

# Installation & User Guide



## Roادرain

**Roادرain 3.8.6 Customer Edition** | Windows x64 | September 2026

### Road drainage and watershed hydrology in one workspace.

Inspect catchments, review hydrology, compare preliminary culvert openings, and produce an engineer-reviewed project record.

### Built by Hydroism

Roادرain is developed under Hydroism, the independent water-engineering and digital-product platform founded by **Amin Rostami, PhD**. Its development brings practical hydrology, hydraulics and GIS workflows into a transparent software environment. Amin has more than 15 years of engineering experience across Iran and Oman.

[hydroism.com](https://hydroism.com) | [Roادرain & pricing](#) | [About the developer](#)

| In this guide                                                | Pages |
|--------------------------------------------------------------|-------|
| Install, update, locate the application and manage a license | 2-4   |
| Shared controls, project files and coordinate entry          | 5     |
| Road Drainage: set up, review and export                     | 6-7   |
| Watershed Hydrology and basin-quality checks                 | 8-9   |
| Unified crossing review, report notes and constraints        | 10-11 |
| Save project records and troubleshoot                        | 12-13 |
| Activate bundled maps and inspect the report atlas           | 14-15 |
| Technical reports, Store delivery and 3.8.6 review           | 16-18 |

**Internet:** required for installation and online maps/data. License import and validation work offline; purchase and renewal are arranged by email. Design-option comparison runs locally without a cloud AI service or API key.

Version 3.8.6 improves the responsive workspace and progress display. Calculations remain DEM-based; optional reference findings remain separate. Roادرain is published on Microsoft Store. Use the official listing to install, then activate your purchased engineering license.



## 01 / INSTALLATION

# Install & activate

| Before you start    | Requirement or preparation                                                                                                                                                                     |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating system    | Windows 10 build 19041 or later, or Windows 11, Intel/AMD x64. ARM64 is not validated. Install current Windows updates. The separate EXE setup checks .NET Framework 4.6.2 or later.           |
| Internet            | Required to download from Microsoft Store and use online data/maps. The separate EXE bootstrap also needs python.org, PyPI and Microsoft WebView2 download services.                           |
| Space and memory    | Allow at least 2 GB for installation, plus project inputs, terrain downloads, caches and outputs. Larger basins need substantially more resources; this is not an analysis capacity guarantee. |
| Before installation | Close RoaDRain if it is open. For an existing installation, follow the update steps on page 3; do not uninstall it first.                                                                      |

## Microsoft Store installation

- 01 Open [RoaDRain on Microsoft Store](#), also linked from [hydroism.com/roadrain](https://hydroism.com/roadrain). Confirm the publisher is **Amin Rostami**, then select Install.
- 02 Open RoaDRain from Start. The Store package contains its Python, GIS and WebView2 runtime; no separate Python installation is required.
- 03 Open **Manage license**, export the device request and follow the purchase and activation steps on page 4. Downloading the app does not include a paid engineering license.
- 04 Keep internet available for online terrain, maps and reference data. Local license validation and supported local operations do not require an online licensing server.

**Customer installation:** use the official Microsoft Store listing. Availability can differ by account, device and region. If the listing is unavailable, contact Hydroism; do not disable Windows protection or use an unsigned packaging artifact.

## Separate publisher EXE edition

If Hydroism supplies a separate setup EXE for testing, it is a different installation channel. Its bootstrap installer downloads official Python 3.13.15, locked dependencies and WebView2 if needed. Follow its installation log and keep internet connected. Store signing does not sign this EXE.

## EXE destination and working data

For the separate EXE edition, use a dedicated writable folder; do not choose Windows, Program Files or a shared system folder. Microsoft Store manages its own package location. RoaDRain keeps its private runtime with the application; no separate Python installation is required.

Download sizes and installed space differ because compressed packages expand during setup. Terrain, network and project caches are additional. Keep free space available for both the existing version and the update while setup verifies the new version.



## 02 / UPDATES &amp; LOCATIONS

# Update & retain your projects

**Microsoft Store edition:** obtain updates through Microsoft Store. Save and close open work before updating, then confirm the installed version. Keep independent .rdn or .hdn project backups.

## Separate publisher EXE test channel

These steps apply only when Hydroism supplies a separate setup EXE for testing. They do not update a Microsoft Store installation.

- 01 Save and close.** Let an active analysis finish or stop it in the application. Close RoadRain and export project backups outside the installation folder.
- 02 Open the newer test EXE.** Setup detects the registered per-user installation and shows **Update existing RoadRain**. An update retains the detected installation directory; do not uninstall first.
- 03 Wait for verification.** Setup stages and checks the new environment before switching the active version and shortcuts. If it fails before activation, the previous active version remains selected.
- 04 Reopen and check.** Confirm the version and open a saved project. Opening a project does not recalculate its basin or hydrology; run again for new results.

## Find your installation and working data

| Location                         | How to find or use it                                                                                                                           |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Microsoft Store application      | Microsoft Store manages the package location. Open RoadRain from Start; do not modify files inside its managed package folder.                  |
| Separate EXE application         | Start menu > RoadRain > Open installation folder. The chosen destination may differ from the default %LOCALAPPDATA%\Programs\Hydroism\RoadRain. |
| Projects, data and license state | %LOCALAPPDATA%\RoadRain - separate from the application installation.                                                                           |
| EXE installation log             | %LOCALAPPDATA%\RoadRain\logs\install-YYYYMMDD-HHMMSS.log                                                                                        |

Paste a path beginning with %LOCALAPPDATA% into Windows File Explorer. Moving from a separate EXE to Microsoft Store is a separate installation: follow page 17 and verify projects, activation and maps before removing the old edition.

Keep independent backups even when updating through the same channel. Do not delete active application files, license state or cache folders while RoadRain is running. Updating does not revise previously exported reports.



## 03 / LICENSING

# Purchase & activate by email

All plans include both Road and Watershed, engineering review, project files and available exports. Licenses last one year from the agreed start date, cover registered PCs and renew manually. There is no payment gateway or automatic renewal.

| Annual plan  | Registered PCs | Price, USD     |
|--------------|----------------|----------------|
| Business     | 1              | \$399 / year   |
| Team         | 3              | \$999 / year   |
| Organization | 10             | \$2,499 / year |

## Request and import your license

- 01 Install RoaDRain on each intended PC. Open **Application > Manage license**. Enter the company name and contact email, then select **Download device request (.rdrequest)**. The request includes a device hash and public encryption key; no private key is sent.
- 02 Email the request file(s), selected plan and billing contact to **hydroism.amin@gmail.com**. Hydroism confirms the price, agreed license dates and payment instructions by email. Send payment only against those confirmed details.
- 03 After payment confirmation, Hydroism emails one **.rdlicense** containing the signed license and, when included in the agreed plan, the encrypted map credential. On the matching PC, select **Import license (.rdlicense)**, then check access and expiry. Import is offline; **Application > Map connection > Test connection** needs internet.

## Renewal, expiry and a replacement computer

Before expiry, email Hydroism to request renewal. After confirmation, import the renewed license. After expiry, new calculations and engineering recomputation are blocked; saved projects, existing outputs and report notes/photos remain accessible. Keep your exported project backups.

For a replacement PC, email its device request. An active offline seat cannot be revoked remotely; transfer normally waits until its expiry, or requires a separate available seat. **Remove local license** removes the local copy on this computer; it does not automatically release or transfer a registered seat. Team and Organization licenses cover their listed devices, not an unlimited network or floating license.

## Offline licensing and online project data

A signed license works locally until its expiry. Keep the system date correct; detected clock rollback can block calculations. Offline controls deter casual copying but cannot guarantee immediate revocation or defeat all clock or application tampering. Major system changes may require reissue.

License verification is offline. Installation, online map tiles, terrain downloads and reference-data services still need internet. Licensing does not make these sources available offline. Product and support: [hydroism.com/roadrain](https://hydroism.com/roadrain); [hydroism.amin@gmail.com](mailto:hydroism.amin@gmail.com).



## 04 / SHARED WORKSPACE

# Controls, files & coordinates

The top command bar provides shared project actions. Switch between **Road drainage** and **Watershed hydrology** from the compact module selector. The left panel holds the workflow; the map keeps the spatial context visible.

| Control or area            | How to use it                                                                                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| New / Open / Save          | Start a project, open a saved project, or export the current result. Save becomes available when a project result exists.                                            |
| Hide / Show tools          | Collapse the left panel to give the map more room. Use the same control to reopen it.                                                                                |
| Workflow navigation        | Open the required setup or result stage in the left panel. Scroll within the panel to reach all fields.                                                              |
| Analysis / Run status      | Follow the real milestone and current operation. Counts and download bytes describe that operation; no overall ETA is inferred. Use Analysis to view or cancel work. |
| Fit map / Layers / Measure | Fit the current selection, show the required basin or drainage layers, and measure mapped distances. Layer names vary by workflow.                                   |

## Use the coordinate order shown by each field

**GIS X/Y convention:** X = longitude, Y = latitude.

**Watershed paste box:** Latitude, longitude - one point per line.

These are different entry orders. Always inspect the point on the map after import.

| Coordinate format example, WGS84 | Correct value      |
|----------------------------------|--------------------|
| Longitude / X                    | 12.50000           |
| Latitude / Y                     | 41.90000           |
| Watershed paste box line         | 41.90000, 12.50000 |

Use decimal degrees for the latitude/longitude entry box. Uploaded GIS data must have a correct coordinate reference system. Merely swapping a CRS label does not transform coordinates.

## Prepare project inputs

Prepare the alignment or outlets, terrain, approved rainfall and runoff assumptions. Road import supports KML, KMZ, GeoJSON and GeoPackage. Watershed GIS selection also supports zipped or complete Shapefiles. Project terrain uses a georeferenced GeoTIFF.

Online maps and data need internet. Local or cached inputs support some offline work. Design-option comparison runs locally with a current license; complete analysis or reports may still need online resources.

Map access comes with your license. Use **Application > Map connection** to check it. See pages 14-15 for map and atlas instructions.



## 05 / ROAD DRAINAGE

# Set up & run a road project

- 01 Load the centreline.** Choose a KML, KMZ, GeoJSON or GPKG, then select **Preview uploaded alignment**. Alternatively use **Draw alignment on map**. Check the road and edit the loaded alignment if necessary.
- 02 Set chainage direction.** Select **Endpoint A** or **Endpoint B** as Ch. 0+000. Set the station interval and decide whether station labels should appear on the maps.
- 03 Set starting terrain coverage.** Choose **Automatic AOI**, or draw a **manual AOI** containing the complete road and intended selections. Select **Continue to project inputs**. An AOI is not a basin clipping boundary.
- 04 Choose the project DEM.** Select public terrain or upload the project DEM. DEM flow routing and delineation provide the calculation basis. The optional external basin comparison is off by default; enable it only when you want a separate TDX/source check.
- 05 Enter rainfall and runoff inputs.** Select the applicable rainfall source or upload the project IDF CSV. Check units, return periods, runoff coefficient/Curve Number or land-cover assumptions, and the project region. Do not use Oman-specific defaults for an unrelated region.
- 06 Review road criteria.** Check roadway classification, design return period, crossing extraction threshold, allowable velocity and structure assumptions. The minimum catchment area filters candidate crossings; it does not cap the size of a contributing basin.
- 07 Run the analysis.** Follow the actual milestone, current operation, processed crossing counts and download bytes. An unknown denominator remains indeterminate; there is no estimated overall percentage or completion time. Keep the computer awake and use **Analysis** to inspect or cancel work.

## Before accepting the screening

| Check                                | Why it matters                                                                                   |
|--------------------------------------|--------------------------------------------------------------------------------------------------|
| Alignment and chainages              | A reversed centreline changes station references even if the map line looks identical.           |
| Drainage and crossing locations      | Small or displaced flow paths may need engineer-led review, site observations or better terrain. |
| Rainfall source and units            | The flow calculation is only as applicable as the adopted rainfall and runoff inputs.            |
| Boundary source and terrain coverage | Inspect the reported method and coverage before interpreting a basin as complete.                |

The default result map may hide catchments and extracted drainage. Enable the relevant layers before assessing the delineated boundary.



## 06 / ROAD RESULTS

# Familiar sidebar, persistent map

The left sidebar has **Results**, **Review** and **Outputs**. The same map stays on the right while you inspect or edit crossings. **Review crossings** opens the sidebar review, with **Edit**, **Options** and **Notes & photos** tools.

## Review the schedule and spatial network

- 01 Open **Schedule** for a wide, filterable dialog. Choose a column view and a crossing to inspect on the same map. Close the dialog to return to the sidebar. Check the road position, chainage, contributing area, routed discharge and structure concept.
- 02 In **Review > Edit**, enable map editing and select a crossing. Its editor opens inside the left sidebar. Change dimensions or switch culvert/bridge type, then select **Stage change**. Use **Remove**, or the add and merge tools, when engineering evidence supports the change.
- 03 Review the staged changes, then select **Recompute & validate**. This recalculates the reviewed project and checks proposed structures against the resulting design flow. Save and package actions remain blocked while design edits await recomputation or undo.
- 04 Inspect the recalculated boundaries, routed flows and structure checks. A failed opening check remains visible as **review required**; a completed run alone does not establish acceptable hydraulic capacity.

## Generate the current package

- 01 Open **Outputs** and choose **1 - Generate current outputs**. It prepares the reports, schedules, GIS layers and package for the current project revision.
- 02 After completion, choose **2 - Download package**. Open the downloaded report, schedule and GIS results and confirm project identity and revision.

| Output                              | Purpose                                                                                                 |
|-------------------------------------|---------------------------------------------------------------------------------------------------------|
| Technical report                    | Interpreted findings, design-screening priorities, limitations, review decisions and site notes/photos. |
| Software/model report               | Detailed saved inputs, methods, settings, tables and results for reproducibility.                       |
| Culvert and bridge locations (KMZ)  | Reviewed crossing positions and associated GIS results.                                                 |
| Culvert and bridge schedule (Excel) | Coordinate design flows, dimensions, types and review findings.                                         |

After changing only a report note or photo, generate outputs again; a hydrology run is unnecessary. Distinct serial crossings may legitimately have nested catchments. Investigate an off-road point or overlap before merging. Check that a merged outlet captures the selected source drainage. Otherwise the report flags uncaptured drainage and required designed conveyance; the app does not create a connecting ditch.



## 07 / WATERSHED HYDROLOGY

# Run an outlet or area analysis

- 01 Select the location.** Add an outlet on the map, or paste **latitude, longitude** coordinates and select **Import coordinates**. For area-based work, draw an analysis area or use **Import GIS selection**. A polyline selection uses its specified corridor buffer.
- 02 Review selection meaning.** For drawn polygons, choose the required **Area relationship**. This governs area-based selection; it does not replace the outlet-point workflow. Inspect the map before continuing.
- 03 Choose terrain.** Set **Project region, DEM source**, and the provider or uploaded GeoTIFF. Select automatic starting coverage or **Manual minimum AOI**. A manual AOI must contain every selected outlet or area.
- 04 Review the DEM calculation basis.** External basin checking is optional and off by default. Enable it to record a separate source comparison. Optional channel burn-in changes DEM routing; its lines, depth and width remain explicit engineering assumptions.
- 05 Enter design rainfall.** Choose **Upload project IDF CSV** or the applicable online/regional provider. Check return periods and the reported source. NOAA Atlas 14 is a United States option; BOM 2016 IFD is an Australia beta option; the Oman database is region-specific.
- 06 Review runoff and timing.** Set manual coefficients or the WorldCover option, time-of-concentration method, abstraction ratio, storm duration, hyetograph and time step. Defaults are starting assumptions for review.
- 07 Run.** Enter project details and select **Run watershed hydrology**. Inspect the basin cards and the boundary/terrain evidence after completion.

## Inspect and export the results

Select a basin to open **Hydrology results**. Use **Interactive charts** to compare return periods, **Event table** for numerical summaries, and **Raw files** for the underlying outputs. Use **Save PNG** or **Save both PNGs** for chart images.

The left results panel groups **Watershed results, Hydrology tables, Raw GIS** and **Reports**. Use **Download complete package** for the assembled outputs and **Save** for the portable .hdm project.

**Multiple outlets:** inspect the selected independent or combined hydrograph treatment. DEM workflows support accumulation and Muskingum options where applicable. Do not sum nested independent hydrographs without resolving drainage overlap and timing.



## 08 / BASIN QUALITY

# DEM results & reference findings

**Calculations use the DEM.** A reference basin is comparison evidence; it does not replace the computed DEM boundary, area, flow path or discharge.

| Finding                         | Effect on results and required response                                                                                                                                                  |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Valid DEM result                | Retained with its calculated hydrology, GIS layers and downloadable reports. Review terrain coverage, the outlet and the stated assumptions.                                             |
| External source disagreement    | Advisory. When checking is enabled, compare the DEM/source areas and available spatial evidence. A discrepancy alone does not cancel valid DEM results.                                  |
| Missing reference data          | Recorded as unavailable or not checked. Missing reference metadata is not proof that the DEM result is wrong.                                                                            |
| One unusable outlet or crossing | Where the run can retain independently valid results, the affected item is omitted and identified in a partial-result finding. Its values are not replaced by zero or fabricated.        |
| Invalid overall calculation     | A run can stop for unusable terrain, incomplete necessary coverage, invalid routing/geometry, unsupported rainfall or no retained basins. Read the specific cause and corrective action. |

## Check complete upstream coverage

An AOI supplies starting coverage; it is not a clipping boundary for contributing drainage. Public DEM coverage may expand upstream. Uploaded terrain cannot supply elevations beyond its valid extent. Inspect gaps, NoData, outlet placement and coastal or flat areas before accepting the result.

## Use comparisons as engineering evidence

External checking is **off by default**. When enabled, findings identify available reference areas, overlap and mismatches without substituting reference hydrology. No separate reference discharge is implied unless it was actually calculated and explicitly recorded. Review survey terrain and local drainage observations to resolve a disagreement.

**Partial is not complete:** read the affected IDs and reasons in the app and both reports. Downloadable retained results do not cover omitted items. Recompute an older saved project to apply the 3.8.5 DEM basis; simply opening or reformatting it retains its historical calculations.



## 09 / UNIFIED REVIEW

# Compare designs & record site evidence

The unified review combines crossing edits, deterministic opening comparisons and report annotations. It requires no cloud AI key or downloaded language model. Free text and photographs are never interpreted as calculation instructions.

## Compare design alternatives

- 01 Open **Review > Options** to show the **Compare opening options** dialog. Select crossings and enter approved numerical constraints, or import the supplied CSV template. Use **Save numeric constraints** to retain them.
- 02 Choose **Compare selected crossings**. Inspect the option score, dimensions, opening reserve and pass/fail findings. Choose at most one option for each crossing.
- 03 Select **Stage selected options**, choose **Back to map**, then use **Recompute & validate** in the Review sidebar. A proposal enters the project only after recomputation. Recheck the final flow and structure status before generating outputs.

## Notes and photos belong to the report

Open **Review > Notes & photos** and choose the crossing. **Save note** saves text independently of numeric draft fields; **Save note & photographs** also saves selected site images. Wait for confirmation, generate the current outputs, then use top-bar **Save** for a portable .rdn revision.

Annotations survive saved-project reopening and review recomputation. A merged crossing retains source notes/photos identified by their original crossing IDs. Changing annotations refreshes report readiness only; it does not change flow, geometry or structure sizing.

## What the scores mean

Effective area = (barrels - spare cells) x width x height  
x (1 - blockage percent / 100)  
Required area = (design Q x discharge factor / velocity)  
x (1 + reserve percent / 100)

Feasible catalogue options are ranked by **opening area x [1 + 0.055 x (barrels - 1)]**. This construction proxy is transparent, but it uses no market prices and is not an economic optimum.

**Scope:** opening and Q/V checks do not solve inlet/outlet control, headwater, tailwater, afflux, scour or structural strength. Manual bridge conversion is checked against Q100; a culvert uses the selected project design event. Read every special-review or failed-check status.



## 10 / APPROVED CONSTRAINTS

# Field & CSV reference

Use the CSV template in **Review > Options**. The **crossing\_id** must match an existing point exactly. Each row represents one crossing. Only crossing\_id is mandatory; include the numeric columns needed. Headers are case-sensitive. Blank numeric cells use the applicable default. Upload a UTF-8 CSV of at most 1 MB (a UTF-8 BOM is accepted).

| CSV field                   | Meaning / default                                                                                                           |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| max_barrels                 | Integer 1-24; default 6. Maximum count considered in the trial structure.                                                   |
| min_width_m / max_width_m   | Clear width of each barrel in metres; defaults 1 / 4. Both must be positive and minimum cannot exceed maximum.              |
| min_height_m / max_height_m | Clear height of each barrel in metres; defaults 1.5 / 4. Both must be positive and minimum cannot exceed maximum.           |
| max_total_width_m           | Sum of clear barrel widths, excluding walls; default 24 m. Positive value.                                                  |
| velocity_limit_m_s          | Positive screening velocity in m/s. Blank uses the crossing's existing allowable velocity; 2 m/s only if none is available. |
| discharge_factor            | Multiplier of current Q for this comparison only; minimum/default 1. It does not overwrite design Q.                        |
| blockage_percent            | Opening allowance from 0 to 90%; default 0.                                                                                 |
| spare_cells                 | Integer 0-23; default 0. Must be smaller than max_barrels. These barrels are excluded from effective area.                  |
| min_reserve_percent         | Additional required opening-area reserve; non-negative, default 0.                                                          |

## From documents to numerical requirements

- 01 Read the governing project documents and identify the relevant dimensional limits, velocity criterion and required allowances.
- 02 Resolve units, applicability and conflicting clauses through the normal engineering review. Enter the approved values in the fields or CSV.
- 03 Record document title, revision, clause and reasoning under **Review > Notes & photos**. Save notes separately from numeric constraints. Up to four JPG, PNG or WebP images per crossing are accepted, maximum 10 MB each.
- 04 Run the comparison and inspect the recorded effective constraints before approving an option.

Do not paste units, formulas, percentages with a % sign, or free-form text into numeric CSV cells. Unknown fields, non-finite values, duplicate or unknown crossing IDs, and contradictory limits require correction. Catalog dimensions remain discrete: expanding a field limit does not create a new standard box size.



## 11 / PROJECT RECORDS

# Save, reopen & export

## Portable project files and output packages are different

| File or output             | Use                                                                                                     |
|----------------------------|---------------------------------------------------------------------------------------------------------|
| Road .rdn project          | Save the current Road project for reopening and continued work.                                         |
| Watershed .hdn project     | Save the current Watershed project for reopening and continued work.                                    |
| Downloaded results package | Issue or archive the generated reports, GIS layers, schedules and other outputs for that project state. |
| Error-details ZIP          | Investigate a failed run. This contains diagnostic evidence, not an approved engineering result.        |

- 01 Save report annotations with **Save note** or **Save note & photographs**. Recompute or undo any staged engineering changes, then select top-bar **Save** to download a fresh .rdn. Keep portable .rdn or .hdn files outside the application installation.
- 02 Use **Open** to select a saved project. Wait for import to finish. Opening a project neither starts a calculation nor cancels another task. Verify its identity, settings and result before editing.
- 03 Use **Edit current project** in Road or **Edit inputs** in Watershed when a calculation input must change. Reused input files remain available unless you choose replacements.
- 04 Run again after changing the outlet, alignment, terrain method, rainfall or other analysis inputs. Opening an old result does not update its geometry or hydrology.
- 05 After engineering changes, save a new project revision and generate a matching output package. Keep the source data, approved assumptions and issued revision together.

## IDF CSV quick reference

The project rainfall table uses **zone**, **duration\_min** and intensity columns named **rp<years>\_intensity\_mm\_hr**, such as **rp100\_intensity\_mm\_hr**. Durations are minutes; intensities are millimetres per hour. Populate all required return periods and durations from the approved project source.

The Road rainfall panel offers a selected-zone intensity preview. The Watershed upload field states the expected column naming. A correctly formatted file can still contain inappropriate engineering values; inspect the rainfall preview and source statement.

## Archive an issueable engineering record

Keep the selected outlet/road, DEM provenance, boundary-method evidence, rainfall reference, runoff assumptions, review decisions, final project file and generated output package. Check GIS exports in the recipient's normal GIS tool and open the report and schedule before issue.

Application data remains under %LOCALAPPDATA%\Roادرain after uninstall. Exported project backups should be stored separately. Do not manually remove active project or cache folders while Roادرain is running.



## 12 / TROUBLESHOOTING

# Recover with useful evidence

| Symptom                               | Action                                                                                                                                                                                                               |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Installation cannot finish            | For Store installation, check the connection and retry in Microsoft Store. For a separate test EXE, close RoaDRain and inspect the install log. Do not bypass hash or signature checks.                              |
| Desktop window does not open          | Wait for startup. Inspect local-runtime.log and desktop-launcher.log in %LOCALAPPDATA%\RoaDRain\logs. Check Windows/WebView2 updates.                                                                                |
| Online map or data request fails      | Open Application > Map connection > Test connection. Check internet and license/map status. Send a fresh device request to Hydroism if reissue is needed. A working basemap does not prove DEM/network availability. |
| Reading inputs or downloads seem slow | Check the active phase, transferred data, internet, disk space and memory. Initial network and terrain downloads can take time.                                                                                      |
| Queued or Stopping...                 | Use Analysis > View progress or Cancel analysis. Queued work cancels before starting; running work stops at a safe checkpoint. Opening another project does not cancel it.                                           |
| Road results do not become usable     | Read the visible loading error and use Retry. Use Edit project if inputs need correction. If it recurs, send the exact message, version and project. Updating the interface alone does not need a new hydrology run. |
| Boundary or routing error             | Read the concise cause and action. Correct missing DEM coverage, coordinate/routing problems or the named outlet, then rerun. External discrepancies alone do not cancel valid DEM results.                          |
| Engineer notes do not persist         | Select Save note and wait for confirmation. It saves text even if draft numeric fields are invalid. Then use top-bar Save for a fresh .rdn; reopen that revision.                                                    |
| Terrain cannot resolve path drop      | If the measured path drop is zero or negative, use suitable finer project DEM or survey terrain. Select Download error details to retain the measured profile. Do not assume a slope.                                |
| No design option passes               | Read which constraints fail. Revisit an approved input only when engineering evidence justifies a change, or design a special structure separately.                                                                  |
| Save or package download is blocked   | Use Recompute & validate or undo staged engineering edits. Rerun stale comparisons and regenerate current outputs. Read the specific status message.                                                                 |

## What to send for support

Provide the app version, Windows version, exact coordinates or saved project, selected DEM and delineation settings, the visible error and **Download error details** ZIP. For setup/startup failures, provide the relevant log. Review diagnostic contents before sharing if the project location is sensitive.

Error details include selected locations, available candidate geometry and sanitized diagnostics. DEM files and API credentials are excluded; provide terrain separately if needed.

Product information: [hydroism.com/roadrain](https://hydroism.com/roadrain). Support and purchases: [hydroism.amin@gmail.com](mailto:hydroism.amin@gmail.com). Quote your installed version and include the relevant project evidence.



## 13 / LICENSED MAP CONNECTION

# One file activates the app and maps

**No API key entry is required.** Hydroism supplies the engineering license and encrypted Esri credential together in your device-bound **.rdlicense**. Import it on the PC that generated the device request.

- 01 Use **Application > Manage license** to download a new **.rdrequest** on the intended PC. Email it to Hydroism with your company, contact and order or existing license reference.
- 02 Import the issued **.rdlicense** through **Manage license**. One import verifies the signed entitlement and makes the enclosed map credential available to the application. Do not edit the file.
- 03 Open **Application > Map connection** and choose **Test connection**. Confirm that the license and Esri services are available. The service test requires internet; license verification itself works offline.
- 04 Open **Map display** and select Satellite, Satellite with labels, Topographic, Terrain or Streets. OpenStreetMap remains a fallback when authenticated imagery is unavailable.

## Choose the background for the task

| Background                        | Engineering use                                                                                                  |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------|
| Satellite / Satellite with labels | Inspect road context, channels, outlets, settlement and ground cover. Image detail and date vary by location.    |
| Topographic / Terrain             | Read geographic relief and place context. These Esri backgrounds do not replace the calculation DEM.             |
| Streets / OpenStreetMap           | Inspect transport and settlement context. Geometry and the current view are retained when switching backgrounds. |

## Existing licenses and renewals

Existing valid licenses continue to authorize analysis. To receive bundled maps, export a fresh request from the current version and ask Hydroism for reissue. An earlier owner-test key may remain usable on that same Windows account during migration; it is not exported to another PC.

If a map credential expires or is replaced, Hydroism supplies an updated license file for import. A map-service failure does not change your catchment or DEM. After access is restored, regenerate report outputs that used a fallback.

The map credential is encrypted in the license file and is not displayed in the customer interface. Windows protects the device private key for the current user. This protects normal distribution; it cannot guarantee secrecy against an administrator inspecting a running process. Keep provider attribution visible.



## 14 / REPORT MAP ATLAS

# Study and basin map plates

Both report types in Road and Watershed include a satellite and a terrain plate for the complete study and every retained basin. Basin identifiers, outlets, drainage and the road alignment remain associated with the correct study geometry.

| Plate                        | What to inspect                                                                                                                       |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Complete study - satellite   | All retained basins, study outlets and the alignment where applicable. Confirm that disconnected or outlying basin parts are visible. |
| Complete study - terrain     | Actual project DEM elevation and shaded relief, with basin/drainage context. Check units and the elevation legend.                    |
| Individual basin - satellite | A focused figure for every retained basin. Check outlet location and alignment between mapped drainage and analysis geometry.         |
| Individual basin - terrain   | The same basin on project elevation and hillshade. This terrain is analysis data, not an illustrative web background.                 |

## Generate and review the atlas

- 01 Save report notes and photographs. Recompute or undo outstanding engineering changes. Confirm the project inputs and result revision.
- 02 Test the map connection before preparing outputs. In Road use **Outputs > Generate current outputs**; in Watershed use its output-generation action. Older saved projects need regenerated outputs to receive the updated report format.
- 03 Open both generated report types. Check full-study coverage and every basin plate: IDs, outlet positions, north arrow, scale, coordinate labels, terrain units and attribution.
- 04 Read the explanation below each map. Unavailable imagery or missing terrain produces an explicit vector-only fallback, not a successful satellite or terrain plate. Restore access or terrain and regenerate.

## Backgrounds and calculations have separate purposes

Satellite imagery provides visual context; it does not change drainage directions, runoff parameters or discharge. Terrain plates use the available project DEM. Basemap appearance alone cannot verify survey levels, culvert inverts or drainage connectivity.

Final figures retain engineering overlays and Esri/source attribution on a defined map grid. The application does not include a raw imagery-tile cache in customer outputs. Credentials are omitted from projects, captions and reports.

Installing an update does not rewrite an already downloaded report. Generate a new output revision after changing annotations, activation/map access or report format. Keep the previous issued revision as a historical record.



## 15 / TECHNICAL REPORTS

# Interpretation and an auditable record

Each module provides two complementary documents. The **technical report** explains the study basis, findings and engineering follow-up. The **software/model report** preserves the detailed saved inputs, settings and numerical results needed to examine or reproduce the run.

| Report component              | Purpose and evidence                                                                                                                                                                                                |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Document control and contents | Identify the project, report revision and recorded preparer/checker details. Complete your organisation's review before issue. A generated document is not an approval.                                             |
| Executive interpretation      | Summarise the actual study scope, governing available events, critical basins/crossings and unresolved checks. Missing data are identified, not invented.                                                           |
| Study basis and methods       | Record source terrain, rainfall, runoff and timing assumptions and the methods actually used. Read the atlas with the source/coverage evidence.                                                                     |
| Results and action register   | Record retained results, omitted IDs and causes, and optional DEM/reference differences. Keep computed values separate from unavailable data. Detailed records remain in the companion software report and package. |
| Conclusions and next steps    | State what the calculated evidence supports and the additional design, survey or validation tasks needed. Site notes/photos remain supporting report content.                                                       |

## Road: use the findings for drainage design development

Review crossing priorities, design-event comparisons, drainage-capture issues, low-confidence evidence and opening-screening findings. An opening reserve based on Q/V is a preliminary geometry check. It is not inlet/outlet-control analysis or proof of headwater, tailwater, afflux, scour or structural adequacy.

## Watershed: distinguish hydrology from flood hydraulics

Review the actual Tc selection, event peaks, runoff volumes and per-basin checks. An adopted peak envelope is not necessarily the peak of one routed hydrograph. Nested independent basins must not be summed as a unique study area or combined discharge without valid overlap and routing treatment.

Hydrology results do not establish flood depths, inundation limits or structure capacity. Check unresolved terrain, flow-path, time-step and water-balance findings against the project evidence before transferring hydrographs into a hydraulic model.

Version 3.8.5 reports the DEM calculation basis and concise run findings in both document types. Recompute older projects before issuing updated results. The report preserves the original calculation version until a new run is completed; report generation does not confer regulatory compliance.



## 16 / MICROSOFT STORE

# Store delivery and activation

**Published product:** install from [RoaDRain on Microsoft Store](#). Store product ID: **9P27ZWDFLKJV**. The Store download and the paid RoaDRain engineering license are separate.

## Install the Store edition

- 01** Open the official listing, also linked from [hydroism.com/roadrain](#). Check the product is **RoaDRain** and the publisher is **Amin Rostami**, then select Install. Listing visibility and availability can vary by account, device and region.
- 02** Use **Windows 10 build 19041 or later, or Windows 11, x64**. The package bundles the Python/GIS runtime and fixed WebView2 runtime. It does not run pip or download its calculation runtime at first launch.
- 03** Open the installed app. Download a device request, arrange the license purchase by email and import the supplied license file as described on page 4. Installation alone does not activate paid engineering functions.
- 04** Keep internet available for Store installation and updates, online imagery, and online terrain/reference data. Signed license checks remain local. Obtain Store-edition updates through Microsoft Store.

## Moving from the separate EXE edition

The first Store installation is a separate installation, not an EXE installer upgrade. Save and close the old app first. Keep independent .rdn/.hdm backups. The Store configuration uses the shared **%LOCALAPPDATA%\RoaDRain** user-data location; verify migration on your PC.

After Store installation, confirm the version, open saved projects and test license and map access before optionally uninstalling the old EXE edition. Do not delete the user-data folder. Later Store updates under the same package identity are designed to retain data and activation.

## Store delivery and license support

Microsoft signs the MSIX distributed through its Store. That signature does not apply to a separate publisher-supplied EXE and does not include a paid RoaDRain license. Purchases and renewals are arranged with Hydroism by email; there is no automatic renewal.

If the listing cannot be opened or installation is unavailable, send Hydroism the displayed message, your Windows version and region. Do not install an unsigned build as a substitute. For activation, send a device request from the intended PC; see page 4.

For the official product links and support, use [hydroism.com/roadrain](#) or [hydroism.amin@gmail.com](mailto:hydroism.amin@gmail.com). Keep project backups when changing installation channels.



# Read progress & review the new run

**Release review:** install the published Store edition and verify representative projects before engineering use. Store distribution does not replace independent review of inputs, assumptions and results.

## Progress describes actual work

The timeline follows entered milestones: input validation, data preparation, DEM analysis, checks, report generation and final publication. The current operation gives finer detail. Processed basin/crossing counts and transferred bytes have separate denominators. Unknown work remains indeterminate; elapsed time is not an ETA or an overall completion percentage.

Use Expand or Compact to change the progress panel. Milestone cards reflow with panel width; narrow tables scroll within their own region. Keyboard focus remains visible. Repeating a terrain pass does not restart the milestone lights. A completed calculation phase does not mean the task is ready: outputs must finish verification and publication. Completed or failed task clocks stop, and an interrupted worker receives a specific restart message.

## Optional source data and first-use downloads

The ordinary run calculates from the DEM without automatically selecting GEOGLOWS/TDX basins. Optional source checking can use external river/catchment data and may need downloads. These are GIS datasets, not Python packages; valid caches can be reused. Optional source failure is reported separately from the validity of the DEM result.

## Recompute and inspect

- 01** Save a backup .rdn/.hdn, reopen the project and confirm its terrain, road/outlets, rainfall and runoff assumptions. Old hybrid settings are normalized to the current DEM calculation basis on a new run.
- 02** First run with external comparison off. Inspect the DEM basin, retained IDs, coverage, flow paths, event peaks and volumes. A valid partial result identifies every omitted item and its cause.
- 03** If needed, enable external comparison and inspect the paired evidence. A reference mismatch is a review item, not an automatic veto of valid DEM outputs.
- 04** Generate both reports and check the study/per-basin maps, diagnostics, calculation version and downloaded files. Existing issued reports remain unchanged until regenerated.

Automated checks and synthetic runs do not replace Windows acceptance or independent engineering review. The unchanged Giandotti mean-height basis, recorded rainfall assumptions and preliminary Q/V opening limitations still require project review.