DILLON
Force Measurement Equipment

Dillon Tower Mobile Application

Quick User Guide

AWT35-100033
Issue AB

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1. Introduction

The Dillon Tower Mobile Application is a program that will interface with the Quick Check-T via Bluetooth™ and will support Data Collection and Reporting for Guyed Cell Tower maintenance.

The Dillon Tower Mobile Application:

- Calculates Target Tensions based on inputted parameters (Attachment Elevation, Guy Radius, Guy Rise or Drop, Wire Type, Wire Size, and Initial Tension percent), location-based temperature readings and American Society for Testing and Materials (ASTM) Breaking Strength Tables
- Stores Pre-Tension “initial” (Pre Tn) ad Post Tensioned (Post Tn) records along with Photos, Date & Time, and GPS coordinates
- Captures Maintenance Log with photos and comments
- Exports Full Site PDF report and Excel (CVS file) of the measurements via email
- Connects to Quick Check-T via Bluetooth™
- Available on both Android (Google Play Store) and iOS (Apple App Store)

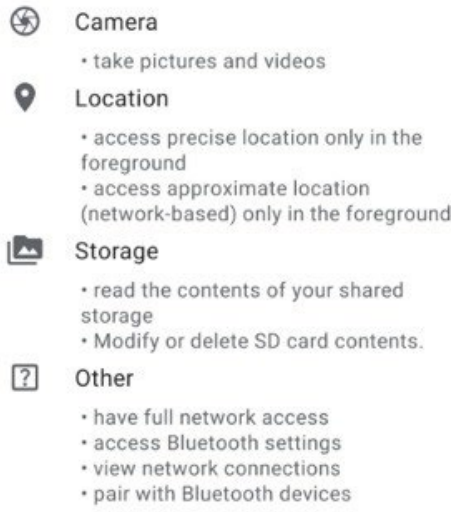
1.1. Dillon Tower App Requirements

iOs:

- Minimum iOS version is 12.1
- iPhone 7 and later have full support
- iPhone 5S through 6S Plus and SE will be able to run the app but may have limitations
- iPad Air 1st gen and later are supported

Android:

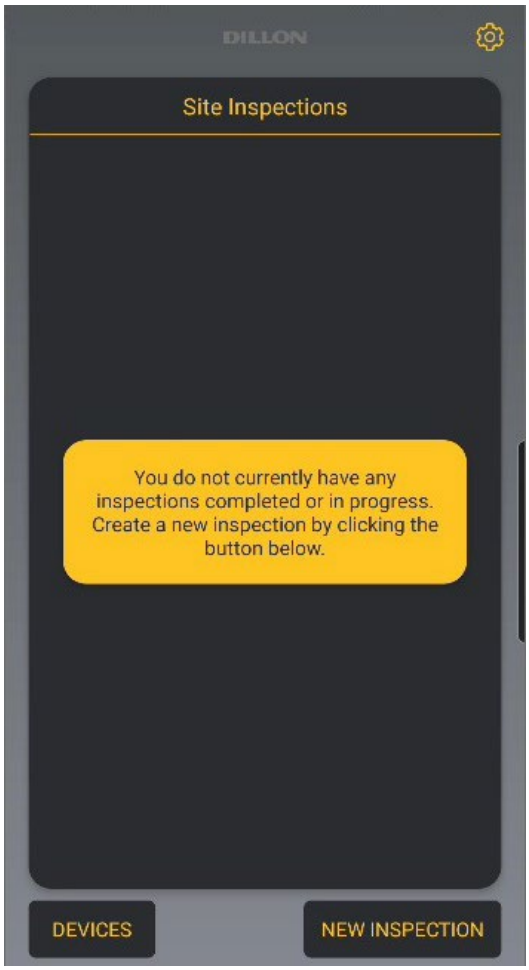
- Minimum Android version is 6.0 (API Level 23 - Marshmallow)



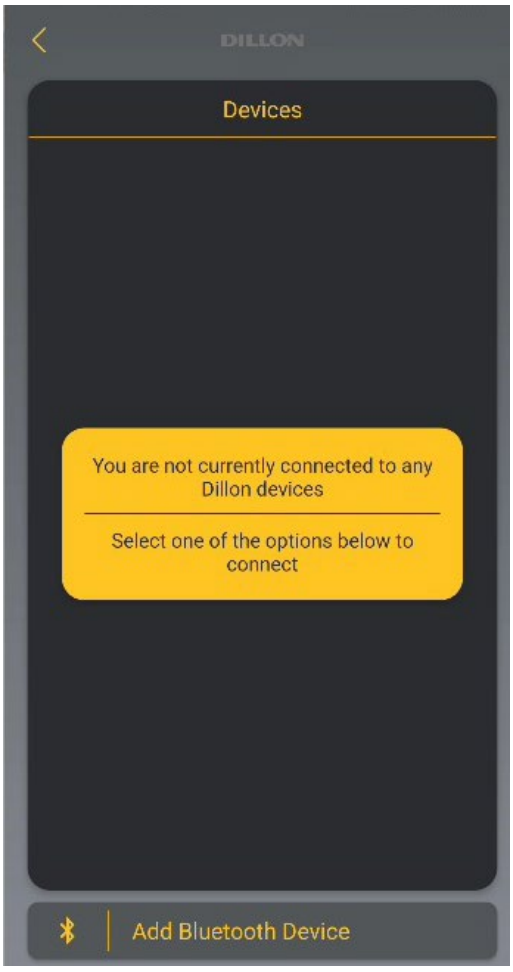
2. Connecting to a Quick Check-T


Dillon Tower

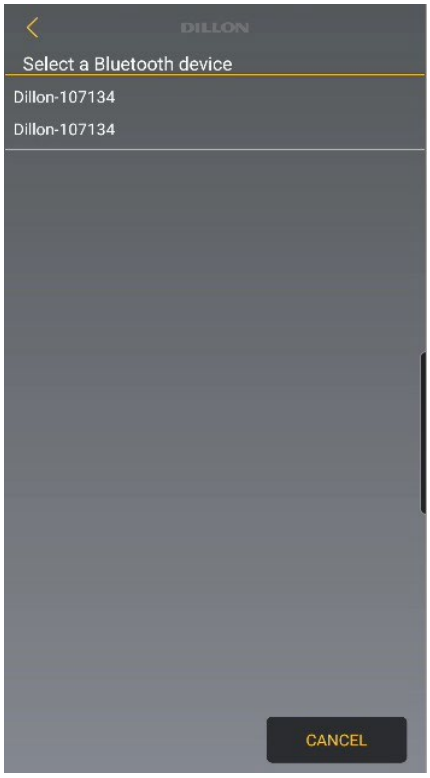
1. Power on the Quick Check-T.
2. Tap on the Dillon Tower icon on your Android or iOS mobile device:
3. From the **Site Inspections** screen, tap on the **Devices** button.



4. From the **Devices** screen, tap on the **Add Bluetooth Device** button if the Quick Check-T is not already listed in the Devices List.

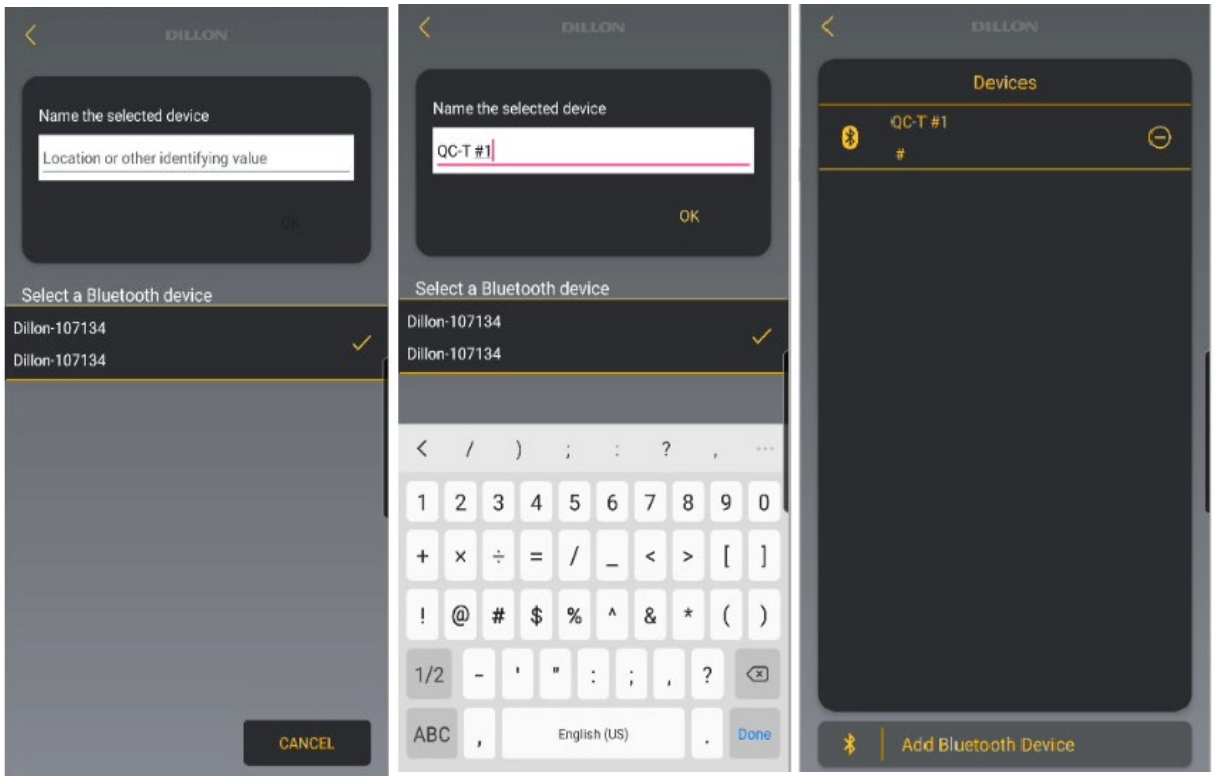


5. The mobile device will now scan for powered on Quick Check-T's in the area and display them in the Devices List.



6. Select the Dillon-Serial Number of the device you want to connect to and **Name the Device**, then tap **OK.**

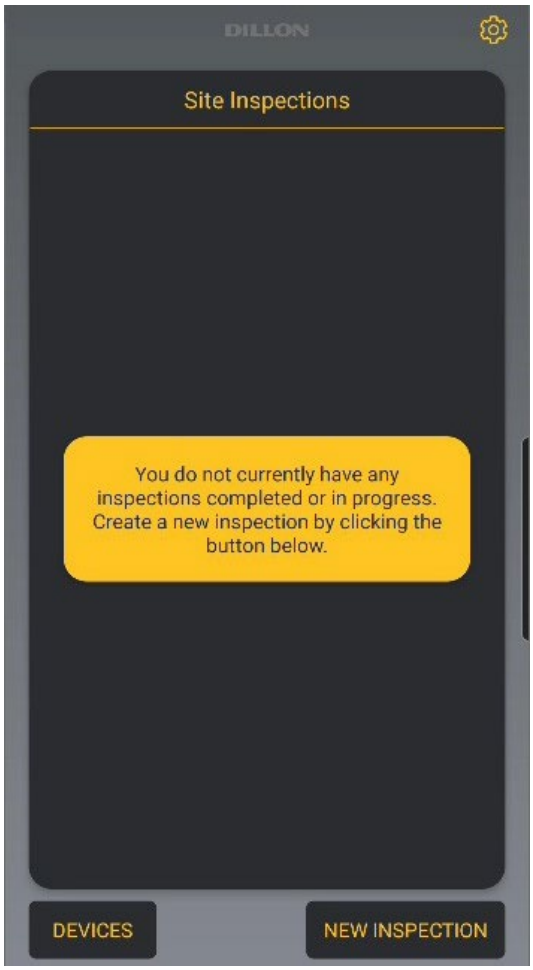
7. Tap the back arrow **<** to go back to the **Site Inspections** screen.



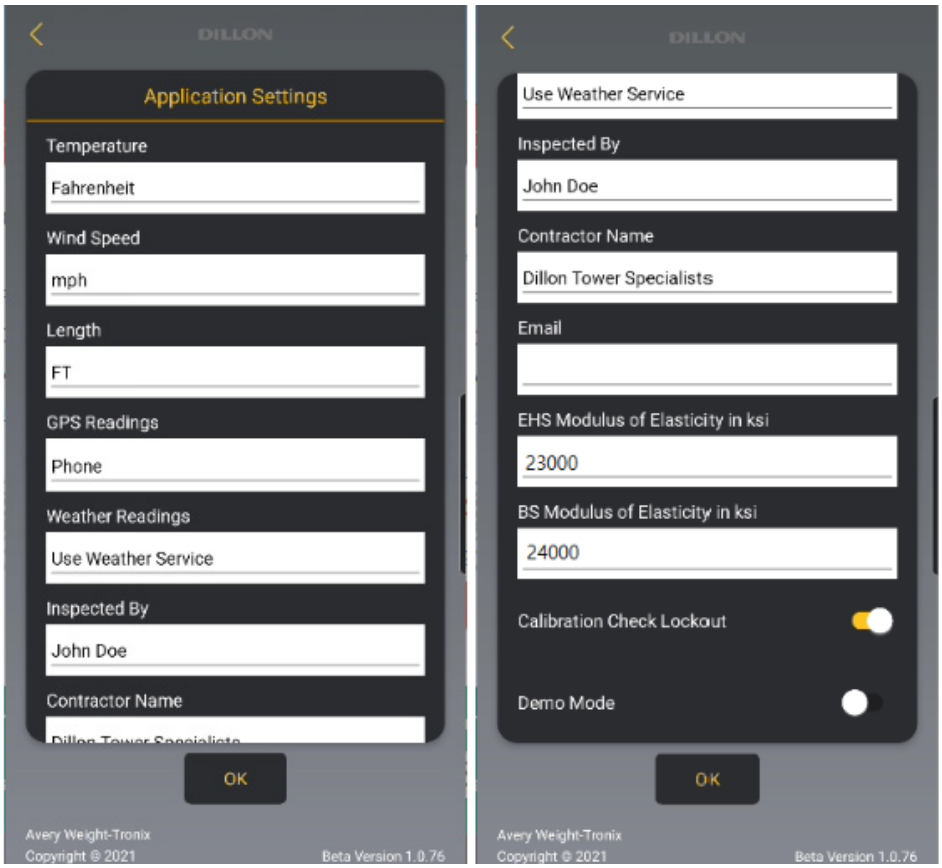
3. Application Settings

1. Tap on the Dillon Tower Icon on your Android or iOS mobile Device:

2. From the **Site Inspections** screen, tap on the settings **Gear** button.



3. The Application Settings lets you change the default parameters of the Tower Application.



Temperature - Used for Calculating Target Tensions.
- Fahrenheit (Default)
- Celsius

Wind Speed - Displayed on Wire Tension Screen and included in the Reports.
- mph (Default)
- kph
- m/s
- knots

Length - Attachment Elevation, Guy Radius, Guy Drop/ Rise unit of measure.
- Feet FT (Default)
- Meters M

GPS Readings - Which device's GPS is used when storing Pre Tn and Post Tn Readings.
- Phone (Default)
- Quick Check
  - The GPS feature must be enabled in the Quick Check.

Weather Readings - Used for Calculating Target Tensions.

- Use Weather Service (Default)
  - The Tower App uses the OpenWeather API to gather local weather information (Temperature and Windspeed). This does require that the mobile device has a Data connection (WiFi or Cellular) and location services enabled.
- Key in Manually
  - This allows the end-user to key in Temperature and Windspeed into the Wire Tension screen, so if the mobile device does not have a Data connection on site, they can still progress with the plumb and tensioning of the guy wires.

Inspected by - This is the end-user's name and will be automatically inserted into each New Site Inspection that is created.

Contractor Name - This is the name of the company performing the Tower Site Inspection or Maintenance and will be automatically inserted into each New Site Inspection that is created.

Email - This is the end-user's email and will be used when reports are exported off the phone via email.

EHS Modulus of Elasticity in ksi - This is used to calculate the Target Tensions on the Wire Tension screen.

- Default is 23,000, but different values can be entered and used.

BS Modulus of Elasticity in ksi - This is used to calculate the Target Tensions on the Wire Tension screen.

- Default is 24,000, but different values can be entered and used.

Calibration Check Lockout On/Off

- When enabled, this feature reuires the end-user to perform a Calibration Check on the Wire Tensions Screen before Pre Tensioned "Initial" (Pre Tn) and Post Tensioned (Post Tn) readings can be stored.

Demo Mode On/Off

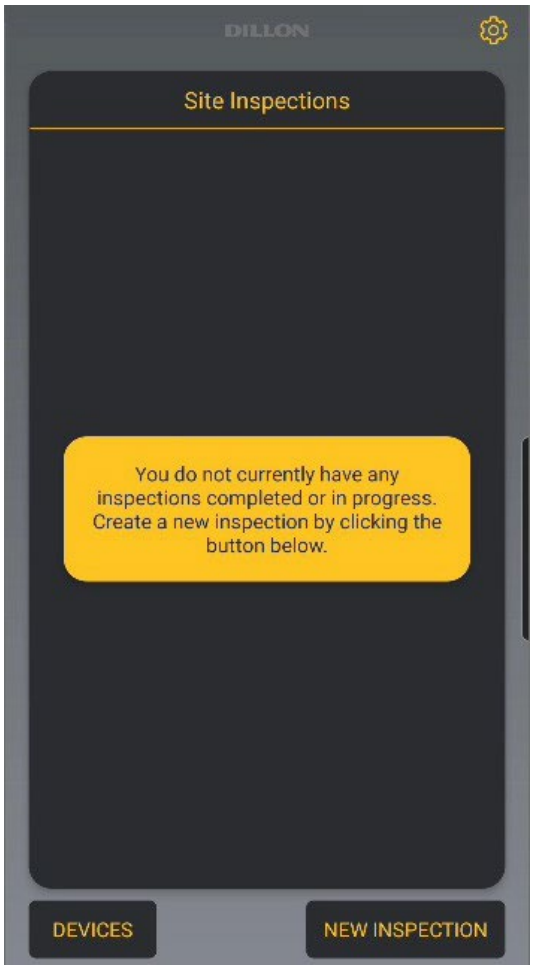
- When enabled, a default set of 16 Wire Sizes will be available on the Wire Tension screen, even if they are not part of the current Quick Check-T's calibration. This is intended for Application Demos and not for regular use. (Default is OFF)

4. After making changes, tap **OK** to return to the **Site Inspections** screen.

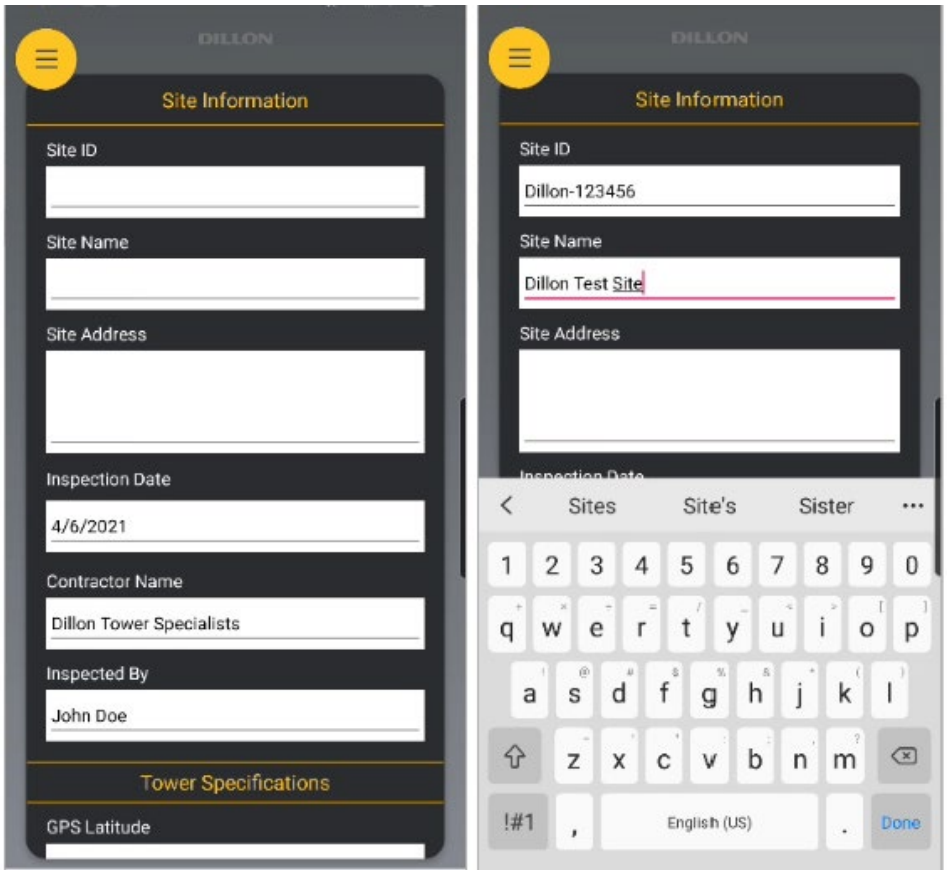
4. Creating a new Site Inspection

1. Tap on the Dillon Tower icon on your Android or iOS mobile device:

2. From the **Site Inspections** screen, tap on the **New Inspection** button.



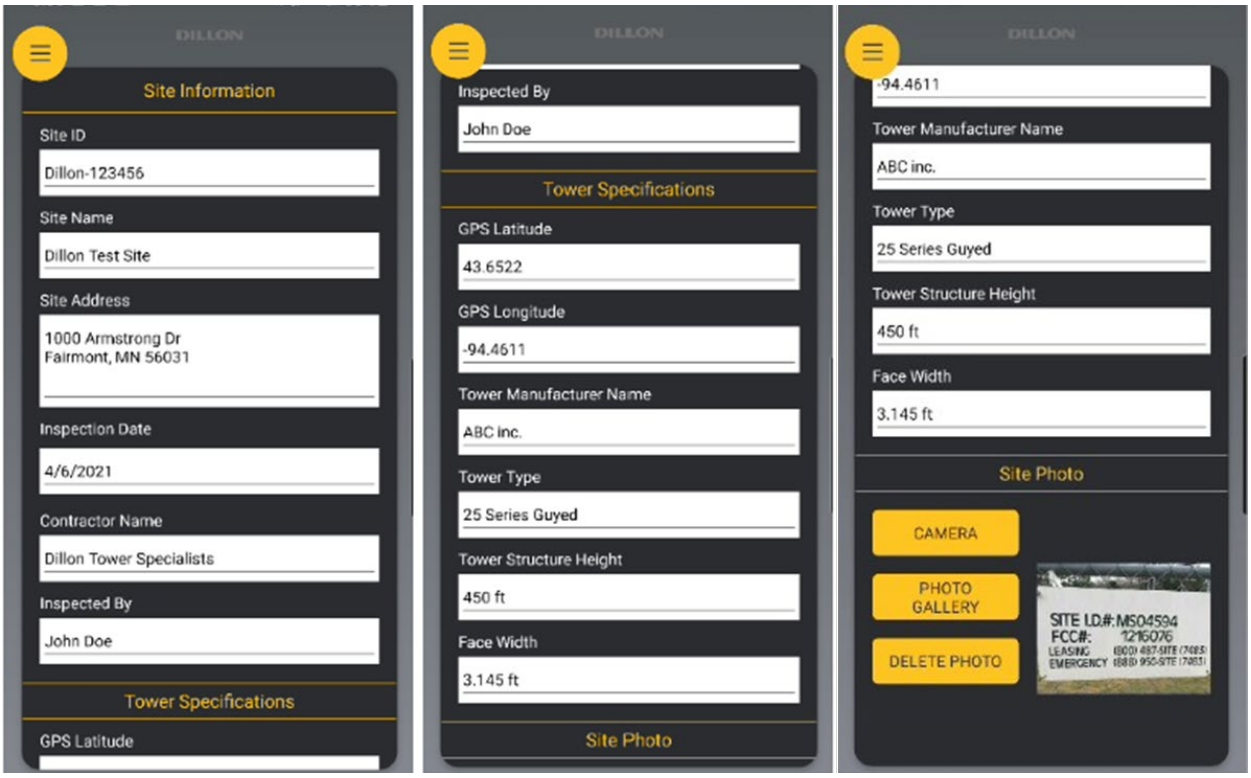
3. This brings up a Site information screen where descriptive information can be entered for the Site the end-user is performing an Inspection or Maintenance on.



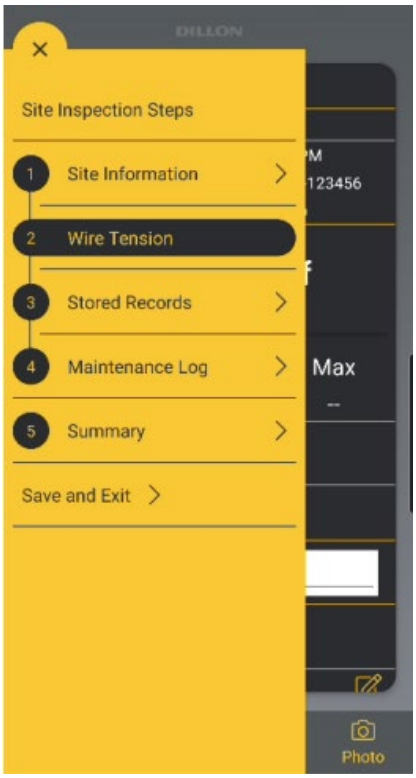
- **Site ID** - This is a required field as the Records and Report reference this ID.
- **Site Name** - This is a required field as the Records and Report reference this Name.
- **Site Address** - optional Address of the Site.
- **Inspection Date** - Pre-populated with the Date and Site information, if entered.
- **Contractor Name** - This is the name of the company performing the Tower Site Inspection or Maintenance. This is pre-populated if entered on the Application Settings screen.
- **Inspected by** - This is the end-user's name. This is pre-populated if entered on the Application Settings screen.
- **GPS Latitude & Longitude** - These are the manually entered GPS coordinates of the Tower, if known.
- **Tower Manufacturer Name** - enter if known.
- **Tower Type** - enter if known.
- **Tower Structure Height** - enter if known.
- **Face Width** - This is the face width of the Tower, enter if known.

- **Site Photo** - This feature allows the user to add a single photo of the Tower Site sign located at the site.
  - **Camera** - this button pulls up the mobile device's camera application.
  - **Photo Gallery** - this button pulls up the mobile device's photo gallery to search for a photo that has already been taken.
  - **Delete Photo** - this removes the current Site Photo so another can be taken in its place.

Example of Site Information:



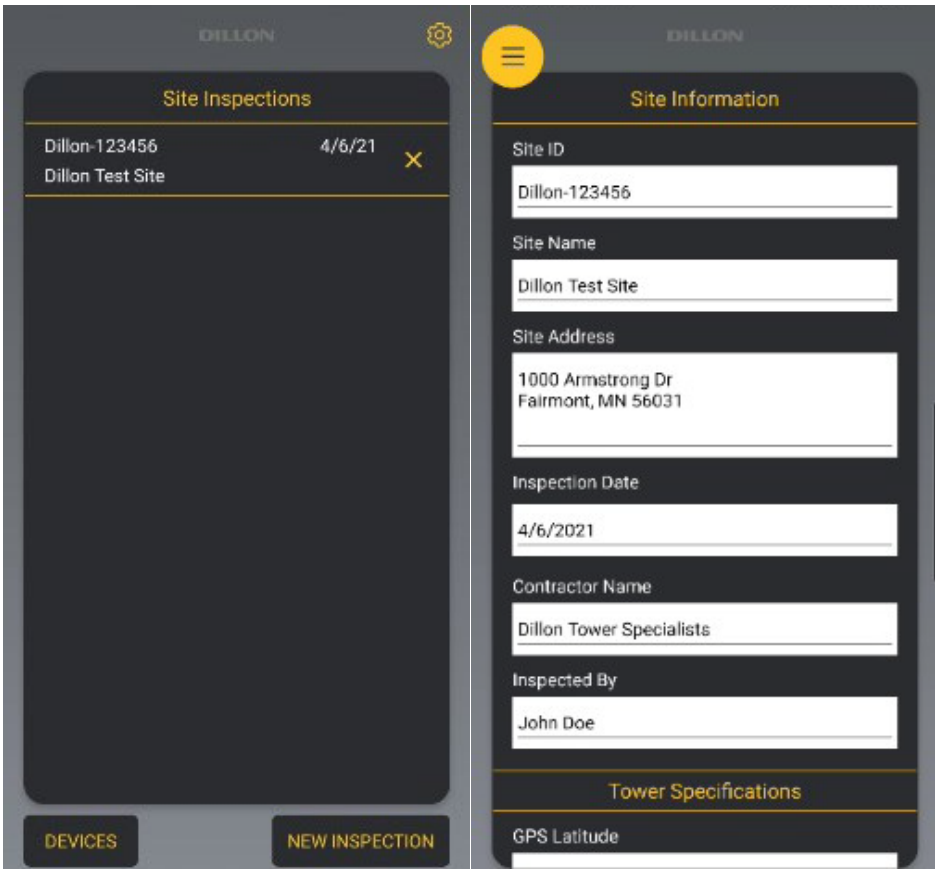
4. Tap the yellow **Menu Button**  , then tap **Save & Exit**



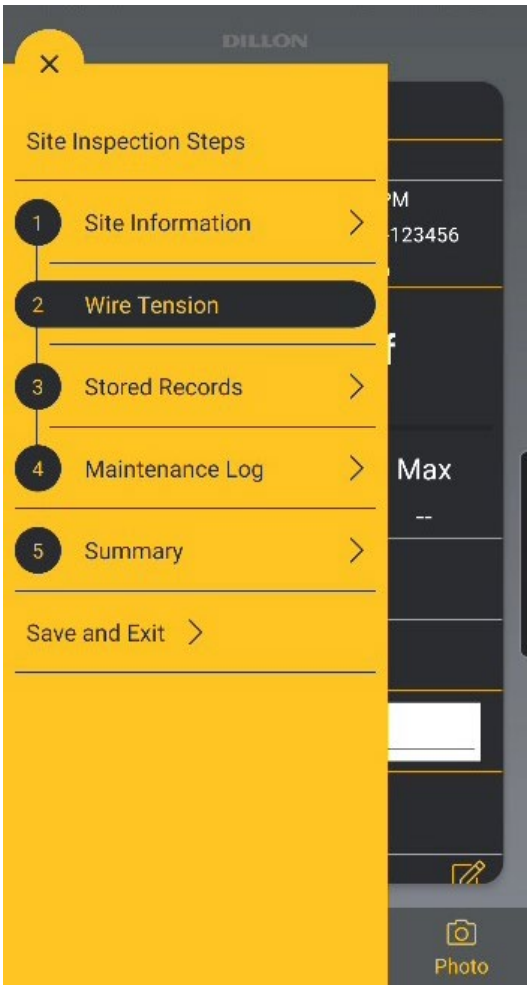
5 Quick Calibration Check

1. Tap on the Dillon Tower Icon on your Android or iOS mobile device: 

2. From the **Site Inspections** screen, select the Inspection you would like to add wire tension readings to.



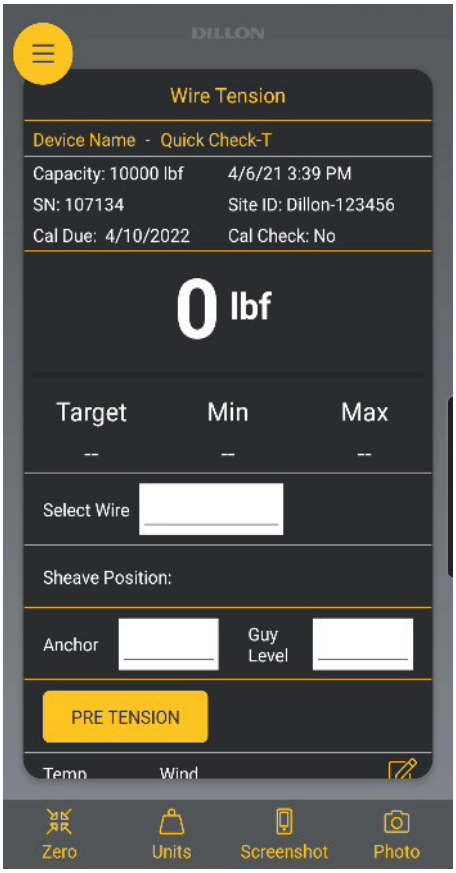
3. Tap the yellow **Menu Button**  , then tap **Wire Tension**.



At this time, the mobile device will attempt to wirelessly connect to the Quick Check-T selected in the **Devices** screen. If unsuccessful, ensure the Quick Check-T is powered on and visible in the **Devices.**

4. Once connected, the Quick Check-T Device information (Capacity, Serial Number, and Calibration Due Date) will be visible at the top of the screen. The live Tension reading will also be visible.

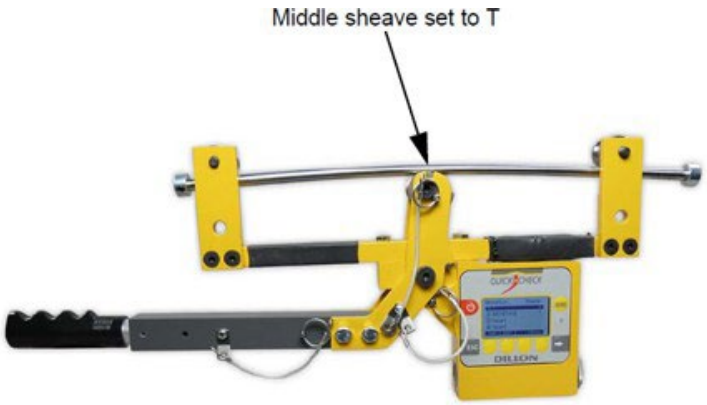
5. The Check Calibration button at the bottom of the Wire Tension screen enables the user to check the Quick Check-T to ensure it is within calibration. When the user tapes the **Check Calibration** button, the user is prompted to insert the Calibration Check Rod that was calibrated with the Quick Check-T.



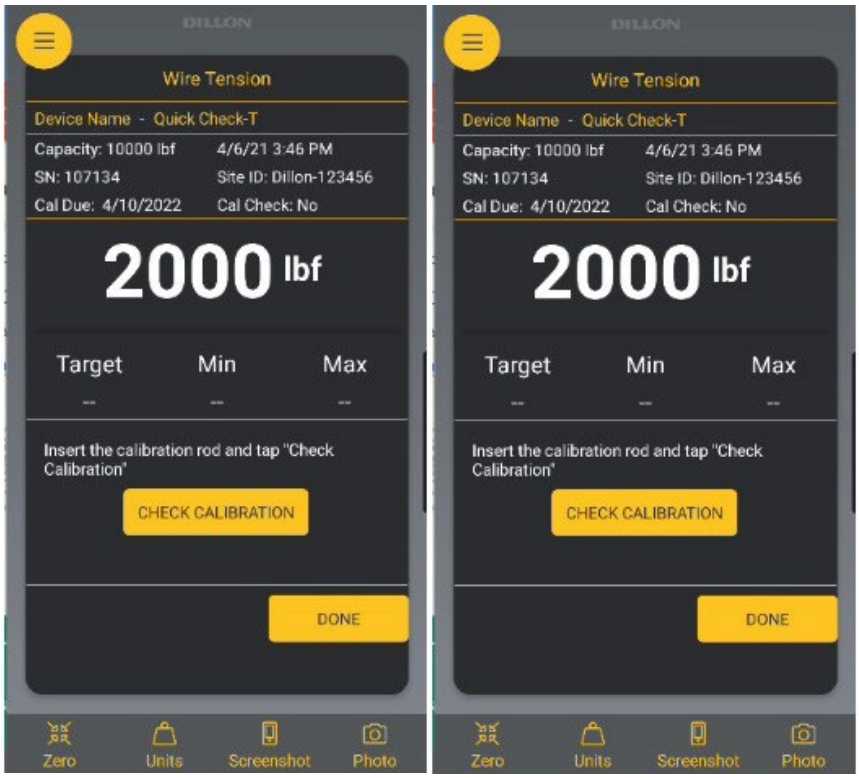
CAUTION!
Before using the calibration check rod, verify that the middle sheave of the Quick Check-T is in the "T" position. Using the calibration check rod with the middle sheave in any other position will result in damage to the rod, requiring both the rod and Quick Check-T to be sent in for recalibration.

The calibration check rod included with the Quick Check-T is intended to verify the tension meter is within calibration. Each calibration check rod is stamped with a serial number and the Quick Check-T will have a calibration associated with that serial number.

6. Clamp the Quick Check-T onto the calibration rod. Be sure the rod is riding in the center groove of all three sheaves, as shown above.
The tension displayed should be 2000 lbs ±80 lbs at 70 degrees Fahrenheit (approximately 21 degrees Celsius) to be considered within tolerance.



7. Tap the **Check Calibration** button on the Tower App to store the Cal Check reading. If the reading is within tolerance, **Cal Check: Yes** will be displayed at the top of the screen and will be exported in the report summary.



Note: The Tower App accepts calibration Check Rod Tension readings between 2000 lbs ±80 lbs to take into consideration temperature variations while on site. It is recommended to send in the Quick Check-T and Cal Rod for calibration every 12 months or as indicated by the Calibration Due Date on the Quick Check.

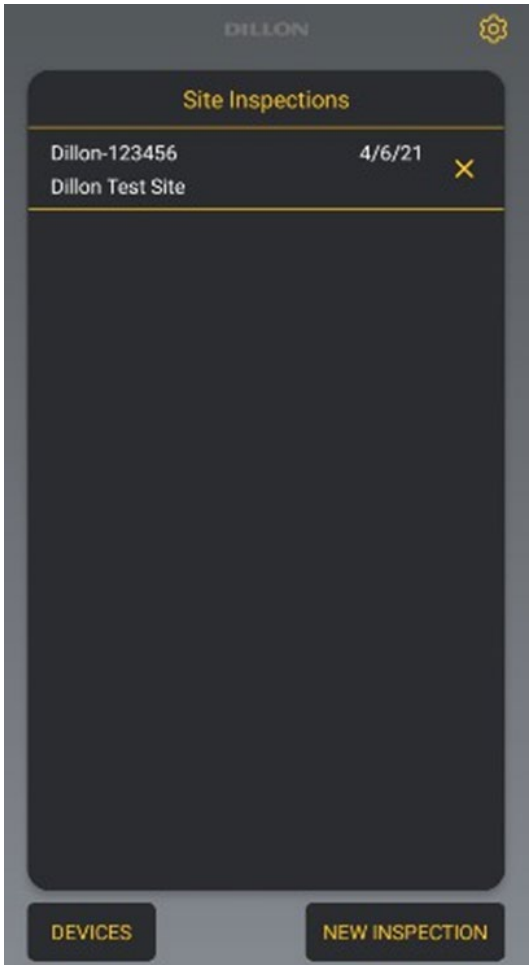
8. Tap **Done** to return to the **Wire Tension** screen.

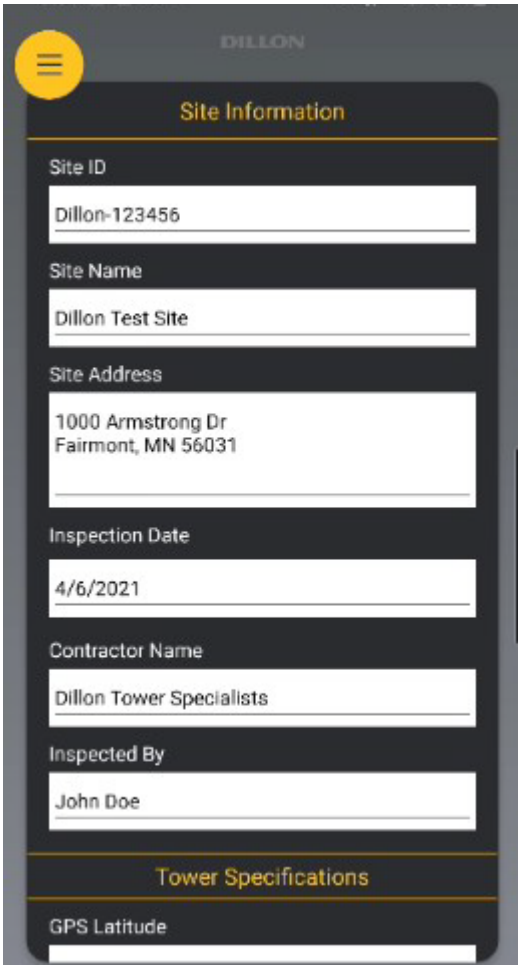
Note: The Check Calibration process changes the selected Wire to the Cal Rod on the Quick Check-T. Before using the Quick Check, ensure the proper wire size is selected on the Wire Tension screen.

6 Wire Tension Readings

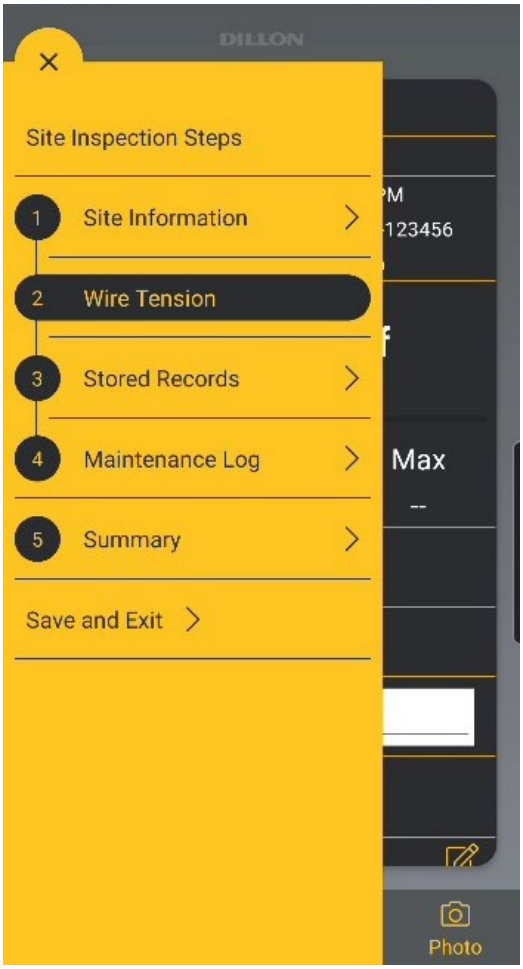
1. Tap on the Dillon Tower icon on your Android or iOS mobile device:

2. From the **Site Inspections** screen, select the Inspection you would like to add wire tension readings to.



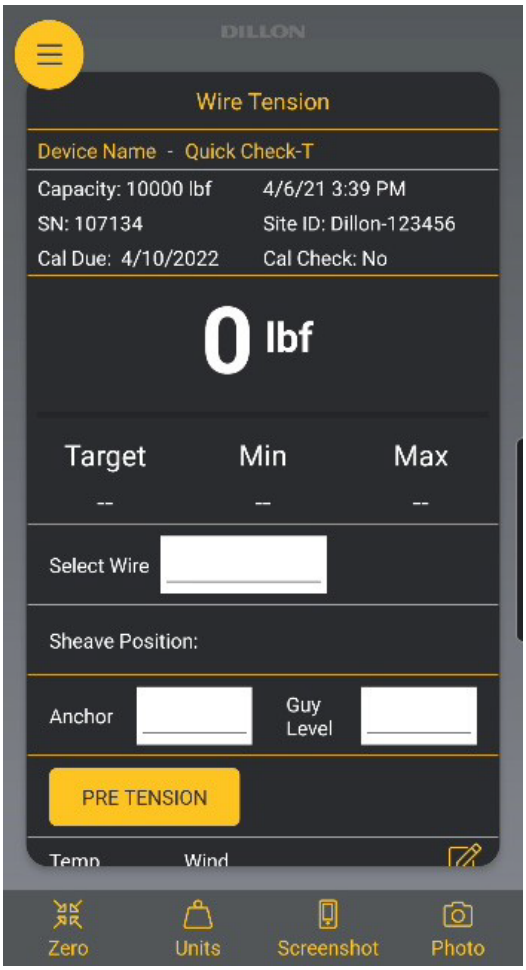


3. Tap the yellow **Menu Button**  , then tap **Wire Tension**.



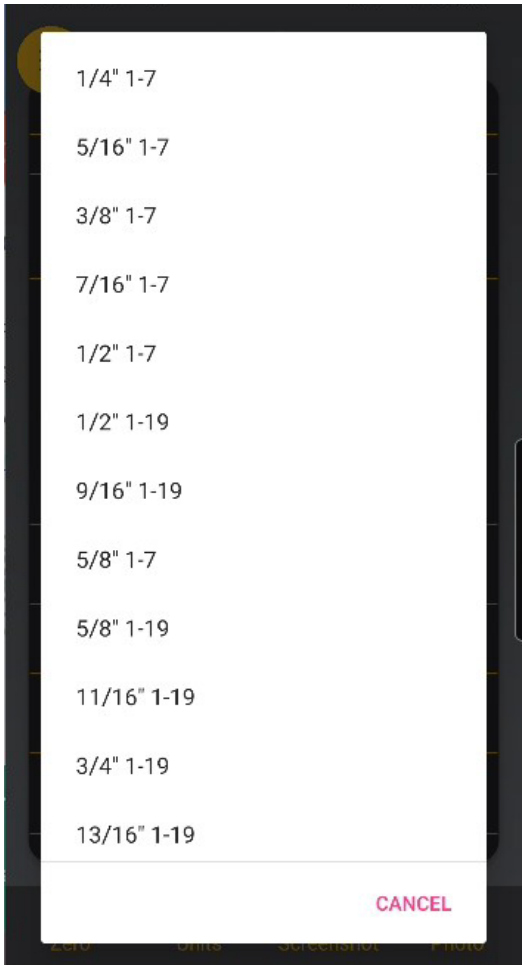
At this time, the mobile device will attempt to wirelessly connect to the Quick Check-T selected in the Devices screen. If unsuccessful, ensure the Quick Check-T is powered on and visible in the **Devices** menu.

4. Once connected, the Quick Check-T Device information (Capacity, Serial Number, and Calibration Due Date) will be visible at the top of the screen. The live Tension reading will also be visible.



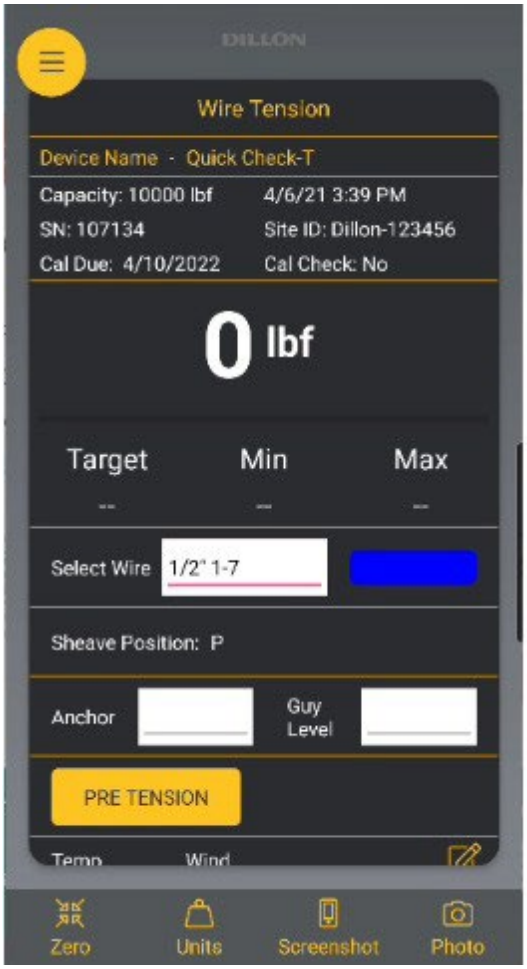
5. The Target, Min & Max Tensions will be blank. Once the Tower and Guy Wire measurements are entered, these will be calculated.

6. Tap the white box next to **Select Wire** to choose the Wire Size selection. This list is comprised of all the Wire calibrations in the current connected Quick Check-T.

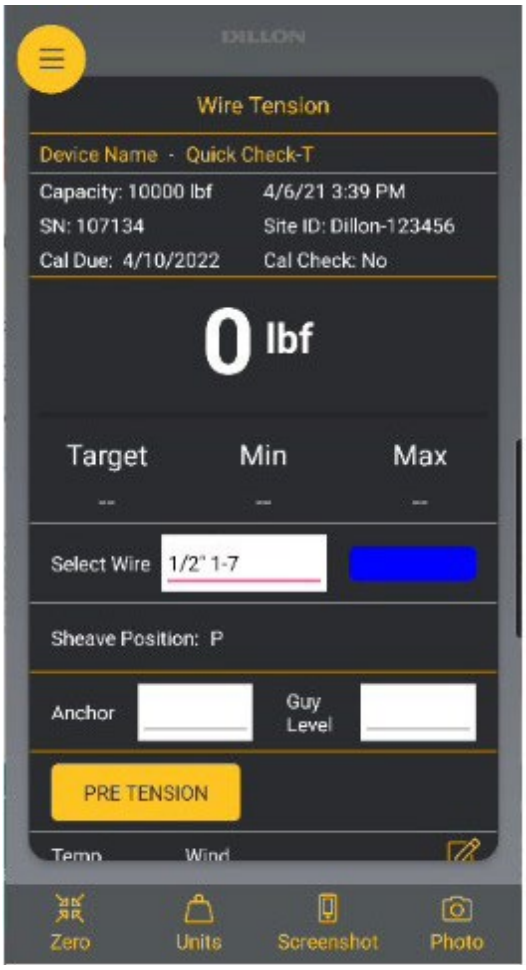


7. Once you select a wire, it will now be visible on the Wire Tension screen and will be selected on the Quick Check-T. The Colored Box next to the Wire Size indicates the paint color of the overwrap on the guy wire cable (Blue in the 1/2” cable example below).

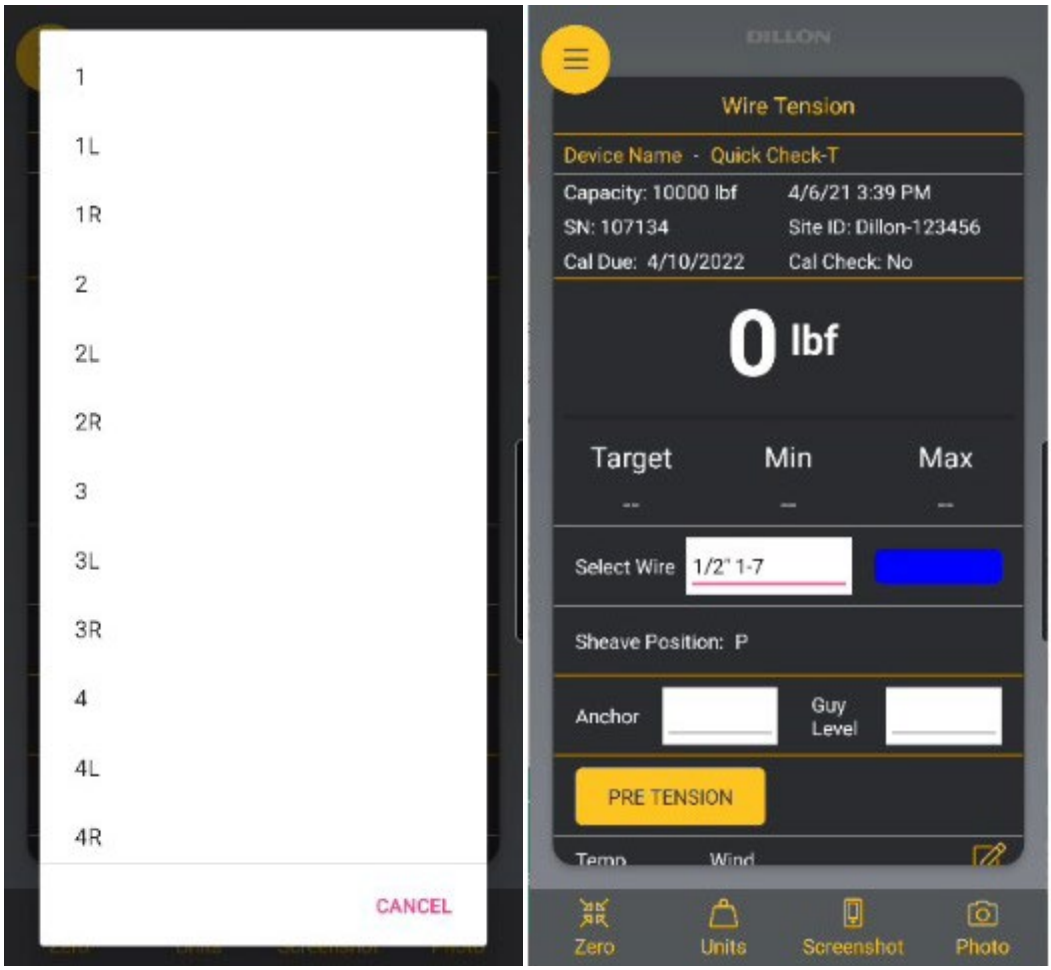
Note: When connected to Tower Application, the mobile device is considered the master. If the Wire selection is changed on the Quick Check-T, the mobile device will set it back to the size selected in the application automatically within a few seconds.



8. Tap the white box next to **Anchor** to choose the Anchor selection. The selected Anchor will show up on the Wire Tension screen as well as the Quick Check-T's screen.

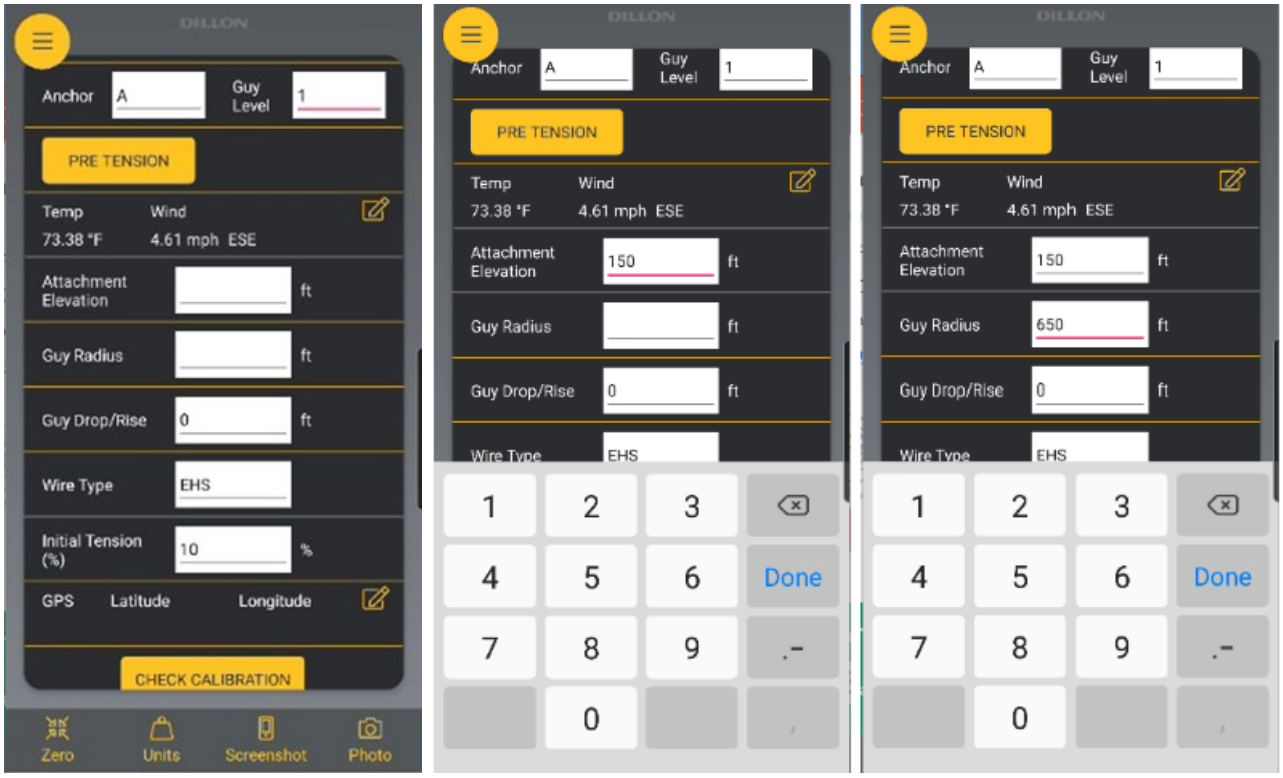


9. Tap the white box next to **Guy Level** to choose the Guy Level (Wire) selection. The selected Guy Level will show up on the Wire Tension and the Quick Check-T's screens.



Note: It is important to have an Anchor & Guy Level selected, as the Pre Tension and Post Tension readings are stored with reference to the chosen selections.

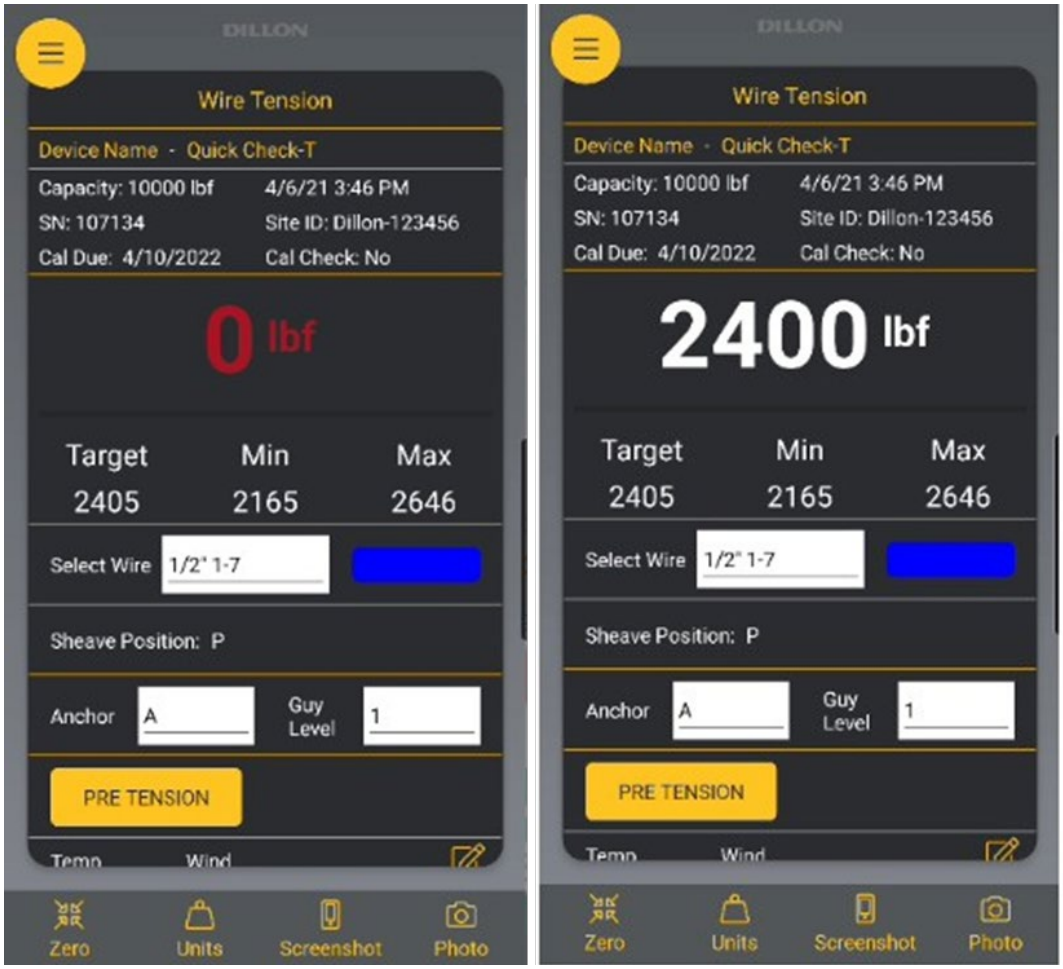
10. Enter in the Tower Measurements (Attachment Elevation, Guy Radius, Guy Drop/Rise) by taping the white boxes next to the labels.



At this time, you can also change the Wire Type from Extra High Strength (EHS) to Bridge Strand (BS) and set the Initial Tension%.

- **Guy Drop/Rise**: Default is 0
- **Wire Type**: Default is EHS
- **Initial Tension%**: Default is 10%

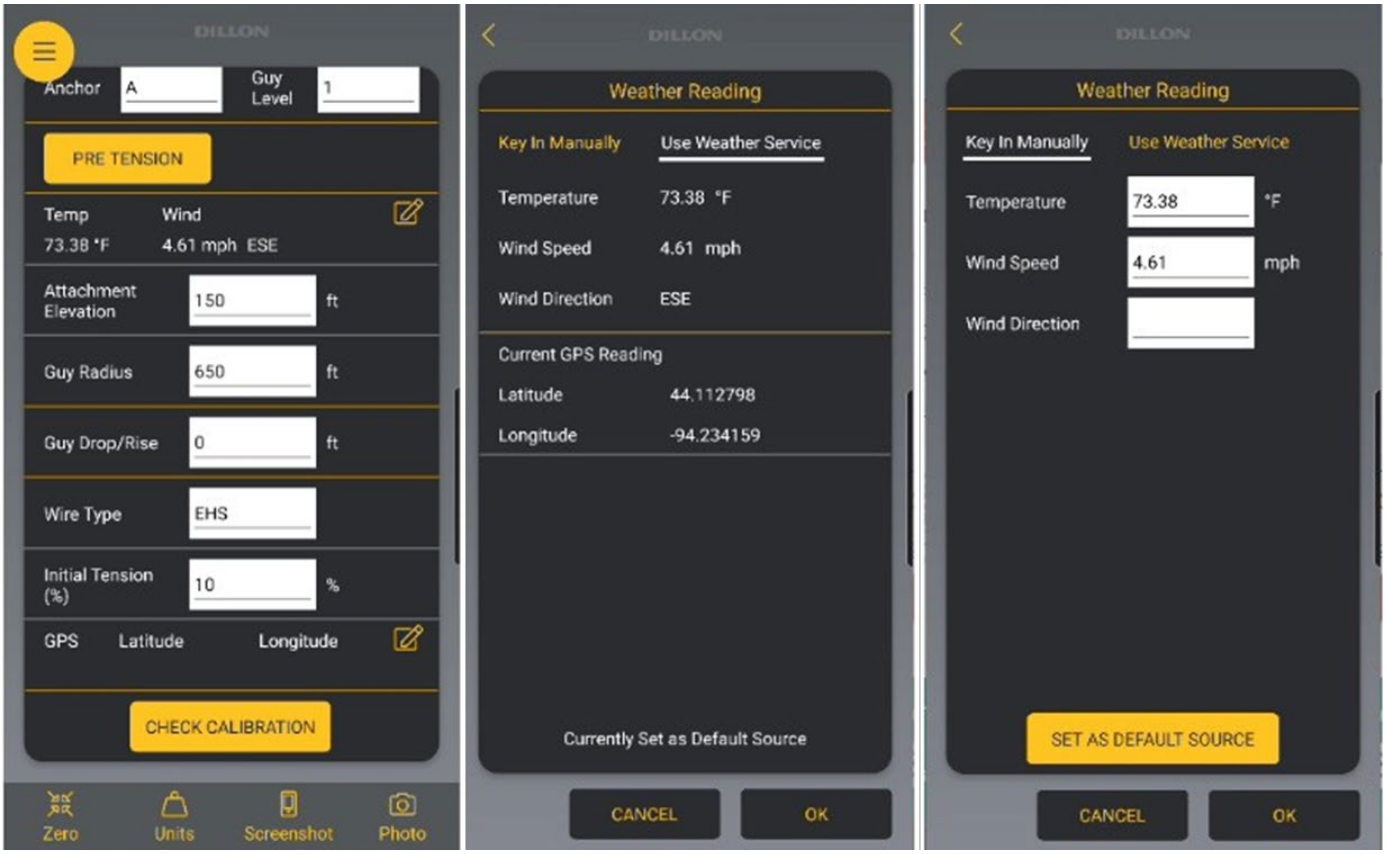
11. Once the Tower Measurements are entered, the Target, Min, and Max Tensions are calculated and displayed under the live tension reading. The Red Live Tension reading indicates the Tension is outside the Min/Max values of the Target tension. Once the Wire is within the Min/Max values, the Tension reading will be white.



12. The Temperature and Wind Speed are displayed on the Wire Tension screen and used to calculate the Target/Min/Max tension. By taping the **Edit** icon, you can change whether the Temperature and Wind Speed are **Keyed in Manually** or updated automatically from the **Weather Service**.

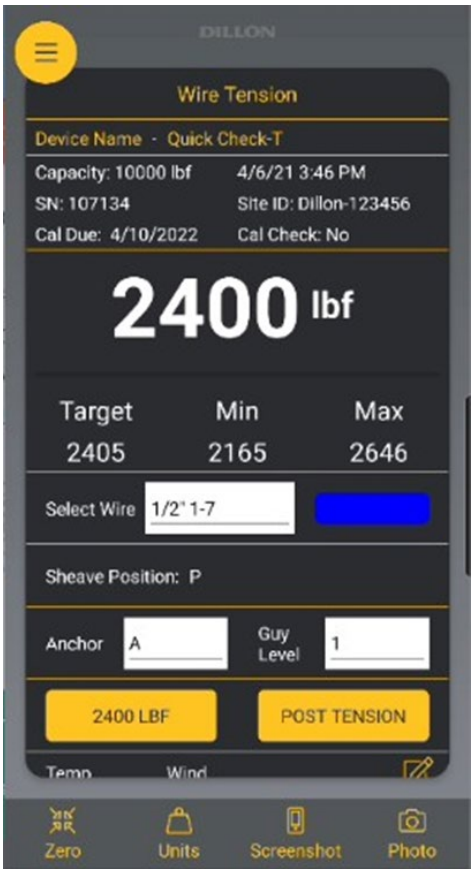
    Weather Service (Default)
    - The Tower App uses the OpenWeather API to gather local weather information (Temperature and Wind Speed). This does require that the mobile device has a data connection (WiFi or Cellular) and location services enabled.

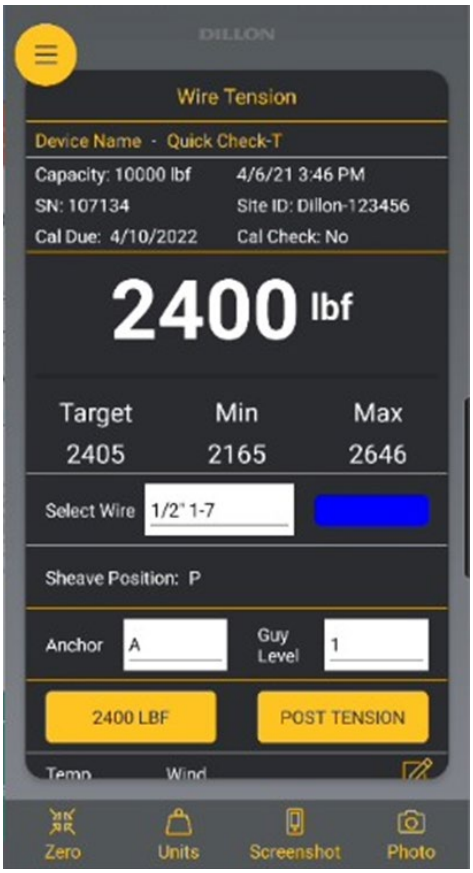
    Key in Manually
    - This allows the end-user to key in Temperature and Wind Speed into the Wire Tension screen.



13. Tap the **OK** button when finished to return to the Wire Tension screen.

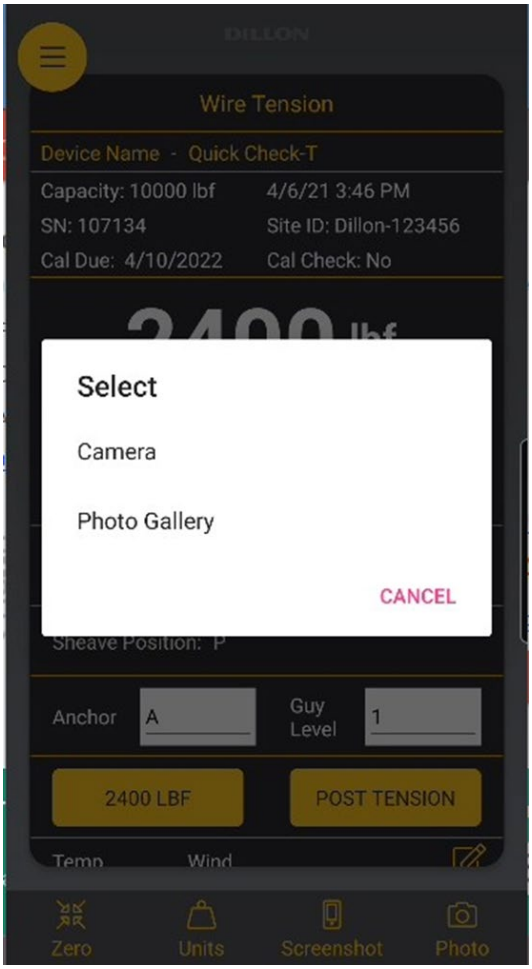
14. Taping the **Pre Tension** button will store the initial Guy Wire Tension reading to the Anchor and Guy Level selection made. The value of the Pre Tension reading will show where the Pre Tension button used to me.

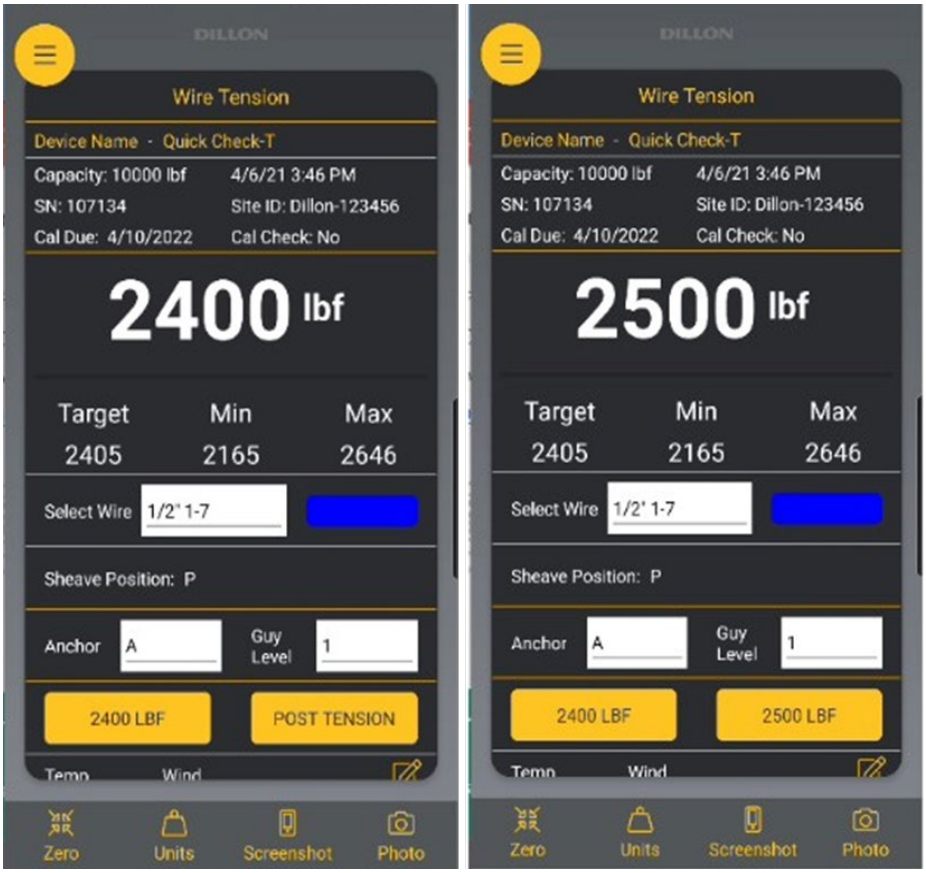




15. After a Pre Tension Reading has been stored, Screenshots and/or Photos can be attached to an Anchor & Guy Level record.
    - Taping the Screenshot button at the bottom of the Wire Tension screen will store the current screen to the record. Multiple screenshots can be stored for each record.
    - Taping the **Photo** button brings up a screen to select either **Camera** or **Photo Gallery** for the source of the photo.

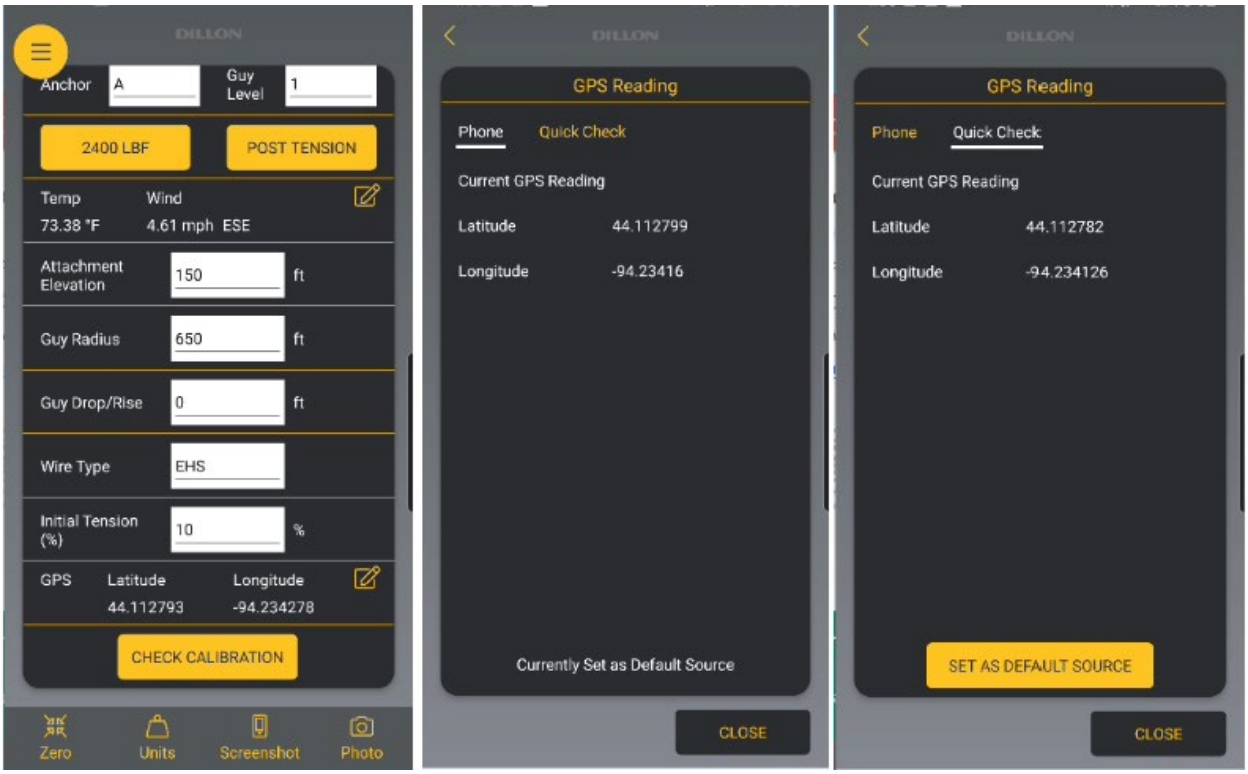
16. After the Guy Wire has been tensioned to target, the Post Tension button can be taped to store the final tension to the Anchor and Guy Level selected. The value of the Post Tension reading will show where the Post Tension button used to be.





17. Additional Screenshots or Photos can be stored to this record as well by taping the Screenshot or Photo buttons.

18. Once a Pre Tension reading has been stored, the GPS coordinates will be visible on the Wire Tension screen for that Anchor and Guy Level selection. By taping the Edit icon, the user can change whether the GPS readings are from the mobile device or the built in GPS in the Quick Check-T.

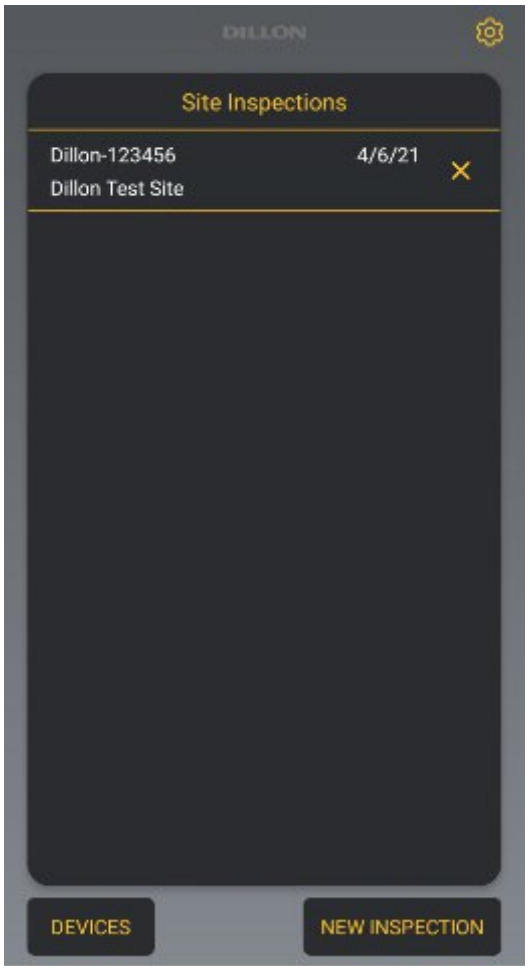


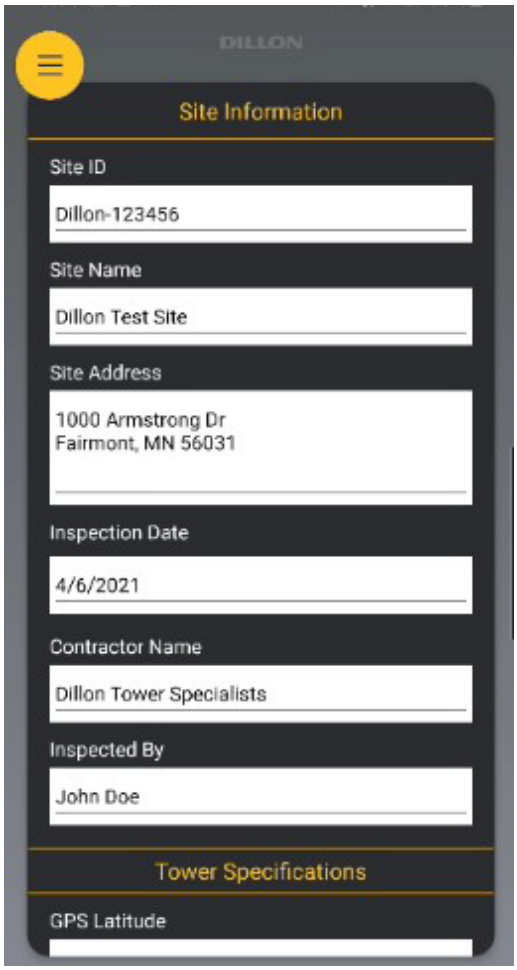
19. Once selected, tap Close to return to the Wire Tension screen.

7 Viewing Stored Records

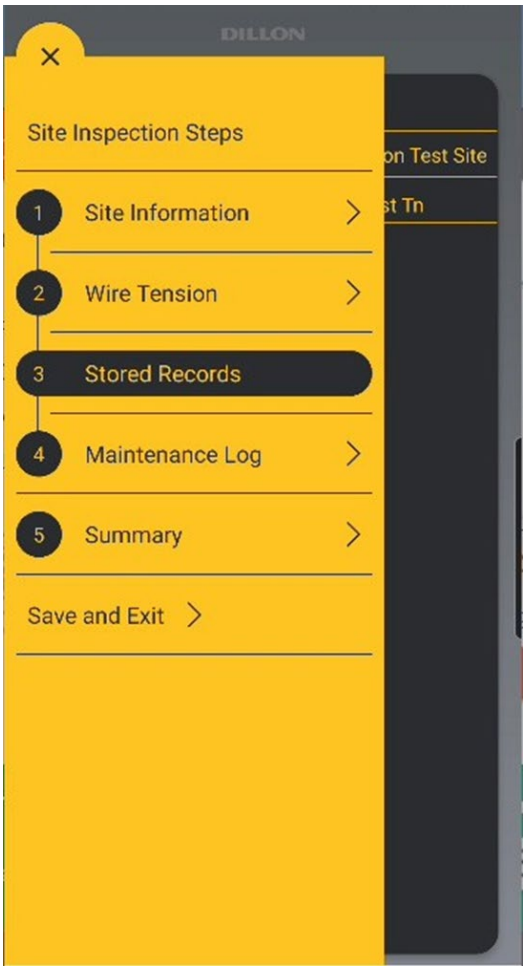
1. Tap on the Dillon Tower icon on your Android or iOS mobile device:

2. From the **Site Inspections** screen, select the inspection you would like to view the stored records on.





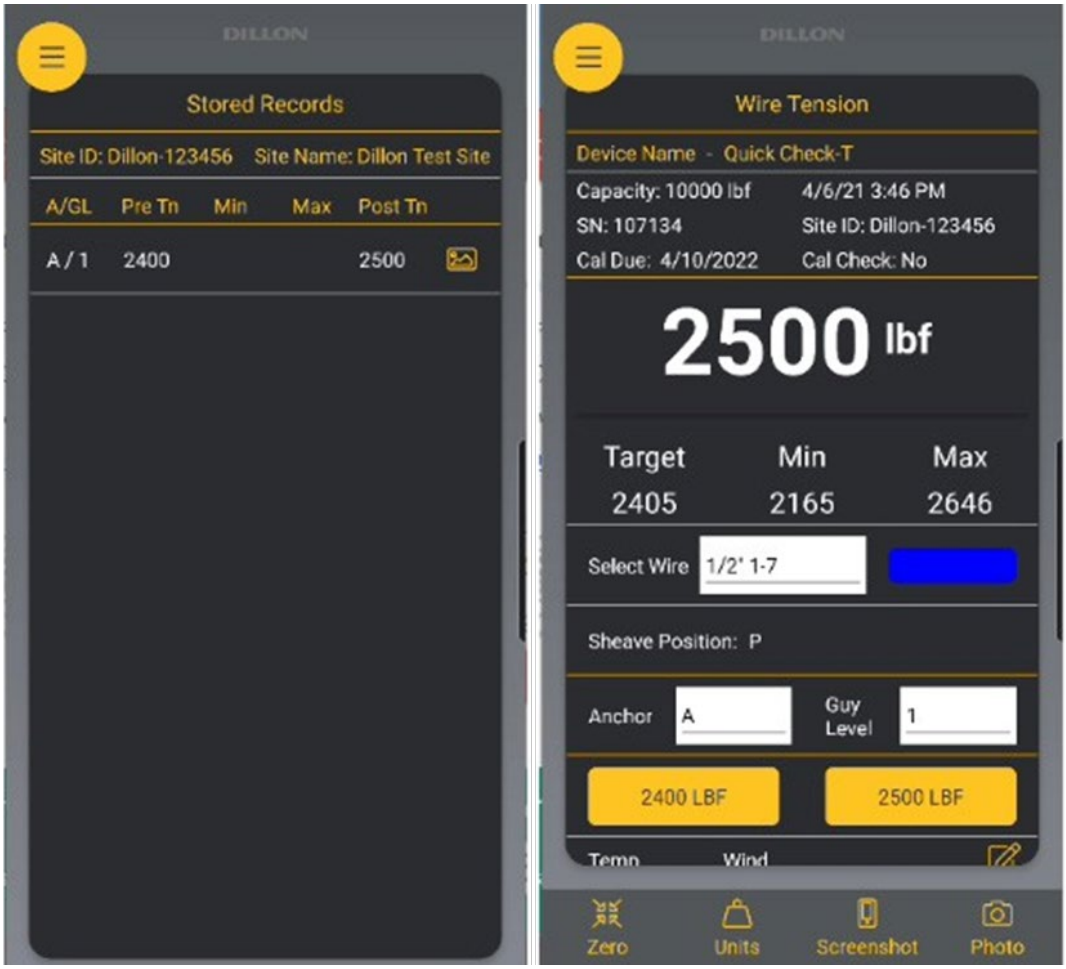
3. Tap the yellow **Menu Button**  , then tap **Stored Records**.



4. This screen shows a summary of all the Pre Tension (Pre Tn) and Post Tension (Post Tn) records stored for each Anchor and Guy Level.

5. By taping on the Photo icon, the associated Screenshots and Photos can be viewed. By taping the **X**, the screenshot and photo will be deleted from the record. Tap **OK** to return to the Store Records screen.

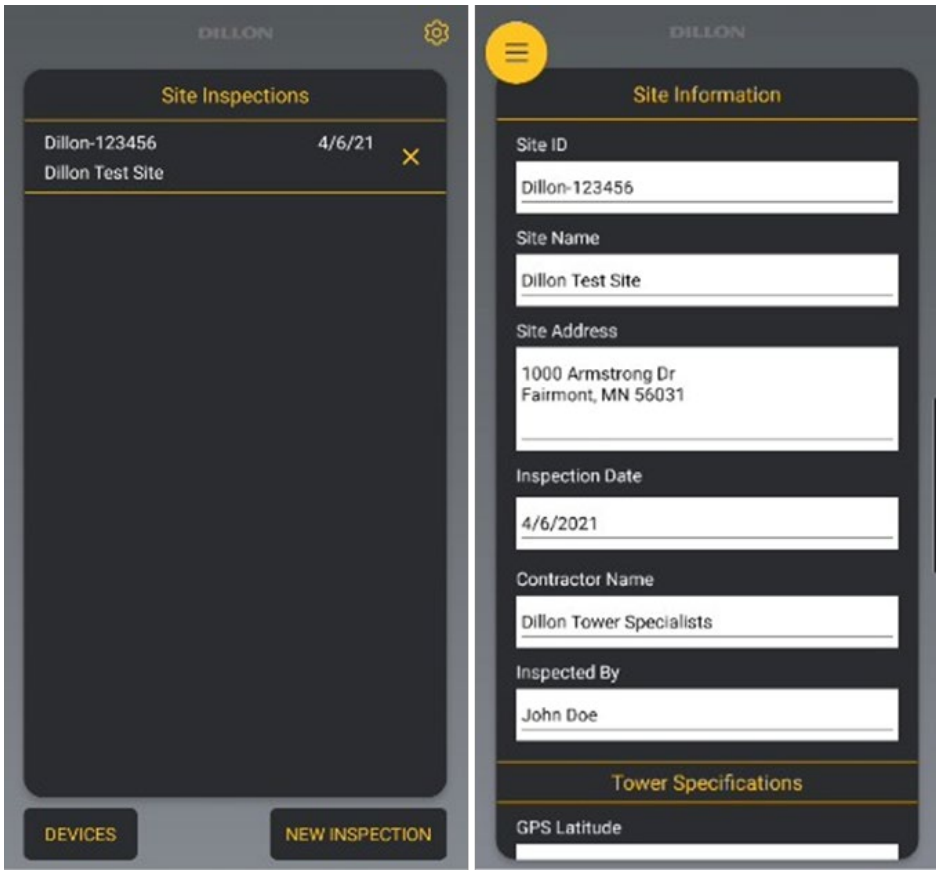
6. By taping any of the store records, the Wire Tension screen will be brought up with the selected Anchor and Guy Level settings already loaded. The intent is the user will periodically go to the Stored Records screen to see a summary of the guy tension measurements and jump to the selected Anchor and Guy Level to complete the Post Tension measurements after adjustments have been made.



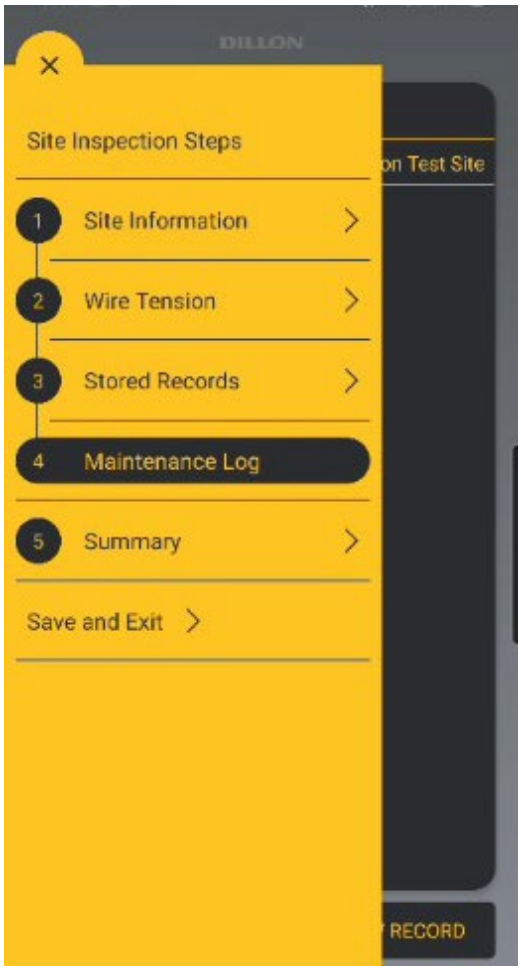
8 Adding Maintenance Items to a Site Inspection Report

1. Tap on the Dillon Tower icon on your Android or iOS mobile device: 

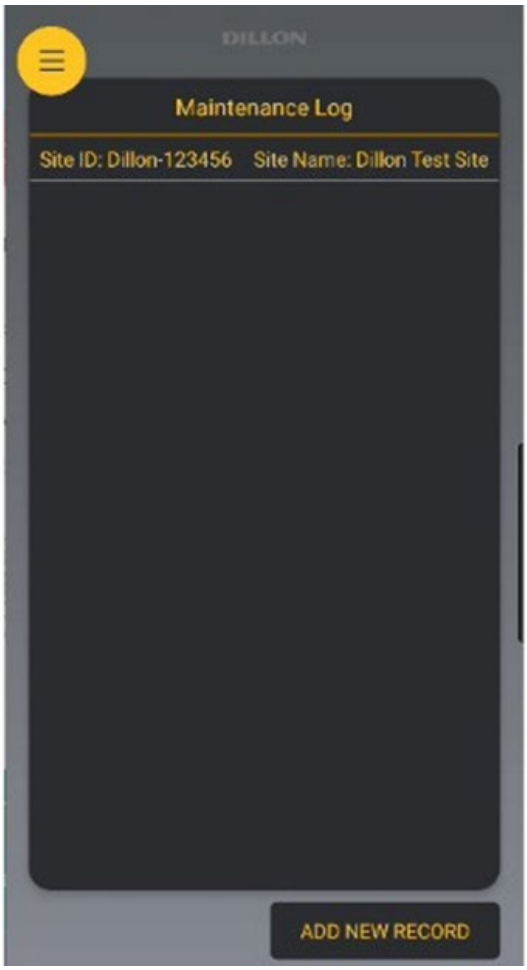
2. From the **Site Inspection** screen, select the Inspection you would like to add the Maintenance Items to.



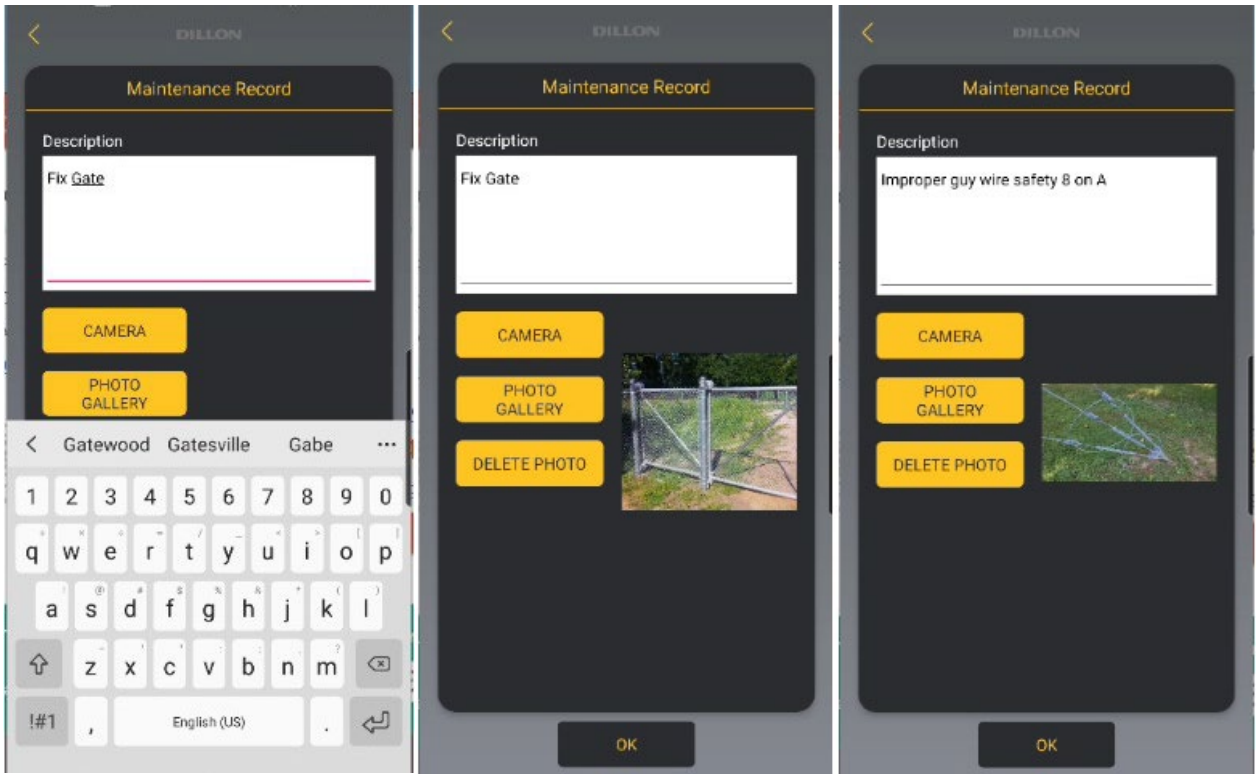
3. Tap the yellow **Menu Button**  , then tap **Maintenance Log**



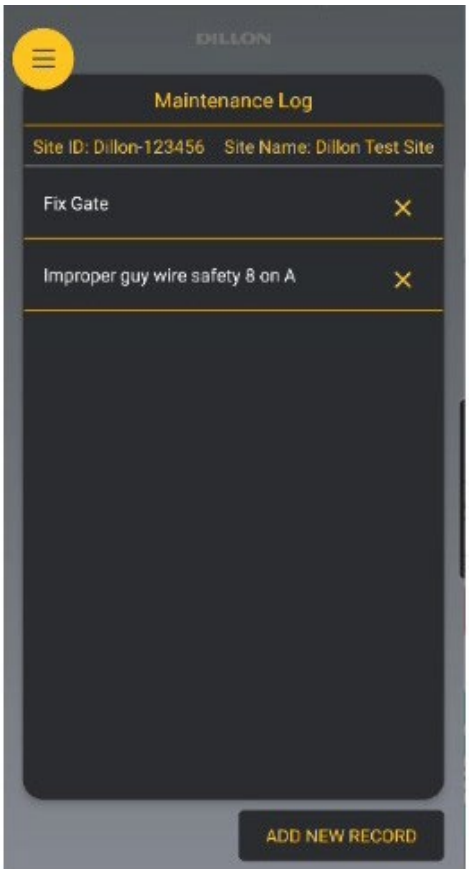
4. Tap **Add New Record.**



5. Enter the Maintenance Information into the Description box. You can also use the Camera and Photo Gallery button to add a single photo of the maintenance item. If additional photos are needed, just add additional maintenance records for those photos.
    - **Camera** - this button pulls up the mobile device's camera application.
    - **Photo gallery** - this button pulls up the mobile device's photo gallery to search for a photo that has already been taken place.
    - **Delete Photo** - this removes the current photo so another can be taken in its place



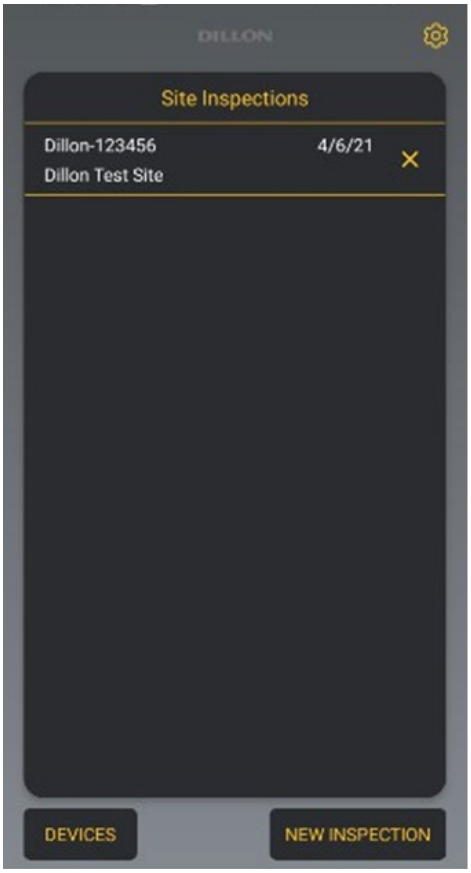
6. Tap **OK** to save the Maintenance Record.

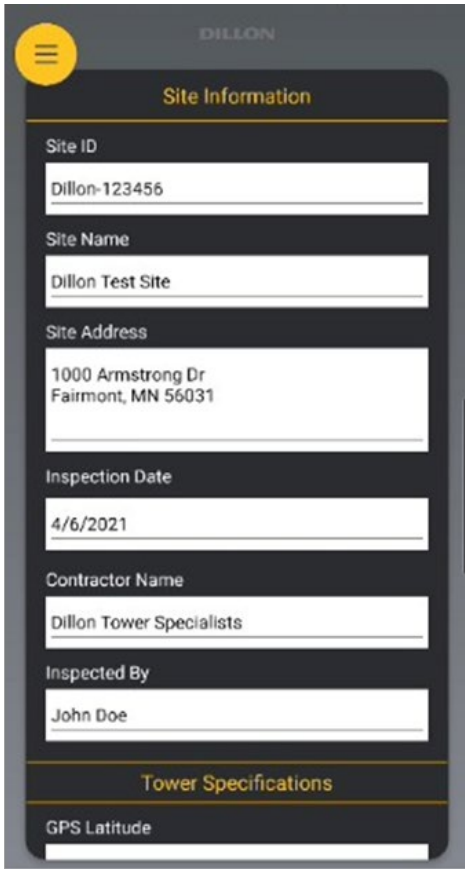


9 Exporting the Site Inspection Report

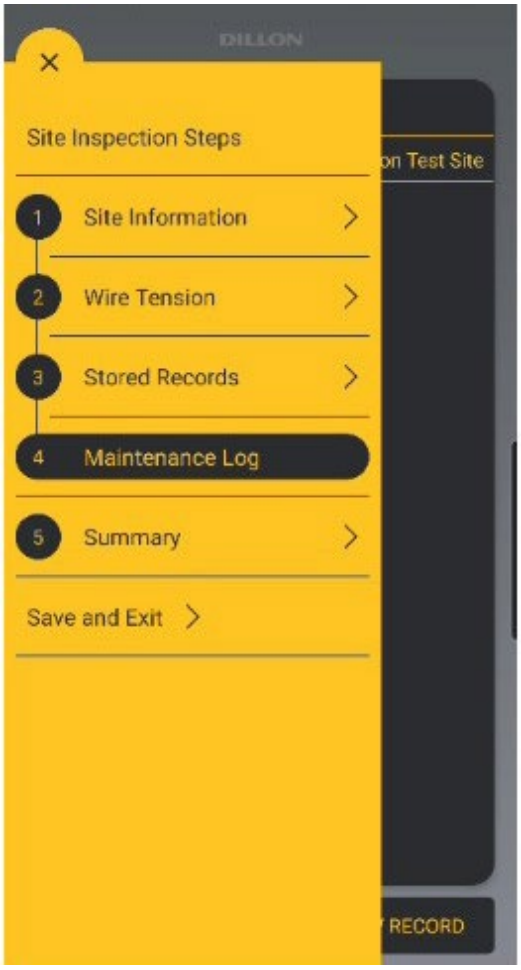
1. Tap on the Dillon Tower icon on your Android or iOS mobile device:

2. From the **Site Inspections** screen, select the Inspection you would like to export the report from.

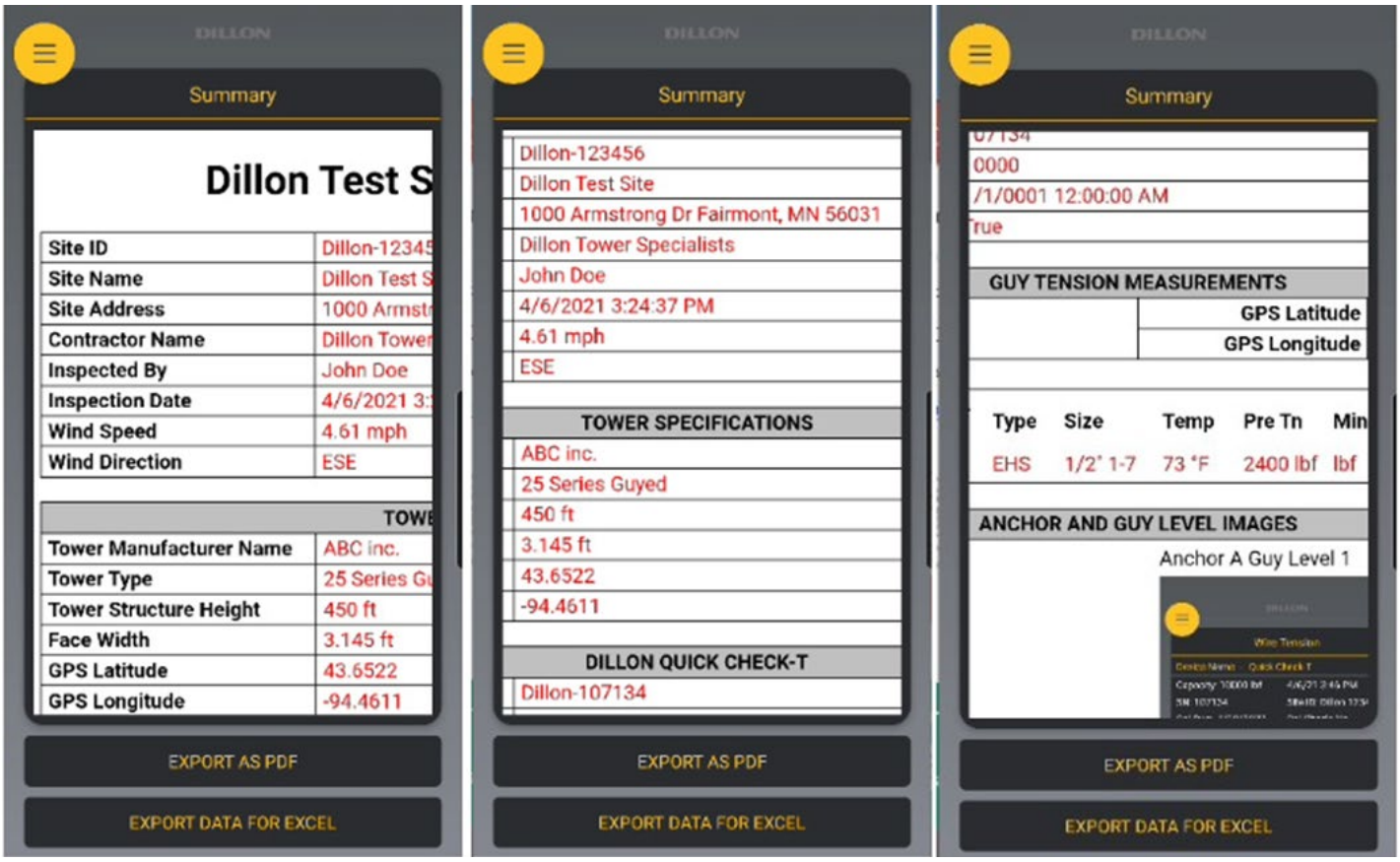




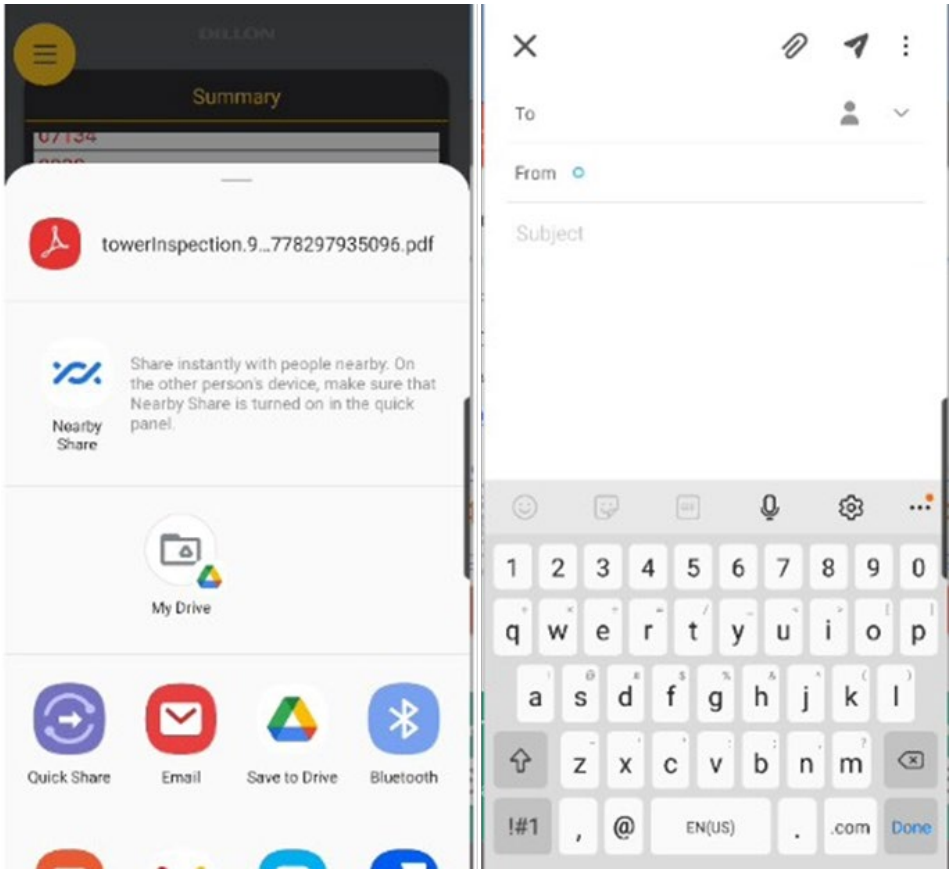
3. Tap the yellow **Menu Button**  , then tap **Summary.**



4. A preview of the Report will be shown on the screen. The preview is pan-able to enable the user to see the full report.



5. Tap the **Export Data as PDF** button. This brings up the sharing options that are available on the mobile device.
   - Tap **Email** to send the Site Report via email.
   - Tap **Save to Drive** to save the Site Report to your Google Drive account (This can be used if the size of the PDF is too large to email).



The exported PDF contains all the Site Information, Wire Pretension “initial” (Pre Tn) and Post Tension (Post Tn) readings, Guy Wire photos & screenshots, and the Maintenance items and photos.

Dillon Test Site (Dillon-123456)

Site ID	Dillon-123456
Site Name	Dillon Test Site
Site Address	1000 Armstrong Dr Fairmont, MN 56031
Contractor Name	Dillon Tower Specialists
Inspected By	John Doe
Inspection Date	4/6/2021 3:24:37 PM
Wind Speed	4.61 mph
Wind Direction	ESE

DILLON

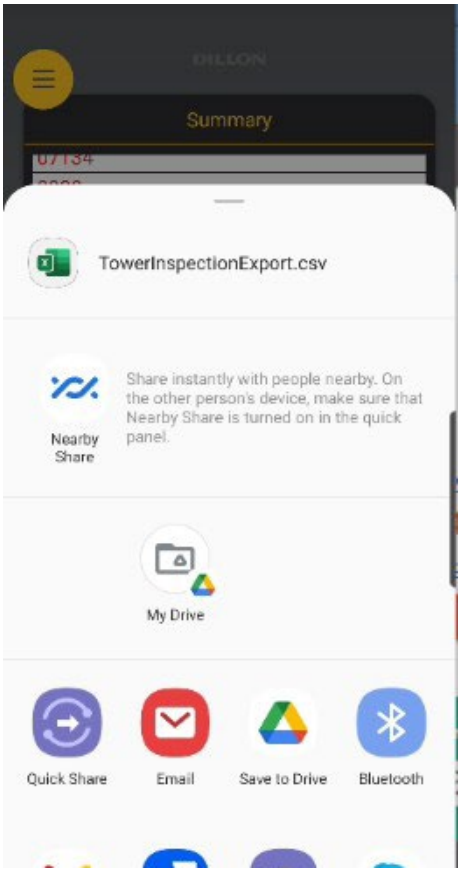
TOWER SPECIFICATIONS	
Tower Manufacturer Name	ABC inc.
Tower Type	25 Series Guyed
Tower Structure Height	450 ft
Face Width	3.145 ft
GPS Latitude	43.6522
GPS Longitude	-94.4611

DILLON QUICK CHECK-T	
Dillon Device Name	Dillon-107134
Serial#	107134
Capacity	10000
Cal Due	1/1/0001 12:00:00 AM
Cal Check	True

GUY TENSION MEASUREMENTS			
Anchor (Leg)	A	GPS Latitude	44.112793
		GPS Longitude	-94.234278

Guy Level	Elev.	Radius	Drop-Rise	Type	Size	Temp	Pre Tn	Min	Max	Post Tn
1	150 ft	650 ft	0 ft	EHS	1/2" 1-7	73 °F	2400 lbf	lbf	lbf	2500 lbf

6. Tap the **Export Data For Excel** button. This brings up the sharing options that are available on the mobile device.
   - Tap **Email** to send the Site Report via email.
   - Tap **Save to Drive** to save the Site Report to your Google Drive account



The exported file is a CSV (Comma-Separate Vales) file that can be imported into a spreadsheet program like Microsoft Excel. The file contains all the Site Information, Wire Pre Tension (Pre Tn) and Post Tension (Post Tn) readings, and text descriptions of the Maintenance Log.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	SITE INFORMATION													
2	Site ID	Dillon-123456												
3	Site Name	Dillon Test Site												
4	Site Address	1000 Armstrong Dr Fairmont, MN 56031												
5	Contractor Name	Dillon Tower Specialists												
6	Inspected By	John Doe												
7	Inspection Date	4/6/2021 15:24												
8	Wind Speed	4.61 mph												
9	Wind Direction	ESE												
10														
11	TOWER SPECIFICATIONS													
12	Tower Manufacturer Name	ABC inc.												
13	Tower Type	25 Series Guyed												
14	Tower Structure Height	450 ft												
15	Face Width	3.145 ft												
16	GPS Latitude	43.6522												
17	GPS Longitude	-94.4611												
18														
19	DILLON QUICK CHECK-T													
20	Dillon Device Name	Dillon-107134												
21	Serial#	107134												
22	Capacity	10000												
23	Cal Due	1/1/0001 12:00:00 AM												
24	Cal Rod	TRUE												
25														
26	GUY TENSION MEASUREMENTS													
27														
28	Anchor (Leg)	GPS Latitude	GPS Longi	Guy Level	Elevation	Guy Radiu	Guy Drop/	Wire Type	Size	Temperat	Pre Tn	Min	Max	Post Tn
29	A	44.112793	-94.2343	1	150 ft	650 ft	0 ft	EHS	1/2" 1-7	73 F	2400			2500
30														
31														
32														
33	MAINTENANCE LOG													
34	Fix Gate													
35	Improper guy wire safety 8 on A													
36														