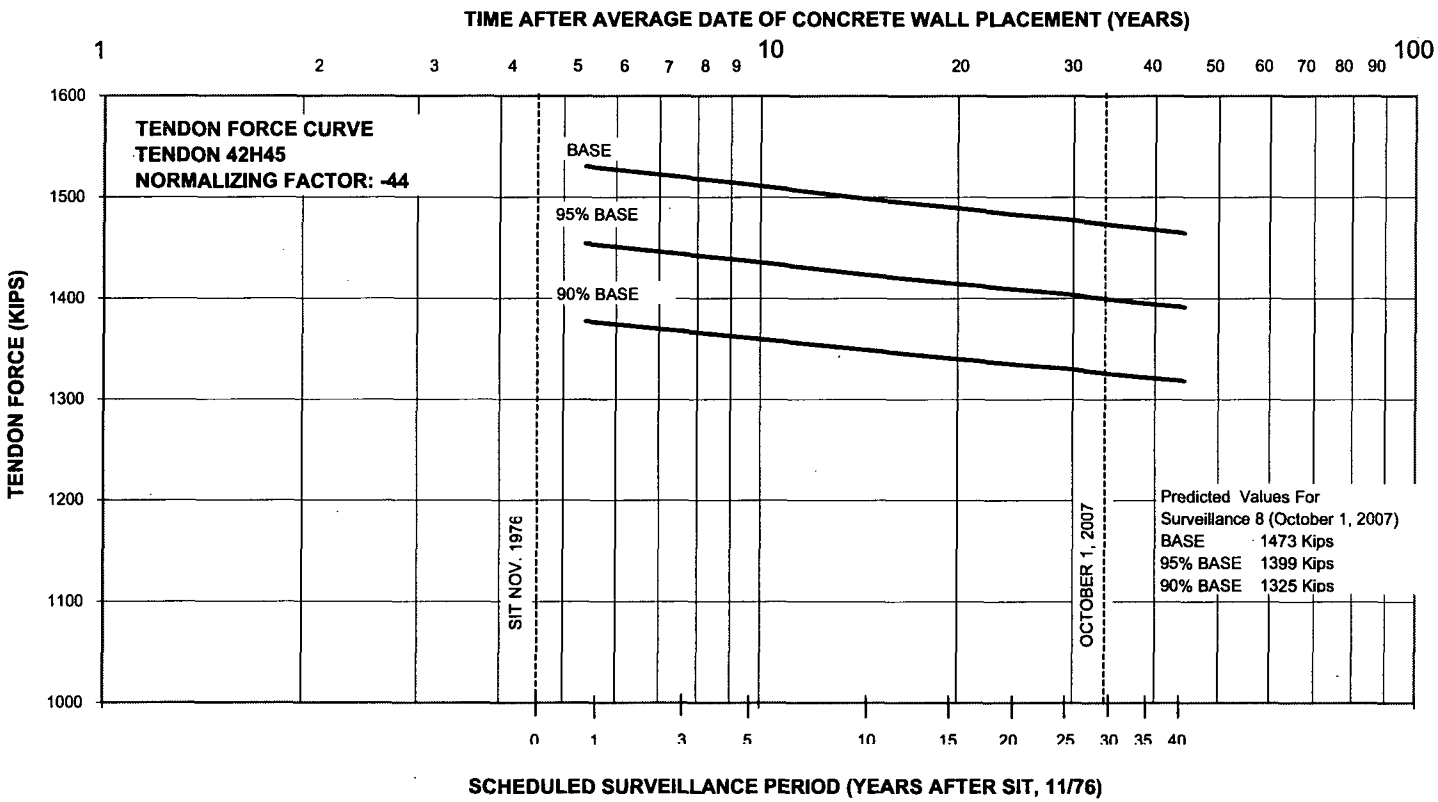
TENDON: 42H45 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1670 FIELD: 1661 AVERAGE: 1665 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 37 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	51.4	2.57%	42.0	0.090	39.5	6.0	1.7	134.6	8.08%	1531	1454	1378	-44
3	7.4	51.4	2.60%	42.5	0.110	48.5	8.5	2.4	144.8	8.69%	1521	1444	1368	-44
5	9.4	51.4	2.68%	43.8	0.123	54.1	10.0	2.8	152.1	9.13%	1513	1438	1362	-44
10	14.4	51.4	2.76%	45.1	0.150	66.0	13.5	3.8	166.3	9.98%	1499	1424	1349	-44
15	19.4	51.4	2.81%	45.9	0.167	73.6	15.5	4.4	175.2	10.52%	1490	1416	1341	-44
17	21.4	51.4									1487	1413	1339	
20	24.4	51.4	2.87%	46.9	0.181	79.0	17.5	4.9	182.2	10.94%	1483	1409	1335	-44
21:3	25.65	51.4									1482	1408	1334	
25	29.4	51.4	2.88%	47.1	0.190	83.2	19.5	5.5	187.2	11.24%	1478	1404	1330	-44
30	34.4	51.4	2.91%	47.6	0.200	88.0	20.4	5.8	192.7	11.57%	1473	1399	1325	-44
35	39.4	51.4	2.93%	47.9	0.209	91.9	21.5	6.1	197.2	11.84%	1468	1395	1321	-44
40	44.4	51.4	2.95%	48.2	0.215	94.7	22.5	6.4	200.6	12.05%	1465	1391	1318	-44
25	29.4										1478	1404	1330	



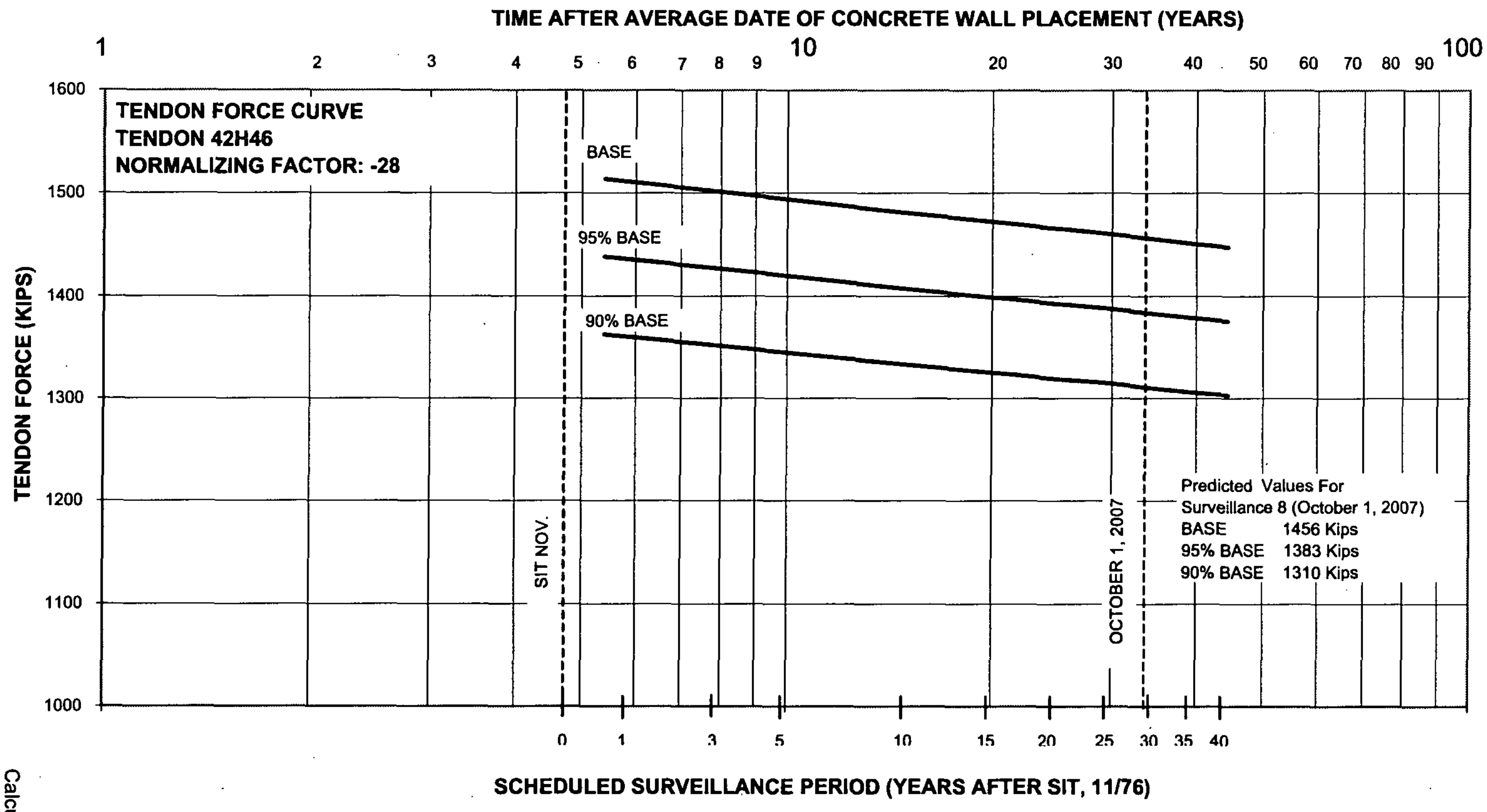
TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 42H45
NORMALIZING FACTOR: -44
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1473 Kips
95% BASE 1399 Kips
90% BASE 1325 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 42H46 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1634 FIELD: 1653 AVERAGE: 1644 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 39 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	46.9	2.57%	42.0	0.090	39.5	6.0	1.7	130.1	7.91%	1514	1438	1362	-28
3	7.4	46.9	2.60%	42.5	0.110	48.5	8.5	2.4	140.3	8.54%	1503	1428	1353	-28
5	9.4	46.9	2.68%	43.8	0.123	54.1	10.0	2.8	147.6	8.98%	1496	1421	1347	-28
10	14.4	46.9	2.76%	45.1	0.150	66.0	13.5	3.8	161.8	9.84%	1482	1408	1334	-28
15	19.4	46.9	2.81%	45.9	0.167	73.6	15.5	4.4	170.8	10.39%	1473	1399	1326	-28
17	21.4	46.9									1470	1397	1323	
20	24.4	46.9	2.87%	46.9	0.181	79.0	17.5	4.9	177.7	10.81%	1466	1393	1319	-28
21:3	25.65	46.9									1465	1392	1318	
25	29.4	46.9	2.88%	47.1	0.190	83.2	19.5	5.5	182.7	11.11%	1461	1388	1315	-28
30	34.4	46.9	2.91%	47.6	0.200	88.0	20.4	5.8	188.3	11.45%	1456	1383	1310	-28
35	39.4	46.9	2.93%	47.9	0.209	91.9	21.5	6.1	192.8	11.73%	1451	1378	1306	-28
40	44.4	46.9	2.95%	48.2	0.215	94.7	22.5	6.4	196.2	11.93%	1448	1375	1303	-28
25	29.4										1461	1388	1315	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 42H46
NORMALIZING FACTOR: -28
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1456 Kips
95% BASE 1383 Kips
90% BASE 1310 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

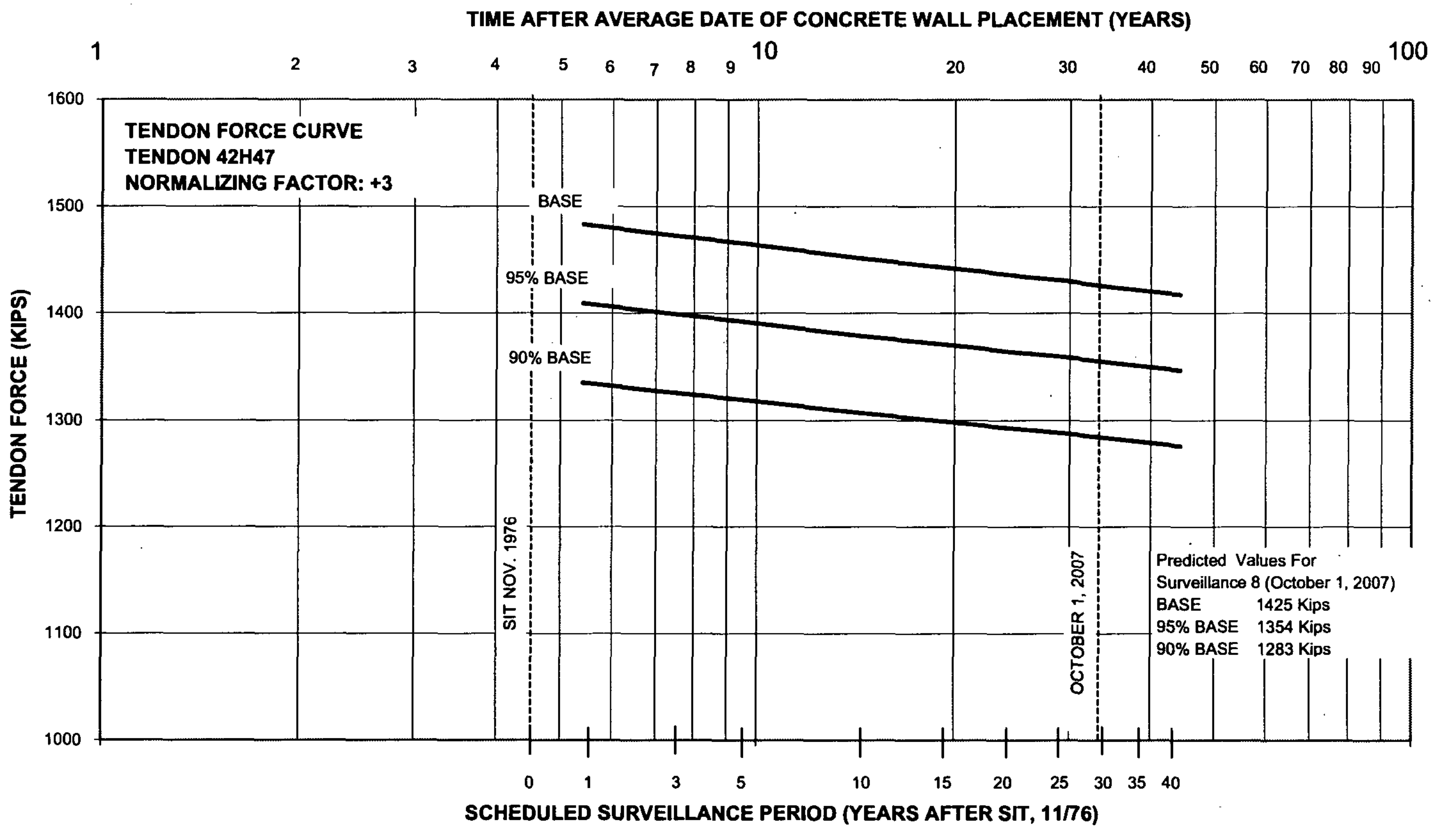
TENDON: 42H47 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1597 FIELD: 1633 AVERAGE: 1615 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 38 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.982

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	48.2	2.57%	42.0	0.090	39.5	6.0	1.7	131.4	8.14%	1483	1409	1335	3
3	7.4	48.2	2.60%	42.5	0.110	48.5	8.5	2.4	141.6	8.77%	1473	1400	1326	3
5	9.4	48.2	2.68%	43.8	0.123	54.1	10.0	2.8	148.9	9.22%	1466	1393	1319	3
10	14.4	48.2	2.76%	45.1	0.150	66.0	13.5	3.8	163.1	10.10%	1452	1379	1307	3
15	19.4	48.2	2.81%	45.9	0.167	73.6	15.5	4.4	172.1	10.66%	1443	1371	1298	3
17	21.4	48.2									1440	1368	1296	
20	24.4	48.2	2.87%	46.9	0.181	79.0	17.5	4.9	179.1	11.09%	1436	1364	1292	3
21:3	25.65	48.2									1435	1363	1291	
25	29.4	48.2	2.88%	47.1	0.190	83.2	19.5	5.5	184.0	11.40%	1431	1359	1288	3
30	34.4	48.2	2.91%	47.6	0.200	88.0	20.4	5.8	189.6	11.74%	1425	1354	1283	3
35	39.4	48.2	2.93%	47.9	0.209	91.9	21.5	6.1	194.1	12.02%	1421	1350	1279	3
40	44.4	48.2	2.95%	48.2	0.215	94.7	22.5	6.4	197.5	12.23%	1417	1346	1276	3
25	29.4										1431	1359	1288	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 42H47
NORMALIZING FACTOR: +3
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1425 Kips
95% BASE 1354 Kips
90% BASE 1283 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

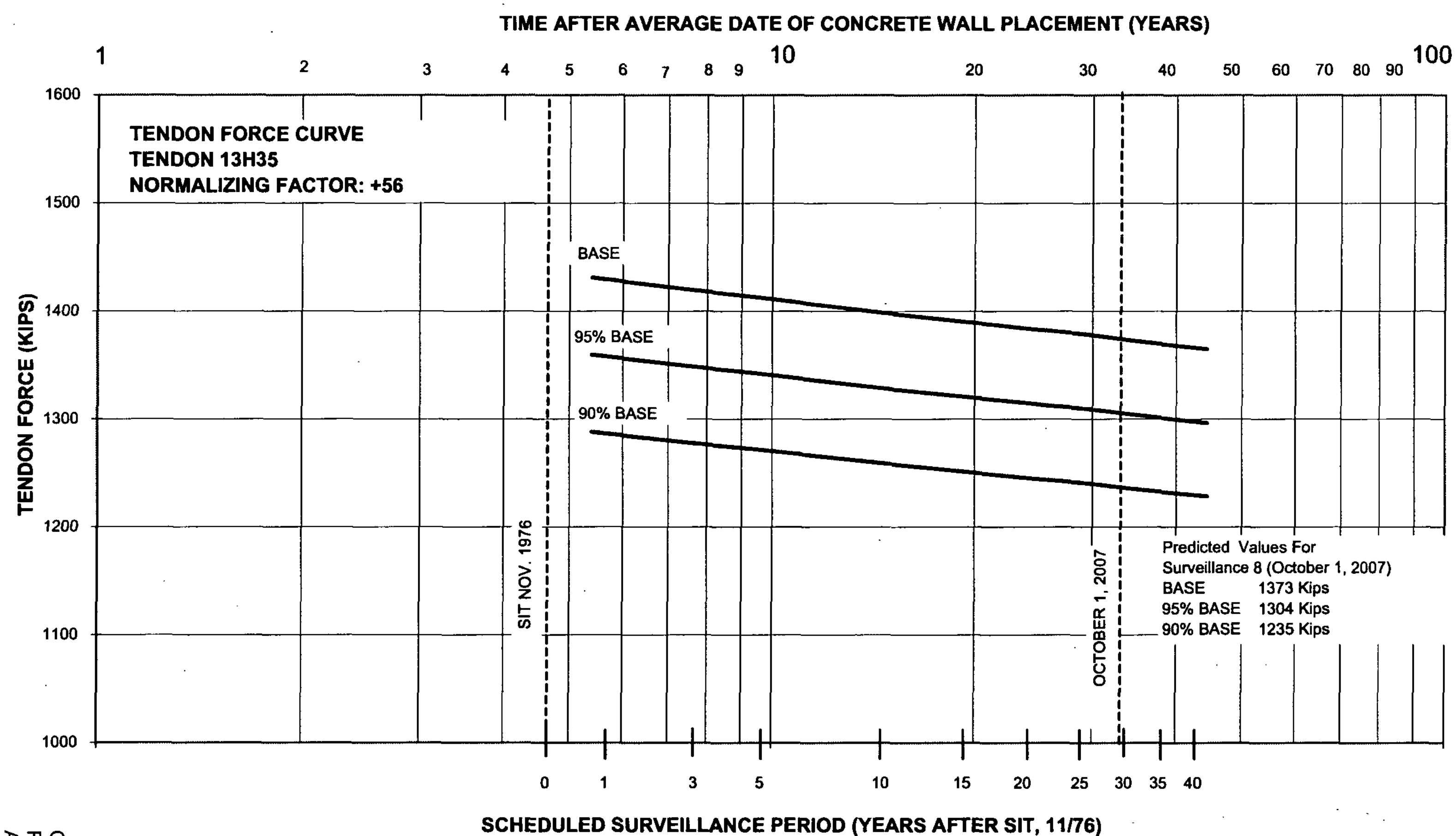
TENDON: 13H35 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1612 FIELD: 1650 AVERAGE: 1631 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 7 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.988

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	116.9	2.57%	42.0	0.090	39.5	6.0	1.7	200.1	12.27%	1431	1359	1288	56
3	7.4	116.9	2.60%	42.5	0.110	48.5	8.5	2.4	210.3	12.90%	1421	1350	1279	56
5	9.4	116.9	2.68%	43.8	0.123	54.1	10.0	2.8	217.6	13.34%	1413	1343	1272	56
10	14.4	116.9	2.76%	45.1	0.150	66.0	13.5	3.8	231.8	14.21%	1399	1329	1259	56
15	19.4	116.9	2.81%	45.9	0.167	73.6	15.5	4.4	240.8	14.76%	1390	1321	1251	56
17	21.4	116.9									1387	1318	1249	
20	24.4	116.9	2.87%	46.9	0.181	79.0	17.5	4.9	247.8	15.19%	1383	1314	1245	56
21:3	25.65	116.9									1382	1313	1244	
25	29.4	116.9	2.88%	47.1	0.190	83.2	19.5	5.5	252.7	15.49%	1378	1309	1240	56
30	34.4	116.9	2.91%	47.6	0.200	88.0	20.4	5.8	258.3	15.84%	1373	1304	1235	56
35	39.4	116.9	2.93%	47.9	0.209	91.9	21.5	6.1	262.8	16.11%	1368	1300	1231	56
40	44.4	116.9	2.95%	48.2	0.215	94.7	22.5	6.4	266.2	16.32%	1365	1297	1228	56
25	29.4										1378	1309	1240	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 13H35
NORMALIZING FACTOR: +56
TENDON FORCE (KIPS)
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1373 Kips
95% BASE 1304 Kips
90% BASE 1235 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

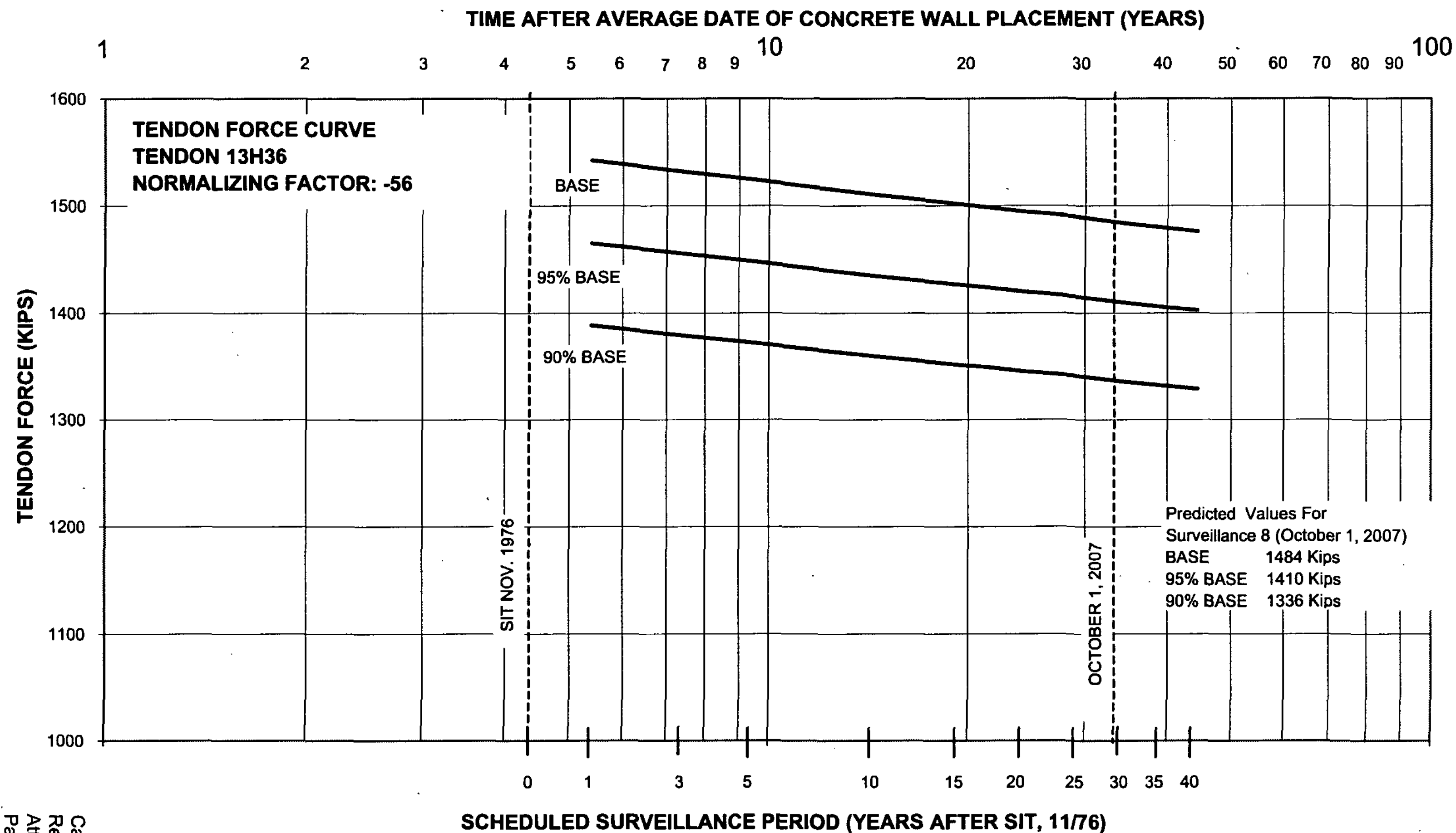
TENDON: 13H36 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS SHOP: 1618 FIELD: 1681 AVERAGE: 1650 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 49 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.982

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION: PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION: FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP: SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP: FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE: m in/in	INDIVIDUAL LOSSES: SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	24.1	2.57%	42.0	0.090	39.5	6.0	1.7	107.3	6.50%	1542	1465	1388	-56
3	7.4	24.1	2.60%	42.5	0.110	48.5	8.5	2.4	117.5	7.12%	1532	1455	1379	-56
5	9.4	24.1	2.68%	43.8	0.123	54.1	10.0	2.8	124.8	7.57%	1525	1449	1372	-56
10	14.4	24.1	2.76%	45.1	0.150	66.0	13.5	3.8	139.0	8.43%	1511	1435	1360	-56
15	19.4	24.1	2.81%	45.9	0.167	73.6	15.5	4.4	148.0	8.97%	1502	1427	1351	-56
17	21.4	24.1									1499	1424	1349	
20	24.4	24.1	2.87%	46.9	0.181	79.0	17.5	4.9	155.0	9.39%	1495	1420	1345	-56
21:3	25.65	24.1									1493	1419	1344	
25	29.4	24.1	2.88%	47.1	0.190	83.2	19.5	5.5	159.9	9.69%	1490	1415	1341	-56
30	34.4	24.1	2.91%	47.6	0.200	88.0	20.4	5.8	165.5	10.03%	1484	1410	1336	-56
35	39.4	24.1	2.93%	47.9	0.209	91.9	21.5	6.1	170.0	10.30%	1480	1406	1332	-56
40	44.4	24.1	2.95%	48.2	0.215	94.7	22.5	6.4	173.4	10.51%	1476	1402	1329	-56
25	29.4										1490	1415	1341	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 13H36
NORMALIZING FACTOR: -56
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1484 Kips
95% BASE 1410 Kips
90% BASE 1336 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

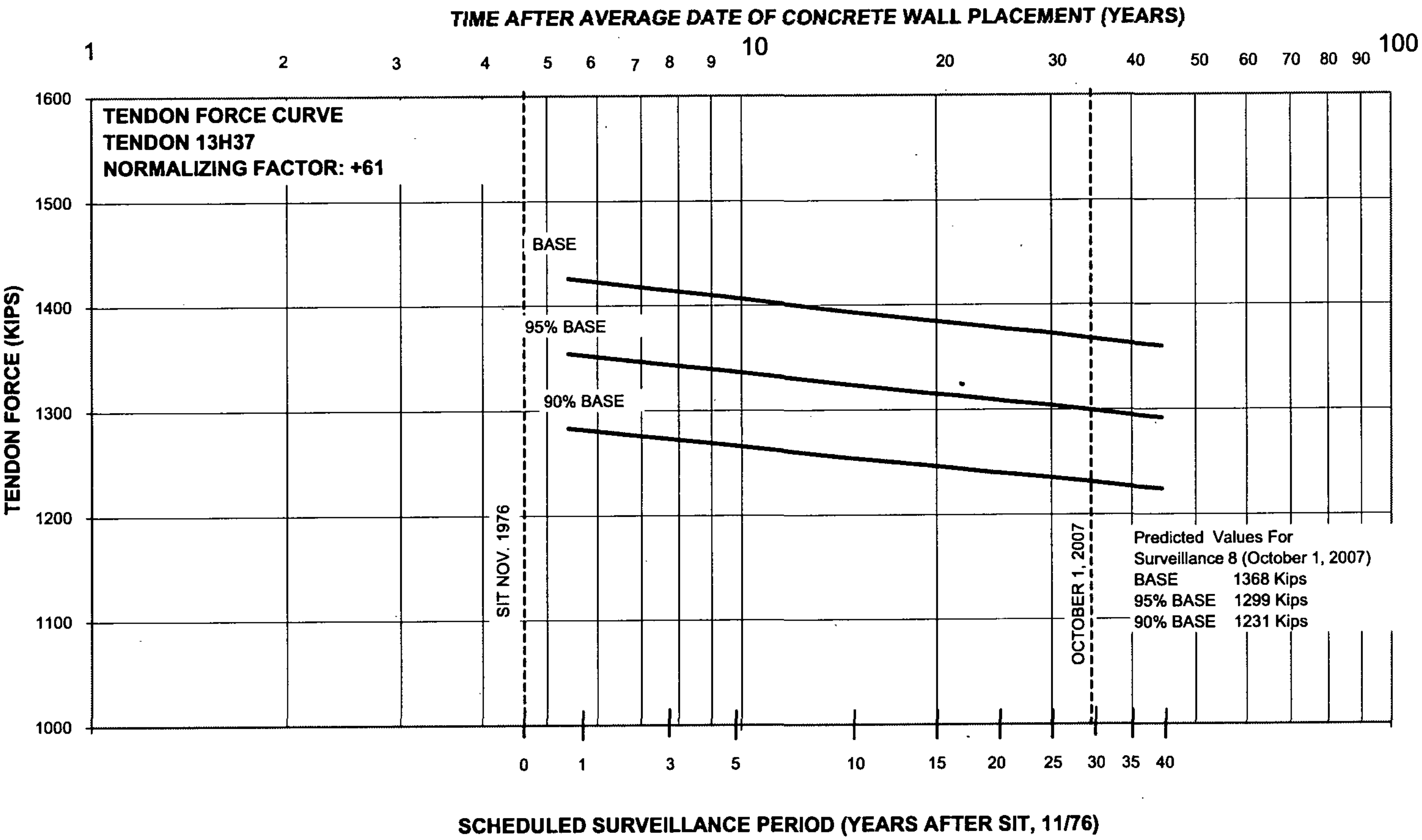
TENDON: 13H37 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1624 FIELD: 1634 AVERAGE: 1629 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 6 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	119.9	2.57%	42.0	0.090	39.5	6.0	1.7	203.1	12.47%	1426	1355	1283	61
3	7.4	119.9	2.60%	42.5	0.110	48.5	8.5	2.4	213.3	13.09%	1416	1345	1274	61
5	9.4	119.9	2.68%	43.8	0.123	54.1	10.0	2.8	220.6	13.54%	1408	1338	1267	61
10	14.4	119.9	2.76%	45.1	0.150	66.0	13.5	3.8	234.8	14.41%	1394	1324	1255	61
15	19.4	119.9	2.81%	45.9	0.167	73.6	15.5	4.4	243.7	14.96%	1385	1316	1247	61
17	21.4	119.9									1382	1313	1244	
20	24.4	119.9	2.87%	46.9	0.181	79.0	17.5	4.9	250.7	15.39%	1378	1309	1240	61
21:3	25.65	119.9									1377	1308	1239	
25	29.4	119.9	2.88%	47.1	0.190	83.2	19.5	5.5	255.7	15.70%	1373	1305	1236	61
30	34.4	119.9	2.91%	47.6	0.200	88.0	20.4	5.8	261.2	16.04%	1368	1299	1231	61
35	39.4	119.9	2.93%	47.9	0.209	91.9	21.5	6.1	265.7	16.31%	1363	1295	1227	61
40	44.4	119.9	2.95%	48.2	0.215	94.7	22.5	6.4	269.1	16.52%	1360	1292	1224	61
25	29.4										1373	1305	1236	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 13H37
NORMALIZING FACTOR: +61
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1368 Kips
95% BASE 1299 Kips
90% BASE 1231 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

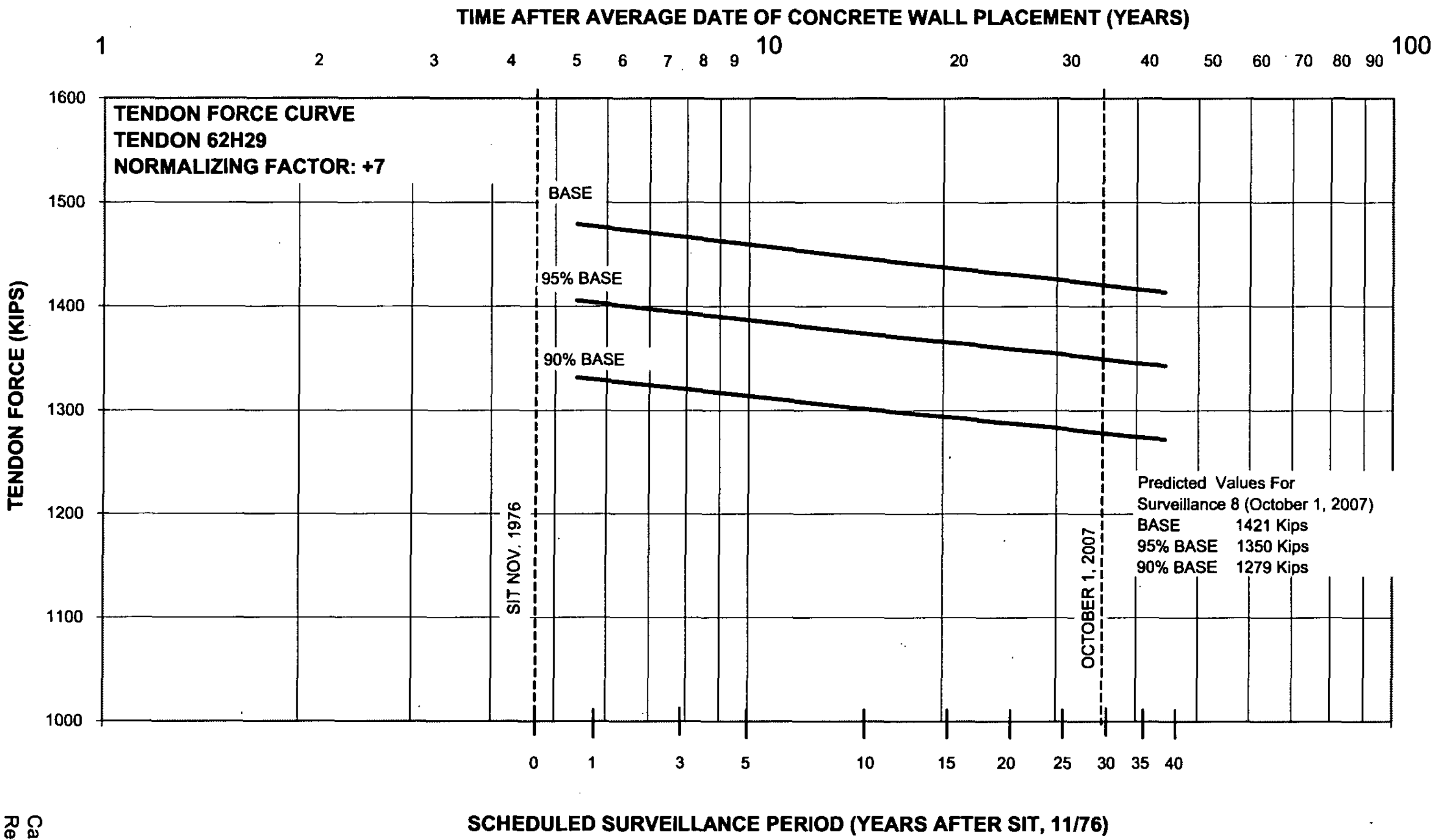
TENDON: 62H29 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1617 FIELD: 1641 AVERAGE: 1629 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 30 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	66.6	2.57%	42.0	0.090	39.5	6.0	1.7	149.8	9.19%	1479	1405	1331	7
3	7.4	66.6	2.60%	42.5	0.110	48.5	8.5	2.4	160.0	9.82%	1469	1396	1322	7
5	9.4	66.6	2.68%	43.8	0.123	54.1	10.0	2.8	167.3	10.27%	1462	1389	1316	7
10	14.4	66.6	2.76%	45.1	0.150	66.0	13.5	3.8	181.5	11.14%	1447	1375	1303	7
15	19.4	66.6	2.81%	45.9	0.167	73.6	15.5	4.4	190.5	11.69%	1439	1367	1295	7
17	21.4	66.6									1436	1364	1292	
20	24.4	66.6	2.87%	46.9	0.181	79.0	17.5	4.9	197.4	12.12%	1432	1360	1288	7
21:3	25.65	66.6									1430	1359	1287	
25	29.4	66.6	2.88%	47.1	0.190	83.2	19.5	5.5	202.4	12.42%	1427	1355	1284	7
30	34.4	66.6	2.91%	47.6	0.200	88.0	20.4	5.8	207.9	12.77%	1421	1350	1279	7
35	39.4	66.6	2.93%	47.9	0.209	91.9	21.5	6.1	212.4	13.04%	1417	1346	1275	7
40	44.4	66.6	2.95%	48.2	0.215	94.7	22.5	6.4	215.8	13.25%	1413	1342	1272	7
25	29.4										1427	1355	1284	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H29
NORMALIZING FACTOR: +7
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1421 Kips
95% BASE 1350 Kips
90% BASE 1279 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

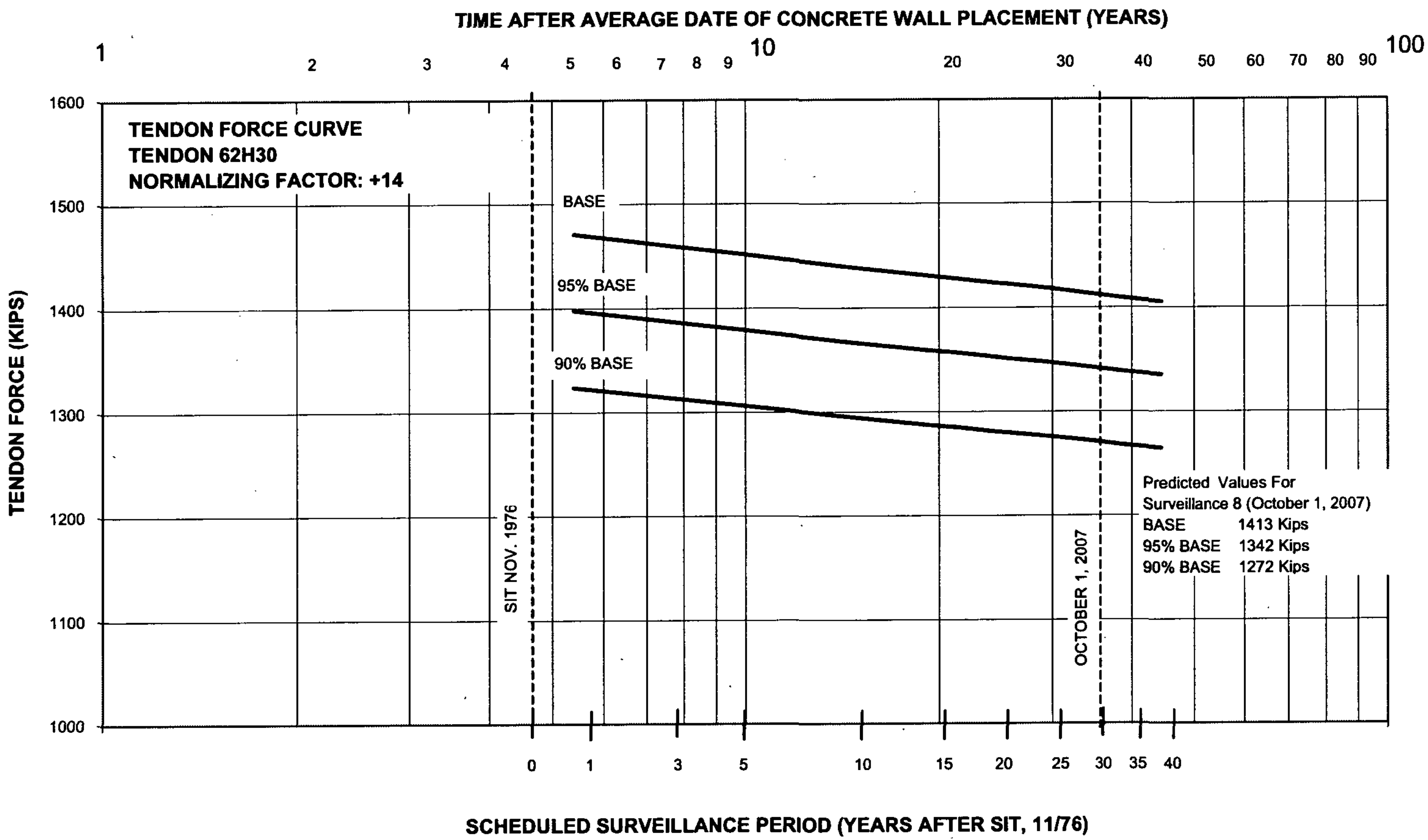
TENDON: 62H30 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1591 FIELD: 1603 AVERAGE: 1597 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 41 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	42.4	2.57%	42.0	0.090	39.5	6.0	1.7	125.6	7.87%	1471	1397	1324	14
3	7.4	42.4	2.60%	42.5	0.110	48.5	8.5	2.4	135.8	8.51%	1461	1388	1315	14
5	9.4	42.4	2.68%	43.8	0.123	54.1	10.0	2.8	143.1	8.96%	1453	1381	1308	14
10	14.4	42.4	2.76%	45.1	0.150	66.0	13.5	3.8	157.3	9.85%	1439	1367	1295	14
15	19.4	42.4	2.81%	45.9	0.167	73.6	15.5	4.4	166.3	10.42%	1430	1359	1287	14
17	21.4	42.4									1428	1356	1285	
20	24.4	42.4	2.87%	46.9	0.181	79.0	17.5	4.9	173.3	10.85%	1423	1352	1281	14
21:3	25.65	42.4									1422	1351	1280	
25	29.4	42.4	2.88%	47.1	0.190	83.2	19.5	5.5	178.2	11.16%	1418	1347	1277	14
30	34.4	42.4	2.91%	47.6	0.200	88.0	20.4	5.8	183.8	11.51%	1413	1342	1272	14
35	39.4	42.4	2.93%	47.9	0.209	91.9	21.5	6.1	188.3	11.79%	1408	1338	1267	14
40	44.4	42.4	2.95%	48.2	0.215	94.7	22.5	6.4	191.7	12.01%	1405	1335	1264	14
25	29.4										1418	1347	1277	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 62H30
NORMALIZING FACTOR: +14
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
1600
1500
1400
1300
1200
1100
1000
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1413 Kips
95% BASE 1342 Kips
90% BASE 1272 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

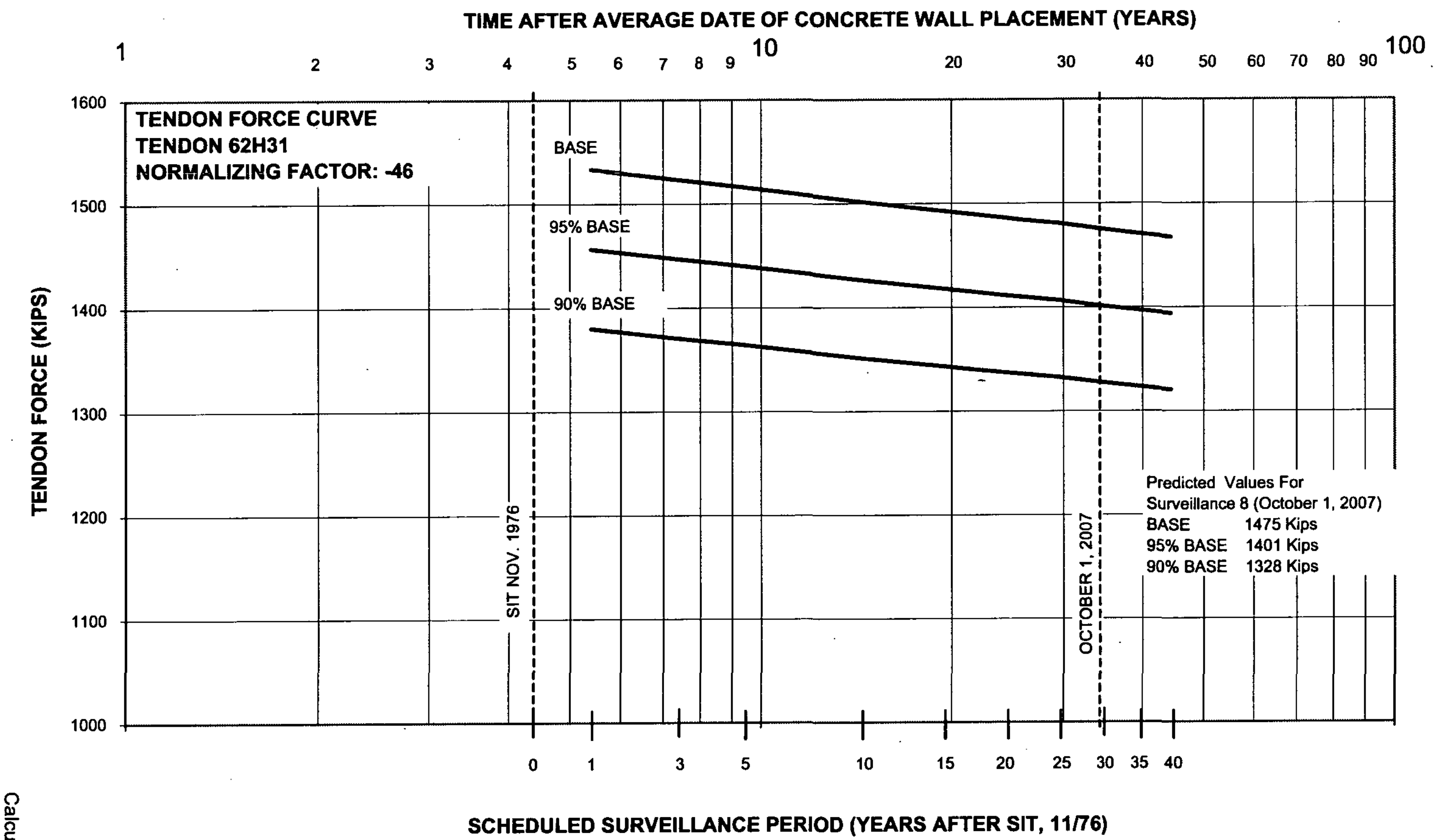
TENDON: 62H31 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1687 FIELD: 1675 AVERAGE: 1681 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 31 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	64.8	2.57%	42.0	0.090	39.5	6.0	1.7	148.0	8.80%	1533	1457	1380	-46
3	7.4	64.8	2.60%	42.5	0.110	48.5	8.5	2.4	158.2	9.41%	1523	1447	1371	-46
5	9.4	64.8	2.68%	43.8	0.123	54.1	10.0	2.8	165.5	9.84%	1516	1440	1364	-46
10	14.4	64.8	2.76%	45.1	0.150	66.0	13.5	3.8	179.7	10.69%	1502	1426	1351	-46
15	19.4	64.8	2.81%	45.9	0.167	73.6	15.5	4.4	188.6	11.22%	1493	1418	1343	-46
17	21.4	64.8									1490	1415	1341	
20	24.4	64.8	2.87%	46.9	0.181	79.0	17.5	4.9	195.6	11.63%	1486	1411	1337	-46
21:3	25.65	64.8									1484	1410	1336	
25	29.4	64.8	2.88%	47.1	0.190	83.2	19.5	5.5	200.6	11.93%	1481	1407	1333	-46
30	34.4	64.8	2.91%	47.6	0.200	88.0	20.4	5.8	206.1	12.26%	1475	1401	1328	-46
35	39.4	64.8	2.93%	47.9	0.209	91.9	21.5	6.1	210.6	12.53%	1471	1397	1324	-46
40	44.4	64.8	2.95%	48.2	0.215	94.7	22.5	6.4	214.0	12.73%	1467	1394	1321	-46
25	29.4										1481	1407	1333	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H31
NORMALIZING FACTOR: -46
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1475 Kips
95% BASE 1401 Kips
90% BASE 1328 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
D101	23	D201	32	D301	21
D102	32	D202	30	D302	22
D103	32	D203	11	D303	8
D104	22	D204	12	D304	30
D105	21	D205	28	D305	20
D106	24	D206	30	D306	23
D107	7	D207	9	D307	7
D108	31	D208	28	D308	30
D109	20	D209	29	D309	19
D110	25	D210	13	D310	24
D111	5	D211	1	D311	6
D112	31	D212	27	D312	30
D113	19	D213	14	D313	18
D114	32	D214	30	D314	25
D115	4	D215	2	D315	5
D116	29	D216	27	D316	30
D117	18	D217	15	D317	17
D118	26	D218	30	D318	26
D119	6	D219	3	D319	4
D120	29	D220	27	D320	30
D121	17	D221	32	D321	16
D122	26	D222	28	D322	26
D123	3	D223	4	D323	3
D124	29	D224	27	D324	30
D125	16	D225	17	D325	15
D126	27	D226	28	D326	26
D127	29	D227	5	D327	2
D128	2	D228	26	D328	29
D129	15	D229	18	D329	14
D130	1	D230	29	D330	27
D131	29	D231	6	D331	1
D132	27	D232	24	D332	29
D133	14	D233	19	D333	13
D134	27	D234	29	D334	28
D135	10	D235	7	D335	9
D136	29	D236	23	D336	28
D137	32	D237	29	D337	28
D138	28	D238	20	D338	12
D139	11	D239	32	D339	32
D140	28	D240	22	D340	28
D141	12	D241	32	D341	11

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	D130	D211	D331				
2	D128	D215	D327				
3	D123	D219	D323				
4	D115	D223	D319				
5	D111	D227	D315				
6	D119	D231	D311				
7	D107	D235	D307				
8	D303						
9	D207	D335					
10	D135						
11	D139	D203	D341				
12	D141	D204	D338				
13	D210	D333					
14	D133	D213	D329				
15	D129	D217	D325				
16	D125	D321					
17	D121	D225	D317				
18	D117	D229	D313				
19	D113	D233	D309				
20	D109	D238	D305				
21	D105	D301					
22	D104	D240	D302				
23	D101	D236	D306				
24	D106	D232	D310				
25	D110	D314					
26	D118	D122	D228	D318	D322	D326	
27	D126	D132	D134	D212	D216	D220	D224
27	D330						
28	D138	D140	D205	D208	D222	D226	D334
28	D336	D337	D340				
29	D116	D120	D124	D127	D131	D136	D209
29	D230	D234	D237	D328	D332		
30	D202	D206	D214	D218	D304	D308	D312
30	D316	D320	D324				
31	D108	D112					
32	D102	D103	D114	D137	D201	D221	D239
32	D241	D339					

Note:
Data extracted from Reference 11 of Calculation S-95-0082

DOME TENDONS DATA INPUT

Reference: S-95-0082

Initial Concrete Stress = 1732.0 (ksi)
Average Force = 1639.0 (kips)

For Tendons in Sequences 1 through 27
Total Stress Sequence (N) = 27
Total Elastic Shortening Losses = 82.7

For Tendons in Sequences 28 thru 32
Total Stress Sequence (N) = 5
Total Elastic Shortening Losses = 47.4

Tendon No.	Lift-off Pressure (ksi) (1)				Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips)		Remarks (3)
	Shop End		Field End							
	Predicted	Actual	Predicted	Actual				Shop End (5)	Field End (5)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
D128	6710	6800	6650	6900	2	159	0.975	1620	1659	
D129	6710	6850	6740	6600	15	161	0.988	1653	1585	S
D130	6870	6850	6810	6800	1	163	1.000	1634	1637	
D211	6810	7100	6870	7000	1	162	0.994	1698	1660	
D212	6770	6600	6770	6700	27	162	0.994	1588	1612	S,C
D213	6840	6900	6800	6800	14	163	1.000	1653	1639	
D237	6810	6900	6810	6900	29	163	1.000	1661	1661	
D238	6800	7050	6840	6800	20	163	1.000	1699	1629	S,D
D239	6810	6800	6840	6650	32	163	1.000	1637	1593	

Notes:

(1) Ref.12, 13, 14 Crystal River 3 R/B Tendon History Sheets - Dome Tendons for Original Stressing. See Attachments B&D.
(2) Ref. 11 Crystal River 3 Tendon Surveillance Loss Calculations. See Attachment C for stress sequence:
(3) S= Selected Tendons, C =Control tendon, D =Detension tendon, A =Alternate tendo
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacent
(4) Wire factors are calculated based on the number of effective wires divided by 163.
(5) Original forces calculated based on the expression in S-95-008:

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

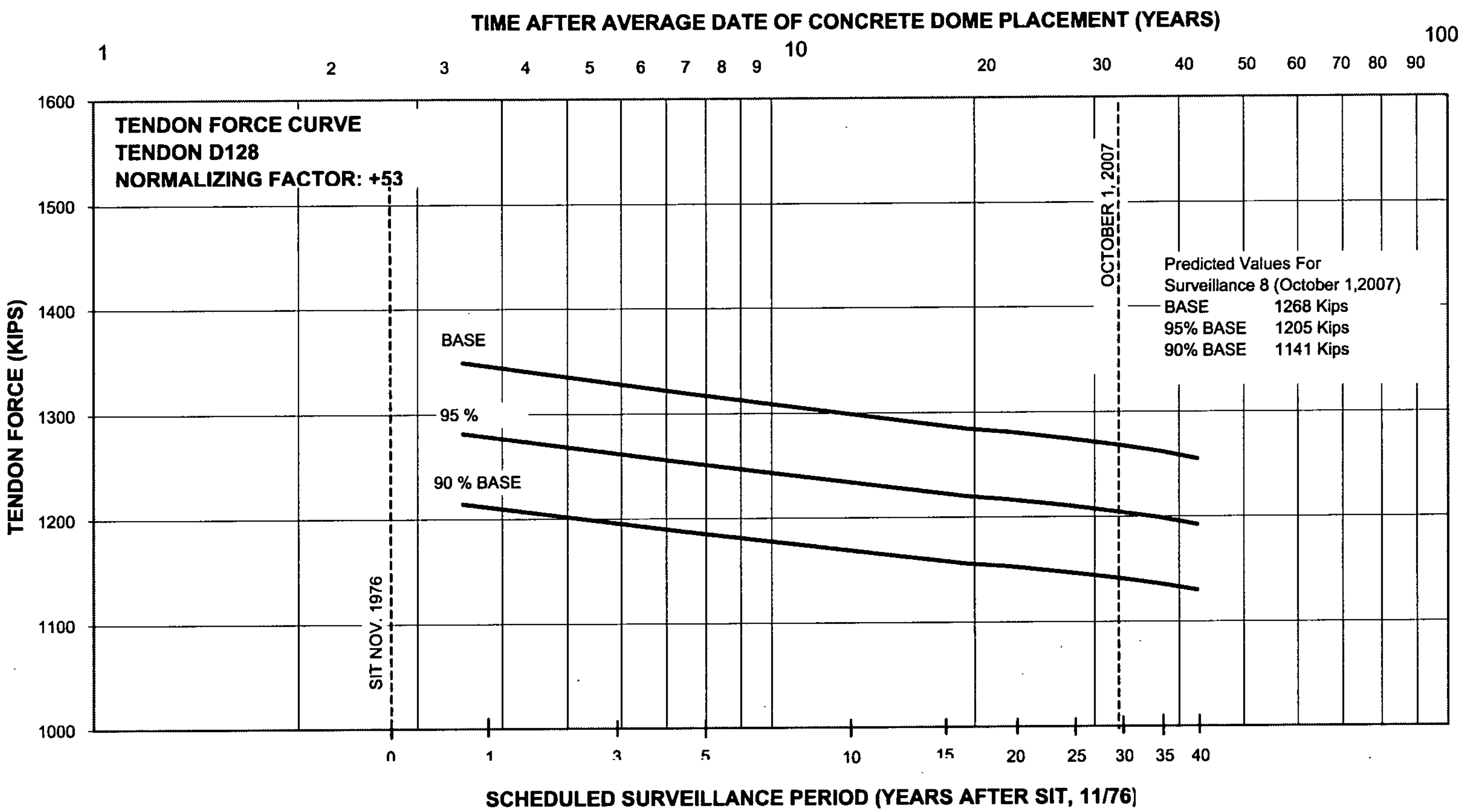
TENDON: D128 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1620 FIELD: 1659 AVERAGE: 1639 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 2 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.975

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	151.6	2.57%	42.3	3.28	92.5	15	4.0	290.4	17.71%	1349	1282	1214	53
3	5.5	151.6	2.60%	42.7	3.86	108.8	18	5.0	308.1	18.79%	1331	1265	1198	53
5	7.5	151.6	2.68%	44.1	4.21	118.7	21	6.0	320.4	19.54%	1319	1253	1187	53
10	12.5	151.6	2.76%	45.4	4.62	130.3	25	7.0	334.3	20.39%	1305	1240	1175	53
15	17.5	151.6	2.81%	46.2	5.21	146.9	27.5	8.0	352.7	21.51%	1287	1222	1158	53
17	19.5	151.6									1284	1220	1156	53
20	22.5	151.6	2.87%	47.2	5.39	152.0	29	8.0	358.8	21.88%	1281	1217	1153	53
21:3	23.75	151.6									1279	1215	1151	53
25	27.5	151.6	2.89%	47.3	5.59	157.6	30.8	9.0	365.5	22.29%	1274	1210	1147	53
30	32.5	151.6	2.91%	47.8	5.78	163.0	32	9.0	371.4	22.65%	1268	1205	1141	53
35	37.5	151.6	2.93%	48.2	5.98	168.6	33	9.0	377.4	23.02%	1262	1199	1136	53
40	42.5	151.6	2.95%	48.5	6.18	174.3	34	10.0	384.4	23.44%	1255	1192	1130	53
25	27.5										1274	1210	1147	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D128
NORMALIZING FACTOR: +53
TENDON FORCE (KIPS)
BASE
95 %
90 % BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1,2007)
BASE 1268 Kips
95% BASE 1205 Kips
90% BASE 1141 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

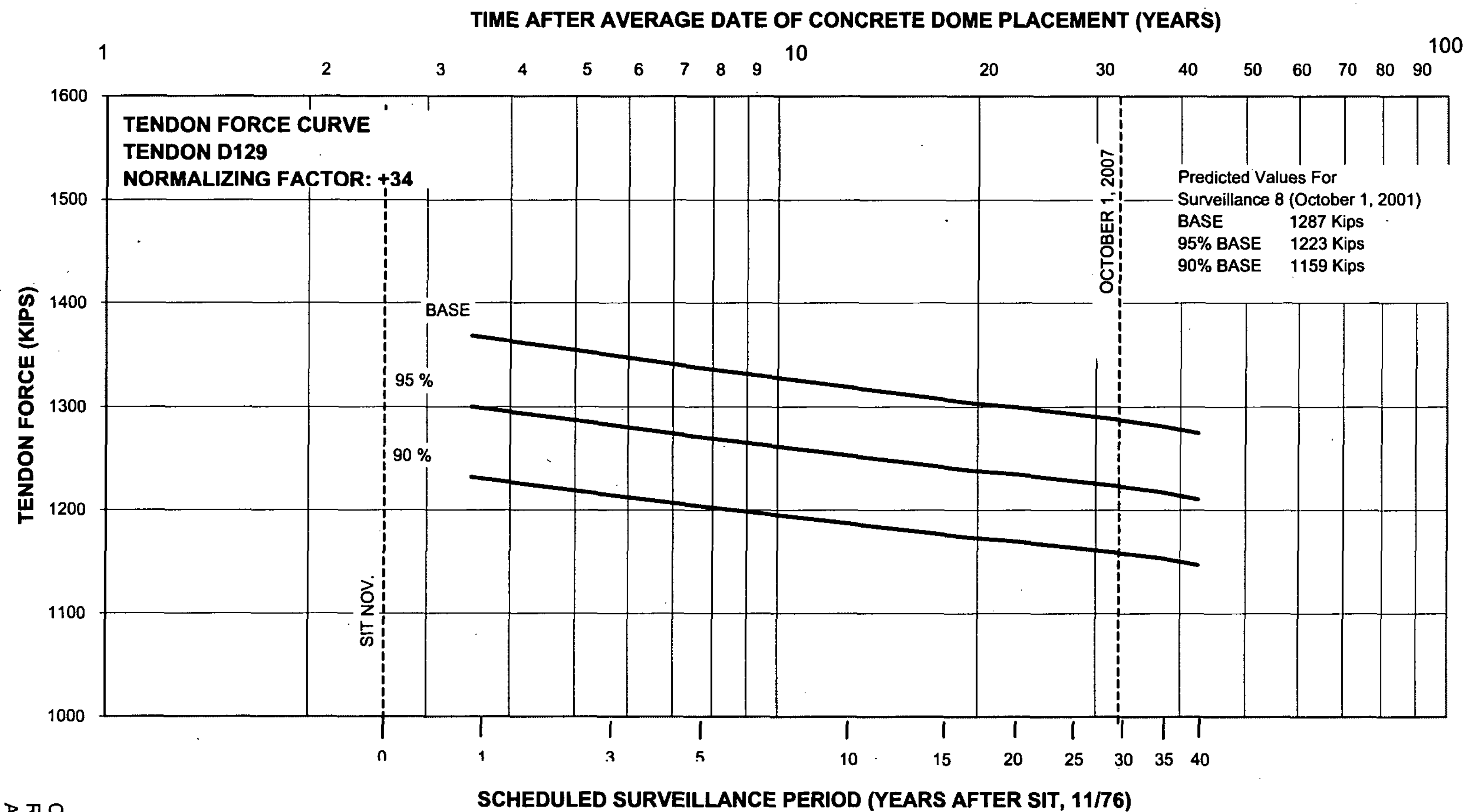
TENDON: D129 INITIAL CONCRETE STRESS (PS NA

ORIGINAL FORCES (KIPS): SHOP: 1653 FIELD: 1585 AVERAGE: 1619 AVERAGE ALL DOME TENDONS 1639

STRESS SEQUENCE: 15 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR 0.988

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	111.8	2.57%	42.3	3.28	92.5	15	4.0	250.6	15.48%	1368	1300	1232	34
3	5.5	111.8	2.60%	42.7	3.86	108.8	18	5.0	268.3	16.57%	1351	1283	1216	34
5	7.5	111.8	2.68%	44.1	4.21	118.7	21	6.0	280.6	17.33%	1338	1271	1205	34
10	12.5	111.8	2.76%	45.4	4.62	130.3	25	7.0	294.5	18.19%	1324	1258	1192	34
15	17.5	111.8	2.81%	46.2	5.21	146.9	27.5	8.0	312.9	19.33%	1306	1241	1175	34
17	19.5	111.8									1304	1238	1173	34
20	22.5	111.8	2.87%	47.2	5.39	152.0	29	8.0	319.0	19.70%	1300	1235	1170	34
21:3	23.75	111.8									1298	1233	1168	34
25	27.5	111.8	2.89%	47.3	5.59	157.6	30.8	9.0	325.7	20.12%	1293	1229	1164	34
30	32.5	111.8	2.91%	47.8	5.78	163.0	32	9.0	331.6	20.48%	1287	1223	1159	34
35	37.5	111.8	2.93%	48.2	5.98	168.6	33	9.0	337.6	20.85%	1281	1217	1153	34
40	42.5	111.8	2.95%	48.5	6.18	174.3	34	10.0	344.6	21.28%	1274	1211	1147	34
25	27.5										1293	1229	1164	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D129
NORMALIZING FACTOR: +34
Predicted Values For
Surveillance 8 (October 1, 2001)
BASE 1287 Kips
95% BASE 1223 Kips
90% BASE 1159 Kips
OCTOBER 1, 2007
BASE
95 %
90 %
SIT NOV.
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

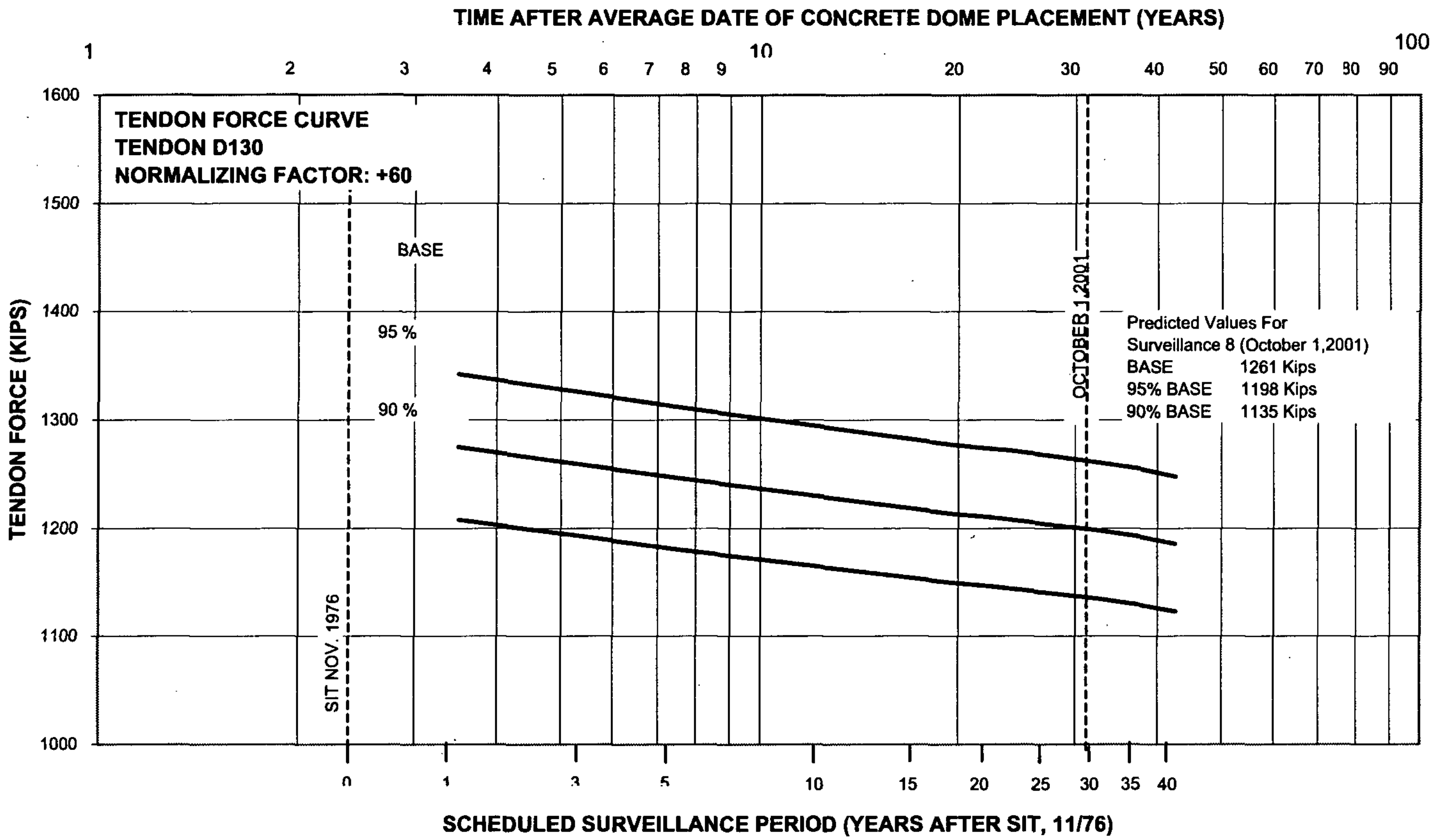
TENDON: D130 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS SHOP: 1634 FIELD: 1637 AVERAGE: 1635 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 1 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	154.6	2.57%	42.3	3.28	92.5	15	4.0	293.4	17.94%	1342	1275	1208	60
3	5.5	154.6	2.60%	42.7	3.86	108.8	18	5.0	311.1	19.03%	1324	1258	1192	60
5	7.5	154.6	2.68%	44.1	4.21	118.7	21	6.0	323.4	19.78%	1312	1246	1181	60
10	12.5	154.6	2.76%	45.4	4.62	130.3	25	7.0	337.3	20.63%	1298	1233	1168	60
15	17.5	154.6	2.81%	46.2	5.21	146.9	27.5	8.0	355.7	21.75%	1280	1216	1152	60
17	19.5	154.6									1277	1213	1149	60
20	22.5	154.6	2.87%	47.2	5.39	152.0	29	8.0	361.8	22.13%	1274	1210	1146	60
21:3	23.75	154.6									1272	1208	1145	60
25	27.5	154.6	2.89%	47.3	5.59	157.6	30.8	9.0	368.5	22.54%	1267	1203	1140	60
30	32.5	154.6	2.91%	47.8	5.78	163.0	32	9.0	374.4	22.90%	1261	1198	1135	60
35	37.5	154.6	2.93%	48.2	5.98	168.6	33	9.0	380.4	23.26%	1255	1192	1129	60
40	42.5	154.6	2.95%	48.5	6.18	174.3	34	10.0	387.4	23.69%	1248	1186	1123	60
25	27.5										1267	1203	1140	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D130
NORMALIZING FACTOR: +60
BASE
95 %
90 %
SIT NOV. 1976
OCTOBER 1,2001
Predicted Values For
Surveillance 8 (October 1,2001)
BASE 1261 Kips
95% BASE 1198 Kips
90% BASE 1135 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

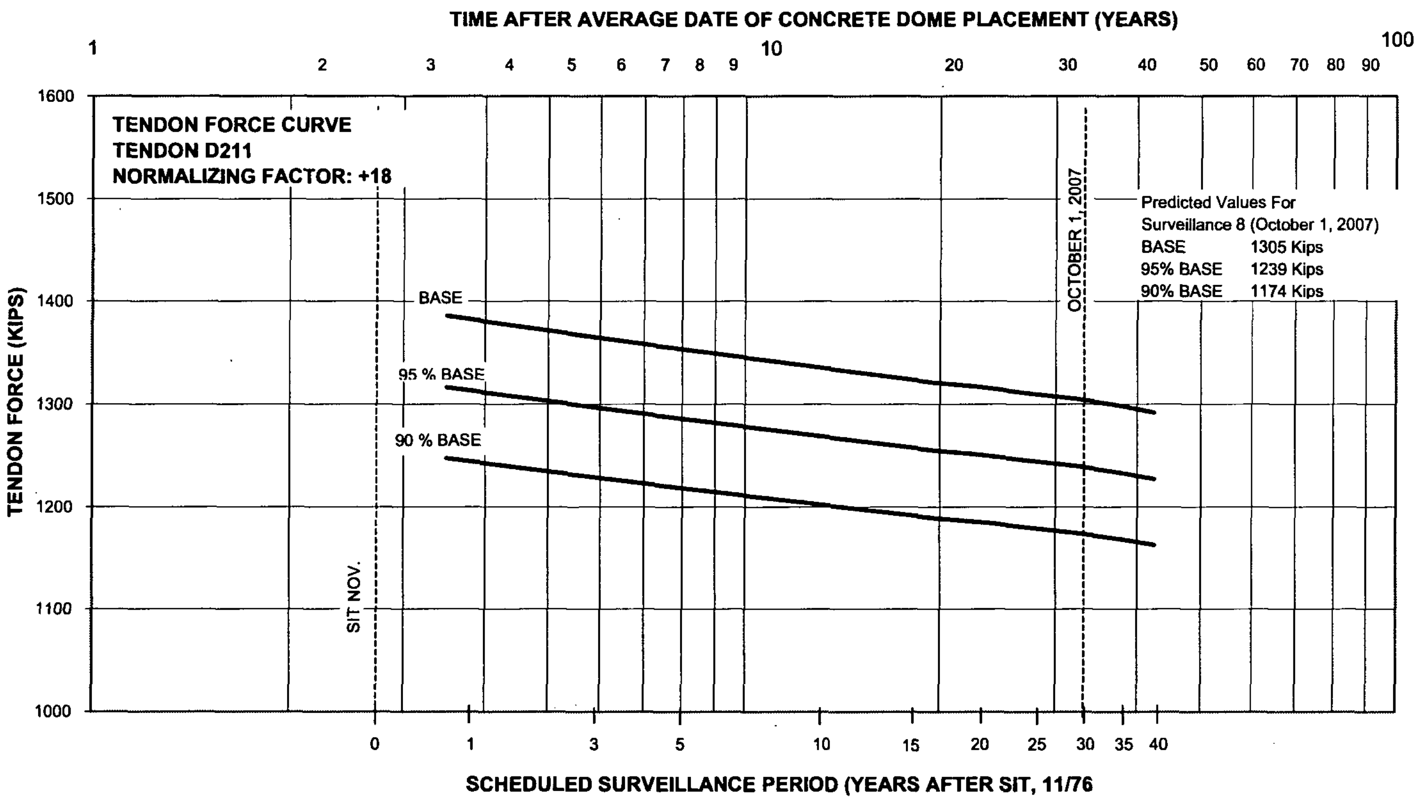
TENDON: D211 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1698 FIELD: 1660 AVERAGE: 1679 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 1 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION PERCENT	STRESS RELAXATION FORCE (KIPS)	CREEP CR. STR. (*.0001)	CREEP FORCE (KIPS)	SHRINKAGE m in/in	SHRINKAGE FORCE (KIPS)	TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	154.6	2.57%	42.3	3.28	92.5	15	4.0	293.4	17.48%	1386	1316	1247	18
3	5.5	154.6	2.60%	42.7	3.86	108.8	18	5.0	311.1	18.53%	1368	1299	1231	18
5	7.5	154.6	2.68%	44.1	4.21	118.7	21	6.0	323.4	19.26%	1356	1288	1220	18
10	12.5	154.6	2.76%	45.4	4.62	130.3	25	7.0	337.3	20.09%	1342	1275	1207	18
15	17.5	154.6	2.81%	46.2	5.21	146.9	27.5	8.0	355.7	21.19%	1323	1257	1191	18
17	19.5	154.6									1321	1255	1189	18
20	22.5	154.6	2.87%	47.2	5.39	152.0	29	8.0	361.8	21.55%	1317	1251	1185	18
21:3	23.75	154.6									1315	1250	1184	18
25	27.5	154.6	2.89%	47.3	5.59	157.6	30.8	9.0	368.5	21.95%	1310	1245	1179	18
30	32.5	154.6	2.91%	47.8	5.78	163.0	32	9.0	374.4	22.30%	1305	1239	1174	18
35	37.5	154.6	2.93%	48.2	5.98	168.6	33	9.0	380.4	22.66%	1299	1234	1169	18
40	42.5	154.6	2.95%	48.5	6.18	174.3	34	10.0	387.4	23.08%	1292	1227	1162	18
25	27.5										1310	1245	1179	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D211
NORMALIZING FACTOR: +18
BASE
95 % BASE
90 % BASE
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1305 Kips
95% BASE 1239 Kips
90% BASE 1174 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76

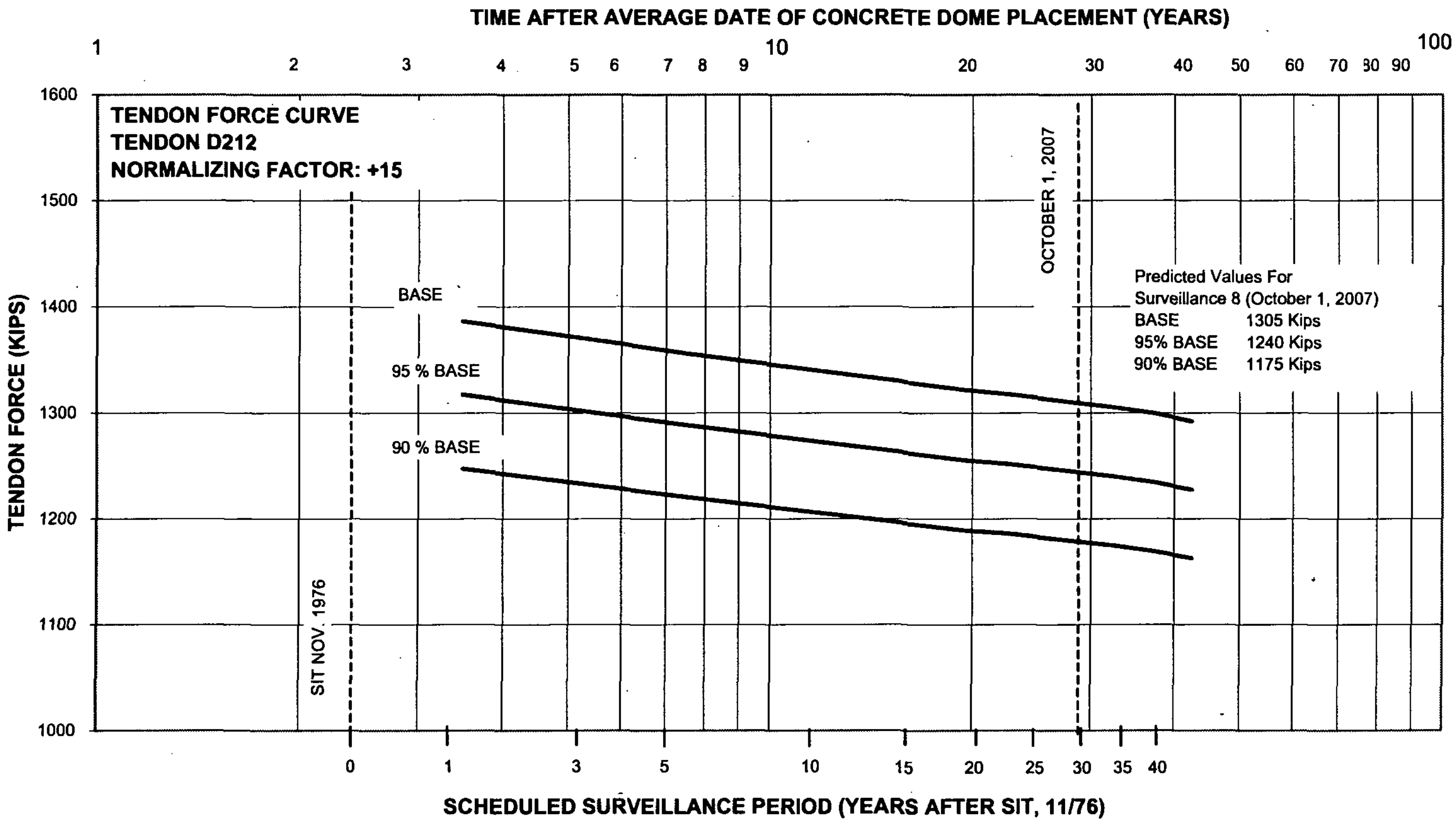
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D212 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS SHOP: 1588 FIELD: 1612 AVERAGE: 1600 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 27 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	75.0	2.57%	42.3	3.28	92.5	15	4.0	213.8	13.36%	1386	1317	1248	15
3	5.5	75.0	2.60%	42.7	3.86	108.8	18	5.0	231.5	14.47%	1369	1300	1232	15
5	7.5	75.0	2.68%	44.1	4.21	118.7	21	6.0	243.8	15.24%	1356	1288	1221	15
10	12.5	75.0	2.76%	45.4	4.62	130.3	25	7.0	257.7	16.11%	1342	1275	1208	15
15	17.5	75.0	2.81%	46.2	5.21	146.9	27.5	8.0	276.1	17.26%	1324	1258	1192	15
17	19.5	75.0									1321	1255	1189	15
20	22.5	75.0	2.87%	47.2	5.39	152.0	29	8.0	282.2	17.64%	1318	1252	1186	15
21:3	23.75	75.0									1316	1250	1185	15
25	27.5	75.0	2.89%	47.3	5.59	157.6	30.8	9.0	288.9	18.06%	1311	1246	1180	15
30	32.5	75.0	2.91%	47.8	5.78	163.0	32	9.0	294.8	18.42%	1305	1240	1175	15
35	37.5	75.0	2.93%	48.2	5.98	168.6	33	9.0	300.8	18.80%	1299	1234	1169	15
40	42.5	75.0	2.95%	48.5	6.18	174.3	34	10.0	307.8	19.24%	1292	1228	1163	15
25	27.5										1311	1246	1180	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D212
NORMALIZING FACTOR: +15
OCTOBER 1, 2007
SIT NOV. 1976
BASE
95 % BASE
90 % BASE
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1305 Kips
95% BASE 1240 Kips
90% BASE 1175 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

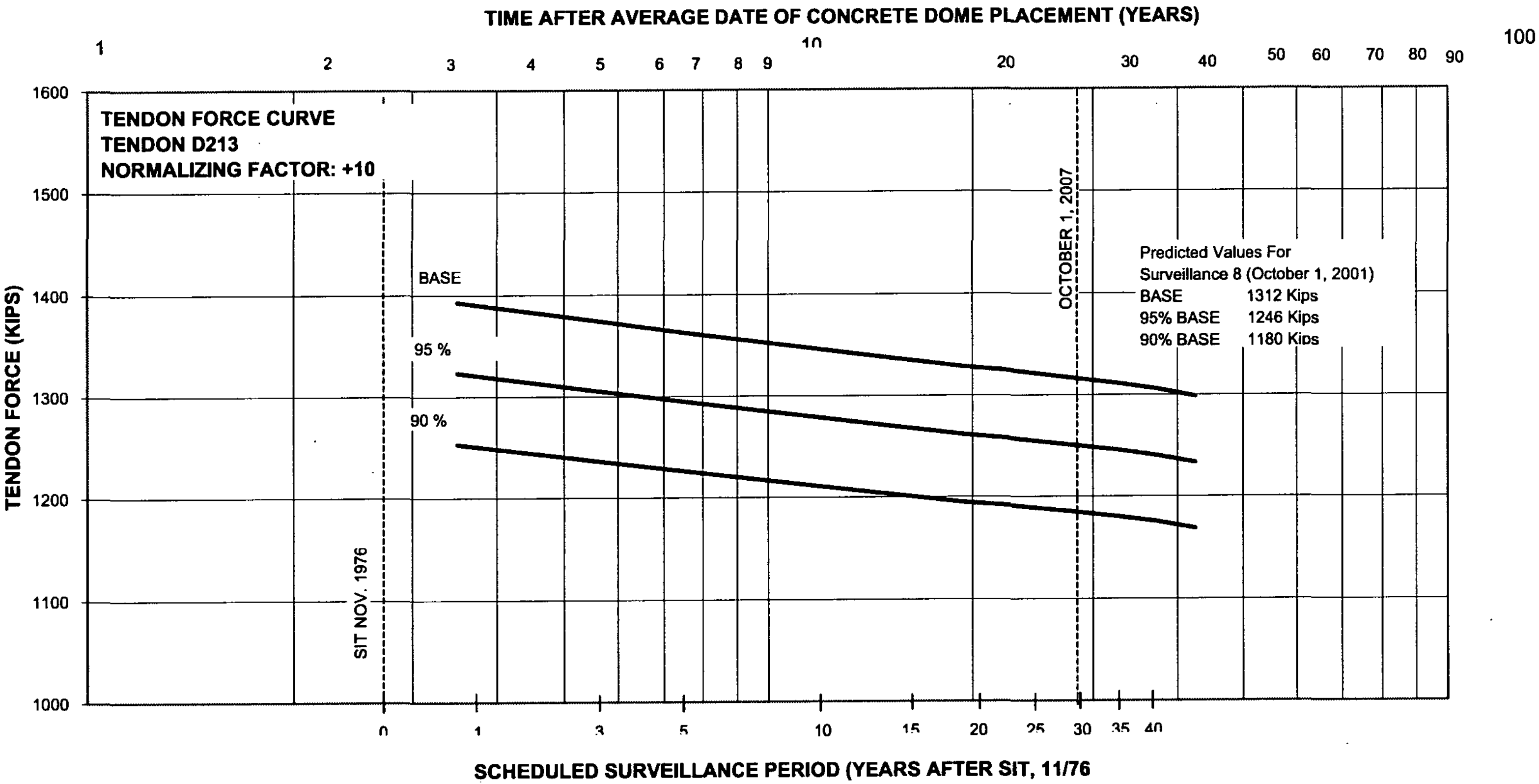
TENDON: D213 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1653 FIELD: 1639 AVERAGE: 1646 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 14 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP CR. STR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	114.8	2.57%	42.3	3.28	92.5	15	4.0	253.6	15.41%	1393	1323	1253	10
3	5.5	114.8	2.60%	42.7	3.86	108.8	18	5.0	271.3	16.48%	1375	1306	1237	10
5	7.5	114.8	2.68%	44.1	4.21	118.7	21	6.0	283.6	17.23%	1363	1294	1226	10
10	12.5	114.8	2.76%	45.4	4.62	130.3	25	7.0	297.5	18.07%	1349	1281	1214	10
15	17.5	114.8	2.81%	46.2	5.21	146.9	27.5	8.0	315.9	19.19%	1330	1264	1197	10
17	19.5	114.8									1328	1261	1195	10
20	22.5	114.8	2.87%	47.2	5.39	152.0	29	8.0	322.0	19.56%	1324	1258	1192	10
21:3	23.75	114.8									1322	1256	1190	10
25	27.5	114.8	2.89%	47.3	5.59	157.6	30.8	9.0	328.7	19.97%	1317	1252	1186	10
30	32.5	114.8	2.91%	47.8	5.78	163.0	32	9.0	334.6	20.33%	1312	1246	1180	10
35	37.5	114.8	2.93%	48.2	5.98	168.6	33	9.0	340.6	20.69%	1306	1240	1175	10
40	42.5	114.8	2.95%	48.5	6.18	174.3	34	10.0	347.6	21.12%	1299	1234	1169	10
25	27.5										1317	1252	1186	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON D213
NORMALIZING FACTOR: +10
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE (KIPS)
BASE
95 %
90 %
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2001)
BASE 1312 Kips
95% BASE 1246 Kips
90% BASE 1180 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76

USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

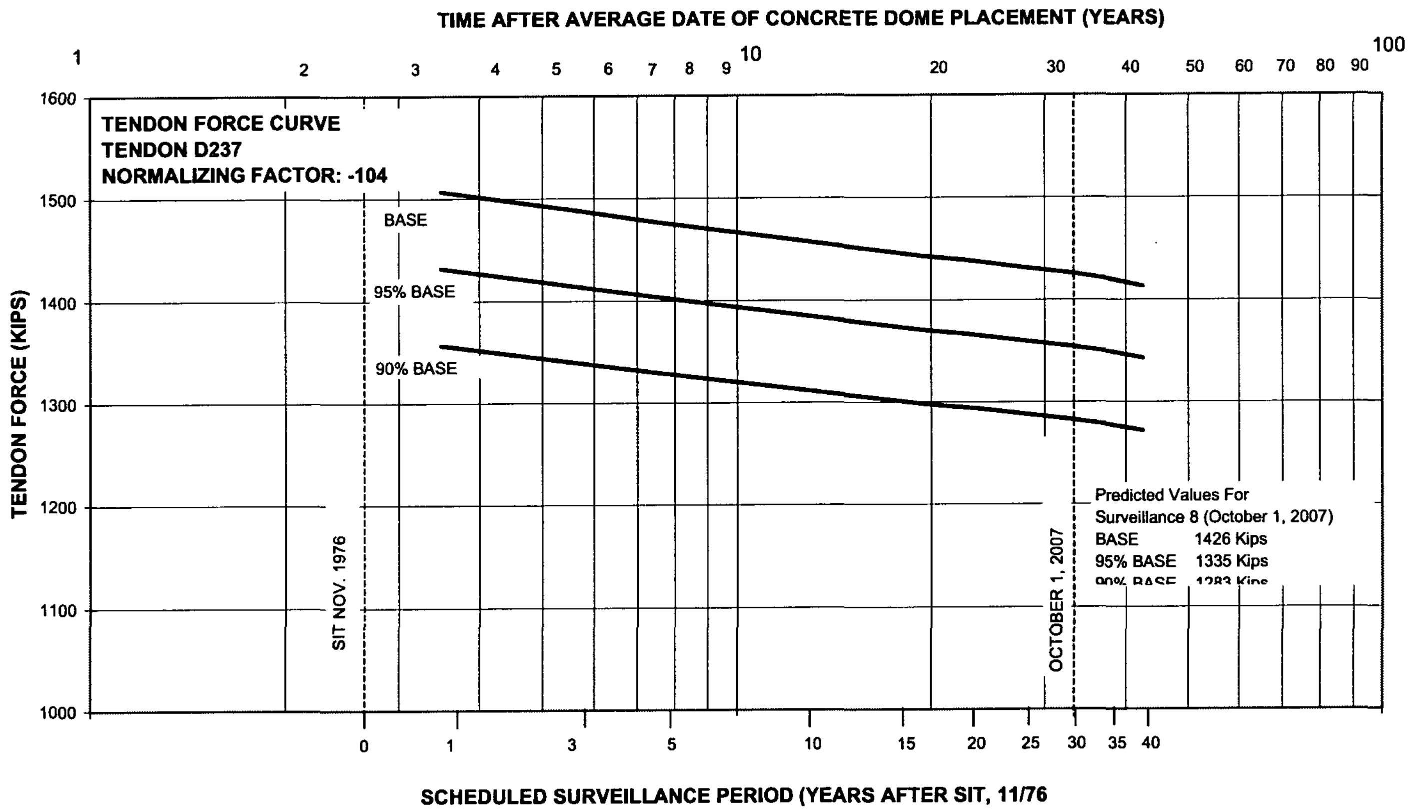
TENDON: D237 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1661 FIELD: 1661 AVERAGE: 1661 AVERAGE ALL DOME TENDONS 1639

STRESS SEQUENCE: 29 OF 5 TOTAL ELASTIC SHORT. LOSS: 47.4 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	CR. STR. (* .0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	14.7	2.57%	42.3	3.28	92.5	15	4.0	153.5	9.25%	1507	1432	1356	-104
3	5.5	14.7	2.60%	42.7	3.86	108.8	18	5.0	171.2	10.31%	1489	1415	1340	-104
5	7.5	14.7	2.68%	44.1	4.21	118.7	21	6.0	183.5	11.05%	1477	1403	1329	-104
10	12.5	14.7	2.76%	45.4	4.62	130.3	25	7.0	197.4	11.89%	1463	1390	1317	-104
15	17.5	14.7	2.81%	46.2	5.21	146.9	27.5	8.0	215.8	13.00%	1445	1373	1300	-104
17	19.5	14.7									1442	1370	1298	-104
20	22.5	14.7	2.87%	47.2	5.39	152.0	29	8.0	221.9	13.37%	1439	1367	1295	-104
21:3	23.75	14.7									1437	1365	1293	-104
25	27.5	14.7	2.89%	47.3	5.59	157.6	30.8	9.0	228.6	13.77%	1432	1360	1289	-104
30	32.5	14.7	2.91%	47.8	5.78	163.0	32	9.0	234.5	14.12%	1426	1355	1283	-104
35	37.5	14.7	2.93%	48.2	5.98	168.6	33	9.0	240.5	14.49%	1420	1349	1278	-104
40	42.5	14.7	2.95%	48.5	6.18	174.3	34	10.0	247.5	14.91%	1413	1342	1272	-104
25	27.5										1432	1360	1289	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D237
NORMALIZING FACTOR: -104
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1426 Kips
95% BASE 1335 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

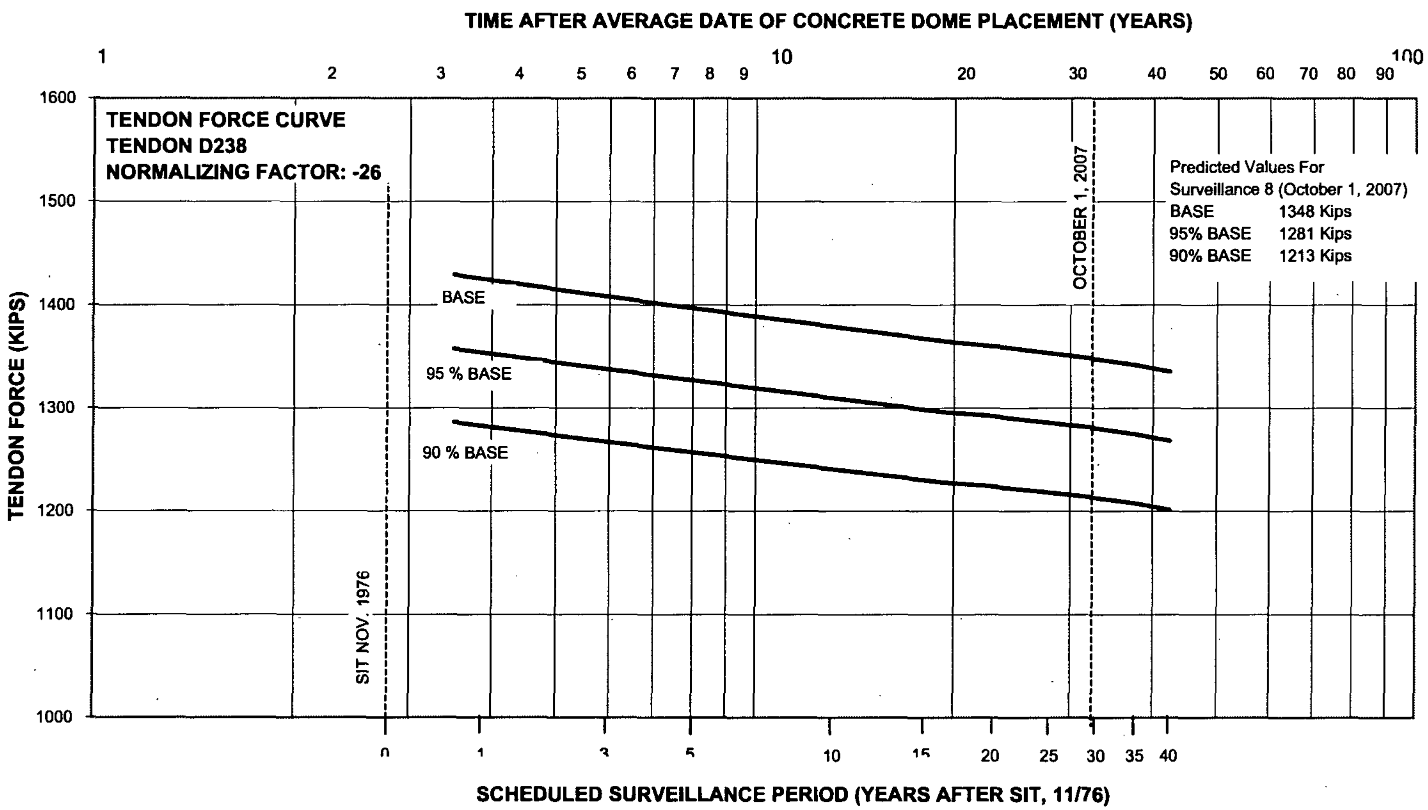
TENDON: D238 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1699 FIELD: 1629 AVERAGE: 1664 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 20 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	96.4	2.57%	42.3	3.28	92.5	15	4.0	235.2	14.13%	1429	1358	1286	-26
3	5.5	96.4	2.60%	42.7	3.86	108.8	18	5.0	252.9	15.20%	1411	1341	1270	-26
5	7.5	96.4	2.68%	44.1	4.21	118.7	21	6.0	265.2	15.94%	1399	1329	1259	-26
10	12.5	96.4	2.76%	45.4	4.62	130.3	25	7.0	279.1	16.77%	1385	1316	1247	-26
15	17.5	96.4	2.81%	46.2	5.21	146.9	27.5	8.0	297.5	17.88%	1367	1298	1230	-26
17	19.5	96.4									1364	1296	1228	-26
20	22.5	96.4	2.87%	47.2	5.39	152.0	29	8.0	303.6	18.24%	1361	1293	1225	-26
21:3	23.75	96.4									1359	1291	1223	-26
25	27.5	96.4	2.89%	47.3	5.59	157.6	30.8	9.0	310.3	18.65%	1354	1286	1219	-26
30	32.5	96.4	2.91%	47.8	5.78	163.0	32	9.0	316.2	19.00%	1348	1281	1213	-26
35	37.5	96.4	2.93%	48.2	5.98	168.6	33	9.0	322.2	19.36%	1342	1275	1208	-26
40	42.5	96.4	2.95%	48.5	6.18	174.3	34	10.0	329.2	19.78%	1335	1268	1202	-26
25	27.5										1354	1286	1219	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON D238
NORMALIZING FACTOR: -26
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1348 Kips
95% BASE 1281 Kips
90% BASE 1213 Kips
BASE
95 % BASE
90 % BASE
SIT NOV. 1976
TENDON FORCE (KIPS)
1600
1500
1400
1300
1200
1100
1000
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

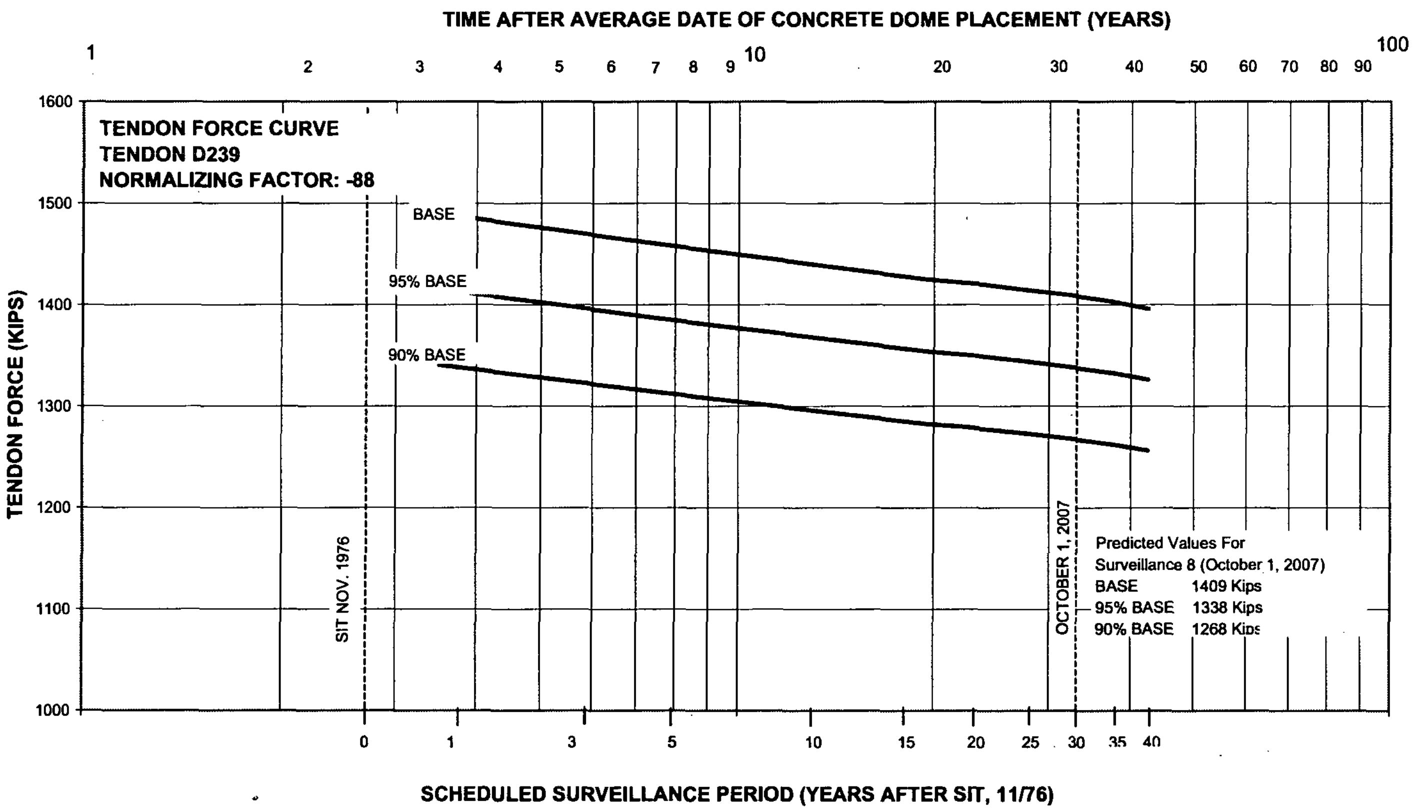
TENDON: D239 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1637 FIELD: 1593 AVERAGE: 1615 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 32 OF 5 TOTAL ELASTIC SHORT. LOSS: 47.4 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (* .0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	-13.7	2.57%	42.3	3.28	92.5	15	4.0	125.1	7.75%	1490	1415	1341	-88
3	5.5	-13.7	2.60%	42.7	3.86	108.8	18	5.0	142.8	8.84%	1472	1399	1325	-88
5	7.5	-13.7	2.68%	44.1	4.21	118.7	21	6.0	155.1	9.60%	1460	1387	1314	-88
10	12.5	-13.7	2.76%	45.4	4.62	130.3	25	7.0	169.0	10.46%	1446	1374	1301	-88
15	17.5	-13.7	2.81%	46.2	5.21	146.9	27.5	8.0	187.4	11.60%	1428	1356	1285	-88
17	19.5	-13.7									1425	1354	1283	-88
20	22.5	-13.7	2.87%	47.2	5.39	152.0	29	8.0	193.5	11.98%	1421	1350	1279	-88
21:3	23.75	-13.7									1420	1349	1278	-88
25	27.5	-13.7	2.89%	47.3	5.59	157.6	30.8	9.0	200.2	12.40%	1415	1344	1273	-88
30	32.5	-13.7	2.91%	47.8	5.78	163.0	32	9.0	206.1	12.76%	1409	1338	1268	-88
35	37.5	-13.7	2.93%	48.2	5.98	168.6	33	9.0	212.1	13.13%	1403	1333	1263	-88
40	42.5	-13.7	2.95%	48.5	6.18	174.3	34	10.0	219.1	13.57%	1396	1326	1256	-88
25	27.5										1415	1344	1273	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON D239
NORMALIZING FACTOR: -88
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1409 Kips
95% BASE 1338 Kips
90% BASE 1268 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

. IDENTIFICATION NUMBER 61V24 CUT LENGTH 188'-6½"

SHOP WASHER ID: PC 121 CR 480 FIELD WASHER ID: PC 120 CR 203

. GAI/QA vendor inspection cover letter number-FPC # 10142 DATE 3/22/74

. Date tendon received on-site 3-11-74 RMR Number 37552

. Date installed in conduit 7-17-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

. Date buttonheaded 9-9-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

. Date stressed 10-11-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12¼, 11⅞	NA, NA	12¼, 11⅞
Lift-Off Pressure - Predicted/Actual	6870, 6775	" , "	N/A
Shim Thickness/80% Ultimate Pressure	13", 7810	4", "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

. Date Bulk-filled 11-8-74 Bulk-Filling NCR's

Time since installation 4 months Inlet Pressure 123 PSI Outlet Temp. 124°

Date end caps refilled: Shop Field

. Data compiled by D. [illegible] Organization Salem

Date 4/4/77

. Additional Comments:

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907 715

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

N IDENTIFICATION NUMBER 12V1 CUT LENGTH 188'-6 1/4

SHOP WASHER ID: PC 121 CR 650 FIELD WASHER ID: PC 120 CR 230

1. GAI/QA vendor inspection cover letter number-FPC # 9957 DATE 2/25/74

2. Date tendon received on-site 1-16-74 RMR Number 36036

3. Date installed in conduit 7-3-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-23-74 Buttonheading NCR's

   Bad wires 4 Accept. Reheads 4 Total Ineffective wires 0

5. Date stressed 9-13-74 Stressing NCR's

   Date restressed N/A Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/8 / 12 1/2	N/A / N/A	12 1/8 / 12 1/2
Lift-Off Pressure - Predicted/Actual	6800 ~~[illegible]~~ / 16950 PSI	" / "	N/A
Shim Thickness/80% Ultimate Pressure	13 1/4 / 17770	4 / "	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 10-23-74 Bulk-Filling NCR's

   Time since installation 3 3/4 months Inlet Pressure 125 PSI Outlet Temp. 118°

   Date end caps refilled: Shop Field

7. Data compiled by [signature] Miller Organization Salem

   Date 4/1/77

8. Additional Comments:

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 12V1

		LIFT OFF CONDITION					RETENSIONING							
Inspection Period and Date	Location	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Reactor Bldg. Temperature °F Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	T	1675		13¼"	12¼"		N/A		N/A	N/A				
9/13/74	B	N/A	N/A	4"	N/A	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3rd	T	1315		13¼"	N/A		N/A		13¼"	N/A				1. Lift-off only
10/9/81	B	N/A	N/A	4"	N/A	163	N/A	N/A	4"	N/A	163	83	83	
4TH	S (TOP)	1535		13 5/8	N/A		N/A		N/A	N/A		85°F	T-70°F	• 4.1 GAL. GREASE NET ADDED
10/30/87	F (BOT.)	N/A	N/A	4	N/A	163	N/A	N/A	N/A	N/A	N/A	TO 90°F	B-N/A	• NOTE - IT WAS CONCLUDED 3RD SURV. LIFTOFF WAS IN ERROR SEE G/C 4TH REPORT.

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

IDENTIFICATION NUMBER 12V2 CUT LENGTH 188'-6 1/2

SHOP WASHER ID: PC 121 CR 557 FIELD WASHER ID: PC 120 CR 232

1. GAI/QA vendor inspection cover letter number-FPC # 9957 DATE 2/25/74

2. Date tendon received on-site 1-16-74 RMR Number 36036

3. Date installed in conduit 7-3-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 8-27-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 10-14-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/8 / 12 1/2	N/A / N/A	12 1/8 12 1/2
Lift-Off Pressure - Predicted/Actual	6800 / 7050 PSI	" / "	N/A
Shim Thickness/80% Ultimate Pressure	13" / 7770	4 / "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 10-23-74 Bulk-Filling NCR's

Time since installation 3 1/4 month Inlet Pressure 112 PSI Outlet Temp. 126°

Date end caps refilled: Shop Field

7. Data compiled by D. Niles Organization Salem

Date 4/1/77

8. Additional Comments:

907 716

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

ID IDENTIFICATION NUMBER 34V16 CUT LENGTH 189' - 2 3/4"

SHOP WASHER ID: PC 121 CR 778 FIELD WASHER ID: PC 121 CR 762

1. GAI/QA vendor inspection cover letter number-FPC # 10.010 DATE 3/1/74

2. Date tendon received on-site 2-8-74 RMR Number 36943

3. Date installed in conduit 7-29-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-11-74 Buttonheading NCR's

Bad wires 2 Accept. Reheads 0 Total Ineffective wires 2

5. Date stressed 10-15-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/4 , 11 3/8	NA , NA	12 1/4 , 11 3/8
Lift-Off Pressure - Predicted/Actual	6740 , 6825 psi	" , "	N/A
Shim Thickness/80% Ultimate Pressure	11" , 7680	4" , "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 161

6. Date Bulk-filled 11-7-74 Bulk-Filling NCR's 1687

Time since installation 4 months Inlet Pressure 160 PSI Outlet Temp. 134°

Date end caps refilled: Shop Field

7. Data compiled by R. Maller Organization Salem

Date 4/1/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRE-STRESSING SYSTEM
TENDON HISTORY

I IDENTIFICATION NUMBER 34V17 CUT LENGTH 188'-10 3/4"

SHOP WASHER ID: PC 121 CR 755 FIELD WASHER ID: PC 121 CR 950

1. GAI/QA vendor inspection cover letter number-FPC # 10,010 DATE 3/1/74

2. Date tendon received on-site 2-8-74 RMR Number 36943

3. Date installed in conduit 7-29-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-25-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 10-11-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/8, 11 1/2	NA, NA	12 1/8, 11 1/2
Lift-Off Pressure - Predicted/Actual	6800, 6900	", "	N/A
Shim Thickness/80% Ultimate Pressure	10 3/8, 7770	4, "	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled ~~[illegible]~~ 11-7-74 Bulk-Filling NCR's 1687

   Time since installation 4 months Inlet Pressure 145 PSI Outlet Temp. 136°

   Date end caps refilled: Shop Field

7. Data compiled by R. Miller Organization Salem

   Date 4/1/77

8. Additional Comments:

Calculation S07-0033
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Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 34V18 CUT LENGTH 188'-5 3/4

SHOP WASHER ID: PC 121 CR 759 FIELD WASHER ID: PC 120 CR 280

1. GAI/QA vendor inspection cover letter number-FPC # 10,010 DATE 3/1/74
2. Date tendon received on-site 2-8-74 RMR Number 36943
3. Date installed in conduit 7-29-74 Installation NCR's
   Wires removed 0 Wires replaced 0 Total Ineffective wires 0
4. Date buttonheaded 8-26-74 Buttonheading NCR's
   Bad wires 9 Accept. Reheads 9 Total Ineffective wires 0
5. Date stressed 9-18-74 Stressing NCR's
   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 5/8 / 12 5/8	NA / NA	12 5/8 / 12 5/8
Lift-Off Pressure - Predicted/Actual	6760 / 6725	" / "	N/A
Shim Thickness/80% Ultimate Pressure	11 3/8 / 7750	4 / "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-7-74 Bulk-Filling NCR's 1687
   Time since installation 4 months Inlet Pressure 160 PSI Outlet Temp. 138°
   Date end caps refilled: Shop Field
7. Data compiled by [illegible signature] Organization Salem
   Date 4/1/77
8. Additional Comments:

Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

IDENTIFICATION NUMBER 45V19 CUT LENGTH 188'-8"

SHOP WASHER ID: PC 121 CR 877 FIELD WASHER ID: PC 120 CR 185

1. GAI/QA vendor inspection cover letter number-FPC # 10043 DATE 3/8/74

2. Date tendon received on-site 2-18-74 RMR Number 37022

3. Date installed in conduit 7-25-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 8-9-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 9-19-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	11 3/4, 12 3/8	NA, NA	11 3/4, 12 3/8
Lift-Off Pressure - Predicted/Actual	6810, 6750	", "	N/A
Shim Thickness/80% Ultimate Pressure	12 3/8, 7780	4", "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-7-74 Bulk-Filling NCR's 1687

   Time since installation 4 months Inlet Pressure 150 PSI Outlet Temp. 140°

   Date end caps refilled: Shop Field

7. Data compiled by D. Mello Organization Salem

   Date 4/1/77

8. Additional Comments:

Calculation S07-0033
Revision 0
Attachment 1

907 716

Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

IDENTIFICATION NUMBER 45V20 CUT LENGTH 188'-7

SHOP WASHER ID: PC 121 CR 877 FIELD WASHER ID: PC 120 CR 260

1. GAI/QA vendor inspection cover letter number-FPC # 10043 DATE 3/8/74

2. Date tendon received on-site 2-18-74 RMR Number 37022

3. Date installed in conduit 7-25-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-4-74 Buttonheading NCR's

Bad wires 2 Accept. Reheads 0 Total Ineffective wires 2

5. Date stressed 10-4-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	11 3/4, 12 3/8	NA, NA	11 3/4, 12 3/8
Lift-Off Pressure - Predicted/Actual	6810, 6750	" , "	N/A
Shim Thickness/80% Ultimate Pressure	12 3/8, 7780	4" , "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-7-74 Bulk-Filling NCR's 1687

Time since installation 4 months Inlet Pressure 151 PSI Outlet Temp. 120°

Date end caps refilled: Shop Field

7. Data compiled by D. Malle Organization Sa. Lim

Date 4/1/77

8. Additional Comments:

907 716

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 45 V 20 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing 161

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D.J. Giff Organization FPC

   Date 6-1-78

8. Additional Comments: BASED ON PRESCON-CONESCO FINAL CONSTRUCTION EFFECTIVE WIRE SUMMARY - TOTAL EFFECTIVE WIRES REDUCED. CONESCO DATA CONFIRMED IN QUALITY RECORDS.

Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

I. ... IDENTIFICATION NUMBER 45V21 CUT LENGTH 188'-8"

SHOP WASHER ID: PC 121 CR 703 FIELD WASHER ID: PC 120 CR 193

1. GAI/QA vendor inspection cover letter number-FPC # 10050 DATE 3/8/74

2. Date tendon received on-site 2-20-74 RMR Number 37257

3. Date installed in conduit 7-25-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 8-9-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 11-11-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	11 3/4, 11 3/4	NA, NA	11 3/4, 11 3/4
...ft-Off Pressure - Predicted/Actual	6800, 6800	", "	N/A
Shim Thickness/80% Ultimate Pressure	13 3/16, 7770	4, "	N/A

Unseated/Broken Wires 1 Total effective wires after stressing 162

6. Date Bulk-filled 11-30-75 Bulk-Filling NCR's

Time since installation 4 months Inlet Pressure 125 105 Outlet Temp. 118°

Date end caps refilled: Shop Field

7. Data compiled by D. [illegible] Organization [illegible]

Date 4/1/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 61V16 CUT LENGTH 189'-0"

SHOP WASHER ID: PC 121 CR 947 FIELD WASHER ID: PC 120 CR 269

- GAI/QA vendor inspection cover letter number-FPC # 10142 DATE 3/22/74
- Date tendon received on-site 3-6-74 RMR Number 37528
- Date installed in conduit 7-12-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

- Date buttonheaded 9-9-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

- Date stressed 10-11-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/4, 12 3/4	NA, NA	12 1/4, 12 3/4
Lift-Off Pressure - Predicted/Actual	6870, 6825 PSI	", "	N/A
Shim Thickness/80% Ultimate Pressure	13", 7810	4", "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

- Date Bulk-filled 10-25-74 Bulk-Filling NCR's

Time since installation 3 months Inlet Pressure 114 PSI Outlet Temp. 120°

Date end caps refilled: Shop Field

- Data compiled by D. Muller Organization Salem

Date 4/4/77

- Additional Comments:

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Florida Power

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 61V17 CUT LENGTH 188'-9 1/4"

SHOP WASHER ID: PC 121 CR 943 FIELD WASHER ID: PC 120 CR 256

. GAI/QA vendor inspection cover letter number-FPC # 10142 DATE 3/22/74

. Date tendon received on-site 3-6-74 RMR Number 37528

. Date installed in conduit 7-16-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

. Date buttonheaded 8-12-74 Buttonheading NCR's

Bad wires 4 Accept. Reheads 4 Total Ineffective wires 0

. Date stressed 9-16-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12" , 11 3/4"	NA , NA	12" , 11 3/4"
Lift-Off Pressure - Predicted/Actual	6870 , 6900 PSI	" , "	N/A
Shim Thickness/80% Ultimate Pressure	12" , 7810	4" , "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

. Date Bulk-filled 10-29-74 Bulk-Filling NCR's

Time since installation 3 months Inlet Pressure 114 PSI Outlet Temp. 116°

Date end caps refilled: Shop Field

. Data compiled by D. Malk Organization Salem

Date 4/4/77

. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 61 V 17 CUT LENGTH ______

SHOP WASHER ID: PC______ CR ______ FIELD WASHER ID: PC______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing 162

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. J. Giffin Organization FPC

   Date 6-1-78

8. Additional Comments: TOTAL EFFECTIVE WIRES REDUCED BASED ON PRESCON - CONESCO FINAL CONSTRUCTION EFFECTIVE WIRE SUMMARY AND QUALITY RECORDS.

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

. . IDENTIFICATION NUMBER 61V18 CUT LENGTH 188'-8 1/4"

SHOP WASHER ID: PC 121 CR 951 FIELD WASHER ID: PC 120 CR 213

. GAI/QA vendor inspection cover letter number-FPC # 10142 DATE 3/22/74

. Date tendon received on-site 3-8-74 RMR Number 37539

. Date installed in conduit 7-16-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

. Date buttonheaded 9-9-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

. Date stressed 10-11-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	11 3/4, 11 1/2	NA, NA	11 3/4, 11 1/2
Lift-Off Pressure - Predicted/Actual	6870, 6700 PSI	", "	N/A
Shim Thickness/80% Ultimate Pressure	13", 7810	4, "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

. Date Bulk-filled 10-29-74 Bulk-Filling NCR's

Time since installation 3 months Inlet Pressure 114 PSI Outlet Temp. 135°

Date end caps refilled: Shop Field

. Data compiled by D. Mille Organization Salem

Date 4/4/77

. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 13 H 35 CUT LENGTH 155'-7 1/2

SHOP WASHER ID: PC 121 CR 510 FIELD WASHER ID: PC 122 CR 1158

1. GAI/QA vendor inspection cover letter number-FPC # 9862 DATE 2/12/74

2. Date tendon received on-site 12-12-73 RMR Number 35157

3. Date installed in conduit 3-19-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-29-74 Buttonheading NCR's

   Bad wires 2 Accept. Reheads 0 Total Ineffective wires 2

5. Date stressed 1-6-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/8	5 1/8 / 4 7/8	10 1/4 / 10
Lift-Off Pressure - Predicted/Actual	6680 / 6650	6670 / 6800	N/A
Shim Thickness/80% Ultimate Pressure	6 9/16 / 7650	6 3/8 / 7600	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 161

6. Date Bulk-filled 9-27-74 Bulk-Filling NCR's

   Time since installation 5 months Inlet Pressure 14 PSI Outlet Temp. 146°

   Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 13H36 CUT LENGTH 155'-9"

SHOP WASHER ID: PC 121 CR 618 FIELD WASHER ID: PC 122 CR 1167

1. GAI/QA vendor inspection cover letter number-FPC # 9862 DATE 2/12/74

2. Date tendon received on-site 12-12-73 RMR Number 35157

3. Date installed in conduit 3-19-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-29-74 Buttonheading NCR's ______

   Bad wires 3 Accept. Reheads 0 Total Ineffective wires 3

5. Date stressed 3-12-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 4 7/8	5 1/8 / 5 1/8	10 1/4 / 10
Lift-Off Pressure - Predicted/Actual	6660 / 6700	6700 / 7000	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4 / 7600	7 / 7650	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 160

6. Date Bulk-filled 8-29-74 Bulk-Filling NCR's ______

   Time since installation 5 months Inlet Pressure 14 PSI Outlet Temp. 146°

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Walla Organization Salem

   Date 4/4/77

8. Additional Comments: ______

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 13 H 37 CUT LENGTH 155'-7 1/4

SHOP WASHER ID: PC N/A CR 509 FIELD WASHER ID: PC 122 CR 1272

1. GAI/QA vendor inspection cover letter number-FPC # 9861 DATE 2/12/74

2. Date tendon received on-site 12-18-73 RMR Number 38449

3. Date installed in conduit 3-18-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-30-74 Buttonheading NCR's

   Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 1-3-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8, 5 1/2	5 1/8, 4 7/8	10 1/4, 10 3/8
Lift-Off Pressure - Predicted/Actual	6720, 6700	6730, 6750	N/A
Shim Thickness/80% Ultimate Pressure	6 13/16, 7700	5 3/8, 7640	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 8-29-75 Bulk-Filling NCR's

   Time since installation 5 months Inlet Pressure 15 PSI Outlet Temp. 148°

   Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power
CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 13 H37 CUT LENGTH ______

SHOP WASHER ID: PC 121 CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. F. Giffin Organization FPC

   Date 9-30-77

8. Additional Comments: IN PREPARATION OF 1ST SURVEILLANCE

1 ST SURVEILLANCE

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 13 H 37 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off ~~Pressure~~ FORCE - Predicted/Actual (KIPS)	1425.6 / 1557	1425.6 / 1654	N/A
Shim Thickness/80% Ultimate Pressure LOCK-OFF FORCE BELOW	/	5 3/4" /	N/A

Unseated/Broken Wires 1 - PREVIOUS 0 - NEW @ SURV. Total effective wires after stressing 162

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop 2-9-78 Field 2-9-78

7. Data compiled by D. J. [signature] Organization FPC

   Date 5-16-78

8. Additional Comments: INSPECTED FIRST SURVEILLANCE (2-2-78)

1) MINOR FIELD RUST ON FIELD STRESSING WASHER; HOWEVER, STILL CORR CAT. #1

2) LOCK-OFF FORCE (SHOP - SAME AS LIFT-OFF; Field - 1611 K)

3) NO CRACKING INDICATION AT ANCHORAGES

4) Field Shims - RECORDS SHOW (5 3/8") - ACTUAL (5 3/4")

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 13H37

Inspection Period and Date	Location	LIFT OFF CONDITION: Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	RETENSIONING: Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S-1	1624		6 13/16	5 1/2		N/A		N/A	N/A				
7-30-74	F-3	1634	1629	5 3/8	4 7/8	162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1st	S-1	1557		6 13/16	N/A		1557		6 13/16	N/A				
2-2-78	F-3	1654	1606	5 3/4	N/A	162	1611	1584	5 3/4	N/A	162	95	57	

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 4-2H45 CUT LENGTH 155'-7

SHOP WASHER ID: PC 121 CR 566 FIELD WASHER ID: PC 122 CR 1194

1. GAI/QA vendor inspection cover letter number-FPC # 9957 DATE 2/25/74

2. Date tendon received on-site 1-16-74 RMR Number 36035

3. Date installed in conduit 1-21-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-10-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-20-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8, 5 7/16	5 1/8, 5	10 1/4, 10 7/16
Lift-Off Pressure - Predicted/Actual	6870, 7000	6810, 6900	N/A
Shim Thickness/80% Ultimate Pressure	7 1/4, 7810	6 3/8, 7780	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 7-31-74 Bulk-Filling NCR's ______

   Time since installation 6 months Inlet Pressure 12 PSI Outlet Temp. 140°

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Walle Organization Salem

   Date 4/4/77

8. Additional Comments: ______

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SHEET 140

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 42H46 CUT LENGTH 155'-5 3/4

SHOP WASHER ID: PC 121 CR 529 FIELD WASHER ID: PC 122 CR 117

1. GAI/QA vendor inspection cover letter number-FPC # 9957 DATE 2/25

2. Date tendon received on-site 1-16-74 RMR Number 36035

3. Date installed in conduit 1-22-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-10-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-26-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 5/8	5 1/8 / 5 1/8	10 1/4 / 10
Lift-Off Pressure - Predicted/Actual	6870 / 6850	6790 / 6850	N/A
Shim Thickness/80% Ultimate Pressure	6 / 7810	5 3/8 / 7750	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 7-31-74 Bulk-Filling NCR's ______

   Time since installation 6 months Inlet Pressure 14 PSI Outlet Temp. 140°

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments: ______

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SHEET 141 C

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 42H47 CUT LENGTH 155'-6 1/2

SHOP WASHER ID: PC 121 CR 561 FIELD WASHER ID: PC 122 CR 1144

1. GAI/QA vendor inspection cover letter number-FPC # 9957 DATE 2/25,

2. Date tendon received on-site 1-16-74 RMR Number 36035

3. Date installed in conduit 1-22-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-11-74 Buttonheading NCR's

Bad wires 3 Accept. Reheads 0 Total Ineffective wires 3

5. Date stressed 2-25-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8, 5 1/8	5 1/8, 5 1/8	10 1/4, 10 1/4
Lift-Off Pressure - Predicted/Actual	6750, 6700	6700, 6800	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8, 7680	6 3/8, 7630	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 160

6. Date Bulk-filled 8-9-74 Bulk-Filling NCR's

Time since installation 7 months Inlet Pressure 25 PSI Outlet Temp. 152°

Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salam

Date 4/4/77

8. Additional Comments:

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Florida Power
CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H6 CUT LENGTH 155'-8 3/4

SHOP WASHER ID: PC 120 CR 341 FIELD WASHER ID: PC 121 CR 1078

1. GAI/QA vendor inspection cover letter number-FPC # 8964 DATE 9/19/73

2. Date tendon received on-site 9-10-73 RMR Number 32632

3. Date installed in conduit 4-18-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-29-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 3-7-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 3/4 / 5 1/2	4 1/4 / 4 3/4	10 / 10 1/4
Lift-Off Pressure - Predicted/Actual	6760 / 6750	6730 / 6650	N/A
Shim Thickness/80% Ultimate Pressure	6 5/8 / 7750	6 / 7660	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's

   Time since installation 6 1/2 months Inlet Pressure 50 psi Outlet Temp. 142°

   Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

~~Calculation S07-0033~~
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Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H7 CUT LENGTH 155'-10"

SHOP WASHER ID: PC 121 CR 376 FIELD WASHER ID: PC 121 CR 747

1. GAI/QA vendor inspection cover letter number-FPC # 8964 DATE 9/19/73

2. Date tendon received on-site 9-10-73 RMR Number 32632

3. Date installed in conduit 4-18-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-29-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 1-31-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/4	5 1/8 / 5	10 1/4 / 10 1/4
Lift-Off Pressure - Predicted/Actual	6760 / 6800	6710 / 6700	N/A
Shim Thickness/80% Ultimate Pressure	7 5/8 / 7750	6 5/8 / 7660	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's ______

   Time since installation 6 1/2 months Inlet Pressure 55 psi Outlet Temp. 140°

   Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments: ______

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H8 CUT LENGTH 155'-9"

SHOP WASHER ID: PC 121 CR 396 FIELD WASHER ID: PC 121 CR 902

1. GAI/QA vendor inspection cover letter number-FPC # 8964 DATE 9/14/73

2. Date tendon received on-site 9-10-73 RMR Number 32632

3. Date installed in conduit 4-18-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-29-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 3-7-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 7/8	5 1/8 / 4 3/4	10 1/4 / 10 5/8
Lift-Off Pressure - Predicted/Actual	6760 / 6750	6730 / 6800	N/A
Shim Thickness/80% Ultimate Pressure	7 7/16 / 7750	6 1/4 / 7660	N/A

   Unseated/Broken Wires 1 Total effective wires after stressing 162

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's

   Time since installation 6 1/2 months Inlet Pressure 55 psi Outlet Temp. 148°

   Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H20 CUT LENGTH 155'-11 1/4

SHOP WASHER ID: PC 120 CR 78 FIELD WASHER ID: PC 122 CR 1138

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-17-73 RMR Number 32681

3. Date installed in conduit 4-15-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-19-74 Buttonheading NCR's

   Bad wires 13 Accept. Reheads 12 Total Ineffective wires 1

5. Date stressed 3-5-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 , 5 1/4	5 1/4 , 5 1/8	10 1/4 , 10 3/8
Lift-Off Pressure - Predicted/Actual	6640 , 6930	6600 , 6600	N/A
Shim Thickness/80% Ultimate Pressure	7 3/8 , 7700	6 5/8 , 7610	N/A

Unseated/Broken Wires 2 Total effective wires after stressing 160

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's

   Time since installation 6 1/2 month Inlet Pressure 50 psi Outlet Temp. 130°

   Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Miller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H21 CUT LENGTH 154'-4

SHOP WASHER ID: PC 120 CR 167 FIELD WASHER ID: PC 122 CR 1141

1. GAI/QA vendor inspection cover letter number-FPC # N/A DATE

2. Date tendon received on-site 10-15-73 RMR Number 33610

3. Date installed in conduit 4-23-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-19-74 Buttonheading NCR's

Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 2-7-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/8	5 1/8 / 5 1/4	10 1/4 / 10 3/8
Lift-Off Pressure - Predicted/Actual	6720 / 6700	6730 / 6950	N/A
Shim Thickness/80% Ultimate Pressure	5 5/8 / 7700	5 9/16 / 7640	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's

Time since installation ~~9~~ 6 1/2 months Inlet Pressure 50 psi Outlet Temp. 130°

Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

Date 4/4/77

8. Additional Comments:

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1ST SURVEILLANCE

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46 H21 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off ~~Pressure~~ FORCE - Predicted/Actual (KIPS)	1425.6 / 1457.5	1425.6 / 1546	N/A
Shim Thickness/80% Ultimate Pressure LOCK-OFF FORCE	5 3/4" /	/	N/A

Unseated/Broken Wires 1- BAD PREV. 0- AT SURV. Total effective wires after stressing 162

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. J. Griffin Organization FPC

Date 5-16-78

8. Additional Comments: INSPECTED FIRST SURVEILLANCE (1-10-78)
1) NO INDICATION OF RUST - CORROSION
2) LOCK-OFF FORCE (SHOP - SAME AS LIFT-OFF; FIELD - 1524 K)
3) NO INDICATION OF CRACKING AT ANCHORAGES

4) SHOP END SHIM - RECORDS SHOW (5 5/8") - ACTUAL (5 3/4")

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 46H21

		LIFT OFF CONDITION					RETENSIONING							
Inspection Period and Date	Location	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S-6	1624		5 5/8	5 1/8		N/A		N/A	N/A				
2-7-75	F-4	1682	1653	5 9/16	5 1/4	162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1st	S-6	1458		5 3/4	N/A		1458		5 3/4	N/A				
1-10-78	F-4	1546	1502	5 9/16	N/A	163	1514	1536	5 9/16	N/A	162 ~~165~~	106	41	
5TH	S-6	1423		5 7/8	N/A		N/A		N/A	N/A				15 GALLONS OF GREASE ADDED OVER REMOVED.
12/7/93	F-4	1427	1425	5 11/16	N/A	162	N/A	N/A	N/A	N/A	N/A	130°	68°	

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 46H22 CUT LENGTH 155'-9 1/2

SHOP WASHER ID: PC 120 CR 41 FIELD WASHER ID: PC 122 CR 1140

1. GAI/QA vendor inspection cover letter number-FPC # 9245 DATE 10/31/73

2. Date tendon received on-site 9-17-73 RMR Number 32681

3. Date installed in conduit 4-23-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-19-74 Buttonheading NCR's

   Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 3-4-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 15 5/8	5 1/8, 5 1/4	10 1/4 10 7/8
Lift-Off Pressure - Predicted/Actual	6720 16750	6730, 7000	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8, 7700	5 9/16, 7640	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 11-4-74 Bulk-Filling NCR's

   Time since installation 6 1/2 months Inlet Pressure 55 psi Outlet Temp. 130°

   Date end caps refilled: Shop 4-14-75 Field 4-14-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 51H33 CUT LENGTH 155'-6 1/2

SHOP WASHER ID: PC 121 CR 457 FIELD WASHER ID: PC 122 CR 1176

1. GAI/QA vendor inspection cover letter number-FPC # 9372 DATE 11/20/73

2. Date tendon received on-site 10-24-73 RMR Number 33918

3. Date installed in conduit 12-27-73 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 6-12-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 1-7-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8, 5 3/8	5 1/8, 4 7/8	10 1/4, 10 1/4
Lift-Off Pressure - Predicted/Actual	6810, 6850	6750, 6800	N/A
Shim Thickness/80% Ultimate Pressure	6 9/16, 7780	6, 7700	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 7-15-74 Bulk-Filling NCR's

Time since installation 8 months Inlet Pressure 34 psi Outlet Temp. 135°

Date end caps refilled: Shop 4-17-75 Field 4-15-75

7. Data compiled by D. Waller Organization Salem

Date 4/4/77

8. Additional Comments:

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Florida Power
CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 51H34 CUT LENGTH 155'-7"

SHOP WASHER ID: PC 121 CR 459 FIELD WASHER ID: PC 121 CR 493

1. GAI/QA vendor inspection cover letter number-FPC # 9372 DATE 11/20/73

2. Date tendon received on-site 10-24-73 RMR Number 33918

3. Date installed in conduit 12-27-73 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 6-12-74 Buttonheading NCR's

Bad wires 6 Accept. Reheads 6 Total Ineffective wires 0

5. Date stressed 3-13-75 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 3/8	5 1/8 / 4 7/8	10 1/4 / 10 1/4
Lift-Off Pressure - Predicted/Actual	6800 / 6800	6750 / 6850	N/A
Shim Thickness/80% Ultimate Pressure	7 3/8 / 7770	7 3/16 / 7700	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 7-15-74 Bulk-Filling NCR's

Time since installation 8 months Inlet Pressure 31 psi Outlet Temp. 136°

Date end caps refilled: Shop 4-17-75 Field 4-15-75

7. Data compiled by D. Walls Organization Salem

Date 4/4/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 51H35 CUT LENGTH 155'-6"

SHOP WASHER ID: PC 120 CR 44 FIELD WASHER ID: PC 122 CR 1152

1. GAI/QA vendor inspection cover letter number-FPC # 9372 DATE 11/20/73

2. Date tendon received on-site 10-29-73 RMR Number 34092

3. Date installed in conduit 12-28-73 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 6-13-74 Buttonheading NCR's ______

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 1-6-75 Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 1/8	5 1/8 / 4 7/8	10 1/4 / 10
Lift-Off Pressure - Predicted/Actual	6810 / 6500	6750 / 6800	N/A
Shim Thickness/80% Ultimate Pressure	6 / 7780	6 / 7700	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 7-15-74 Bulk-Filling NCR's ______

   Time since installation 8 months Inlet Pressure 33 psi Outlet Temp. 135°

   Date end caps refilled: Shop 4-17-75 Field 4-15-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments: ______

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 62H29 CUT LENGTH 155'-8 1/2

SHOP WASHER ID: PC 121 CR 393 FIELD WASHER ID: PC 122 CR 1113

1. GAI/QA vendor inspection cover letter number-FPC # 8920 DATE 9/13/73

2. Date tendon received on-site 8-20-73 RMR Number 31858

3. Date installed in conduit 11-14-73 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 5-20-74 Buttonheading NCR's

   Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 2-11-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	NA , 15 1/2	5 1/8 , 4 7/8	NA , 10 3/8
Lift-Off Pressure - Predicted/Actual	NA , 6750	6700 , 6750	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8 , NA	6 3/8 , 7650	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 6-5-74 Bulk-Filling NCR's

   Time since installation 7 months Inlet Pressure 20 lbs Outlet Temp. 115°

   Date end caps refilled: Shop 3-13-75 Field 4-15-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 62H30 CUT LENGTH 155'-7 1/2"

SHOP WASHER ID: PC 120 CR 96 FIELD WASHER ID: PC 121 CR 609

1. GAI/QA vendor inspection cover letter number-FPC # 8920 DATE 9/13/73

2. Date tendon received on-site 8-20-73 RMR Number 31858

3. Date installed in conduit 11-14-73 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 5-21-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-28-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 9/16	5 1/8 / 4 3/4	10 1/4 / 10 5/16
Lift-Off Pressure - Predicted/Actual	6800 / 6600	6750 / 6600	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8 / 7770	6 5/8 / 7700	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 6-13-74 Bulk-Filling NCR's

   Time since installation 7 months Inlet Pressure 15 lbs Outlet Temp. 120°

   Date end caps refilled: Shop 3-13-75 Field 4-15-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

Florida Power
CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER 62H31 CUT LENGTH 155'-6 3/4

SHOP WASHER ID: PC 120 CR 164 FIELD WASHER ID: PC 121 CR 958

1. GAI/QA vendor inspection cover letter number-FPC # 8920 DATE 9/13/73

2. Date tendon received on-site 8-20-73 RMR Number 31858

3. Date installed in conduit 11-15-73 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 5-22-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 2-12-75 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8 / 5 3/8	5 1/8 / 5 1/8	10 1/4 / 10 1/2
Lift-Off Pressure - Predicted/Actual	6800 / 7000	6750 / 6900	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4 / 7770	6 / 7700	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 6-13-74 Bulk-Filling NCR's

   Time since installation 8 months Inlet Pressure 30 lb. Outlet Temp. 134°

   Date end caps refilled: Shop 3-14-75 Field 4-15-75

7. Data compiled by D. Waller Organization Salem

   Date 4/4/77

8. Additional Comments:

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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D128 CUT LENGTH 146'-2½"

SHOP WASHER ID: PC 121 CR 637 FIELD WASHER ID: PC 121 CR 894

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38020

3. Date installed in conduit 5-10-74 Installation NCR's 1368

   Wires removed 2 Wires replaced 0 Total Ineffective wires 2

4. Date buttonheaded 10-22-74 Buttonheading NCR's

   Bad wires 4 Accept. Reheads 4 Total Ineffective wires 0

5. Date stressed 11-5-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4⅞"/4⅝"	4⅞"/4⅞"	9¾"/9½"
Lift-Off Pressure - Predicted/Actual	6710/6800	6650/6900	N/A
Shim Thickness/80% Ultimate Pressure	6"/7620	6/7600	N/A

Unseated/Broken Wires 2 Total effective wires after stressing 159

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's

   Time since installation 10½ months Inlet Pressure 55 psi Outlet Temp. 120°

   Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salem

   Date 3/30/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D128 CUT LENGTH ____

SHOP WASHER ID: PC ____ CR ____ FIELD WASHER ID: PC ____ CR ____

1. GAI/QA vendor inspection cover letter number-FPC # ____ DATE ____
2. Date tendon received on-site ____ RMR Number ____
3. Date installed in conduit ____ Installation NCR's ____
   Wires removed ____ Wires replaced ____ Total Ineffective wires ____
4. Date buttonheaded ____ Buttonheading NCR's ____
   Bad wires ____ Accept. Reheads ____ Total Ineffective wires ____
5. Date stressed ____ Stressing NCR's ____
   Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ____ Total effective wires after stressing ____
6. Date Bulk-filled ____ Bulk-Filling NCR's ____
   Time since installation ____ Inlet Pressure ____ Outlet Temp. ____
   Date end caps refilled: Shop ____ Field ____
7. Data compiled by D. Muller Organization Salem
   Date 4/11/77
8. Additional Comments: Dome Repairs –
   Degreasing - Shop End (7/9/76) Field End (7/10/76)
   Lift-Off reading - Shop 5100 (7/9/76) Field 6200 (7/11/76) 5800 (7/17/76)
   Detensioning - Shop 4600 Field 6200 (7/17/76)
   Regreasing - (12/1/76) 200 PSIG NCR #2582, 172°-162° NCR #2581

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D129 CUT LENGTH 144'-6 1/4"

SHOP WASHER ID: PC 121 CR 996 FIELD WASHER ID: PC 121 CR 866

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38020 4/11/74

3. Date installed in conduit 5-13-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-23-74 Buttonheading NCR's

Bad wires 8 Accept. Reheads 7 Total Ineffective wires 1

5. Date stressed 11-19-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 7/8"/4 5/8"	4 7/8"/5	9 3/4"/9 5/8"
Lift-Off Pressure - Predicted/Actual	6710/6850	6740/6600	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4"/7660	6 /7700	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 161

6. Date Bulk-filled 3-25-75 Bulk-Filling NCR's

Time since installation 10 1/2 months Inlet Pressure 55 psi Outlet Temp. 118°

Date end caps refilled: Shop Field

7. Data compiled by D. Wells Organization Salem

Date 3/30/77

8. Additional Comments: One (1) wire apparently pulled thru buttonhead on field End. Washer after stressing.

One (1) wire missing from Tendon

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D129 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Waller Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair —

Degreasing - Shop End (7/16/76) Field End (7/16/76)

Lift-off Readings - Shop 6200 (7/15/76) Field 6000 (7/16/76)

Regreasing - 12/1/76 200 PSIG NCR # 2582, 180° NCR # 2581

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRE-STRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D130 CUT LENGTH 142'-7½"

SHOP WASHER ID: PC 121 CR 924 FIELD WASHER ID: PC 122 CR 1260

1. GAI/QA vendor inspection cover letter number-FPC # 10202 DATE 4/1/74

2. Date tendon received on-site 3-22-74 RMR Number 38020

3. Date installed in conduit 5-13-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 9-20-74 Buttonheading NCR's

   Bad wires 8 Accept. Reheads 8 Total Ineffective wires 0

5. Date stressed 10-31-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4¾"/5"	4¾"/5"	9½"/10"
Lift-Off Pressure - Predicted/Actual	6870/6850	6810/6800	N/A
Shim Thickness/80% Ultimate Pressure	5⅝"/7810	5⅜"/7780	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 4-4-75 Bulk-Filling NCR's

   Time since installation 10¾ months Inlet Pressure 55 psi Outlet Temp. 140°

   Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salem

   Date 3/30/77

8. Additional Comments:

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D211 CUT LENGTH 142'-0½"

SHOP WASHER ID: PC 121 CR 487 FIELD WASHER ID: PC 122 CR 1268

1. GAI/QA vendor inspection cover letter number-FPC # 10245 DATE 4/10/74

2. Date tendon received on-site 3-29-74 RMR Number 38246

3. Date installed in conduit 5-30-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-17-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 10-30-74 Stressing NCR's 1681, 1683

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4⅜" / 5¼"	5" / 5½"	9⅜" / 10¾"
Lift-Off Pressure - Predicted/Actual	6,810 / 7,100 psi	6,870 / 7,000 psi	N/A
Shim Thickness/80% Ultimate Pressure	5½" / 17,780	6" / 17,810	N/A

Unseated/Broken Wires 1 Total effective wires after stressing 162

6. Date Bulk-filled 3-26-75 Bulk-Filling NCR's

Time since installation 9¾ months Inlet Pressure 50 psi Outlet Temp. 132°

Date end caps refilled: Shop Field

7. Data compiled by D. Waller Organization Salem

Date 3/29/77

8. Additional Comments: One wire not seated on washer.

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CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

Florida Power Corporation

TENDON IDENTIFICATION NUMBER D211 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Walker Organization Salem

   Date 4/11/77

8. Additional Comments: Dome Repair –
Degreasing – Shop (7/15/76)

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D212 CUT LENGTH 144'-3"

SHOP WASHER ID: PC 121 CR 1032 FIELD WASHER ID: PC 122 CR 1214

1. GAI/QA vendor inspection cover letter number-FPC # 10245 DATE 4/10/74

2. Date tendon received on-site 3-29-74 RMR Number 38246

3. Date installed in conduit 6-4-74 Installation NCR's 1410

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-17-74 Buttonheading NCR's

Bad wires 1 Accept. Reheads 0 Total Ineffective wires 1

5. Date stressed 12-3-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 3/8" / 4 5/8"	5 1/8" / 4 7/8"	9 1/2" / 9 1/2"
Lift-Off Pressure - Predicted/Actual	6,770 / 6600 psi	6,770 / 6,700 psi	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8" / 7,730	6 3/8" / 7,720	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 3-26-75 Bulk-Filling NCR's

Time since installation 9 3/4 mnths Inlet Pressure 47 psi Outlet Temp. 124°

Date end caps refilled: Shop Field

7. Data compiled by D Waller Organization Salem

Date 3/29/77

8. Additional Comments:

Calculation S07-0033
~~Revision 0~~
Attachment 1

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. D212

		LIFT OFF CONDITION					RETENSIONING					Reactor Bldg. Temperature °F		
Inspection Period and Date	Location	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elong-ation (in)	Total Effective Wires	Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	S	1588		6 3/8"	4 5/8"		N/A		N/A	N/A				
12/3/74	F	1612	1600	6 3/8"	4 7/8"	162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3 rd	S	1392		6 3/8"	N/A		N/A		N/A	N/A				1. Lift-off only
10/26/81	F	1285	1338	6 3/8"	N/A	162	N/A	N/A	N/A	N/A	162	82	83	
4TH	S-1	1292		6 5/8	N/A		N/A		N/A	N/A		85° TO	S 67°F	1. 12 GAL OF GREASE NET ADDED
10/26/87	F-3	1260	1276	6 1/2	N/A	162	N/A	N/A	N/A	N/A	N/A	90°F	F 72°F	

Calculation S07-0033
Revision 0
Attachment 1
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Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D213 CUT LENGTH 146'-2 1/4"

SHOP WASHER ID: PC 121 CR 984 FIELD WASHER ID: PC 121 CR 878

1. GAI/QA vendor inspection cover letter number-FPC # 10245 DATE 4/10/74

2. Date tendon received on-site 3-29-74 RMR Number 38246

3. Date installed in conduit 6-10-74 Installation NCR's ______

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-16-74 Buttonheading NCR's ______

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 11-18-74 Stressing NCR's ______

Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8" / 4 3/4"	4 3/8" / 4 3/4"	9 1/2" / 9 1/2"
Lift-Off Pressure - Predicted/Actual	6840 / 6,900 PSI	6,800 / 6,800 PSI	N/A
Shim Thickness/80% Ultimate Pressure	6 5/8" / 7,790	6 3/8 / 7,770	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-26-75 Bulk-Filling NCR's ______

Time since installation 9 1/2 months Inlet Pressure 51 PSI Outlet Temp. 122°

Date end caps refilled: Shop ______ Field ______

7. Data compiled by D Walle Organization Salem

Date 3/29/77

8. Additional Comments: Yellow shims

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D213 CUT LENGTH ______

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC ______ CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

   Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

   Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

   Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

   Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

   Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by D Walker Organization Sealers

   Date 4/11/77

8. Additional Comments: Dome Repair —
   Degreasing - Shop - (7/15/76)

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D237 CUT LENGTH 123' - 2 3/4

SHOP WASHER ID: PC 121 CR 915 FIELD WASHER ID: PC 121 CR 654

1. GAI/QA vendor inspection cover letter number-FPC # 10360 DATE 5/1/74
2. Date tendon received on-site 4-8-74 RMR Number 38547
3. Date installed in conduit 8-7-74 Installation NCR's
   Wires removed 0 Wires replaced 0 Total Ineffective wires 0
4. Date buttonheaded 10-8-74 Buttonheading NCR's
   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0
5. Date stressed 12-5-74 Stressing NCR's
   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	5 1/8" / 4 3/4"	3" / 3 7/8"	8 1/8" / 8 5/8"
Lift-Off Pressure - Predicted/Actual	6,810 / 6,900 PSI	6,810 / 6,900 PSI	N/A
Shim Thickness/80% Ultimate Pressure	6 3/4" / 7,780	6 3/8" / 7,780	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163
6. Date Bulk-filled 3-26-75 Bulk-Filling NCR's
   Time since installation 7 3/4 months Inlet Pressure 70 PSI Outlet Temp. 130°
   Date end caps refilled: Shop Field
7. Data compiled by D. Waller Organization Salem
   Date 3/29/77
8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D238 CUT LENGTH 118'-11 3/4"

SHOP WASHER ID: PC 121 CR 1029 FIELD WASHER ID: PC — CR 657

1. GAI/QA vendor inspection cover letter number-FPC # 10360 DATE 5/1/74

2. Date tendon received on-site 4-8-74 RMR Number 38547

3. Date installed in conduit 8-7-74 Installation NCR's

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-8-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 11-25-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 7/8" / 4 1/2"	3" / 3 3/4"	7 7/8" / 8 1/4"
Lift-Off Pressure - Predicted/Actual	6,800 / 7,050 PSI	6,840 / 6,800 PSI	N/A
Shim Thickness/80% Ultimate Pressure	7" / 7,770	6 3/8" / 7,790	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-26-75 Bulk-Filling NCR's

   Time since installation 7 3/4 months Inlet Pressure 50 PSI Outlet Temp. 134°

   Date end caps refilled: Shop Field

7. Data compiled by D Waller Organization Salem

   Date 3/29/77

8. Additional Comments:

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D 238 CUT LENGTH

SHOP WASHER ID: PC ______ CR ______ FIELD WASHER ID: PC 121 CR ______

1. GAI/QA vendor inspection cover letter number-FPC # ______ DATE ______

2. Date tendon received on-site ______ RMR Number ______

3. Date installed in conduit ______ Installation NCR's ______

Wires removed ______ Wires replaced ______ Total Ineffective wires ______

4. Date buttonheaded ______ Buttonheading NCR's ______

Bad wires ______ Accept. Reheads ______ Total Ineffective wires ______

5. Date stressed ______ Stressing NCR's ______

Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	/	/	/
Lift-Off Pressure - Predicted/Actual	/	/	N/A
Shim Thickness/80% Ultimate Pressure	/	/	N/A

Unseated/Broken Wires ______ Total effective wires after stressing ______

6. Date Bulk-filled ______ Bulk-Filling NCR's ______

Time since installation ______ Inlet Pressure ______ Outlet Temp. ______

Date end caps refilled: Shop ______ Field ______

7. Data compiled by D.J. Giffin Organization FPC

Date 9-30-77

8. Additional Comments: IN PREPARATION FOR 1ST SURVEILLANCE

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D239 CUT LENGTH 114'-5"

SHOP WASHER ID: PC 121 CR 928 FIELD WASHER ID: PC 121 CR 645

1. GAI/QA vendor inspection cover letter number-FPC # 10360 DATE 5/1/74

2. Date tendon received on-site 4-8-74 RMR Number 38547

3. Date installed in conduit 8-7-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-8-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 11-12-74 Stressing NCR's 1691, 1692

Date restressed (12-9-74)(4-2-75) Restressing NCR's 1768, 1691, 1692

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 5/8" / 13 5/8"	3" / 14 1/4"	7 5/8" / 17 7/8"
Lift-Off Pressure - Predicted/Actual	6810 / 6800 PSI	6840 / 6650 PSI	N/A
Shim Thickness/80% Ultimate Pressure	6" / 7780	7" / 7790	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 4-2-75 Bulk-Filling NCR's

Time since installation 7 3/4 months Inlet Pressure 25 PSI Outlet Temp. 135°

Date end caps refilled: Shop Field

7. Data compiled by D. Walla Organization Salem

Date 3/29/77

8. Additional Comments: Tendon was restressed 3 times. 9 1/2 turns (twist) were removed.

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D336 CUT LENGTH 128'-5 1/4

SHOP WASHER ID: PC 122 CR 1132 FIELD WASHER ID: PC 122 CR 1234

1. GAI/QA vendor inspection cover letter number-FPC # N/A DATE ______

2. Date tendon received on-site 4-29-74 RMR Number 39098

3. Date installed in conduit 5-14-74 Installation NCR's ______

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-2-74 Buttonheading NCR's ______

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 12-4-74 Stressing NCR's ______

Date restressed ______ Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 1/8 / 4 3/4	4 1/8 / 4	8 1/4 / 8 3/4
Lift-Off Pressure - Predicted/Actual	6840/6750	6800/6700	N/A
Shim Thickness/80% Ultimate Pressure	6 3/8 / 7790	6 3/4 / 7770	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-28-75 Bulk-Filling NCR's ______

Time since installation 10 1/2 months Inlet Pressure 25 PSI Outlet Temp. 130°

Date end caps refilled: Shop ______ Field ______

7. Data compiled by D. Waller Organization Salem

Date 4/1/77

8. Additional Comments: ______

Florida Power CORPORATION

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D337 CUT LENGTH 124'-6 1/2

SHOP WASHER ID: PC 121 CR 1071 FIELD WASHER ID: PC 121 CR 998

1. GAI/QA vendor inspection cover letter number-FPC # N/A DATE ____

2. Date tendon received on-site 4-29-74 RMR Number 39098

3. Date installed in conduit 5-14-74 Installation NCR's ____

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 10-2-74 Buttonheading NCR's ____

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

5. Date stressed 12-4-74 Stressing NCR's ____

Date restressed ____ Restressing NCR's ____

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	4 1/8 / 4 3/8	4 1/8 / 4 1/4	8 1/4 / 8 5/8
Lift-Off Pressure - Predicted/Actual	6840/6850	6800/6650	N/A
Shim Thickness/80% Ultimate Pressure	6 1/4 / 7790	6 / 7770	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 3-28-75 Bulk-Filling NCR's 1883

Time since installation 10 1/2 months Inlet Pressure 85 PSI Outlet Temp. 120°

Date end caps refilled: Shop ____ Field ____

7. Data compiled by D Waller Organization Salem

Date 4/1/77

8. Additional Comments: ____

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

TENDON IDENTIFICATION NUMBER D338 CUT LENGTH 120'-2½"

SHOP WASHER ID: PC 121 CR 1105 FIELD WASHER ID: PC 121 CR 994

1. GAI/QA vendor inspection cover letter number-FPC # 10917 DATE 6/26/74
2. Date tendon received on-site 5-3-74 RMR Number 39132
3. Date installed in conduit 5-14-74 Installation NCR's 1371

   Wires removed 1 Wires replaced 0 Total Ineffective wires 1
4. Date buttonheaded 10-2-74 Buttonheading NCR's

   Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0
5. Date stressed 11-18-74 Stressing NCR's

   Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	3 7/8 / 4 1/4	3 7/8 / 3 3/4	7 3/4 / 8
Lift-Off Pressure - Predicted/Actual	6770/6800	6800/6850	N/A
Shim Thickness/80% Ultimate Pressure	6 3/4 / 7700	6 / 7750	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 162

6. Date Bulk-filled 3-28-75 Bulk-Filling NCR's

   Time since installation 10½ months Inlet Pressure 53 psi Outlet Temp. 130°

   Date end caps refilled: Shop Field
7. Data compiled by D. Waller Organization Salem

   Date 4/1/77
8. Additional Comments:

DOCUMENT COVER SHEET

Document No: CR-1002-500

Title: PRE–SURVEILLANCE ENGINEERING PACKAGE

0	Original Issue	*B.A. GIOMETTI*	*08/15/07*	*C.E. COX*	*8/15/07*
No.	**Description**	**Prepared By**	**Date**	**Reviewed By**	**Date**
		PSC SIGN OFF			
REVISIONS					

TABLE OF CONTENTS

1.0 PURPOSE

1.1 SURVEILLANCE PURPOSE

1.1.1 The purpose of the Tendon Surveillance Program is to demonstrate the integrity of the containment post-tensioning system, including containment tendons, tendon end anchorage hardware; general and adjacent concrete integrity, and evaluation of the corrosion protective (grease) system. Individual inspections of selected tendons, as well as tendon wire and grease sample testing evaluate the overall integrity of the post-tensioning system.

1.2 DOCUMENT PURPOSE

1.2.1 The purpose of this document is to provide the engineering data and evaluations necessary to perform surveillance related activities. The scope of this document addresses:

1.2.1.1 The scope of work for the 8th period (30th Year) Tendon Surveillance

1.2.1.2 Predicted forces and normalization factors for selected scope tendons as well as the tendons adjacent to the ones selected. The predicted forces are used to accept as-found force levels if they are within the outlined acceptance criteria.

1.2.1.3 Tendon retensioning elongation tendon for all tendons scheduled to be detensioned for wire removal. The retension data is used to compare the elongation data obtained while restoring the tendon's force to the elongation that was observed while originally stressing the tendon in order to assure the force has been properly restored.

1.2.1.4 Grease void volumes for selected surveillance tendons and their respective adjacent tendons. The volumes allow IWL Level II Inspectors to document the percentage of the total void volume that is removed during inspection and replaced upon completion. This documentation is required per IWL-2526. If the absolute difference between the subject amounts exceeds 10% of the net duct volume, the Licensee shall report the conditions as required by 10CFR50.55a.

1.2.1.5 The design of the support frames and work platforms, which will be used to access hoop and dome tendons in order to assure their ability to withstand working and natural loadings.

1.2.1.5.1 The platform and the Upper Support Frame have been designed for both lateral and vertical loads by analyzing various loading conditions with RISA-3D Version 5.5. RISA-3D calculates both the force and stress in each individual member with respect to the member size designation. The entire system has been designed in accordance with AISC 9th Ed. ASD.

2.0 REFERENCES

2.1 REFERENCE DOCUMENTS

2.1.1 Crystal River Unit 3 Final Safety Analysis Report (FSAR), latest revision

2.1.2 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components", 1992 Edition, with 1992 Addenda.

2.1.3 NRC Regulatory Guide 1.35, Revision 3. Dated July 1990, "Inservice Inspection of Ungrouted Tendons in Prestressed Concrete Containment"

2.1.4 Code of Federal Regulation 10 CFR 50.55a

2.1.5 AISC Manual of Steel Construction – Allowable Stress Design, 9th Edition.

2.1.6 ASCE Standard SEI/ASCE 7-02 – Minimum Design Loads for Buildings and Other Structures, 2nd Edition.

2.1.7 ASME Standard A120.1-2001 – Safety Requirements for Powered Platforms for Building Maintenance

2.1.8 PSC Engineering Document E-GEN-500 – Rail Clamp Capacity Test

2.1.9 PSC Engineering Document CR-N991-100, "Predicted Base Forces For The 30th Year Containment IWL Inspection"

2.1.10 PSC Engineering Document CR-N1002-010, "SQ 11.1 Restressing"

2.1.11 PSC Engineering Document CR-N1002-010, "SQ 12.1 Grease Void Volumes"

2.1.12 PSC Engineering Document CR-N1002-100, "Upper Support Frame Set Position Design"

2.1.13 PSC Engineering Document CR-N1002-101, "Upper Support Frame Moving Position Design"

2.1.14 PSC Engineering Document CR-N1002-102, "Work Platform Design"

2.2 REFERENCE DRAWINGS

2.2.1 S – 425 – 001 IWE/IWL Inspection Concrete Layout 0° to 180°

2.2.2 S – 425 – 002 IWE/IWL Inspection Concrete Layout 180° to 360°

2.2.3 S – 425 – 003 IWE/IWL Inspection Exterior Dome Layout

2.2.4 S – 425 – 004 IWE/IWL Inspection Vertical Tendon Layout

2.2.5 S – 425 – 005 IWE/IWL Inspection Hoop Tendon "13" Layout

2.2.6 S – 425 – 006 IWE/IWL Inspection Hoop Tendon "42" Layout

2.2.7 S – 425 – 007 IWE/IWL Inspection Hoop Tendon "53" Layout

2.2.8 S – 425 – 008 IWE/IWL Inspection Hoop Tendon "64" Layout

2.2.9 S – 425 – 009 IWE/IWL Inspection Hoop Tendon "51" Layout

2.2.10 S – 425 – 0010 IWE/IWL Inspection Hoop Tendon "62" Layout

2.2.11 S – 425 – 0011 IWE/IWL Inspection Dome Tendons Layout – Plan

2.2.12 S – 425 – 0012 IWE/IWL Inspection Dome Tendons Layout – Elevation

2.2.13 S – 425 – 0020 IWE/IWL Inspection Tendon Detail

2.2.14 SC – 421 – 041 Reactor Building Ring Girder Concrete Outline – Plan and Sections

3.0 BACKGROUND

3.1 CONTAINMENT ARRANGEMENT

3.1.1 The Crystal River Unit 3 containment building is a post-tensioned and reinforced concrete structure comprised of a vertical cylinder with a hemispherical dome roof, and is supported on a conventional reinforced concrete foundation slab.

3.1.2 The containment structure post-tensioning system provides sufficient external pressure load on the containment structure to balance the internal pressure of the structure as well as the design basis accident internal containment pressure.

3.1.3 The containment post-tensioning system consists of:

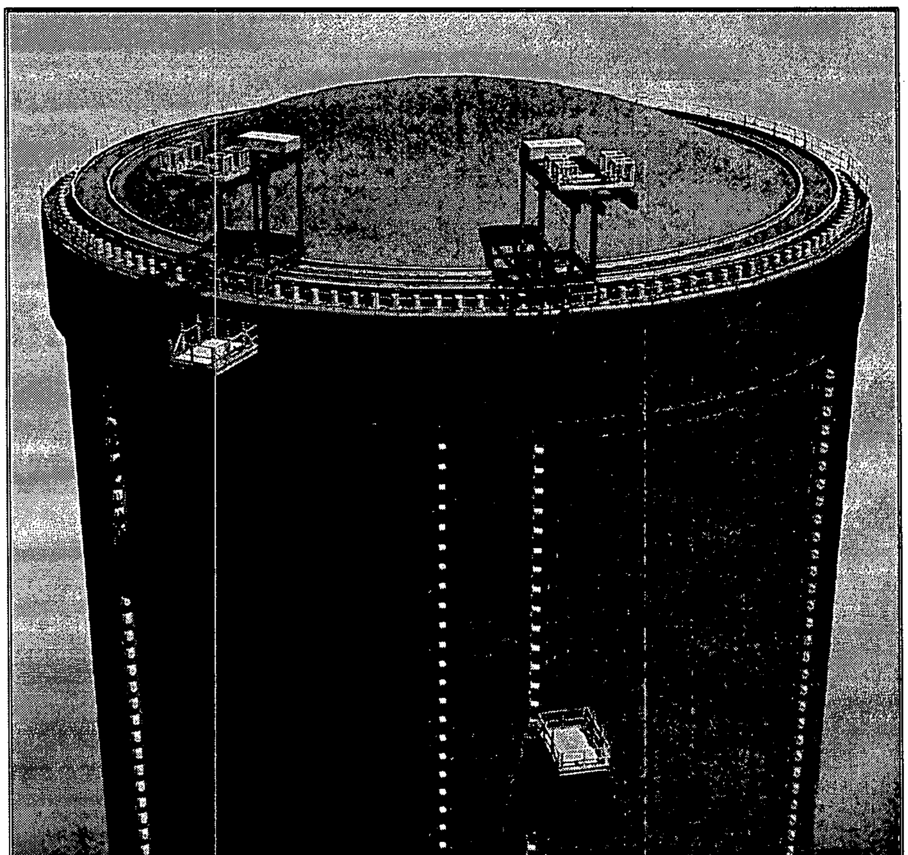
3.1.3.1 Approximately 144 vertical tendons in the cylinder wall anchored at the top surface of the ring girder and at the bottom of the base slab;

3.1.3.2 Approximately 282 hoop tendons in the cylinder wall anchored alternately at 120 degrees to each other. Each tendon encloses 120 degrees of arc and is anchored at two of the six vertical buttresses.

3.1.3.3 Three groups of 41 dome tendons (total 123 tendons) alternately oriented at 120 degrees to each other and anchored at the vertical face of the ring girder;

3.1.4 Each tendon consists of nominally 163 7mm diameter high strength low relaxation wires with buttonhead anchorages. The tendons are housed in individual spirally wrapped, corrugated, thin wall sheet metal sheathing connected to a steel bearing plate and trumplet at each end. The sheathing is cast into the containment structure concrete walls and dome. The tendons are capped at each anchorage with a sheathing filler cap and the tendon sheathing and caps are filled with corrosion preventing grease.

FIGURE 1: TYPICAL SURVEILLANCE SETUP



3.1.5 Inspection Equipment

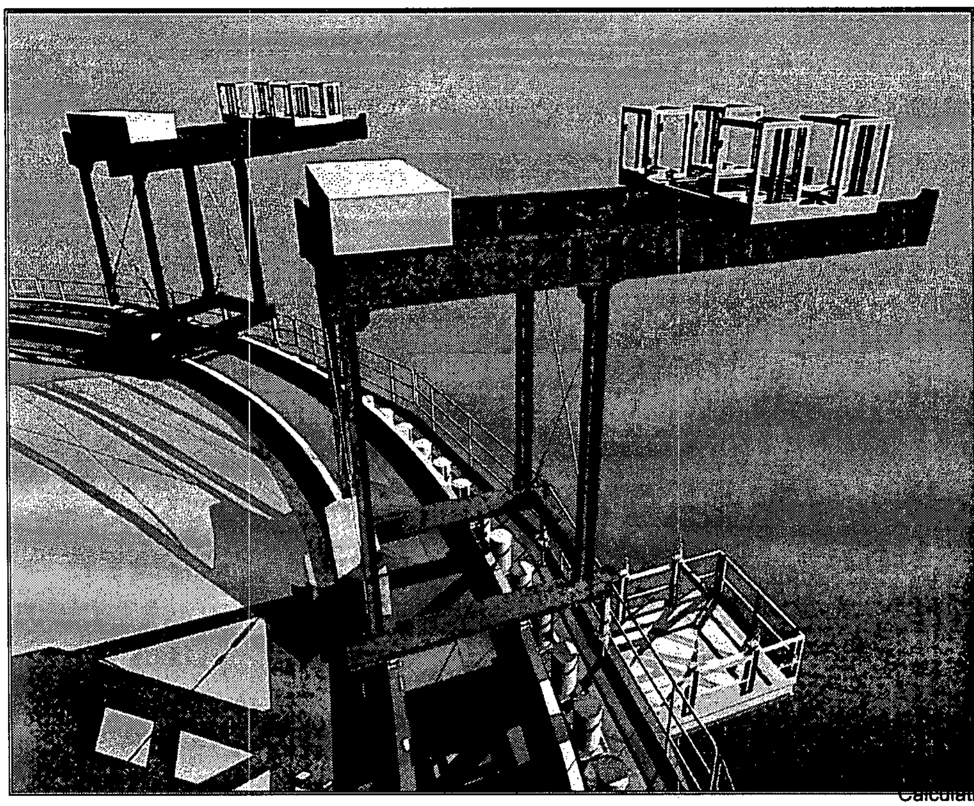
3.1.5.1 In order to perform the work required, PSC will supply the following equipment in order to perform the inspection activities. This list is for information only and equipment may be added or subtracted as needed.

1400 Ton Hydraulic Rams	Heise Digital Hydraulic Gauge	55 gallon empty drums
Jack Chairs	Misc. Electrical Transformers	110 volt electric cable
High Pressure Hydraulic Pumps	Tractel Motor Assemblies	480 volts electric cable
Jack chair extensions	2 Ga. OTC pump	Buttonhead puller
163 wire stressing adapters	Jib supports	Smooth wire puller
Pull rods with nuts	Hydraulic wire puller	Surveillance tool trailer
Inspection platforms (2)	1" diameter guide pins	Grease can plugs
Upper Support Frames (2)	1" diameter eye bolts	Graco grease pump
5 ton electric chain hoists (2)	Trolleys	Grease hose 1½" x 50'
Spider baskets/platforms	1½" diameter brass shut-off valves	55 gallon drum heater
Hydraulic hoses - 20' long	Shop and field pulling caps	Office Trailer
0-10000 psi Hydraulic Gauges	Anchorhead lifting ring	Mobile crane

3.1.6 Access Equipment

3.1.6.1 In order to access the hoop and dome tendons, two Upper Support Frames (hereafter referred to as USF) will be installed on the containment dome rails. Each USF will have a 5-Ton hoist running on a monorail to facilitate the positioning of the hydraulic stressing ram. A work platform will also be hung from each USF attached to four drive motors, which will raise and lower the platform into working position. The entire USF assembly will utilize rollers, which will allow it to travel circumferentially around the dome in order to access all selected tendons.

FIGURE 2: UPPER SUPPORT FRAMES INSTALLED ON CONTAINMENT DOME



3.1.6.2 The setup and design information for the Upper Support Frames and work platforms is included in section 8.0 of this document.

3.1.7 Stressing Equipment

3.1.7.1 In order to perform stressing activities on the selected tendons (i.e. monitoring tendon forces, detensioning, and retensioning) PSC will provide the required 1400-ton hydraulic ram setups. Each setup includes:

3.1.7.1.1 A calibrated hydraulic cylinder used for stressing, whose calibration is traceable to the National Institute of Standards and Technology (NIST).

3.1.7.1.2 A jack chair used to support the cylinder against the bearing plate as well as facilitate the removal and installation of stressing shims.

3.1.7.1.3 A pullrod/nut combination to convert the compressive force of the cylinder to a tensile force being applied to the tendon

3.1.7.1.4 A 163-wire stressing adapter to couple the pulling rod to each selected tendon's anchorhead.

3.1.7.1.5 A two stage high pressure hydraulic pump to power the cylinder

3.1.7.1.6 A calibrated field gauge for reading the pressure applied

3.1.7.2 Extreme caution shall be taken to ensure that the stressing adapter is fully engaged with the anchorhead in order to eliminate the potential for overstressing of the anchorhead threads.

4.0 SCOPE OF WORK

4.1 TENDON SELECTION REQUIREMENTS

4.1.1 The specific requirements for selection of the scope of work as well as specific requirements and acceptance criteria for the performance of the inspection for the 8th period (30th Year) Tendon Surveillance are defined by The Crystal River Technical Specifications, the Code of Federal Regulations 10 CFR 50.55a and ASME Section XI, Sub-Section IWL, define the specific requirements for selection of the inspection tendons.

4.2 TENDON SELECTION

4.2.1 Tendons were selected for the eighth surveillance period by Progress Energy Florida and distributed to Precision Surveillance Corporation. Tendons to be examined are selected on a random basis among the tendons that have not been examined during previous inspections, except for one tendon from each group, which is designated as the common tendon and is examined during each surveillance.

4.2.1.1 Eleven tendons were selected for this surveillance consisting of 5 hoop tendons, 3 vertical tendons, and 3 dome tendons. In addition to the eleven surveillance tendons, one tendon from each group (vertical, hoop, dome) was selected as an alternate. The alternate tendons will only be inspected in the event that one of the surveillance tendons is found to be inaccessible. Table 1 below lists the tendons selected for the current surveillance as well as the inspections that will be performed on each tendon.

4.2.2 In the event that the acceptance criteria are not met for a certain tendon, it may be necessary to inspect either one or both tendons adjacent to the selected tendon. The criteria and need for this inspection are outlined in the applicable governing codes (see references 2.1.2, 2.1.3, and 2.1.4) as well as the surveillance procedure. The adjacent tendons are listed in Table 2.

TABLE 1 : SCOPE OF WORK

CRYSTAL RIVER UNIT 3 – 30TH YEAR SURVEILLANCE SCOPE OF WORK

TENDON	END	VISUAL					PHYSICAL					COMMENTS
		SQ6.0	SQ6.1	SQ7.0	SQ8.0	SQ8.3	SQ9.0	SQ10.2	SQ10.3	SQ11.0	SQ12.1	
12V01	D & G	●	●	●	●	●	●				●	COMMON, STEAM ZONE @ DOME
45V20	D & G	●	●	●	●	●	●				●	ORIGINAL SCOPE
61V17	D & G	●	●	●	●	●	●	●	●	●	●	DETENSION
34V17	D & G											ALTERNATE
13H36	BT. 1 & 3	●	●	●	●	●	●				●	
42H46	BT. 2 & 4	●	●	●	●	●	●				●	STEAM ZONE @ BT2
46H21	BT. 4 & 6	●	●	●	●	●	●				●	COMMON
51H34	BT. 5 & 1	●	●	●	●	●	●	●	●	●	●	DETENSION, STEAM ZONE @BT1
62H30	BT. 6 & 2	●	●	●	●	●	●				●	STEAM ZONE @BT 2
46H07	BT. 4 & 6											ALTERNATE
D129	BT. 3 & 5	●	●	●	●	●	●				●	STEAM ZONE @BT3
D212	BT. 1 & 3	●	●	●	●	●	●				●	COMMON
D238	BT. 4 & 6	●	●	●	●	●	●	●	●	●	●	DETENSION
D337	BT. 1 & 5											ALTERNATE

LEGEND

SQ 6.0 – GREASE CAP REMOVAL
SQ 6.1 – INSPECTION FOR WATER
SQ 7.0 – AQUIRE GREASE SAMPLES
SQ 8.0 – ANCHORAGE INSPECTION
SQ 8.3 – CONCRETE INSPECTION
SQ 9.0 – MONITOR TENDON FORCE
SQ 10.2 – TENDON WIRE INSPECTION
SQ 10.3 – TESTING TENDON WIRES
SQ 11.0 – RETENSION TENDONS
SQ 12.1 – GREASE REPLACEMENT

TABLE 2 : ADJACENT TENDONS

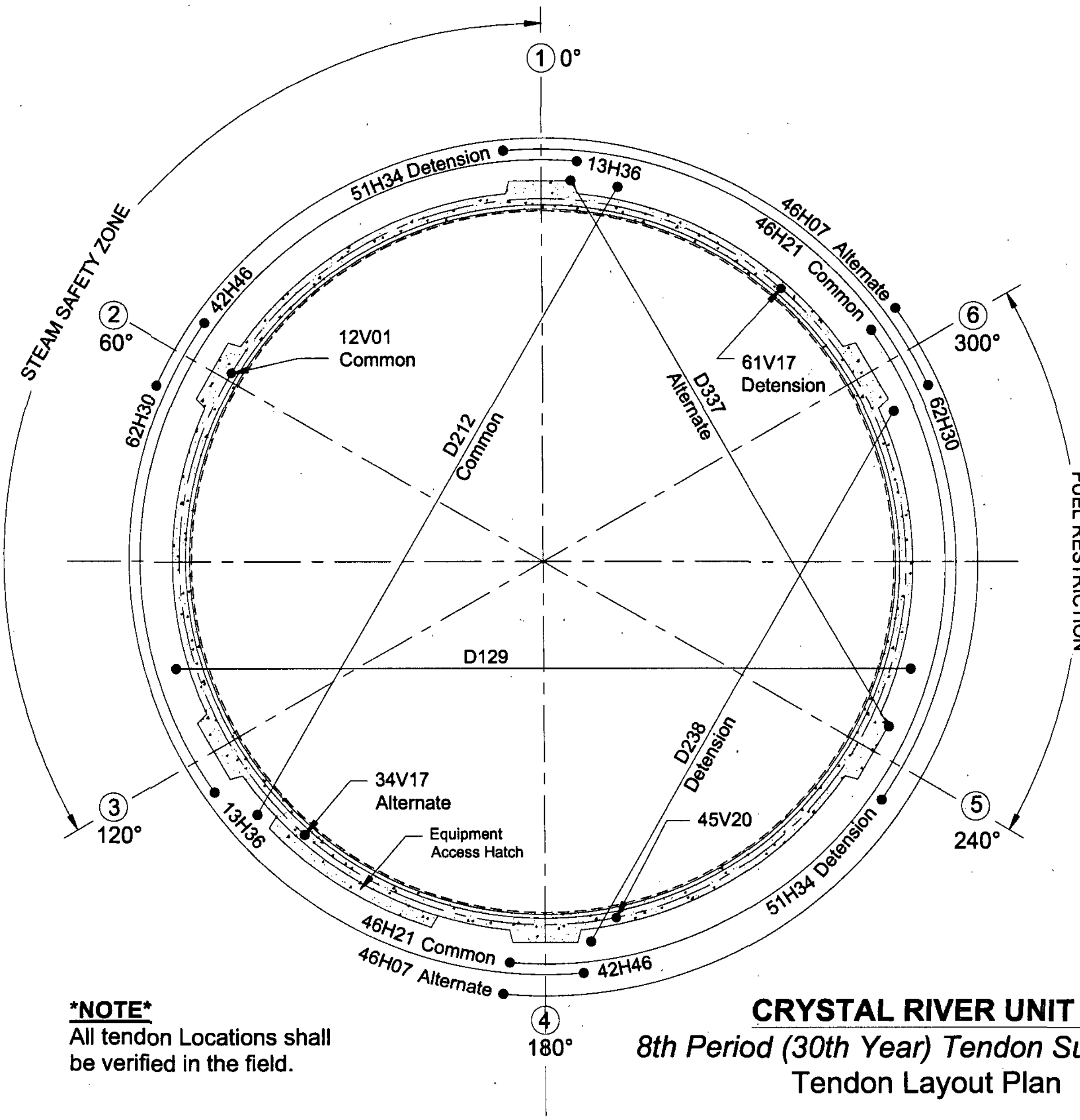
CRYSTAL RIVER UNIT 3 – 30TH YEAR SURVEILLANCE ADJACENT TENDONS

TENDON	END	COMMENTS	TENDON	END	COMMENTS
61V24	D & G	ADJACENT	51H33	BT. 5 & 1	ADJACENT
12V02	D & G	ADJACENT	51H35	BT. 5 & 1	ADJACENT
45V19	D & G	ADJACENT	62H29	BT. 6 & 2	ADJACENT
45V21	D & G	ADJACENT	62H31	BT. 6 & 2	ADJACENT
61V16	D & G	ADJACENT	46H06	BT. 4 & 6	ADJACENT OF ALTERNATE
61V18	D & G	ADJACENT	46H08	BT. 4 & 6	ADJACENT OF ALTERNATE
34V16	D & G	ADJACENT	D128	BT. 3 & 5	ADJACENT
34V18	D & G	ADJACENT	D130	BT. 3 & 5	ADJACENT
13H35	BT. 1 & 3	ADJACENT	D211	BT. 1 & 3	ADJACENT
13H37	BT. 1 & 3	ADJACENT	D213	BT. 1 & 3	ADJACENT
42H45	BT. 2 & 4	ADJACENT	D237	BT. 4 & 6	ADJACENT
42H47	BT. 2 & 4	ADJACENT	D239	BT. 4 & 6	ADJACENT
46H20	BT. 4 & 6	ADJACENT	D336	BT. 1 & 5	ADJACENT
46H22	BT. 4 & 6	ADJACENT	D338	BT. 1 & 5	ADJACENT

4.3 TENDON LAYOUT

4.3.1 In order to properly locate the correct tendon in the field, layouts of the selected surveillance tendons as well as alternates have been performed. There is a plan and elevation view showing the tendons as well as surrounding buildings. The tendon layouts are shown below in Figures 3, 4 and 5.

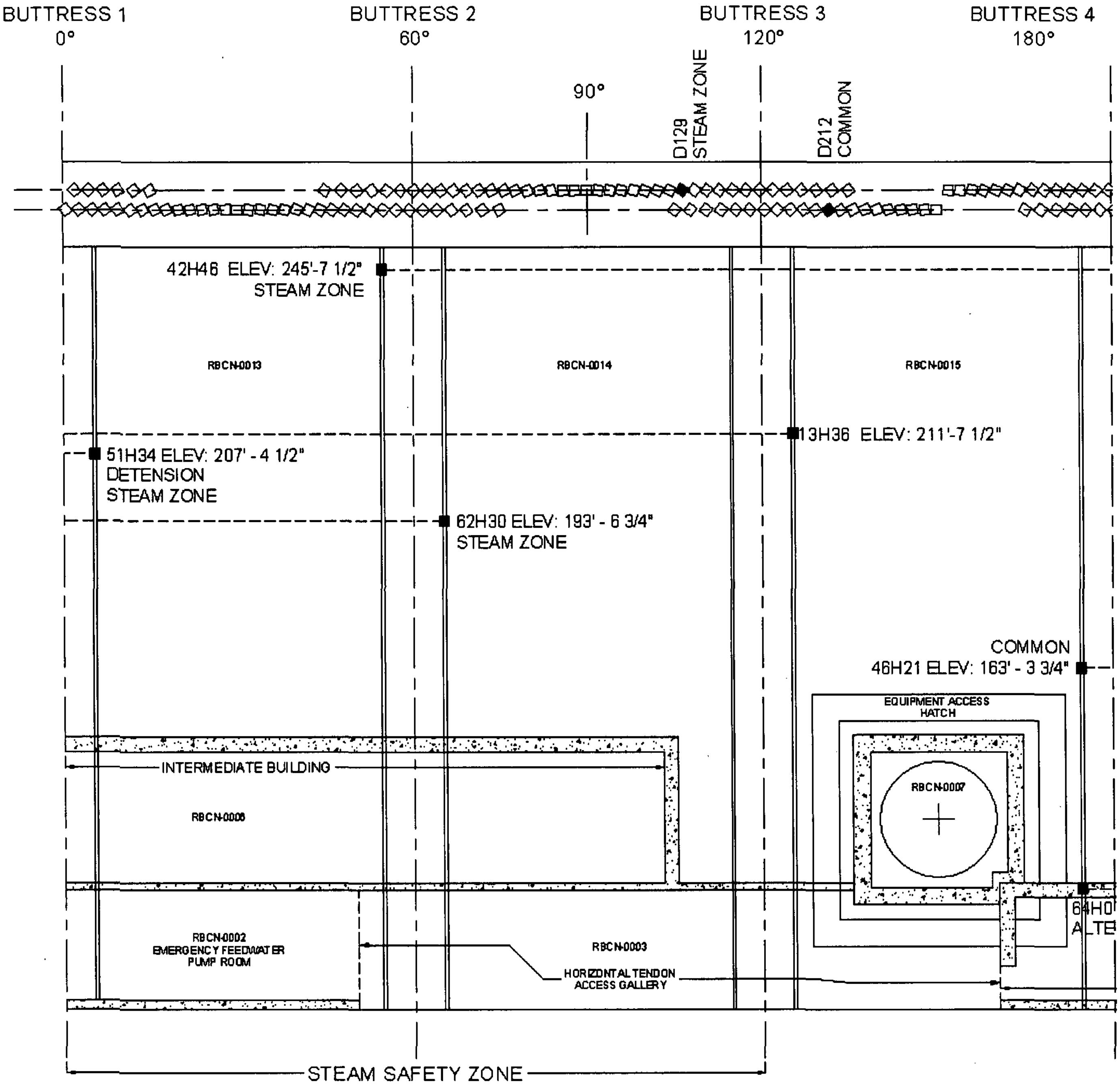
FIGURE 3: CR03 8TH PERIOD SURVEILLANCE – TENDON LAYOUT – PLAN



NOTE
All tendon Locations shall be verified in the field.

CRYSTAL RIVER UNIT 3
8th Period (30th Year) Tendon Surveillance
Tendon Layout Plan

FIGURE 4: CR03 8TH PERIOD SURVEILLANCE – TENDON LAYOUT – ELEVATION 0° TO 180°



CRYSTAL RIVER UNIT 3

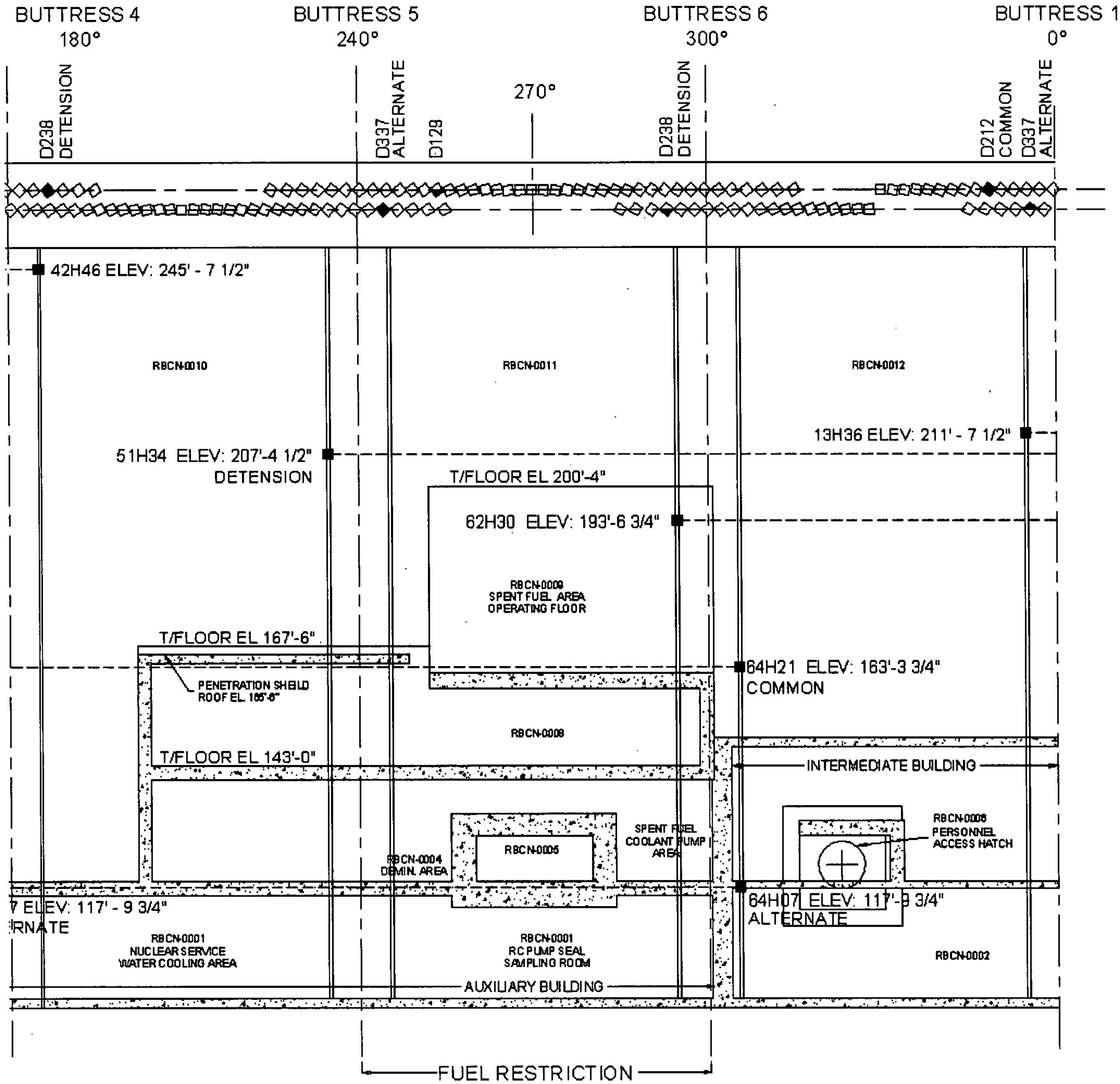
8th Period (30th Year) Tendon Surveillance

Tendon Layout Elevation - 0° to 180°

NOTE
All tendon Locations shall be verified in the field.

DOCUMENT NUMBER: CR-N1002-500	REVISION: 0	PAGE: 9
DOCUMENT TITLE: PRE-SURVEILLANCE ENGINEERING PACKAGE		
PROJECT TITLE: 30TH YEAR TENDON SURVEILLANCE AT CRYSTAL RIVER	DATE: 08/15/07	

FIGURE 5: CR03 8TH PERIOD SURVEILLANCE – TENDON LAYOUT – ELEVATION 180° TO 360°



CRYSTAL RIVER UNIT 3

8th Period (30th Year) Tendon Surveillance

Tendon Layout Elevation - 180° to 360°

NOTE
All tendon Locations shall be verified in the field.

5.0 MONITOR TENDON FORCES

5.1 Performing Lift-off Testing

5.1.1 In order to check the force being held by each of the selected surveillance tendons a Lift-off test will be performed. This process will be performed in accordance with the PSC supplied In-Service Inspection Procedure. A lift-off is achieved by transferring the tension on the tendon from its shim stack to the hydraulic ram. Once the tension has been transferred, the force is calculated from the internal pressure of the hydraulic ram. The steps involved in performing a liftoff are as follows:

5.1.1.1 The hydraulic pressure will be applied to the ram until lift-off is achieved.

5.1.1.2 After achieving lift-off 2 feeler gauges (0.030 inch) shall be inserted about 180 degrees apart, between the anchor head and the top shim.

5.1.1.3 The pressure will then be reduced to transfer the load back to the shim stack.

5.1.1.4 Pressure will be applied to the tendon until the feeler gauge can be pulled out with some effort.

5.1.1.5 These steps will then be repeated until three consecutive readings within the specified tolerance are achieved.

5.1.1.6 The pressure used to achieve liftoff is then converted to the force for that tendon using the hydraulic ram calibration data, which is traceable to NIST, and the normalization factor and compared to the predicted force for that tendon to verify acceptability.

5.1.2 The predicted forces and normalization factors for each surveillance tendon, as well as the tendons adjacent to it, have been calculated and included in Attachment C and are summarized below in Table 3.

Table 3 : Sq 9.1 – Predicted Forecs Summary

CRYSTAL RIVER UNIT 3 – SQ 9.1 – PREDICTED FORECS SUMMARY									
TENDON	PREDICTED BASE (kips)	95% PREDICTED BASE (kips)	90% PREDICTED BASE (kips)	NORMALI-ZATION FACOTR	TENDON	PREDICTED BASE (kips)	95% PREDICTED BASE (kips)	90% PREDICTED BASE (kips)	NORMALI-ZATION FACOTR
61V24	1529	1452	1376	-14	13H35	1373	1304	1235	+56
12V01	1525	1449	1372	-9	13H36	1484	1410	1336	-56
12V02	1596	1516	1437	-80	13H37	1368	1299	1231	+61
45V19	1484	1409	1335	+31	62H29	1421	1350	1279	+7
45V20	1507	1432	1357	+7	62H30	1413	1342	1272	+14
45V21	1533	1456	1380	-19	62H31	1475	1401	1328	-46
61V16	1523	1447	1371	-8	D128	1268	1205	1141	+53
61V17	1498	1423	1348	+17	D129	1287	1223	1159	+34
61V18	1493	1418	1344	+21	D130	1261	1198	1135	+60
46H20	1467	1394	1321	-39	D211	1305	1239	1174	+18
46H21	1441	1369	1297	-12	D212	1305	1240	1175	+15
46H22	1486	1412	1337	-57	D213	1312	1246	1180	+10
51H33	1392	1323	1253	+36	D237	1426	1335	1283	-104
51H34	1487	1413	1339	-59	D238	1348	1281	1213	-26
51H35	1348	1281	1213	+79	D239	1409	1338	1268	-88
42H45	1473	1399	1325	-44					
42H46	1456	1383	1310	-28	= SURVEILLANCE TENDON				
42H47	1425	1354	1283	+3	= ADJACENT TENDON				

6.0 RETENSION TENDONS

6.1 DETENSIONING, WIRE REMOVAL, AND RETENSIONING OF TENDONS

6.1.1 One tendon out of each group (vertical, hoop, and dome) is selected to have a wire removed and tested. This process will be performed in accordance with the PSC supplied In-Service Inspection Procedure. In order for this to be accomplished the following will happen:

6.1.1.1 Liftoff-testing will be completed to ensure the tendon's force is at an acceptable level.

6.1.1.2 Once the liftoff has been completed, the force will be transferred to the hydraulic ram and all of the shims will be removed.

6.1.1.3 After the shims have been removed, the pressure will then be released from both ends of the tendon until there is no longer any force on it. This is the detensioning of the tendon.

6.1.1.4 While the tendon is in the detensioned state, a sample wire is removed and scheduled for physical testing as required by IWL-2523.

6.1.1.5 Once the wire has been removed, the tendon is then restored to an acceptable force by pressurizing the ram and replacing the stressing shims.

6.1.2 In order to perform an acceptable restressing operation, the following parameters must be calculated since the tendon has one less effective wire (because of the removed test wire).

6.1.2.1 The new Pre-Tension Force (PTF)

6.1.2.2 The new Overstress Force (OSF) which is 80% of the tendons Gross Ultimate Tensile Strength (GUTS)

6.1.2.3 The new elongations at each of the measurement stops and at OSF

6.1.3 All of the new restressing calculations are included in Attachment D and the parameters are summarized in Table 4 below.

TABLE 4 : SQ 11.1 – RESTRESSING DATA

CRYSTAL RIVER UNIT 3 – SQ 11.1 – RESTRESSING DATA									
TENDON	PREVIOUSLY		AT RETENSIONING						ORIGINAL ELONGATION (in.)
	ORIGINAL PTF (kips)	ORIGINAL OSF (kips)	NUMBER OF WIRES	NEW PTF (kips)	NEW OSF (kips)	600 (kips)	1200 (kips)	
61V17	357	1866	162	354	1855	1.92	6.62	11.75
			161	352	1843	1.95	6.68	
			160	350	1832	1.98	6.74	
51H34	362	1866	162	359	1855	1.65	5.76	10.25
			161	357	1843	1.67	5.81	
			160	355	1832	1.70	5.87	
D238	359	1866	162	357.1	1854.6	1.34	4.64	8.25
			161	354.9	1843.1	1.36	4.68	
			160	352.7	1831.7	1.38	4.73	

7.0 GREASE VOID VOLUMES

7.1 GREASE REPLACEMENT

7.1.1 Once all inspections have concluded, any sheathing filler (grease) that was lost during the inspections must be replaced. Throughout the inspection all grease that is removed is documented. The required methods of refilling, as well as the acceptance requirements for amount refilled, are dependent upon the percentage of the total void that is lost. In order to calculate this percentage, the grease void volume has been calculated for each selected surveillance tendon as well as both of its adjacent tendons. The grease void calculations are included in Attachment E and are summarized below in Table 5.

TABLE 5 : SQ 12.1 – GREASE VOID VOLUMES

CRYSTAL RIVER UNIT 3 – SQ 12.1 – GREASE VOID VOLUMES

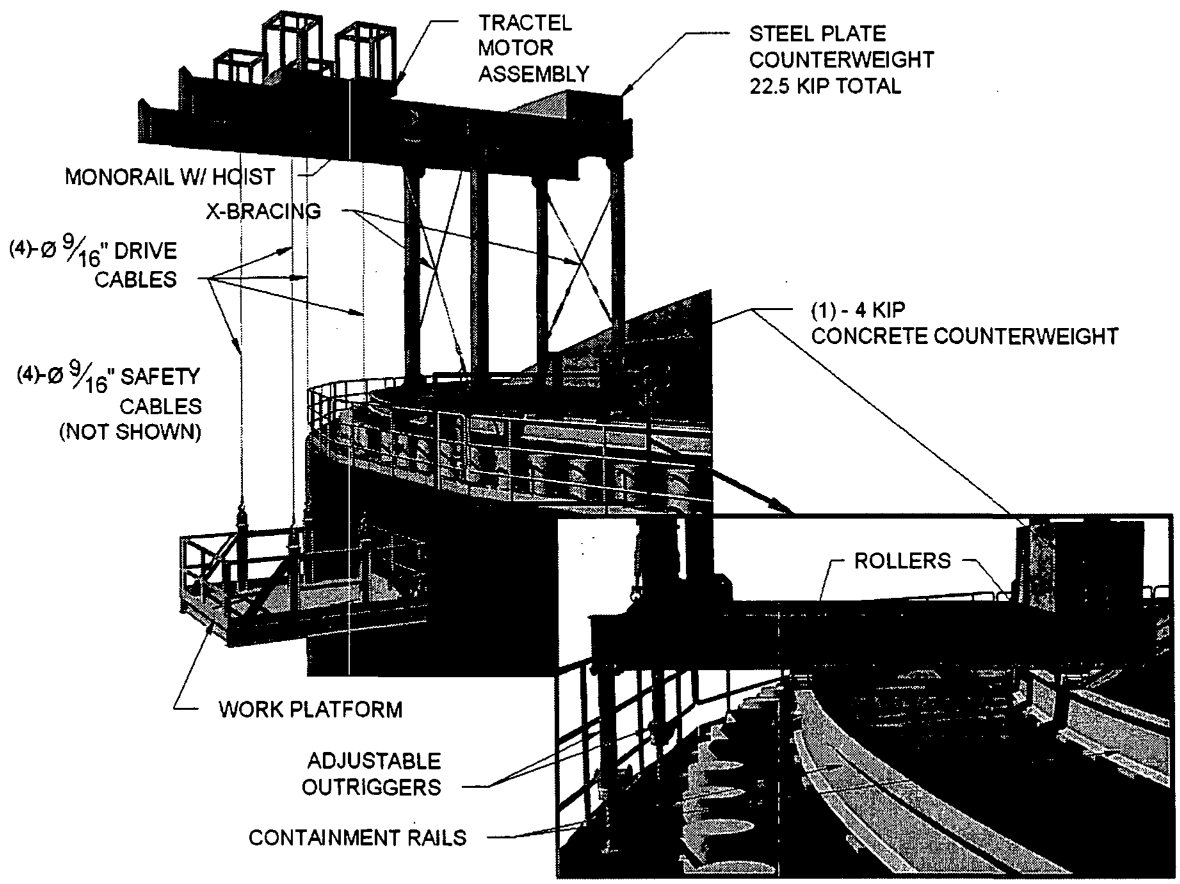
TENDON	NET DUCT VOLUME (GALLONS)	10% DUCT VOLUME (GALLONS)	TENDON	NET DUCT VOLUME (GALLONS)	10% DUCT VOLUME (GALLONS)	TENDON	NET DUCT VOLUME (GALLONS)	10% DUCT VOLUME (GALLONS)
61V24	144.09	14.41	13H35	121.77	12.18	D128	118.31	11.83
12V01	143.97	14.40	13H36	121.67	12.17	D129	116.41	11.64
12V02	144.12	14.41	13H37	122.18	12.22	D130	116.12	11.61
45V19	144.51	14.45	42H45	121.40	12.14	D211	115.58	11.56
45V20	144.47	14.45	42H46	122.57	12.26	D212	115.99	11.60
45V21	144.05	14.40	42H47	121.84	12.18	D213	116.85	11.69
61V16	144.36	14.44	46H20	121.37	12.14	D237	104.93	10.49
61V17	144.74	14.47	46H21	122.06	12.21	D238	102.59	10.26
61V18	144.15	14.42	46H22	122.43	12.24	D239	100.43	10.04
34V16	145.50	14.55	51H33	121.94	12.19	D336	107.62	10.76
34V17	145.67	14.57	51H34	120.88	12.09	D337	106.08	10.61
34V18	144.97	14.50	51H35	122.21	12.22	D338	103.92	10.39
			62H29	121.93	12.19			
			62H30	121.75	12.17			
			62H31	122.13	12.21			
			46H06	122.00	12.20			
			46H07	121.18	12.12	= SURVEILLANCE TENDON		
			46H08	121.46	12.15	= ADJACENT TENDON		

8.0 UPPER SUPPORT FRAME & WORK PLATFORM DESIGN

8.1 EQUIPMENT ARRANGEMENT

8.1.1 The two Upper Support Frames (a.k.a. USF) will be installed on top of the containment rail system. The USF will support the work platform with four drive cables and four safety cables, as well as a hydraulic stressing ram hanging from a 5-Ton hoist. See Figures 6 and 7 below for the setup of components and dimensions respectively.

FIGURE 6: USF & WORK PLATFORM COMPONENT SETUP



8.1.2 The work platform will be raised/lowered by four Tractel 2050XE drive units. The Tractel units have a man-riding capacity of 4 kips each, for a total of 16 kips when using a single part line. The drive and safety cables (each a set of 4 cables) will consist of 9/16" diameter wire rope. The steel cable has a minimum breaking strength of 40 kips, for a total ultimate strength of 160 kips (for each set). This means in this configuration, the support cables have a safety factor of 10.

8.1.3 The Tractel drive units will be arranged on a separate assembly unit, which will attach to the top flanges of the USF. This allows for the placement of the basket in an optimal location for the work being performed. The entire assembly, including framing, drive units, and 200 feet of drive cables, weighs 4.4 kips.

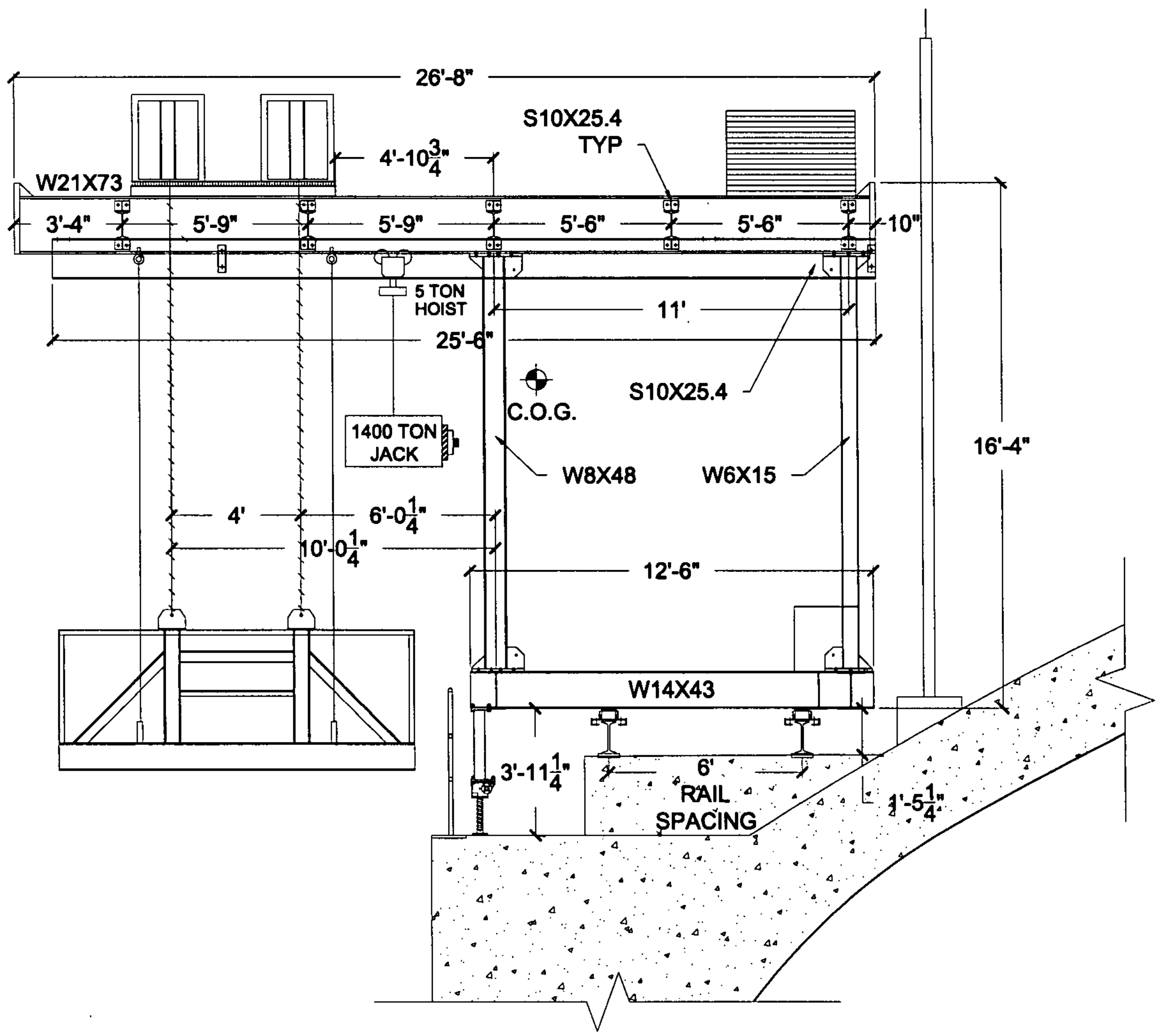
8.1.4 A spider basket may be hung from the USF to facilitate the transportation of personnel and material/tooling between the work platform and the containment dome or ground. The spider basket has a dead weight of 250 lbs. and a capacity of 1,000 lbs. This setup will exert a maximum of 1,250 lbs. of force on the USF when installed.

8.1.5 The hydraulic ram will be supported from a 5-ton capacity (10 kip working load) electric hoist. The hoist itself weighs 1.8 kips. In this configuration the maximum load the hoist could exert on the USF is 11.8 kips.

8.1.6 When the USF is in a set position (either working or storage) two outriggers at the outer edge of the USF will be lowered to the concrete to increase its support base width. These outriggers will consist of structural tube stub columns connected to worm gear screw jacks. The screw jacks will be outfitted with a standard hex bolt connection so that they can be raised and lowered using a standard ratchet or impact wrench. The screw jacks are model M15-U-T-12.0-L-B-TP made by T.K. Simplex, and have a working load capacity of 15-ton (30 kips).

8.1.7 The counterweight used for the system will be a combination of 22.5 kips of steel plate and 4 kip of concrete. Also, the platform will be tied down to the containment rails using PSC custom tie downs (Reference PSC Calculation E-GEN-500 – Rail Clamp Capacity Test). The tie downs are designed and tested for a maximum force of 40 kips each. The total hold-down force for this frame will be 106.5 kips {22.5+4+40+40 = 106.5 kips}.

FIGURE 7: USF DIMENSIONS



8.2 Design Loads

Table 6 :USF Design Loads

CRYSTAL RIVER UNIT 3 – DETAILED WORK PLATFORM LOADS					
Load Description	**Class**	**Unit Weight**	**Quantity**	**Total Weight**	**Class Totals**
Platform Self-Weight	D.L.	3,850 lbs.	1	3,850 lbs.	3,850 lbs.
Personnel	L.L.	250 lbs.	4	1,000 lbs.	2,600 lbs.
New/Scrap Grease Drum	L.L.	500 lbs.	1	500 lbs.	
Shims	L.L.	100 lbs.	1	100 lbs.	
Tools	L.L.	250 lbs.	1	250 lbs.	
Hydraulic Jack Pump	L.L.	750 lbs.	1	750 lbs.	
				Total Work Platform Weight =	6,450 lbs.

CRYSTAL RIVER UNIT 3 – DESIGN LOADS USED IN THE WORK PLATFORM ANALYSIS					
Load Description	**Class**	**Load Magnitude**	**Quantity of Loads Applied in RISA**	**Magnitude of Loads Applied in RISA**	**Comments**
Platform Live Load	L.L.	2.6 kips	80 sq. ft.	0.033 ksf	
Hydraulic Pump	L.L.	0.75 kips	1	0.75 kips	
Miscellaneous Live Load	L.L.	0.5 kips	80 sq. ft.	0.006 ksf	
5:1 Platform Live Load	L.L.	13.0 kips	80 sq. ft.	0.163 ksf	

CRYSTAL RIVER UNIT 3 – DESIGN LOADS USED IN THE UPPER SUPPORT FRAME ANALYSIS					
Load Description	**Class**	**Load Magnitude**	**Quantity of Loads Applied in RISA**	**Magnitude of Loads Applied in RISA**	**Comments**
Platform Dead	D.L.	3.85 kips	4	0.96 kips	
Platform Live	L.L.	2.6 kips	4	0.65 kips	
Tractel Support Basket	D.L.	4.4 kips	4	1.1 kips	
Trolley/Hoist	L.L.	11.8 kips	1	11.8 kips	
Steel Counterweight	D.L.	22.5 kips	8.0 ft.	2.813 kip/ft	
Concrete Counterweight	D.L.	4.0 kips	2	2.0 kips	
30mph Wind X-Dir ($W_{//30}$)	W.L.	1.79 kips	64.78 ft.	0.028 kip/ft	
30mph Wind Z-Dir ($W_{\perp 30}$)	W.L.	1.54 kips	40.44 ft.	0.038 kip/ft	
150mph Wind X-Dir ($W_{//150}$)	W.L.	18.19 kips	64.78 ft.	0.281 kip/ft	
150mph Wind Z-Dir ($W_{\perp 150}$)	W.L.	12.22 kips	40.44 ft.	0.302 kip/ft	
DBE Earthquake (EL_X)	E.L.	6.75 kips	53.34 ft.	0.127 kip/ft	
DBE Earthquake (EL_Y)	E.L.	1.78 kips	90.84 ft.	0.020 kip/ft	
DBE Earthquake (EL_Z)	E.L.	6.75 kips	37.5 ft.	0.180 kip/ft	
MHE Earthquake (EL_X)	E.L.	17.38 kips	53.34 ft.	0.326 kip/ft	
MHE Earthquake (EL_Y)	E.L.	5.3 kips	90.84 ft.	0.058 kip/ft	
MHE Earthquake (EL_Z)	E.L.	17.38 kips	37.5 ft.	0.463 kip/ft	

8.3 LATERAL LOADS

8.3.1 Two percent (2%) of Operating Weight:

$$[(10^K + 6.45^K + 11.8^K + 26.5^K)*0.02] = \mathbf{1.10^K} \text{ (Conservative)}$$

USF DL — Platform DL+LL — Hoist — Counterweight

8.3.2 Wind Loading

8.3.2.1 The wind loading for the USF has been calculated in two directions for two different wind speeds. The first wind speed is 30 mph and the second is 150 mph. The 30mph condition is evaluated under working conditions, while the 150mph condition is evaluated when the platform is secured and uninhabited. The wind loads are applied perpendicular to containment (along the radius) and parallel to the containment building (tangent to the circle) in order to ensure the structure's ability to withstand these forces, and the tie-down system's ability to secure the USF on top of the containment building. 2% of the operating weight is also included in the wind load calculation to account for any accidental impact loading. The variables and dimensions used for calculating the design wind loads are tabulated in Tables 7 and 8 below, respectively.

TABLE 7 : WIND LOADING VARIABLES

Description	Variable	Value
Basic Wind speed	V	30 / 150 mph
Wind Directionality Factor	K_d	1.0
Importance Factor	I	1.15
Exposure Category	-	D
Building Height	z	195'
Velocity Pressure Coefficient	K_z	1.61
Topographic Factor	K_{zt}	1.0
Gust Effect Factor	G	0.8
Enclosure Classification	-	OPEN
Internal Pressure Coefficient	GC_{pi}	0.0
External Pressure Coefficient	C_f	1.6

TABLE 8 : WIND LOADING DIMENSIONS

Physical Dimensions		
Dimension	Parallel to Containment	Perpendicular to Containment
Projected Area (A_f)	125.26 sq. ft.	81.48 sq. ft.
Length that Wind Load is Applied in RISA (L_w)	64.78 ft.	40.44 ft.
* Areas and Lengths calculated from AutoCAD		

8.3.2.2 30mph condition:

8.3.2.2.1 Velocity Pressure Calculation:

$$q_z = 0.00256 K_z K_{zt} K_d V^2 I$$
$$q_{z30} = 0.00256(1.61)(1.0)(1.0)(30)^2(1.15) = \mathbf{4.27}\ \mathbf{lb/ft^2}$$

8.3.2.2.2 Design Wind load parallel to containment ($W_{//30}$):

$$F = q_z G C_f A_f$$
$$F_{//30} = (4.27)(0.8)(1.6)(125.26) = 684.6 lb. = 0.6846^K + 1.10^K = \mathbf{1.79^K}$$

Distributed Load Applied in RISA: $W_{//30} = \dfrac{F}{L_W} = \dfrac{1.79}{64.78} = \mathbf{0.028\ k/ft}$

8.3.2.2.3 Design Wind load perpendicular to containment ($W_{\perp 30}$):

$$F = q_z G C_f A_f$$
$$F_{\perp 30} = (4.27)(0.8)(1.6)(81.48) = 445.3 lb. = 0.4453^K + 1.10^K = \mathbf{1.54^K}$$

Distributed Load Applied in RISA: $W_{\perp 30} = \dfrac{F}{L_W} = \dfrac{1.54}{40.44} = \mathbf{0.038\ k/ft}$

8.3.2.3 150mph condition:

8.3.2.3.1 Velocity Pressure Calculation:

$$q_z = 0.00256 K_z K_{zt} K_d V^2 I$$

$$q_{z150} = 0.00256(1.61)(1.0)(1.0)(150)^2(1.15) = \mathbf{106.6\ {}^{lb}\!/_{ft^2}}$$

8.3.2.3.2 Design Wind load parallel to containment ($\boldsymbol{W_{//150}}$):

$$F = q_z G C_f A_f$$

$$F_{//150} = (106.6)(0.8)(1.6)(125.26) = 17{,}091 lb. = 17.09^K + 1.10^K = \mathbf{18.19}^K$$

Distributed Load Applied in RISA: $W_{//150} = \frac{F}{L_W} = \frac{18.19}{64.78} = \mathbf{0.281\ {}^{k}\!/_{ft}}$

8.3.2.3.3 Design Wind load perpendicular to containment ($\boldsymbol{W_{\perp 150}}$):

$$F = q_z G C_f A_f$$

$$F_{\perp 150} = (106.6)(0.8)(1.6)(81.48) = 11{,}118 lb. = 11.12^K + 1.10^K = \mathbf{12.22}^K$$

Distributed Load Applied in RISA: $W_{\perp 150} = \frac{F}{L_W} = \frac{12.22}{40.44} = \mathbf{0.302\ {}^{k}\!/_{ft}}$

8.3.3 Seismic Loading:

8.3.3.1 The seismic loading conditions have been calculated using peak spectral accelerations from previous experience in designing the upper support frames to determine the representative static loads. The load combinations consist of a static distributed load being applied to the top story of the frame in each of the three ordinate directions. Static loadings have been calculated for two different accelerations, a Design Basis Earthquake (DBE) and a Maximum Hypothetical Earthquake (MHE). The DBE condition is evaluated under working conditions, while the MHE is only evaluated when the USF is secured and the platform uninhabited. The seismic loads considered are extremely conservative considering the required acceleration of 0.05g required by Reference 2.1.6. The dead loads and dimensions used for calculating the design seismic loads are tabulated in Tables 9 and 10 below, respectively.

TABLE 9 : SEISMIC DEAD LOADS

DEAD LOADS USED TO CALCULATE HORIZONTAL AND VERTICAL SEISMIC FORCES	
USF Dead	10.0^K
Counterweight	26.5^K
Tractel Support	4.4^K
Total D.L.	40.9^K

TABLE 10 : SEISMIC DIMENSIONS

LENGTH THAT SEISMIC LOAD IS APPLIED IN RISA (L_{EQ})	
X-DIRECTION	53.34 ft.
Y-DIRECTION	90.84 ft.
Z-DIRECTION	37.5 ft.
* Lengths calculated from AutoCAD	

8.3.3.2 The frequency and period of the USF are calculated below.

$$\text{Maximum Fundamental Period, } T = T_a \cdot C_V = C_T \cdot h_n^{3/4} \cdot C_V = 0.03 \cdot (14)^{3/4} \cdot 1.7 = 0.37$$

$$\text{Frame Frequency, } f = \frac{1}{T} = \frac{1}{0.37} = 2.71 \Rightarrow use\ \mathbf{3.0} \therefore \mathbf{Conservative}$$

8.3.3.3 Peak spectral accelerations are listed below. ∴ **Conservative (Reference 2.1.6)**

$$\text{Horizontal DBE} = 0.33g \qquad \text{Vertical DBE} = \tfrac{2}{3}\cdot 0.13g = 0.087g$$

$$\text{Horizontal MHE} = 0.85g \qquad \text{Vertical MHE} = \tfrac{2}{3}\cdot 0.39g = 0.259g$$

8.3.3.4 DBE Seismic Forces are calculated below.

$$EL_X = \tfrac{1}{2}\cdot 0.33\cdot(10+26.5+4.4) = 6.75^K$$

$$EL_Y = \tfrac{1}{2}\cdot 0.087\cdot(10+26.5+4.4) = 1.78^K$$

$$EL_Z = \tfrac{1}{2}\cdot 0.33\cdot(10+26.5+4.4) = 6.75^K$$

8.3.3.5 MHE Seismic Forces are calculated below.

$$EL_X = \tfrac{1}{2}\cdot 0.85\cdot(10+26.5+4.4) = 17.38^K$$

$$EL_Y = \tfrac{1}{2}\cdot 0.259\cdot(10+26.5+4.4) = 5.30^K$$

$$EL_Z = \tfrac{1}{2}\cdot 0.85\cdot(10+26.5+4.4) = 17.38^K$$

8.4 FRAME ANALYSIS

8.4.1 Member Design:

8.4.1.1 All of the members have been designed for both lateral and vertical loads by analyzing various loading conditions with RISA-3D Version 5.5. RISA-3D calculates the stresses in each member, with respect to the member size and designation, and checks them against the allowable stresses defined in the applicable code. All of the members for the USF and work platform have been designed in accordance with AISC 9th Edition ASD [Reference 2.1.5] and ASME A120.1-2001 [Reference 2.1.7].

8.4.1.2 Section 3.3.4.1 of ASME A120.1-2001 states "At no time shall the rated load be placed in its most outboard position without a system stability factor of 4." In the RISA-3D analysis, the AISC standard uses 60% of yield to determine the member's allowable stress. Therefore, in order to meet the previously stated requirement, PSC is using a load factor of 2.4 (4 x 60% = 2.4) to reach the 4 to 1 rating. (i.e., rated hoist load x 2.4/60% = rated hoist load x 4) for the overload calculation of the outrigger beams.

8.4.1.3 In the USF analysis, two separate models were evaluated. The first model, which includes "set position" in the title, is indicative of the setup the USF will have when in a stationary working position, as well as when stored while not in use. The second model represents the "moving position" in which the front outriggers have been lifted to facilitate the movement of the platform to a new working position. Because of the very limited amount of time the USF will spend in the moving position, the extreme lateral loading cases (150mph & MHE) are not considered for that model.

8.4.1.3.1 In the analysis of the set position, sixteen different load combinations have been evaluated and they are detailed, along with the analysis in Attachment F. The model configuration, applied loads with corresponding code checks and reactions, and a tabulation of the envelope solution are also included in Attachment F. All of the load combinations have been considered, and the worst case code check for each member is displayed in the envelope solution. The allowable stress increase of 1/3 for lateral loading conditions have been applied to the appropriate load combinations. All of the member's stresses, code checks and boundary condition reactions are acceptable.

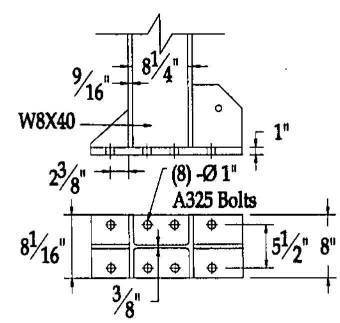
8.4.1.3.2 In the analysis of the moving position, nine different load combinations have been evaluated and they are detailed, along with the analysis in Attachment G. The model configuration, applied loads with corresponding code checks and reactions, and a tabulation of the envelope solution are also included in Attachment G. All of the load combinations have been considered, and the worst-case code check for each member is displayed in the envelope solution. The allowable stress increase of 1/3 for lateral loading conditions have been applied to the appropriate load combinations. All of the member's stresses, code checks and boundary condition reactions are acceptable.

8.4.1.3.3 In the work platform analysis, two load combinations were analyzed: the working load and dead load plus five times the live load. All lateral loading on the platform itself is negligible due to the pendulum effect of hanging from cables. The model configuration, applied loads with corresponding code checks and reactions, and a tabulation of the load combinations' solution are included in Attachment H. All of the members' stresses, code checks and boundary condition reactions are acceptable.

8.4.2 Connections:

8.4.2.1 Column Connections (Reference 2.1.5 – ASD 9th Ed, Pgs. 4-116 to 4-122)

FIGURE 8: COLUMN CONNECTION



Maximum Forces: *Shear* = -11.4^K, *Moment* = $20.22^{K\text{-}ft}$

Check Bolt Capacity: $F_f = \dfrac{M}{(d - t_{fb})} = \dfrac{20.22 \cdot 12}{(8.25 - 0.5625)} = 31.56^K$

$4\ \varnothing\ 1"$ *A325 Bolts* $= 4(34.6^K) = 138.4^K > 31.56^K$

$\therefore$ **ACCEPTABLE**

Check remaining Shear Bolts: $4\ \varnothing\ 1"$ *A325 Bolts* $= 4(16.5^K) = 66.0^K > 11.4^K$ *max*

$\therefore$ **ACCEPTABLE**

Check Flange to Plate Weld: $D_{req'd} = \dfrac{31.56}{[2(8.0625 + 0.5625) - 0.375]0.928} = 2.02$

Existing ¼" welds, D = 4 > 2.02 $\therefore$ **ACCEPTABLE**

Check End Plate: $P_e = 2.375 - \dfrac{1.0}{4} - 0.707(.1875) = 1.99in.$

$$C_a = 1.13 \text{ for } F_y = 36ksi$$

$$C_b = \sqrt{\frac{8.0625}{8}} = 1.00$$

$$\frac{A_f}{A_w} = \frac{8.0625 \cdot .5625}{[8.25 - (2 \cdot 0.5625)] \cdot 0.375} = 1.70$$

$$\frac{P_e}{d_b} = \frac{1.99}{1.0} = 1.99$$

$$\alpha_m = 1.13 \cdot 1.00 \cdot (1.70)^{1/3} \cdot (1.99)^{1/4} = 1.602$$

$$M_e = 1.602 \cdot 31.56 \cdot (1.99/4) = 25.2kip - in$$

Req'd Plate Thickness: $t_p = \sqrt{\dfrac{6 \cdot 25.2}{27 \cdot 8}} = 0.837in < 1.0\ in$ existing $\therefore$ **ACCEPTABLE**

Check Web to Plate Weld: *Required weld to develop maximum web tension stress* (F_y = 21.6 *ksi*)

$D_{req'd} = \dfrac{21.6 \cdot 0.375}{2 \cdot 0.928} = 4.36 < 6$, existing 3/8" weld $\therefore$ **ACCEPTABLE**

Beam Stiffeners: ½" stiffeners welded to both flanges and web with 3/16" weld both sides are **ACCEPTABLE** by engineering judgment

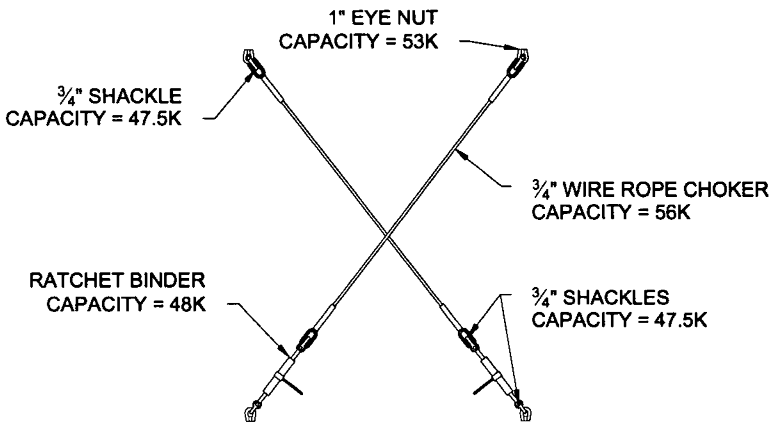
8.4.2.2 All other framing:

Minimum of (4) – ∅ 3/4" *Bolts*
Shear Capacity of ∅ 3/4" *A325 Bolt* = $9.3^K \rightarrow 4(9.3^K) = 37.2^K$
Tensile Capacity of ∅ 3/4" *A325 Bolt* = $19.4^K \rightarrow 4(19.4^K) = 77.6^K$
∴ **ACCEPTABLE** by *engineering judgment.*

8.4.3 X-Bracing:

8.4.3.1 The X-bracing is made up of several rigging components, which have an ultimate capacity able to withstand the maximum forces generated in the bracing due to all the lateral loading conditions. Below, Figure 9 depicts the typical bracing setup, with the ultimate capacities of each component listed. In the design below, the ultimate capacity of the system has been taken as 47.5 kip, because that is the capacity of the weakest link.

FIGURE 9: X-BRACING SYSTEM



8.4.3.2 The maximum force the X-Bracing (members M17, M18, M19, M20) will have to sustain as calculated by the envelope solution of the set position is as follows:

Maximum Tensile Force = $38.257^K < 47.5^K$ ∴ **ACCEPTABLE**

8.4.4 Tie-Downs:

8.4.4.1 The back end of each frame will be tied down to the containment building rails in two places (one each side) using PSC's rail clamp system, or a system that is similar. The total capacity as defined in Reference 2.1.8 is 40 kip for each tie down. A system that is used in lieu of the system in Reference 2.1.8 will be designed and tested acceptably to withstand 40 kip as well.

8.4.4.2 The maximum downward reaction vector the rear tie down locations (Nodes N30 and N31 for the set position, and Nodes N32 and N33 for the moving position) will have to sustain is determined by reviewing the resulting reactions from each load combination solution. Tables 11 and 12 below summarize the vertical reaction vectors for all load cases in each model. The maximum downward reactions come from Load combination LC16 from the set position calculation. The PSC tie down system is more than capable of withstanding the required – 5.5 kip of hold down force.

TABLE 11 : USF VERTICAL REACTIONS – SET POSITION

USF VERTICAL REACTIONS – SET POSITION					
Load Combination		Vertical Reaction (kips)			
Number	Description	Joint N30	Joint N31	Joint N34	Joint N35
LC 2	DL	10.90	10.90	11.00	11.00
LC 3	DL+LL+Hoist In	14.30	14.30	14.80	14.80
LC 4	DL+LL+Hoist Out	4.70	4.60	24.40	24.40
LC 5	4:1 Equivalent	1.60	1.60	31.40	31.40
LC 6	DL+LL+WLX30	5.30	4.00	25.90	23.00
LC 7	DL+LL-WLX30	4.00	5.30	23.00	25.90
LC 8	DL+LL+WLZ30	4.10	4.10	25.00	25.00
LC 9	DL+LL-WLZ30	5.20	5.20	23.90	23.90
LC 10	DL+LL+WLX150	20.80	9.80	27.80	-2.50
LC 11	DL+LL-WLX150	9.80	20.90	-3.20	28.10
LC 12	DL+LL+WLZ150	11.00	11.00	16.80	16.80
LC 13	DL+LL-WLZ150	19.60	19.60	8.20	8.20
LC 14	DL+LL+DBE(X)+DBE(Y)+DBE(Z)	1.40	-1.80	39.60	17.20
LC 15	DL+LL-DBE(X)-DBE(Y)-DBE(Z)	7.90	11.10	9.30	31.70
LC 16	DL+LL+MHE(X)+MHE(Y)+MHE(Z)	2.40	-5.50	49.70	-8.10
LC 17	DL+LL-MHE(X)-MHE(Y)-MHE(Z)	-5.80	2.10	-2.50	55.30

TABLE 12 : USF VERTICAL REACTIONS – MOVING POSITION

USF VERTICAL REACTIONS – MOVING POSITION					
Load Combination		Vertical Reaction (kips)			
Number	Description	Joint N30	Joint N31	Joint N32	Joint N33
LC 2	DL	17.90	17.90	4.00	4.00
LC 3	DL+LL+Hoist In	24.00	24.00	5.00	5.00
LC 4	4:1 Equivalent	35.40	35.40	-2.50	-2.50
LC 5	DL+LL+WLX30	25.80	22.30	5.30	4.70
LC 6	DL+LL-WLX30	22.30	25.80	4.70	5.30
LC 7	DL+LL+WLZ30	24.90	24.90	4.10	4.10
LC 8	DL+LL-WLZ30	23.20	23.20	5.90	5.90
LC 9	DL+LL+DBE(X)+DBE(Y)+DBE(Z)	44.10	16.80	-3.10	-1.50
LC 10	DL+LL-DBE(X)-DBE(Y)-DBE(Z)	4.00	31.30	13.20	11.40

8.4.4.3 In addition to the rear tie downs, during the periods where the USF is left unattended for extended periods of time (i.e. overnight) the front columns (Nodes N32 and N33) will be secured to the front containment rail using rigging components similar to the X-bracing that have a minimum ultimate capacity of 25 kip. By reviewing the lateral reactions at Nodes N32 and N33 for all load combinations, the maximum reaction vector comes from Load combinations LC16 and LC17 from the set position calculation. Table 13 below summarizes the lateral reactions from all of the load combinations in the set position model. The maximum lateral reaction magnitude of 20.42 kip will be adequately resisted by the rigging components.

TABLE 13 : USF LATERAL REACTIONS – SET POSITION

USF LATERAL REACTIONs – SET POSITION							
Load Combination		Lateral Reactions (kips)					
		Joint N32			Joint N33		
Number	Description	X Dir.	Z Dir.	Lateral Reaction Magnitude	X Dir.	Z Dir.	Lateral Reaction Magnitude
LC 2	DL	0.00	0.00	0.00	0.00	0.00	0.00
LC 3	DL+LL+Hoist In	0.00	0.00	0.00	0.00	0.00	0.00
LC 4	DL+LL+Hoist Out	0.00	0.00	0.00	0.00	0.00	0.00
LC 5	4:1 Equivalent	0.00	0.00	0.00	0.00	0.00	0.00
LC 6	DL+LL+WLX30	-0.10	0.10	0.14	-1.10	-0.10	1.10
LC 7	DL+LL-WLX30	1.40	-0.10	1.40	3.00	0.10	3.00
LC 8	DL+LL+WLZ30	0.00	-0.40	0.40	0.00	-0.40	0.40
LC 9	DL+LL-WLZ30	0.00	0.70	0.70	0.00	0.70	0.70
LC 10	DL+LL+WLX150	-0.90	1.00	1.35	10.30	-1.00	10.35
LC 11	DL+LL-WLX150	14.40	-1.10	14.44	2.60	1.10	2.82
LC 12	DL+LL+WLZ150	0.00	-2.90	2.90	0.00	-2.90	2.90
LC 13	DL+LL-WLZ150	0.00	5.80	5.80	0.00	5.80	5.80
LC 14	DL+LL+DBE(X)+DBE(Y)+DBE(Z)	-0.10	-2.20	2.20	6.70	-4.30	7.96
LC 15	DL+LL-DBE(X)-DBE(Y)-DBE(Z)	6.70	2.20	7.05	0.10	4.30	4.30
LC 16	DL+LL+MHE(X)+MHE(Y)+MHE(Z)	-0.20	-5.80	5.80	17.20	-11.00	20.42
LC 17	DL+LL-MHE(X)-MHE(Y)-MHE(Z)	17.20	-11.00	20.42	0.20	-5.70	5.70

8.4.5 Overturning Stability:

8.4.5.1 Stability factors have been calculated for three different load combinations on the USF. When in the set position, the stability factors were calculated for the working load condition as well as to check for the acceptance of the ANSI 4:1 overturning requirement. For the moving position, the frame is checked for the worst case loading while moving to ensure its stability. The stability factor is the ratio of the negative moment (overturning) to the positive moment (tie-downs/counterweight). Figures 10 and 11 depict the locations of each force, and Tables 14 through 16 calculate the stability factor for each load condition.

FIGURE 10: SET POSITION OVERTURNING STABILITY

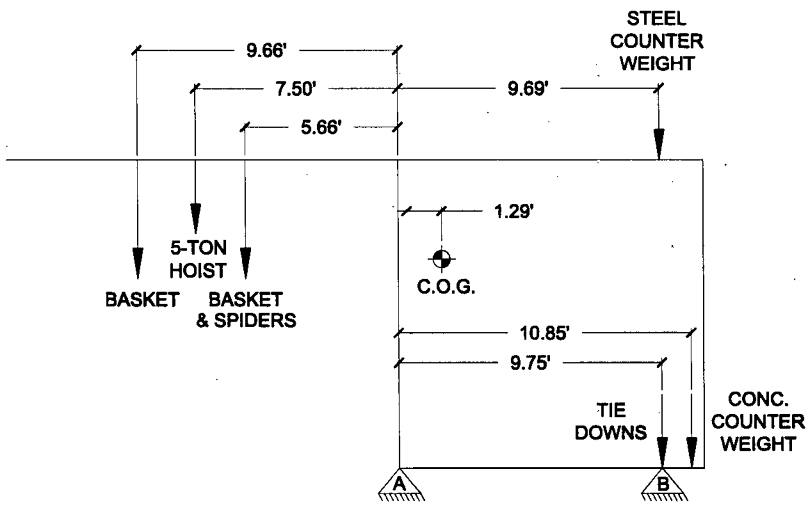


TABLE 14 : USF LATERAL REACTIONS – SET POSITION

Set Position - Working Load :
Hoist all at working Position, Basket Fully Loaded, Spider Loaded, Counterweights installed
No Tie-Downs

Negative Moment				Positive Moment			
Frame Weight		Hoist		Frame Weight		Hoist	
Force	Location	Force	Location	Force	Location	Force	Location
		11.8 K	7.5 ft.	10.0 K	1.29 ft.		
Basket		Spider Baskets		Counterweight		Tie Down	
Force	Location	Force	Location	Force	Location	Force	Location
2.71 K	5.66 ft.	1.25 K	6.00 ft.	22.5 K	9.69 ft.		
2.71 K	5.66 ft.			4.0 K	10.85 ft.		
2.71 K	9.66 ft.						
2.71 K	9.66 ft.						

Safety Factor	
Negative Moment =	-179.06 K-ft
Positive Moment =	274.28 K-ft
Total Down Force =	60.39 K
Reaction at "A" =	50.37 K
Reaction at "B" =	10.02 K
Saftey Factor	1.53

TABLE 15 : USF LATERAL REACTIONS – SET POSITION

Set Position - ANSI A120.1-2001 4:1 Stability Factor
Hoist all the way out, Basket Fully Loaded, Counterweights installed, Spider Loaded, Tie-Downs Installed

Negative Moment				Positive Moment			
Frame Weight		Hoist		Frame Weight		Hoist	
Force	Location	Force	Location	Force	Location	Force	Location
		11.8 K	7.5 ft.	10.0 K	1.29 ft.		
Basket		Spider Baskets		Counterweight		Tie Down	
Force	Location	Force	Location	Force	Location	Force	Location
2.71 K	5.66 ft.	1.25 K	6.00 ft.	22.5 K	9.69 ft.	25.0 K	9.75 ft.
2.71 K	5.66 ft.			4.0 K	10.85 ft.	25.0 K	9.75 ft.
2.71 K	9.66 ft.						
2.71 K	9.66 ft.						

Safety Factor	
Negative Moment =	-179.06 K-ft
Positive Moment =	761.78 K-ft
Total Down Force =	110.39 K
Reaction at "A" =	49.05 K
Reaction at "B" =	61.34 K
Saftey Factor	4.25

FIGURE 11: MOVING POSITION OVERTURNING STABILITY

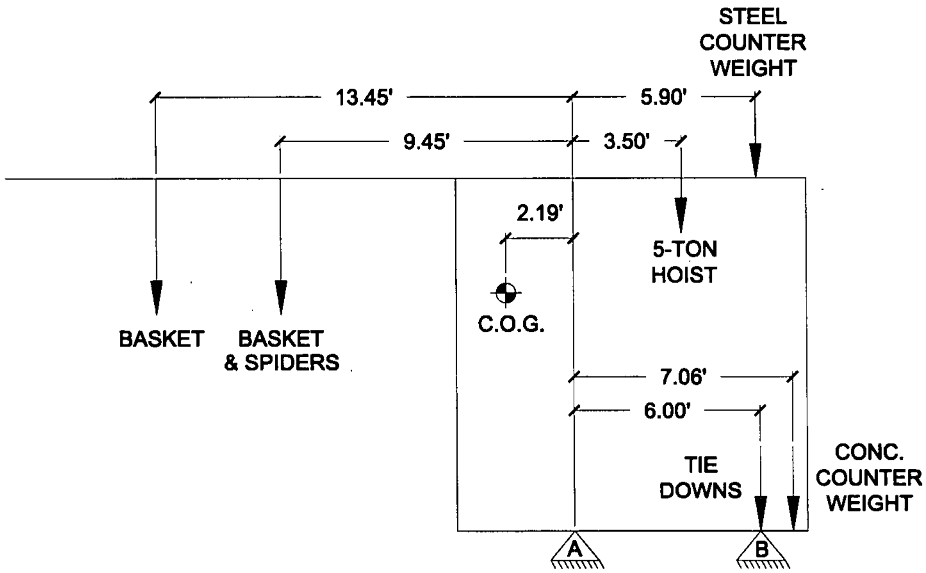


TABLE 16 : USF LATERAL REACTIONS – SET POSITION

Moving Position - Transit Load:
Basket Fully Loaded, Counterweights installed
NO tie downs or Hoist

Negative Moment

Frame Weight		Hoist	
Force	Location	Force	Location
10.0 K	2.14 ft.		

Basket		Spider Baskets	
Force	Location	Force	Location
2.71 K	9.45 ft.	1.25 K	9.45 ft.
2.71 K	9.45 ft.		
2.71 K	13.45 ft.		
2.71 K	13.45 ft.		

Positive Moment

Frame Weight		Hoist	
Force	Location	Force	Location
		9.7 K	3.5 ft.

Counterweight		Tie Down	
Force	Location	Force	Location
22.5 K	5.90 ft.	5.0 K	6.0 ft.
4.0 K	7.06 ft.	5.0 K	6.0 ft.

Safety Factor

Negative Moment =	-157.83 K-ft
Positive Moment =	254.87 K-ft
Total Down Force =	68.29 K
Reaction at "A" =	58.08 K
Reaction at "B" =	10.21 K
Saftey Factor	1.61

ATTACHMENT A – ASME SECTION XI, 1992 EDITION WITH 1992 ADDENDA

SUBSECTION IWL
REQUIREMENTS FOR CLASS CC CONCRETE COMPONENTS OF LIGHT-WATER COOLED PLANTS

Tables

ARTICLE IWL-1000
SCOPE AND RESPONSIBILITY

IWL-1100 SCOPE

(a) This Subsection provides the rules and requirements for preservice examination, inservice inspection and repair of the reinforced concrete and the post-tensioning systems of Class CC components, herein referred to as concrete containments as defined by CC-1000.

(b) The rules and requirements of this Subsection do not apply to the following:

(1) steel portions not backed by concrete;

(2) shell metallic liners;

(3) penetration liners extending the containment liner through the surrounding shell concrete.

IWL-1200 ITEMS SUBJECT TO EXAMINATION

IWL-1210 EXAMINATION REQUIREMENTS

The examination requirements of this Subsection shall apply to concrete containments.

IWL-1220 ITEMS EXEMPT FROM EXAMINATION

The following items are exempt from the examination requirements of IWL-2000:

(a) tendon end anchorages that are inaccessible, subject to the requirements of IWL-2521.1;

(b) portions of the concrete surface that are covered by the liner, foundation material, or backfill, or are otherwise obstructed by adjacent structures, components, parts, or appurtenances.

ARTICLE IWL-2000
EXAMINATION AND INSPECTION

IWL-2100 INSPECTION

Examinations shall be verified by an Inspector.

IWL-2200 PRESERVICE EXAMINATION

Preservice examination shall be performed in accordance with the requirements of IWL-2500.

IWL-2210 EXAMINATION SCHEDULE

Preservice examination shall be completed prior to initial plant startup.

IWL-2220 EXAMINATION REQUIREMENTS

IWL-2220.1 Concrete

(a) Preservice examination shall be performed in accordance with IWL-2510.

(b) The preservice examination shall be performed following completion of the containment Structural Integrity Test.

IWL-2220.2 Unbonded Post-Tensioning Systems. The following information shall be documented in the preservice examination records. This information may be extracted from construction records.

(a) Date on which each tendon was tensioned.

(b) Initial seating force in each tendon.

(c) For each tendon anchorage, the location of all missing or broken wires or stands and unseated wires.

(d) For each tendon anchorage, the location of all missing or detached buttonheads or missing wedges.

(e) The product designation for the corrosion protection medium used to fill the tendon duct.

IWL-2230 PRESERVICE EXAMINATION OF REPAIRS AND MODIFICATIONS

(a) When a concrete containment or a portion thereof is repaired or modified during the service lifetime of a plant, the preservice examination requirements shall be met for the repair or modification.

(b) When the repair or modification is performed while the plant is not in service, the preservice examination shall be performed prior to resumption of service.

(c) When the repair or modification is performed while the plant is in service, the preservice examination may be deferred to the next scheduled outage.

IWL-2300 VISUAL EXAMINATION, PERSONNEL QUALIFICATION, AND RESPONSIBLE ENGINEER A92

IWL-2310 VISUAL EXAMINATION AND PERSONNEL QUALIFICATION

(a) VT-1C visual examinations are conducted to determine concrete deterioration and distress for suspect areas detected by VT-3C, and conditions (e.g., cracks, wear, or corrosion) of tendon anchorage and wires or strands. Minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height shall be as specified in IWA-2210 for VT-1 visual examination.

(b) VT-3C visual examinations are conducted to determine the general structural condition of concrete surfaces of containments by identifying areas of concrete deterioration and distress, such as defined in ACI 201.1 R-68. The minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height shall be as specified in IWA-2210 for VT-3 visual examination.

(c) The Owner's written practice shall define qualification requirements for concrete examination personnel in accordance with IWA-2300. Limited certification in accordance with IWA-2350 may be used for examiners limited to concrete.

IWL-2320 RESPONSIBLE ENGINEER

The Responsible Engineer shall be a Registered Professional Engineer experienced in evaluating the in-service condition of structural concrete. The Responsible Engineer shall have knowledge of the design and Construction Codes and other criteria used in design and construction of concrete containments in nuclear power plants.

The Responsible Engineer shall be responsible for the following:

(a) development of plans and procedures for examination of concrete surfaces;

(b) approval, instruction, and training of concrete examination personnel;

(c) evaluation of examination results;

(d) preparation of repair procedures;

(e) submittal of report to the Owner documenting results of examinations and repairs.

IWL-2400 INSERVICE INSPECTION SCHEDULE

IWL-2410 CONCRETE

(a) Concrete shall be examined in accordance with IWL-2510 at 1, 3, and 5 years following the completion of the containment Structural Integrity Test CC-6000 and every 5 years thereafter.

(b) The 1, 3, and 5 year examinations shall commence not more than 6 months prior to the specified dates and shall be completed not more than 6 months after such dates. If plant operating conditions are such that examination of portions of the concrete cannot be completed within this stated time interval, examination of those portions may be deferred until the next regularly scheduled plant outage.

(c) The 10 year and subsequent examinations shall commence not more than 1 year prior to the specified dates and shall be completed not more than 1 year after such dates.

IWL-2420 UNBONDED POST-TENSIONING SYSTEMS

(a) Unbonded post-tensioning systems shall be examined in accordance with IWL-2520 at 1, 3, and 5 years following the completion of the containment Structural Integrity Test and every 5 years thereafter.

(b) The 1, 3, and 5 year examinations shall com-

mence not more than 6 months prior to the specified dates and shall be completed not more than 6 months after such dates. If plant operating conditions are such that examination of portions of the post-tensioning system cannot be completed within this stated time interval, examination of those portions may be deferred until the next regularly scheduled plant outage.

(c) The 10 year and subsequent examinations shall commence not more than 1 year prior to the specified dates and shall be completed not more than 1 year after such dates.

IWL-2421 Sites With Two Plants

(a) For sites with two plants, the examination requirements for the concrete containments may be modified if both containments utilize the same prestressing system and are essentially identical in design, if post-tensioning operations for the two containments were completed not more than 2 years apart, and if both containments are similarly exposed to or protected from the outside environment.

(b) When the conditions of IWL-2421(a) are met, the inspection dates and examination requirements may be as follows.

(1) For the containment with the first Structural Integrity Test, all examinations required by IWL-2500 shall be performed at 1, 3, 10, 20, and 30 years. Only the examinations required by IWL-2524 and IWL-2525 need be performed at 5, 15, 25, and 35 years.

(2) For the containment with the second Structural Integrity Test, all examinations required by IWL-2500 shall be performed at 1, 5, 15, 25, and 35 years. Only the examinations required by IWL-2524 and IWL-2525 need be performed at 3, 10, 20, and 30 years.

IWL-2500 EXAMINATION REQUIREMENTS

Examination shall be performed in accordance with the requirements of Table IWL-2500-1.

A92 IWL-2510 EXAMINATION OF CONCRETE

(1) Concrete surface areas, including coated areas, except those exempted by IWL-1200(b), shall be VT-3C visual examined for evidence of conditions indicative of damage or degradation, such as defined in ACI 201.1 R-68, in accordance with IWL-2310(b). Selected areas, such as those that indicate suspect conditions, shall receive a VT-1C examination in accordance with IWL-2310(a).

(b) The examination shall be performed by, or under the direction of, the Responsible Engineer. A92

(c) Visual examinations may be performed from floors, roofs, platforms, walkways, ladders, ground surface, or other permanent vantage points, unless temporary close-in access is required by the inspection plan. A92

IWL-2520 EXAMINATION OF UNBONDED POST-TENSIONING SYSTEMS

IWL-2521 Tendon Selection

(a) Tendons to be examined during an inspection shall be selected on a random basis except as noted in IWL-2521(b) and (c). The population from which the random sample is drawn shall consist of all tendons which have not been examined during earlier inspections. The number of tendons to be examined during an inspection shall be as specified in Table IWL-2521-1.

(b) One tendon of each type (as defined in Table IWL-2521-1) shall be selected from the first year inspection sample and designated as a common tendon. Each common tendon shall be examined during each inspection. A common tendon shall not be detensioned unless required by IWL-3300. If a common tendon is detensioned, another common tendon of the same type shall be selected from the first year inspection sample.

(c) If a containment with a stranded post-tensioning system is constructed with a predesignated number of detensionable tendons, one tendon of each type shall be selected from among those which are detensionable. The remaining tendons shall be selected from among those which cannot be detensioned.

IWL-2521.1 Exemptions. The following requirements shall apply to tendon anchorages that are not accessible for examination because of safety or radiological hazards or because of structural obstructions.

(a) After the process of randomly selecting tendons to be examined, any inaccessible tendons shall be designated as exempt and removed from the sample.

(b) Substitute tendons shall be selected for all tendons designated as exempt. Each substitute tendon shall be selected so that it is located as close as possible to

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TABLE IWL-2500-1
EXAMINATION CATEGORIES

EXAMINATION CATEGORY L-A, CONCRETE							
Item No.	Parts Examined	Test or Examination Requirement	Test or Examination Method	Acceptance Standard	Extent of Examination	Frequency of Examination	Deferral of Examination
L1.10	Concrete Surface						
L1.11	All Areas	IWL-2510	Visual, VT-3C	IWL-3210	IWL-2510	IWL-2410	NA
L1.12	Suspect Areas	IWL-2510	Visual, VT-1C	IWL-3210	IWL-2510	IWL-2410	NA

EXAMINATION CATEGORY L-B, UNBONDED POST-TENSIONING SYSTEM							
Item No.	Parts Examined	Test or Examination Requirement	Test or Examination Method	Acceptance Standard	Extent of Examination	Frequency of Examination	Deferral of Examination
L2.10	Tendon	IWL-2522	IWL-2522	IWL-3221.1	IWL-2521	IWL-2420	NA
L2.20	Wire or Strand	IWL-2523	IWL-2523.2	IWL-3221.2	IWL-2523.1	IWL-2420	NA
L2.30	Anchorage Hardware and Surrounding Concrete	IWL-2524	Visual, VT-1 and VT-1C	IWL-3221.3	IWL-2524.1	IWL-2420	NA
L2.40	Corrosion Protection Medium	IWL-2525	IWL-2525.2(a)	IWL-3221.4	IWL-2525.1(a)	IWL-2420	NA
L2.50	Free Water	IWL-2525	IWL-2525.2(b)		IWL-2525.1(b)	IWL-2420	NA

TABLE IWL-2521-1
NUMBER OF TENDONS FOR EXAMINATION

Inspection Period	Percentage[1,2] of all Tendons of Each Type[3]	Required Minimum[1] Number of Each Type	Maximum Required Number of Each Type
1st year	4	4	10
3rd year	4	4	10
5th year	4	4	10
10th year	2	3	5
15th year	2	3	5
20th year	2	3	5
25th year	2	3	5
30th year	2	3	5
35th year	2	3	5

NOTES:
(1) Fractional tendon numbers shall be rounded to the next higher integer. Actual number examined shall not be less than the minimum required number and need not be more than the maximum required number.
(2) The reduced sample size listed for the 10th year and subsequent inspections is applicable only if the acceptance criteria of IWL-3221.1 are met during each of the earlier inspections.
(3) A tendon type is defined by its geometry and position in the containment; e.g., hoop, vertical, dome, helical, and inverted U.

the exempted tendon, and shall be examined in accordance with IWL-2520.

(c) Each exempted tendon shall be examined in accordance with IWL-2524 and IWL-2525 to the extent that the end anchorages of the exempt tendon are accessible either during operation or at an outage.

IWL-2522 Tendon Force Measurements

(a) The prestressing force in all inspection sample tendons shall be measured by lift-off or an equivalent test.

(b) Equipment used to measure tendon force shall be calibrated in accordance with a calibration procedure prior to the first tendon force measurement and following the final tendon force measurement of the inspection period. Accuracy of the calibration shall be within 1.5% of the specified minimum ultimate strength of the tendon. If the post-test calibration differs from the pretest calibration by more than the specified accuracy tolerance, the results of the examination shall be evaluated.

IWL-2523 Tendon Wire and Strand Sample Examination and Testing

IWL-2523.1 Tendon Detensioning and Sample Removal. One sample tendon of each type shall be completely detensioned. A single wire or strand shall be removed from each detensioned tendon.

IWL-2523.2 Sample Examination and Testing

(a) Each removed wire or strand shall be examined over its entire length for corrosion and mechanical damage. The examination shall determine the location of most severe corrosion, if any. Strand wires shall be examined for wedge slippage marks.

(b) Tension tests shall be performed on each removed wire or strand: one at each end, one at mid-length, and one in the location of the most corroded area, if any. The following information shall be obtained from each test:

(1) yield strength
(2) ultimate tensile strength
(3) elongation

IWL-2523.3 Retensioning. Tendons that have been detensioned shall be retensioned to at least the force predicted for the tendon at the time of the test. However, the retensioning force shall not exceed 70% of the specified minimum ultimate tensile strength of the tendon based on the number of effective wires or strands in the tendon at the time of retensioning.

IWL-2524 Examination of Tendon Anchorage Areas

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IWL-2524.1 Visual Examination. A ~~VT-1~~ visual examination in accordance with IWA-2411 shall be performed on the tendon anchorage hardware, including bearing plates, anchorheads, wedges, buttonheads, shims, and the concrete extending outward a distance of 2 ft from the edge of the bearing plate. The following shall be documented:

(a) concrete cracks having widths greater than 0.01 in.;

(b) corrosion, broken or protruding wires, missing buttonheads, broken strands, and cracks in tendon anchorage hardware;

(c) broken wires or strands, protruding wires and detached buttonheads following retensioning of tendons which have been detensioned.

IWL-2524.2 Free Water Documentation. The quantity of free water contained in the anchorage end cap as well as any which drains from the tendon during the examination process shall be documented.

IWL-2525 Examination of Corrosion Protection Medium and Free Water

IWL-2525.1 Samples

(a) Samples of the corrosion protection medium shall

TABLE IWL-2525-1
CORROSION PROTECTION MEDIUM ANALYSIS

Characteristic	Test Method	Acceptance Limit
Water content	ASTM D 95	In course of preparation
Water soluble chlorides	ASTM D 512 [Note (1)]	10 ppm maximum
Water soluble nitrates	ASTM D 992 [Note (1)]	10 ppm maximum
Water soluble sulfides	APHA 427 [Note (1)] (Methylene blue)	10 ppm maximum
Reserve alkalinity (Base number)	ASTM D 974 Modified [Note (2)]	[Note (3)]

NOTES:

(1) *Water Soluble Ion Tests.* The inside (bottom and sides) of a one (1) liter beaker, approx. OD 105 mm, height 145 mm, is thoroughly coated with 100 ±10 grams of the sample. The coated beaker is filled with approximately 900 ml of distilled water and heated in an oven at a controlled temperature of 100°F (37.8°C) ±2°F for 4 hours. The water extraction is tested by the noted test procedures for the appropriate water soluble ions. Results are reported as PPM in the extracted water.

(2) *ASTM D 974 Modified.* Place 10 g of sample in a 500 ml Erlenmeyer flask. Add 10 cc isopropyl alcohol and 5 cc toluene. Heat until sample goes into solution. Add 90 cc distilled water and 20 cc $1NH_2SO_4$. Place solution on a steam bath for ½ hour. Stir well. Add a few drops of indicator (1% phenolphthalein) and titrate with 1NNaOH until the lower layer just turns pink. If acid or base solutions are not exactly 1N, the exact normalities should be used when calculating the base number. The Total Base Number (TBN), expressed as milligrams of KOH per gram of sample, is calculated as follows:

$$TBN = \frac{[(20)\ (N_A) - (B)\ (N_B)]\ 56.1}{W}$$

where

B = milliliters NaOH
N_A = normality of H_2SO_4 solution
N_B = normality of NaOH solution
W = weight of sample in grams

(3) The base number shall be at least 50% of the as-installed value, unless the as-installed value is 5 or less, in which case the base number shall be no less than zero. If the tendon duct is filled with a mixture of materials having various as-installed base numbers, the lowest number shall govern acceptance.

be taken from each end of each tendon examined. Free water shall not be included in the samples.

(b) Samples of free water shall be taken where water is present in quantities sufficient for laboratory analysis.

IWL-2525.2 Sample Analysis

(a) Corrosion protection medium samples shall be thoroughly mixed and analyzed for reserve alkalinity, water content, and concentrations of water soluble chlorides, nitrates, and sulfides. Analyses shall be performed in accordance with the procedures specified in Table IWL-2525-1.

(b) Free water samples shall be analyzed to determine pH.

IWL-2526 Removal and Replacement of Corrosion Protection Medium

The amount of corrosion protection medium removed at each anchorage shall be measured and the total amount removed from each tendon (two anchorages) shall be recorded. The total amount replaced in each tendon shall be recorded and differences between amount removed and amount replaced shall be documented.

ARTICLE IWL-3000
ACCEPTANCE STANDARDS

IWL-3100 PRESERVICE EXAMINATION

IWL-3110 CONCRETE SURFACE CONDITION

IWL-3111 Acceptance by Examination

The condition of the surface is acceptable if the Responsible Engineer determines that there is no evidence of damage or degradation sufficient to warrant further evaluation or repair.

IWL-3112 Acceptance by Evaluation

Items with examination results that do not meet the acceptance standards of IWL-3111 shall be evaluated as required by IWL-3300.

IWL-3113 Acceptance by Repair

Repairs required to reestablish acceptability of an item shall be completed as required by IWL-3300. Acceptable completion of the repair shall constitute acceptability of the item.

IWL-3120 UNBONDED POST-TENSIONING SYSTEM

The condition of the unbonded post-tensioning system is acceptable if it met the requirements of the construction specification at the time of installation.

IWL-3200 INSERVICE EXAMINATION

IWL-3210 CONCRETE SURFACE CONDITION

IWL-3211 Acceptance by Examination

The condition of the concrete surface is acceptable if the Responsible Engineer determines that there is no evidence of damage or degradation sufficient to warrant further evaluation or repair.

IWL-3212 Acceptance by Evaluation

Items with examination results that do not meet the acceptance standards of IWL-3211 shall be evaluated as required by IWL-3300.

IWL-3213 Acceptance by Repair

Repairs to reestablish the acceptability of an item shall be completed as required by IWL-3300. Acceptable completion of the repair shall constitute acceptability of the item.

IWL-3220 UNBONDED POST-TENSIONING SYSTEMS

IWL-3221 Acceptance by Examination

IWL-3221.1 Tendon Force. Tendon forces are acceptable if:

(a) the average of all measured tendon forces, including those measured in IWL-3221.1(b)(2), for each type of tendon is equal to or greater than the minimum required prestress specified at the anchorage for that type of tendon;

(b) the measured force in each individual tendon is not less than 95% of the predicted force unless the following conditions are satisfied:

(1) the measured force in not more than one tendon is between 90% and 95% of the predicted force;

(2) the measured forces in two tendons located adjacent to the tendon in IWL-3221.1(b)(1) are not less than 95% of the predicted forces; and

(3) the measured forces in all the remaining sample tendons are not less than 95% of the predicted force.

IWL-3221.2 Tendon Wire or Strand Samples. The condition of wire or strand samples is acceptable if:

(a) samples are free of physical damage;

(b) sample ultimate tensile strength and elongation be not less than minimum specified values.

IWL-3221.3 Tendon Anchorage Areas. The condition of tendon anchorage areas is acceptable if:

(a) there is no evidence of cracking in anchor heads, shims, or bearing plates;

(b) there is no evidence of active corrosion;

(c) broken or unseated wires, broken strands, and detached buttonheads were documented and accepted during a preservice examination or during a previous inservice examination;

(d) cracks in the concrete adjacent to the bearing plates do not exceed 0.01 in. in width.

IWL-3221.4 Corrosion Protection Medium. Corrosion protection medium is acceptable when the reserve alkalinity, water content, and soluble ion concentrations of all samples are within the limits specified in Table IWL-2525-1.

IWL-3222 Acceptance by Evaluation

Items with examination results that do not meet the acceptance standards of IWL-3221 shall be evaluated as required by IWL-3300.

IWL-3223 Acceptance by Repair or Replacement

Repairs or replacements to reestablish acceptability the condition of an item shall be completed as re- ired by IWL-3300. Acceptable completion of the repair or replacement shall constitute acceptability of the item.

IWL-3300 EVALUATION

IWL-3310 EVALUATION REPORT

Items with examination results that do not meet the acceptance standards of IWL-3100 or IWL-3200 shall be evaluated by the Owner. The Owner shall be responsible for preparation of an Engineering Evaluation Report stating the following:

(a) the cause of the condition which does not meet the acceptance standards;

(b) the acceptability of the concrete containment without repair of the item;

(c) whether or not repair or replacement is required and, if required, the extent, method, and completion date for the repair or replacement;

(d) extent, nature, and frequency of additional examinations.

IWL-3320 REVIEW BY AUTHORITIES

The Engineering Evaluation Report shall be subject to review by the regulatory and enforcement authorities having jurisdiction at the plant site.

ARTICLE IWL-4000
REPAIR PROCEDURES

IWL-4100 GENERAL

IWL-4110 SCOPE

This Article provides rules and requirements for repair of concrete containments.

IWL-4120 REPAIR/REPLACEMENT PROGRAM

(a) Repairs shall be performed in accordance with the Repair/Replacement Program required by IWA-4140.

(b) Repairs shall be completed in accordance with the Repair Plan of IWL-4200.

(c) The Repair/Replacement Program shall address concrete material control.

IWL-4200 REPAIR PLAN

The Repair Plan shall be developed under the direction of a Responsible Engineer (IWL-2500).

IWL-4210 CONCRETE REPAIR

(a) The Repair Plan shall specify requirements for removal of defective material.

(b) The affected area shall be visually examined to assure proper surface preparation of concrete and reinforcing steel prior to placement of repair material.

(c) When removal of defective material exposes reinforcing steel, the reinforcing steel shall receive a VT-1 visual examination. Reinforcing steel is acceptable when the Responsible Engineer determines that there is no evidence of damage or degradation sufficient to warrant further evaluation or repair. When required, reinforcing steel shall be repaired in accordance with IWL-4220. Repair of exposed-end anchors of the post-tensioning system shall be in accordance with IWL-4230.

(d) Repair material shall be chemically, mechanically, and physically compatible with existing concrete.

(e) When detensioning of prestressing tendons is required for repair of the concrete surface adjacent to the tendon, the Repair Plan shall require the following:

(1) selection of repair material to minimize stress and strain incompatibilities between repair material and existing concrete;

(2) procedures for application of repair material;

(3) procedures for detensioning and retensioning of prestressing tendons.

(f) The Repair Plan shall specify requirements for in-process sampling and testing of repair material.

IWL-4220 REPAIR OF REINFORCING STEEL

Damaged reinforcing steel shall be repaired by any method permitted in the original Construction Code or in Section III, Division 2, with or without removal of the damaged reinforcing steel.

IWL-4230 REPAIR OF THE POST-TENSIONING SYSTEM

(a) Weld repair of bearing plates and shim plates of the post-tensioning system shall meet the applicable requirements of IWA-4000. The corrosion protection medium shall be restored following the repair.

(b) Procedures for detensioning and retensioning of prestressing tendons shall be specified in the Repair Plan.

IWL-4300 EXAMINATION

The repaired area shall be examined in accordance with IWL-2000 to establish a new preservice record and shall meet the acceptance standards of IWL-3000.

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ARTICLE IWL-5000
SYSTEM PRESSURE TESTS

IWL-5100 SCOPE

This Article provides requirements for pressure testing concrete containments following repair or replacement.

IWL-5200 SYSTEM TEST REQUIREMENTS

IWL-5210 GENERAL

A containment pressure test shall be performed following repair or replacement unless any of the following conditions exist:

(a) The Engineering Evaluation Report (IWL-3310) demonstrates that the structural integrity of containment in the existing unrepaired condition has not been reduced below that required by the original design criteria.

(b) The repair or replacement affects only the cover concrete external to the outermost layer of structural reinforcing steel or post-tensioning tendons.

(c) The repair or replacement involves only exchange of post-tensioning tendons, tendon anchorage hardware, shims, or corrosion protection medium.

IWL-5220 TEST PRESSURE

The pressure test shall be conducted at the design basis accident pressure, P_a.

IWL-5230 LEAKAGE TEST

If the repair or replacement penetrated the containment metallic liner, or otherwise breached containment leak-tight integrity, a leakage rate test shall be conducted as required by IWE-5000.

IWL-5240 SCHEDULE OF PRESSURE TEST

If the repair or replacement is performed with the plant shutdown, the pressure test shall be conducted prior to resumption of operation. If the repair or replacement is performed with the plant in operation, the pressure test may be deferred until the next scheduled integrated leak-rate test.

IWL-5250 TEST PROCEDURE AND EXAMINATIONS

The pressure test shall be conducted in accordance with a detailed procedure prepared under the direction of the Responsible Engineer. The surface of all containment concrete placed during repair or replacement operations shall be examined by VT-1 examination prior to start of pressurization, at test pressure, and following completion of depressurization. Extended surface examinations, additional examinations during pressurization, other examinations, and measurements of structural response to pressure shall be conducted as specified by the Responsible Engineer.

IWL-5260 CORRECTIVE MEASURES

If the surface examinations of IWL-5250 cannot satisfy the requirements specified by the Responsible Engineer, the area shall be examined to the extent necessary to establish requirements for corrective action. Repairs shall be performed in accordance with IWL-4000, and pressure testing shall be repeated in accordance with IWL-5200, prior to returning the containment to service.

IWL-5300 REPORT

A pressure test report shall be prepared under the direction of the Responsible Engineer. This report may be an addition to a previously-prepared Engineering Evaluation Report (IWL-3310). The report shall describe pressure test procedures and examination results and shall state whether or not the repair or replacement is acceptable. If the repair or replacement is not acceptable, the report shall specify corrective measures.

ARTICLE IWL-7000
REPLACEMENTS

IWL-7100 GENERAL REQUIREMENTS

IWL-7110 SCOPE

(a) This Article provides rules and requirements for reinstallation and replacement of post-tensioning system items for concrete containments.

(b) Grease caps and installation screws are exempt from the requirements of this Article.

IWL-7120 REPLACEMENT PROGRAM

The following items, as applicable, shall be contained in the Replacement Plan:

(a) requirements for removal of items that are to be replaced;

(b) surface preparation required prior to installation of replacement items;

(c) examinations required prior to installation of replacement items;

(d) detensioning and retensioning requirements for tendons affected by installation of replacement items;

(e) requirements and procedures applicable to installation of replacement items;

(f) in-process sampling and testing requirements to be performed during installation of replacement items.

ATTACHMENT B – NRC REGULATORY GUIDE 1.35, REVISION 3

U.S. NUCLEAR REGULATORY COMMISSION

Revision 3
July 1990

REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

REGULATORY GUIDE 1.35
(TASK SC 810-4)

INSERVICE INSPECTION OF UNGROUTED TENDONS IN PRESTRESSED CONCRETE CONTAINMENTS

A. INTRODUCTION

General Design Criterion 53, "Provisions for Containment Testing and Inspection," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires, in part, that the reactor containment be designed to permit (1) periodic inspection of all important areas and (2) an appropriate surveillance program. This guide describes a basis acceptable to the NRC staff for developing an appropriate inservice inspection and surveillance program for ungrouted tendons[1] in prestressed concrete containment structures of light-water-cooled reactors.

The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

Any information collection activities mentioned in this regulatory guide are contained as requirements in 10 CFR Part 50, which provides the regulatory basis for this guide. The information collection requirements in 10 CFR Part 50 have been cleared under OMB Clearance No. 3150-0011.

B. DISCUSSION

Following the issuance for public comment of the proposed Revision 3 of this regulatory guide (Task SC 810-4) and of the accompanying proposed Regulatory Guide 1.35.1 (Task SC 807-4) in April 1979, the NRC Office of Research awarded a contract to Oak Ridge National Laboratory (ORNL). The contract work included evaluating actual inspections performed by licensees, the methods of implementing Revision 2 of this guide, and the opinions and problems of utilities, A/Es, vendors, etc., related to Revision 2 of this regulatory guide. The contractor also considered the pertinent portion of the January 1982 draft version of "Inservice Inspection of Concrete Pressure Components," developed by a Working Group of ASME Section XI, in making final suggestions for modifying this guide. These suggestions were published in NUREG/CR-2719.[2]

This guide has been revised to reflect public comments, suggestions from ORNL, and additional staff review.

Regulatory Position 1 provides general information on the applicability of the guide, frequency of inservice inspections, and inspections when there are two containments at a site.

Regulatory Position 2 delineates the method of determining sample size and emphasizes random sampling. If random sampling can not be assured, it is acceptable to select representative samples from

[1]For the purpose of this guide, a tendon is defined as a separate continuous multiwire or multistrand tensioned element anchored at both ends to an end anchorage assembly.

[2]NUREG/CR-2719, "Evaluation of Inservice Inspections of Greased Prestressing Tendons," by J. R. Dougan, Nuclear Regulatory Commission, September 1982. Available for sale from the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082, or from the National Technical Information Service, Springfield, VA 22161.

between the pairs of buttresses and from various heights. The samples for each inspection may be selected any time prior to the inspection. Since inspections can be performed when the plant is operating, there may be certain areas where inspection of a randomly selected tendon might result in some radiological exposure to the inspecting personnel. The position provides for substituting a readily accessible tendon for such a tendon.

Regulatory Position 3 describes the areas and extent of visual examinations during each inspection.

Regulatory Position 4 presents the criteria for performing prestress monitoring tests.

Regulatory Position 5 states the extent and scope of tendon material testing.

Regulatory Position 6 lists items that should be considered in the inspection of sheathing filler grease. In order to assess the potential grease leakage, a recommendation is made to compare the amount of sheathing filler grease removed with that being replaced.

Regulatory Position 7 discusses the individual criteria for evaluating inspection results as follows:

In Regulatory Position 7.1, prestress monitoring criteria have been developed to ensure that any signs of systematic tendon force degradation are detected and investigated. Acceptance of 95% of the predicted force for two tendons out of three in Regulatory Position 7.1.3 is a slightly relaxed criterion from Revision 2 of the guide. It should be recognized, however, that the primary objective is to compare the measured tendon forces against the predicted forces at the time of the lift-off testing. Regulatory Guide 1.35.1 provides guidance on establishing the predicted forces.

A provision has been added to check the average of measured forces against the minimum required force in an average (hypothetical) tendon in a group. This provision is added as a result of a suggestion from the contractor (ORNL) and public comments. It should be recognized that each individual tendon force (measured) will have to be modified to reflect the condition of an average tendon. The contributing modifying factors would be the difference in installation forces and in the elastic shortening losses, assuming the time-dependent characteristics remain essentially the same for the group of tendons.

The loss of prestress from creep and shrinkage of concrete and stress relaxation of the tendon steel are time-dependent and are predicted on such a basis. The predicted tendon force may be represented by a sloped line in a semi-logarithmic graph. The trend of the actual effective tendon force is obtained by joining the points on the graph representing the measured tendon forces in two or more surveillances of the same tendon or tendons in a group. By extending the trend line, one can determine when the effective tendon force will be below the minimum required.

Regulatory Position 7.2 provides a means of tracking elongations during lift-off testing. The 10% tolerance in elongations at specific loads of retensioned tendons should include the effect of differential friction (from fully greased vs. coated tendons) and errors attributed to calibration, measurement procedures, and equipment.

Regulatory Position 7.4 provides detailed guidance on the results of the grease examination.

The incident of tendon anchor head failures at Farley demonstrated that the free water in grease was the main source of hydrogen for hydrogen stress cracking of high-hardness anchor heads. High-hardness anchor heads are used in large-size tendon systems (i.e., ≥750 tons). Since the small-size (≤750 tons) tendons have not exhibited such characteristics, two limits for water are provided. It should be recognized that these limits are not the threshold limits for distress in anchor heads. When these limits are exceeded, it is advisable to detension the tendon and look for cracks on the shim side of the anchor heads.

An assessment of a base number for filler grease has been proposed for new grease in ASME Section III, Division 2, and for new and old grease in ASME Section XI. The grease used in many operating plants tends to have a low base number (≤5). The newer grease formulations tend to have base numbers in excess of 20. Hence, two acceptance limits have been provided.

At least two plants that implemented the detailed grease examination criteria experienced problems with the void limit of 5%. Further inquiry into the matter revealed that when the injection pressure was very high (twice the pressure used during installation of grease), the amount of grease replaced was 10 to 15% higher than that removed. The staff discourages this practice, as there is a likelihood of tearing the sheathing joints at such pressures, opening a way for grease to seep into the concrete. Hence, Regulatory Position 7.4 has been revised to reflect this consideration.

The NRC staff encourages operating plant licensees to review their existing tendon inservice inspection programs and evaluate them from the standpoint of operating convenience, safety improvements, and cost reduction potential.

The NRC staff recognizes that in some older plants (plants operating before the initial issuance of Regulatory Guide 1.35 in 1974), adopting all provisions of this revised guide may not be feasible without extensive retrofitting. In such cases, licensees are advised to present their revised inservice inspection programs with any necessary exemptions from the specific provisions of this guide. If licensees adopt this Revision 3 to Regulatory Guide 1.35, it should be adopted in its entirety, not just segments of the guide.

C. REGULATORY POSITION

1. GENERAL

1.1. The inservice inspection program described in this guide should be used with the following types of prestressed concrete containment structures:

a. Prestressed concrete containments having a shallow-dome roof on cylindrical walls with the cylinder prestressed in hoop and vertical directions and the dome prestressed by three families of tendons at 60°.

b. Prestressed concrete containments having a hemispherical-dome roof on cylindrical walls with two families of inverted U tendons placed at 90° to each other and hoop tendons located in the cylinder and dome.

1.2. For containments that differ from these two types, the program described should serve as the basis for the development of a comparable inservice inspection program.

1.3. The inservice inspection should be performed 1, 3, and 5 years after the initial structural integrity test (ISIT) and every 5 years thereafter.

1.4. Containments should be designed and constructed so that the prestressing anchor hardware is accessible for inservice inspection.

1.5. All containment structures with ungrouted tendons should be inspected in accordance with this guide. However, the liftoff force comparison may be performed as shown in Figure 1 if any two containments at the same site are shown to satisfy all three of the following conditions:

a. The containments are identical in all aspects such as size, tendon system, design, materials of construction, and method of construction.

b. Their ISITs were performed within two years of each other.

c. There is no unique situation that may subject either containment to a different potential for structural or tendon deterioration.

For both containments, the visual and filler grease inspection should be performed according to Regulatory Positions 3 and 6 at frequencies described in Regulatory Position 1.3.

2. SAMPLE SELECTION

2.1. For the inspections at 1, 3, and 5 years, 4% of the population of each group (vertical, hoop, dome, and inverted U) of tendons should be selected randomly with a minimum of four tendons from each group. The sample size from any group need not exceed ten.

2.2. If the inspections performed at 1, 3, and 5 years indicate no abnormal degradation of the post-tensioning system, 2% of the population of each group (vertical, hoop, dome, and inverted U) of tendons or five tendons, whichever is less, may be selected for the subsequent inspection with a minimum of three tendons for each group.

2.3. The fraction obtained as a percentage of a tendon population should be rounded off to the nearest integer.

2.4. The tendons to be inspected should be randomly selected from each group during each inspection. However, to develop a history and to correlate the observed data, one tendon from each group should be kept unchanged after the initial selection, and these unchanged tendons should be identified as control tendons.

2.5. If, owing to plant operating conditions, a randomly selected tendon from a group cannot be inspected during a scheduled inspection, another sample from the group should be randomly selected. The tendon that was selected but not inspected should be inspected during the following plant shutdown and accepted (or rejected) on an individual tendon basis.

2.6. Tendons, except the control tendons, that had been inspected and found intact during previous inspections should be excluded from the group population during subsequent inspections.

3. VISUAL INSPECTION

3.1. The exterior surface of the containment should be visually examined to detect areas of large spall,[3] severe scaling, D-cracking in an area of 25 square feet or more, other surface deterioration or disintegration, or grease leakage.

3.2. Tendon anchorage assembly hardware (such as bearing plates, stressing washers, shims, wedges, and buttonheads) of all tendons selected as described in Regulatory Position 2 should be visually examined. For those containments for which only visual inspections need be performed, tendons selected as described in Regulatory Position 2 should be visually examined to the extent practical without dismantling load-bearing components of the anchorage or removing grease caps.

3.3. Bottom grease caps of all vertical tendons should be visually inspected to detect grease leakage or grease cap deformations. Removal of grease caps is not necessary for this inspection.

[3]The terms "large spall," "severe scaling," "D-cracking," "deterioration" and "disintegration" are as defined in the American Concrete Institute publication, ACI 201.1R-68, "Guide for Making a Condition Survey of Concrete in Service." The publication can be obtained from the American Concrete Institute, Redford Station, Detroit, Michigan 48219.

3.4. Concrete surrounding visually inspected tendon anchorages should also be checked visually for indications of abnormal material behavior.

4. PRESTRESS MONITORING TESTS

Tendons selected as described in Regulatory Position 2 should be subjected to liftoff or other equivalent tests to monitor their prestress. Additionally, the tests should include the following:

4.1. One tendon, randomly selected from each group of tendons during each inspection, should be subjected to necessary detensioning in order to identify broken or damaged wires or strands.

4.2. The simultaneous measurement of elongation and jacking force during retensioning should be made at a minimum of three approximately equally spaced levels of force between zero and the lock-off force.

5. TENDON MATERIAL TESTS AND INSPECTIONS

5.1. A previously stressed tendon wire or strand from one tendon of each group should be removed for testing and examination over its entire length to determine if evidence of corrosion or other deleterious effects is present. At each successive inspection, the samples should be selected from different tendons. The tendon selected may be the same as that selected for detensioning. In addition, all wires or strands identified as broken should be removed for tensile testing and visual examination.

5.2. Tensile tests should be made on at least three samples cut from each removed wire or strand, one at each end and one at mid-length. The samples should be the maximum length practical for testing and the gauge length for the measurement of elongation should be in accordance with the relevant ASTM specification. The following information should be obtained from each test:

1. Yield strength
2. Ultimate tensile strength
3. Elongation at ultimate tensile strength

6. INSPECTION OF FILLER GREASE

A sample of sheathing filler grease from each of the sample tendons should be taken and analyzed according to the following national standards.

1. To determine water content, ASTM D95, "Standard Test Methods for Water in Petroleum Products and Bituminous Materials by Distillation."[4]
2. To determine reserve alkalinity, ASTM D974, "Standard Test Methods for Neutralization Number by Color-Indicator Titration."[4,5]
3. To determine the concentrations of water-soluble chlorides, ASTM D512, "Standard Test Methods for Chloride Ion in Water."[4]
4. To determine nitrates, ASTM D3867, "Standard Test Methods for Nitrite-Nitrate in Water"[4] (formerly ASTM D992).
5. To determine sulfides, APHA 428, "Standard Methods for Examination of Water and Waste Water."[6]

In addition, the amount of sheathing filler grease removed and replaced should be compared to assess grease leakage within the structure.

7. EVALUATION OF INSPECTION RESULTS

7.1. The prestressing force measured for each tendon in the tests described in Regulatory Position 4 should be compared with the limits predicted for the time of that test. Regulatory Guide 1.35.1 provides further information on the determination of these limits.

7.1.1. If the measured prestressing force of the selected tendon in a group lies above the prescribed lower limit, the liftoff test is considered to be a positive indication of the sample tendon's acceptability.

7.1.2. If the measured prestressing force of a selected tendon in a group lies between 95% of the prescribed lower limit and 90% of the prescribed lower limit, two additional tendons, one on each side of the first tendon, should be checked for their prestressing forces. If the prestressing forces of each of the second and third tested tendons are above 95% of the prescribed lower limits for the tendons, all three tendons should be restored to the required level of integrity and the tendon group should be considered acceptable.

7.1.3. In Regulatory Position 7.1.2, if the prestressing force of any two adjoining tendons falls below 95% of the prescribed lower limits of the tendons, additional lift-off testing should be done to detect the cause and extent of such occurrence. The condition should be considered reportable.

7.1.4. If the measured prestressing force of the selected tendon lies below 90% of the prescribed lower limit, the defective tendon should be fully investigated and a determination should be made as to the extent and cause of such occurrence. Such an occurrence should be considered a reportable condition.

[4]ASTM Standards can be obtained from the American Society of Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

[5]Modified by Note 3 of Table CC-2422-1 of the ASME B&PV, Section III, Div. 2, 1982 Winter Addenda.

[6]APHA Standards can be obtained from the American Public Health Association, 1015 Eighteenth Street NW., Washington, DC 20036.

7.1.5. If the average of all measured tendon forces for each group (corrected for average condition) is found to be less than the minimum required prestress level (as defined in the plant's Technical Specifications) at anchorage location for that group, the condition should be considered reportable.

7.1.6. If from consecutive surveillances the measured prestressing forces for the same tendon or tendons in a group indicate a trend of prestress loss larger than expected and the resulting prestressing forces will be less than the minimum required for the group before the next scheduled surveillance, additional lift-off testing should be done to determine the cause and extent of such occurrence. The condition should be considered reportable.

7.2. During detensioning and retensioning of tendons (Regulatory Position 4.2), if the elongation corresponding to a specific load differs by more than 10% from that recorded during installation of the tendons, an investigation should be made to ensure that the difference is not related to wire failures or slip of wires in anchorages. A difference of more than 10% should be considered reportable.

7.3. Failure in the tensile test at a strength or elongation value less than the minimum requirements of the tendon material should be considered reportable. Other conditions that indicate corrosion (metal reduction) found by visually examining wire or strands should be considered reportable.

7.4. Reportable conditions for sampled sheathing filler grease include:

a.	Water content	Exceeding 10% by wt
b.	Chlorides	Exceeding 10 ppm
c.	Nitrates	Exceeding 10 ppm
d.	Sulfides	Exceeding 10 ppm
e.	Reserve alkalinity (Base numbers)	Less than 50% of the installed value or less than zero when the installed value was less than 5

f. Amount of grease replaced exceeds 5% of the net duct volume, when injected at the original installation pressure.

g. Grease leakage detected during general visual examination of the containment exterior surface.

h. Presence of free water.

8. REPORTING TO THE NRC

The reportable conditions listed in Regulatory Positions 7.1.3, 7.1.4, 7.1.5, 7.3, or 7.4 could indicate a possible abnormal degradation of the containment structure (a boundary designed to contain radioactive materials). Any such condition should be reported to the NRC in accordance with the recommended reporting program of Regulatory Guide 1.16, "Reporting of Operating Information—Appendix A Technical Specifications."

The NRC staff recognizes that for some containment designs, adoption of all provisions of this guide may not be feasible. In those cases, licensees should present alternatives for those provisions of the guide they are unable to implement.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC staff's plans for using this regulatory guide.

Except in those cases in which the applicant or licensee proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the methods described herein will be used in the evaluation of inservice inspection and surveillance programs for the following nuclear power plants using prestressed concrete containments with ungrouted tendons:

1. Plants for which the construction permit or design approval is issued after July 31, 1990.
2. Plants for which the licensee voluntarily commits to the provisions of this guide.

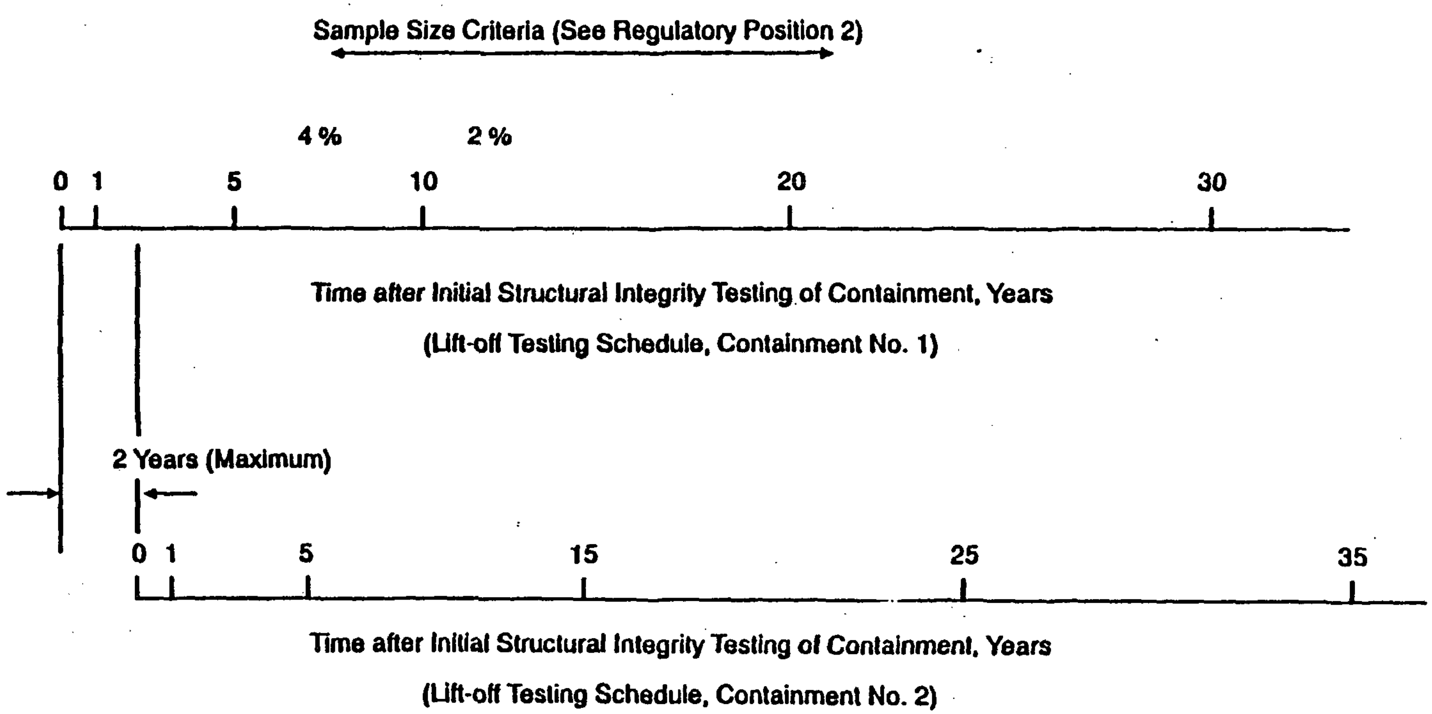

Figure 1. Schedule of Lift-off Testing for Two Containments at a Site
(See Regulatory Position 1.5)

REGULATORY ANALYSIS

A separate regulatory analysis was prepared for this Revision 3 to Regulatory Guide 1.35. The regulatory analysis is contained in NUREG/CR-4712, "Regulatory Analysis of Regulatory Guide 1.35 (Revision 3, Draft 2)—In-Service Inspection of Ungrouted Tendons in Prestressed Concrete Containments" (February 1987), and is available for inspection or copying for a fee in the Commission's Public Document Room, 2120 L Street NW., Lower Level, Washington, DC. NUREG/CR-4712 is also for sale at the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082, and at the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

ATTACHMENT C – CR-N991-100, "PREDICTED BASE FORCES"

DOCUMENT COVER SHEET

Document No: CR-N991-001

Title: PREDICTED BASE FORCES FOR THE 30^{TH} YEAR CONTAINMENT IWL INSPECTION

PSC
MASTER COPY
INITIAL CEC DATE 8/8/07

2	Addition of Write-Up	B.A. GIOMETTI	08/08/07	C.E. COX	08/08/07
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		PSC SIGN OFF			
REVISIONS					

TABLE OF CONTENTS

1.0 PURPOSE AND OBJECTIVE

The purpose of this calculation is to provide tendon force curves for Florida Power Corporation for the Crystal River Unit 3 facility in support of the upcoming 8TH tendon surveillance period scheduled for the Fall of 2007. The following information and calculations here within are based upon FPC Calculation S-95-0082 and PSC Calculation N750-001. The same design process will be utilized for generating the tendon force curves for the current tendon surveillance. Specific tasks to be performed as part of this scope include the following:

1.1 Determine the predicted tendon losses and develop force/time curves for each of the selected tendons for the eighth surveillance period. Generate the tendon force curves for the selected tendons and the tendons adjacent to the selected tendons.

1.2 In addition to the current force curves developed, calculation CR-N991-001 supports all tendon force calculations for any period for the selected individual tendon.

2.0 DESIGN INPUT

Design input information has been reviewed and can be found in FPC calculation S-95-0082. These calculations have included all force losses, which the surveillance tendons have incurred since original installation. The original installations cards are in Appendix-A. Data taken from these sheets include the effective wires and the original tendon force at installation.

3.0 SCOPE AND TENDON SELECTION

Tendons were selected for the eighth surveillance period by Florida Power Corporation and distributed to Precision Surveillance Corporation. The tendons selected for the eighth surveillance are listed below.

UNIT 3 – CRYSTAL RIVER 30TH YEAR SURVEILLANCE SCOPE OF WORK		
VERTICALS	HOOPS	DOMES
12V01(C)	13H36	D129
45V20	42H46	D212(C)
61V17	46H21(C)	D238(D)
34V17(A)	51H34(D)	D337(A)
	62H30	
	46H07(A)	
(C) – COMMON	(D) – DETENSION	(A) - ALTERNATE

4.0 CALCULATIONS

4.1 General Background

Tendon forces curves are to be prepared for the upcoming 8th tendon surveillance period at CR3. From the basic criteria as presented in Calculation S-95-0082, the supporting work for this surveillance will be based upon those calculations.

4.1.1 Tendon losses have been calculated in the past per the Reference 8, 9, 10 and 11 of Calculation S-95-0082. The individual losses include the following.

4.1.1.1 Force loss due to elastic shortening of the containment as a result of the prestressing process and the particular sequence of tendon stressing.

4.1.1.2 Force loss due to the stress relaxation of the tendon wires.

4.1.1.3 Loss of prestress force due to the creep characteristics of the concrete structure.

4.1.1.4 Loss of prestress force due to the shrinkage of the concrete structure.

4.1.2 Based on the work previously accomplished in the prior surveillances, new spreadsheets were prepared this surveillance using Microsoft Excel for the collection of input data and for the calculation of tendon losses needed for generation for the force curves. The generation of the force curves was also automated this surveillance by using Excel to plot the graphs. The organization of most data used for this calculation was setup into Excel workbooks with subfiles built and included in each workbook. There is a separate workbook for each of the three tendon groups and each one contains the following:

4.1.2.1 Tabulated input data.

4.1.2.2 Original tendon stressing sequences.

4.1.2.3 Effective wire summaries.

4.1.2.4 Original Stressing Data

4.1.2.5 Separate sheets including each tendon loss spreadsheet, plot data and an individual force curve.

4.2 Schedule Information

4.2.1 The expected timing for the eighth surveillance is Fall 2007. A date of October 1, 2007 will be used as basis for determining the predicted values of Base, 95% Base and 90% Base and labeling this information on the force curves. A vertical line will be shown on the force curves at the point of the eighth surveillance and the calculated values of Base, 95% Base and 90% Base representing points on the curves at that time will be included on each of the curves.

4.3 General Procedure for Force Curve Generation

The same procedure within the calculation for the preparation of the force curves for the fourth, fifth, sixth and seventh surveillance periods will be followed.

4.3.1 Preparation of Data Input Spreadsheets

4.3.1.1 In each of the Excel workbooks is a data input file where data from source calculations and current tendon history sheets has been tabulated. See Appendix-A for tendon history sheets.

4.3.2 Procedure for Determination of Individual Tendon Losses

The procedure for the tendon loss calculations, as derived from the reference documentation, is as follows:

4.3.2.1 Calculate original force in the tendons.

$$ORIG_{FORCE} = 0.7 x F_{ULT} x \left(\frac{ActualLiftoffpressure}{PredictedLiftoffpressure} \right) x WireFactor$$

Where: F_{ult} (Kip Force) = Tendon Area (in^2) x f_{ult} (ksi) = 0.05985 x 240

f_{ult} = 240 ksi, typical for all CR3 wires.

Wire Area = 0.07685 in^2

Tendon Area (in^2) = Area/Wire (in^2) x No. of Wires. (Considered by wire factor.)

4.3.2.1.1 Actual and predicted original liftoff pressures are obtained from the Tendon History Sheets. See Appendix-A for Tendon History Sheets.

4.3.2.1.2 The above expression was used as the basis for the calculations for all of the shop and field end forces calculated on the Data Input Spreadsheets. This procedure does not apply to retensioned tendons.

4.3.2.1.3 Note that the wire factor as shown in the various spreadsheets is a value representing the tabulated number of effective wires over a total of 163. The number of wires is usually 163 unless cut, loose or considered ineffective. The number of effective wires as recorded from the original installation is documented on the tendon history sheets.

4.3.2.1.4 Note that the wire factor used is based on current information and is not based on the number of wires at the time of installation, therefore the original Force calculated may not be the "original force" in the tendon back at that time. The effect of less effective wires lowers the curve vertically. This is insignificant at the current time as the curve of interest will be correct for use at this time.

4.3.2.2 Calculate Elastic Shortening Losses

4.3.2.2.1 The elastic shortening losses are a function of the stressing sequence number for the individual tendon. In addition, the tendon wire factors are also considered and used. The base expression used to calculate these forces is the same as used in previous calculations and is already built into the basic spreadsheet templates. All the equations for elastic shortening were confirmed as being the same as established in prior calculations. Based on the review of the procedure for calculating these losses, it is concluded that the existing templates are still appropriate and correct with the additional input of stressing sequence data and wire factors to be input for the current group of tendons for this surveillance.

4.3.2.2.2 The original stressing sequences and data input worksheets for all tendons are at the beginning of each design input/output of the three types of tendons. See Appendix-A for tendon wire factor and source data.

4.3.2.2.3 Elastic Shortening Losses for Dome Tendons

4.3.2.2.3.1 There are two expressions used for elastic shortening for the dome tendons depending on the stress sequence numbers. For dome tendons in sequences 1 through 27, the Domelow template is used. For tendons in sequences 28 through 32, the Domehigh template is to be used. This is because of the two separate expressions used for the calculation.

Elastic Shortening Losses:

For Dome Tendons in Sequences 1 through 27
N = 27 Total Sequences
n = Sequence of particular tendon.

Force Loss due to elastic shortening = F_{les}

$$F_{les} = \left[\left[\frac{(N-n)}{N}\right]x(82.7)+75\right]xWireFactor$$

Elastic Shortening Losses:

For Dome Tendons in Sequences 28 through 32
N = 5 (Sequences 28 through 32)
n = Sequence number less 27

i.e. for sequence 28, n = 1
for sequence 29, n = 2
for sequence 30, n = 3
for sequence 31, n = 4
for sequence 32, n = 5

$$F_{les} = \left[\left[\frac{(N-n)}{N}\right]x(47.4)-13.7\right]xWireFactor$$

4.3.2.2.3.2 The value for elastic shortening in kips declines as the stressing sequence increases. A review of the data for the dome group show that values for the dome group goes from 154.6 kips for sequence 1 tendons down to 75 kips for sequence 27 tendons, and further going down to –13.7 kips for the last sequence, sequence 32. Note that wire factor differences between individual tendons will cause the calculated result to vary slightly for two tendons within the same stressing sequence.

4.3.2.2.4 Elastic Shortening Losses for Hoop Tendons:

N = 60 Total Sequences.
n = Sequence of particular tendon.
Force Loss due to elastic shortening =

$$F_{les} = \left[\frac{(N-n))}{N}x134.0\right]xWireFactor$$

4.3.2.2.4.1 A review of the data for the hoop tendon group shows that the range of values for the calculated elastic shortening goes from 127.3 kips for sequence 3 tendons down to 0 kips for the last tendon sequence, sequence 60.

4.3.2.2.5 Elastic Shortening Losses for Vertical Tendons:

N = 31 Total Sequences.
n = Sequence of particular tendon.
Force Loss due to elastic shortening:

$$F_{les} = \left[\frac{(N-n))}{N}x134.0\right]xWireFactor$$

4.3.2.2.5.1 A review of the data for the vertical tendon group shows that the range of values calculated for elastic shortening goes from 71.1 kips for sequence 1 tendons down to 4.7 kips for sequence 29 tendons. There are a total of 31 stressing sequences for the vertical tendons.

4.3.2.3 Calculate Wire Stress Relaxation Losses

4.3.2.3.1 Wire stress relaxation losses and the procedure for the determination of these losses for the 4th, 5th, 6th and 7th surveillances are addressed in previous calculations. The original wire relaxation curve, as provided by test data from the wire vendor, forms the bases for wire relaxation loss values. It was determined that the same procedures and figures as calculated in those prior calculations are still applicable for this surveillance.

4.3.2.3.2 Note that there were adjustments made to the original stress relaxation values from the vendor relaxation curve to allow for some conservatism and for temperature consideration of 100° F vs. 68° F. Also, per the original design, the wire factor or actual number of effective wires was considered as negligible for these losses and was not included. Note that values for stress relaxation range between 40 and 50 kips for the surveillance period for all three tendon groups.

4.3.2.4 Calculate Creep Losses

4.3.2.4.1 Original concrete creep calculations can be found in Calculation 2-95-0082. The losses are based on the curve contained in the reference calculation. Creep values are different for each of the three groups of tendons. For the dome tendons in the coming surveillance period, creep values are the same and are approximately 152 to 158 kips. Hoop values are between 79 and 83 kips and verticals are 36 to 38 kips.

4.3.2.5 Calculate Shrinkage Losses

4.3.2.5.1 Original losses from shrinkage were taken from Calculation S-95-0082. The straight line shrinkage losses in micro inches per inch as calculated in the previously stated calculation are still applicable for this surveillance period. Tabulated values from the references were input into the dome, hoop and vertical spreadsheets. There are no additional variables or considerations, and the same values are to be used for this calculation. From a review of the output information, the dome values are constant at 8 to 9 kips, hoop values are above 5 kips and verticals are also slightly above 5 kips.

4.3.2.6 Total Losses

4.3.2.6.1 Calculated force losses for elastic shortening, wire stress relaxation, creep and shrinkage are added for a total of all losses. Also, a percent of this total of all losses is calculated based on the original average force in the tendon.

4.3.2.7 Determine Predicted Forces for Base, 95% Base and 90% Base values

4.3.2.7.1 The original force, less the total of losses calculated yields the base predicted value for the subject period of surveillance inspection. The 95% and 90% values are then calculated based on the calculated predicted base value.

4.3.2.8 Normalization Factors

4.3.2.8.1 Normalization factors are calculated based on the expressions and the source article contained in Attachment 1 of Calculation S-95-0082. This factor usually does not change much over the forty-year time span of the calculation. The base expression for the dome normalization factor value is presented as follows:

$$(A - B) \times (1 - C) + (D - 97.7)$$

Where:
A = Average of all Domes group.
B = Original average tendon force.
C = Wire Stress Relaxation Percentage.
D = Elastic Shortening.

As an example, Dome tendon D212 calculates as follows:

Normalization Factor = (1639 – 1600) x (1 – 0.0291) + (75 – 97.7)

Normalization Factor = +15 (which matches the spreadsheet calculation.)
Similar calculations are completed for the hoop and vertical tendons.

4.3.2.9 Plotting of Data

4.3.2.9.1 Only the data from Column B, L, M, & N are tabulated on a separate area on the side of the spreadsheet. See columns R, S, T & U; Rows 40 through 50. Only these values are selected for plotting on the force curves. This is for ease of plotting and has no affect on the quality or accuracy of the plots.

4.3.2.9.2 The plots of all dome curves with all the data point showed the force curve plot line as slightly crooked from a true linear plot. The large scale used showed some inflection points slightly off of linear. After investigation, the condition was avoided by omitting data points at year 10 and 15 after SIT for the final plotted figures. This was done on for presentation purposes and there is no affect on the accuracy of the plot or the base values calculated and presented on each curve.

4.4 INDIVIDUAL TENDON LOSSES CALCULATION WORKSHEET: NOTES AND LEGEND

4.4.1 Individual tendon losses are calculated based on the procedure presented in the preceding section. The following notes explain the spreadsheet process, input and calculations performed for each of the columns presented. The shaded values on the losses worksheet are extracted from the data input worksheet.

CALCULATION LEGEND

COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
A	Inspection Period after SIT	I	Shrinkage Force
B	Years after Concrete Placement	J	Total Force Loss
C	Elastic Shortening	K	Total Percent Loss
D	Stress Relaxation Percent	L	Base
E	Stress Relaxation Forces	M	95% Base
F	Creep Strain	N	90% Base
G	Creep Strain Force	O	Normalization Factor
H	Shrinkage Values		

5.0 SUMMARY OF PREDICTED FORCES

PREDICTED FORCES				
TENDON	PREDICTED BASE (KIPS)	95% PREDICTED BASE (KIPS)	90% PREDICTED BASE (KIPS)	NORMALIZATION FACTORS
61V24	1529	1452	1376	-14
12V01	1525	1449	1372	-9
12V02	1596	1516	1437	-80
45V19	1484	1409	1335	+31
45V20	1507	1432	1357	+7
45V21	1533	1456	1380	-19
61V16	1523	1447	1371	-8
61V17	1498	1423	1348	+17
61V18	1493	1418	1344	+21
46H20	1467	1394	1321	-39
46H21	1441	1369	1297	-12
46H22	1486	1412	1337	-57
51H33	1392	1323	1253	+36
51H34	1487	1413	1339	-59
51H35	1348	1281	1213	+79
42H45	1473	1399	1325	-44
42H46	1456	1383	1310	-28
42H47	1425	1354	1283	+3
13H35	1373	1304	1235	+56
13H36	1484	1410	1336	-56
13H37	1368	1299	1231	+61
62H29	1421	1350	1279	+7
62H30	1413	1342	1272	+14
62H31	1475	1401	1328	-46
D128	1268	1205	1141	+53
D129	1287	1223	1159	+34
D130	1261	1198	1135	+60
D211	1305	1239	1174	+18
D212	1305	1240	1175	+15
D213	1312	1246	1180	+10
D237	1426	1335	1283	-104
D238	1348	1281	1213	-26
D239	1409	1338	1268	-88

(shaded) = Surveillance Tendon

(unshaded) = Adjacent Tendon

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
12V01	7	34V01	4	56V01	1
12V02	27	34V02	21	56V02	27
12V03	16	34V03	13	56V03	10
12V04	27	34V04	23	56V04	27
12V05	8	34V05	5	56V05	2
12V06	25	34V06	26	56V06	27
12V07	9	34V07	14	56V07	11
12V08	28	34V08	30	56V08	27
12V09	17	34V09	30	56V09	3
12V10	28	34V10	23	56V10	28
12V11	28	34V11	31	56V11	12
12V12	28	34V12	25	56V12	27
12V13	1	34V13	16	56V13	4
12V14	20	34V14	28	56V14	24
12V15	10	34V15	7	56V15	13
12V16	23	34V16	28	56V16	24
12V17	11	34V17	26	56V17	29
12V18	21	34V18	8	56V18	24
12V19	2	34V19	17	56V19	14
12V20	31	34V20	26	56V20	24
12V21	3	34V21	9	56V21	5
12V22	21	34V22	25	56V22	23
12V23	12	34V23	18	56V23	15
12V24	21	34V24	25	56V24	23
23V01	1	45V01	7	61V01	4
23V02	19	45V02	20	61V02	22
23V03	10	45V03	16	61V03	13
23V04	19	45V04	30	61V04	22
23V05	2	45V05	8	61V05	6
23V06	20	45V06	19	61V06	25
23V07	11	45V07	30	61V07	14
23V08	20	45V08	17	61V08	25
23V09	3	45V09	9	61V09	5
23V10	23	45V10	18	61V10	26
23V11	12	45V11	1	61V11	15
23V12	23	45V12	19	61V12	26
23V13	4	45V13	22	61V13	7
23V14	24	45V14	20	61V14	26
23V15	13	45V15	10	61V15	16
23V16	23	45V16	20	61V16	26
23V17	5	45V17	2	61V17	8
23V18	24	45V18	20	61V18	26
23V19	14	45V19	11	61V19	17
23V20	24	45V20	21	61V20	29
23V21	6	45V21	30	61V21	9
23V22	24	45V22	21	61V22	26
23V23	24	45V23	12	61V23	18
23V24	24	45V24	22	61V24	26

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	12V13	23V01	45V11	56V01			
2	12V19	23V05	45V17	56V05			
3	12V21	23V09	56V09				
4	23V13	34V01	56V13	61V01			
5	23V17	34V05	56V21	61V09			
6	23V21	61V05					
7	12V01	34V15	45V01	61V13			
8	12V05	34V18	45V05	61V17			
9	12V07	34V21	45V09	61V21			
10	12V15	23V03	45V15	56V03			
11	12V17	23V07	45V19	56V07			
12	12V23	23V11	45V23	56V11			
13	23V15	34V03	56V15	61V03			
14	23V19	34V07	56V19	61V07			
15	56V23	61V11					
16	12V03	34V13	45V03	61V15			
17	12V09	34V19	45V08	61V19			
18	34V23	45V10	61V23				
19	23V02	23V04	45V06	45V12			
20	12V14	23V06	23V08	45V02	45V14	45V16	45V18
21	12V18	12V22	12V24	34V02	45V20	45V22	
22	45V13	45V24	61V02	61V04			
23	12V16	23V10	23V12	23V16	34V04	34V10	56V22
23	56V24						
24	23V14	23V18	23V20	23V22	23V23	23V24	56V14
24	56V16	56V18	56V20				
25	12V06	34V12	34V22	34V24	61V06	61V08	
26	34V06	34V17	34V20	61V10	61V12	61V14	61V16
26	61V18	61V22	61V24				
27	12V02	12V04	56V02	56V04	56V06	56V08	56V12
28	12V08	12V10	12V11	12V12	34V14	34V16	56V10
29	56V17	61V20					
30	34V08	34V09	45V04	45V07	45V21		
31	12V20	34V11					

Note:
Data extracted from Reference 11 of Calculation S-95-0082.

VERTICAL TENDONS DATA INPUT

Ref.: CALCULATION S-95-0082

Initial Concrete Stress = 967.0 (ksi)
Average Force = 1644.0 (kips)
Total Stress Sequence (N) = 31
Total Elastic Shortening = 73.5

Tendon No.	Lift-off Pressure (ksi) (1) Shop End Predicted	Shop End Actual	Field End Predicted	Field End Actual	Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips) Shop End (5)	Field End (5)	Remarks (3)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
61V24	6870	6775	N/A	N/A	26	163	1.000	1634	N/A	
12V1	6800	6950	N/A	N/A	7	163	1.000	1675	N/A	S,C
12V2	6800	7050	N/A	N/A	27	163	1.000	1699	N/A	
45V19	6810	6750	N/A	N/A	11	163	1.000	1624	N/A	
45V20	6810	6750	N/A	N/A	21	163	1.000	1624	N/A	S
45V21	6800	6800	N/A	N/A	30	162	0.994	1629	N/A	
61V16	6870	6825	N/A	N/A	26	163	1.000	1628	N/A	
61V17	6870	6900	N/A	N/A	8	163	1.000	1646	N/A	S,D
61V18	6870	6700	N/A	N/A	26	163	1.000	1598	N/A	

Notes:
(1) Ref. Crystal River 3 R/B Tendon History Sheets - Vertical Tendons for Original Stressir
(2) Ref. Crystal River 3 Tendon Surveillance Loss Calculations, Tendon Stress Sequence, Pages 28 and 2
(3) S =Selected Tendons, C =Control tendon, D =Detensioned tendon, A =Alternate tend
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacen
(4) Wire factors are calculated based on the number of effective wires divided by 163.
(5) Original forces calculated based on the expression in S-95-008:

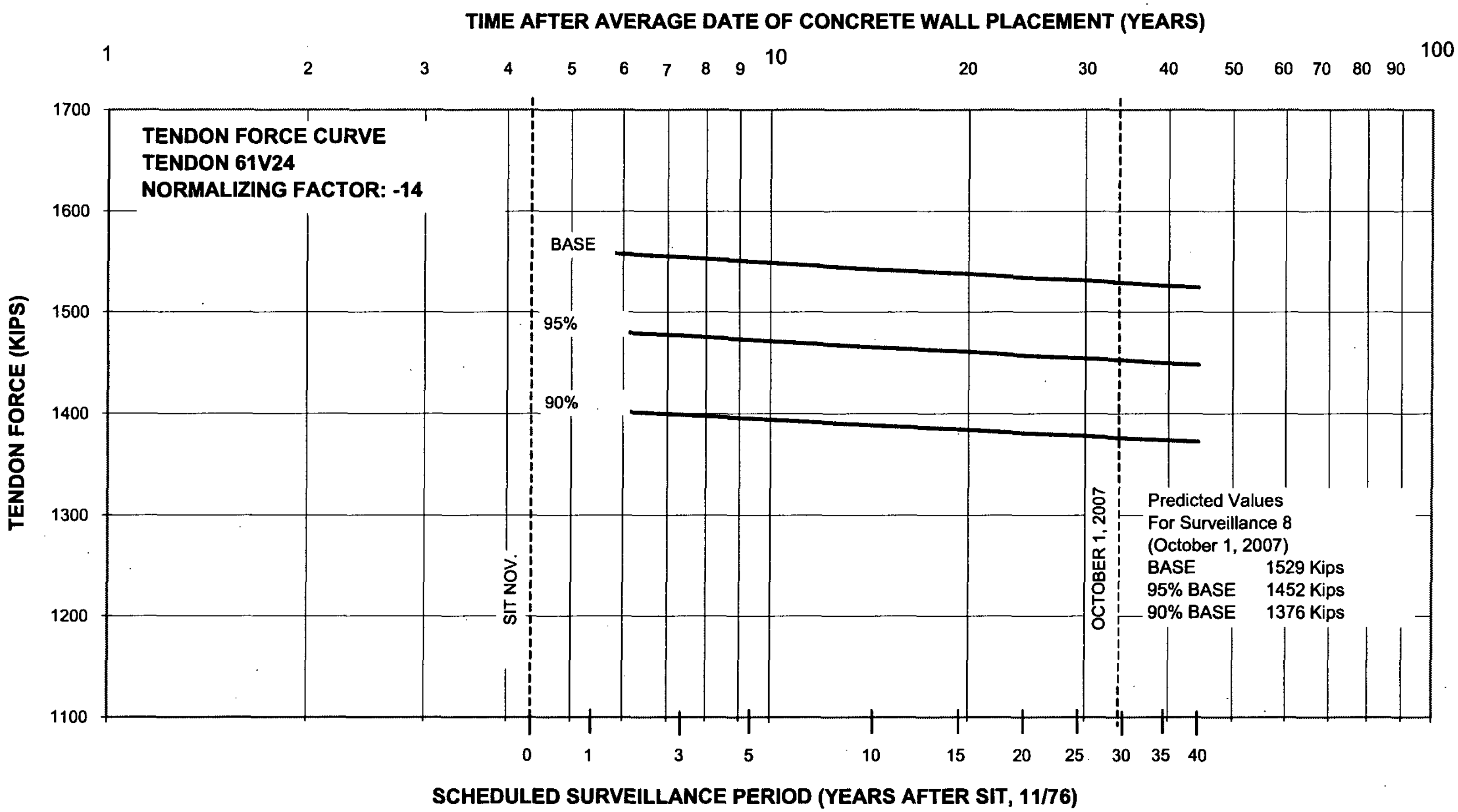
TENDON: 61V24 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1634 FIELD: 1634 AVERAGE: 1634 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 26 *OF* 31 *TOTAL ELASTIC SHORT. LOSS:* 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	11.9	2.57%	42.3	0.096	18.6	6.0	1.7	74.5	4.56%	1560	1482	1404	-14
3	7.4	11.9	2.60%	42.7	0.117	22.6	8.5	2.4	79.6	4.87%	1554	1477	1399	-14
5	9.4	11.9	2.68%	44.1	0.130	25.4	10.0	2.8	84.2	5.15%	1550	1472	1395	-14
10	14.4	11.9	2.76%	45.4	0.157	30.5	13.5	3.8	91.6	5.60%	1542	1465	1388	-14
15	19.4	11.9	2.81%	46.2	0.173	33.3	15.5	4.4	95.8	5.86%	1538	1461	1384	-14
17	21.4	11.9									1537	1460	1383	
20	24.4	11.9	2.87%	47.2	0.188	36.1	17.5	4.9	100.1	6.12%	1534	1457	1381	-14
21:3	25.65	11.9									1533	1457	1380	
25	29.4	11.9	2.89%	47.3	0.197	37.8	19.5	5.5	102.5	6.27%	1532	1455	1378	-14
30	34.4	11.9	2.91%	47.8	0.207	39.8	20.4	5.8	105.3	6.44%	1529	1452	1376	-14
35	39.4	11.9	2.93%	48.2	0.216	41.5	21.5	6.1	107.7	6.59%	1526	1450	1374	-14
40	44.4	11.9	2.95%	48.5	0.221	42.6	22.5	6.4	109.4	6.69%	1525	1448	1372	-14
25	29.4										1532	1455	1378	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 61V24
NORMALIZING FACTOR: -14
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values
For Surveillance 8
(October 1, 2007)
BASE 1529 Kips
95% BASE 1452 Kips
90% BASE 1376 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

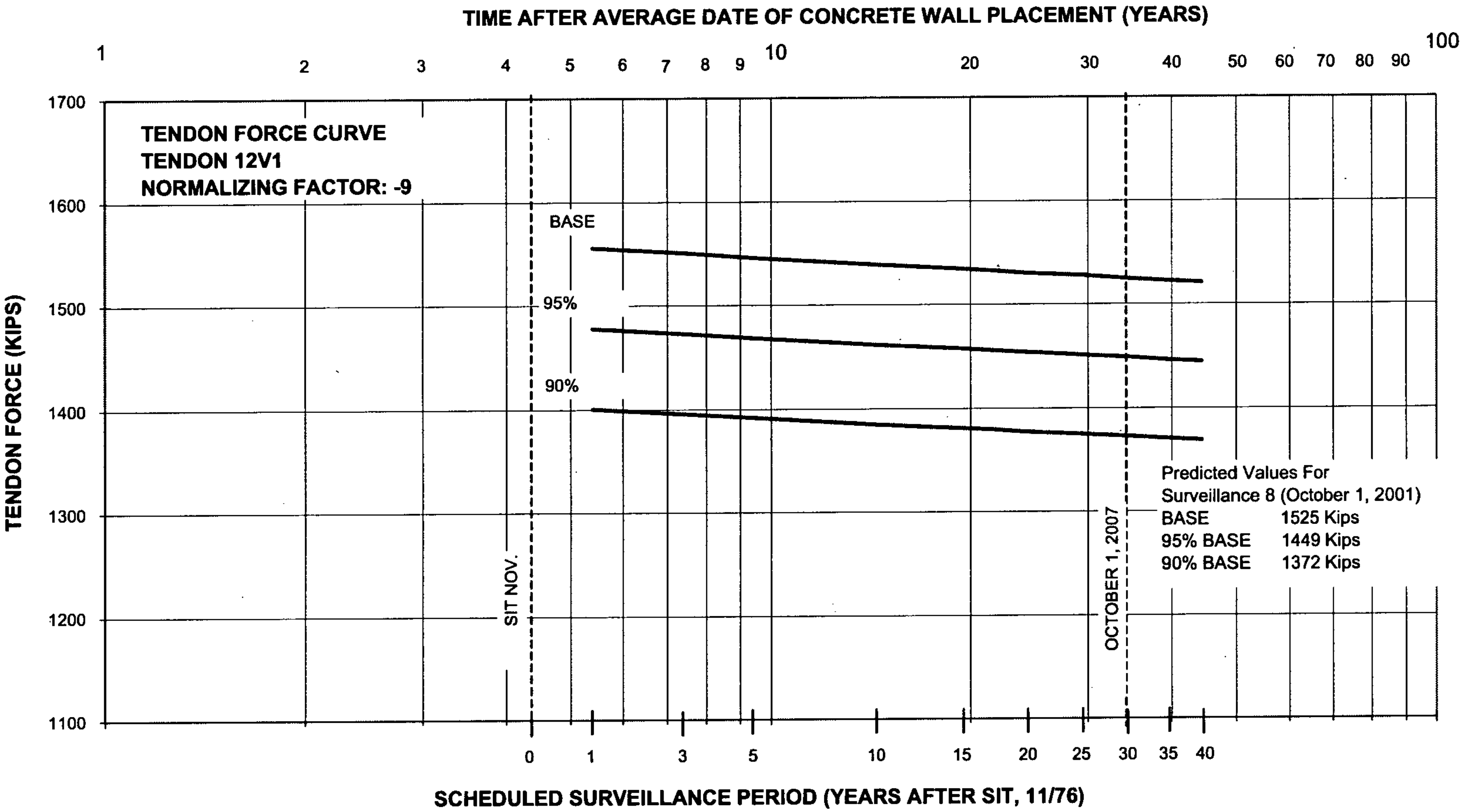
TENDON: 12V1 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1675 FIELD: 1675 AVERAGE: 1675 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 7 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	56.9	2.57%	42.3	0.096	18.6	6.0	1.7	119.5	7.13%	1556	1478	1400	-9
3	7.4	56.9	2.60%	42.7	0.117	22.6	8.5	2.4	124.6	7.44%	1550	1473	1395	-9
5	9.4	56.9	2.68%	44.1	0.130	25.4	10.0	2.8	129.2	7.71%	1546	1469	1391	-9
10	14.4	56.9	2.76%	45.4	0.157	30.5	13.5	3.8	136.6	8.16%	1538	1462	1385	-9
15	19.4	56.9	2.81%	46.2	0.173	33.3	15.5	4.4	140.8	8.41%	1534	1458	1381	-9
17	21.4	56.9									1533	1456	1379	
20	24.4	56.9	2.87%	47.2	0.188	36.1	17.5	4.9	145.1	8.66%	1530	1453	1377	-9
21:3	25.65	56.9									1529	1453	1376	
25	29.4	56.9	2.89%	47.3	0.197	37.8	19.5	5.5	147.5	8.81%	1528	1451	1375	-9
30	34.4	56.9	2.91%	47.8	0.207	39.8	20.4	5.8	150.3	8.97%	1525	1449	1372	-9
35	39.4	56.9	2.93%	48.2	0.216	41.5	21.5	6.1	152.7	9.12%	1522	1446	1370	-9
40	44.4	56.9	2.95%	48.5	0.221	42.6	22.5	6.4	154.4	9.22%	1521	1445	1369	-9
25	29.4										1528	1451	1375	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 12V1
NORMALIZING FACTOR: -9
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE (KIPS)
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2001)
BASE 1525 Kips
95% BASE 1449 Kips
90% BASE 1372 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

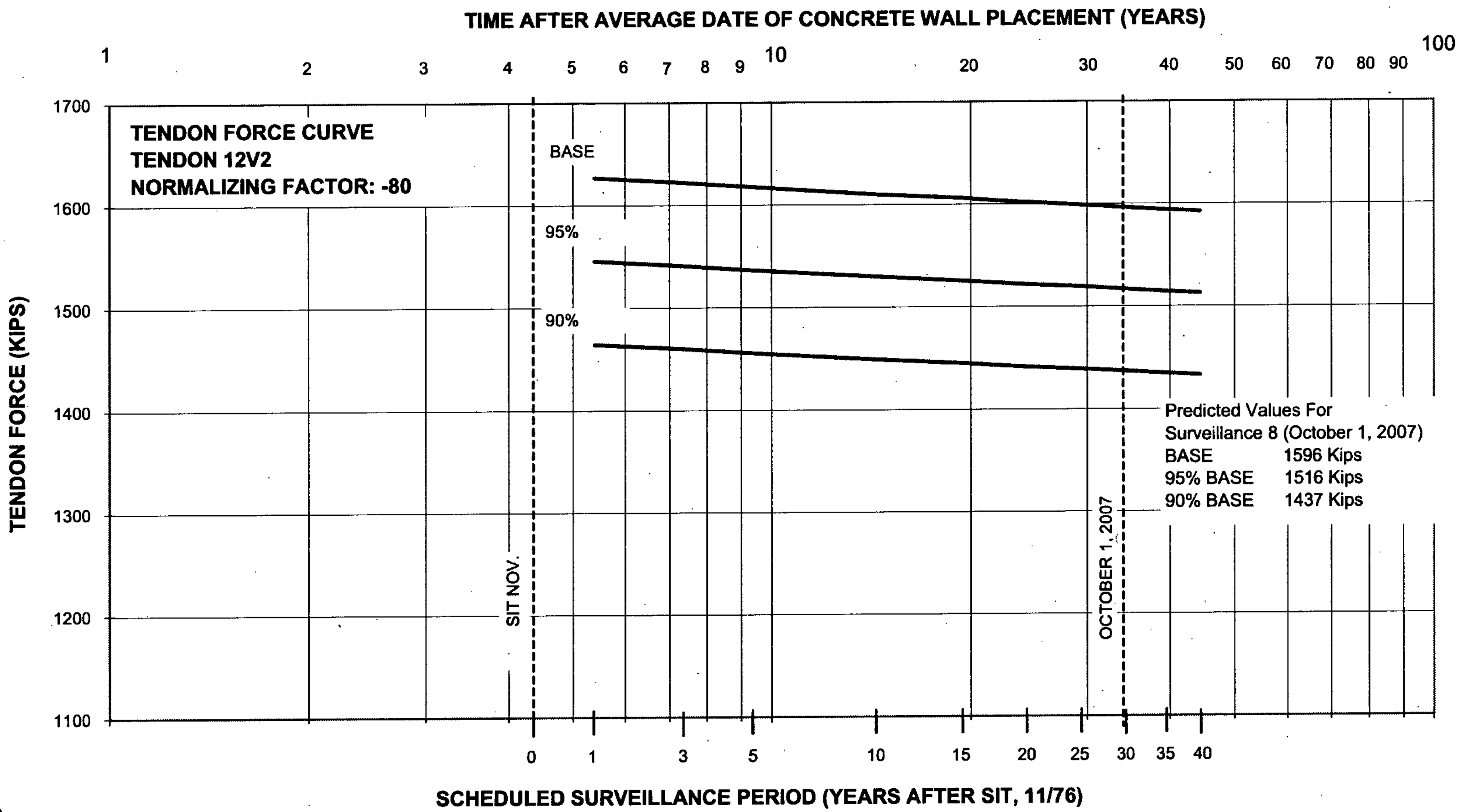
TENDON: 12V2 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1699 FIELD: 1699 AVERAGE: 1699 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 27 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	9.5	2.57%	42.3	0.096	18.6	6.0	1.7	72.1	4.24%	1627	1546	1464	-80
3	7.4	9.5	2.60%	42.7	0.117	22.6	8.5	2.4	77.2	4.54%	1622	1541	1460	-80
5	9.4	9.5	2.68%	44.1	0.130	25.4	10.0	2.8	81.8	4.81%	1617	1537	1456	-80
10	14.4	9.5	2.76%	45.4	0.157	30.5	13.5	3.8	89.2	5.25%	1610	1530	1449	-80
15	19.4	9.5	2.81%	46.2	0.173	33.3	15.5	4.4	93.4	5.50%	1606	1526	1445	-80
17	21.4	9.5									1604	1524	1444	
20	24.4	9.5	2.87%	47.2	0.188	36.1	17.5	4.9	97.7	5.75%	1602	1521	1441	-80
21:3	25.65	9.5									1601	1521	1441	
25	29.4	9.5	2.89%	47.3	0.197	37.8	19.5	5.5	100.1	5.89%	1599	1519	1439	-80
30	34.4	9.5	2.91%	47.8	0.207	39.8	20.4	5.8	102.9	6.05%	1596	1516	1437	-80
35	39.4	9.5	2.93%	48.2	0.216	41.5	21.5	6.1	105.3	6.20%	1594	1514	1435	-80
40	44.4	9.5	2.95%	48.5	0.221	42.6	22.5	6.4	107.0	6.30%	1592	1513	1433	-80
25	29.4										1599	1519	1439	



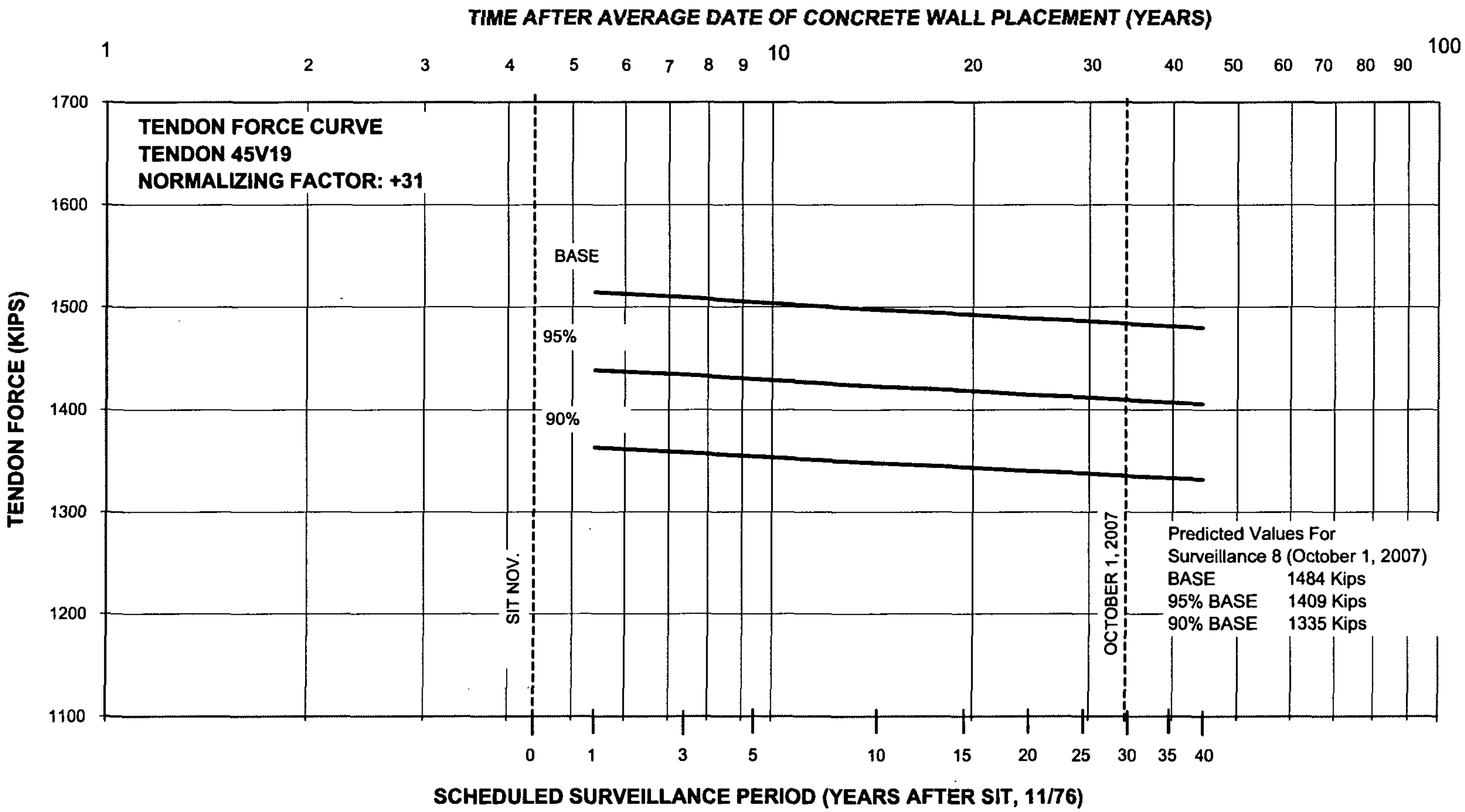
TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 12V2
NORMALIZING FACTOR: -80
BASE
95%
90%
TENDON FORCE (KIPS)
1700
1600
1500
1400
1300
1200
1100
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1596 Kips
95% BASE 1516 Kips
90% BASE 1437 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 45V19 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1624 AVERAGE: 1624 AVERAGE ALL VERT TENDONS: 1644
STRESS SEQUENCE: 11 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	47.4	2.57%	42.3	0.096	18.6	6.0	1.7	110.0	6.77%	1514	1439	1363	31
3	7.4	47.4	2.60%	42.7	0.117	22.6	8.5	2.4	115.1	7.09%	1509	1434	1358	31
5	9.4	47.4	2.68%	44.1	0.130	25.4	10.0	2.8	119.7	7.37%	1505	1430	1354	31
10	14.4	47.4	2.76%	45.4	0.157	30.5	13.5	3.8	127.1	7.83%	1497	1423	1348	31
15	19.4	47.4	2.81%	46.2	0.173	33.3	15.5	4.4	131.3	8.08%	1493	1419	1344	31
17	21.4	47.4									1491	1417	1342	
20	24.4	47.4	2.87%	47.2	0.188	36.1	17.5	4.9	135.6	8.35%	1489	1414	1340	31
21:3	25.65	47.4									1488	1414	1339	
25	29.4	47.4	2.89%	47.3	0.197	37.8	19.5	5.5	138.0	8.50%	1486	1412	1338	31
30	34.4	47.4	2.91%	47.8	0.207	39.8	20.4	5.8	140.8	8.67%	1484	1409	1335	31
35	39.4	47.4	2.93%	48.2	0.216	41.5	21.5	6.1	143.2	8.82%	1481	1407	1333	31
40	44.4	47.4	2.95%	48.5	0.221	42.6	22.5	6.4	144.9	8.92%	1480	1406	1332	31
25	29.4										1486	1412	1338	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 45V19
NORMALIZING FACTOR: +31
TENDON FORCE (KIPS)
1700
1600
1500
1400
1300
1200
1100
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1484 Kips
95% BASE 1409 Kips
90% BASE 1335 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

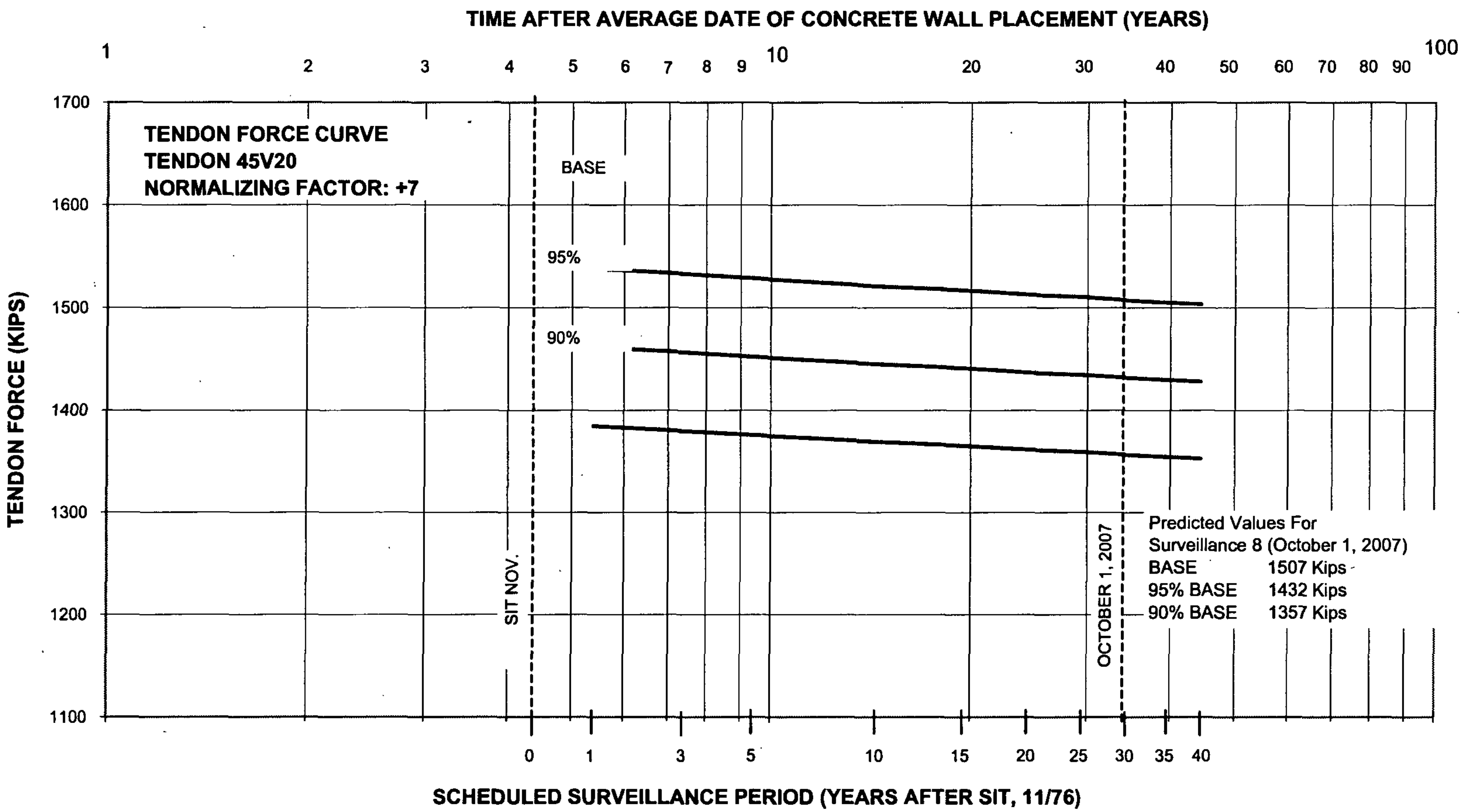
TENDON: 45V20 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1624 AVERAGE: 1624 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 21 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: SP. CR. (*.0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	23.7	2.57%	42.3	0.096	18.6	6.0	1.7	86.3	5.31%	1538	1461	1384	7
3	7.4	23.7	2.60%	42.7	0.117	22.6	8.5	2.4	91.4	5.63%	1533	1456	1380	7
5	9.4	23.7	2.68%	44.1	0.130	25.4	10.0	2.8	96.0	5.91%	1528	1452	1376	7
10	14.4	23.7	2.76%	45.4	0.157	30.5	13.5	3.8	103.4	6.37%	1521	1445	1369	7
15	19.4	23.7	2.81%	46.2	0.173	33.3	15.5	4.4	107.6	6.62%	1517	1441	1365	7
17	21.4	23.7									1515	1439	1364	
20	24.4	23.7	2.87%	47.2	0.188	36.1	17.5	4.9	111.9	6.89%	1513	1437	1361	7
21:3	25.65	23.7									1512	1436	1361	
25	29.4	23.7	2.89%	47.3	0.197	37.8	19.5	5.5	114.3	7.04%	1510	1435	1359	7
30	34.4	23.7	2.91%	47.8	0.207	39.8	20.4	5.8	117.1	7.21%	1507	1432	1357	7
35	39.4	23.7	2.93%	48.2	0.216	41.5	21.5	6.1	119.5	7.36%	1505	1430	1354	7
40	44.4	23.7	2.95%	48.5	0.221	42.6	22.5	6.4	121.2	7.46%	1503	1428	1353	7
25	29.4										1510	1435	1359	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 45V20
NORMALIZING FACTOR: +7
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1507 Kips
95% BASE 1432 Kips
90% BASE 1357 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

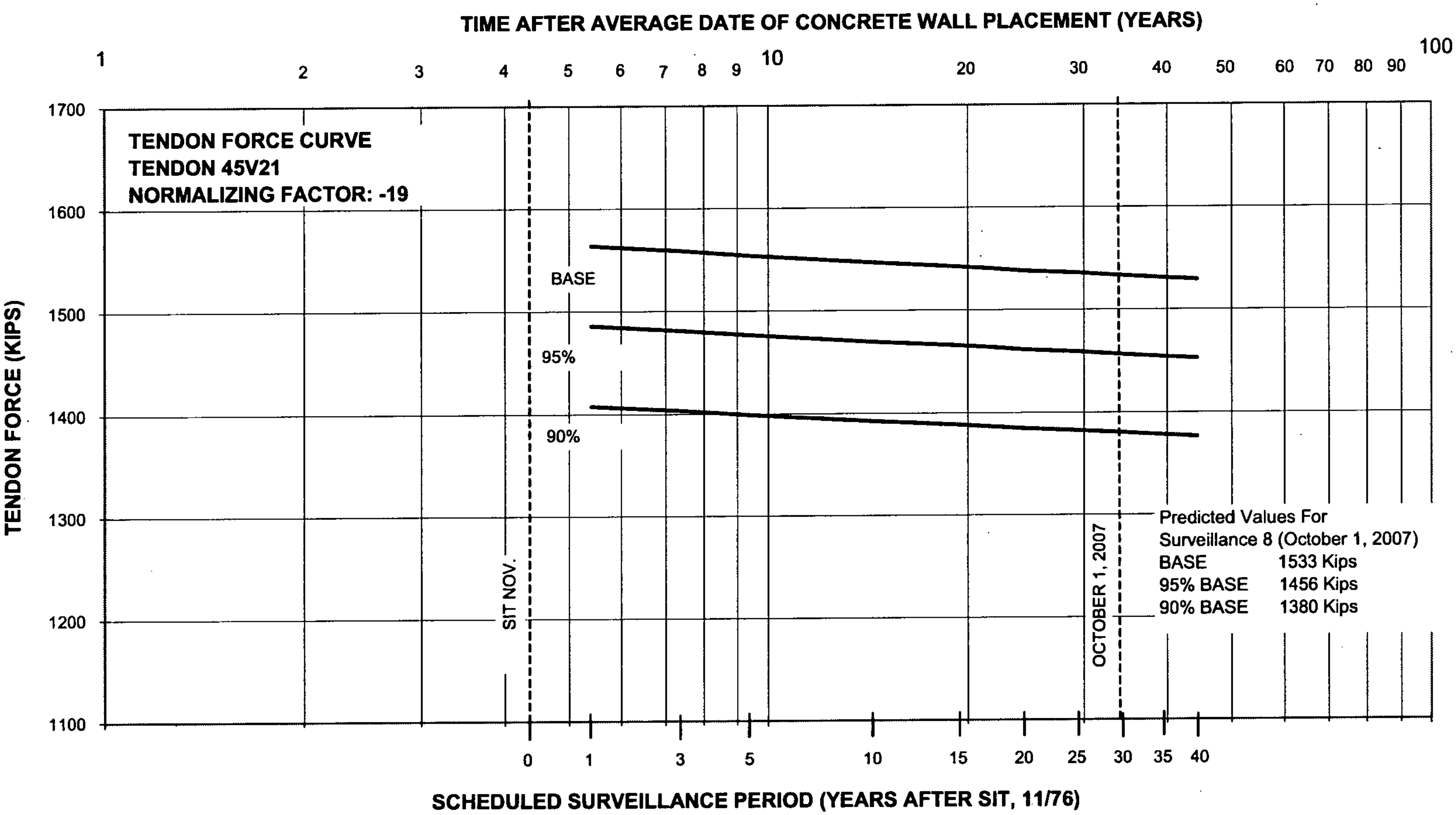
TENDON: 45V21 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1629 FIELD: 1629 AVERAGE: 1629 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 30 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	2.4	2.57%	42.3	0.096	18.6	6.0	1.7	65.0	3.99%	1564	1486	1408	-18
3	7.4	2.4	2.60%	42.7	0.117	22.6	8.5	2.4	70.1	4.30%	1559	1481	1403	-18
5	9.4	2.4	2.68%	44.1	0.130	25.4	10.0	2.8	74.7	4.58%	1554	1477	1399	-18
10	14.4	2.4	2.76%	45.4	0.157	30.5	13.5	3.8	82.1	5.04%	1547	1469	1392	-18
15	19.4	2.4	2.81%	46.2	0.173	33.3	15.5	4.4	86.3	5.30%	1543	1465	1388	-18
17	21.4	2.4									1541	1464	1387	
20	24.4	2.4	2.87%	47.2	0.188	36.1	17.5	4.9	90.6	5.56%	1538	1461	1384	-19
21:3	25.65	2.4									1538	1461	1384	
25	29.4	2.4	2.89%	47.3	0.197	37.8	19.5	5.5	93.0	5.71%	1536	1459	1382	-19
30	34.4	2.4	2.91%	47.8	0.207	39.8	20.4	5.8	95.8	5.88%	1533	1456	1380	-19
35	39.4	2.4	2.93%	48.2	0.216	41.5	21.5	6.1	98.2	6.03%	1531	1454	1378	-19
40	44.4	2.4	2.95%	48.5	0.221	42.6	22.5	6.4	99.9	6.13%	1529	1453	1376	-19
25	29.4										1536	1459	1382	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 45V21
NORMALIZING FACTOR: -19
TENDON FORCE (KIPS)
1700 1600 1500 1400 1300 1200 1100
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1533 Kips
95% BASE 1456 Kips
90% BASE 1380 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

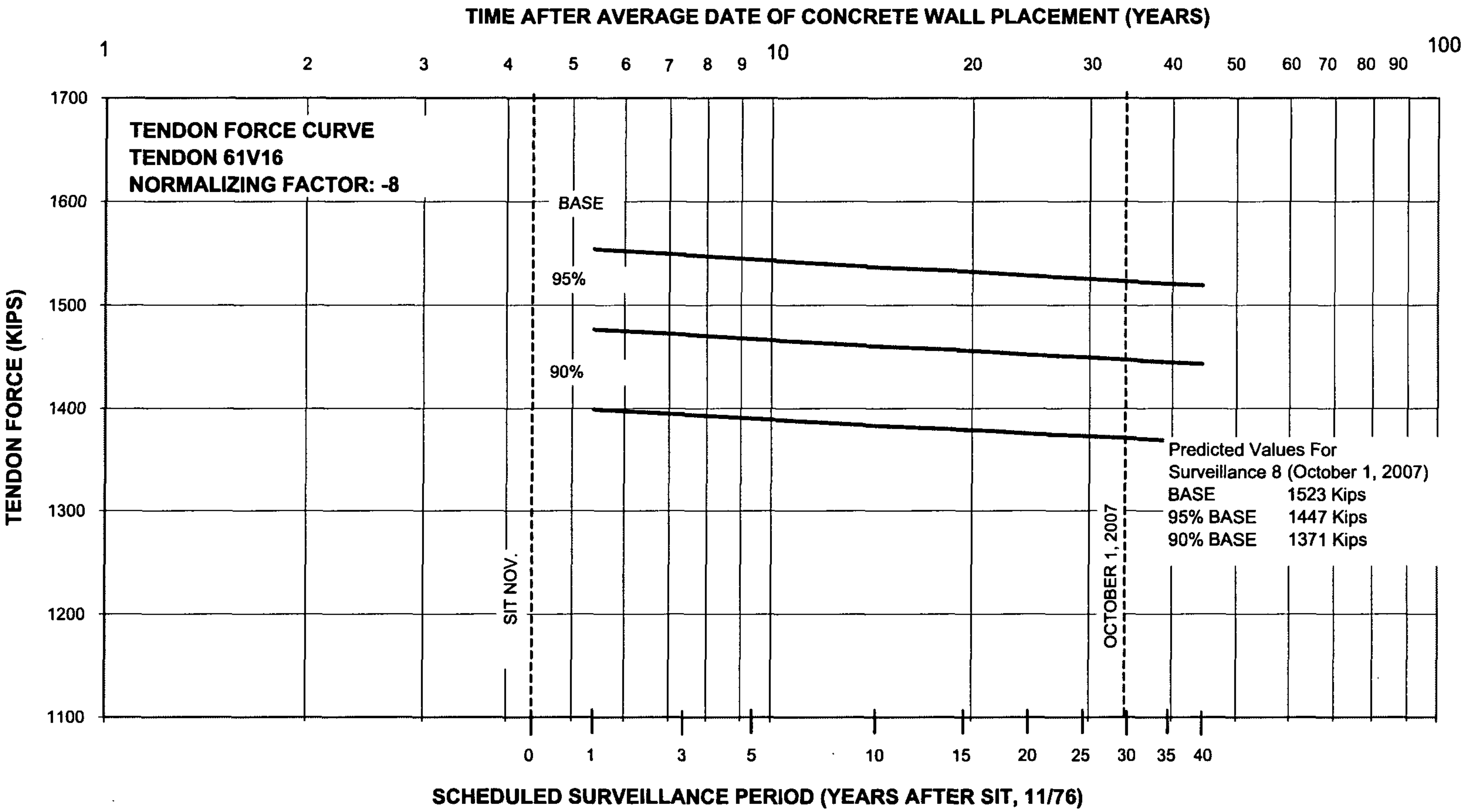
TENDON: 61V16 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1628 FIELD: 1628 AVERAGE: 1628 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 26 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	11.9	2.57%	42.3	0.096	18.6	6.0	1.7	74.5	4.57%	1554	1476	1398	-8
3	7.4	11.9	2.60%	42.7	0.117	22.6	8.5	2.4	79.6	4.89%	1549	1471	1394	-8
5	9.4	11.9	2.68%	44.1	0.130	25.4	10.0	2.8	84.2	5.17%	1544	1467	1390	-8
10	14.4	11.9	2.76%	45.4	0.157	30.5	13.5	3.8	91.6	5.62%	1537	1460	1383	-8
15	19.4	11.9	2.81%	46.2	0.173	33.3	15.5	4.4	95.8	5.88%	1532	1456	1379	-8
17	21.4	11.9									1531	1454	1378	
20	24.4	11.9	2.87%	47.2	0.188	36.1	17.5	4.9	100.1	6.15%	1528	1452	1375	-8
21:3	25.65	11.9									1528	1451	1375	
25	29.4	11.9	2.89%	47.3	0.197	37.8	19.5	5.5	102.5	6.29%	1526	1449	1373	-8
30	34.4	11.9	2.91%	47.8	0.207	39.8	20.4	5.8	105.3	6.46%	1523	1447	1371	-8
35	39.4	11.9	2.93%	48.2	0.216	41.5	21.5	6.1	107.7	6.61%	1521	1445	1368	-8
40	44.4	11.9	2.95%	48.5	0.221	42.6	22.5	6.4	109.4	6.72%	1519	1443	1367	-8
25	29.4										1526	1449	1373	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
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10
20
30
40
50
60
70
80
90
100
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE (KIPS)
TENDON FORCE CURVE
TENDON 61V16
NORMALIZING FACTOR: -8
BASE
95%
90%
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1523 Kips
95% BASE 1447 Kips
90% BASE 1371 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

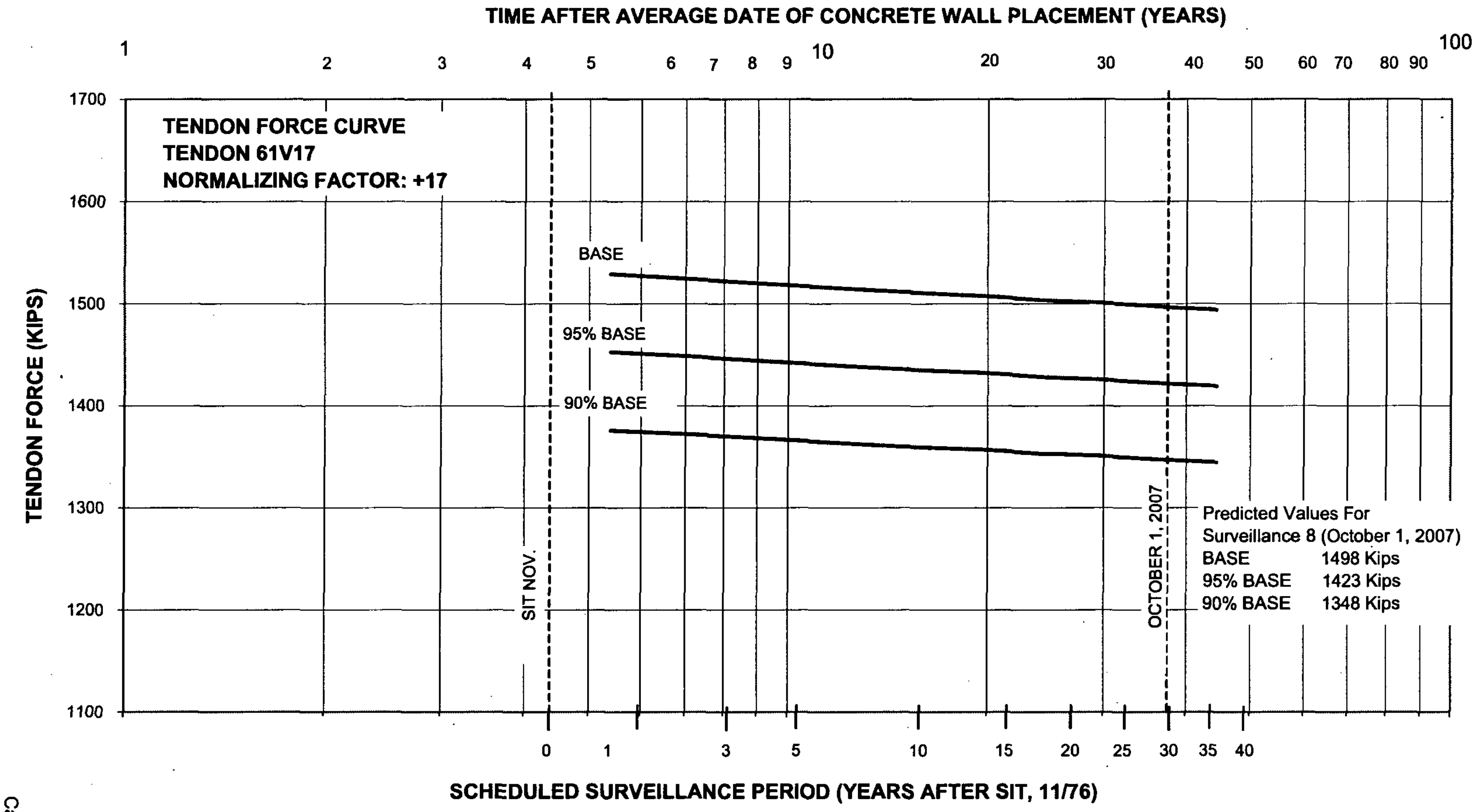
TENDON: 61V17 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1646 FIELD: 1646 AVERAGE: 1646 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 8 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	54.5	2.57%	42.3	0.096	18.6	6.0	1.7	117.1	7.12%	1529	1453	1376	17
3	7.4	54.5	2.60%	42.7	0.117	22.6	8.5	2.4	122.2	7.43%	1524	1448	1371	17
5	9.4	54.5	2.68%	44.1	0.130	25.4	10.0	2.8	126.8	7.71%	1519	1443	1367	17
10	14.4	54.5	2.76%	45.4	0.157	30.5	13.5	3.8	134.2	8.15%	1512	1436	1361	17
15	19.4	54.5	2.81%	46.2	0.173	33.3	15.5	4.4	138.4	8.41%	1508	1432	1357	17
17	21.4	54.5									1506	1431	1355	
20	24.4	54.5	2.87%	47.2	0.188	36.1	17.5	4.9	142.7	8.67%	1503	1428	1353	17
21:3	25.65	54.5									1503	1428	1352	
25	29.4	54.5	2.89%	47.3	0.197	37.8	19.5	5.5	145.1	8.82%	1501	1426	1351	17
30	34.4	54.5	2.91%	47.8	0.207	39.8	20.4	5.8	147.9	8.99%	1498	1423	1348	17
35	39.4	54.5	2.93%	48.2	0.216	41.5	21.5	6.1	150.3	9.13%	1496	1421	1346	17
40	44.4	54.5	2.95%	48.5	0.221	42.6	22.5	6.4	152.0	9.24%	1494	1419	1345	17
25	29.4										1501	1426	1351	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
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8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE (KIPS)
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE CURVE
TENDON 61V17
NORMALIZING FACTOR: +17
BASE
95% BASE
90% BASE
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1498 Kips
95% BASE 1423 Kips
90% BASE 1348 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

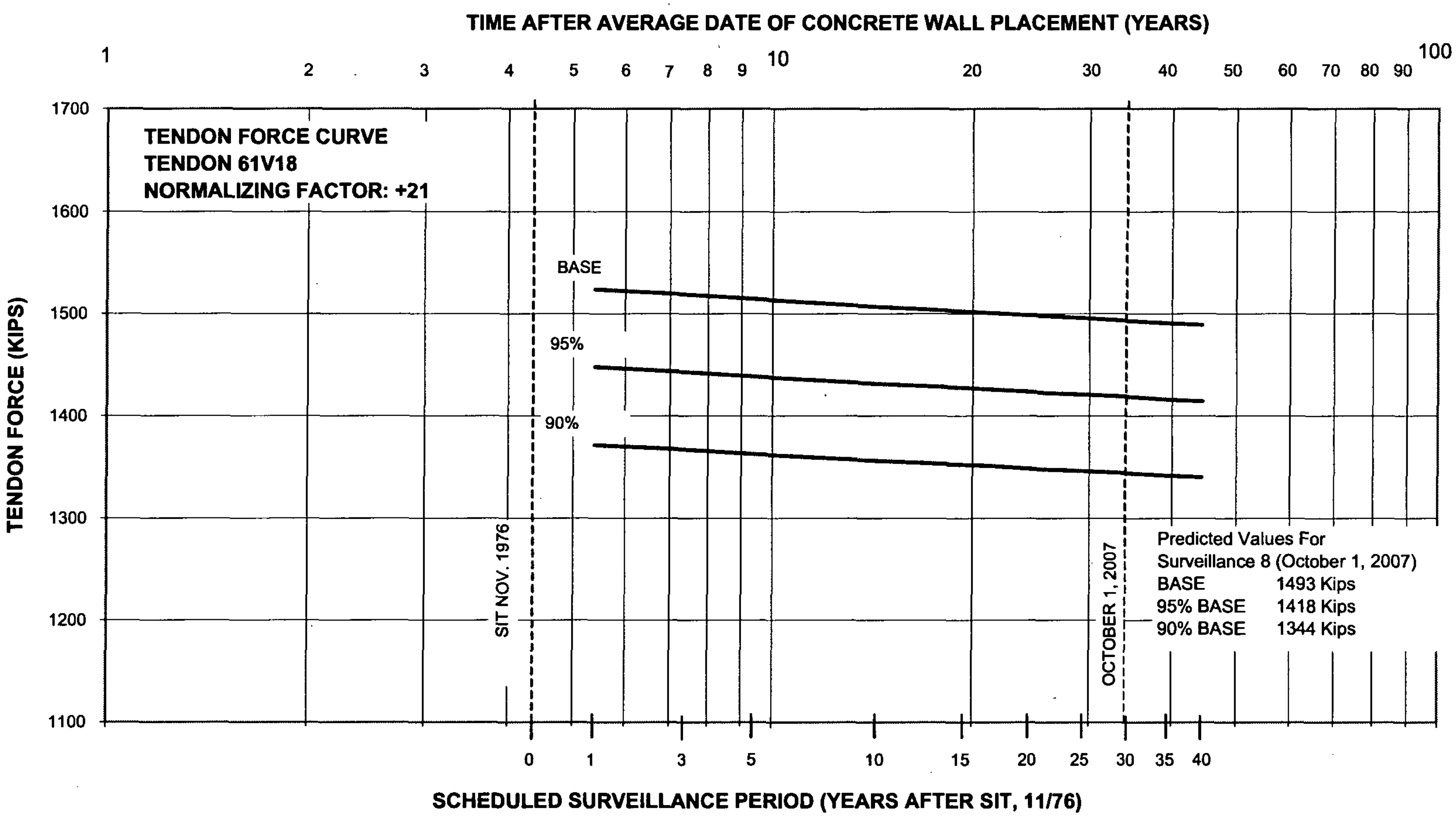
TENDON: 61V18 INITIAL CONCRETE STRESS (PSI) : 967

ORIGINAL FORCES (KIPS): SHOP: 1598 FIELD: 1598 AVERAGE: 1598 AVERAGE ALL VERT TENDONS: 1644

STRESS SEQUENCE: 26 OF 31 TOTAL ELASTIC SHORT. LOSS: 73.5 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM VERTINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	11.9	2.57%	42.3	0.096	18.6	6.0	1.7	74.5	4.66%	1524	1448	1372	21
3	7.4	11.9	2.60%	42.7	0.117	22.6	8.5	2.4	79.6	4.98%	1519	1443	1367	21
5	9.4	11.9	2.68%	44.1	0.130	25.4	10.0	2.8	84.2	5.27%	1514	1439	1363	21
10	14.4	11.9	2.76%	45.4	0.157	30.5	13.5	3.8	91.6	5.73%	1507	1431	1356	21
15	19.4	11.9	2.81%	46.2	0.173	33.3	15.5	4.4	95.8	5.99%	1503	1427	1352	21
17	21.4	11.9									1501	1426	1351	
20	24.4	11.9	2.87%	47.2	0.188	36.1	17.5	4.9	100.1	6.26%	1498	1423	1348	21
21:3	25.65	11.9									1498	1423	1348	
25	29.4	11.9	2.89%	47.3	0.197	37.8	19.5	5.5	102.5	6.41%	1496	1421	1346	21
30	34.4	11.9	2.91%	47.8	0.207	39.8	20.4	5.8	105.3	6.59%	1493	1418	1344	21
35	39.4	11.9	2.93%	48.2	0.216	41.5	21.5	6.1	107.7	6.74%	1491	1416	1342	21
40	44.4	11.9	2.95%	48.5	0.221	42.6	22.5	6.4	109.4	6.84%	1489	1415	1340	21
25	29.4										1496	1421	1346	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
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40
50
60
70
80
90
100
1700
1600
1500
1400
1300
1200
1100
TENDON FORCE CURVE
TENDON 61V18
NORMALIZING FACTOR: +21
BASE
95%
90%
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1493 Kips
95% BASE 1418 Kips
90% BASE 1344 Kips
TENDON FORCE (KIPS)
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
13H01	20	35H01	20	42H01	21
13H02	55	35H02	59	42H02	46
13H03	20	35H03	20	42H03	22
13H04	55	35H04	59	42H04	45
13H05	19	35H05	19	42H05	22
13H06	55	35H06	58	42H06	60
13H07	19	35H07	19	42H07	23
13H08	55	35H08	58	42H08	45
13H09	17	35H09	19	42H09	24
13H10	54	35H10	58	42H10	44
13H11	17	35H11	17	42H11	24
13H12	54	35H12	57	42H12	44
13H13	16	35H13	16	42H13	25
13H14	54	35H14	57	42H14	44
13H15	60	35H15	15	42H15	26
13H16	53	35H16	57	42H16	43
13H17	15	35H17	14	42H17	27
13H18	53	35H18	56	42H18	43
13H19	15	35H19	13	42H19	27
13H20	53	35H20	56	42H20	42
13H21	13	35H21	13	42H21	29
13H22	52	35H22	56	42H22	42
13H23	12	35H23	12	42H23	29
13H24	51	35H24	55	42H24	42
13H25	11	35H25	11	42H25	30
13H26	51	35H26	55	42H26	42
13H27	10	35H27	11	42H27	30
13H28	51	35H28	55	42H28	42
13H29	9	35H29	11	42H29	31
13H30	51	35H30	54	42H30	41
13H31	9	35H31	9	42H31	32
13H32	49	35H32	54	42H32	41
13H33	8	35H33	9	42H33	33
13H34	49	35H34	54	42H34	41
13H35	7	35H35	8	42H35	33
13H36	49	35H36	51	42H36	40
13H37	6	35H37	7	42H37	34
13H38	48	35H38	51	42H38	40
13H39	6	35H39	6	42H39	35
13H40	48	35H40	50	42H40	39
13H41	4	35H41	5	42H41	36
13H42	48	35H42	49	42H42	39
13H43	4	35H43	4	42H43	36
13H44	47	35H44	49	42H44	39
13H45	47	35H45	3	42H45	37
13H46	47	35H46	49	42H46	39
13H47	2	35H47	3	42H47	38

Stress Sequence Sorted by Tendon Numbeı

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
46H01	21	51H01	20	62H01	21
46H02	47	51H02	60	62H02	46
46H03	21	51H03	19	62H03	22
46H04	47	51H04	59	62H04	45
46H05	22	51H05	1	62H05	23
46H06	46	51H06	59	62H06	45
46H07	23	51H07	18	62H07	23
46H08	46	51H08	59	62H08	45
46H09	23	51H09	17	62H09	23
46H10	46	51H10	58	62H10	45
46H11	24	51H11	16	62H11	24
46H12	45	51H12	58	62H12	44
46H13	24	51H13	16	62H13	24
46H14	45	51H14	58	62H14	44
46H15	25	51H15	15	62H15	25
46H16	45	51H16	57	62H16	44
46H17	26	51H17	14	62H17	25
46H18	44	51H18	57	62H18	43
46H19	27	51H19	14	62H19	26
46H20	44	51H20	56	62H20	43
46H21	28	51H21	13	62H21	27
46H22	43	51H22	56	62H22	42
46H23	28	51H23	13	62H23	28
46H24	42	51H24	56	62H24	42
46H25	29	51H25	12	62H25	29
46H26	41	51H26	53	62H26	42
46H27	31	51H27	9	62H27	30
46H28	41	51H28	52	62H28	41
46H29	31	51H29	9	62H29	30
46H30	31	51H30	52	62H30	41
46H31	32	51H31	8	62H31	31
46H32	40	51H32	50	62H32	41
46H33	32	51H33	8	62H33	32
46H34	40	51H34	50	62H34	41
46H35	33	51H35	7	62H35	33
46H36	40	51H36	50	62H36	40
46H37	34	51H37	7	62H37	34
46H38	39	51H38	49	62H38	39
46H39	35	51H39	6	62H39	35
46H40	38	51H40	49	62H40	39
46H41	35	51H41	6	62H41	35
46H42	38	51H42	49	62H42	39
46H43	36	51H43	5	62H43	36
46H44	38	51H44	48	62H44	38
46H45	36	51H45	4	62H45	37
46H46	38	51H46	48	62H46	38
46H47	37	51H47	2	62H47	38

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	51H05						
2	13H47	51H47					
3	35H45	35H47					
4	13H41	13H43	35H43	51H45			
5	35H41	51H43					
6	13H37	13H39	35H39	51H39	51H41		
7	13H35	35H37	51H35	51H37			
8	13H33	35H35	51H31	51H33			
9	13H29	13H31	35H31	35H33	51H27	51H29	
10	13H27						
11	13H25	35H25	35H27	35H29			
12	13H23	35H23	51H25				
13	13H21	35H19	35H21	51H21	51H23		
14	35H17	51H17	51H19				
15	13H17	13H19	35H15	51H15			
16	13H13	35H13	51H11	51H13			
17	13H09	13H11	35H11	51H09			
18	51H07						
19	13H05	13H07	35H05	35H07	35H09	51H03	
20	13H01	13H03	35H01	35H03	51H01		
21	42H01	46H01	46H03	62H01			
22	42H03	42H05	46H05	62H03			
23	42H07	46H07	46H09	62H05	62H07	62H09	
24	42H09	42H11	46H11	46H13	62H11	62H13	
25	42H13	46H15	62H15	62H17			
26	42H15	46H17	62H19				
27	42H17	42H19	46H19	62H21			
28	46H21	46H23	62H23				
29	42H21	42H23	46H25	62H25			
30	42H25	42H27	62H27	62H29			
31	42H29	46H27	46H29	46H30	62H31		
32	42H31	46H31	46H33	62H33			
33	42H33	42H35	46H35	62H35			
34	42H37	46H37	62H37				
35	42H39	46H39	46H41	62H39	62H41		
36	42H41	42H43	46H43	46H45	62H43		
37	42H45	46H47	62H45				
38	42H47	46H40	46H42	46H44	46H46	62H44	62H46
38	62H47						
39	42H40	42H42	42H44	42H46	46H38	62H38	62H40
39	62H42						
40	42H36	42H38	46H32	46H34	46H36	62H36	

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
41	42H30	42H32	42H34	46H26	46H28	62H28	62H30
41	62H32	62H34					
42	42H20	42H22	42H24	42H26	42H28	46H24	62H22
42	62H24	62H26					
43	42H16	42H18	46H22	62H18	62H20		
44	42H10	42H12	42H14	46H18	46H20	62H12	62H14
44	62H16						
45	42H04	42H08	46H12	46H14	46H16	62H04	62H06
45	62H08	62H10					
46	42H02	46H06	46H08	46H10	62H02		
47	13H44	13H45	13H46	46H02	46H04		
48	13H38	13H40	13H42	51H44	51H46		
49	13H32	13H34	13H36	35H42	35H44	35H46	51H38
49	51H40	51H42					
50	35H40	51H32	51H34	51H36			
51	13H24	13H26	13H28	13H30	35H36	35H38	
52	13H22	51H28	51H30				
53	13H16	13H18	13H20	51H26			
54	13H10	13H12	13H14	35H30	35H32	35H34	
55	13H02	13H04	13H06	13H08	35H24	35H26	35H28
56	35H18	35H20	35H22	51H20	51H22	51H24	
57	35H12	35H14	35H16	51H16	51H18		
58	35H06	35H08	35H10	51H10	51H12	51H14	
59	35H02	35H04	51H04	51H06	51H08		
60	13H15	42H06	51H02				

Note:
Data extracted from Reference 11 of Calculation S-95-0082.

Initial Concrete Stress = 1732.0 (ksi)
Average Force = 1635.0 (kips)
Total Stress Sequence (N) = 60
Total Elastic Shortening Losses = 134

Reference: S-95-0082

Tendon No.	Lift-off Pressure (ksi) (1)				Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips)		Remarks (3)
	Shop End		Field End					Shop End (5)	Field End (5)	
	Predicted	Actual	Predicted	Actual						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
46H20	6640	6930	6600	6600	44	160	0.982	1679	1609	
46H21	6720	6700	6730	6950	28	162	0.994	1624	1682	S,C
46H22	6720	6750	6730	7000	43	162	0.994	1636	1694	
51H33	6810	6850	6750	6800	8	163	1.000	1649	1651	
51H34	6800	6800	6750	6850	50	163	1.000	1639	1663	S,D
51H35	6810	6500	6750	6800	7	163	1.000	1564	1651	
42H45	6870	7000	6810	6900	37	163	1.000	1670	1661	
42H46	6870	6850	6790	6850	39	163	1.000	1634	1653	S
42H47	6750	6700	6700	6800	38	160	0.982	1597	1633	
13H35	6680	6650	6670	6800	7	161	0.988	1612	1650	
13H36	6660	6700	6700	7000	49	160	0.982	1618	1681	S
13H37	6720	6700	6730	6750	6	162	0.994	1624	1634	
62H29	6800	6750	6700	6750	30	162	0.994	1617	1641	
62H30	6800	6600	6750	6600	41	163	1.000	1591	1603	S
62H31	6800	7000	6750	6900	31	163	1.000	1687	1675	

Note:

(1) Ref. Crystal River 3 R/B Tendon History Sheets - Hoop Tendons for Original Stressin(
(2) Ref. Crystal River 3 Tendon Surveillance Loss Calculations, Tendon Stress Sequence, Pages 29, 29a and 29t
(3) S =Selected tensons, C =Control tendon, D =Detension tendon, A =Alternate tendoı
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacent
(4) Wire factors are calculated based on the number of effective wires divided by 163.

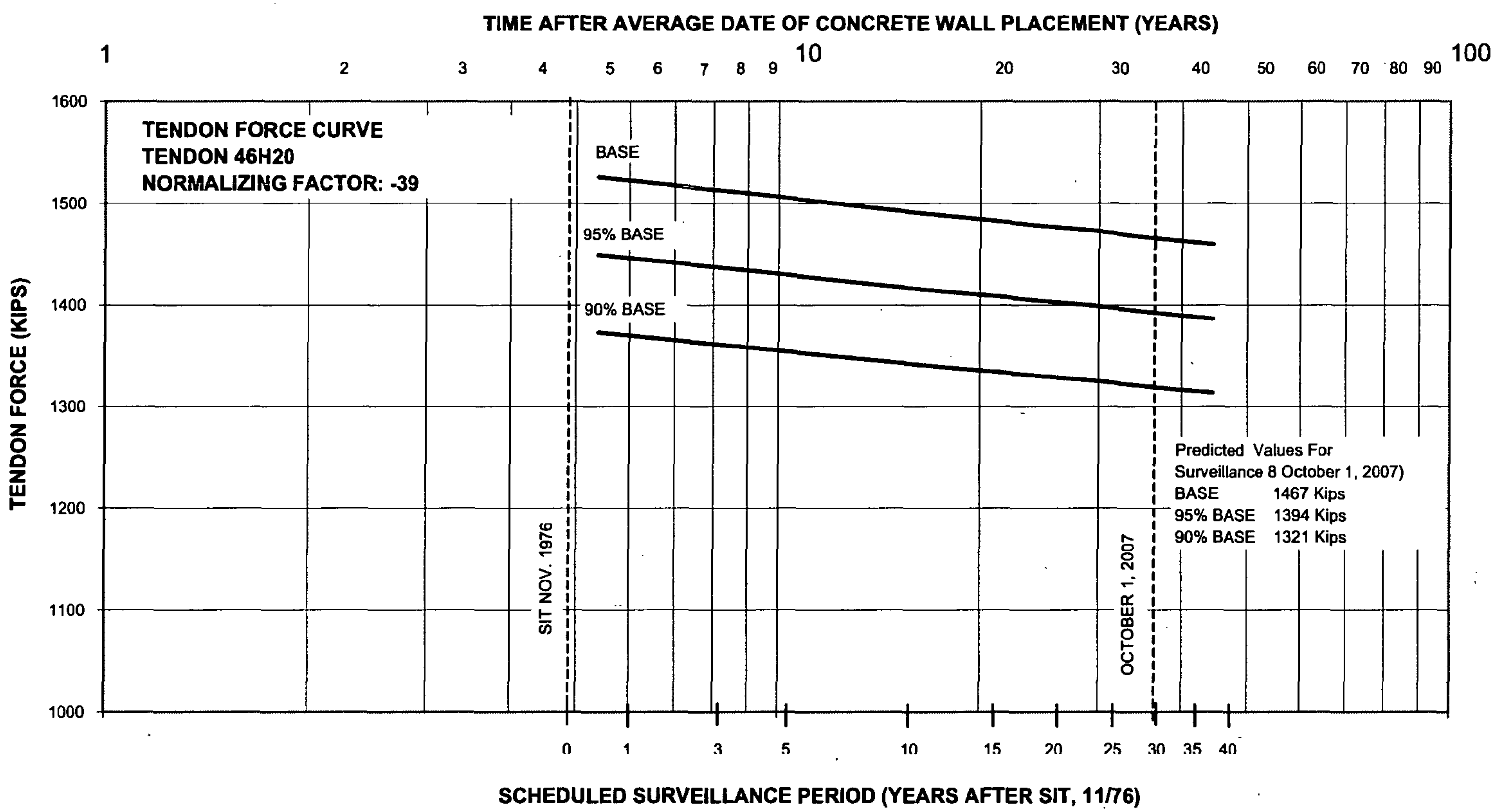
TENDON: 46H20 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1679 FIELD: 1609 AVERAGE: 1644 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 44 OF 60 *TOTAL ELASTIC SHORT. LOSS:* 134.0 WIRE FACTOR: 0.982

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	35.1	2.57%	42.0	0.090	39.5	6.0	1.7	118.3	7.19%	1526	1449	1373	-39
3	7.4	35.1	2.60%	42.5	0.110	48.5	8.5	2.4	128.5	7.82%	1515	1440	1364	-39
5	9.4	35.1	2.68%	43.8	0.123	54.1	10.0	2.8	135.8	8.26%	1508	1433	1357	-39
10	14.4	35.1	2.76%	45.1	0.150	66.0	13.5	3.8	150.0	9.12%	1494	1419	1345	-39
15	19.4	35.1	2.81%	45.9	0.167	73.6	15.5	4.4	158.9	9.67%	1485	1411	1336	-39
17	21.4	35.1									1482	1408	1334	
20	24.4	35.1	2.87%	46.9	0.181	79.0	17.5	4.9	165.9	10.09%	1478	1404	1330	-39
21:3	25.65	35.1									1477	1403	1329	
25	29.4	35.1	2.88%	47.1	0.190	83.2	19.5	5.5	170.9	10.39%	1473	1399	1326	-39
30	34.4	35.1	2.91%	47.6	0.200	88.0	20.4	5.8	176.4	10.73%	1467	1394	1321	-39
35	39.4	35.1	2.93%	47.9	0.209	91.9	21.5	6.1	180.9	11.01%	1463	1390	1317	-39
40	44.4	35.1	2.95%	48.2	0.215	94.7	22.5	6.4	184.3	11.21%	1460	1387	1314	-39
25	29.4										1473	1399	1326	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H20
NORMALIZING FACTOR: -39
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 October 1, 2007)
BASE 1467 Kips
95% BASE 1394 Kips
90% BASE 1321 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

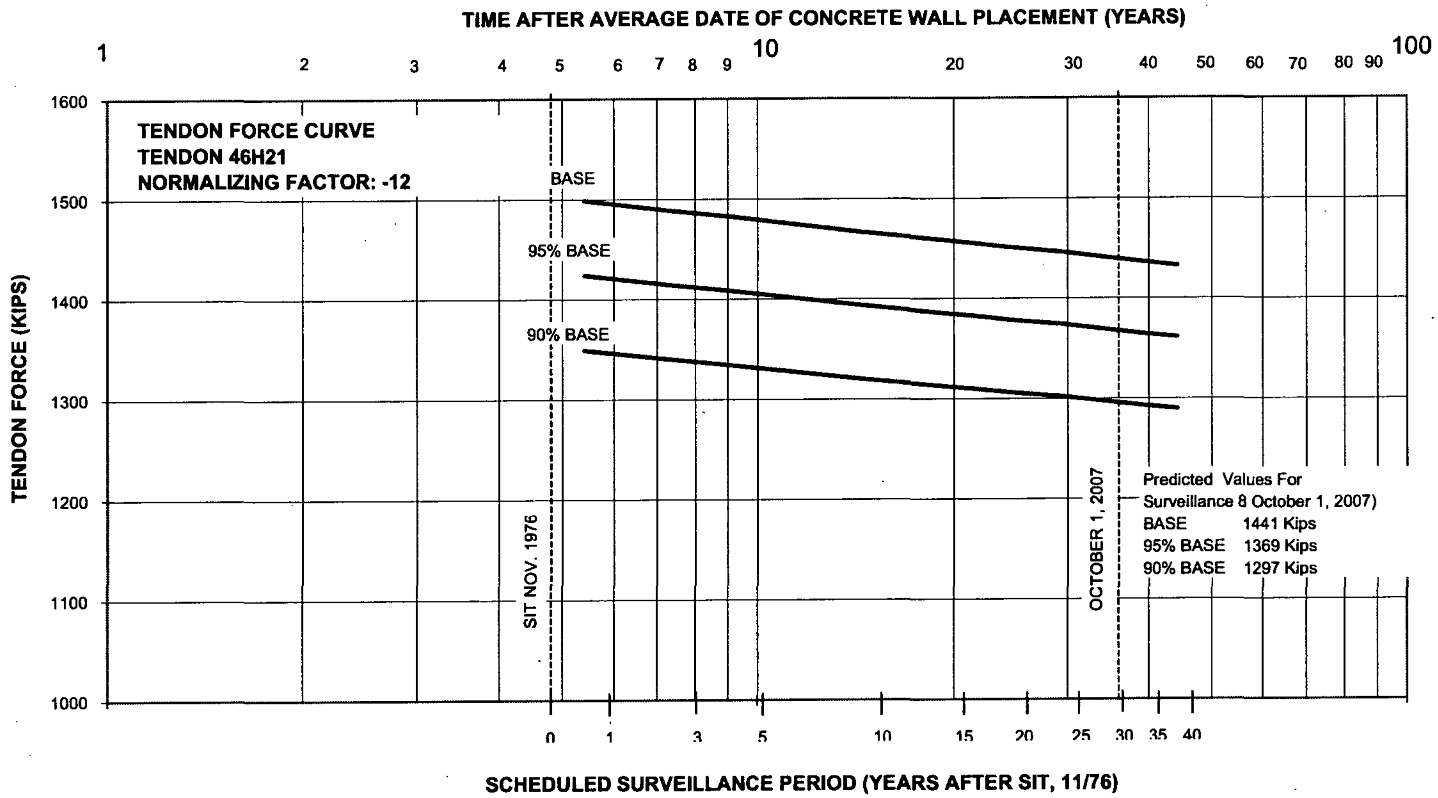
TENDON: 46H21 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1624 FIELD: 1682 AVERAGE: 1653 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 28 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	71.0	2.57%	42.0	0.090	39.5	6.0	1.7	154.2	9.33%	1499	1424	1349	-12
3	7.4	71.0	2.60%	42.5	0.110	48.5	8.5	2.4	164.4	9.95%	1489	1414	1340	-12
5	9.4	71.0	2.68%	43.8	0.123	54.1	10.0	2.8	171.7	10.39%	1481	1407	1333	-12
10	14.4	71.0	2.76%	45.1	0.150	66.0	13.5	3.8	185.9	11.25%	1467	1394	1320	-12
15	19.4	71.0	2.81%	45.9	0.167	73.6	15.5	4.4	194.9	11.79%	1458	1385	1312	-12
17	21.4	71.0									1455	1383	1310	
20	24.4	71.0	2.87%	46.9	0.181	79.0	17.5	4.9	201.9	12.21%	1451	1379	1306	-12
21:3	25.65	71.0									1450	1377	1305	
25	29.4	71.0	2.88%	47.1	0.190	83.2	19.5	5.5	206.8	12.51%	1446	1374	1302	-12
30	34.4	71.0	2.91%	47.6	0.200	88.0	20.4	5.8	212.4	12.85%	1441	1369	1297	-12
35	39.4	71.0	2.93%	47.9	0.209	91.9	21.5	6.1	216.9	13.12%	1436	1364	1293	-12
40	44.4	71.0	2.95%	48.2	0.215	94.7	22.5	6.4	220.3	13.33%	1433	1361	1290	-12
25	29.4										1446	1374	1302	

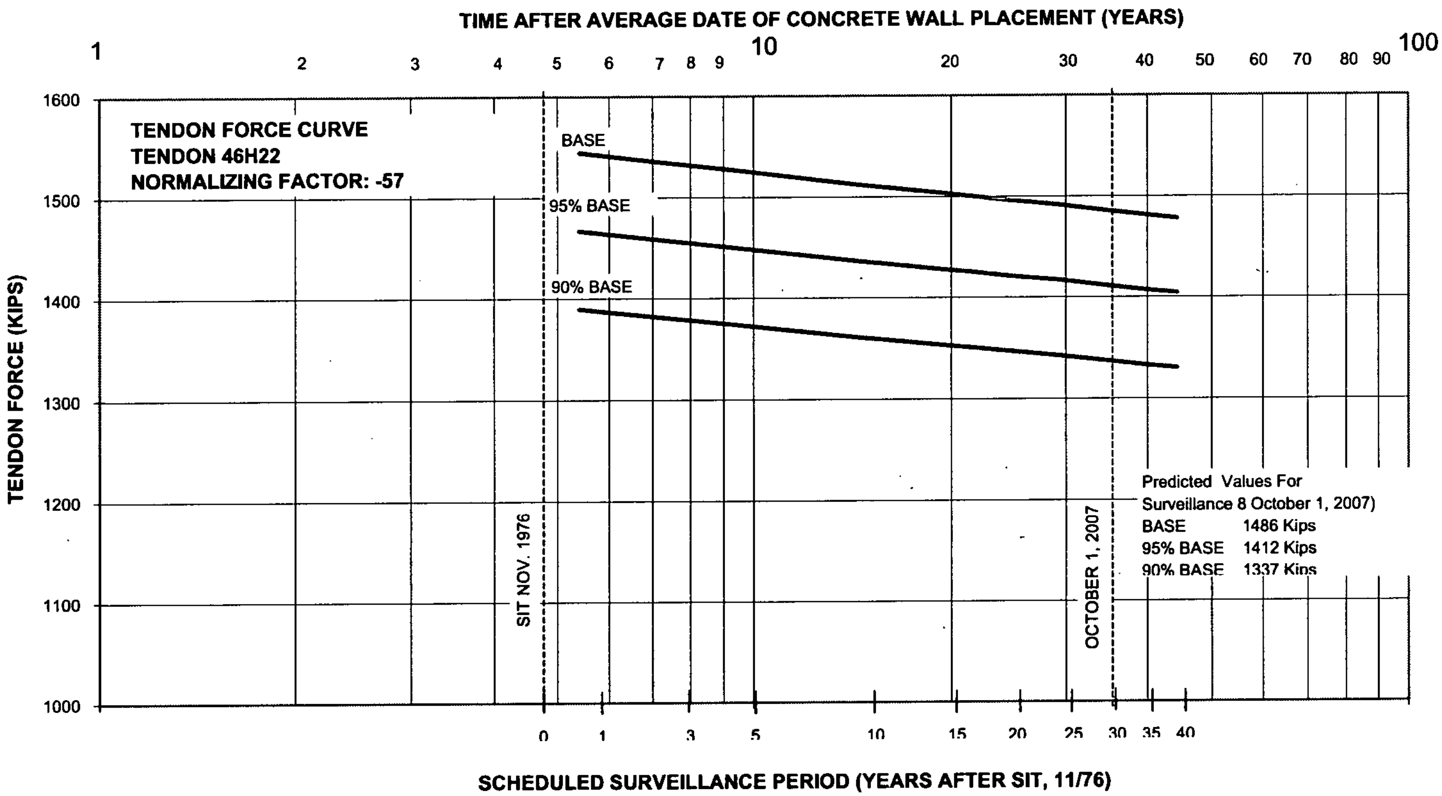

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 46H21
NORMALIZING FACTOR: -12
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 October 1, 2007)
BASE 1441 Kips
95% BASE 1369 Kips
90% BASE 1297 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 46H22 INITIAL CONCRETE STRESS (PSI 1732

ORIGINAL FORCES (KIPS): SHOP: 1636 FIELD: 1694 AVERAGE: 1665 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 43 OF 60 TOTAL ELASTIC SHORT. LOS 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS	TOTAL PERCENT LOSS	BASE	95% BASE	90% BASE	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)	(KIPS)		(KIPS)	(KIPS)	(KIPS)	(KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	37.7	2.57%	42.0	0.090	39.5	6.0	1.7	120.9	7.26%	1544	1467	1390	-57
3	7.4	37.7	2.60%	42.5	0.110	48.5	8.5	2.4	131.1	7.88%	1534	1457	1381	-57
5	9.4	37.7	2.68%	43.8	0.123	54.1	10.0	2.8	138.4	8.31%	1527	1450	1374	-57
10	14.4	37.7	2.76%	45.1	0.150	66.0	13.5	3.8	152.6	9.17%	1513	1437	1361	-57
15	19.4	37.7	2.81%	45.9	0.167	73.6	15.5	4.4	161.6	9.70%	1504	1428	1353	-57
17	21.4	37.7									1501	1426	1351	
20	24.4	37.7	2.87%	46.9	0.181	79.0	17.5	4.9	168.6	10.12%	1497	1422	1347	-57
21:3	25.65	37.7									1495	1421	1346	
25	29.4	37.7	2.88%	47.1	0.190	83.2	19.5	5.5	173.5	10.42%	1492	1417	1342	-57
30	34.4	37.7	2.91%	47.6	0.200	88.0	20.4	5.8	179.1	10.75%	1486	1412	1337	-57
35	39.4	37.7	2.93%	47.9	0.209	91.9	21.5	6.1	183.6	11.03%	1482	1408	1333	-57
40	44.4	37.7	2.95%	48.2	0.215	94.7	22.5	6.4	187.0	11.23%	1478	1404	1330	-57
25	29.4										1492	1417	1342	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 46H22
NORMALIZING FACTOR: -57
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 October 1, 2007)
BASE 1486 Kips
95% BASE 1412 Kips
90% BASE 1337 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

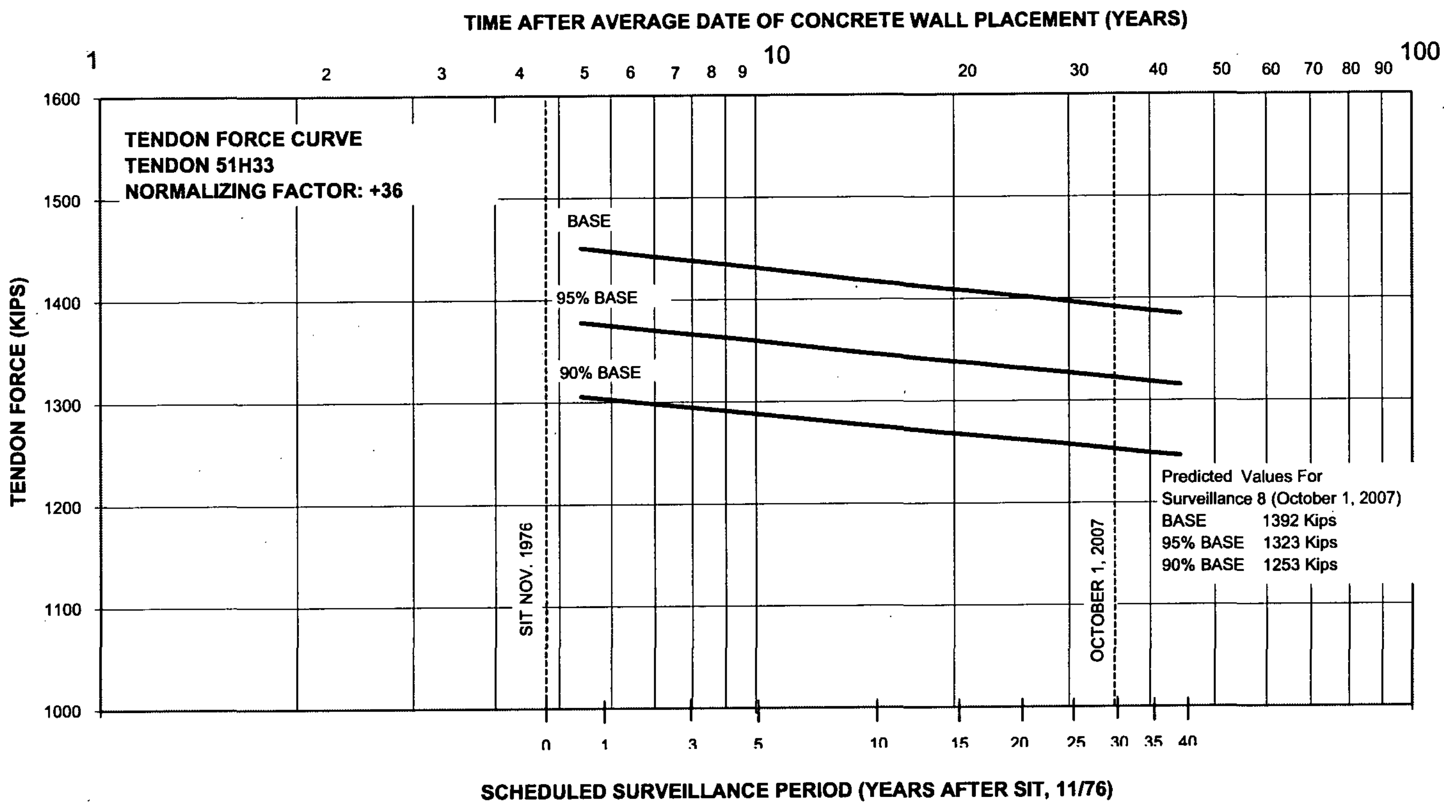
TENDON: 51H33 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1649 FIELD: 1651 AVERAGE: 1650 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 8 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	116.1	2.57%	42.0	0.090	39.5	6.0	1.7	199.3	12.08%	1450	1378	1305	36
3	7.4	116.1	2.60%	42.5	0.110	48.5	8.5	2.4	209.5	12.70%	1440	1368	1296	36
5	9.4	116.1	2.68%	43.8	0.123	54.1	10.0	2.8	216.8	13.14%	1433	1361	1290	36
10	14.4	116.1	2.76%	45.1	0.150	66.0	13.5	3.8	231.0	14.00%	1419	1348	1277	36
15	19.4	116.1	2.81%	45.9	0.167	73.6	15.5	4.4	240.0	14.55%	1410	1339	1269	36
17	21.4	116.1									1407	1337	1266	
20	24.4	116.1	2.87%	46.9	0.181	79.0	17.5	4.9	247.0	14.97%	1403	1333	1263	36
21:3	25.65	116.1									1402	1332	1261	
25	29.4	116.1	2.88%	47.1	0.190	83.2	19.5	5.5	251.9	15.27%	1398	1328	1258	36
30	34.4	116.1	2.91%	47.6	0.200	88.0	20.4	5.8	257.5	15.61%	1392	1323	1253	36
35	39.4	116.1	2.93%	47.9	0.209	91.9	21.5	6.1	262.0	15.88%	1388	1318	1249	36
40	44.4	116.1	2.95%	48.2	0.215	94.7	22.5	6.4	265.4	16.09%	1384	1315	1246	36
25	29.4										1398	1328	1258	

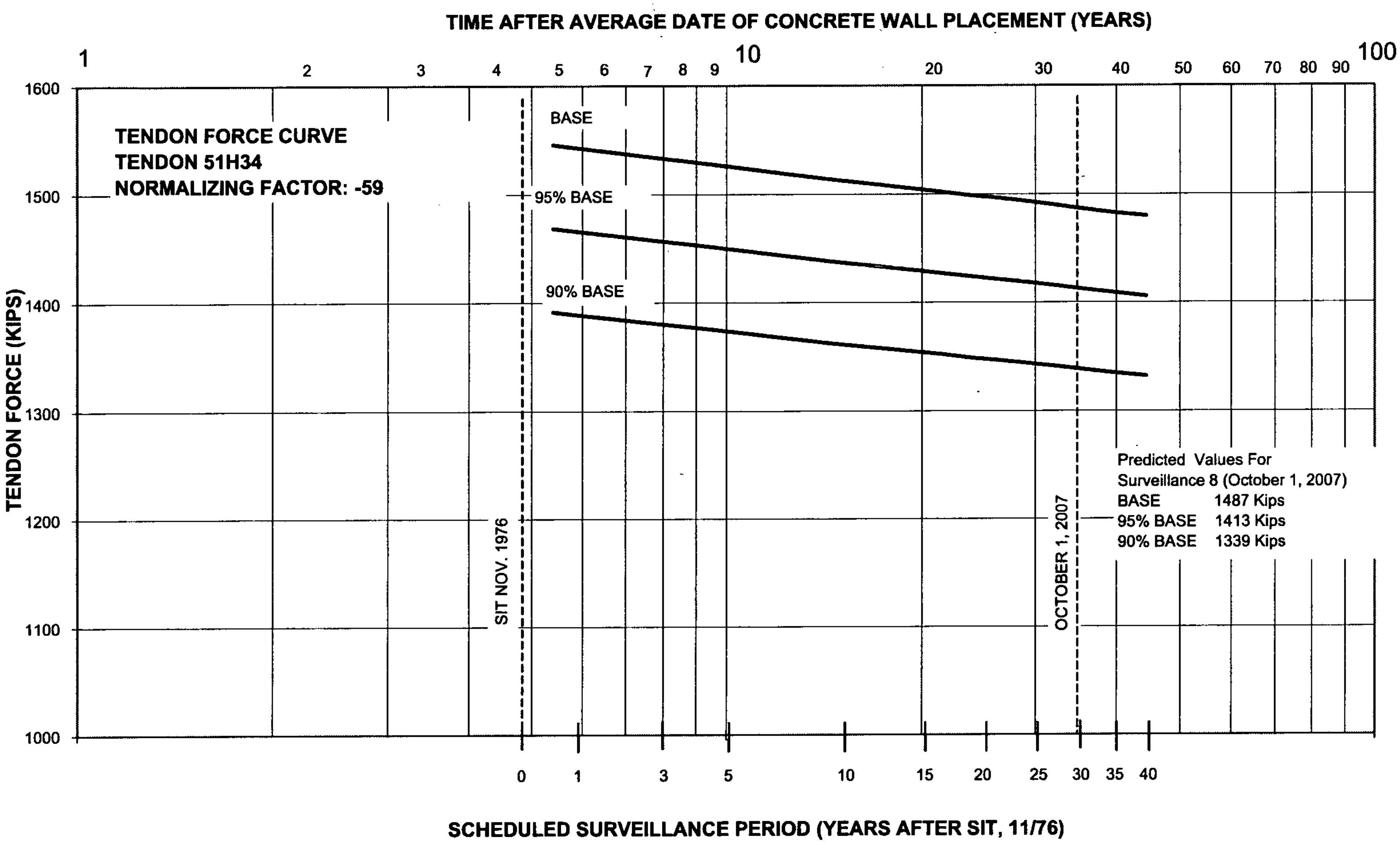

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 51H33
NORMALIZING FACTOR: +36
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1392 Kips
95% BASE 1323 Kips
90% BASE 1253 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 51H34 INITIAL CONCRETE STRESS (PS 1732

ORIGINAL FORCES (KIPS): SHOP: 1639 FIELD: 1663 AVERAGE: 1651 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 50 OF 60 TOTAL ELASTIC SHORT. LOS 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	22.3	2.57%	42.0	0.090	39.5	6.0	1.7	105.5	6.39%	1546	1468	1391	-59
3	7.4	22.3	2.60%	42.5	0.110	48.5	8.5	2.4	115.7	7.01%	1535	1459	1382	-59
5	9.4	22.3	2.68%	43.8	0.123	54.1	10.0	2.8	123.0	7.45%	1528	1452	1375	-59
10	14.4	22.3	2.76%	45.1	0.150	66.0	13.5	3.8	137.2	8.31%	1514	1438	1362	-59
15	19.4	22.3	2.81%	45.9	0.167	73.6	15.5	4.4	146.2	8.86%	1505	1430	1354	-59
17	21.4	22.3									1502	1427	1352	
20	24.4	22.3	2.87%	46.9	0.181	79.0	17.5	4.9	153.2	9.28%	1498	1423	1348	-59
21:3	25.65	22.3									1497	1422	1347	
25	29.4	22.3	2.88%	47.1	0.190	83.2	19.5	5.5	158.1	9.58%	1493	1418	1344	-59
30	34.4	22.3	2.91%	47.6	0.200	88.0	20.4	5.8	163.7	9.91%	1487	1413	1339	-59
35	39.4	22.3	2.93%	47.9	0.209	91.9	21.5	6.1	168.2	10.19%	1483	1409	1335	-59
40	44.4	22.3	2.95%	48.2	0.215	94.7	22.5	6.4	171.6	10.39%	1479	1406	1332	-59
25	29.4										1493	1418	1344	



TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE (KIPS)
TENDON FORCE CURVE
TENDON 51H34
NORMALIZING FACTOR: -59
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1487 Kips
95% BASE 1413 Kips
90% BASE 1339 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

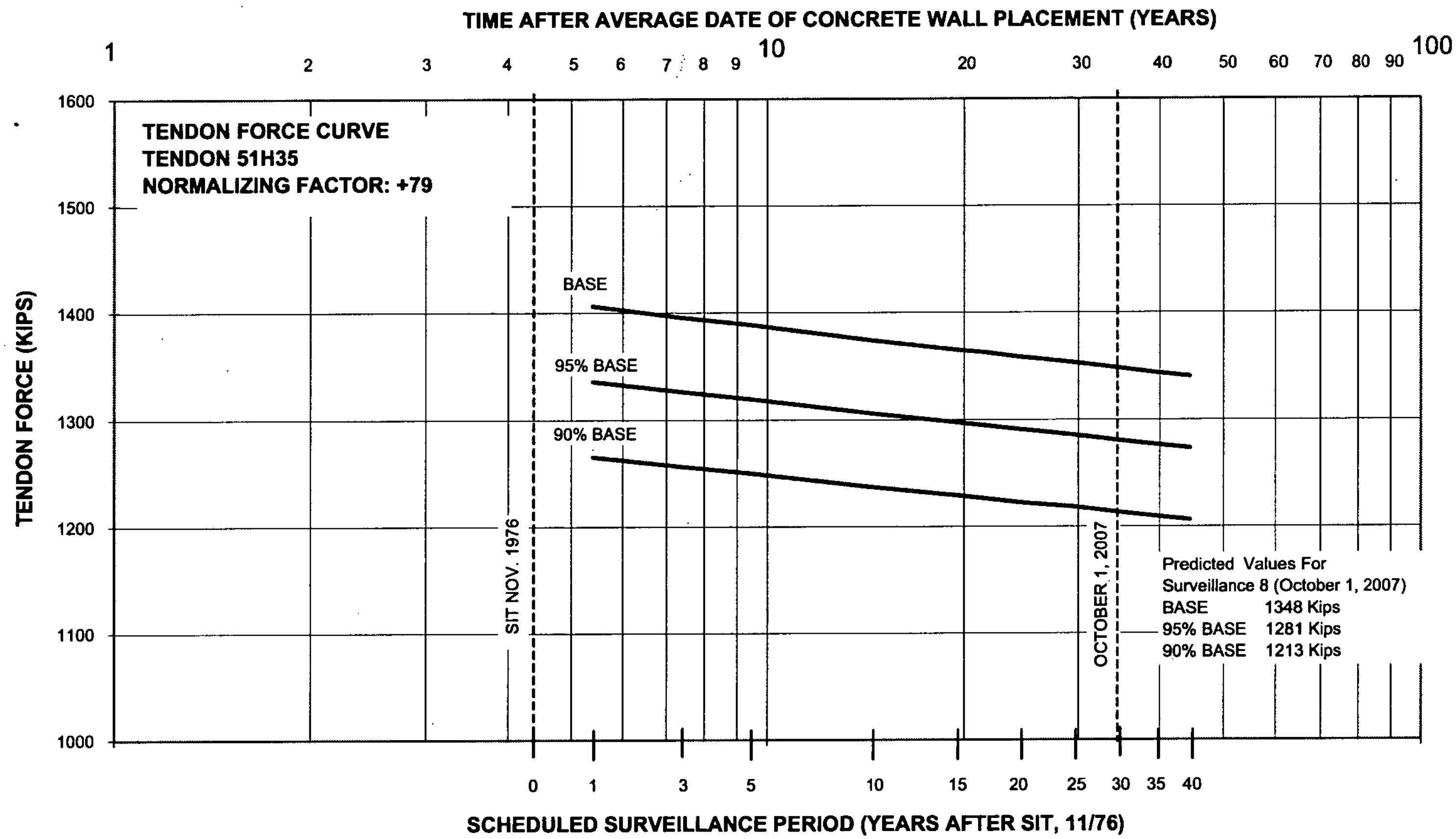
TENDON: 51H35 INITIAL CONCRETE STRESS (PSI) 1732

ORIGINAL FORCES (KIPS) SHOP: 1564 FIELD: 1651 AVERAGE: 1608 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 7 OF 60 TOTAL ELASTIC SHORT. LOSS 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	118.4	2.57%	42.0	0.090	39.5	6.0	1.7	201.6	12.54%	1406	1336	1266	79
3	7.4	118.4	2.60%	42.5	0.110	48.5	8.5	2.4	211.8	13.17%	1396	1326	1256	79
5	9.4	118.4	2.68%	43.8	0.123	54.1	10.0	2.8	219.1	13.63%	1389	1319	1250	79
10	14.4	118.4	2.76%	45.1	0.150	66.0	13.5	3.8	233.3	14.51%	1374	1306	1237	79
15	19.4	118.4	2.81%	45.9	0.167	73.6	15.5	4.4	242.2	15.07%	1365	1297	1229	79
17	21.4	118.4									1363	1295	1226	
20	24.4	118.4	2.87%	46.9	0.181	79.0	17.5	4.9	249.2	15.50%	1358	1291	1223	79
21:3	25.65	118.4									1357	1289	1222	
25	29.4	118.4	2.88%	47.1	0.190	83.2	19.5	5.5	254.2	15.81%	1354	1286	1218	79
30	34.4	118.4	2.91%	47.6	0.200	88.0	20.4	5.8	259.7	16.15%	1348	1281	1213	79
35	39.4	118.4	2.93%	47.9	0.209	91.9	21.5	6.1	264.2	16.44%	1343	1276	1209	79
40	44.4	118.4	2.95%	48.2	0.215	94.7	22.5	6.4	267.6	16.65%	1340	1273	1206	79
25	29.4										1354	1286	1218	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 51H35
NORMALIZING FACTOR: +79
TENDON FORCE (KIPS)
1600
1500
1400
1300
1200
1100
1000
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1348 Kips
95% BASE 1281 Kips
90% BASE 1213 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

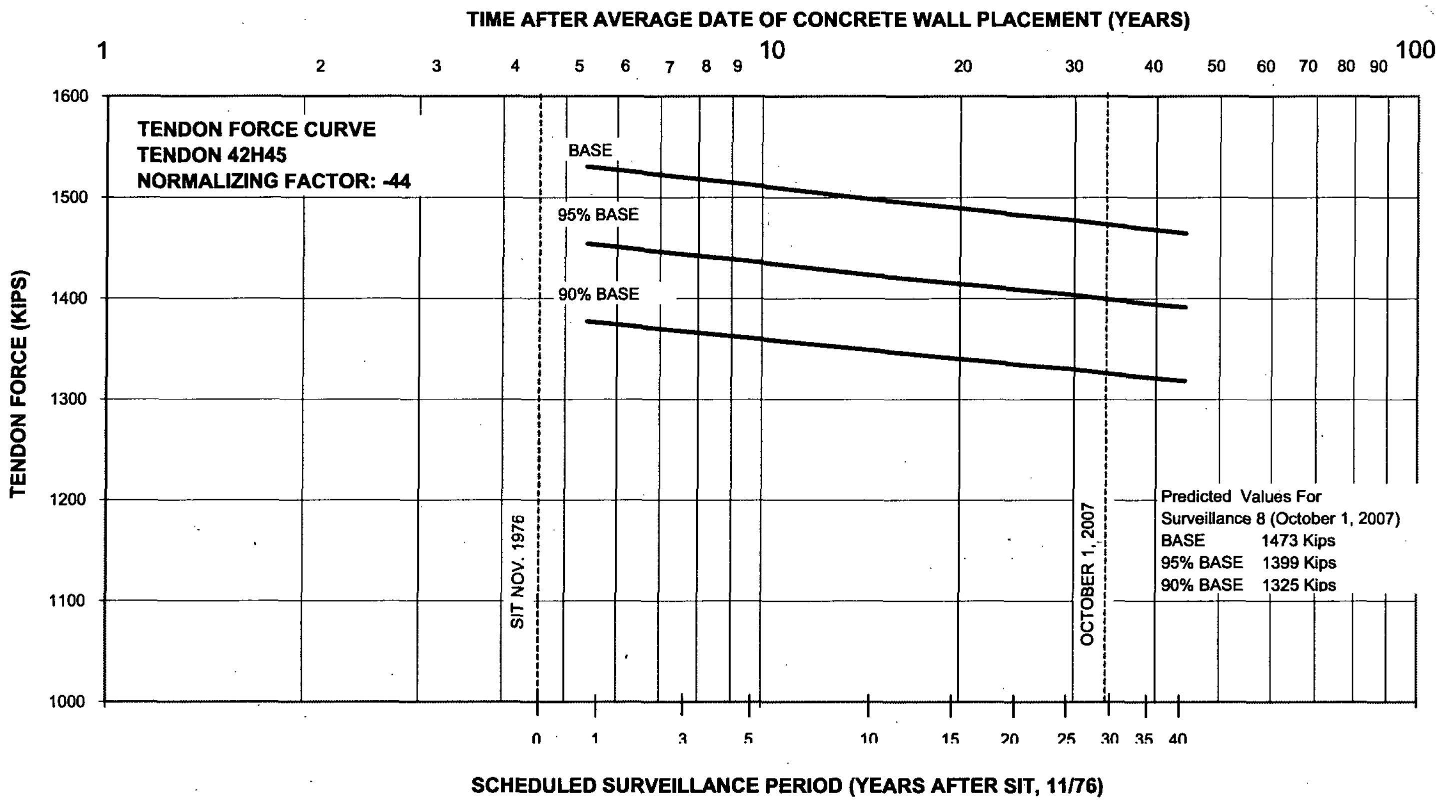
TENDON: 42H45 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1670 FIELD: 1661 AVERAGE: 1665 AVERAGE ALL HOOP TENDONS: 1636

STRESS SEQUENCE: 37 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	51.4	2.57%	42.0	0.090	39.5	6.0	1.7	134.6	8.08%	1531	1454	1378	-44
3	7.4	51.4	2.60%	42.5	0.110	48.5	8.5	2.4	144.8	8.69%	1521	1444	1368	-44
5	9.4	51.4	2.68%	43.8	0.123	54.1	10.0	2.8	152.1	9.13%	1513	1438	1362	-44
10	14.4	51.4	2.76%	45.1	0.150	66.0	13.5	3.8	166.3	9.98%	1499	1424	1349	-44
15	19.4	51.4	2.81%	45.9	0.167	73.6	15.5	4.4	175.2	10.52%	1490	1416	1341	-44
17	21.4	51.4									1487	1413	1339	
20	24.4	51.4	2.87%	46.9	0.181	79.0	17.5	4.9	182.2	10.94%	1483	1409	1335	-44
21:3	25.65	51.4									1482	1408	1334	
25	29.4	51.4	2.88%	47.1	0.190	83.2	19.5	5.5	187.2	11.24%	1478	1404	1330	-44
30	34.4	51.4	2.91%	47.6	0.200	88.0	20.4	5.8	192.7	11.57%	1473	1399	1325	-44
35	39.4	51.4	2.93%	47.9	0.209	91.9	21.5	6.1	197.2	11.84%	1468	1395	1321	-44
40	44.4	51.4	2.95%	48.2	0.215	94.7	22.5	6.4	200.6	12.05%	1465	1391	1318	-44
25	29.4										1478	1404	1330	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 42H45
NORMALIZING FACTOR: -44
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1473 Kips
95% BASE 1399 Kips
90% BASE 1325 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

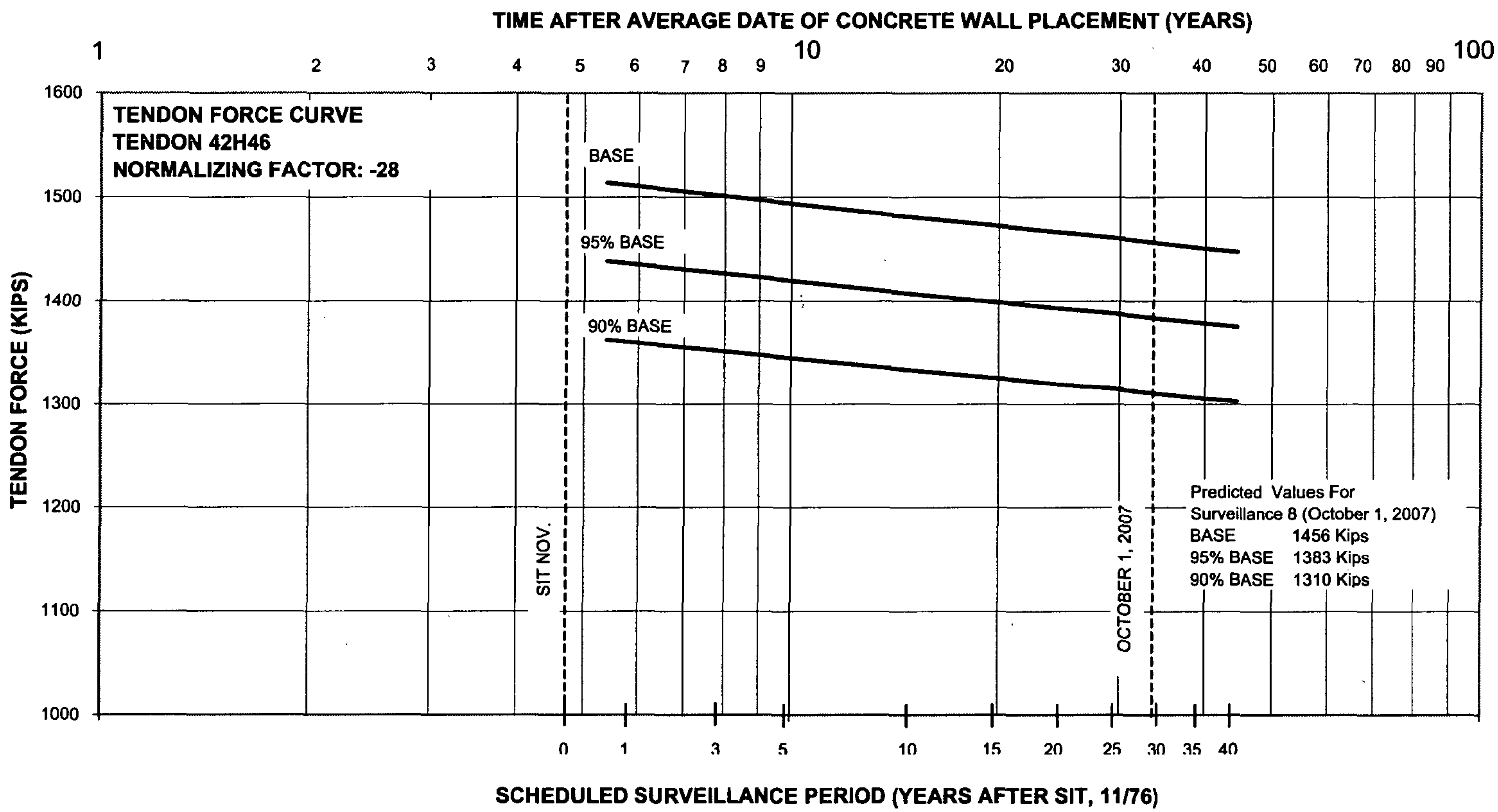
TENDON: 42H46 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1634 FIELD: 1653 AVERAGE: 1644 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 39 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	46.9	2.57%	42.0	0.090	39.5	6.0	1.7	130.1	7.91%	1514	1438	1362	-28
3	7.4	46.9	2.60%	42.5	0.110	48.5	8.5	2.4	140.3	8.54%	1503	1428	1353	-28
5	9.4	46.9	2.68%	43.8	0.123	54.1	10.0	2.8	147.6	8.98%	1496	1421	1347	-28
10	14.4	46.9	2.76%	45.1	0.150	66.0	13.5	3.8	161.8	9.84%	1482	1408	1334	-28
15	19.4	46.9	2.81%	45.9	0.167	73.6	15.5	4.4	170.8	10.39%	1473	1399	1326	-28
17	21.4	46.9									1470	1397	1323	
20	24.4	46.9	2.87%	46.9	0.181	79.0	17.5	4.9	177.7	10.81%	1466	1393	1319	-28
21:3	25.65	46.9									1465	1392	1318	
25	29.4	46.9	2.88%	47.1	0.190	83.2	19.5	5.5	182.7	11.11%	1461	1388	1315	-28
30	34.4	46.9	2.91%	47.6	0.200	88.0	20.4	5.8	188.3	11.45%	1456	1383	1310	-28
35	39.4	46.9	2.93%	47.9	0.209	91.9	21.5	6.1	192.8	11.73%	1451	1378	1306	-28
40	44.4	46.9	2.95%	48.2	0.215	94.7	22.5	6.4	196.2	11.93%	1448	1375	1303	-28
25	29.4										1461	1388	1315	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 42H46
NORMALIZING FACTOR: -28
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE (KIPS)
BASE
95% BASE
90% BASE
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1456 Kips
95% BASE 1383 Kips
90% BASE 1310 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

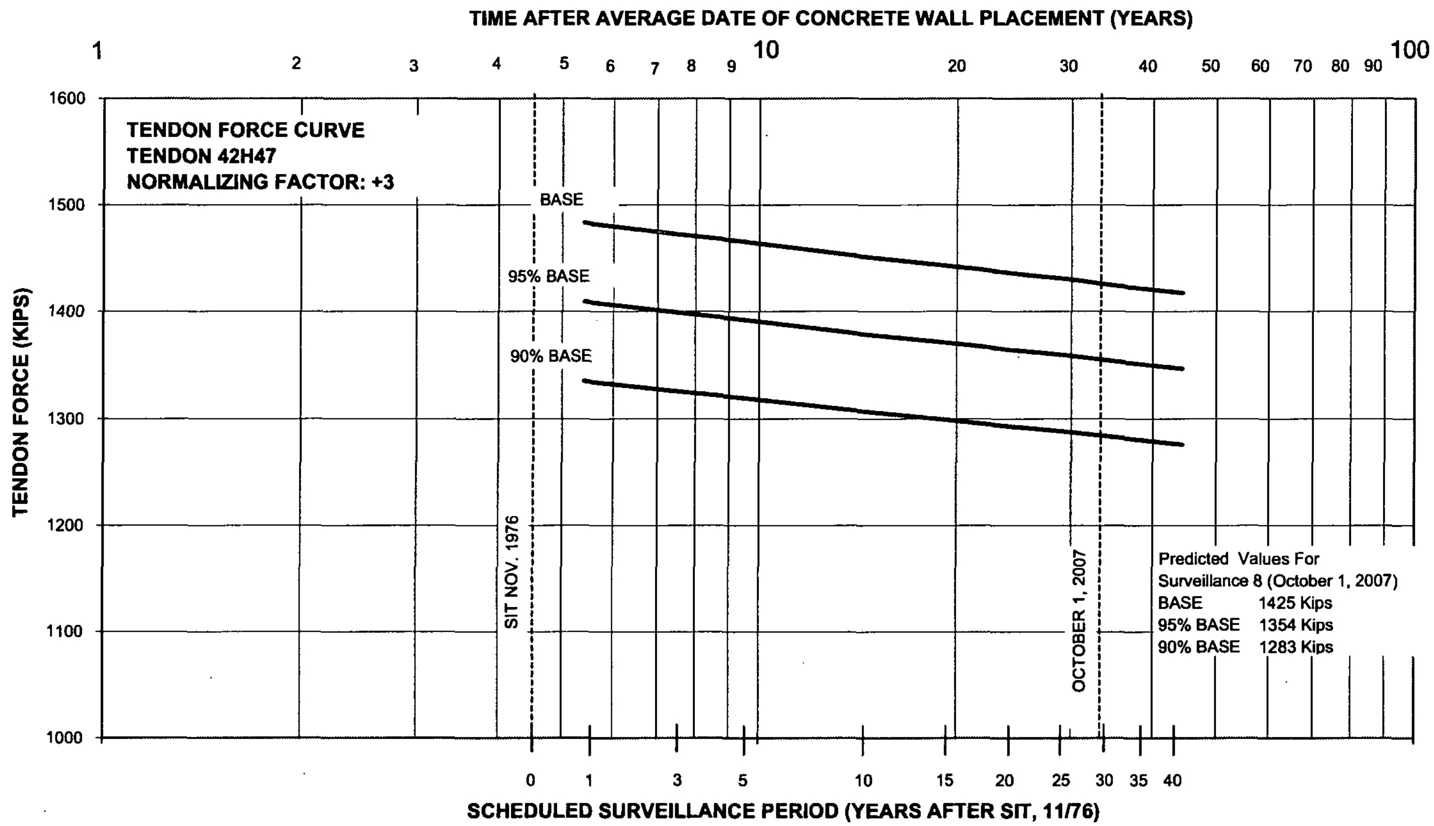
TENDON: 42H47 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1597 FIELD: 1633 AVERAGE: 1615 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 38 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.982

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	48.2	2.57%	42.0	0.090	39.5	6.0	1.7	131.4	8.14%	1483	1409	1335	3
3	7.4	48.2	2.60%	42.5	0.110	48.5	8.5	2.4	141.6	8.77%	1473	1400	1326	3
5	9.4	48.2	2.68%	43.8	0.123	54.1	10.0	2.8	148.9	9.22%	1466	1393	1319	3
10	14.4	48.2	2.76%	45.1	0.150	66.0	13.5	3.8	163.1	10.10%	1452	1379	1307	3
15	19.4	48.2	2.81%	45.9	0.167	73.6	15.5	4.4	172.1	10.66%	1443	1371	1298	3
17	21.4	48.2									1440	1368	1296	
20	24.4	48.2	2.87%	46.9	0.181	79.0	17.5	4.9	179.1	11.09%	1436	1364	1292	3
21:3	25.65	48.2									1435	1363	1291	
25	29.4	48.2	2.88%	47.1	0.190	83.2	19.5	5.5	184.0	11.40%	1431	1359	1288	3
30	34.4	48.2	2.91%	47.6	0.200	88.0	20.4	5.8	189.6	11.74%	1425	1354	1283	3
35	39.4	48.2	2.93%	47.9	0.209	91.9	21.5	6.1	194.1	12.02%	1421	1350	1279	3
40	44.4	48.2	2.95%	48.2	0.215	94.7	22.5	6.4	197.5	12.23%	1417	1346	1276	3
25	29.4										1431	1359	1288	

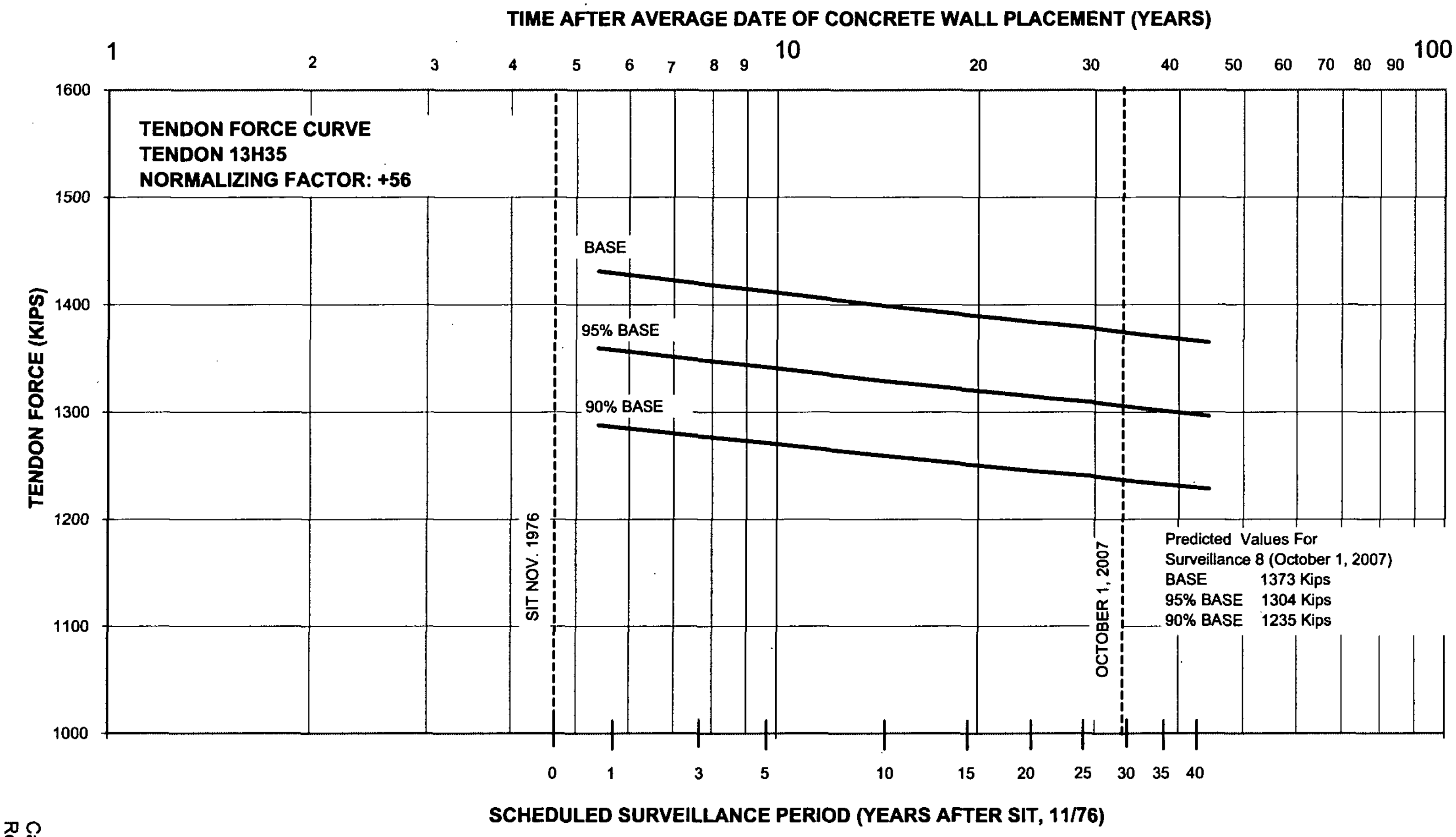

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 42H47
NORMALIZING FACTOR: +3
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1425 Kips
95% BASE 1354 Kips
90% BASE 1283 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 13H35   INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS)   SHOP: 1612   FIELD: 1650   AVERAGE: 1631   AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 7 OF 60   TOTAL ELASTIC SHORT. LOSS: 134.0   WIRE FACTOR: 0.988

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	116.9	2.57%	42.0	0.090	39.5	6.0	1.7	200.1	12.27%	1431	1359	1288	56
3	7.4	116.9	2.60%	42.5	0.110	48.5	8.5	2.4	210.3	12.90%	1421	1350	1279	56
5	9.4	116.9	2.68%	43.8	0.123	54.1	10.0	2.8	217.6	13.34%	1413	1343	1272	56
10	14.4	116.9	2.76%	45.1	0.150	66.0	13.5	3.8	231.8	14.21%	1399	1329	1259	56
15	19.4	116.9	2.81%	45.9	0.167	73.6	15.5	4.4	240.8	14.76%	1390	1321	1251	56
17	21.4	116.9									1387	1318	1249	
20	24.4	116.9	2.87%	46.9	0.181	79.0	17.5	4.9	247.8	15.19%	1383	1314	1245	56
21:3	25.65	116.9									1382	1313	1244	
25	29.4	116.9	2.88%	47.1	0.190	83.2	19.5	5.5	252.7	15.49%	1378	1309	1240	56
30	34.4	116.9	2.91%	47.6	0.200	88.0	20.4	5.8	258.3	15.84%	1373	1304	1235	56
35	39.4	116.9	2.93%	47.9	0.209	91.9	21.5	6.1	262.8	16.11%	1368	1300	1231	56
40	44.4	116.9	2.95%	48.2	0.215	94.7	22.5	6.4	266.2	16.32%	1365	1297	1228	56
25	29.4										1378	1309	1240	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 13H35
NORMALIZING FACTOR: +56
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1373 Kips
95% BASE 1304 Kips
90% BASE 1235 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

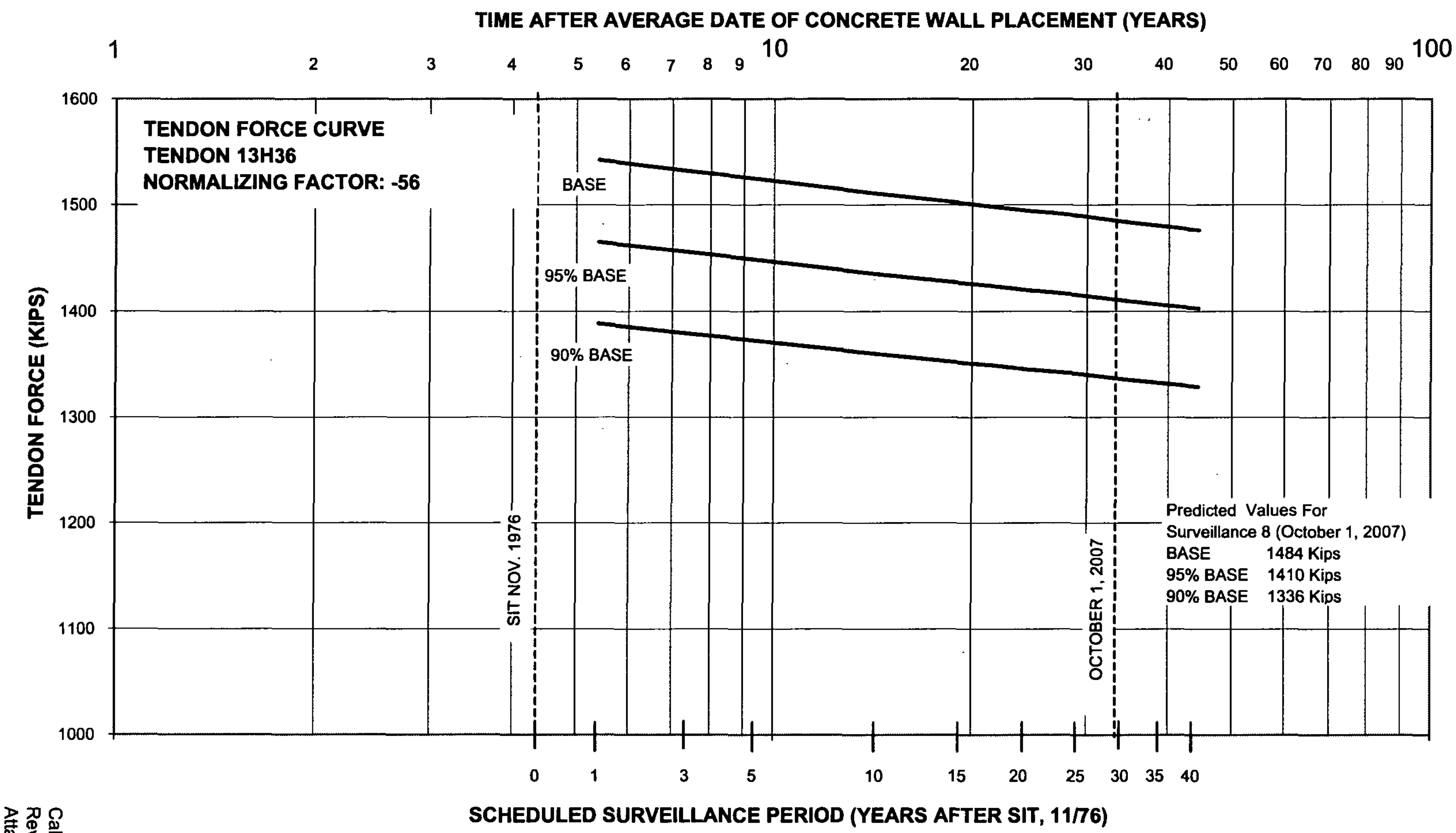
TENDON: 13H36 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS SHOP: 1618 FIELD: 1681 AVERAGE: 1650 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 49 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.982

NOTE: *SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET*

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	24.1	2.57%	42.0	0.090	39.5	6.0	1.7	107.3	6.50%	1542	1465	1388	-56
3	7.4	24.1	2.60%	42.5	0.110	48.5	8.5	2.4	117.5	7.12%	1532	1455	1379	-56
5	9.4	24.1	2.68%	43.8	0.123	54.1	10.0	2.8	124.8	7.57%	1525	1449	1372	-56
10	14.4	24.1	2.76%	45.1	0.150	66.0	13.5	3.8	139.0	8.43%	1511	1435	1360	-56
15	19.4	24.1	2.81%	45.9	0.167	73.6	15.5	4.4	148.0	8.97%	1502	1427	1351	-56
17	21.4	24.1									1499	1424	1349	
20	24.4	24.1	2.87%	46.9	0.181	79.0	17.5	4.9	155.0	9.39%	1495	1420	1345	-56
21:3	25.65	24.1									1493	1419	1344	
25	29.4	24.1	2.88%	47.1	0.190	83.2	19.5	5.5	159.9	9.69%	1490	1415	1341	-56
30	34.4	24.1	2.91%	47.6	0.200	88.0	20.4	5.8	165.5	10.03%	1484	1410	1336	-56
35	39.4	24.1	2.93%	47.9	0.209	91.9	21.5	6.1	170.0	10.30%	1480	1406	1332	-56
40	44.4	24.1	2.95%	48.2	0.215	94.7	22.5	6.4	173.4	10.51%	1476	1402	1329	-56
25	29.4										1490	1415	1341	

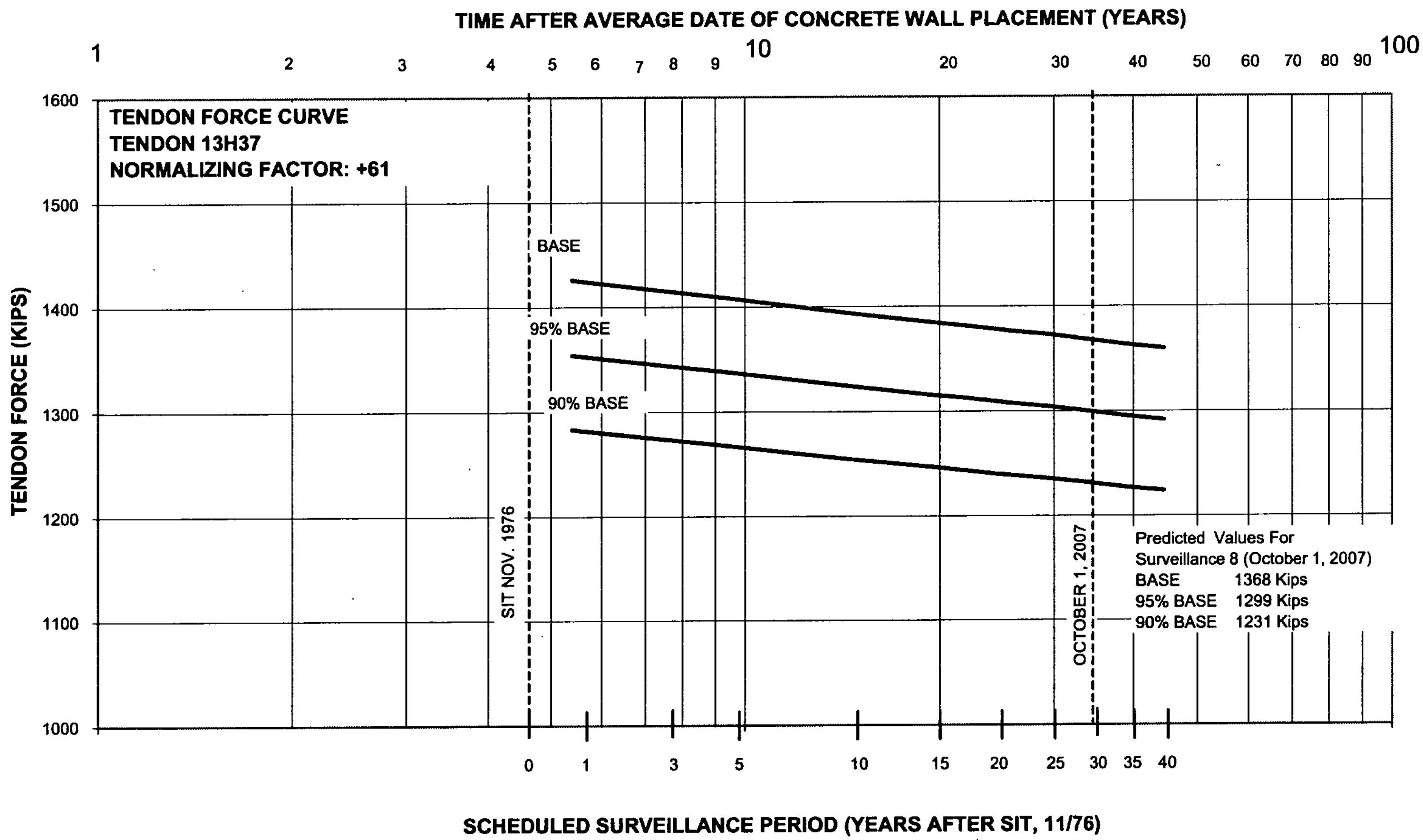

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 13H36
NORMALIZING FACTOR: -56
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1484 Kips
95% BASE 1410 Kips
90% BASE 1336 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 13H37   INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS)   SHOP: 1624   FIELD: 1634   AVERAGE: 1629   AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 6 OF 60   TOTAL ELASTIC SHORT. LOSS: 134.0   WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	119.9	2.57%	42.0	0.090	39.5	6.0	1.7	203.1	12.47%	1426	1355	1283	61
3	7.4	119.9	2.60%	42.5	0.110	48.5	8.5	2.4	213.3	13.09%	1416	1345	1274	61
5	9.4	119.9	2.68%	43.8	0.123	54.1	10.0	2.8	220.6	13.54%	1408	1338	1267	61
10	14.4	119.9	2.76%	45.1	0.150	66.0	13.5	3.8	234.8	14.41%	1394	1324	1255	61
15	19.4	119.9	2.81%	45.9	0.167	73.6	15.5	4.4	243.7	14.96%	1385	1316	1247	61
17	21.4	119.9									1382	1313	1244	
20	24.4	119.9	2.87%	46.9	0.181	79.0	17.5	4.9	250.7	15.39%	1378	1309	1240	61
21:3	25.65	119.9									1377	1308	1239	
25	29.4	119.9	2.88%	47.1	0.190	83.2	19.5	5.5	255.7	15.70%	1373	1305	1236	61
30	34.4	119.9	2.91%	47.6	0.200	88.0	20.4	5.8	261.2	16.04%	1368	1299	1231	61
35	39.4	119.9	2.93%	47.9	0.209	91.9	21.5	6.1	265.7	16.31%	1363	1295	1227	61
40	44.4	119.9	2.95%	48.2	0.215	94.7	22.5	6.4	269.1	16.52%	1360	1292	1224	61
25	29.4										1373	1305	1236	

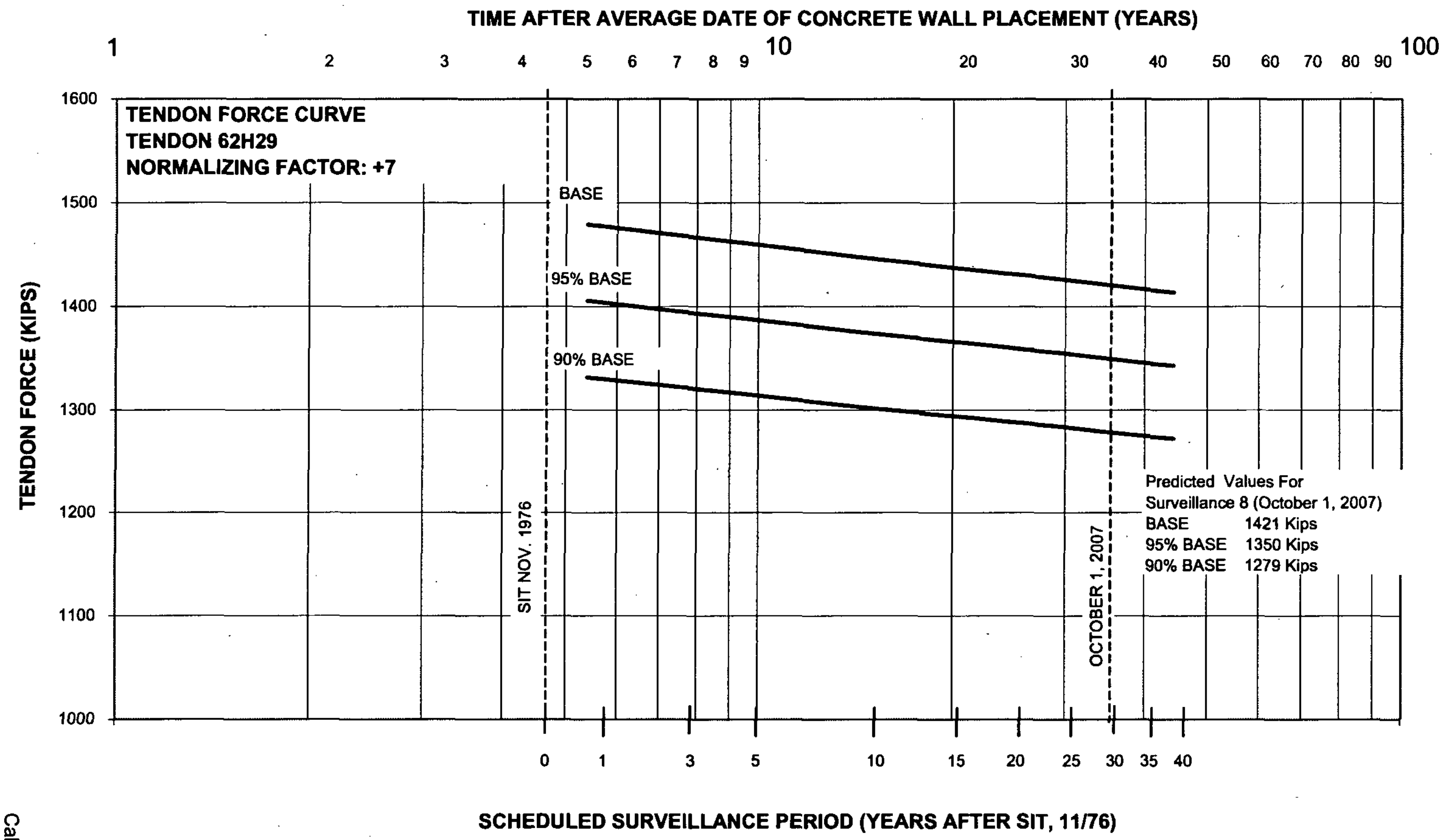

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON 13H37
NORMALIZING FACTOR: +61
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE (KIPS)
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1368 Kips
95% BASE 1299 Kips
90% BASE 1231 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 62H29 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1617 FIELD: 1641 AVERAGE: 1629 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 30 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	INDIVIDUAL LOSSES: STRESS RELAXATION PERCENT	INDIVIDUAL LOSSES: STRESS RELAXATION FORCE (KIPS)	INDIVIDUAL LOSSES: CREEP SP. CR. (*.0001)	INDIVIDUAL LOSSES: CREEP FORCE (KIPS)	INDIVIDUAL LOSSES: SHRINKAGE m in/in	INDIVIDUAL LOSSES: SHRINKAGE FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	66.6	2.57%	42.0	0.090	39.5	6.0	1.7	149.8	9.19%	1479	1405	1331	7
3	7.4	66.6	2.60%	42.5	0.110	48.5	8.5	2.4	160.0	9.82%	1469	1396	1322	7
5	9.4	66.6	2.68%	43.8	0.123	54.1	10.0	2.8	167.3	10.27%	1462	1389	1316	7
10	14.4	66.6	2.76%	45.1	0.150	66.0	13.5	3.8	181.5	11.14%	1447	1375	1303	7
15	19.4	66.6	2.81%	45.9	0.167	73.6	15.5	4.4	190.5	11.69%	1439	1367	1295	7
17	21.4	66.6									1436	1364	1292	
20	24.4	66.6	2.87%	46.9	0.181	79.0	17.5	4.9	197.4	12.12%	1432	1360	1288	7
21:3	25.65	66.6									1430	1359	1287	
25	29.4	66.6	2.88%	47.1	0.190	83.2	19.5	5.5	202.4	12.42%	1427	1355	1284	7
30	34.4	66.6	2.91%	47.6	0.200	88.0	20.4	5.8	207.9	12.77%	1421	1350	1279	7
35	39.4	66.6	2.93%	47.9	0.209	91.9	21.5	6.1	212.4	13.04%	1417	1346	1275	7
40	44.4	66.6	2.95%	48.2	0.215	94.7	22.5	6.4	215.8	13.25%	1413	1342	1272	7
25	29.4										1427	1355	1284	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H29
NORMALIZING FACTOR: +7
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1421 Kips
95% BASE 1350 Kips
90% BASE 1279 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

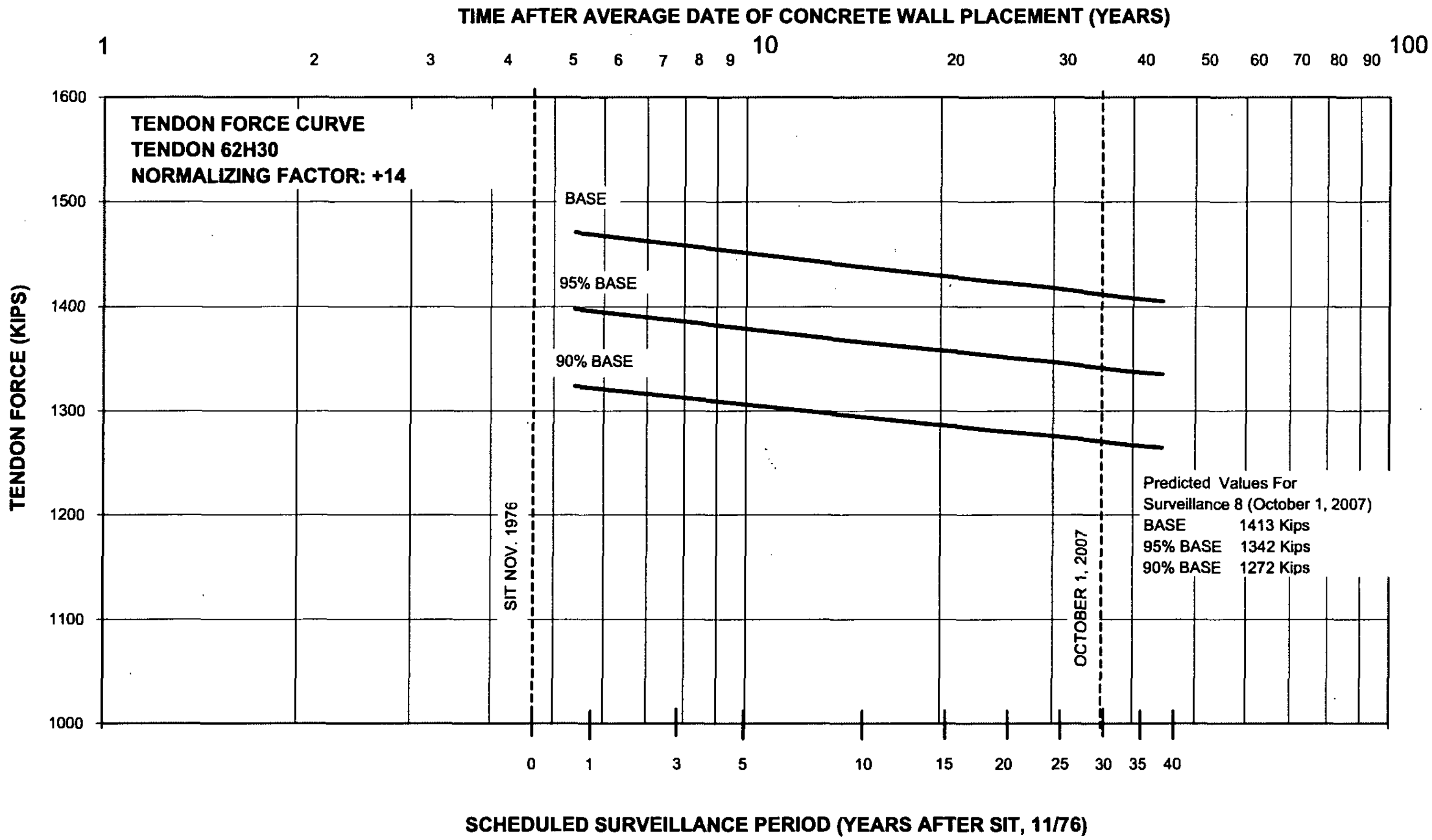
TENDON: 62H30 INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS): SHOP: 1591 FIELD: 1603 AVERAGE: 1597 AVERAGE ALL HOOP TENDONS: 1635

STRESS SEQUENCE: 41 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	42.4	2.57%	42.0	0.090	39.5	6.0	1.7	125.6	7.87%	1471	1397	1324	14
3	7.4	42.4	2.60%	42.5	0.110	48.5	8.5	2.4	135.8	8.51%	1461	1388	1315	14
5	9.4	42.4	2.68%	43.8	0.123	54.1	10.0	2.8	143.1	8.96%	1453	1381	1308	14
10	14.4	42.4	2.76%	45.1	0.150	66.0	13.5	3.8	157.3	9.85%	1439	1367	1295	14
15	19.4	42.4	2.81%	45.9	0.167	73.6	15.5	4.4	166.3	10.42%	1430	1359	1287	14
17	21.4	42.4									1428	1356	1285	
20	24.4	42.4	2.87%	46.9	0.181	79.0	17.5	4.9	173.3	10.85%	1423	1352	1281	14
21:3	25.65	42.4									1422	1351	1280	
25	29.4	42.4	2.88%	47.1	0.190	83.2	19.5	5.5	178.2	11.16%	1418	1347	1277	14
30	34.4	42.4	2.91%	47.6	0.200	88.0	20.4	5.8	183.8	11.51%	1413	1342	1272	14
35	39.4	42.4	2.93%	47.9	0.209	91.9	21.5	6.1	188.3	11.79%	1408	1338	1267	14
40	44.4	42.4	2.95%	48.2	0.215	94.7	22.5	6.4	191.7	12.01%	1405	1335	1264	14
25	29.4										1418	1347	1277	

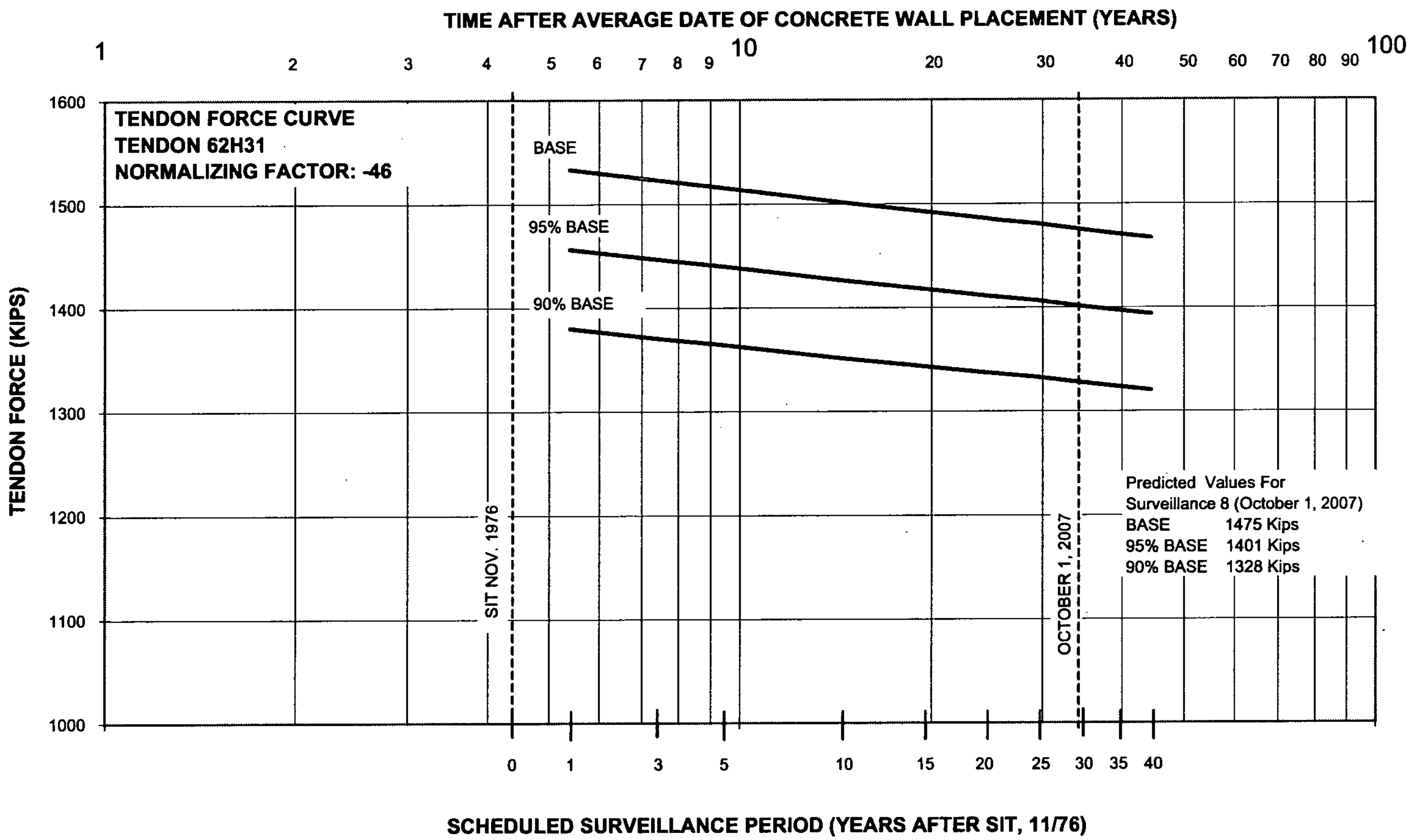

TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
TENDON FORCE CURVE
TENDON 62H30
NORMALIZING FACTOR: +14
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1413 Kips
95% BASE 1342 Kips
90% BASE 1272 Kips
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

TENDON: 62H31   INITIAL CONCRETE STRESS (PSI): 1732

ORIGINAL FORCES (KIPS) SHOP: 1687 FIELD: 1675 AVERAGE: 1681 AVERAGE ALL HOOP TENDONS: 1635
STRESS SEQUENCE: 31 OF 60 TOTAL ELASTIC SHORT. LOSS: 134.0 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM HOOPINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	SP. CR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	5.4	64.8	2.57%	42.0	0.090	39.5	6.0	1.7	148.0	8.80%	1533	1457	1380	-46
3	7.4	64.8	2.60%	42.5	0.110	48.5	8.5	2.4	158.2	9.41%	1523	1447	1371	-46
5	9.4	64.8	2.68%	43.8	0.123	54.1	10.0	2.8	165.5	9.84%	1516	1440	1364	-46
10	14.4	64.8	2.76%	45.1	0.150	66.0	13.5	3.8	179.7	10.69%	1502	1426	1351	-46
15	19.4	64.8	2.81%	45.9	0.167	73.6	15.5	4.4	188.6	11.22%	1493	1418	1343	-46
17	21.4	64.8									1490	1415	1341	
20	24.4	64.8	2.87%	46.9	0.181	79.0	17.5	4.9	195.6	11.63%	1486	1411	1337	-46
21:3	25.65	64.8									1484	1410	1336	
25	29.4	64.8	2.88%	47.1	0.190	83.2	19.5	5.5	200.6	11.93%	1481	1407	1333	-46
30	34.4	64.8	2.91%	47.6	0.200	88.0	20.4	5.8	206.1	12.26%	1475	1401	1328	-46
35	39.4	64.8	2.93%	47.9	0.209	91.9	21.5	6.1	210.6	12.53%	1471	1397	1324	-46
40	44.4	64.8	2.95%	48.2	0.215	94.7	22.5	6.4	214.0	12.73%	1467	1394	1321	-46
25	29.4										1481	1407	1333	


TIME AFTER AVERAGE DATE OF CONCRETE WALL PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON 62H31
NORMALIZING FACTOR: -46
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1475 Kips
95% BASE 1401 Kips
90% BASE 1328 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

Stress Sequence Sorted by Tendon Number

Tendon No.	Sequence No.	Tendon No.	Sequence No.	Tendon No.	Sequence No.
D101	23	D201	32	D301	21
D102	32	D202	30	D302	22
D103	32	D203	11	D303	8
D104	22	D204	12	D304	30
D105	21	D205	28	D305	20
D106	24	D206	30	D306	23
D107	7	D207	9	D307	7
D108	31	D208	28	D308	30
D109	20	D209	29	D309	19
D110	25	D210	13	D310	24
D111	5	D211	1	D311	6
D112	31	D212	27	D312	30
D113	19	D213	14	D313	18
D114	32	D214	30	D314	25
D115	4	D215	2	D315	5
D116	29	D216	27	D316	30
D117	18	D217	15	D317	17
D118	26	D218	30	D318	26
D119	6	D219	3	D319	4
D120	29	D220	27	D320	30
D121	17	D221	32	D321	16
D122	26	D222	28	D322	26
D123	3	D223	4	D323	3
D124	29	D224	27	D324	30
D125	16	D225	17	D325	15
D126	27	D226	28	D326	26
D127	29	D227	5	D327	2
D128	2	D228	26	D328	29
D129	15	D229	18	D329	14
D130	1	D230	29	D330	27
D131	29	D231	6	D331	1
D132	27	D232	24	D332	29
D133	14	D233	19	D333	13
D134	27	D234	29	D334	28
D135	10	D235	7	D335	9
D136	29	D236	23	D336	28
D137	32	D237	29	D337	28
D138	28	D238	20	D338	12
D139	11	D239	32	D339	32
D140	28	D240	22	D340	28
D141	12	D241	32	D341	11

Stress Sequence Sorted by Sequence Number

Sequence No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.	Tendon No.
1	D130	D211	D331				
2	D128	D215	D327				
3	D123	D219	D323				
4	D115	D223	D319				
5	D111	D227	D315				
6	D119	D231	D311				
7	D107	D235	D307				
8	D303						
9	D207	D335					
10	D135						
11	D139	D203	D341				
12	D141	D204	D338				
13	D210	D333					
14	D133	D213	D329				
15	D129	D217	D325				
16	D125	D321					
17	D121	D225	D317				
18	D117	D229	D313				
19	D113	D233	D309				
20	D109	D238	D305				
21	D105	D301					
22	D104	D240	D302				
23	D101	D236	D306				
24	D106	D232	D310				
25	D110	D314					
26	D118	D122	D228	D318	D322	D326	
27	D126	D132	D134	D212	D216	D220	D224
27	D330						
28	D138	D140	D205	D208	D222	D226	D334
28	D336	D337	D340				
29	D116	D120	D124	D127	D131	D136	D209
29	D230	D234	D237	D328	D332		
30	D202	D206	D214	D218	D304	D308	D312
30	D316	D320	D324				
31	D108	D112					
32	D102	D103	D114	D137	D201	D221	D239
32	D241	D339					

Note:
Data extracted from Reference 11 of Calculation S-95-0082

DOME TENDONS DATA INPUT

Reference: S-95-0082

Initial Concrete Stress = 1732.0 (ksi)
Average Force = 1639.0 (kips)

For Tendons in Sequences 1 through 27
Total Stress Sequence (N) = 27
Total Elastic Shortening Losses = 82.7

For Tendons in Sequences 28 thru 32
Total Stress Sequence (N) = 5
Total Elastic Shortening Losses = 47.4

Tendon No.	Lift-off Pressure (ksi) (1)				Stress Sequence (n) (2)	No. of Effective Wires (1)	Wire Factor #/163 (4)	Original Forces (kips)		Remarks (3)
	Shop End		Field End					Shop End (5)	Field End (5)	
	Predicted	Actual	Predicted	Actual						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
D128	6710	6800	6650	6900	2	159	0.975	1620	1659	
D129	6710	6850	6740	6600	15	161	0.988	1653	1585	S
D130	6870	6850	6810	6800	1	163	1.000	1634	1637	
D211	6810	7100	6870	7000	1	162	0.994	1698	1660	
D212	6770	6600	6770	6700	27	162	0.994	1588	1612	S,C
D213	6840	6900	6800	6800	14	163	1.000	1653	1639	
D237	6810	6900	6810	6900	29	163	1.000	1661	1661	
D238	6800	7050	6840	6800	20	163	1.000	1699	1629	S,D
D239	6810	6800	6840	6650	32	163	1.000	1637	1593	

Notes:
(1) Ref.12, 13, 14 Crystal River 3 R/B Tendon History Sheets - Dome Tendons for Original Stressing. See Attachments B&D.
(2) Ref. 11 Crystal River 3 Tendon Surveillance Loss Calculations. See Attachment C for stress sequence:
(3) S= Selected Tendons, C =Control tendon, D =Detension tendon, A =Alternate tendo
E = Exempted Tendons (5th Surveillance), All Other Tendons are Adjacent
(4) Wire factors are calculated based on the number of effective wires divided by 163.
(5) Original forces calculated based on the expression in S-95-008:

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

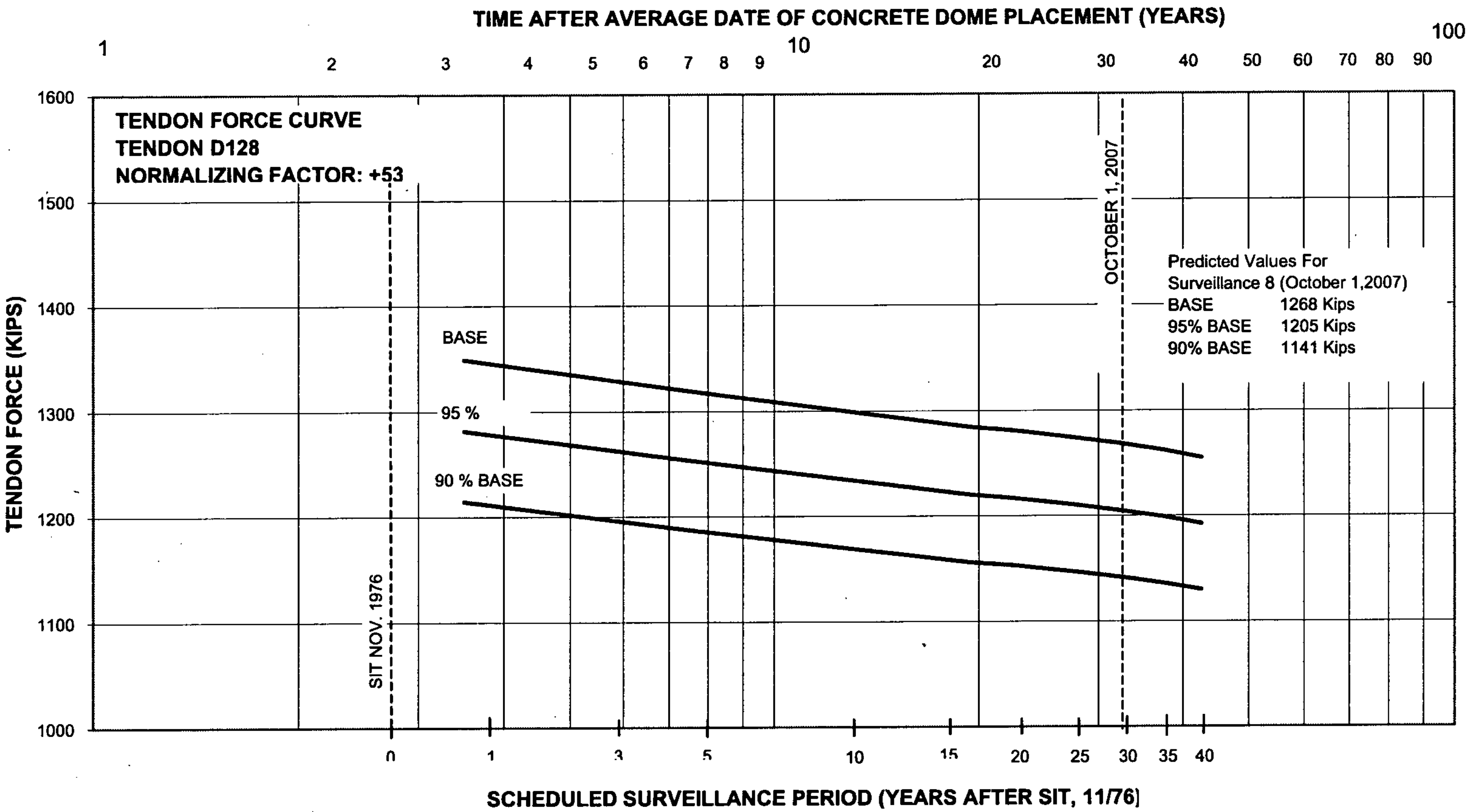
TENDON: D128 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1620 FIELD: 1659 AVERAGE: 1639 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 2 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.975

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	151.6	2.57%	42.3	3.28	92.5	15	4.0	290.4	17.71%	1349	1282	1214	53
3	5.5	151.6	2.60%	42.7	3.86	108.8	18	5.0	308.1	18.79%	1331	1265	1198	53
5	7.5	151.6	2.68%	44.1	4.21	118.7	21	6.0	320.4	19.54%	1319	1253	1187	53
10	12.5	151.6	2.76%	45.4	4.62	130.3	25	7.0	334.3	20.39%	1305	1240	1175	53
15	17.5	151.6	2.81%	46.2	5.21	146.9	27.5	8.0	352.7	21.51%	1287	1222	1158	53
17	19.5	151.6									1284	1220	1156	53
20	22.5	151.6	2.87%	47.2	5.39	152.0	29	8.0	358.8	21.88%	1281	1217	1153	53
21:3	23.75	151.6									1279	1215	1151	53
25	27.5	151.6	2.89%	47.3	5.59	157.6	30.8	9.0	365.5	22.29%	1274	1210	1147	53
30	32.5	151.6	2.91%	47.8	5.78	163.0	32	9.0	371.4	22.65%	1268	1205	1141	53
35	37.5	151.6	2.93%	48.2	5.98	168.6	33	9.0	377.4	23.02%	1262	1199	1136	53
40	42.5	151.6	2.95%	48.5	6.18	174.3	34	10.0	384.4	23.44%	1255	1192	1130	53
25	27.5										1274	1210	1147	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
TENDON FORCE CURVE
TENDON D128
NORMALIZING FACTOR: +53
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE (KIPS)
BASE
95 %
90 % BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1,2007)
BASE 1268 Kips
95% BASE 1205 Kips
90% BASE 1141 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

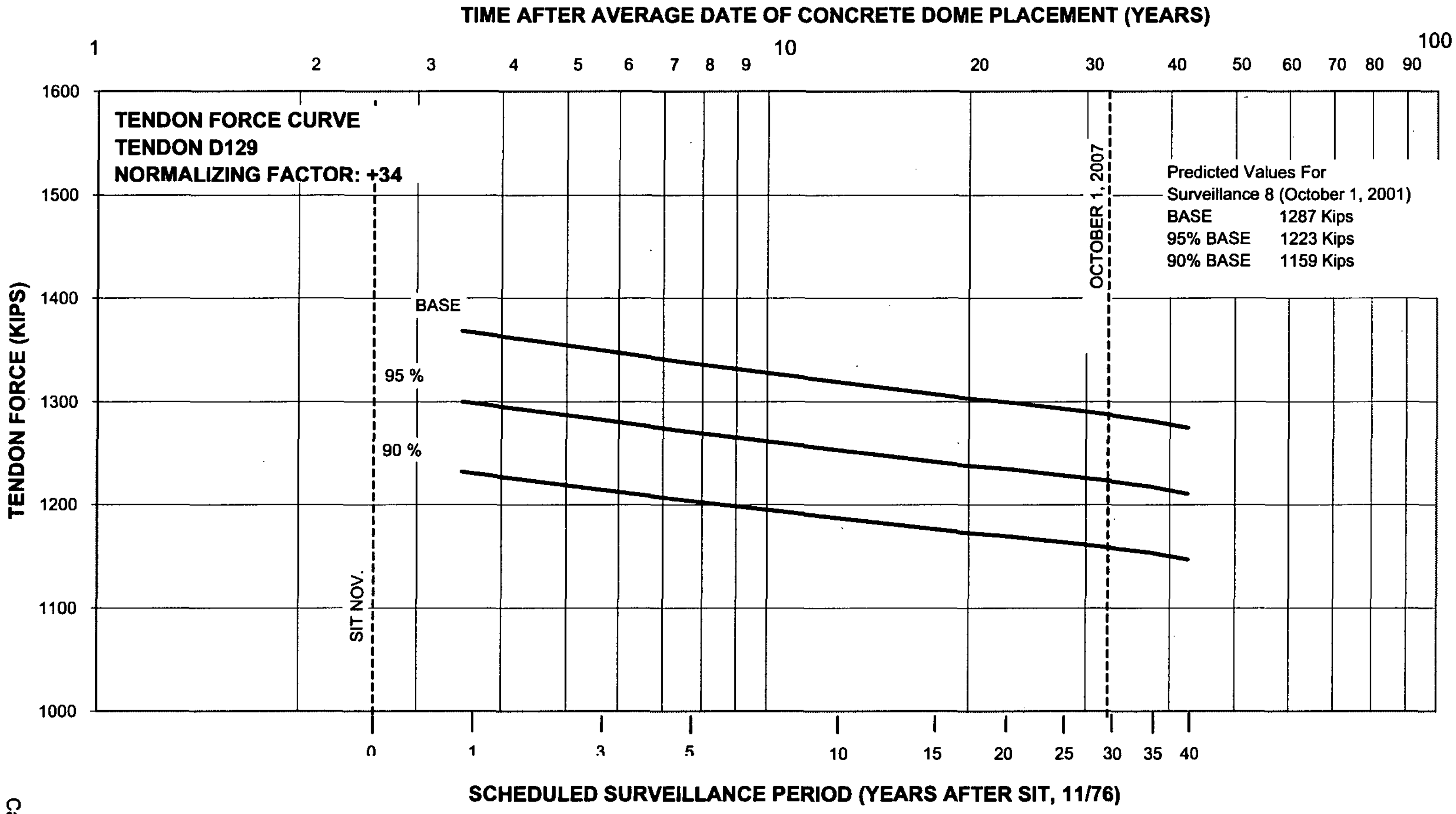
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D129 INITIAL CONCRETE STRESS (PS NA

ORIGINAL FORCES (KIPS): SHOP: 1653 FIELD: 1585 AVERAGE: 1619 AVERAGE ALL DOME TENDONS 1639
STRESS SEQUENCE: 15 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR 0.988

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	(KIPS)
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	111.8	2.57%	42.3	3.28	92.5	15	4.0	250.6	15.48%	1368	1300	1232	34
3	5.5	111.8	2.60%	42.7	3.86	108.8	18	5.0	268.3	16.57%	1351	1283	1216	34
5	7.5	111.8	2.68%	44.1	4.21	118.7	21	6.0	280.6	17.33%	1338	1271	1205	34
10	12.5	111.8	2.76%	45.4	4.62	130.3	25	7.0	294.5	18.19%	1324	1258	1192	34
15	17.5	111.8	2.81%	46.2	5.21	146.9	27.5	8.0	312.9	19.33%	1306	1241	1175	34
17	19.5	111.8									1304	1238	1173	34
20	22.5	111.8	2.87%	47.2	5.39	152.0	29	8.0	319.0	19.70%	1300	1235	1170	34
21:3	23.75	111.8									1298	1233	1168	34
25	27.5	111.8	2.89%	47.3	5.59	157.6	30.8	9.0	325.7	20.12%	1293	1229	1164	34
30	32.5	111.8	2.91%	47.8	5.78	163.0	32	9.0	331.6	20.48%	1287	1223	1159	34
35	37.5	111.8	2.93%	48.2	5.98	168.6	33	9.0	337.6	20.85%	1281	1217	1153	34
40	42.5	111.8	2.95%	48.5	6.18	174.3	34	10.0	344.6	21.28%	1274	1211	1147	34
25	27.5										1293	1229	1164	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1
10
100
2 3 4 5 6 7 8 9 20 30 40 50 60 70 80 90
TENDON FORCE CURVE
TENDON D129
NORMALIZING FACTOR: +34
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2001)
BASE 1287 Kips
95% BASE 1223 Kips
90% BASE 1159 Kips
BASE
95 %
90 %
SIT NOV.
TENDON FORCE (KIPS)
1600 1500 1400 1300 1200 1100 1000
0 1 3 5 10 15 20 25 30 35 40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

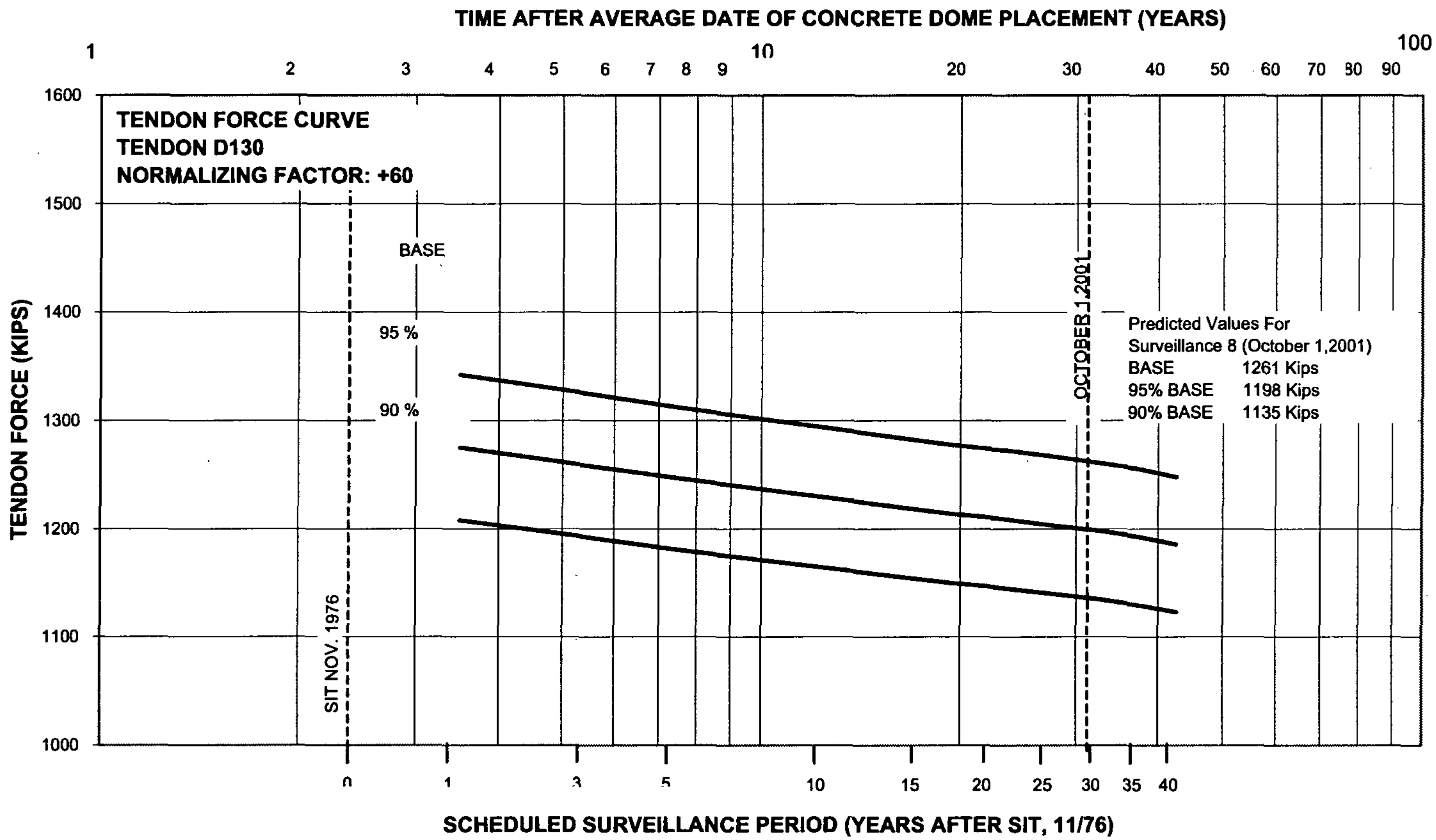
TENDON: D130 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS SHOP: 1634 FIELD: 1637 AVERAGE: 1635 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 1 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES								TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	154.6	2.57%	42.3	3.28	92.5	15	4.0	293.4	17.94%	1342	1275	1208	60
3	5.5	154.6	2.60%	42.7	3.86	108.8	18	5.0	311.1	19.03%	1324	1258	1192	60
5	7.5	154.6	2.68%	44.1	4.21	118.7	21	6.0	323.4	19.78%	1312	1246	1181	60
10	12.5	154.6	2.76%	45.4	4.62	130.3	25	7.0	337.3	20.63%	1298	1233	1168	60
15	17.5	154.6	2.81%	46.2	5.21	146.9	27.5	8.0	355.7	21.75%	1280	1216	1152	60
17	19.5	154.6									1277	1213	1149	60
20	22.5	154.6	2.87%	47.2	5.39	152.0	29	8.0	361.8	22.13%	1274	1210	1146	60
21:3	23.75	154.6									1272	1208	1145	60
25	27.5	154.6	2.89%	47.3	5.59	157.6	30.8	9.0	368.5	22.54%	1267	1203	1140	60
30	32.5	154.6	2.91%	47.8	5.78	163.0	32	9.0	374.4	22.90%	1261	1198	1135	60
35	37.5	154.6	2.93%	48.2	5.98	168.6	33	9.0	380.4	23.26%	1255	1192	1129	60
40	42.5	154.6	2.95%	48.5	6.18	174.3	34	10.0	387.4	23.69%	1248	1186	1123	60
25	27.5										1267	1203	1140	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D130
NORMALIZING FACTOR: +60
BASE
95 %
90 %
SIT NOV. 1976
OCTOBER 1,2001
Predicted Values For
Surveillance 8 (October 1,2001)
BASE 1261 Kips
95% BASE 1198 Kips
90% BASE 1135 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

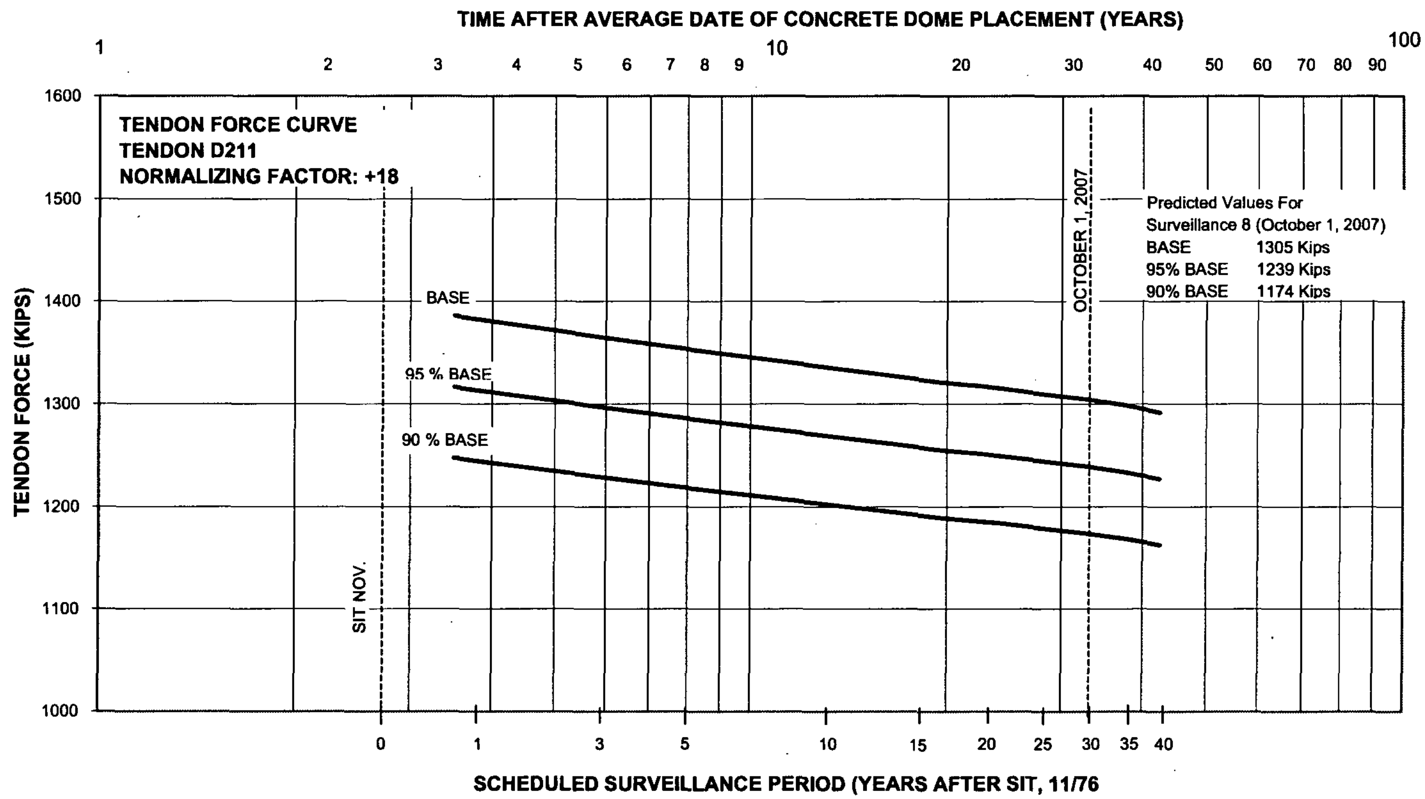
TENDON: D211 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1698 FIELD: 1660 AVERAGE: 1679 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 1 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: CR. STR. (*.0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	154.6	2.57%	42.3	3.28	92.5	15	4.0	293.4	17.48%	1386	1316	1247	18
3	5.5	154.6	2.60%	42.7	3.86	108.8	18	5.0	311.1	18.53%	1368	1299	1231	18
5	7.5	154.6	2.68%	44.1	4.21	118.7	21	6.0	323.4	19.26%	1356	1288	1220	18
10	12.5	154.6	2.76%	45.4	4.62	130.3	25	7.0	337.3	20.09%	1342	1275	1207	18
15	17.5	154.6	2.81%	46.2	5.21	146.9	27.5	8.0	355.7	21.19%	1323	1257	1191	18
17	19.5	154.6									1321	1255	1189	18
20	22.5	154.6	2.87%	47.2	5.39	152.0	29	8.0	361.8	21.55%	1317	1251	1185	18
21:3	23.75	154.6									1315	1250	1184	18
25	27.5	154.6	2.89%	47.3	5.59	157.6	30.8	9.0	368.5	21.95%	1310	1245	1179	18
30	32.5	154.6	2.91%	47.8	5.78	163.0	32	9.0	374.4	22.30%	1305	1239	1174	18
35	37.5	154.6	2.93%	48.2	5.98	168.6	33	9.0	380.4	22.66%	1299	1234	1169	18
40	42.5	154.6	2.95%	48.5	6.18	174.3	34	10.0	387.4	23.08%	1292	1227	1162	18
25	27.5										1310	1245	1179	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D211
NORMALIZING FACTOR: +18
TENDON FORCE (KIPS)
BASE
95 % BASE
90 % BASE
SIT NOV.
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1305 Kips
95% BASE 1239 Kips
90% BASE 1174 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76

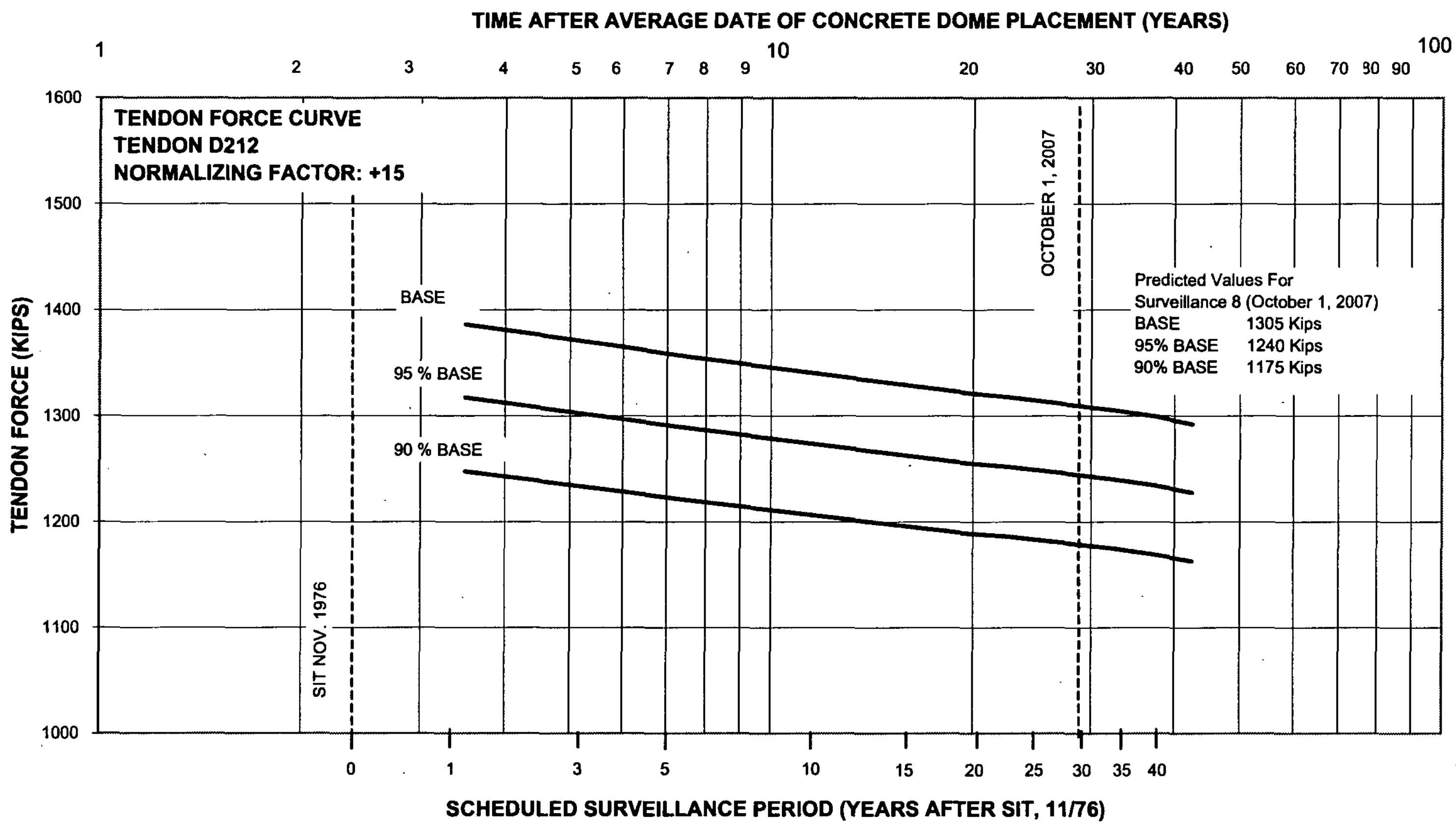
USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

TENDON: D212 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS SHOP: 1588 FIELD: 1612 AVERAGE: 1600 AVERAGE ALL DOME TENDONS: 1639
STRESS SEQUENCE: 27 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR 0.994

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	75.0	2.57%	42.3	3.28	92.5	15	4.0	213.8	13.36%	1386	1317	1248	15
3	5.5	75.0	2.60%	42.7	3.86	108.8	18	5.0	231.5	14.47%	1369	1300	1232	15
5	7.5	75.0	2.68%	44.1	4.21	118.7	21	6.0	243.8	15.24%	1356	1288	1221	15
10	12.5	75.0	2.76%	45.4	4.62	130.3	25	7.0	257.7	16.11%	1342	1275	1208	15
15	17.5	75.0	2.81%	46.2	5.21	146.9	27.5	8.0	276.1	17.26%	1324	1258	1192	15
17	19.5	75.0									1321	1255	1189	15
20	22.5	75.0	2.87%	47.2	5.39	152.0	29	8.0	282.2	17.64%	1318	1252	1186	15
21:3	23.75	75.0									1316	1250	1185	15
25	27.5	75.0	2.89%	47.3	5.59	157.6	30.8	9.0	288.9	18.06%	1311	1246	1180	15
30	32.5	75.0	2.91%	47.8	5.78	163.0	32	9.0	294.8	18.42%	1305	1240	1175	15
35	37.5	75.0	2.93%	48.2	5.98	168.6	33	9.0	300.8	18.80%	1299	1234	1169	15
40	42.5	75.0	2.95%	48.5	6.18	174.3	34	10.0	307.8	19.24%	1292	1228	1163	15
25	27.5										1311	1246	1180	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D212
NORMALIZING FACTOR: +15
TENDON FORCE (KIPS)
BASE
95 % BASE
90 % BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1305 Kips
95% BASE 1240 Kips
90% BASE 1175 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

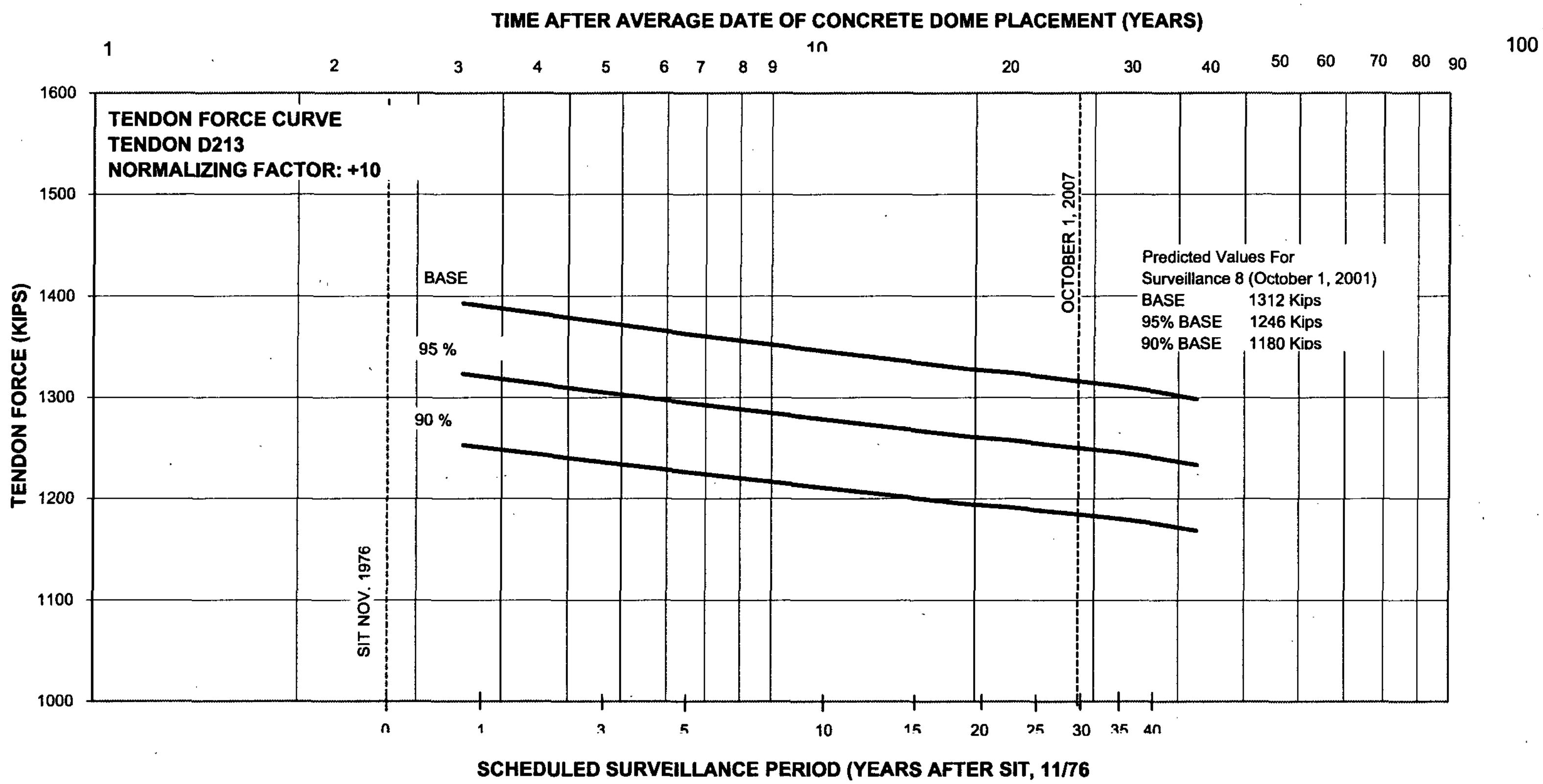
TENDON: D213 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1653 FIELD: 1639 AVERAGE: 1646 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 14 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES: ELASTIC SHORT.	STRESS RELAXATION: PERCENT	STRESS RELAXATION: FORCE (KIPS)	CREEP: CR. STR. (*.0001)	CREEP: FORCE (KIPS)	SHRINKAGE: m in/in	SHRINKAGE: FORCE (KIPS)	TOTAL LOSSES: TOTAL FORCE LOSS (KIPS)	TOTAL LOSSES: TOTAL PERCENT LOSS	PREDICTED FORCES: BASE (KIPS)	PREDICTED FORCES: 95% BASE (KIPS)	PREDICTED FORCES: 90% BASE (KIPS)	NORMALIZING FACTOR (KIPS)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	114.8	2.57%	42.3	3.28	92.5	15	4.0	253.6	15.41%	1393	1323	1253	10
3	5.5	114.8	2.60%	42.7	3.86	108.8	18	5.0	271.3	16.48%	1375	1306	1237	10
5	7.5	114.8	2.68%	44.1	4.21	118.7	21	6.0	283.6	17.23%	1363	1294	1226	10
10	12.5	114.8	2.76%	45.4	4.62	130.3	25	7.0	297.5	18.07%	1349	1281	1214	10
15	17.5	114.8	2.81%	46.2	5.21	146.9	27.5	8.0	315.9	19.19%	1330	1264	1197	10
17	19.5	114.8									1328	1261	1195	10
20	22.5	114.8	2.87%	47.2	5.39	152.0	29	8.0	322.0	19.56%	1324	1258	1192	10
21:3	23.75	114.8									1322	1256	1190	10
25	27.5	114.8	2.89%	47.3	5.59	157.6	30.8	9.0	328.7	19.97%	1317	1252	1186	10
30	32.5	114.8	2.91%	47.8	5.78	163.0	32	9.0	334.6	20.33%	1312	1246	1180	10
35	37.5	114.8	2.93%	48.2	5.98	168.6	33	9.0	340.6	20.69%	1306	1240	1175	10
40	42.5	114.8	2.95%	48.5	6.18	174.3	34	10.0	347.6	21.12%	1299	1234	1169	10
25	27.5										1317	1252	1186	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D213
NORMALIZING FACTOR: +10
TENDON FORCE (KIPS)
BASE
95 %
90 %
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2001)
BASE 1312 Kips
95% BASE 1246 Kips
90% BASE 1180 Kips
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76

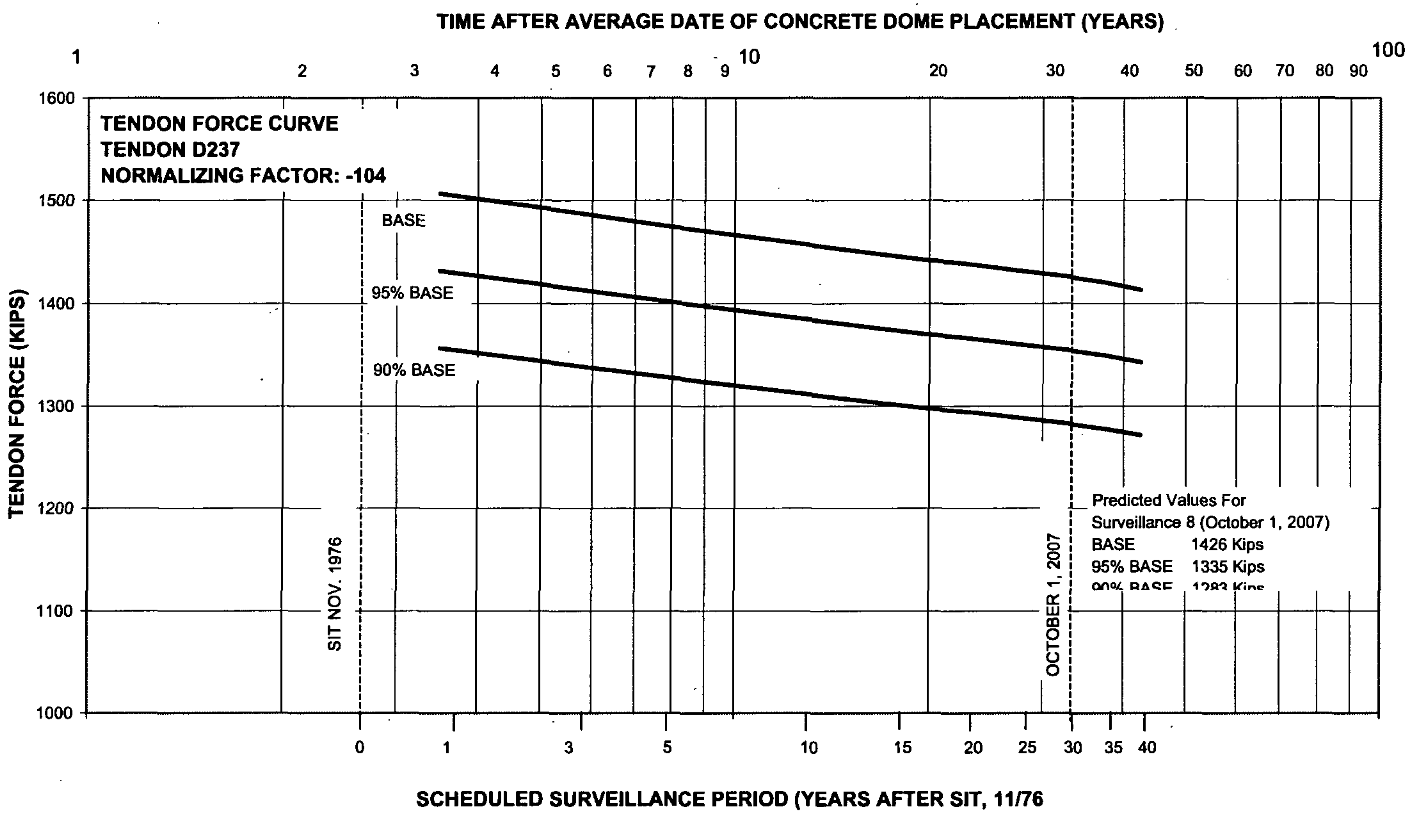
USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

TENDON: D237 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1661 FIELD: 1661 AVERAGE: 1661 AVERAGE ALL DOME TENDONS 1639
STRESS SEQUENCE: 29 OF 5 TOTAL ELASTIC SHORT. LOSS: 47.4 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (* .0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	14.7	2.57%	42.3	3.28	92.5	15	4.0	153.5	9.25%	1507	1432	1356	-104
3	5.5	14.7	2.60%	42.7	3.86	108.8	18	5.0	171.2	10.31%	1489	1415	1340	-104
5	7.5	14.7	2.68%	44.1	4.21	118.7	21	6.0	183.5	11.05%	1477	1403	1329	-104
10	12.5	14.7	2.76%	45.4	4.62	130.3	25	7.0	197.4	11.89%	1463	1390	1317	-104
15	17.5	14.7	2.81%	46.2	5.21	146.9	27.5	8.0	215.8	13.00%	1445	1373	1300	-104
17	19.5	14.7									1442	1370	1298	-104
20	22.5	14.7	2.87%	47.2	5.39	152.0	29	8.0	221.9	13.37%	1439	1367	1295	-104
21:3	23.75	14.7									1437	1365	1293	-104
25	27.5	14.7	2.89%	47.3	5.59	157.6	30.8	9.0	228.6	13.77%	1432	1360	1289	-104
30	32.5	14.7	2.91%	47.8	5.78	163.0	32	9.0	234.5	14.12%	1426	1355	1283	-104
35	37.5	14.7	2.93%	48.2	5.98	168.6	33	9.0	240.5	14.49%	1420	1349	1278	-104
40	42.5	14.7	2.95%	48.5	6.18	174.3	34	10.0	247.5	14.91%	1413	1342	1272	-104
25	27.5										1432	1360	1289	



TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
1600
1500
1400
1300
1200
1100
1000
TENDON FORCE CURVE
TENDON D237
NORMALIZING FACTOR: -104
BASE
95% BASE
90% BASE
TENDON FORCE (KIPS)
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1426 Kips
95% BASE 1335 Kips
0
1
3
5
10
15
20
25
30
35
40
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76

USE FOR DOME TENDONS WITH STRESSING SEQUENCES LESS THAN 27

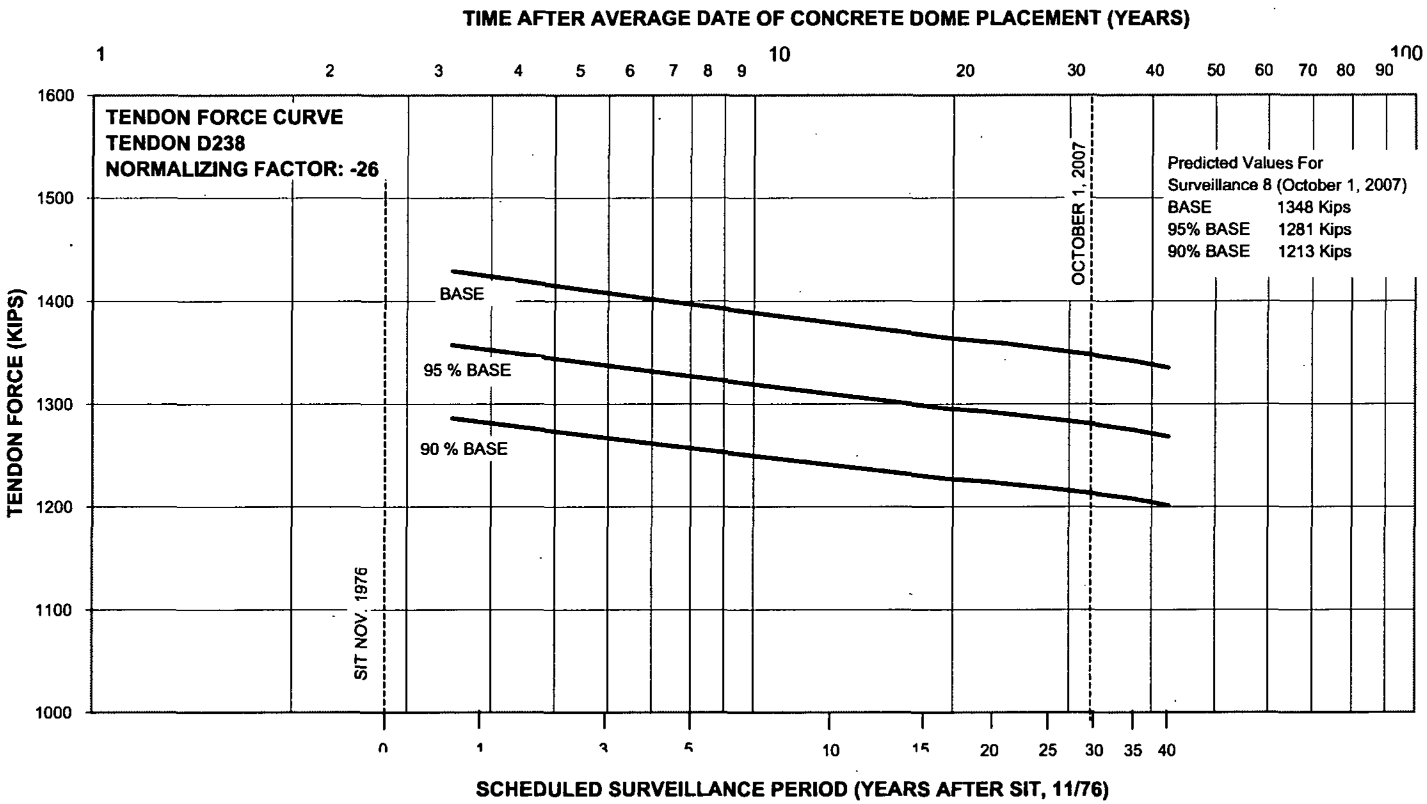
TENDON: D238 INITIAL CONCRETE STRESS (PSI) : NA

ORIGINAL FORCES (KIPS): SHOP: 1699 FIELD: 1629 AVERAGE: 1664 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 20 OF 27 TOTAL ELASTIC SHORT. LOSS: 82.7 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (*.0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	96.4	2.57%	42.3	3.28	92.5	15	4.0	235.2	14.13%	1429	1358	1286	-26
3	5.5	96.4	2.60%	42.7	3.86	108.8	18	5.0	252.9	15.20%	1411	1341	1270	-26
5	7.5	96.4	2.68%	44.1	4.21	118.7	21	6.0	265.2	15.94%	1399	1329	1259	-26
10	12.5	96.4	2.76%	45.4	4.62	130.3	25	7.0	279.1	16.77%	1385	1316	1247	-26
15	17.5	96.4	2.81%	46.2	5.21	146.9	27.5	8.0	297.5	17.88%	1367	1298	1230	-26
17	19.5	96.4									1364	1296	1228	-26
20	22.5	96.4	2.87%	47.2	5.39	152.0	29	8.0	303.6	18.24%	1361	1293	1225	-26
21:3	23.75	96.4									1359	1291	1223	-26
25	27.5	96.4	2.89%	47.3	5.59	157.6	30.8	9.0	310.3	18.65%	1354	1286	1219	-26
30	32.5	96.4	2.91%	47.8	5.78	163.0	32	9.0	316.2	19.00%	1348	1281	1213	-26
35	37.5	96.4	2.93%	48.2	5.98	168.6	33	9.0	322.2	19.36%	1342	1275	1208	-26
40	42.5	96.4	2.95%	48.5	6.18	174.3	34	10.0	329.2	19.78%	1335	1268	1202	-26
25	27.5										1354	1286	1219	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D238
NORMALIZING FACTOR: -26
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1348 Kips
95% BASE 1281 Kips
90% BASE 1213 Kips
OCTOBER 1, 2007
SIT NOV. 1976
BASE
95 % BASE
90 % BASE
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

USE FOR DOME TENDONS WITH STRESSING SEQUENCES GREATER THAN 27

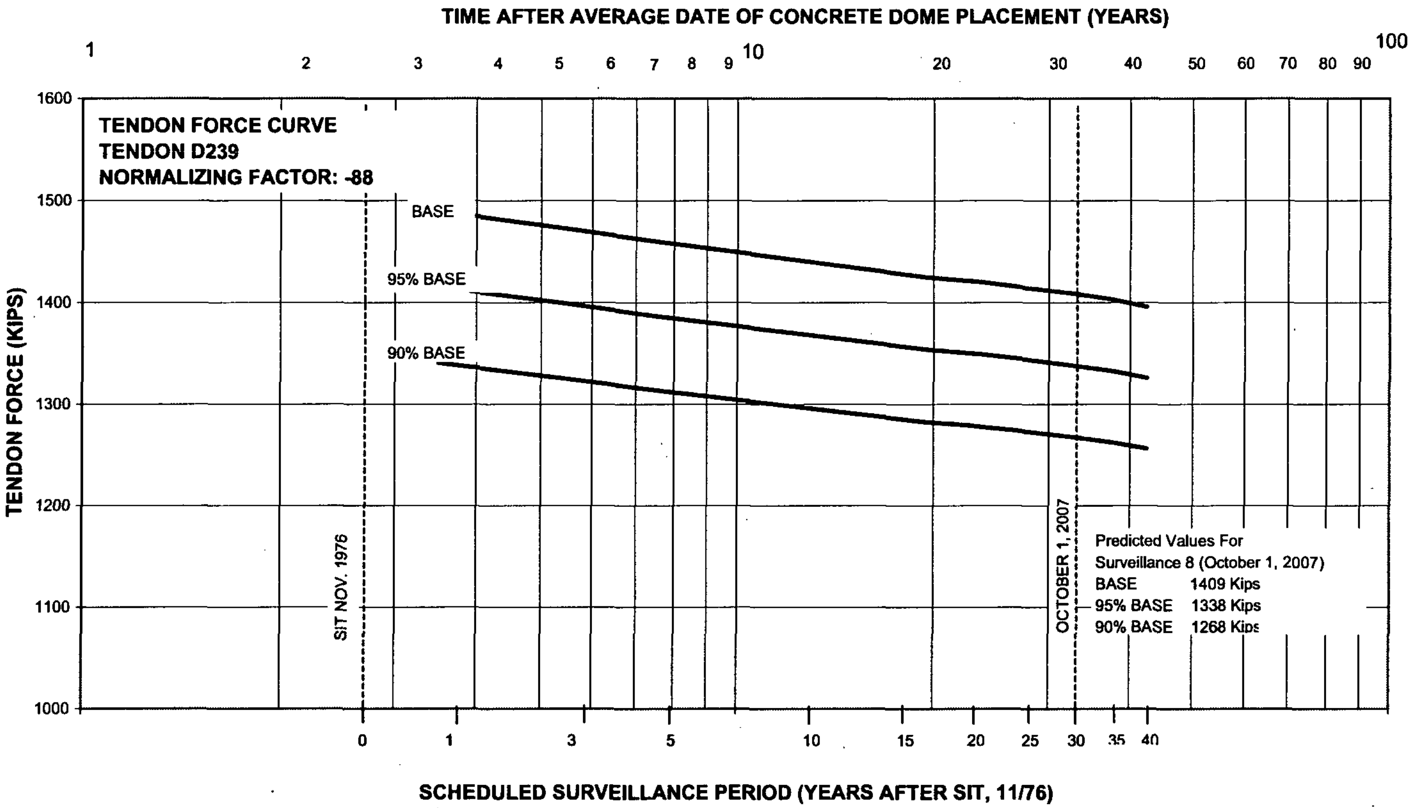
TENDON: D239 INITIAL CONCRETE STRESS (PSI): NA

ORIGINAL FORCES (KIPS): SHOP: 1637 FIELD: 1593 AVERAGE: 1615 AVERAGE ALL DOME TENDONS: 1639

STRESS SEQUENCE: 32 OF 5 TOTAL ELASTIC SHORT. LOSS: 47.4 WIRE FACTOR: 1.000

NOTE: SHADED VALUES ARE EXTRACTED FROM DOMEINP WORK SHEET

INSPECT. PERIOD AFTER SIT (YR:MO)	YEARS AFTER CONCRETE PLACEMENT (LOG)	INDIVIDUAL LOSSES							TOTAL LOSSES		PREDICTED FORCES			NORMALIZING FACTOR (KIPS)
		ELASTIC SHORT.	STRESS RELAXATION		CREEP		SHRINKAGE		TOTAL FORCE LOSS (KIPS)	TOTAL PERCENT LOSS	BASE (KIPS)	95% BASE (KIPS)	90% BASE (KIPS)	
			PERCENT	FORCE (KIPS)	CR. STR. (* .0001)	FORCE (KIPS)	m in/in	FORCE (KIPS)						
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
1	3.5	-13.7	2.57%	42.3	3.28	92.5	15	4.0	125.1	7.75%	1490	1415	1341	-88
3	5.5	-13.7	2.60%	42.7	3.86	108.8	18	5.0	142.8	8.84%	1472	1399	1325	-88
5	7.5	-13.7	2.68%	44.1	4.21	118.7	21	6.0	155.1	9.60%	1460	1387	1314	-88
10	12.5	-13.7	2.76%	45.4	4.62	130.3	25	7.0	169.0	10.46%	1446	1374	1301	-88
15	17.5	-13.7	2.81%	46.2	5.21	146.9	27.5	8.0	187.4	11.60%	1428	1356	1285	-88
17	19.5	-13.7									1425	1354	1283	-88
20	22.5	-13.7	2.87%	47.2	5.39	152.0	29	8.0	193.5	11.98%	1421	1350	1279	-88
21:3	23.75	-13.7									1420	1349	1278	-88
25	27.5	-13.7	2.89%	47.3	5.59	157.6	30.8	9.0	200.2	12.40%	1415	1344	1273	-88
30	32.5	-13.7	2.91%	47.8	5.78	163.0	32	9.0	206.1	12.76%	1409	1338	1268	-88
35	37.5	-13.7	2.93%	48.2	5.98	168.6	33	9.0	212.1	13.13%	1403	1333	1263	-88
40	42.5	-13.7	2.95%	48.5	6.18	174.3	34	10.0	219.1	13.57%	1396	1326	1256	-88
25	27.5										1415	1344	1273	


TIME AFTER AVERAGE DATE OF CONCRETE DOME PLACEMENT (YEARS)
TENDON FORCE CURVE
TENDON D239
NORMALIZING FACTOR: -88
BASE
95% BASE
90% BASE
SIT NOV. 1976
OCTOBER 1, 2007
Predicted Values For
Surveillance 8 (October 1, 2007)
BASE 1409 Kips
95% BASE 1338 Kips
90% BASE 1268 Kips
TENDON FORCE (KIPS)
SCHEDULED SURVEILLANCE PERIOD (YEARS AFTER SIT, 11/76)

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

Tendon IDENTIFICATION NUMBER 61V24 CUT LENGTH 188'-6½"

Shop WASHER ID: PC 121 CR 480 FIELD WASHER ID: PC 120 CR 203

GAI/QA vendor inspection cover letter number-FPC # 10142 DATE 3/22/74

Date tendon received on-site 3-11-74 RMR Number 37552

Date installed in conduit 7-17-74 Installation NCR's

Wires removed 0 Wires replaced 0 Total Ineffective wires 0

Date buttonheaded 9-9-74 Buttonheading NCR's

Bad wires 0 Accept. Reheads 0 Total Ineffective wires 0

Date stressed 10-11-74 Stressing NCR's

Date restressed Restressing NCR's

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12¼, 11⅞	NA, NA	12¼, 11⅞
Lift-Off Pressure - Predicted/Actual	6870, 6775	", "	N/A
Shim Thickness/80% Ultimate Pressure	13", 7810	4", "	N/A

Unseated/Broken Wires 0 Total effective wires after stressing 163

Date Bulk-filled 11-8-74 Bulk-Filling NCR's

Time since installation 4 months Inlet Pressure 123 PSI Outlet Temp. 124°

Date end caps refilled: Shop Field

Data compiled by D. Waller Organization Salem

Date 4/4/77

Additional Comments:

Calculation S07-0033
Revision 0
Attachment 2
Page 138 of 329

907 715

Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON HISTORY

IDENTIFICATION NUMBER 12V1 CUT LENGTH 188'-6 1/4

SHOP WASHER ID: PC 121 CR 650 FIELD WASHER ID: PC 120 CR 230

1. GAI/QA vendor inspection cover letter number-FPC # 9957 DATE 2/25/74

2. Date tendon received on-site 1-16-74 RMR Number 36036

3. Date installed in conduit 7-3-74 Installation NCR's ______

   Wires removed 0 Wires replaced 0 Total Ineffective wires 0

4. Date buttonheaded 7-23-74 Buttonheading NCR's ______

   Bad wires 4 Accept. Reheads 4 Total Ineffective wires 0

5. Date stressed 9-13-74 Stressing NCR's ______

   Date restressed N/A Restressing NCR's ______

	SHOP END	FIELD END	TOTAL
Elongation (1500 psi to 80% ult.)-Pred./Act.	12 1/8 / 12 1/2	N/A / N/A	12 1/8 / 12 1/2
Lift-Off Pressure - Predicted/Actual	6800 ~~[illegible]~~ / 16950 PSI	" / "	N/A
Shim Thickness/80% Ultimate Pressure	13 1/4 / 17770	4 / "	N/A

   Unseated/Broken Wires 0 Total effective wires after stressing 163

6. Date Bulk-filled 10-23-74 Bulk-Filling NCR's ______

   Time since installation 3 3/4 months Inlet Pressure 125 PSI Outlet Temp. 118°

   Date end caps refilled: Shop ______ Field ______

7. Data compiled by [illegible] Miller Organization Salem

   Date 4/1/77

8. Additional Comments: ______

Calculation S07-0033
Revision 0
Attachment 2

S07 716

CRYSTAL RIVER UNIT NO. 3
REACTOR BUILDING PRESTRESSING SYSTEM
TENDON SURVEILLANCE RECORD

TENDON NO. 12V1

Inspection Period and Date	Location	LIFT OFF CONDITION Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	RETENSIONING Force (kips)	Avg. Force (kips)	Shim Thickness (in)	Elongation (in)	Total Effective Wires	Reactor Bldg. Temperature °F Int.	Ext.	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original Stressing	T	1675		13¼"	12¼"		N/A		N/A	N/A				
9/13/74	B	N/A	N/A	4"	N/A	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3rd	T	1315		13¼"	N/A		N/A		13¼"	N/A				1. Lift-off only
10/9/81	B	N/A	N/A	4"	N/A	163	N/A	N/A	4"	N/A	163	83	83	
4TH	S (TOP)	1535		13 5/8	N/A		N/A		N/A	N/A		85°F	T - 70°F	. 4.1 GAL. GREASE NET ADDED
10/30/87	F (BOT.)	N/A	N/A	4	N/A	163	N/A	N/A	N/A	N/A	N/A	TO 90°F	B - N/A	• NOTE - IT WAS CONCLUDED 3RD SURV. LIFTOFF WAS IN ERROR SEE G/C 4TH REPORT.