SUBMITTAL

FOR

COPLAY-NORTHAMPTON BRIDGE

POST-TENSIONING ASSEMBLY DRAWING,
STRESSING SEQUENCE & ELONGATION SCHEDULE
AND
STRESSING CALCULATIONS
(FOR NON-EIT AND EIT TENDONS)

SUBMITTED FOR APPROVAL

December 21, 2017
NOTES FOR REVIEWER/APPROVAL BODY:

1. Please note that DSI’s supplied duct and intermediate grout vent ports are made of polypropylene material (Note from Rev.1). However, the trumpet, duct coupler and grout tube, as shown in the material table on sheet PT-1, are made of polyethylene. Industry standards and specifications, such as the PTI/ASBI M50, section 4.3.2 as well as AASHTO LRFD section 10.8.5, allow the use of either polyethylene or polypropylene for inlets, outlets and vents (Note from Rev.1).

2. Rev.2 combines both the non-EIT tendons and EIT tendons in one submittal.
3. This Rev.3 addresses the removal of PE Spacer from EIT Tendon, change of closure pour width from 2’ to 1’, and minor other changes.
JOB NAME: COPLAY-NORTHAMPTON BRIDGE
STRESSING SEQUENCE, JACKING FORCE AND ELONGATION SCHEDULE (REV. 1)

Assumed Values:
Coefficient of friction = 0.23 \( \text{rad} \)
Coefficient of winch friction = 0.002 \( \text{rad ft} \)
Cross sectional area of strand = 0.217 in\(^2\)
Modulus of elasticity of strand = 28,500 ksi
Live End Anchor Set = 0.375 in
Dead End Anchor Set = 0.125 in
Length of strands inside the jack = 45 in
Stress ratio to ultimate = 0.75

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<th>STRESSING SEQUENCE</th>
<th>BEAM NO.</th>
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<th>NO. OF STRANDS FOR TENDON (0.65 DIAM.)</th>
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<th>20% OF REQUIRED JACKING GAUGE PRESSURE (psi)</th>
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CROSS SECTION A-B

**NOTES:**
1. **TENDON T1's ARE ELECTRICALLY ISOLATED TENDONS (EIT).**
2. **TENDONS T2 THROUGH T4 ARE NON-ELECTRICALLY ISOLATED TENDONS (N-EIT).**
3. **STRESSING TABLE ON THIS SHEET IS APPLICABLE TO BOTH ELECTRICALLY ISOLATED (EIT) AND NON-ELECTRICALLY ISOLATED (N-EIT).**
**Strand Lap Splicing Detail at Closure Pour (Typ. For 1 Strand)**

- **Strip Strands to Protrude and Splice**

**Elevation**

- 2 Plastic Zip Ties (by Others)
- 3/8" (9mm) Corrugated PP Duct
- Duct Support Bar
- Duct Support Shell

**Section A-A**

- Duct Support Details

1. Support Corrugations of Duct and Half Shell Support (Loose Cond.
2. Tighten and Tighten with 2 Plastic Zip Ties
3. Half Shell Duct Supports Must Be Used at All Support Locations

**Details**

- GTI Ø 100 FC Duct Half Shell
- GTI PN 223297

**Notes:**

1. Work this sheet with Sheet PT-3.
COPLAY-NORTHAMPTON BRIDGE

Installation Instructions for Electrically Isolated Tendons (EIT)

DSI PROJECT NO. J116488

PREPARED FOR TRUMBALL CORPORATION

October 13, 2017
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4. Electrical Resistance Test Procedure ............................................ 4
1 Introduction and Scope

The installation and stressing of electrically isolated tendons requires special attention and skills. The electrically isolated material, i.e. the ducts, the trumpet and the insulating plate shall never be damaged during the installation process. At anchors, ducts, duct couplers and vent tube joints a leak tight connection shall generally be provided by appropriate actions.

2 Installation Procedures at the Precast Yard

1. Preassemble the multi-plane anchor (151001 19 2371) and plastic trumpet (68 19 5377) as shown in sheet PT-3. Make sure trumpet is inserted all the way as shown. Before securing the anchor body to the forms, an inspection shall be performed to ensure the trumpet flange is engaged as shown in Detail 1 of sheet PT-3. Grease the bolts to facilitate removal later.
2. Bolt the multi-plane anchor with trumpet to the form using the six threaded holes in anchor body. The spiral should be tied to adjacent reinforcement. Align axis of spiral with anchor body. Plug unused port in the anchor body as shown.
3. Connect the trumpet to the duct as shown using closed cell neoprene blend seal (68 00 583), slip-on-coupler (U00220415) and heat shrink it. Install the duct according to the profile specified in the project documents. Make sure to secure the duct at every two feet using two (2) plastic zip ties. No damage should be done to the duct system during installation.
4. At both ends of each precast segment, make sure two (2) prestress strands are protruding 18 inches. This will be used later at the job site as shown in sheet PT-4.
5. Concrete shall not be poured until a thorough inspection is carried out and approval is given to proceed.

→ Concreting can now proceed.

3 Installation Procedures at the Job Site

3.1 Completion of System Installation

1. After the precast segments are erected, couple the duct at the closure pours using short section of ducts and stepless duct coupler as shown on sheet PT-3.
2. Before casting closure pours, lap splice protruding prestress strands as shown on sheet PT-4.
3. After the concrete in the closure pours has gained the required strength, install strands by pushing or pulling individually or as a bundle into ducts. Allow sufficient tail length for stressing.
4. Check the wedge plate for rust, dirt and grit. Clean wedge holes with wire brush if necessary. Lightly grease or oil wedge holes.
5. Check wedges for rust, dirt and grit. Discard rusty wedges. Use only clean wedges.
6. Install the isolation plate (68 19 8716).
7. Install the PE-spacer (68 19 6084).
8. Install the wedge plate (68 19 1370), slip the wedges over the strands and loosely seat in wedge holes using a 3/4" ID pipe.

→ Stressing can now proceed

9. Follow the stressing sequence and procedure per shop drawings sheet PT-2.
10. After the stressing operation is completed and engineer’s approval is obtained, cut the strand tails by an abrasive saw. Do not use a torch.

11. Prepare the grout cap before its installation as described below in section 3.2. Install the grout cap with O-ring using six bolts. Be careful to prevent damage to cap threads or the cap itself.

12. Thread 3/4” NPT pipe nipple into the threaded port of the grout cap using short 21mm grout tube and 21mm female-3/4” NPT male connector (see sheet PT-3). This hole is used as a grout injection.

13. Perform a final check of all grouting ports, vents and valves. Prepare for grouting operations.

→ Grouting can now proceed.

14. Follow the submitted and approved project grouting plan.

15. After the grout has hardened, perform the electrical resistance test as described below in section 4.

16. After the EIT test is completed and approved, remove grout ports pipe nipple and insert plugs. Clean the blockout and fill the pour back with approved concrete mix.

17. Cut grout tube at low and high points flush with concrete and fill the recess with an approved non-shrink grout.

3.2 Preparation of Grout Cap

Drill a hole for the 3/8” NPT core drip in the centre of the cap dome as shown in shop drawing PT-4. Install 3/8” core drip and connect the electrical AWG #12 copper wire to the wedge plate as shown in Detail 1 and Detail 2 in shop drawing PT-4. Seal the core drip with silicone.

4 Electrical Resistance Test Procedure

Electrical measurements shall be performed by a qualified electrician using a suitable LCR-meter, i.e. CMT-437 or equivalent. Measurements shall be done at both anchorages as shown in drawing PT-4.

Table 1: expected minimum values of electrical resistance based on tendon length

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<th>Beam No.</th>
<th>Length, L (ft)</th>
<th>Length, L (m)</th>
<th>R_L (kΩm)</th>
<th>Minimum R (Ω)</th>
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R_L is the min. value of the length normalized electrical resistance.

R = R_L/L

• Connect the positive electrical wire to the tendon through the anchorage, and the negative cable to the protruding prestressed strand.
• Measure the electrical resistance R using standard LCR-meter.
• The field Measured minimum electrical resistance R shall be as shown in table above.
ADAPT Corporation
1733 Woodside Rd., Suite 220
Redwood City, CA, 94061, USA

ADAPT CORPORATION
1733 Woodside Road, Suite 220, Redwood City, CA 94061 USA
Tel: (650) 306 2400, Fax: (650) 306 2401
E-mail: support@adaptsoft.com, Web site: www.adaptsoft.com

ADAPT-FELT Standard 2014
ADAPT POST-TENSIONING STRESS LOSS & ELONGATION PROGRAM
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Aug 22, 2017
TIME: 13:18:35

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B16-T1

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu).................... 0.23000 /radian
Coefficient of wobble friction (K)....................... 0.00020 rad/ft
Ultimate strength of strand ......................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ........................................... 0.38 inch
Cross-sectional area of strand ....................... 0.217 inch^2
Total Number of Strands per Tendon.................. 15
Modulus of elasticity of strand .................... 28500.00 ksi
STRESSING .......................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
          2=partial/regular parabola; 3=harped; 4=general; 5=straight;
          6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B16-T1)

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547.34 ft (total length of tendon)

SUMMARY:
- Average initial stress (after release) ............... 183.12 ksi
- Long term stress losses ............................... 0.00 ksi
- Final average stress ................................. 183.12 ksi
- Final average force in tendon ....................... 596.07 k

Anchor set influence from left pull (189.2 ksi; 0.701) .. 94.46 ft
Anchor set influence from right pull (190.38 ksi; 0.705) .. 99.11 ft
Elongation at left pull before anchor set ................ 40.306 inch
Elongation at right pull before anchor set ............... 2.647 inch
Elongation at left pull after anchor set ................. 39.931 inch
Elongation at right pull after anchor set ............... 2.272 inch
Total elongation after anchor set ........................ 42.203 inch
Ratio of total elongation to tendon length after anchor set ........................ 0.077 inch/ft
Jacking force ....................................... 659.30 k

CRITICAL STRESS RATIOS:
- At stressing 0.750; At anchorage 0.660; Max along tendon 0.705
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B16-T1
1.2 FILE NAME : B16-T1

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

Average initial stress (after release) .................... 183.12 ksi
Long term stress losses ................................. 0.00 ksi
Final average stress .................................... 183.12 ksi
Final average force in tendon ........................... 596.07 k

Anchor set influence from left pull (189.21ksi;0.701) .. 94.46 ft
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Ratio of total elongation to tendon length after anchor set .......... 0.077 inch/ft
Jacking force ........................................... 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.660; Max along tendon 0.705

5 - DESIGNER'S NOTES

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B16-T2

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) .................. 0.23000 /radian
Coefficient of wobble friction (K) .................. 0.00020 rad/ft
Ultimate strength of strand .................. 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
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          6=extended reversed parabola; 7=cantilever down
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<tr>
<td>1</td>
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<td>16.00</td>
<td>69.00</td>
<td>0.00</td>
<td>0.37</td>
<td>0.20</td>
<td>179.04</td>
<td>187.73</td>
</tr>
<tr>
<td>2</td>
<td>175.75</td>
<td>1</td>
<td>69.00</td>
<td>47.25</td>
<td>69.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>183.23</td>
<td>176.93</td>
</tr>
<tr>
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<td>191.06</td>
<td>1</td>
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<td>16.00</td>
<td>47.00</td>
<td>0.18</td>
<td>0.60</td>
<td>0.00</td>
<td>183.68</td>
<td>189.48</td>
</tr>
</tbody>
</table>

547.34 ft (total length of tendon)

SUMMARY:

- Average initial stress (after release): 184.82 ksi
- Long term stress losses: 0.00 ksi
- Final average stress: 184.82 ksi
- Final average force in tendon: 601.59 k
- Anchor set influence from left pull (190.80ksi;0.707): 99.87 ft
- Anchor set influence from right pull (191.74ksi;0.710): 104.25 ft
- Elongation at left pull before anchor set: 40.730 inch
- Elongation at right pull before anchor set: 2.614 inch
- Elongation at left pull after anchor set: 40.355 inch
- Elongation at right pull after anchor set: 2.239 inch
- Total elongation after anchor set: 42.594 inch
- Ratio of total elongation to tendon length after anchor set: 0.078 inch/ft
- Jacking force: 659.30 k

CRITICAL STRESS RATIOS:

At stressing 0.750; At anchorage 0.670; Max along tendon 0.710
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B16-T2
1.2 FILE NAME : B16-T2

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

- Average initial stress (after release) ................. 184.82 ksi
- Long term stress losses ................................ 0.00 ksi
- Final average stress ..................................... 184.82 ksi
- Final average force in tendon ......................... 601.59 k
- Anchor set influence from left pull (190.80ksi;0.707) .. 99.87 ft
- Anchor set influence from right pull (191.74ksi;0.710) .. 104.25 ft
- Elongation at left pull before anchor set .............. 40.730 inch
- Elongation at right pull before anchor set ............ 2.614 inch
- Elongation at left pull after anchor set ............... 40.355 inch
- Elongation at right pull after anchor set ............. 2.239 inch
- Total elongation after anchor set ..................... 42.594 inch
- Ratio of total elongation to tendon length after anchor set ................. 0.078 inch/ft
- Jacking force ........................................... 659.30 k

CRITICAL STRESS RATIOS :
- At stressing 0.750; At anchorage 0.670; Max along tendon 0.710

5 - DESIGNER'S NOTES
DATE: Aug 22, 2017
TIME: 13:39:23

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B16-T3

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (\(\mu\)) .................... 0.23000 /radian
Coefficient of wobble friction (K) .............................. 0.00020 rad/ft
Ultimate strength of strand .................. .................. 270.00 ksi
Ratio of jacking stress to strand's ultimate strength ........ 0.75
Anchor set ................................................. 0.38 inch
Cross-sectional area of strand ......................... 0.217 inch^2
Total Number of Strands per Tendon .................... 15
Modulus of elasticity of strand .................... 28500.00 ksi

STRESSING ............................................ AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1= reversed parabola;
2= partial/regular parabola; 3= harped; 4= general; 5= straight;
6= extended reversed parabola; 7= cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length

Stresses tabulated are after anchor set but before long-term losses.
### TENDON ID, GEOMETRY AND STRESS PROFILE (B16-T3)

<table>
<thead>
<tr>
<th>SPAN ft</th>
<th>P</th>
<th>start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
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<tr>
<td>1</td>
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<td>31.00</td>
<td>10.00</td>
<td>63.00</td>
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<td>0.37</td>
<td>0.20</td>
<td>182.31</td>
<td>189.04</td>
</tr>
<tr>
<td>2</td>
<td>175.75</td>
<td>1</td>
<td>63.00</td>
<td>41.25</td>
<td>63.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>185.21</td>
<td>178.59</td>
</tr>
<tr>
<td>3</td>
<td>191.06</td>
<td>1</td>
<td>63.00</td>
<td>10.00</td>
<td>31.00</td>
<td>0.18</td>
<td>0.60</td>
<td>0.00</td>
<td>185.39</td>
<td>190.52</td>
</tr>
</tbody>
</table>

547.34 ft (total length of tendon)

#### SUMMARY :
- Average initial stress (after release)................... 186.53 ksi
- Long term stress losses .................................. 0.00 ksi
- Final average stress ..................................... 186.53 ksi
- Final average force in tendon ............................. 607.16 k
- Anchor set influence from left pull (192.43ksi;0.713) .. 105.00 ft
- Anchor set influence from right pull (193.13ksi;0.715) .. 109.15 ft
- Elongation at left pull before anchor set .................. 41.160 inch
- Elongation at right pull before anchor set .................. 2.578 inch
- Elongation at left pull after anchor set .................... 40.785 inch
- Elongation at right pull after anchor set .................... 2.203 inch
- Total elongation after anchor set .......................... 42.988 inch
- Ratio of total elongation to 
  tendon length after anchor set ........................... 0.079 inch/ft
- Jacking force ................................................ 659.30 k

#### CRITICAL STRESS RATIOS :
- At stressing 0.750; At anchorage 0.680; Max along tendon 0.715
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B16-T3
1.2 FILE NAME : B16-T3

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

Average initial stress (after release) ...................... 186.53 ksi
Long term stress losses ........................................ 0.00 ksi
Final average stress ............................................. 186.53 ksi
Final average force in tendon .................................. 607.16 k

Anchor set influence from left pull (192.43ksi;0.713) .. 105.00 ft
Anchor set influence from right pull (193.13ksi;0.715) .. 109.15 ft
Elongation at left pull before anchor set ..................... 41.16 inch
Elongation at right pull before anchor set .................... 2.578 inch
Elongation at left pull after anchor set ....................... 40.785 inch
Elongation at right pull after anchor set ..................... 2.203 inch
Total elongation after anchor set ................................ 42.988 inch
Ratio of total elongation to tendon length after anchor set .. 0.079 inch/ft
Jacking force ...................................................... 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.680; Max along tendon 0.715

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

**DATE:** Aug 22, 2017  **TIME:** 13:40:43

**PROJECT TITLE:**
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

**SPECIFIC TITLE:**
B16-T4

**FRICTION & ELONGATION CALCULATIONS:**

**INPUT PARAMETERS:**
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient of angular friction (meu)</td>
<td>0.23000 /radian</td>
</tr>
<tr>
<td>Coefficient of wobble friction (K)</td>
<td>0.00020 rad/ft</td>
</tr>
<tr>
<td>Ultimate strength of strand</td>
<td>270.00 ksi</td>
</tr>
<tr>
<td>Ratio of jacking stress to strand's ultimate strength</td>
<td>0.75</td>
</tr>
<tr>
<td>Anchor set</td>
<td>0.38 inch</td>
</tr>
<tr>
<td>Cross-sectional area of strand</td>
<td>0.217 inch^2</td>
</tr>
<tr>
<td>Total Number of Strands per Tendon</td>
<td>15</td>
</tr>
<tr>
<td>Modulus of elasticity of strand</td>
<td>28500.00 ksi</td>
</tr>
</tbody>
</table>

**STRESSING:**
AT BOTH ENDS

**STRESSING:**
AT BOTH ENDS

**LEGEND:**

P .... = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down

X1/L etc = horizontal distances to control points in geometry of the tendon divided by span length

Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B16-T4)

<table>
<thead>
<tr>
<th>SPAN (ft)</th>
<th>P</th>
<th>start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
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<td>15.00</td>
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<td>0.20</td>
<td>185.66</td>
<td>190.41</td>
<td>187.21</td>
</tr>
<tr>
<td>2  175.75</td>
<td>1</td>
<td>57.00</td>
<td>35.25</td>
<td>57.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>187.21</td>
<td>180.36</td>
<td>187.13</td>
</tr>
<tr>
<td>3  191.06</td>
<td>1</td>
<td>57.00</td>
<td>4.00</td>
<td>15.00</td>
<td>0.18</td>
<td>0.60</td>
<td>0.00</td>
<td>187.13</td>
<td>191.60</td>
<td>186.56</td>
</tr>
</tbody>
</table>

| 547.34 ft (total length of tendon) |

**SUMMARY:**
- Average initial stress (after release): 188.27 ksi
- Long term stress losses: 0.00 ksi
- Final average stress: 188.27 ksi
- Final average force in tendon: 612.83 k
- Anchor set influence from left pull (194.11 ksi; 0.719): 109.89 ft
- Anchor set influence from right pull (194.56 ksi; 0.721): 113.82 ft
- Elongation at left pull before anchor set: 41.596 inch
- Elongation at right pull before anchor set: 2.544 inch
- Elongation at left pull after anchor set: 41.221 inch
- Elongation at right pull after anchor set: 2.169 inch
- Total elongation after anchor set: 43.389 inch
- Ratio of total elongation to tendon length after anchor set: 0.079 inch/ft
- Jacking force: 659.30 k

**CRITICAL STRESS RATIOS:**
- At stressing 0.750; At anchorage 0.691; Max along tendon 0.721
1- PROJECT TITLE: SR 7404 SEC 07M OVER THE LEHIGH RIVER
1.1 SPECIFIC TITLE: B16-T4
1.2 FILE NAME: B16-T4

2 - TENDON STRESSES [ksi]

<table>
<thead>
<tr>
<th>Span 1</th>
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<th>Span 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friction Loss Parameters</td>
<td>Long Term Losses</td>
<td>Friction Loss Parameters</td>
</tr>
<tr>
<td>180</td>
<td>185</td>
<td>190</td>
</tr>
</tbody>
</table>

3 - TENDON PROFILE [in]

<table>
<thead>
<tr>
<th>Span 1</th>
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<th>Span 3</th>
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<td>Stress End</td>
</tr>
<tr>
<td>4</td>
<td>35.25</td>
<td>4</td>
</tr>
</tbody>
</table>

4 - SUMMARY

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average initial stress (after release)</td>
<td>188.27 ksi</td>
</tr>
<tr>
<td>Long term stress losses</td>
<td>0.00 ksi</td>
</tr>
<tr>
<td>Final average stress</td>
<td>188.27 ksi</td>
</tr>
<tr>
<td>Final average force in tendon</td>
<td>612.83 k</td>
</tr>
<tr>
<td>Anchor set influence from left pull (194.11ksi;0.719)</td>
<td>109.89 ft</td>
</tr>
<tr>
<td>Anchor set influence from right pull (194.56ksi;0.721)</td>
<td>113.82 ft</td>
</tr>
<tr>
<td>Elongation at left pull before anchor set</td>
<td>41.596 inch</td>
</tr>
<tr>
<td>Elongation at right pull before anchor set</td>
<td>2.544 inch</td>
</tr>
<tr>
<td>Elongation at left pull after anchor set</td>
<td>41.221 inch</td>
</tr>
<tr>
<td>Elongation at right pull after anchor set</td>
<td>2.169 inch</td>
</tr>
<tr>
<td>Total elongation after anchor set</td>
<td>43.389 inch</td>
</tr>
<tr>
<td>Ratio of total elongation to tendon length after anchor set</td>
<td>0.079 inch/ft</td>
</tr>
<tr>
<td>Jacking force</td>
<td>659.30 k</td>
</tr>
</tbody>
</table>

CRITICAL STRESS RATIOS:
At stressing 0.750; At anchorage 0.691; Max along tendon 0.721

5 - DESIGNER'S NOTES
ADAPT Corporation
1733 Woodside Rd., Suite 220
Redwood City, CA, 94061, USA

This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Aug 22, 2017
TIME: 13:58:37

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B17-T1

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) ....................... 0.23000 /radian
Coefficient of wobble friction (K) .......................... 0.00020 rad/ft
Ultimate strength of strand ................................. 270.00 ksi
Ratio of jacking stress to strand's ultimate strength .... 0.75
Anchor set .................................................... 0.38 inch
Cross-sectional area of strand .............................. 0.217 inch^2
Total Number of Strands per Tendon ....................... 15
Modulus of elasticity of strand ........................... 28500.00 ksi
STRESSING .................................................. AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: l=reversed parabola;
                      2=partial/regular parabola; 3=harped; 4=general; 5=straight;
                      6=extended reversed parabola; 7=cantilever down
X1/L etc  = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE  (B17-T1)

<table>
<thead>
<tr>
<th>SPAN ft</th>
<th>P</th>
<th>start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
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</thead>
<tbody>
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<td>181.29</td>
</tr>
<tr>
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<td>1</td>
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<td>53.25</td>
<td>75.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>181.29</td>
<td>175.13</td>
<td>181.78</td>
</tr>
<tr>
<td>3</td>
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<td>75.00</td>
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<td>63.00</td>
<td>0.19</td>
<td>0.62</td>
<td>0.00</td>
<td>181.78</td>
<td>188.11</td>
<td>177.20</td>
</tr>
</tbody>
</table>

544.63 ft (total length of tendon)

SUMMARY :
- Average initial stress (after release)             182.91 ksi
- Long term stress losses                           0.00 ksi
- Final average stress                               182.91 ksi
- Final average force in tendon                      595.38 k
- Anchor set influence from left pull (189.21 ksi; 0.701) 94.46 ft
- Anchor set influence from right pull (189.88 ksi; 0.703) 97.18 ft
- Elongation at left pull before anchor set          40.139 inch
- Elongation at right pull before anchor set         2.556 inch
- Elongation at left pull after anchor set           39.764 inch
- Elongation at right pull after anchor set          2.181 inch
- Total elongation after anchor set                  41.945 inch
- Ratio of total elongation to tendon length after anchor set 0.077 inch/ft
- Jacking force                                     659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.656; Max along tendon 0.703
1- PROJECT TITLE: SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE: B17-T1
1.2 FILE NAME: B17-T1

2 - TENDON STRESSES [ksi]

<table>
<thead>
<tr>
<th>Span 1</th>
<th>Span 2</th>
<th>Span 3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>185</td>
<td>180</td>
</tr>
<tr>
<td>180</td>
<td>180</td>
<td>175</td>
</tr>
</tbody>
</table>

Friction Loss Parameters
Long Term Losses

3 - TENDON PROFILE [in]

<table>
<thead>
<tr>
<th>Span 1</th>
<th>Span 2</th>
<th>Span 3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>73.75</td>
</tr>
<tr>
<td>70</td>
<td>53.25</td>
<td>53.25</td>
</tr>
<tr>
<td>63</td>
<td>22</td>
<td>22</td>
</tr>
</tbody>
</table>

4 - SUMMARY

- Average initial stress (after release) ...................... 182.91 ksi
- Long term stress losses .................................... 0.00 ksi
- Final average stress ....................................... 182.91 ksi
- Final average force in tendon ............................. 595.38 k

- Anchor set influence from left pull (189.21ksi;0.701) ........ 94.46 ft
- Anchor set influence from right pull (189.88ksi;0.703) ........ 97.18 ft
- Elongation at left pull before anchor set .................. 40.139 inch
- Elongation at right pull before anchor set ................. 2.556 inch
- Elongation at left pull after anchor set ................... 39.764 inch
- Elongation at right pull after anchor set ................... 2.181 inch
- Total elongation after anchor set .......................... 41.945 inch

- Ratio of total elongation to tendon length after anchor set ........... 0.077 inch/ft
- Jacking force ............................................ 659.30 k

CRITICAL STRESS RATIOS:
- At stressing 0.750; At anchorage 0.656; Max along tendon 0.703

5 - DESIGNER'S NOTES
DATE: Aug 22, 2017  TIME: 14:00:05

PROJECT TITLE: SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE: B17-T2

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu).................... 0.23000 /radian
Coefficient of wobble friction (K)...................... 0.00020 rad/ft
Ultimate strength of strand .................. 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ........................................... 0.38 inch
Cross-sectional area of strand .................. 0.217 inch^2
Total Number of Strands per Tendon .............. 15
Modulus of elasticity of strand ............. 28500.00 ksi
STRESSING ........................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
### TENDON ID, GEOMETRY AND STRESS PROFILE (B17-T2)

<table>
<thead>
<tr>
<th>SPAN ft</th>
<th>P start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>47.00</td>
<td>16.00</td>
<td>69.00</td>
<td>0.00</td>
<td>0.37</td>
<td>0.20</td>
<td>179.04</td>
<td>187.73</td>
<td>183.23</td>
</tr>
<tr>
<td>2</td>
<td>69.00</td>
<td>47.25</td>
<td>69.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>183.23</td>
<td>176.87</td>
<td>183.59</td>
</tr>
<tr>
<td>3</td>
<td>69.00</td>
<td>16.00</td>
<td>47.00</td>
<td>0.19</td>
<td>0.62</td>
<td>0.00</td>
<td>183.59</td>
<td>189.15</td>
<td>180.12</td>
</tr>
</tbody>
</table>

---

**SUMMARY:**

- Average initial stress (after release): 184.66 ksi
- Long term stress losses: 0.00 ksi
- Final average stress: 184.66 ksi
- Final average force in tendon: 601.08 k

- Anchor set influence from left pull (190.80ksi;0.707): 99.87 ft
- Anchor set influence from right pull (191.34ksi;0.709): 102.55 ft
- Elongation at left pull before anchor set: 40.562 inch
- Elongation at right pull before anchor set: 2.356 inch
- Elongation at left pull after anchor set: 40.187 inch
- Elongation at right pull after anchor set: 2.161 inch
- Total elongation after anchor set: 42.347 inch
- Ratio of total elongation to tendon length after anchor set: 0.078 inch/ft
- Jacking force: 659.30 k

**CRITICAL STRESS RATIOS:**

At stressing 0.750; At anchorage 0.667; Max along tendon 0.709
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B17-T2
1.2 FILE NAME : B17-T2

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

Average initial stress (after release) ....................... 184.66 ksi
Long term stress losses ........................................ 0.00 ksi
Final average stress ........................................... 184.66 ksi
Final average force in tendon ............................... 601.08 k

Anchor set influence from left pull (190.80ksi;0.707) .. 99.87 ft
Anchor set influence from right pull (191.34ksi;0.709) .. 102.55 ft
Elongation at left pull before anchor set ................. 40.562 inch
Elongation at right pull before anchor set ............... 2.536 inch
Elongation at left pull after anchor set ................. 40.187 inch
Elongation at right pull after anchor set ............... 2.161 inch
Total elongation after anchor set ....................... 42.347 inch
Ratio of total elongation to tendon length after anchor set .......... 0.078 inch/ft
Jacking force ............................................. 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.667; Max along tendon 0.709

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

**DATE:** Aug 22, 2017  
**TIME:** 14:01:39

**PROJECT TITLE:**  
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

**SPECIFIC TITLE:**  
B17-T3

**FRICTION & ELONGATION CALCULATIONS:**

**INPUT PARAMETERS:**
- Coefficient of angular friction (meu) .................. 0.23000 /radian
- Coefficient of wobble friction (K) ................... 0.00020 rad/ft
- Ultimate strength of strand ....................... 270.00 ksi
- Ratio of jacking stress to strand's ultimate strength 0.75
- Anchor set ........................................... 0.38 inch
- Cross-sectional area of strand ...................... 0.217 inch^2
- Total Number of Strands per Tendon ............... 15
- Modulus of elasticity of strand ...................... 28500.00 ksi

**STRESSING ...........................................**  
**AT BOTH ENDS**

**LEGEND:**
- P ........ = Tendon profile type defined as: 1=reversed parabola; 2=partial/regular parabola; 3=harped; 4=general; 5=straight; 6=extended reversed parabola; 7=cantilever down
- X1/L etc = horizontal distances to control points in geometry of the tendon divided by span length

Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B17-T3)

<table>
<thead>
<tr>
<th>LENGTH</th>
<th>&lt; TENDON HEIGHT in.&gt;</th>
<th>Horizontal ratios</th>
<th>STRESS (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN ft</td>
<td>P start center right</td>
<td>X1/L X2/L X3/L</td>
<td>start center right</td>
</tr>
<tr>
<td>1 180.53</td>
<td>1 31.00 10.00 63.00</td>
<td>0.00 0.37 0.20</td>
<td>182.31 189.04 185.21</td>
</tr>
<tr>
<td>2 175.75</td>
<td>1 63.00 41.25 63.00</td>
<td>0.11 0.50 0.11</td>
<td>185.21 178.64 185.42</td>
</tr>
<tr>
<td>3 188.35</td>
<td>1 63.00 10.00 31.00</td>
<td>0.19 0.62 0.00</td>
<td>185.42 190.24 183.12</td>
</tr>
</tbody>
</table>

544.63 ft (total length of tendon)

SUMMARY:
- Average initial stress (after release): 186.43 ksi
- Long term stress losses: 0.00 ksi
- Final average stress: 186.43 ksi
- Final average force in tendon: 606.84 k
- Anchor set influence from left pull (192.43ksi; 0.713): 105.00 ft
- Anchor set influence from right pull (192.84ksi; 0.714): 107.65 ft
- Elongation at left pull before anchor set: 40.989 inch
- Elongation at right pull before anchor set: 2.514 inch
- Elongation at left pull after anchor set: 40.614 inch
- Elongation at right pull after anchor set: 2.139 inch
- Total elongation after anchor set: 42.753 inch
- Ratio of total elongation to tendon length after anchor set: 0.078 inch/ft
- Jacking force: 659.30 k

CRITICAL STRESS RATIOS:
- At stressing 0.750; At anchorage 0.678; Max along tendon 0.714
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B17-T3
1.2 FILE NAME : B17-T3

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

   Average initial stress (after release) .................... 186.43 ksi
   Long term stress losses ......................................... 0.00 ksi
   Final average stress ............................................. 186.43 ksi
   Final average force in tendon ................................. 606.84 k

   Anchor set influence from left pull (192.43ksi;0.713) .. 105.00 ft
   Anchor set influence from right pull (192.84ksi;0.714) .. 107.65 ft
   Elongation at left pull before anchor set .................. 40.989 inch
   Elongation at right pull before anchor set ................. 2.514 inch
   Elongation at left pull after anchor set .................... 40.614 inch
   Elongation at right pull after anchor set .................... 2.139 inch
   Total elongation after anchor set ......................... 42.753 inch
   Ratio of total elongation to tendon length after anchor set .... 0.078 inch/ft
   Jacking force ......................................................... 659.30 k

   CRITICAL STRESS RATIOS :
   At stressing 0.750; At anchorage 0.678; Max along tendon 0.714

5 - DESIGNER'S NOTES
DATE: Aug 22, 2017                                      TIME: 14:03:07

PROJECT TITLE:                       SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:                   B17-T4

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) ............... 0.23000 /radian
Coefficient of wobble friction (K) ................. 0.00020 rad/ft
Ultimate strength of strand....................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ........................................... 0.38 inch
Cross-sectional area of strand .................... 0.217 inch^2
Total Number of Strands per Tendon ................ 15
Modulus of elasticity of strand ................... 28500.00 ksi
STRESSING ........................................... AT BOTH ENDS

LEGEND:
P .......... = Tendon profile type defined as: 1=reversed parabola; 2=partial/regular parabola; 3=harped; 4=general; 5=straight; 6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B17-T4)

LENGTH < TENDON HEIGHT in.> Horizontal ratios <-- STRESS (ksi) -->
SPAN ft P start center right X1/L X2/L X3/L start center right
-1----2-----3----4------5------6-------7----8----9--------10------11------12-
1 180.53 1 15.00 4.00 57.00 0.00 0.37 0.20 185.66 190.41 187.21
2 175.75 1 57.00 35.25 57.00 0.11 0.50 0.11 187.21 180.42 187.28
3 188.35 1 57.00 4.00 15.00 0.19 0.62 0.00 187.28 191.38 186.19

--------------------------------------
544.63 ft (total length of tendon)

SUMMARY :
Average initial stress (after release)....................... 188.23 ksi
Long term stress losses ......................................... 0.00 ksi
Final average stress ............................................ 188.23 ksi
Final average force in tendon ................................. 612.70 k

Anchor set influence from left pull (194.11ksi;0.719) .. 109.89 ft
Anchor set influence from right pull (194.37ksi;0.720) .. 112.52 ft
Elongation at left pull before anchor set .................... 41.423 inch
Elongation at right pull before anchor set .................... 2.492 inch
Elongation at left pull after anchor set ...................... 41.048 inch
Elongation at right pull after anchor set ...................... 2.117 inch
Total elongation after anchor set ............................. 43.165 inch
Ratio of total elongation to tendon length after anchor set 0.079 inch/ft
Jacking force .................................................. 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.690; Max along tendon 0.720
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B17-T4
1.2 FILE NAME : B17-T4

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

- Average initial stress (after release) : 188.23 ksi
- Long term stress losses : 0.00 ksi
- Final average stress : 188.23 ksi
- Final average force in tendon : 612.70 k
- Anchor set influence from left pull (194.11ksi;0.719) : 109.89 ft
- Anchor set influence from right pull (194.37ksi;0.720) : 112.52 ft
- Elongation at left pull before anchor set : 41.423 inch
- Elongation at right pull before anchor set : 2.492 inch
- Elongation at left pull after anchor set : 41.048 inch
- Elongation at right pull after anchor set : 2.117 inch
- Total elongation after anchor set : 43.165 inch
- Ratio of total elongation to tendon length after anchor set : 0.079 inch/ft
- Jacking force : 659.30 k

CRITICAL STRESS RATIOS :
- At stressing 0.750; At anchorage 0.690; Max along tendon 0.720

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Aug 22, 2017
TIME: 14:06:26

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B18-T1

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
- Coefficient of angular friction (meu)........................... 0.23000 /radian
- Coefficient of wobble friction (K)............................... 0.00020 rad/ft
- Ultimate strength of strand ......................... 270.00 ksi
- Ratio of jacking stress to strand's ultimate strength 0.75
- Anchor set ............................................. 0.38 inch
- Cross-sectional area of strand ....................... 0.217 inch^2
- Total Number of Strands per Tendon............... 15
- Modulus of elasticity of strand ..................... 28500.00 ksi

STRESSING ........................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regualr parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B18-T1)

<table>
<thead>
<tr>
<th>SPAN ft</th>
<th>P</th>
<th>start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>63.00</td>
<td>22.00</td>
<td>75.00</td>
<td>0.00</td>
<td>0.37</td>
<td>0.20</td>
<td>175.88</td>
<td>186.49</td>
<td>181.29</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>75.00</td>
<td>53.25</td>
<td>75.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>181.29</td>
<td>175.10</td>
<td>181.77</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>75.00</td>
<td>22.00</td>
<td>63.00</td>
<td>0.19</td>
<td>0.61</td>
<td>0.00</td>
<td>181.77</td>
<td>187.98</td>
<td>177.15</td>
</tr>
</tbody>
</table>

542.36 ft (total length of tendon)

SUMMARY:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average initial stress (after release)</td>
<td>182.88 ksi</td>
</tr>
<tr>
<td>Long term stress losses</td>
<td>0.00  ksi</td>
</tr>
<tr>
<td>Final average stress</td>
<td>182.88 ksi</td>
</tr>
<tr>
<td>Final average force in tendon</td>
<td>595.29 k</td>
</tr>
<tr>
<td>Anchor set influence from left pull (189.21ksi;0.701)</td>
<td>94.50 ft</td>
</tr>
<tr>
<td>Anchor set influence from right pull (189.85ksi;0.703)</td>
<td>96.77 ft</td>
</tr>
<tr>
<td>Elongation at left pull before anchor set</td>
<td>39.986 inch</td>
</tr>
<tr>
<td>Elongation at right pull before anchor set</td>
<td>2.528 inch</td>
</tr>
<tr>
<td>Elongation at left pull after anchor set</td>
<td>39.611 inch</td>
</tr>
<tr>
<td>Elongation at right pull after anchor set</td>
<td>2.153 inch</td>
</tr>
<tr>
<td>Total elongation after anchor set</td>
<td>41.764 inch</td>
</tr>
<tr>
<td>Ratio of total elongation to tendon length after anchor set</td>
<td>0.077 inch/ft</td>
</tr>
<tr>
<td>Jacking force</td>
<td>659.30 k</td>
</tr>
</tbody>
</table>

CRITICAL STRESS RATIOS:

At stressing 0.750; At anchorage 0.656; Max along tendon 0.703
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B18-T1
1.2 FILE NAME : B18-T1

2 - TENDON STRESSES [ksi]

Friction Loss Parameters
Long Term Losses

20 30 40 50 60 70
Span 1 Span 2 Span 3

3 - TENDON PROFILE [in]

63 75 75 63
Stress End Stress End Stress End
22 53.25 22
Span 1 Span 2 Span 3

4 - SUMMARY

Average initial stress (after release) .................. 182.88 ksi
Long term stress losses ............................... 0.00 ksi
Final average stress ................................ 182.88 ksi
Final average force in tendon ....................... 595.29 k

Anchor set influence from left pull (189.21ksi;0.701) .. 94.50 ft
Anchor set influence from right pull (189.85ksi;0.703) .. 96.77 ft
Elongation at left pull before anchor set ............ 39.986 inch
Elongation at right pull before anchor set .......... 2.528 inch
Elongation at left pull after anchor set .............. 39.611 inch
Elongation at right pull after anchor set .......... 2.153 inch
Total elongation after anchor set .................. 41.764 inch
Ratio of total elongation to tendon length after anchor set .......... 0.077 inch/ft
Jacking force ........................................ 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.656; Max along tendon 0.703

5 - DESIGNER’S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Aug 22, 2017
TIME: 14:08:34

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B18-T2

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu)................. 0.23000 /radian
Coefficient of wobble friction (K)................... 0.00020 rad/ft
Ultimate strength of strand ...................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ......................................... 0.38 inch
Cross-sectional area of strand ...................... 0.217 inch^2
Total Number of Strands per Tendon............... 15
Modulus of elasticity of strand .................. 28500.00 ksi
STRESSING ........................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE  (B18-T2)

<table>
<thead>
<tr>
<th>SPAN (ft)</th>
<th>P</th>
<th>CENTER</th>
<th>RIGHT</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>STRESS (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>180.69</td>
<td>47.00</td>
<td>16.00</td>
<td>69.00</td>
<td>0.00</td>
<td>0.37</td>
<td>0.20</td>
</tr>
<tr>
<td>2</td>
<td>175.92</td>
<td>69.00</td>
<td>47.25</td>
<td>69.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
</tr>
<tr>
<td>3</td>
<td>185.75</td>
<td>69.00</td>
<td>16.00</td>
<td>47.00</td>
<td>0.19</td>
<td>0.61</td>
<td>0.00</td>
</tr>
</tbody>
</table>

542.36 ft (total length of tendon)

**SUMMARY :**
- Average initial stress (after release)................... 184.64 ksi
- Long term stress losses ................................... 0.00 ksi
- Final average stress ...................................... 184.64 ksi
- Final average force in tendon ............................ 601.00 k
- Anchor set influence from left pull (190.80ksi; 0.707) .. 99.93 ft
- Anchor set influence from right pull (191.31ksi; 0.709) .. 102.02 ft
- Elongation at left pull before anchor set ............... 40.406 inch
- Elongation at right pull before anchor set .............. 2.509 inch
- Elongation at left pull after anchor set ............... 40.031 inch
- Elongation at right pull after anchor set .............. 2.134 inch
- Total elongation after anchor set ....................... 42.165 inch
- Ratio of total elongation to tendon length after anchor set ................ 0.078 inch/ft
- Jacking force ........................................... 659.30 k

**CRITICAL STRESS RATIOS :**
- At stressing 0.750; At anchorage 0.667; Max along tendon 0.709
1- PROJECT TITLE: SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE: B18-T2
1.2 FILE NAME: B18-T2

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

Average initial stress (after release) ................. 184.64 ksi
Long term stress losses ................................. 0.00 ksi
Final average stress ................................... 184.64 ksi
Final average force in tendon ........................... 601.00 k
Anchorage set influence from left pull (190.80ksi;0.707) .. 99.93 ft
Anchorage set influence from right pull (191.31ksi;0.709) .. 102.02 ft
Elongation at left pull before anchor set ............... 40.406 inch
Elongation at right pull before anchor set ............. 2.509 inch
Elongation at left pull after anchor set ............... 40.031 inch
Elongation at right pull after anchor set ............. 2.134 inch
Total elongation after anchor set ....................... 42.165 inch
Ratio of total elongation to tendon length after anchor set .......... 0.078 inch/ft
Jacking force ........................................... 659.30 k

CRITICAL STRESS RATIOS:
At stressing 0.750; At anchorage 0.667; Max along tendon 0.709

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Aug 22, 2017
TIME: 14:10:11

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B18-T3

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu)................. 0.23000 /radian
Coefficient of wobble friction (K).................... 0.00020 rad/ft
Ultimate strength of strand ......................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ........................................... 0.38 inch
Cross-sectional area of strand ....................... 0.217 inch^2
Total Number of Strands per Tendon.................... 15
Modulus of elasticity of strand ...................... 28500.00 ksi
STRESSING ......................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
### TENDON ID, GEOMETRY AND STRESS PROFILE (B18-T3)

<table>
<thead>
<tr>
<th>SPAN (ft)</th>
<th>P</th>
<th>start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start stress (ksi)</th>
<th>center stress (ksi)</th>
<th>right stress (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>31.00</td>
<td>10.00</td>
<td>63.00</td>
<td>0.00</td>
<td>0.37</td>
<td>0.20</td>
<td>182.32</td>
<td>189.05</td>
<td>185.21</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>63.00</td>
<td>41.25</td>
<td>63.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>185.21</td>
<td>178.62</td>
<td>185.42</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>63.00</td>
<td>10.00</td>
<td>31.00</td>
<td>0.19</td>
<td>0.61</td>
<td>0.00</td>
<td>185.42</td>
<td>190.14</td>
<td>183.08</td>
</tr>
</tbody>
</table>

**SUMMARY:**

- Average initial stress (after release): 186.41 ksi
- Long term stress losses: 0.00 ksi
- Final average stress: 186.41 ksi
- Final average force in tendon: 606.76 k
- Anchor set influence from left pull (192.44ksi;0.713): 105.06 ft
- Anchor set influence from right pull (192.82ksi;0.714): 107.04 ft
- Elongation at left pull before anchor set: 40.832 inch
- Elongation at right pull before anchor set: 2.487 inch
- Elongation at left pull after anchor set: 40.457 inch
- Elongation at right pull after anchor set: 2.112 inch
- Total elongation after anchor set: 42.569 inch
- Ratio of total elongation to tendon length after anchor set: 0.078 inch/ft
- Jacking force: 659.30 k

**CRITICAL STRESS RATIOS:**

At stressing 0.750; At anchorage 0.678; Max along tendon 0.714
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B18-T3
1.2 FILE NAME : B18-T3

2 - TENDON STRESSES [ksi]

<table>
<thead>
<tr>
<th>Span 1</th>
<th>Span 2</th>
<th>Span 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>20</td>
<td>31</td>
</tr>
</tbody>
</table>

3 - TENDON PROFILE [in]

<table>
<thead>
<tr>
<th>Span 1</th>
<th>Span 2</th>
<th>Span 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>41.25</td>
<td>10</td>
</tr>
</tbody>
</table>

4 - SUMMARY

Average initial stress (after release) .................. 186.41 ksi
Long term stress losses ................................ 0.00 ksi
Final average stress .................................... 186.41 ksi
Final average force in tendon ......................... 606.76 k
Anchor set influence from left pull (192.44 ksi; 0.713) .. 105.06 ft
Anchor set influence from right pull (192.82 ksi; 0.714) .. 107.04 ft
Elongation at left pull before anchor set ........... 40.832 inch
Elongation at right pull before anchor set .......... 2.487 inch
Elongation at left pull after anchor set .......... 40.457 inch
Elongation at right pull after anchor set .......... 2.312 inch
Total elongation after anchor set .................. 42.569 inch
Ratio of total elongation to tendon length after anchor set .......... 0.078 inch/ft
Jacking force ....................................... 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.678; Max along tendon 0.714

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Aug 22, 2017  TIME: 14:11:40

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B18-T4

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) .................. 0.23000 /radian
Coefficient of wobble friction (K) .................... 0.00020 rad/ft
Ultimate strength of strand ........................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ........................................... 0.38 inch
Cross-sectional area of strand ........................ 0.217 inch^2
Total Number of Strands per Tendon ................... 15
Modulus of elasticity of strand ...................... 28500.00 ksi
STRESSING ......................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B18-T4)

| SPAN (ft) | P (start) | X1/L | X2/L | X3/L | X4/L | X5/L | X6/L | X7/L | X8/L | X9/L | X10/L | X11/L | X12/L | Stress (ksi) |
|---------|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--------|--------|--------|------------|
| 1       | 180.69  | 15.00 | 4.00 | 57.00 | 0.00 | 0.37 | 0.20 |     |     |     |      |   |     | 185.67    |
| 2       | 175.92  | 57.00 | 35.25 | 57.00 | 0.11 | 0.50 | 0.11 |     |     |     |      |   |     | 187.21    |
| 3       | 185.75  | 57.00 | 4.00 | 15.00 | 0.19 | 0.61 | 0.00 |     |     |     |      |   |     | 187.27    |

542.36 ft (total length of tendon)

SUMMARY:
- Average initial stress (after release): 188.21 ksi
- Long term stress losses: 0.00 ksi
- Final average stress: 188.21 ksi
- Final average force in tendon: 612.62 k

Anchor set influence from left pull (194.11 ksi; 0.719) : 109.94 ft
Anchor set influence from right pull (194.35 ksi; 0.720) : 111.82 ft
Elongation at left pull before anchor set: 41.264 inch
Elongation at right pull before anchor set: 2.466 inch
Elongation at left pull after anchor set: 40.889 inch
Elongation at right pull after anchor set: 2.091 inch
Total elongation after anchor set: 42.980 inch
Ratio of total elongation to tendon length after anchor set: 0.079 inch/ft
Jacking force: 659.30 k

CRITICAL STRESS RATIOS:
At stressing 0.750; At anchorage 0.689; Max along tendon 0.720
1 - PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B18-T4
1.2 FILE NAME : B18-T4

2 - TENDON STRESSES [ksi]

Friction Loss Parameters
Long Term Losses

3 - TENDON PROFILE [in]

4 - SUMMARY

Average initial stress (after release) .................. 188.21 ksi
Long term stress losses ................................. 0.00 ksi
Final average stress .................................... 188.21 ksi
Final average force in tendon ........................... 612.62 k

Anchor set influence from left pull (194.1 ksi; 0.719) .. 109.94 ft
Anchor set influence from right pull (194.35 ksi; 0.720) .. 111.82 ft
Elongation at left pull before anchor set ................ 41.264 inch
Elongation at right pull before anchor set ............... 2.466 inch
Elongation at left pull after anchor set ................... 40.889 inch
Elongation at right pull after anchor set .................. 2.091 inch
Total elongation after anchor set ....................... 42.980 inch
Ratio of total elongation to tendon length after anchor set .... 0.079 inch/ft
Jacking force ........................................... 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.689; Max along tendon 0.720

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.


PROJECT TITLE:  
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:  
B19-T1

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) ............... 0.23000 /radian
Coefficient of wobble friction (K) .................. 0.00020 rad/ft
Ultimate strength of strand ......................... 270.00 ksi
Ratio of jacking stress to strand’s ultimate strength .... 0.75
Anchor set ............................................ 0.38 inch
Cross-sectional area of strand ....................... 0.217 inch^2
Total Number of Strands per Tendon ................. 15
Modulus of elasticity of strand ..................... 28500.00 ksi
STRESSING ........................................... AT BOTH ENDS

LEGEND:
P ....... = Tendon profile type defined as: 1=reversed parabola;
         2=partial/regular parabola; 3=harped; 4=general; 5=straight;
         6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B19-T1)

<table>
<thead>
<tr>
<th>LENGTH</th>
<th>&lt; TENDON HEIGHT in.&gt;</th>
<th>Horizontal ratios</th>
<th>STRESS (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN ft</td>
<td>P</td>
<td>start</td>
<td>center</td>
</tr>
<tr>
<td>1 180.85</td>
<td>1</td>
<td>63.00</td>
<td>22.00</td>
</tr>
<tr>
<td>2 176.08</td>
<td>1</td>
<td>75.00</td>
<td>53.25</td>
</tr>
<tr>
<td>3 183.15</td>
<td>1</td>
<td>75.00</td>
<td>22.00</td>
</tr>
</tbody>
</table>

540.08 ft (total length of tendon)

SUMMARY:
- Average initial stress (after release) ................... 182.86 ksi
- Long term stress losses .................................. 0.00 ksi
- Final average stress ...................................... 182.86 ksi
- Final average force in tendon ............................ 595.20 k
- Anchor set influence from left pull (189.22ksi;0.701) .. 94.54 ft
- Anchor set influence from right pull (189.85ksi;0.703) .. 96.37 ft
- Elongation at left pull before anchor set ............... 39.829 inch
- Elongation at right pull before anchor set ............. 2.503 inch
- Elongation at left pull after anchor set ............. 39.454 inch
- Elongation at right pull after anchor set ............. 2.128 inch
- Total elongation after anchor set .................. 41.582 inch
- Ratio of total elongation to tendon length after anchor set .................. 0.077 inch/ft
- Jacking force .......................................... 659.30 k

CRITICAL STRESS RATIOS:
- At stressing 0.750; At anchorage 0.656; Max along tendon 0.703
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B19-T1
1.2 FILE NAME : B19-T1

2 - TENDON STRESSES [ksi]

<table>
<thead>
<tr>
<th>Span 1</th>
<th>Span 2</th>
<th>Span 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress End</td>
<td>Stress End</td>
<td>Stress End</td>
</tr>
<tr>
<td>63</td>
<td>75.75</td>
<td>75.75</td>
</tr>
</tbody>
</table>

3 - TENDON PROFILE [in]

4 - SUMMARY

Average initial stress (after release) .................... 182.86 ksi
Long term stress losses ...................................... 0.00 ksi
Final average stress ........................................ 182.86 ksi
Final average force in tendon .............................. 595.20 k

Anchor set influence from left pull (189.22ksi;0.701) .. 94.54 ft
Anchor set influence from right pull (189.85ksi;0.703) .. 96.37 ft
Elongation at left pull before anchor set .................. 39.829 inch
Elongation at right pull before anchor set .................. 2.503 inch
Elongation at left pull after anchor set .................... 39.454 inch
Elongation at right pull after anchor set ................... 2.128 inch
Total elongation after anchor set ............................ 41.582 inch
Ratio of total elongation to tendon length after anchor set 0.077 inch/ft
Jacking force ................................................ 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.656; Max along tendon 0.703

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

FRICITION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
- Coefficient of angular friction (meu).......................... 0.23000 /radian
- Coefficient of wobble friction (K).............................. 0.00020 rad/ft
- Ultimate strength of strand .................................. 270.00 ksi
- Ratio of jacking stress to strand's ultimate strength .... 0.75
- Anchor set ......................................................... 0.38 inch
- Cross-sectional area of strand ................................. 0.217 inch^2
- Total Number of Strands per Tendon......................... 15
- Modulus of elasticity of strand ............................... 28500.00 ksi
- STRESSING ....................................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1= reversed parabola;
          2= partial/regular parabola; 3= harped; 4= general; 5= straight;
          6= extended reversed parabola; 7= cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B19-T2)

<table>
<thead>
<tr>
<th>SPAN ft</th>
<th>P  start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>180.85</td>
<td>47.00</td>
<td>16.00</td>
<td>69.00</td>
<td>0.00</td>
<td>0.37</td>
<td>0.20</td>
<td>179.07</td>
<td>187.75</td>
</tr>
<tr>
<td>2</td>
<td>176.08</td>
<td>1</td>
<td>69.00</td>
<td>47.25</td>
<td>69.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>183.24</td>
</tr>
<tr>
<td>3</td>
<td>183.15</td>
<td>1</td>
<td>69.00</td>
<td>16.00</td>
<td>47.00</td>
<td>0.19</td>
<td>0.61</td>
<td>0.00</td>
<td>183.53</td>
</tr>
</tbody>
</table>

540.08 ft (total length of tendon)

SUMMARY:
Average initial stress (after release) ............... 184.61 ksi
Long term stress losses .................................. 0.00 ksi
Final average stress ..................................... 184.61 ksi
Final average force in tendon .......................... 600.90 k

Anchor set influence from left pull (190.81ksi;0.707) .. 99.96 ft
Anchor set influence from right pull (191.31ksi;0.709) .. 101.50 ft
Elongation at left pull before anchor set ............... 40.248 inch
Elongation at right pull before anchor set .............. 2.483 inch
Elongation at left pull after anchor set .................. 39.873 inch
Elongation at right pull after anchor set ............... 2.108 inch
Total elongation after anchor set ....................... 41.981 inch
Ratio of total elongation to tendon length after anchor set .................. 0.078 inch/ft
Jacking force ............................................ 659.30 k

CRITICAL STRESS RATIOS:
At stressing 0.750; At anchorage 0.667; Max along tendon 0.709
1- PROJECT TITLE: SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE: B19-T2
1.2 FILE NAME: B19-T2

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

   Average initial stress (after release) ....................... 184.61 ksi
   Long term stress losses ...................................... 0.00 ksi
   Final average stress ........................................ 184.61 ksi
   Final average force in tendon .............................. 600.90 k

   Anchor set influence from left pull (190.81ksi;0.707) ... 99.96 ft
   Anchor set influence from right pull (191.31ksi;0.709) ... 101.50 ft
   Elongation at left pull before anchor set ............... 40.248 inch
   Elongation at right pull before anchor set ............. 2.483 inch
   Elongation at left pull after anchor set ............... 39.873 inch
   Elongation at right pull after anchor set ............ 2.108 inch
   Total elongation after anchor set .................... 41.981 inch
   Ratio of total elongation to tendon length after anchor set .................. 0.078 inch/ft
   Jacking force ........................................... 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.667; Max along tendon 0.709

5 - DESIGNER'S NOTES
DATE: Aug 22, 2017
TIME: 15:22:36

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B19-T3

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) .................... 0.23000 /radian
Coefficient of wobble friction (K) ...................... 0.00020 rad/ft
Ultimate strength of strand ......................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set .................................. 0.38 inch
Cross-sectional area of strand .................... 0.217 inch^2
Total Number of Strands per Tendon .............. 15
Modulus of elasticity of strand ................. 28500.00 ksi
STRESSING ................................ AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B19-T3)

<table>
<thead>
<tr>
<th>SPAN ft</th>
<th>P start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
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<tr>
<td>1</td>
<td>180.85</td>
<td>31.00</td>
<td>10.00</td>
<td>63.00</td>
<td>0.00</td>
<td>0.37</td>
<td>0.20</td>
<td>182.33</td>
<td>189.06</td>
</tr>
<tr>
<td>2</td>
<td>176.08</td>
<td>63.00</td>
<td>41.25</td>
<td>63.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>185.21</td>
<td>178.56</td>
</tr>
<tr>
<td>3</td>
<td>183.15</td>
<td>63.00</td>
<td>10.00</td>
<td>31.00</td>
<td>0.19</td>
<td>0.61</td>
<td>0.00</td>
<td>185.36</td>
<td>190.04</td>
</tr>
</tbody>
</table>

540.08 ft (total length of tendon)

SUMMARY:
- Average initial stress (after release) ...................... 186.38 ksi
- Long term stress losses ..................................... 0.00 ksi
- Final average stress ....................................... 186.38 ksi
- Final average force in tendon .............................. 606.66 k
- Anchor set influence from left pull (192.44ksi;0.713) .... 105.10 ft
- Anchor set influence from right pull (192.81ksi;0.714) ... 106.39 ft
- Elongation at left pull before anchor set .................. 40.671 inch
- Elongation at right pull before anchor set ................. 2.461 inch
- Elongation at left pull after anchor set ................... 40.296 inch
- Elongation at right pull after anchor set .................. 2.086 inch
- Total elongation after anchor set .......................... 42.383 inch
- Ratio of total elongation to tendon length after anchor set 0.078 inch/ft
- Jacking force .................................................. 659.30 k

CRITICAL STRESS RATIOS:
- At stressing 0.750; At anchorage 0.678; Max along tendon 0.714
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B19-T3
1.2 FILE NAME : B19-T3

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

Average initial stress (after release) .................. 186.38 ksi
Long term stress losses .................................. 0.00 ksi
Final average stress .................................... 186.38 ksi
Final average force in tendon .......................... 606.66 k
Anchor set influence from left pull (192.44ksi;0.713) .. 105.10 ft
Anchor set influence from right pull (192.81ksi;0.714) .. 106.39 ft
Elongation at left pull before anchor set .............. 40.67 inch
Elongation at right pull before anchor set ............. 2.46 inch
Elongation at left pull after anchor set ............... 40.296 inch
Elongation at right pull after anchor set ............ 2.086 inch
Total elongation after anchor set .................. 42.383 inch
Ratio of total elongation to tendon length after anchor set ........ 0.078 inch/ft
Jacking force ........................................ 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.678; Max along tendon 0.714

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.


PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B19-T4

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) .................... 0.23000 /radian
Coefficient of wobble friction (K) ....................... 0.00020 rad/ft
Ultimate strength of strand ......................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ............................................ 0.38 inch
Cross-sectional area of strand ..................... 0.217 inch^2
Total Number of Strands per Tendon .................. 15
Modulus of elasticity of strand ...................... 28500.00 ksi
Stressing ............................................. AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B19-T4)

<table>
<thead>
<tr>
<th>SPAN ft</th>
<th>P start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>180.85</td>
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<td>15.00</td>
<td>4.00</td>
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<td>0.37</td>
<td>0.20</td>
<td>185.67</td>
</tr>
<tr>
<td>2</td>
<td>176.08</td>
<td>1</td>
<td>57.00</td>
<td>35.25</td>
<td>57.00</td>
<td>0.11</td>
<td>0.50</td>
<td>0.11</td>
<td>187.21</td>
</tr>
<tr>
<td>3</td>
<td>183.15</td>
<td>1</td>
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<td>15.00</td>
<td>0.19</td>
<td>0.61</td>
<td>0.00</td>
<td>187.22</td>
</tr>
</tbody>
</table>

540.08 ft (total length of tendon)

SUMMARY:
- Average initial stress (after release) ....................... 188.17 ksi
- Long term stress losses ........................................ 0.00 ksi
- Final average stress ............................................ 188.17 ksi
- Final average force in tendon ................................ 612.50 k
- Anchor set influence from left pull (194.11ksi;0.719) .. 109.99 ft
- Anchor set influence from right pull (194.34ksi;0.720) .. 111.05 ft
- Elongation at left pull before anchor set ................. 41.101 inch
- Elongation at right pull before anchor set ............... 40.726 inch
- Elongation at left pull after anchor set .................. 2.065 inch
- Elongation at right pull after anchor set ............... 42.791 inch
- Total elongation after anchor set .......................... 0.079 inch/ft
- Ratio of total elongation to tendon length after anchor set 659.30 k

CRITICAL STRESS RATIOS:
- At stressing 0.750; At anchorage 0.689; Max along tendon 0.720
1. PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B19-T4
1.2 FILE NAME : B19-T4

2. TENDON STRESSES [ksi]

<table>
<thead>
<tr>
<th>Span 1</th>
<th>Span 2</th>
<th>Span 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friction Loss Parameters</td>
<td>Friction Loss Parameters</td>
<td>Friction Loss Parameters</td>
</tr>
<tr>
<td>Long Term Losses</td>
<td>Long Term Losses</td>
<td>Long Term Losses</td>
</tr>
</tbody>
</table>

3. TENDON PROFILE [in]

<table>
<thead>
<tr>
<th>Span 1</th>
<th>Span 2</th>
<th>Span 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress End</td>
<td>Stress End</td>
<td>Stress End</td>
</tr>
<tr>
<td>4</td>
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<td>30</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

4. SUMMARY

- Average initial stress (after release) ...................... 188.17 ksi
- Long term stress losses ................................. 0.00 ksi
- Final average stress .................................... 188.17 ksi
- Final average force in tendon ......................... 612.50 k
- Anchor set influence from left pull (194.11ksi;0.719) .. 109.99 ft
- Anchor set influence from right pull (194.34ksi;0.720) .. 111.05 ft
- Elongation at left pull before anchor set ............... 41.101 inch
- Elongation at right pull before anchor set .............. 2.440 inch
- Elongation at left pull after anchor set ............... 40.726 inch
- Elongation at right pull after anchor set ............... 2.065 inch
- Total elongation after anchor set ...................... 42.791 inch
- Ratio of total elongation to tendon length after anchor set .......... 0.079 inch/ft
- Jacking force ........................................... 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.689; Max along tendon 0.720

5. DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.


PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B20-T1

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) ..................... 0.23000 /radian
Coefficient of wobble friction (K) ..................... 0.00020 rad/ft
Ultimate strength of strand ..................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set .......................................... 0.38 inch
Cross-sectional area of strand ..................... 0.217 inch^2
Total Number of Strands per Tendon ................... 15
Modulus of elasticity of strand ..................... 28500.00 ksi
STRESSING ........................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
          2=partial/regular parabola; 3=harped; 4=general; 5=straight;
          6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B20-T1)

<table>
<thead>
<tr>
<th>SPAN ft</th>
<th>P</th>
<th>start</th>
<th>center</th>
<th>right</th>
<th>X1/L</th>
<th>X2/L</th>
<th>X3/L</th>
<th>start</th>
<th>center</th>
<th>right</th>
</tr>
</thead>
<tbody>
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<td>75.00</td>
<td>0.00</td>
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<td></td>
<td>175.87</td>
<td>186.50</td>
<td>181.30</td>
</tr>
<tr>
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<td>75.00</td>
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<td>0.60</td>
<td>0.00</td>
<td>181.64</td>
<td>187.75</td>
<td>177.11</td>
</tr>
</tbody>
</table>

537.79 ft (total length of tendon)

SUMMARY:
Average initial stress (after release) ......................... 182.81 ksi
Long term stress losses ........................................... 0.00 ksi
Final average stress ............................................ 182.81 ksi
Final average force in tendon .................................... 595.04 k

Anchor set influence from left pull (189.21ksi;0.701) .... 94.55 ft
Anchor set influence from right pull (189.83ksi;0.703) .... 95.97 ft
Elongation at left pull before anchor set ..................... 39.667 inch
Elongation at right pull before anchor set .................... 2.478 inch
Elongation at left pull after anchor set ...................... 39.292 inch
Elongation at right pull after anchor set ..................... 2.103 inch
Total elongation after anchor set ............................. 41.395 inch
Ratio of total elongation to tendon length after anchor set .. 0.077 inch/ft
Jacking force ....................................................... 659.30 k

CRITICAL STRESS RATIOS:
At stressing 0.750; At anchorage 0.656; Max along tendon 0.703
1 - PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B20-T1
1.2 FILE NAME : B20-T1

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average initial stress (after release)</td>
<td>182.81 ksi</td>
</tr>
<tr>
<td>Long term stress losses</td>
<td>0.00 ksi</td>
</tr>
<tr>
<td>Final average stress</td>
<td>182.81 ksi</td>
</tr>
<tr>
<td>Final average force in tendon</td>
<td>595.04 k</td>
</tr>
<tr>
<td>Anchor set influence from left pull</td>
<td>94.55 ft</td>
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<tr>
<td>Anchor set influence from right pull</td>
<td>95.97 ft</td>
</tr>
<tr>
<td>Elongation at left pull before anchor set</td>
<td>39.667 inch</td>
</tr>
<tr>
<td>Elongation at right pull before anchor set</td>
<td>2.478 inch</td>
</tr>
<tr>
<td>Elongation at left pull after anchor set</td>
<td>39.292 inch</td>
</tr>
<tr>
<td>Elongation at right pull after anchor set</td>
<td>2.103 inch</td>
</tr>
<tr>
<td>Total elongation after anchor set</td>
<td>41.395 inch</td>
</tr>
<tr>
<td>Ratio of total elongation to tendon length after anchor set</td>
<td>0.077 inch/ft</td>
</tr>
<tr>
<td>Jacking force</td>
<td>659.30 k</td>
</tr>
</tbody>
</table>

CRITICAL STRESS RATIOS:
At stressing 0.750; At anchorage 0.656; Max along tendon 0.703

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Aug 22, 2017

PROJECT TITLE:
SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE:
B20-T2

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu).............. 0.23000 /radian
Coefficient of wobble friction (K).................. 0.00020 rad/ft
Ultimate strength of strand ....................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ............................................. 0.38 inch
Cross-sectional area of strand ..................... 0.217 inch^2
Total Number of Strands per Tendon ............... 15
Modulus of elasticity of strand .................... 28500.00 ksi
STRESSING ........................................... AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
### TENDON ID, GEOMETRY AND STRESS PROFILE (B20-T2)

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<th>X3/L</th>
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</tbody>
</table>

537.79 ft (total length of tendon)

**SUMMARY:**
- Average initial stress (after release) .............. 184.56 ksi
- Long term stress losses .............................. 0.00 ksi
- Final average stress .................................. 184.56 ksi
- Final average force in tendon ....................... 600.75 k
- Anchor set influence from left pull (190.80ksi;0.707) .. 99.98 ft
- Anchor set influence from right pull (191.29ksi;0.708) .. 100.97 ft
- Elongation at left pull before anchor set ............ 40.085 inch
- Elongation at right pull before anchor set .......... 2.457 inch
- Elongation at left pull after anchor set ............ 39.710 inch
- Elongation at right pull after anchor set .......... 2.082 inch
- Total elongation after anchor set .................... 41.792 inch
- Ratio of total elongation to tendon length after anchor set .... 0.078 inch/ft
- Jacking force ........................................ 659.30 k

**CRITICAL STRESS RATIOS:**
- At stressing 0.750; At anchorage 0.667; Max along tendon 0.708
ADAPT Structural Concrete Software
E-mail: support@adaptsoft.com, Web site: www.adaptsoft.com
ADAPT-FELT Ver. 2014
Date: 8/22/2017   Time: 15:27

1- PROJECT TITLE :  SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B20-T2
1.2 FILE NAME : B20-T2

2 - TENDON STRESSES [ksi]

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
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<tr>
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</tr>
</tbody>
</table>

Friction Loss Parameters  Long Term Losses

3 - TENDON PROFILE [in]

<table>
<thead>
<tr>
<th>Span 1</th>
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<th>Span 3</th>
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<tr>
<td>16</td>
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</tr>
</tbody>
</table>

4 - SUMMARY

Average initial stress (after release) .......... 184.56 ksi
Long term stress losses .......................... 0.00 ksi
Final average stress ............................. 184.56 ksi
Final average force in tendon ................... 600.75 k

Anchor set influence from left pull (190.80ksi;0.707) .. 99.98 ft
Anchor set influence from right pull (191.29ksi;0.708) .. 100.97 ft
Elongation at left pull before anchor set ........... 40.085 inch
Elongation at right pull before anchor set .......... 2.457 inch
Elongation at left pull after anchor set ............ 39.710 inch
Elongation at right pull after anchor set .......... 2.082 inch
Total elongation after anchor set .................. 41.792 inch
Ratio of total elongation to tendon length after anchor set .......... 0.078 inch/ft
Jacking force ...................................... 659.30 k

CRITICAL STRESS RATIOS:
At stressing 0.750; At anchorage 0.667; Max along tendon 0.708

5 - DESIGNER’S NOTES

PROJECT TITLE: SR 7404 SEC 07M OVER THE THE LEHIGH RIVER

SPECIFIC TITLE: B20-T3

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu) ............... 0.23000 /radian
Coefficient of wobble friction (K) ..................... 0.00020 rad/ft
Ultimate strength of strand ....................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength 0.75
Anchor set ............................................. 0.38 inch
Cross-sectional area of strand ..................... 0.217 inch^2
Total Number of Strands per Tendon .................. 15
Modulus of elasticity of strand ..................... 28500.00 ksi
STRESSING ........................................... AT BOTH ENDS

LEGEND:
P ....... = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
TENDON ID, GEOMETRY AND STRESS PROFILE (B20-T3)

<table>
<thead>
<tr>
<th>SPAN ft</th>
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</table>

537.79 ft (total length of tendon)

SUMMARY:

Average initial stress (after release) .................. 186.33 ksi
Long term stress losses ................................... 0.00 ksi
Final average stress ...................................... 186.33 ksi
Final average force in tendon ............................ 606.52 k

Anchor set influence from left pull (192.44ksi;0.713) .. 105.14 ft
Anchor set influence from right pull (192.79ksi;0.714) .. 105.74 ft
Elongation at left pull before anchor set ............... 40.507 inch
Elongation at right pull before anchor set ............. 2.436 inch
Elongation at left pull after anchor set ............... 40.132 inch
Elongation at right pull after anchor set ............. 2.061 inch
Total elongation after anchor set ..................... 42.193 inch
Ratio of total elongation to tendon length after anchor set ........ 0.078 inch/ft
Jacking force .............................................. 659.30 k

CRITICAL STRESS RATIOS:

At stressing 0.750; At anchorage 0.678; Max along tendon 0.714
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B20-T3
1.2 FILE NAME : B20-T3

2 - TENDON STRESSES [ksi]

<table>
<thead>
<tr>
<th>Span 1</th>
<th>Span 2</th>
<th>Span 3</th>
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</thead>
<tbody>
<tr>
<td>Friction Loss Parameters</td>
<td>Long Term Losses</td>
<td>Friction Loss Parameters</td>
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<tr>
<td>Stress End</td>
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<td>Stress End</td>
</tr>
</tbody>
</table>

3 - TENDON PROFILE [in]

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Stress End</td>
<td>Stress End</td>
<td>Stress End</td>
</tr>
</tbody>
</table>

4 - SUMMARY

Average initial stress (after release) ................. 186.33 ksi
Long term stress losses ........................................ 0.00 ksi
Final average stress ........................................... 186.33 ksi
Final average force in tendon .............................. 606.52 k

Anchor set influence from left pull (192.44ksi;0.713) .. 105.14 ft
Anchor set influence from right pull (192.79ksi;0.714) .. 105.74 ft
Elongation at left pull before anchor set ............... 40.507 inch
Elongation at right pull before anchor set ............... 2.436 inch
Elongation at left pull after anchor set .................. 40.132 inch
Elongation at right pull after anchor set ............... 2.061 inch
Total elongation after anchor set ......................... 42.193 inch

Ratio of total elongation to tendon length after anchor set ............... 0.078 inch/ft
Jacking force ........................................... 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.678; Max along tendon 0.714

5 - DESIGNER'S NOTES
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Aug 22, 2017
TIME: 15:30:23

PROJECT TITLE:
SR 7404 SEC 07M OVER THE LEHIGH RIVER

SPECIFIC TITLE:
B20-T4

FRICTION & ELONGATION CALCULATIONS:

INPUT PARAMETERS:
Coefficient of angular friction (meu).................... 0.23000 /radian
Coefficient of wobble friction (K).......................... 0.00020 rad/ft
Ultimate strength of strand ............................... 270.00 ksi
Ratio of jacking stress to strand's ultimate strength .... 0.75
Anchor set .................................................. 0.38 inch
Cross-sectional area of strand ............................. 0.217 inch^2
Total Number of Strands per Tendon ...................... 15
Modulus of elasticity of strand ........................... 28500.00 ksi
STRESSING ................................................ AT BOTH ENDS

LEGEND:
P ........ = Tendon profile type defined as: 1=reversed parabola;
2=partial/regular parabola; 3=harped; 4=general; 5=straight;
6=extended reversed parabola; 7=cantilever down
X1/L etc = horizontal distances to control points in geometry of the
tendon divided by span length
Stresses tabulated are after anchor set but before long-term losses.
## Tendon ID, Geometry and Stress Profile (B20-T4)

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<td>0.50</td>
<td>0.11</td>
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<td>0.60</td>
<td>0.00</td>
<td>187.14</td>
<td>191.11</td>
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</table>

537.79 ft (total length of tendon)

**Summary:**
- Average initial stress (after release) ............... 188.13 ksi
- Long term stress losses .................................. 0.00 ksi
- Final average stress ..................................... 188.13 ksi
- Final average force in tendon .......................... 612.37 k

- Anchor set influence from left pull (194.11 ksi; 0.719) .. 110.05 ft
- Anchor set influence from right pull (194.32 ksi; 0.720) .. 110.30 ft
- Elongation at left pull before anchor set .................. 40.936 inch
- Elongation at right pull before anchor set .................. 2.414 inch
- Elongation at left pull after anchor set ................... 40.561 inch
- Elongation at right pull after anchor set ................... 2.039 inch
- Total elongation after anchor set .......................... 42.600 inch
- Ratio of total elongation to tendon length after anchor set .......................... 0.079 inch/ft
- Jacking force ............................................. 659.30 k

**Critical Stress Ratios:**
- At stressing 0.750; At anchorage 0.689; Max along tendon 0.720
1- PROJECT TITLE : SR 7404 SEC 07M OVER THE THE LEHIGH RIVER
1.1 SPECIFIC TITLE : B20-T4
1.2 FILE NAME : B20-T4

2 - TENDON STRESSES [ksi]

3 - TENDON PROFILE [in]

4 - SUMMARY

Average initial stress (after release) .................. 188.13 ksi
Long term stress losses ............................... 0.00 ksi
Final average stress ................................... 188.13 ksi
Final average force in tendon ....................... 612.37 k

Anchor set influence from left pull (194.11ksi;0.719) .. 110.05 ft
Anchor set influence from right pull (194.32ksi;0.720) .. 110.30 ft
Elongation at left pull before anchor set ............... 40.936 inch
Elongation at right pull before anchor set ............. 2.414 inch
Elongation at left pull after anchor set ............... 40.561 inch
Elongation at right pull after anchor set ............. 2.039 inch
Total elongation after anchor set .................. 42.600 inch
Ratio of total elongation to tendon length after anchor set 0.079 inch/ft
Jacking force ........................................ 659.30 k

CRITICAL STRESS RATIOS :
At stressing 0.750; At anchorage 0.689; Max along tendon 0.720

5 - DESIGNER’S NOTES