SOLIDCOMP OY

Laser Scanning Project Buyer's Guide

SolidComp is your laser scanning partner

See, manage, document and develop your industrial environment with unprecedented accuracy.

We deliver dimensionally accurate laser scanning, mobile scanning, drone imaging, coordinate measurement and 3D modelling projects for industrial environments. When needed, we bring the data directly into Reality Twin, where it can be used for design, maintenance, safety and decision-making.

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QUICK GUIDE TO PREPARING A REQUEST FOR QUOTATION

- Include the name of the enquiring company and contact person.
- Provide a short description of your site and what you want the project to achieve.
- State the size of the area to be scanned and the required measurement accuracy, including whether the accuracy requirement varies between areas or objects.
- Describe the location of the area or areas to be scanned at a general level.
- Provide any preliminary information about the area to be scanned, such as a floor plan, area map and photographs.
- Tell us what end products you need, such as a point cloud, surface model, 3D model, 360 images or a Reality Twin environment.
- Tell us whether the project already has a deadline or scanning dates linked to a shutdown.
- Tell us whether you already have a working coordinate system for the area.
- In confidential projects, it is useful to mention the possible need for a non-disclosure agreement as early as possible. We can agree on an NDA at the beginning of discussions.

A GUIDE TO PROCURING 3D DOCUMENTATION FOR INDUSTRIAL ENVIRONMENTS

This guide is intended for buyers, project managers, designers, maintenance specialists, HSE and HSEQ managers and technical decision-makers at production facilities who are planning laser scanning and digitisation projects in industrial environments.

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HOW TO PREPARE A GOOD REQUEST FOR QUOTATION

A thorough request for quotation clarifies and speeds up the project. A request for quotation for a laser scanning project does not yet require all technical details. Its purpose is to provide the service provider with enough information to assess the scope of work, select the right implementation method and identify potential risks and additional needs.

A good request for quotation answers at least the following questions:

- What site will be scanned?
- How will the data be used?
- How large and complex is the site?
- What accuracy and delivery formats are needed?
- When should the work be carried out and when is the data needed?
- What source material is available?
- Is there an existing coordinate system?
- Are there safety, permit or access restrictions at the site?
- Is post-processing, modelling or Reality Twin needed?
- Are special data structures needed for integrations or later use?

1. DESCRIBE THE SITE CLEARLY

Floor area alone is not enough to define the project. A 500-square-metre open hall is different from a 500-square-metre process area with several levels, pipework, equipment and limited access routes.

In the request for quotation, it is useful to state:

- the name and location of the site
- whether it is, for example, a factory, production line, process area, hall, outdoor area, tank area, mining site, building, yard area or another environment
- whether the site is indoors, outdoors or both, as weather and snow conditions affect outdoor scanning
- whether the area is in use, in production, in shutdown, under construction or under demolition
- what possible access restrictions apply to the area
- whether the area has several levels, confined spaces, high places, hazardous substances, a drone ban or other factors to consider

2. EXPLAIN THE INTENDED USE OF THE DATA

The intended use is the most important information in the request for quotation. The same site can be scanned in different ways depending on whether the data will be used for design, documentation, training or as the basis for a digital twin.

State whether the data is intended to support, for example:

- modification design
- an investment project
- pipework or equipment design
- demolition planning
- clash checking
- inspection of completed installations
- maintenance
- wear monitoring or inspection scanning
- shutdown planning
- safety planning
- onboarding or training
- tender calculation
- project communication
- documentation
- Reality Twin implementation
- centralising existing scan data

If there are several intended uses, they should be stated. The service provider can then propose a solution that serves both immediate and later use.

3. DEFINE THE AREA TO BE SCANNED

Where possible, the request for quotation should include:

- a floor plan or area map
- photographs of the site, where possible
- boundary of the production line or process area
- marked areas to be scanned
- information about critical points
- information about areas that do not need to be scanned

If the exact boundary is not yet known, state this. Often a preliminary

estimate can be made based on a general boundary and refined later, for example during a joint site review.

In defining the scope, it is useful to distinguish between:

- general scanning of the whole area
- objects that require particularly detailed scanning
- outdoor areas
- yard and roof areas
- investigation needs related to underground structures

4. DESCRIBE THE COMPLEXITY OF THE SITE

The complexity of the site directly affects scanning time and the number of scanning stations.

In the request for quotation, it is useful to describe:

- whether the space is open or full of structures
- whether there are many pipes, cable trays, service platforms or pieces of equipment in the area
- whether the site has several floors or levels
- whether visibility is limited
- whether there are many loose items, storage areas or movable objects
- whether work is taking place at the same time as other contractors
- whether there are blind spots that are especially important to access

Site complexity is not a problem. It simply needs to be taken into account in the method, schedule and cost estimate.

At this stage, the customer should also consider how the scanning personnel will move within the area. Who will act as the contact person on the scanning days?

5. DESCRIBE THE EXISTING COORDINATE SYSTEM

In the request for quotation, it is useful to mention:

- whether the facility or area has an existing coordinate system
- whether control points are available
- whether the control points are documented and reliable
- whether the facility's own coordinate system or a national coordinate system is used

- whether the new data should be tied to previous scan data
- whether the data may need to be supplemented in the future

If there is no coordinate system, we can assess whether the project should include creating or documenting one. This is particularly important if the goal is long-term data use.

6. STATE THE SCHEDULE AND CRITICAL DATES

In the request for quotation, it is useful to state:

- when scanning can be carried out
- when the data is needed for use
- whether the work is linked to a shutdown
- whether scanning must be done while production is stopped
- whether access to the area is limited to certain days or times
- whether post-processing or modelling has a separate deadline
- whether the data needs to be produced in phases or whether phased delivery is possible

The schedule can affect the method. If the data is needed quickly, post-processing may be limited, or basic data can be delivered first and modelled data later. If the goal is extensive 3D modelling or a Reality Twin environment, separate processing time is reserved for this in the schedule.

7. STATE SAFETY AND PERMIT REQUIREMENTS

In industrial sites, safety affects project implementation. If your operating practices are not already familiar to SolidComp, the request for quotation should include information about, for example:

- work permits
- access permits
- driving permits
- required safety training
- personal protective equipment requirements
- ATEX areas
- tank work
- working at height
- confined spaces
- chemicals or hazardous substances
- isolating areas
- production restrictions
- photography or drone imaging restrictions
- information security or confidentiality requirements

If the safety requirements are standard, more detailed site-specific information can also be provided at a later stage of the project.

If several contractors are working at the site at the same time or if scanning is planned for a precisely defined point in a contract, the timing should be planned well in advance and checked before implementation.

8. STATE WHAT DELIVERY FORMATS ARE NEEDED

It is useful to define in the request for quotation which data formats are needed for the deliverables. For example:

- point cloud
- coloured point cloud
- ReCap data
- E57 data
- mesh or surface model
- Navisworks-compatible data
- DWG or STEP model
- IFC or BIM-compatible data
- AVEVA E3D / LFD data
- 360 images
- drone-based area model
- reports or calculations
- Reality Twin environment

If the required formats are not yet known precisely, state the software used and the intended use. We can propose suitable delivery formats.

9. DESCRIBE POST-PROCESSING AND MODELLING NEEDS

Standard data processing is included in the price of a laser scanning project. Integrations and additional services are often customised case by case, which means they are priced separately.

In the request for quotation, it is useful to separate scanning and post-processing. If the modelling need is not yet defined, this is also useful information to include in the request for quotation. The quotation can then be phased if needed: first scanning and basic data, followed by a separate refinement of the modelling scope.

10. INFORMATION SECURITY, ACCESS RIGHTS AND DEPLOYMENT MODEL

Scanning data can be critical from a business and safety perspective, so it is important to agree in advance how the data will be handled, stored and delivered to the customer. In the request for quotation, state if your organisation has requirements related to, for example:

- data classification
- storage location, such as within the EU
- data retention time
- data transfer method
- access rights

If Reality Twin is also implemented as part of the procurement, the request for quotation should define already at an early stage whether the environment should be cloud-hosted in the EU or deployed on-premises.. SolidComp's operating model is based on secure information management and controlled sharing. We are ISO 27001 compliant.

11. DESCRIBE ANY REALITY TWIN NEED OR LATER USE

If the 3D data is to be used more broadly than in a single project, it is worth describing any potential Reality Twin need in the request for quotation. Mention, for example:

- whether the data should be placed in a centralised visual environment
- whether use is needed in a browser, desktop application or mobile device
- whether plans, documents or asset information should be included
- whether there is existing scan data that should be brought in
- whether integrations are needed now or in the future

Identifying a Reality Twin need does not mean that the software must be implemented immediately. It does, however, help produce the data in a way that makes it easier to use later.

11.1. DESCRIBE THE SYSTEMS IN USE AND REALITY TWIN INTEGRATION NEEDS

If the scanned area will be implemented in Reality Twin and the project is connected to asset management, maintenance or document management, the request for quotation should state which systems are in use. For example:

- SAP
- IBM Maximo
- M-Files
- SharePoint
- Vitec ALMA
- Pinja Novi
- Autodesk environments
- IFS
- other CMMS, ERP, EAM, DMS or design systems

Integrations are usually a separate package, but taking them into account already during the laser scanning phase can reduce later work.

12. STATE ANY RESTRICTIONS AND UNCERTAINTIES

A good request for quotation does not hide uncertainties. On the contrary, they should be brought forward. Mention, for example, if:

- the area's documentation is outdated
- not all access routes are known
- the production schedule may change
- part of the area may not be available
- other contractors may be working in the area
- the coordinate system is uncertain
- the quantity or quality of previous scan data is unknown
- scanning outdoor areas depends on the weather
- drone imaging may involve permits or wind restrictions
- part of the site may be closed for safety reasons

This helps the service provider plan the implementation realistically.

REQUEST FOR QUOTATION CHECKLIST

BASIC INFORMATION

- [ ] Company and contact person
- [ ] Name and address of the site
- [ ] Project objective
- [ ] Desired timing for laser scanning
- [ ] Desired delivery schedule for files
- [ ] Whether this is a new project, an update or a supplement to existing data

SITE AND SCOPE

- [ ] What is the intended use of the scanning?
- [ ] Indoor area, outdoor area or both?
- [ ] Estimated area or scope
- [ ] Floor plan, map, photographs, boundary image
- [ ] Areas to be scanned
- [ ] Objects requiring especially detailed scanning
- [ ] Areas that do not need to be scanned
- [ ] High, confined, hazardous or difficult-to-access objects

ACCURACY AND DATA LEVEL

- [ ] What level of accuracy is needed?
- [ ] Which objects require particular accuracy?
- [ ] Is a near-photographic view needed?
- [ ] Is design-ready data needed?
- [ ] Is a point cloud, surface model, 3D model or several types of data needed?

COORDINATE SYSTEM

- [ ] Does the facility have its own coordinate system?
- [ ] Are control points available?
- [ ] Is previous scan data available?
- [ ] Do you want the data tied to previous data?
- [ ] Is creation, checking or documentation of the coordinate system needed?

AVAILABLE SOURCE MATERIAL

- [ ] No source material
- [ ] Floor plans
- [ ] Layouts
- [ ] P&ID diagrams
- [ ] Asset lists
- [ ] Old point cloud or 3D model
- [ ] Photographs
- [ ] Area maps
- [ ] Control point lists

SAFETY AND PERMITS

- [ ] Are there special requirements for the storage, transfer or retention of scanning data?
- [ ] Is safety training required for SolidComp's field personnel?
- [ ] Are work, access or driving permits needed?
- [ ] Are there ATEX, chemical, tank or other special areas?
- [ ] Is special protective equipment required?
- [ ] Is photography or drone imaging restricted?

DELIVERABLES

- [ ] Point cloud: E57, PTS, PTX, ReCap or other
- [ ] Surface model: NWD, OBJ, STL or other
- [ ] 3D model: DWG, STEP, IFC, RVT or other
- [ ] 360 images
- [ ] Drone-based area model
- [ ] E3D / LFD data
- [ ] Reports, calculations or inspections
- [ ] Reality Twin environment
- [ ] Whether SAP or other integrations are wanted in the Reality Twin environment later

DESIGN SOFTWARE USED

- [ ] Which software is the data planned to be used with?

POST-PROCESSING

- [ ] Is 3D modelling needed? Which objects will be modelled?
- [ ] Are model sections needed?
- [ ] Is clash checking needed?
- [ ] Is a mesh or surface model needed?
- [ ] Is a comparison analysis needed, such as monitoring structural changes over time?
- [ ] Is data optimisation for viewing use needed?
- [ ] Is a documented modelling report or recording of assumptions needed?
- [ ] Are API, SSO or access rights solutions needed?
- [ ] Cloud or on-premises?

PROCURING A LASER SCANNING PROJECT

A well-defined laser scanning project produces dimensionally accurate and usable data to support design, maintenance, safety, project management, training and decision-making.

Procuring a laser scanning project includes:

- deciding what kind of source data is needed from the area
- forming a view of how the data will be used and how long it should serve the organisation
- defining the scanning need: what is sensible to scan now, what may be scanned later and what should be left outside the project scope
- selecting the scanning service provider

Requesting a quotation or making another enquiry never obligates you in any way. We value open communication and contact, including situations where you do not wish to proceed with a quotation at this time.

SCANNING DATA FOR ENGINEERING DESIGN FIRMS

Laser scanning can also be ordered by a party other than the owner of the production facility. We deliver scanning data for use in almost all design software.

If you work with an engineering design firm, the procurement needs usually come from them. It is useful to review client responsibility matters with your design partner in advance.

WHAT A LASER SCANNING PROJECT INCLUDES

In laser scanning, an existing physical environment is captured in digital point cloud form. A laser scanner measures a large number of points from its surroundings, and these points form a three-dimensional point cloud that reflects the real site at true scale.

A point cloud is not yet an actual 3D model. It is measured data that describes the surfaces, structures, equipment and environment detected by the scanner. Design data can be overlaid on it, surface models or 3D models can be created from it, and it can be connected as part of a digital twin.

For the buyer, the most important question is how the data will be used after the project. The intended use affects almost everything: the scanning method, accuracy requirement, scanning area, coordinate system, post-processing, delivery formats, schedule and cost.

The greatest value of laser scanning often comes from the fact that the same data can be used for several purposes and projects. For example, scanning can support design now, maintenance later and documentation management in the long term.

MAIN LASER SCANNING METHODS

TRADITIONAL TRIPOD LASER SCANNING

Tripod laser scanning is a method well suited to dimensionally accurate industrial documentation. The scanner is placed at a measurement station, from which it measures its surroundings in 360 degrees. A large number of points can be measured from one station, and by combining several stations a comprehensive point cloud can be produced for a larger site.

Tripod laser scanning is particularly suitable for sites that require high measurement accuracy and reliable geometry. Typical use cases include process areas, paper machines, pipework, crushers, mills, production lines, equipment and other sites where measurements must support design, installation or inspection.

Strengths: Accuracy, geometric reliability and suitability for demanding industrial environments.

Limitations: Scans are captured from individual stations, so large or highly complex sites require several stations. This affects the duration of fieldwork, the amount of post-processing and the project price.

MOBILE LASER SCANNING

Mobile laser scanning measures the environment while moving. It is particularly suitable for rapid general mapping of large areas, access routes, large halls, factory sites and spaces where the main priority is to obtain a comprehensive overview quickly.

Strengths: Speed. Mobile laser scanning can be an appropriate choice when the area is large, the schedule is tight or a general 3D dataset is needed for later review.

Limitations: Accuracy is lower than with traditional tripod laser scanning, so it does not replace more detailed scanning in sites where millimetre-level measurement data is required.
In many industrial sites, the best solution is a combination: broad general scanning with a mobile method and more detailed scanning of critical areas with a tripod scanner.

HANDHELD SCANNING

In the digitisation of industrial environments, handheld scanning complements other data when the site contains small or difficult-to-access details. The use case is usually limited: individual components, small pieces of equipment or objects that require highly detailed scanning. If scanning requires sub-millimetre accuracy, it is carried out with a handheld scanner.

DRONE IMAGING AND PHOTOGRAMMETRY

Drone imaging is not laser scanning. It is a documentation method based on photography. The images can be used through photogrammetry to create 3D surface models, area models and visual overviews.

Drone imaging is particularly suitable for outdoor areas: factory yards, roof structures, the tops of tanks, facades, storage areas, terrain and other sites that are difficult or risky to document from the ground alone.

Drone data can be combined with laser scanning data if the different datasets are tied to the same coordinate system. This is useful, for example, when indoor laser scanning, outdoor drone data and, where

needed, additional ground-based scanning are to be combined into one complete dataset.

GROUND-PENETRATING RADAR

Ground-penetrating radar is used to locate underground structures such as pipes, cables, ducts, foundations or other hidden objects. It is particularly useful on old factory sites where documentation may be incomplete, fragmented or outdated. Ground-penetrating radar is typically a tool for risk management, design and preparation for excavation work.

Ground-penetrating radar does not produce data that is as directly visually interpretable as laser scanning of the visible environment. The results require expert interpretation. SolidComp delivers ground-penetrating radar as a complete service that includes interpretation of results and consulting.

GAUSSIAN VISUALS

Gaussian Visuals is a method focused on visual clarity and a near-photographic 3D view. It complements dimensionally accurate point clouds, surface models and technical 3D data, but does not replace them.

Gaussian Visuals is useful when data is intended especially for communication, training, onboarding, stakeholder discussions or understanding the site for users who do not work with point clouds or CAD models on a daily basis.

A high-quality Gaussian-level end result requires a dedicated scanner suitable for this purpose, so the need should be identified already during project planning.

ONE METHOD OR A HYBRID IMPLEMENTATION?

In industrial sites, one method is not always enough. For example, digitising a large production facility may include:

- mobile laser scanning for large indoor areas
- tripod laser scanning for critical equipment and process areas
- drone imaging for roofs, yards and facades
- supplementary ground-based scanning for blind spots
- ground-penetrating radar to identify underground structures
- 3D modelling for design or documentation

- preparing a Reality Twin environment for managing and sharing the data

The buyer does not need to choose the method before the first discussion. However, it is worth describing the intended use clearly in the request for quotation so that we can propose the right combination.

WHAT SCANNING ACCURACY MEANS

In laser scanning and complementary methods, device- and method-specific accuracy classes are often used to give the customer an initial understanding of the purposes for which different methods are suitable.

The indicative accuracy classes used in SolidComp's laser scanning project price estimate calculator are:

- +/- 1 mm – Traditional tripod laser scanning
- +/- 10 mm – Mobile laser scanning
- +/- 20 mm – Highly visual data (Gaussian Visuals)
- +/- 100 mm – Drone imaging
- +/- 20 mm – Drone imaging + laser scanning (area model)

These are device accuracies stated by the equipment manufacturers. The accuracy achieved in practice may vary depending on site conditions, measurement distance, visibility, scanning method and post-processing. Project-specific accuracy is always defined according to the intended use.

A point cloud is usually more accurate than a surface model produced from it or a separately modelled 3D model. When points are converted into a mesh or objects are modelled based on the point cloud, the result can be very useful for its intended purpose, but it is not the same as the original measured point cloud.

The buyer should define accuracy through the intended use. For example, "we need dimensionally accurate data around a paper machine as source data for pipework design" is better initial information than simply saying "we need data that is as accurate as possible".

An unnecessarily high accuracy requirement can increase the scope of the project without providing corresponding added value. An accuracy level that is too low, on the other hand, can make the data insufficient for design or installation inspection. Our specialists can help you decide on a suitable accuracy level that supports both current and future needs.

DEFINING MEASUREMENT ACCURACY

The required measurement accuracy can be defined, for example, by specifying the maximum permissible error for the point cloud. In this context, permissible error means a 95% confidence level, meaning that 95% of random test measurements on unambiguous objects fall below the required value.

The permissible error can be expressed, for example, as follows:

- +/- 25 mm for undefined building objects
- +/- 10 mm for objects requiring particular dimensional accuracy
- +/- 100 mm for area-type terrain objects

COORDINATE SYSTEM AND CONTROL POINTS

The coordinate system is one of the most important considerations if the data is to be used in the long term. If scan data is tied to the facility's coordinate system, data from different projects can be combined reliably, and the same base data can be supplemented later.

If the production facility already has a working and documented coordinate system, this should be mentioned in the request for quotation. If there is no coordinate system or if its reliability is uncertain, this should also be stated. In this case, the project can include checking, updating or building the coordinate system.

A well-defined coordinate system is especially important when:

- several scanning projects will be carried out on the factory site
- the data will be supplemented over several years
- data produced by different parties will be combined
- scan data is used as source data for design
- data is taken into Reality Twin or another long-term management environment
- changes are being made that must be positioned accurately in relation to the existing environment

WHAT DELIVERABLES CAN BE PRODUCED FROM LASER SCANNING?

The end result of a laser scanning project can be narrow or broad in scope. The delivered data should be defined according to who will use it and in which software.

Typical delivery formats include:

- Point clouds: for example E57, PTS, PTX and ReCap.
- Surface models: for example NWD, OBJ and STL.
- 3D models: for example DWG, STEP, IFC or other agreed formats.
- Images: 360 images and standard photographs.
- Special formats and viewing environments: for example Reality Twin, Scene2go, AVEVA LFD and agreed reports, calculations or measured field points

In SolidComp's industrial laser scanning projects, we generally deliver the data as:

- a point cloud in ReCap and E57 formats
- a triangulated and coloured mesh model for Navisworks use

We can deliver datasets in almost any required file format.

The buyer should make sure that the formats are suitable for their own operating environment. If the data will be used by, for example, an engineering design firm, maintenance, production, the HSEQ team and external contractors, different user groups may have different needs.

POST-PROCESSING AND MODELLING

Raw data is not final usable data. After fieldwork, the data is processed, scans are combined, tied to a coordinate system where necessary, checked and exported to the agreed formats.

Post-processing can include, for example:

- 3D modelling / solid modelling based on the point cloud
- preparation of E3D, LFD or other special datasets
- model sections
- combining and registering point clouds
- tying data to a coordinate system

- cleaning and optimising the data
- colouring and combining images
- creating a mesh or surface model
- producing design formats
- reports, calculations and inspections

In 3D modelling, it is important to agree what will be modelled and at what level of accuracy. Will all visible geometry be modelled, or only selected equipment, pipes, platforms or structures? Is the model needed for design, visualisation, clash checking or documentation? How will blind spots, assumptions and areas that cannot be measured be handled?

A good modelling project also includes a clear scope. Otherwise, there is a risk that the customer expects and pays for a complete model of everything, even though the practical need only concerns selected objects.

Modelling should be defined in accordance with PSK 3402 and PSK 3403 standards when the data is used as source data for industrial design, documentation, modification work or long-term maintenance. PSK 3402 supports the definition of point cloud and modelling procurement, while PSK 3403 covers the use of point cloud data in industry. The standards help define more clearly the scope of modelling, accuracy, delivery formats, coordinate system and later use of the data.

ANALYSES: MEASURING WEAR, DEFORMATION AND FLATNESS

Laser scanning is not only a documentation method. The measured geometry can be compared either with design geometry or with a previously measured condition. This provides numerical information on what has actually happened at the site.

TYPICAL INDUSTRIAL ANALYSIS NEEDS INCLUDE THE FOLLOWING:

Wear and lining thickness analysis. Mills, crushers, flue gas ducts and equipment, silos, hoppers and tanks wear unevenly. By scanning the inner surface during a shutdown and comparing it either with nominal geometry or a previous measurement, the wear distribution

can be obtained across the entire surface, not only from individual measurement points. This supports planning of lining replacement intervals, estimation of material use and defining the shutdown scope in advance.

Deformation and structural analysis. Steel structures, support structures, tank shells and supporting frames can deform due to load, temperature, settlement or damage. In the analysis, measured geometry is compared with the design or previous condition, and deviations are presented as measured values and cross-sections. Use cases include structural condition assessments, damage investigations and source data for repair planning.

Floor straightness and flatness analysis. Hall floors, machine foundations, crane runway areas and installation bases often require information on how much a level deviates from horizontal or from the designed elevation. The scan is used to produce an elevation deviation map and cross-sections, based on which levelling needs, installation suitability or the suitability of a machine foundation can be assessed.

Inspection of installations and as-built conditions. Comparing the completed installation with the design shows deviations before they are discovered during commissioning.

What the buyer should define for an analysis need: The reliability of an analysis depends on the comparison reference. In the request for quotation, it is useful to state:

- what the measured geometry will be compared against: nominal or design geometry, a previous scan or both
- whether previous data is available and in which coordinate system it is
- the scale of deviation of interest, such as millimetres or centimetres
- whether the result is required as a map, cross-sections, a table or a report
- whether the need is a one-off inspection or recurring monitoring

In recurring monitoring, the coordinate system is decisive. If datasets from different points in time are not tied to the same documented coordinate system, the measured "change" may partly be a registration difference rather than a real change in the site. This should be solved in the first project, even if the monitoring need is only in the future.

It is also important to note that the detectable change threshold is not the same as the accuracy stated by the device. It is affected by measurement distance, surface material, the control point network, registration and the comparison method. We define case-specifically the accuracy level at which the analysis can realistically be produced and record this as part of the delivery.

DIGITAL TWIN AND 3D DATA MANAGEMENT

For data use, an individual point cloud may be enough if the organisation has its own tools and expertise to use it. In many production facilities, however, data accumulates from several projects, different years and different suppliers. It then becomes necessary to decide how the data will be kept findable, up to date and usable.

Reality Twin is a visual digital twin environment into which point clouds, surface models, 3D models, images, designs and asset information can be brought, for example. Its purpose is not to replace all existing systems, but to make information related to the physical environment easier to use in the correct location context.

Implementing Reality Twin should be considered especially if:

- scan data is to be used in several projects
- the data is needed by several roles in the organisation
- 3D data should be centralised into one view
- maintenance, design, safety or production need the same visual source data
- documents or asset information should be linked directly to physical locations
- previously produced scan data should be used in a centralised way
- future integrations with maintenance, document management or ERP systems are planned

When 3D data is used as part of daily operations, integrations can be a significant part of the overall solution. Systems that can potentially be connected include:

- maintenance systems and EAM/CMMS solutions, such as SAP or IBM Maximo
- document management systems, such as M-Files or SharePoint
- asset management systems
- design and CAD/BIM systems
- IoT and sensor data sources
- operations and production systems

Integrations do not need to be finalised during the first laser scanning project, but their potential need should be identified. Integrations affect, for example, how assets are identified, what metadata is collected, how the coordinate system and asset hierarchies are defined and what access rights are needed.

If the goal is to later connect the 3D model to a maintenance or document management system, the request for quotation should state at the beginning which systems are used in the organisation.

INFORMATION SECURITY, ACCESS RIGHTS AND DEPLOYMENT MODEL

If the project outcome is a file delivery of laser scanning data, information security is primarily related to the handling, distribution and storage of files. If the data is taken into a browser-based, cloud or on-premises environment, such as a digital twin or another user interface, the significance of access rights and information security increases.

The buyer should clarify already at the beginning of the procurement:

- whether the data should be handled in a cloud environment or whether the organisation requires an on-premises solution
- whether the organisation's own authentication, such as Microsoft Entra ID or another SSO solution, will be used
- whether role-based or area-based access rights are needed
- whether contractors or partners can use part of the data
- whether the data contains safety-classified or otherwise restricted information
- where the data may be stored and how it is delivered

PRICE AND COST FACTORS

The price of a laser scanning project is affected by factors such as:

- the size of the area to be scanned
- the relationship between indoor and outdoor areas
- site complexity
- required accuracy
- selected scanning method
- number of scanning stations
- possible blind spots and special objects
- site location and travel costs
- permits, inductions and safety requirements
- need for a coordinate system
- amount of post-processing
- scope of 3D modelling
- delivery formats
- possible Reality Twin implementation
- need for integrations
- schedule urgency

The buyer should use the laser scanning project price estimate calculator on SolidComp's website for an initial indicative estimate. However, the actual quotation should be requested separately once the technical source information for the project has been described in sufficient detail.

SOLIDCOMP IS YOUR RELIABLE LASER SCANNING PARTNER

SolidComp has extensive experience in demanding industrial sites in Finland and internationally. We deliver laser scanning projects as a complete service, from defining the need to fieldwork, data processing, 3D modelling and, where needed, implementation of a Reality Twin environment.

For the customer, this means an easier and more predictable project. SolidComp's specialists help from the very beginning to define the best possible project scope. When scanning, post-processing and the later use of data are planned together, unnecessary work is avoided and the end result serves the buyer's need.

The complete service makes the project cost-effective and straightforward for the customer. When the same partner is responsible for measurement, the coordinate system, data processing, modelling and later use, information flow improves and responsibilities remain clear.

Our offering also covers expert services such as analyses for monitoring structural changes, interpretation of ground-penetrating radar results, tendering consulting and the provision of impartial third-party statements.

SolidComp is your laser scanning partner

We deliver dimensionally accurate laser scanning, mobile scanning, drone imaging, coordinate measurement and 3D modelling projects for industrial environments. When needed, we bring the data directly into Reality Twin, where it can be used for design, maintenance, safety and decision-making.

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