

Wildland Engineers Calc

Combined User Guide · iOS and Android beta

Hydraulic calculations, hose-lay planning, terrain measurement, aerial supply, water-tender delivery and thermal estimates.

The app is displayed on your device as **Wildfire Engineers Calc**.

One guide for both platforms

Shared workflows appear once. The platform-reference table and touch/keyboard chapter identify differences and the exact actions to use.

This edition

- Full-access beta installation and navigation on iOS and Android.
- Separate map-style and Hose Lay / Measure control rows.
- Connecting hose-lay lines, pin editing and Multi-Leg import.
- 100-foot profile distance marks and readable relay-pump elevation details.
- Saved measurements, feedback and practical troubleshooting.

Planning use only. Independently verify inputs and results. Follow agency procedures, equipment ratings and incident-command decisions. This guide is not an operational authorization.

Updated October 4, 2026. Describes the current beta interface; older installed iOS or Android builds may differ. US Letter portrait, suitable for color or black-and-white printing.

Contents and quick start

Contents

1. Installation, access and navigation
2. Platform reference: iOS versus Android
3. Touch controls, gestures and keyboard entry
4. PDP: hydraulic pump discharge pressure
5. Multi-Leg: hose sections and relay planning
6. Imported terrain and elevation profile
7. Tools: friction-loss comparison and nozzle calculations
8. Heli / WT: aerial and tender supply
9. Thermo: heat-removal and altitude estimates
10. Map: Hose Lay and import
11. Map: Measure and saved measurements
12. Contact and troubleshooting
13. Field-use checklist

Quick start: map route to relay plan

1. Open **Map** (look under **More** if your device groups tabs), then choose **Hose Lay**.
2. Place the first pin at the source pump. Add intermediate route pins in order, ending at the target/nozzle.
3. Wait for elevations to load. Check route segments and units before sending the route to Multi-Leg.
4. Choose **Send to Multi-Leg**, open Multi-Leg and accept the replacement prompt.
5. Enter flow, confirm each hose diameter/coefficient, review each length and elevation change, and set the final nozzle pressure.
6. Set the pump pressure limit to calculate relay stages. Read the elevation profile and relay-pump list.

Do not assume imported geometry changes on the map. Editing lengths or elevation changes in Multi-Leg updates its calculations and profile, but does not move pins, replot the original route or fetch new terrain elevations.

1 • Installation, access and navigation

iPhone and iPad

1. Install Apple's **TestFlight** app.
2. Open the developer-provided beta invitation or the iOS beta link on wildcalc.com.
3. Accept the invitation, then install or update **Wildfire Engineers Calc**.
4. Check the available version and build in TestFlight. Earlier builds may differ from the interface described here.

Use your own Apple account. You do not need the developer's Expo credentials. Expo Go is a separate development-preview method, not the standalone beta.

Android, including Google Pixel

1. Use the latest Android APK link supplied by the developer. The website's download may not yet contain the latest directly supplied build.
2. Download the APK on your phone, open it and approve installation when prompted. Android may ask you to allow installation from that browser or file manager.
3. To update, install the new APK **over the existing app**. Do not uninstall first: removal can delete device-local saved measurements.
4. Open the app after installation. A standalone APK does not require Expo Go.

A native map-interface change requires a newer APK; a server-only change does not. Re-downloading an older APK does not obtain a newer native interface.

Full access during this beta

The current beta enables PDP, Multi-Leg, Heli / WT, Thermo, Tools and Map without a paid subscription or an active trial. Contact shows **Beta Access — full access enabled**. This is temporary testing policy, not a permanent store entitlement.

No separate customer sign-up is needed to unlock the beta. The app initializes a session for server-backed features. Owner Account access is separate.

If tools are blocked by a purchase prompt, check the installed build and report the issue. Do not purchase a subscription merely to unlock this beta. Installing a beta update does not cancel an existing store subscription.

Navigation, units and connectivity

Use **PDP, Multi-Leg, Heli / WT, Thermo, Tools, Map and Contact**. Some devices group screens under **More**. Tools → **Appearance** selects Light, Dark or System.

Confirm units on each screen. Check converted values after a unit change. Map imagery, new terrain-elevation lookups and feedback submission need connectivity. Do not assume cached maps or saved

measurements provide a complete offline terrain dataset.

Platform reference • iOS versus Android

Calculator inputs and calculation workflows are shared. Installation, system navigation, map providers and keyboards can differ. Follow the column for your device; wording can vary with operating-system version and language.

Task or feature	iOS / iPhone	Android / Pixel
Install beta	Use TestFlight and the supplied invitation. Accept, then tap Install.	Download the supplied signed APK, open it and tap Install. Allow this installation source if Android requests it.
Update	Open TestFlight and use Update when the intended build is available.	Open the newer APK and install over the existing app. Do not uninstall first.
Find screens	Native-style tabs may group extra screens under More. Older compatible iOS versions may use the classic tab bar.	Use the bottom tab icons and labels. Locate Map and Contact by their names/icons.
Base map	Apple Maps is the default native provider.	Google Maps is the native provider.
Terrain style	A third-party topographic tile overlay is used.	The native Google terrain map is used.
Keyboard and Back	The decimal keypad may not show Done. Use on-screen Save, Cancel or Close for the relevant action.	Keyboard layout depends on the selected keyboard. Back can dismiss the keyboard or a supported dialog; it is not a Save command.

Differences that do not change the calculation

Sat is satellite/hybrid, Road is the standard base, Topo uses the USGS overlay, and Relief uses hillshade over the hybrid base. These controls and the Hose Lay / Measure workflows are shared, even though native map appearance, gestures and tile coverage can differ.

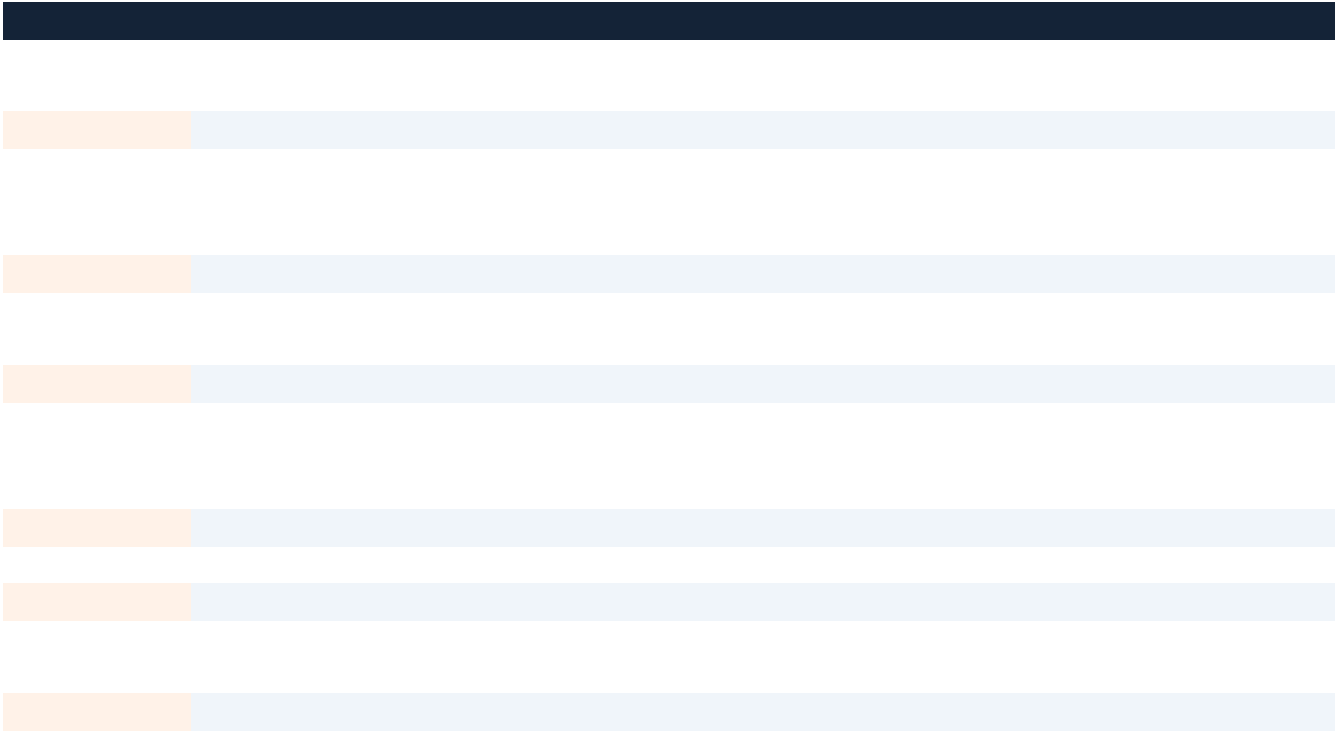
Both platforms offer Light, Dark and System under Tools → Appearance. System appearance follows the device setting; colors and native dialogs may differ without changing the numerical result.

Permissions and local data

Allow location access when using the center-on-location function. If access was denied, use the device's application settings to review the permission. Grant only the access needed for your use. Neither platform requires a separate customer account to unlock the current full-access beta.

Saved measurements are local to the installed app on that device. They do not automatically transfer between an iPhone and a Pixel, synchronize through an account, or form a cloud backup. Record important routes elsewhere.

Build differences: the separate map-style and tool-tab rows describe the updated interface. An older installed iOS or Android build may still show the floating selector. Updating the server alone cannot change a native interface already installed on a phone.



Controls reference • Touch and keyboard

How to read the instructions

Tap means one finger touch. **Press and hold** / **long-press** means keep your finger on an item before moving it. **Pan** / **drag the map** means move your finger across the map background, not a pin. **Swipe** / **scroll** means move through a panel or chart. Screen labels are the same unless an iOS or Android difference is explicitly called out.

Action	Touch control on both platforms
Open a calculator	Tap its bottom tab; on iOS use More if that screen is grouped there.
Change a value	Tap the input, replace the selected value and check the unit beside it. Most calculator inputs select their value on focus.
Choose units or modes	Tap the labeled unit/mode button. Recheck the displayed values after changing units.
Pan or zoom the map	Drag the background to pan. Use the native two-finger pinch/spread gesture to change map zoom.
Add a hose-lay pin	Select Hose Lay and tap the map. Tap locations in order from source to target.
Move a hose-lay pin	Press and hold the pin, then drag and release it. Wait for the updated elevation lookup.
Edit a hose-lay pin	Tap the pin, then its callout to open editing. Tap Save to keep edits. Delete Pin removes that pin.
Add measurement points	Select Measure. Tap the map once for A. Pan the map so the crosshair is at B, then tap Set Point B. Repeat for C, D and additional points; extra map taps alone are not the point-add workflow.
Review a long profile	Swipe horizontally through the Multi-Leg elevation profile. This is separate from zooming the map.
Remove the last point	Use Undo in the current tool. Hose Lay and Measure have separate point lists.
Save or load a measurement	Tap Save Measurement; use Saved (n) and Load to restore it. At least two points are needed to save.
Submit feedback	Contact → Send Feedback → choose category → enter message → optionally attach screenshot → submit.

Numeric keystrokes and text entry

1. Tap the value you want to change. Replace the existing selection, or use the keyboard's delete/backspace key to remove unwanted digits.
2. Enter digits and a decimal **period (.)** where needed. Do not type units, thousands separators or scientific notation into numeric fields. The common calculator inputs accept one decimal point.
3. For a field that permits a negative value, place **minus (-)** first: for example **-25** for a downhill elevation change. Do not use a minus sign in a field that represents an unsigned quantity.
4. Use the screen's unit selector rather than typing ft, m, psi or kPa into a numeric input. Keep absolute altitude distinct from elevation change.
5. Calculator results generally update as valid inputs change. Pressing Enter or Return is not an app-wide Calculate, Save, import or submit shortcut. Use each explicit on-screen action.

iOS keyboard notes

Most unsigned calculator inputs use the decimal keypad; signed inputs request a numbers-and-punctuation keyboard. A decimal keypad may lack Done or minus. Use a signed field for negative values. Use an available Done control to finish editing, or select another field/control. Scroll the form to reach lower inputs.

Android keyboard notes

Gboard, Samsung Keyboard and other keyboards can show different decimal, minus and completion keys. Use the appropriate numeric/punctuation layout. If the keyboard covers a control, dismiss it with Android's keyboard-hide/Back action, then tap the visible screen control. Back does not save or submit data.

Manual measurement coordinates

Use the point's Edit action and enter decimal latitude and longitude. Latitude must be **-90 to 90**; longitude must be **-180 to 180**. Use negative latitude for south and negative longitude for west; for example, **37.50000, -119.50000**. Tap the row's Save action to apply the edit, or Cancel to discard it. Coordinate display formats are not permission to enter degree/minute/second text into these decimal fields.

There are no documented app-specific physical-keyboard shortcuts. Use the touch controls and on-screen buttons described here; ordinary keyboard selection/deletion behavior depends on the device.

2 • PDP: hydraulic pump discharge pressure

Use PDP to estimate the discharge pressure for a single hose lay from flow, hose friction loss, elevation change and nozzle pressure.

Choose a mode

- **Direct Flow:** enter known GPM or LPM.
- **Nozzle Calc:** use the available nozzle inputs to obtain flow, then review that flow before planning the hose lay.

Enter and check the inputs

1. Set pressure, flow, elevation and hose-length units.
2. Enter source-pump and target elevations. A target above the pump adds elevation pressure; a lower target reduces it.
3. Enter the hose diameter/coefficient and total length. Use the coefficient appropriate to your equipment rather than assuming the default matches it.
4. Enter the planned nozzle pressure and flow. Confirm whether the calculation uses a single line or the displayed parallel-line option.
5. For relay estimates, enter the maximum allowable pump discharge pressure.

Read the results

Review friction loss, elevation pressure and required Engine PDP together. The basic relationship is **required PDP = nozzle pressure + hose friction loss + elevation pressure**. The app uses the selected hose coefficients and unit conversions.

Where shown, compare parallel-line results and calculated relay count/spacing. Parallel lines share the intended flow as modeled; actual flow balance depends on layout and equipment.

Planning only: a computed pump count or spacing is not approval to operate equipment at that pressure. Validate against pump capacity at the required flow, hose and fitting ratings, intake requirements and agency limits.

Common input checks

- Use consistent units and distinguish hose length from elevation.
- Check signs: uphill elevation should not be entered as a downhill change.
- Recheck diameter and coefficient before accepting a high-pressure result.

3 • Multi-Leg: hose sections and relay planning

Use Multi-Leg when a route has sections with different hose diameters, lengths or elevation changes.

Build or review the legs

1. Enter the overall flow and select units.
2. Add or remove legs as needed. For every leg, check diameter/coefficient, length and **Elevation Δ** .
3. Elevation Δ is the change across that leg, not its absolute altitude. Positive is uphill; negative is downhill.
4. Enter the nozzle-pressure requirement for the final outlet. Review any parallel-line setting on the intended legs.
5. Read each leg's results and the overall totals.

Relay planner

Enter the pump pressure limit. The planner groups legs into pump stages according to the calculated load. The source is the first pump; additional stages are identified as **P2**, **P3** and so on.

The **Divide NP across relay pumps** control changes how the final nozzle-pressure requirement is distributed in the calculation. Review the explanatory text and resulting pump count when you change it.

For imported routes, relay stages begin at existing route pins. Pump markers and the placement note identify these locations. The planner does not create newly surveyed coordinates between route pins.

Imported data

The map import asks whether to replace the current legs. Confirm the source and target labels before accepting. Check hose properties and flow after import: map geometry alone does not define your actual hose equipment.

Changing leg lengths or elevation deltas recalculates Multi-Leg and its profile only. It does not move the map route, resample altitude at a new endpoint or verify that the revised length follows the terrain.

Clearing the main map route resets its imported-leg state. Save or record important planning values before replacing or clearing a route.

4 • Imported terrain and elevation profile

The elevation profile appears in Multi-Leg after importing a hose lay from Map. It plots cumulative distance and cumulative elevation change along the entered legs.

Distance along the bottom

- **0 ft** is the source pump.
- Marks continue at **100, 200, 300 ft** and every additional 100 ft.
- The last mark is the exact target distance, including a partial final interval. Displayed numbers are rounded.
- Long profiles expand horizontally. Swipe/scroll sideways to follow the route from source to target.
- The 100-foot distance ruler remains in feet even when other profile values use meters.

Relay-pump markers and elevations

Short identifiers such as **P2** and **P3** appear beside the relay dots and dashed guides. To prevent overlapping text, full elevations are listed **below the chart**, not attached to the marker name.

Each color-matched entry has two lines:

P2 • [distance] ft from source
Elevation: [value] ft ASL (or m ASL)

If source elevation is available, the pump elevation is calculated from the imported source altitude plus cumulative leg elevation change. If the source altitude is missing, the entry explicitly reports the change **from source** instead of claiming an ASL altitude.

Understand the profile

The vertical profile represents change from the source; source is zero. The target callout is net gain/loss. Relay entries may show ASL altitude while the plotted vertical axis remains relative.

The line connects imported leg endpoints. It is not a continuously sampled terrain survey, and 100-foot marks do not mean altitude was measured at every 100 feet. Review the peak/critical-point information when shown.

Relay entries appear when the relay planner produces additional pump stages. Enter a meaningful flow and pump-pressure limit before expecting relay markers. Zoom controls may depend on the app's reported access state; sideways scrolling of long profiles is available independently.

5 • Tools: friction loss and nozzles

Friction-loss layout comparison

Open **Tools** and use its friction-loss section to compare parallel hose arrangements.

1. Select units and enter flow.
2. Select hose diameter/coefficient and length.
3. Enter nozzle pressure and elevation change.
4. Review the comparison table for one through four lines. Compare loss per length, total friction loss and PDP.

More parallel lines can reduce modeled friction loss because flow is divided. Verify that the planned arrangement actually supports the assumed flow division.

Nozzle calculations

The nozzle section has **GPM**, **Diameter** and **Pressure** modes. Choose the quantity you want to solve and supply the other two.

- **GPM:** calculate flow from nozzle diameter and pressure.
- **Diameter:** calculate required diameter from flow and pressure.
- **Pressure:** calculate pressure from flow and diameter.

Use the displayed common-flow table for comparison. These relationships should not substitute for the nozzle manufacturer's performance data, particularly when nozzle type or operating behavior differs from the modeled assumption.

Appearance

Scroll to **Appearance**. Choose **Light**, **Dark** or **System**. This changes the screen theme only; the printed manual uses a white background for readability and low ink use.

Before relying on a result

- Make sure the selected mode matches the quantity you intended to calculate.
- Check that all required inputs are present and valid.
- Confirm flow/pressure units and diameter scale.
- Verify real-world nozzle and hose ratings independently.

6 • Heli / WT: aerial and tender supply

Helicopter delivery

1. Open **Heli / WT** and use the helicopter section.
2. Enter helicopter count, bucket capacity, flight speed and **round-trip** distance.
3. Enter dip and drop times in the displayed units.
4. Review round-trip time, trips per hour, delivery per helicopter and combined delivery/flow.

Confirm whether an entered distance already includes both outbound and return travel. Do not enter a one-way distance as a round trip without adjusting it.

Water-tender delivery

1. Enter tender count, tank capacity, travel speed and round-trip distance.
2. Review the calculated fill time and cycle time, and the delivered volume per hour for one tender and all tenders.
3. Where applicable, enter the allocation to dust abatement. Review the tenders and supply remaining for the fire line.

Fill/cycle values include the app's modeled assumptions. Actual fill sources, traffic, turnaround, loading and unloading conditions may differ. Use conservative operational estimates.

Supply matching

The matching section compares fire-line tender supply against aerial delivery. Review **Tenders Needed to Match Heli**, **Current Supply Match** and the delivery-rate results. Dust-abatement allocation reduces fire-line supply when configured.

Calculated fleet size is an estimate, not a deployment instruction. Weather, aircraft limits, crew availability, road restrictions, refill throughput and incident priorities can dominate the real outcome.

Beta checks

- Increase aircraft or tender count and confirm the corresponding combined supply changes.
- Change bucket/tank units and check that displayed capacities remain sensible.
- Change dust allocation and inspect fire-line availability.

7 • Thermo: heat removal and altitude

Use **Thermo** to estimate water heat-removal capacity from the displayed flow, water-temperature and altitude inputs.

Workflow

1. Select flow and temperature units.
2. Enter water flow, starting water temperature and altitude.
3. Review the standard calculation and its breakdown.
4. If appropriate to your test, enable the **BlazeTamer** option and compare the enhanced result with the standard result.

Outputs

The primary thermal-capacity display uses **Kilowatts** or **BTU / Second**, as shown on the screen. The Standard Breakdown separates the modeled contributions. Altitude affects the boiling-temperature estimate used by the calculation.

The optional BlazeTamer display applies a modeled **1.43x** enhancement. Treat this as the application's assumption, not proof of an operational improvement or a guarantee about a specific product or fire condition.

What the result does not mean

A calculated thermal capacity does not imply that all delivered water will absorb that amount of heat at an incident. Actual contact, distribution, evaporation, runoff and exposure conditions matter.

These results support comparison and planning. Do not use them to infer a safe exposure threshold, guarantee extinguishment, or override agency or manufacturer guidance.

Beta checks

- Change flow and check the capacity response.
- Switch output units and check magnitude/label consistency.
- Change altitude and water temperature and compare the breakdown.
- Toggle the enhancement and confirm standard and enhanced outputs remain distinguishable.

8 • Map: Hose Lay and Multi-Leg import

Map styles and tool tabs

Open **Map**, or More → Map if needed. In the updated interface, the bottom panel contains two separate rows: map styles first, then **Hose Lay** / **Measure**. The map-style controls should not cover either tool tab. Scroll the panel back to the top if the controls are out of view.

Style	Display
Sat	Satellite imagery with hybrid labels.
Topo	USGS topographic overlay; intended for United States coverage.
Terrain	Google terrain on Android; topographic overlay on iOS.
Relief	Hillshade overlay over the satellite/hybrid base.
Road	Standard road map.

Allow location access if you want to center on your position. The location button recenters the map; the compass displays orientation information. Neither guarantees surveyed coordinates or terrain accuracy.

Plot a hose-lay route

1. Select **Hose Lay**.
2. Tap the source-pump location first.
3. Tap successive locations in route order, ending at the target/nozzle. The first pin is green, intermediate relay pins are blue and the end pin is orange. The route supports up to 30 pins.
4. After the second pin, an **orange line connects the pins**. It should remain above the Topo and Relief overlays. Adding, dragging or removing pins updates the line.
5. Tap a pin and its callout to inspect or edit it. Long-press and drag to correct placement. A failed-elevation callout offers a retry.
6. Wait for elevation lookups, then review segment lengths, elevation changes, total distance and source/target elevations. Confirm feet or meters.

Connecting lines represent the selected pin-to-pin route, not a surveyed path or a complete hose inventory. Add intermediate pins where the route bends. Allow for actual hose deployment, terrain, access and slack.

Import and revise

Tap **Send to Multi-Leg**, open Multi-Leg and accept the replacement prompt. Verify source/target labels, each length and each elevation change. Then enter flow, hose properties, nozzle pressure and the pump-pressure limit.

Undo removes the last hose-lay pin. **Clear** asks before removing all hose-lay pins and resets associated imported-leg state. Measure points have their own Clear control.

Unavailable elevation is not zero. Retry with connectivity and inspect all imported values. Editing lengths or elevation deltas in Multi-Leg does not move map pins or resample the original terrain.

9 • Map: Measure and saved measurements

Measure a route

1. Choose the map's **Measure** tool.
2. Tap the map to set **Point A**.
3. Pan the map to position the crosshair at the next location.
4. Tap **Set Point B**, then continue with C and further points as needed.
5. Review point coordinates/elevations, segment distances and the total. Use the available distance/elevation units.

The measure panel provides **Undo** and **Clear**. Review editable coordinates carefully. Point and segment elevation results may load separately from distance results.

Save and reload

Choose **Save Measurement** to store the current measurement on the device. Open **Saved (n)** to inspect saved entries, then use **Load** to restore one. Delete entries you no longer need. Storage is limited to 20 saved measurements.

Saved measurements are device-local, not a promised cloud backup or account-sync feature. Do not rely on them surviving app removal or device replacement. Record essential routes elsewhere.

Elevation totals

Gain, loss and net elevation depend on terrain values for the required points. If only some lookups succeed, complete elevation totals may be unavailable even when distances are visible. Loading older saved routes can require fresh elevation lookup.

Measure and Hose Lay are distinct workflows. Saving or loading a measurement is not the same as sending a hose lay to Multi-Leg.

Starting again

Use **New Measurement** when shown to start another measurement, or the Measure panel's Clear action to reset its points. Keep the map's main route Clear separate from this control.

10 • Contact and troubleshooting

Send feedback

1. Open **Contact** → **Send Feedback**.
2. Choose Bug Report, Calculation Issue, Feature Request or General Feedback.
3. Describe the issue. Include device/OS, installed build or download used, screen, reproduction steps, inputs/units, expected result and actual result.
4. Optionally attach a screenshot, then submit while online.

Thank you! means the report was accepted and saved. The server also attempts an email notification, but the confirmation is not a guarantee that the notification arrived in the developer's inbox. Do not repeatedly resubmit a report solely because an email is delayed.

A submission error means you should review its message and connectivity. For a screenshot-related error, retry without the image or use a smaller image. Avoid sensitive incident information and personal details.

Troubleshooting

- **Map styles cover Measure:** install the latest map-controls APK. Its styles occupy a separate row above Hose Lay and Measure.
- **No connecting hose-lay line:** place at least two pins in Hose Lay. Use the current native build. A line should update after pins move or are removed.
- **Empty map tiles:** check connectivity and try Road or Sat. Topo coverage and third-party tile availability vary by region.
- **Elevation unavailable:** wait, check connectivity and retry. Do not infer zero.
- **Purchase prompt in beta:** confirm the installed build and report it; full-access beta tools should not require a purchase.
- **No relay markers:** check flow and pump-pressure limit. Markers appear when the planner calculates additional pump stages.
- **Unreadable profile:** scroll horizontally and use the separate pump distance/elevation rows below the chart.
- **Unexpected hydraulic result:** verify units, diameter/coefficient, flow, lengths, nozzle pressure and elevation signs.

11 • Field-use checklist

Before relying on a plan, check the following items and record the installed build, device and any limitations.

- ☐ Correct installed beta and intended units.
- ☐ Inputs checked against actual equipment and conditions.
- ☐ Map styles and both tool tabs accessible.
- ☐ Hose-lay pins and connecting lines follow the intended route.
- ☐ Elevations loaded or missing values explicitly identified.
- ☐ Imported source/target and leg values checked.
- ☐ Profile distances and relay elevations understood.
- ☐ Pump, hose and fitting limits independently verified.
- ☐ Essential routes recorded outside device-local storage.

Date: _____ Device: _____
Installed build / download: _____
Notes: _____