



Date in Field: July 2, 2024  
 Contractor: J.Gill and Company (J.Gill)  
 Owner: Village of Oak Park  
 Location: Oak Park, IL  
 Weather: Overcast 70's °F  
 Report By: Erika Green

## Present at Site

Name	Company	
Erika Green	Walker Consultants	<a href="mailto:egreen@walkerconsultants.com">egreen@walkerconsultants.com</a>
John Morgan	Walker Consultants	<a href="mailto:jmorgan@walkerconsultants.com">jmorgan@walkerconsultants.com</a>
Jose Perez	Walker Consultants	<a href="mailto:jperez@walkerconsultants.com">jperez@walkerconsultants.com</a>
Chris Zaras	Walker Consultants	<a href="mailto:czaras@walkerconsultants.com">czaras@walkerconsultants.com</a>
Esteban Salas	J.Gill and Co.	<a href="mailto:esteban@jgillandcompany.com">esteban@jgillandcompany.com</a>
J.Gill Crew	J.Gill and Co.	

## Distribution

Name	Company	Email Address
Sean Keane	Village of Oak Park	<a href="mailto:skeane@oak-park.us">skeane@oak-park.us</a>
Dan Moser	Walker Consultants	<a href="mailto:dmoser@walkerconsultants.com">dmoser@walkerconsultants.com</a>
John Morgan	Walker Consultants	<a href="mailto:jmorgan@walkerconsultants.com">jmorgan@walkerconsultants.com</a>
Erika Green	Walker Consultants	<a href="mailto:egreen@walkerconsultants.com">egreen@walkerconsultants.com</a>
Jose Perez	Walker Consultants	<a href="mailto:jperez@walkerconsultants.com">jperez@walkerconsultants.com</a>

## Summary

Walker Consultants (Walker) was on site on the date listed above to perform a limited slab post-tensioned (PT) tendon evaluation of the second tier (first supported tier), west bay of the Village of Oak Park Avenue Parking Structure located at 720 North Boulevard in Oak Park, Illinois. The following is a summary of our findings and conceptual repair recommendations based on our limited slab PT tendon evaluation.

## Background and Description

1. The Avenue Parking Structure located in Oak Park, Illinois is a six-level parking structure with approximate overall plan dimensions of 119 feet by 241 feet. The parking structure is oriented in the north-south direction with the west bay being flat and the east bay ramped. Structurally, the concrete floor slabs contain post-tensioning slab tendons as well as regular reinforcing bars.
2. Vehicular access to and exiting from the parking structure is provided on the south elevation at the west (flat) bay. Vehicular circulation is provided by the ramped parking areas to access all levels starting at the north end of the east bay. Pedestrian access is provided by a stair tower at the southwest corner and by a stair/elevator tower on the west elevation towards the north end.

3. Prior to our limited review of the slab PT tendons on the second tier, west bay of the parking structure, Walker identified 6 broken/de-tensioned PT tendons in this bay from the underside of the slab during a progress site visit where we were on site to observe partial depth concrete repairs in progress. Based on these identified broken PT tendons, Walker recommended a limited slab PT tendon evaluation focused on this level and bay of the parking structure.

## Conclusion and Recommendations

Based on our limited review of the second tier, west bay slab PT tendons, we conclude and recommend the following items:

1. Investigative slab PT tendon openings were made (by J. Gill) and reviewed by Walker along grid lines 2, 5, 6 and 9 between grid lines A and C.
2. The slab PT tendons were typically in pairs of two adjacent tendons in the investigative opening locations.
3. Walker reviewed 84 PT tendon segments in approximately 43 investigative openings at the west bay on the second tier. Based on the locations of these investigative openings, limited portions of approximately 34 full length tendons were reviewed within this bay (some tendons were reviewed at more than one location along the tendon's full length).
4. Walker visually observed the condition of the embedded slab post-tensioning system at slab excavations and performed in-situ testing of the tendons' general tension using the "screwdriver penetration" test and the "pry-bar lift-off" test.
5. Out of the approximately 34 total full-length tendons reviewed within this bay, 14 tendons were identified during our limited PT tendon evaluation as being broken/de-tensioned and recommended for repairs. In isolated areas, several broken/de-tensioned tendons were located adjacent to other broken/de-tensioned tendons in the same general area, leaving few slab tendons with tension within these areas.
6. In pairs of PT tendons where one tendon was found to be tensioned and one tendon de-tensioned, due to the close proximity of the tendons and due to the potential dangers involved with repairing one tendon in such close proximity to another tensioned tendon, both tendons in these types of pairs need to be de-tensioned during the repair process in order to perform proper repairs. This results in approximately 20 tendons in need of repair of the 34 total tendons present.
7. Walker observed mild steel reinforcement in the slab within the investigative openings. These reinforcing bars help to supplement the slab structural capacity. However, even with the reinforcing bars, the slab needs the original PT tendons to have code required full structural capacity.
8. Based on our observations during our limited slab PT tendon evaluation, Walker recommends that properly designed tendon repairs be performed or properly designed slab structural strengthening begin within the next two months, by September 2<sup>nd</sup>.
9. Walker recommends that the slab be repaired or strengthened by one of the following two methods:
  - a. Method 1: Repair slab PT tendons - To repair the slab tendons in place, the broken/corroded tendons will be removed, and new tendons will be installed and restressed. The necessary temporary shoring will require closing the parking structure for approximately 8 to 12 weeks for this repair method. We would expect the approximate repair design life for this method to be

10+ years along with proper maintenance repairs. Our opinion of probable construction cost for this method ranges from approximately \$350,000 to repair known broken tendons to \$650,000 to repair all tendons in this bay. Based on previous experience, it is likely that all tendons will require repair in this bay.

- b. Method 2: Install new steel beams to permanently support the slabs - Installation of new steel beams will occur on the underside of the slab for this entire bay. The new steel beams will be supported by the existing PT beams. The parking structure will likely be able to remain open during this repair method. We would expect the approximate repair design life for this method to be 20+ years along with proper maintenance repairs. Our opinion of probable construction cost for this method ranges from approximately \$500,000 to \$600,000.
10. Walker recommends that these two different slab repair methods be partially designed and sent to a Contractor for final pricing and final construction schedule determination. Once pricing and schedule are developed, then one of the two methods can be selected and the final design for that method can be fully designed.
  11. The structural repair options should be properly designed by an Illinois Licensed Structural Engineer with significant experience with post-tensioned slab system repair and strengthening.
  12. In the interest of time, we recommend the structural repairs be negotiated with J.Gill, since J. Gill is already familiar with the structure and with PT slab repairs and strengthening.
  13. Walker recommends the Village of Oak Park procure emergency funds that can be used to expedite these repairs and prevent the need for closure and shoring of the structure on September 2<sup>nd</sup>.
  14. Based on the conditions found at the second tier, west bay, Walker recommends performing additional slab PT tendon evaluation. Prior to performing additional slab PT investigation in other areas of this parking structure, a few of the broken PT slab tendons in this current bay should be removed full length to allow us to determine the specific cause and the specific location(s) of slab PT tendon deterioration. With this knowledge from this bay, we can develop a targeted, cost-effective additional investigation program for the remainder of the structure.

ATTACHMENTS:

Attachment A – Photos

Attachment B – Tendon Results Plan View

Attachment C– PT Investigation Log

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## Attachment A - Photos

### Photos

Photo 1. Partial overview of some slab excavations.



Photo 2. Walker performing "pry-bar lift-off" test on slab PT tendons.



Photo 3. Walker performing “screwdriver penetration” test on slab PT tendons.



Photo 4. Walker performing “screwdriver penetration” test on slab PT tendons.



Photo 5. Walker performing “screwdriver penetration” test on slab PT tendons. Note broken/de-tensioned tendon (arrow).



Photo 6. Walker performing “pry-bar lift-off” test and “screwdriver penetration” test on slab PT tendons.



Photo 7. Walker dimensioning concrete cover at slab PT tendons.



Photo 8. Example of tensioned (good) PT tendons in excavation.

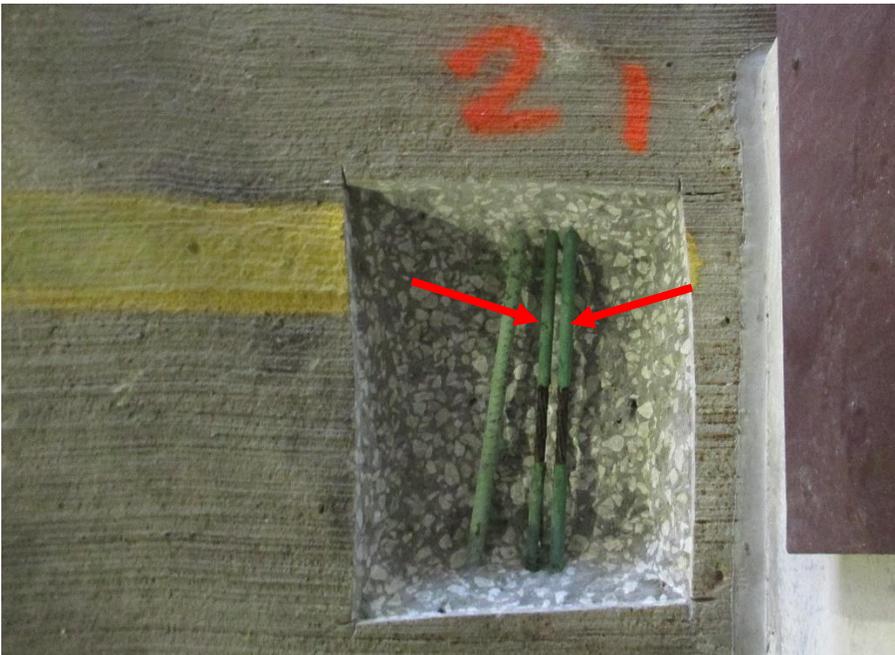


Photo 9. Example of broken/de-tensioned PT tendons identified during the evaluation.



Photo 10. Example of broken/de-tensioned PT tendons identified during the evaluation.

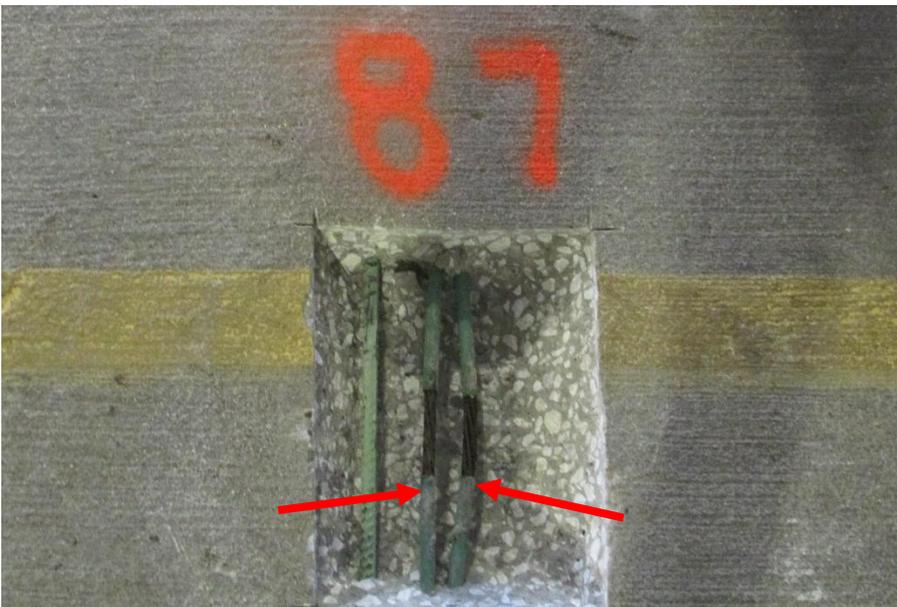


Photo 11. Example of broken/de-tensioned PT tendons identified during the evaluation.



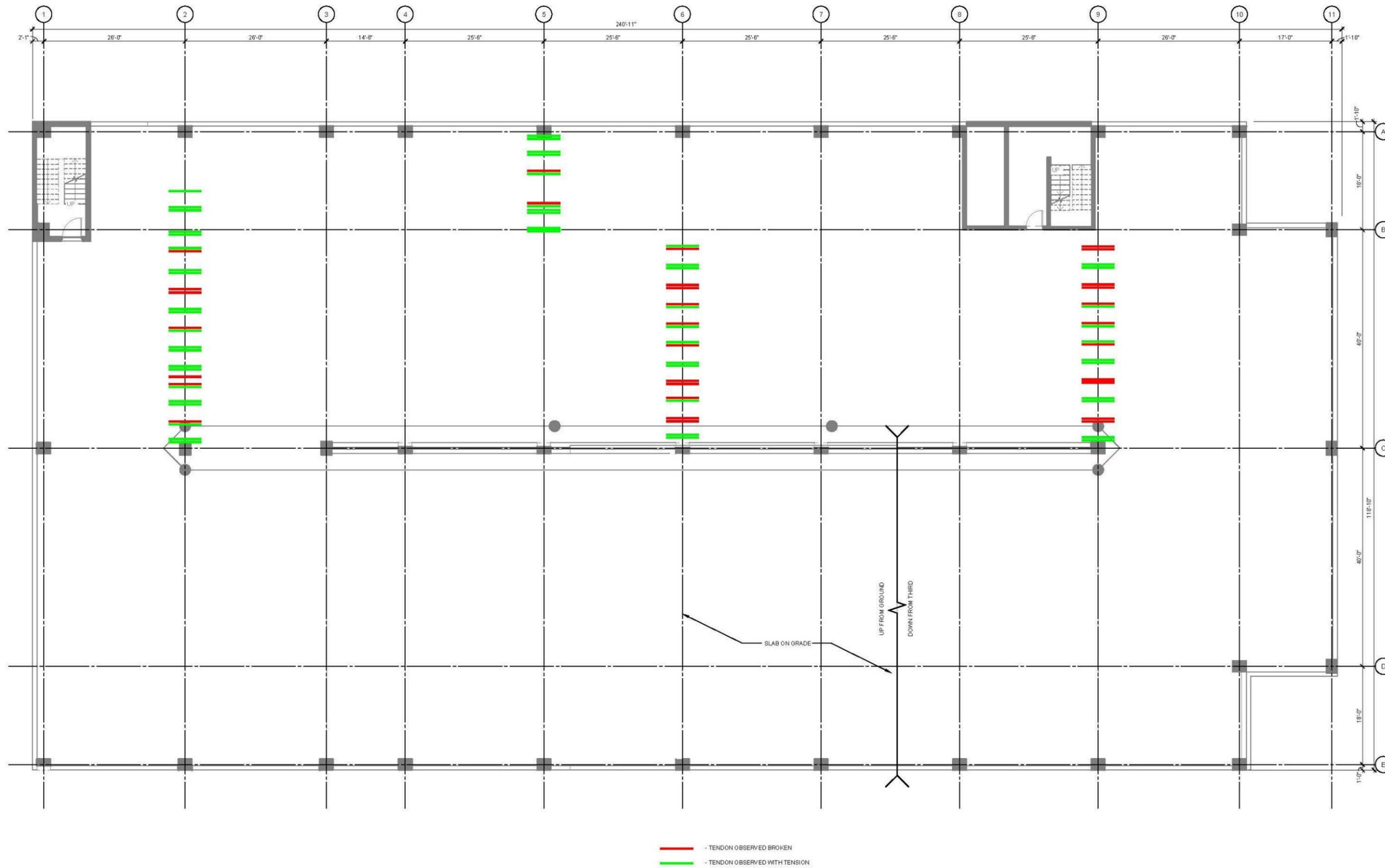
Photo 12. Example of broken/de-tensioned PT tendons identified during the evaluation.



Photo 13. Example of slab excavation showing mild steel reinforcement.



Attachment B – Tendon Results Plan View



1 SECOND TIER PLAN







Village of Oak Park Avenue Parking Structure  
 Limited Slab Post-Tensioned (PT) Tendon Evaluation

Walker No. 31-009465.20  
 Field Report

<b>Project:</b>	Village of Oak Park – Avenue PS (31-009465-20)
<b>Column Line:</b>	C6

Tendon No.	Distance (From Col. CL)	Cover	Corrosion	Grease	Pry Bar Test	Screwdriver Test	Overall Tension/ Notes
23	From C6, 2'-2"	3 1/4"	None	Good	T	T	
24	2'-3"	3 1/4"	None	Good	T	T	
25	5'-2"	1 7/8"	None	Good	B	B	B
26	5'-3"	2"	None	Good	B	B	B
27	8'-11"	2 1/4"	None	Good	T	T	
28	9'-0"	2 1/4"	None	Good	T	PT	B (1 broken wire)
29	12'-0"	2 1/8"	None	Good	B	B	B
30	12'-1"	2 1/8"	None	Good	B	B	B
31	15'-4"	2 1/2"	None	Good	T	T	
32	15'-5"	2 1/2"	None	Good	T	T	
33	19'-1"	2 1/8"	None	Good	B	B	B
34	19'-2"	2 1/2"	None	Good	T	T	
35	22'-6"	2 1/2"	None	Good	T	T	
36	22'-7"	2 1/2"	None	Good	B	B	B
37	26'-1"	2 1/8"	None	Good	T	T	
38	26'-2"	2 1/8"	None	Good	B	B	B
39	29'-7"	2 1/8"	None	Good	B	B	B
40	29'-8"	2"	None	Good	B	B	B
41	33'-3"	2 1/8"	None	Good	T	T	
42	33'-4"	2"	None	Good	T	T	
43	36'-9"	2 1/8"	None	Good	B	B	B
44	36'-10"	2 1/4"	None	Good	T	T	





<b>Project:</b>	Village of Oak Park – Avenue PS (31-009465-20)
<b>Column Line:</b>	C2

Tendon No.	Distance (From Col. CL)	Cover	Corrosion	Grease	Pry Bar Test	Screwdriver Test	Overall Tension/ Notes
57	From C2, 1'-4"	3 3/4"	None	Good	T	T	
58	1'-5"	3 3/4"	None	Good	T	T	
59	4'-7"	2 3/4"	None	Good	T	T	
60	4'-8"	3"	None	Good	B	B	B
61	8'-3"	2 3/4"	None	Good	T	T	
62	8'-4"	2 1/2"	None	Good	T	T	
63	11'-5"	2 1/4"	None	Good	T	T	
64	11'-6"	2 1/4"	None	Good	B	B	B
65	13'-1"	2 3/8"	None	Good	PT	PT	B (1 broken wire, this is an add tendon)
66	14'-8"	2 1/2"	None	Good	T	T	
67	14'-9"	2 1/2"	None	Good	T	T	
68	18'-2"	2 3/8"	None	Good	T	T	
69	18'-3"	2 1/8"	None	Good	T	T	
70	21'-9"	2 1/2"	None	Good	T	T	
71	21'-10"	2 1/4"	None	Good	B	B	B
72	25'-2"	2 3/4"	None	Good	T	T	
73	25'-3"	2 5/8"	None	Good	T	T	
74	28'-9"	2 1/4"	None	Good	B	B	B
75	28'-11"	2 1/4"	None	Good	B	B	B
76	32'-4"	2 1/2"	None	Good	T	T	
77	32'-5"	2 1/4"	None	Good	T	T	
78	36'-4"	2"	None	Good	B	B	B
79	36'-5"	2"	None	Good	T	T	
80	39'-4"	1 7/8"	None	Good	T	T	
81	39'-5"	2"	None	Good	T	T	
82	43'-10"	2"	None	Good	T	T	
83	43'-11"	1 7/8"	None	Good	T	T	
84	47'-1"	1 3/4"	None	Good	T	T	This is an add tendon