

Procurement Guide

For the European open tender for InSAR based deformation service for the Dutch built environment (2026)

Contracting Authority:

The Netherlands Organisation for Applied Scientific Research (TNO)

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Definitions

In this Procurement Guide, words written with an initial capital, both singular and plural, shall have the following meanings. Terms not mentioned in this list but defined in the Dutch Public Procurement Act [*Aanbestedingswet*] have the meaning assigned to them in the Procurement Act.

Contracting Authority	: TNO, Netherlands Organisation for applied scientific research
Procurement Guide	: the present document describing the Procurement Procedure.
Procurement Procedure	: the present European public Procurement Procedure by which the conclusion of the Contract is tendered.
Dutch Public Procurement Act	: Dutch Public Procurement Act 2012 (hereinafter: "Procurement Act" or "Aw") concerning the implementation of procurement directives 2014/23/EU, 2014/24/EU and 2014/25/EU
Procurement Documents	: all documents prepared by or on behalf of TNO for the purpose of the Procurement Procedure.
Announcement	: the Notice of Procurement Procedure at www.TenderNed.nl .
Annex(es)	: The Annexes to the Procurement Guide, namely: <ul style="list-style-type: none">• A01 to A.[...] - i.e. the formats to be used by the Tenderer in preparing and submitting its Tender,• B01 to B.[...] - i.e. the formats to be used by the intended beneficiary for the purpose of submitting supporting documents relating to the ESPD at the request of TNO,• C01 to C.[...] - i.e. documents and (additional) information, which form part of the Procurement Guide and are not intended for submission by the Tenderer or the intended beneficiary.
Combination	: an alliance of enterprises tendering jointly as a single Tenderer, each of the Combination members being jointly and severally liable for the performance of the Contract.
Third Party	: natural persons on whom, or legal entities on which, a Tenderer may rely in order to meet the Suitability Requirements of financial and economic standing and/or technical and professional competence, irrespective of the legal nature of its links with said Third Party.
Suitability Requirements	: the requirements imposed by TNO on Tenderers not excluded on the basis of the Grounds for Exclusion, which Tenderers must meet as a minimum in order to be eligible for the award of the Contract, on penalty of invalidation, as described in Section 5.
Award criterion	: the criterion used by TNO in the assessment and ranking of Tenders for the purpose of awarding the Contract, as referred to in Section 6.
Award decision	: the written communication of TNO's choice of the Tenderer with which it intends to conclude the Contract or its choice not to conclude a Contract.
Tenderer	: an entrepreneur submitting a Tender.
Tender	: an offer/quotation made by a Tenderer.
Minimum Requirements	: the requirements set by TNO regarding the manner in which the Contractor must perform the Contract.
Information Notice	: the document containing further information about the Procurement Procedure and/or the Procurement Documents and in which TNO presents and answers the Tenderers' questions in anonymised form.
Contractor	: the Tenderer with which the Contract is concluded.
Contract	: the Contract concluded with the Contractor pursuant to the outcome of the Procurement Procedure e.g. the Purchase Order provided to the Contractor, referring to this Tender procedure and the Tender concerned. The Contract is concluded after it has been signed by TNO and the Contractor.

Grounds for Exclusion	: grounds for exclusion from participation in the Procurement Procedure, which – depending on the provisions of the Procurement Documents – relate to circumstances concerning the (person of the) Tenderer, the (person of the) Third Party and/or the (person of the) Subcontractor.
European Single Procurement Document	: the declaration as referred to in Article 2.84(1) of the Procurement Act, which TNO has attached to the Procurement Guide as Annex A01 (hereinafter: ESPD).

1 Contracting Authority and Contract

1.1 TNO

TNO, Netherlands Organisation for applied scientific research, hereinafter referred to as "TNO", is a modern unit-driven Research & Knowledge organisation, established by law in 1932 to make scientific research applicable to enterprises, government bodies and civil-society organisations and thereby strengthen innovative capacity.

TNO is a public-law legal entity and operates under the ministerial responsibility of the Dutch Minister of Economic Affairs but, as an organisation, performs its tasks independently.

Every day, TNO's employees are working on the development and application of innovative research. TNO provides contract research and specialist consultancy and licenses patents and specialist software. TNO starts up new enterprises to bring innovations to market.

TNO's strength lies in its ability to combine diverse fields of science to create ground-breaking, sustainable solutions. Increasingly, TNO does so by collaborating with government bodies, industry, other knowledge institutions and civil-society organisations, both nationally and internationally. Through its work, TNO stimulates economic growth and social innovation.

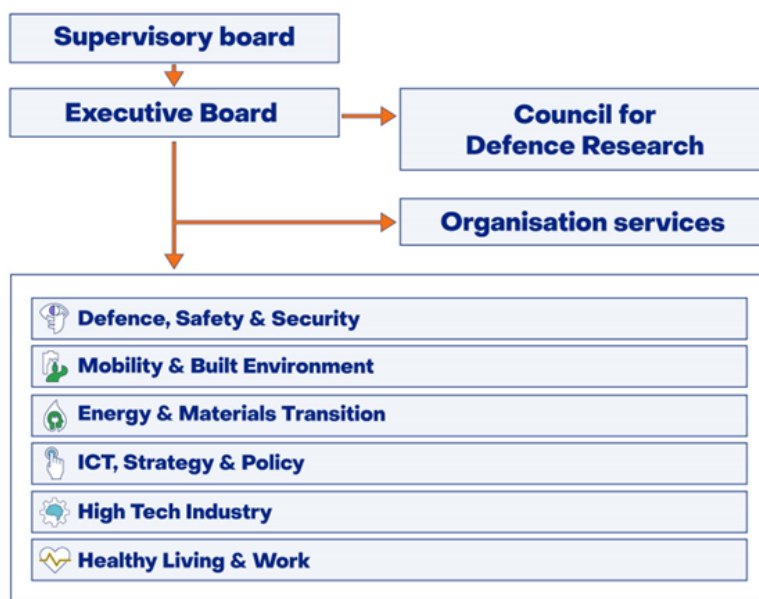
TNO's mission is creating impactful innovations for the sustainable wellbeing and prosperity of society. How TNO fulfils this mission is described in its strategic plan for 2022-2025 and focuses on four societal challenges: a safe and secure society, a sustainable society, a healthy society and the digitalisation of society and industry.

TNO's goal is to connect, change and accelerate: Innovation for Life

For more information on TNO, see: www.TNO.nl.

1.2 The TNO organisation

With TNO's highly ambitious approach comes an organisational form that effectively facilitates this ambition and a culture that challenges employees to innovate and collaborate. The TNO organisation has a unit structure as shown below:



The six organisational units (Units) are market-oriented and recognisable to TNO's customers and partners. The Units are based across the Netherlands with a total of 21 locations/research facilities.

The head office is located in The Hague and accommodates the central staff bodies (Shared Services Organisation) and from where the entire TNO organisation is supported and managed.

The Procurement department is effecting the procurement on behalf of TNO in close cooperation with the AGE (TNO Advisory Group for Economic Affairs) department. TNO AGE advises the Ministry of Climate Policy and Green Growth (KGG) on the implementation of the Mining Act and on issues related to the energy transition, local and regional authorities, and other stakeholders in the public domain.

Procurement, as part of the Finance & Procurement department, is responsible for organising and executing procurement processes and ensuring that these processes are in line with the TNO objectives.

1.3 Purpose of the Tender

The purpose of the current Tender Procedure is to select one (1) Contractor to supply high-resolution InSAR deformation measurements over the South Limburg mining district using high-resolution (lower than five meters) SAR data, covering the

period from 2015 to end of 2025, to support the assessment of potential damage to the built environment caused by historical coal mining activities. This supply and the manner in which it is to be supplied must comply with the requirements as set out in the Procurement Documents.

1.4 Term of the Contract

TNO aims to have the Contract commence on the date mentioned in the schedule of paragraph 2.1. The Contract will consist of a Purchase Order to be sent based on the offer of the winning Tenderer.

1.5 Current situation and vision of future situation

A detailed deformation analysis of the Dutch coal-mining region based on RADARSAT-2 is currently available. As part of ongoing research into the after-effects of historical coal mining, TNO has been using the available Level-2 products in combination with geological, geomechanical and geohydrological models to assess phenomena such as sinkholes and differential displacements.

With the establishment of the Institute for People, Environment and Mining (I3ML), the Commission for Mining Damage (CM) has initiated in-depth assessments of potential mining-related damages in the region. To support this work, higher-resolution InSAR data with a spatial resolution finer than 5 metres in X-band is required. For the CM, assessments focusing on individual residential buildings within the designated area of interest are required. Deformation insights derived from InSAR are interpreted together with other relevant sources of information, including geological conditions, historical subsurface mining activities, rising mine-water levels, and additional factors that may influence ground or structural movement.

To enable these assessments, the CM requires detailed, building-specific InSAR reports. At a minimum, these reports must include:

- A clear description of the temporal evolution of ground movement in the vicinity of the building;
- Quantification of curvature, tilt, and other deformation characteristics of the building itself and surrounding structures;
- Identification of anomalous or irregular deformation patterns at or around the building.

Producing these insights requires a long, consistent, high-resolution and high-accuracy InSAR time series. In addition, it is essential that CM analysts are able to visually inspect the underlying measurement points and evaluate the temporal coherence of deformation signals. Therefore, the contractor shall provide an interactive viewer in which Persistent Scatterer Interferometric (PSI) and Distributed Scatterer Interferometric (DSI) points, with an explicit and unambiguous distinction between the two in the viewer, building reports and associated deformation characteristics can be queried and examined.

Given the nature of CM's work, all building-specific reports are for internal use only and form part of the formal assessment of damage claims. Transparency and explainability of the processing chain and resulting interpretations are therefore critical. Each building report must clearly document how the results were obtained and present the underlying evidence in an accessible and reproducible manner.

In parallel with the CM-related activities, TNO's research in this field will continue. The acquired Level-2 and Level-3a products will be used to strengthen scientific understanding and further develop models related to the previously mentioned after-effects - including sinkholes, differential deformation and mine-water dynamics - alongside other relevant mining-related mechanisms. These datasets form an essential component of TNO's broader Limburg research programme.

The results and insights derived from TNO's research will be of a public nature. They are intended to support the Ministry for Climate and Green Growth (KGG) and to provide transparent, scientifically grounded information to the public. The newly acquired data will therefore serve a dual purpose: enabling building-level assessments for the CM while also contributing to national knowledge development on long-term mining-related ground deformation.

With this tender, TNO aims to acquire the data necessary to support both the CM assessments and the continuation of TNO's research and public knowledge-building activities.

1.6 Objective, scope and content of the proposed Contract

Following the present Procurement Procedure, TNO intends to award a contract for the **InSAR based deformation service for the Dutch built environment (2026)** in accordance with this Procurement Guide.

The Contract to be entered into provides for the supply of products and the provision of services, as specified in detail in the Programme of Requirements (Section 8).

In general terms, the contract involves:

- Acquisition of high-resolution (lower than five meters) SAR imagery
- InSAR processing including processing of SAR to InSAR and time series
- Derivation of Level-2 products from InSAR processing (see Annex CO4 for specification of variables and file structure)
- Derivation of Level-3 products from Level-2 (see Annex CO4 specification of variables and file structure)
- Online portal for querying of timeseries and building specific reports
- Quality control (QC) assessment
- Reporting (Processing report, QC report, and individual building reports)

1.6.1 Product level definition

The product level definition throughout this Tender is defined as follows and further detailed in Annex CO4:

Level-1 SLC (Single Look Complex): The Level-1 SLC product consists of focused data, and delivered in slant-range geometry.

Level-2 LoS (Line-of-Sight) time series: A matrix dataset of measurement points where each point includes and not limited to displacement time series, with values per SAR acquisition as well as velocity, acceleration and error estimates. Data is generated at full for both ascending and descending tracks, distributed as a tabular geospatial database (CSV as a minimum).

Level-3a Vertical/Horizontal time series displacements: A product derived from the ascending and descending Level-2 LoS datasets consisting but not limited to the orthogonal displacement components (vertical/horizontal). The Level-3a Vertical/Horizontal time series displacements layers are resampled to a grid. The format is a geotiff which has to be a multi-band geotiff in which the information layers are stacked (geotiff as a minimum).

Level-3b Tilt/Curvature (Object-based Structural Deformation Parameters): A product consisting of object-based deformation indicators derived from the Level-2 Line-of-Sight (LoS) time series and Level-3a Vertical and Horizontal time series displacement components. This product delivers, per-building, estimates of and not limited to tilt and curvature components, capturing differential deformation patterns across each building footprint. Additional building-level metrics will be defined in consultation with TNO at the start of the project and shall be proposed by the Tenderer. Results are provided as a tabular geospatial database (CSV as a minimum), containing one record per building with all the defined parameters and other proposed metrics.

1.6.2 Tilt and curvature definitions

Tilt: Tilt is defined as the change in subsidence between two points divided by the horizontal distance between those points. Tilt therefore represents the first derivative of the subsidence profile. While the sign of tilt is not inherently critical, the convention typically adopted is that a positive tilt indicates increasing subsidence in the direction of measurement. Tilt is a dimensionless quantity, as it represents a ratio of vertical displacement to horizontal distance. For this tender, it is recommended to express tilt components in unit of millimetres per kilometre (mm/km).

Curvature: Curvature is defined as the rate of change of tilt, i.e. the second derivative of subsidence. It is calculated as the change in tilt between two adjacent segments of the tilt profile divided by the average length of those segments. Curvature is commonly expressed as the inverse of the radius of curvature, with units of km^{-1} (or 1/km). If required, the curvature value may be inverted to obtain the radius of curvature, which is typically expressed in kilometres. For the purposes of this tender, it is recommended that curvature components be reported in either inverse kilometres (km^{-1}) or as the radius of curvature (km).

Curvature typically varies across e.g., a subsidence profile: it is convex (hogging) near the edges of a subsiding area and becomes concave (sagging) toward the centre of the subsidence bowl. By convention, convex (hogging) curvature is assigned a positive sign, while concave (sagging) curvature is assigned a negative sign.

The definitions and conventions adopted here for tilt and curvature follow the following reference: *Subsidence from Coal Mining Activities – Background Review, Commonwealth of Australia (2014)*. More theoretical treatments can be found in *Kratzsch, H. (1983), Mining Subsidence Engineering, ISBN-13: 978-3-642-81925-4*.

2 Procurement Procedure

The procurement procedure is carried out in accordance with the relevant regulations stipulated under the Aw. TNO has opted for the public procedure. This tender has been published on and will proceed through TenderNed, www.TenderNed.nl.

2.1 Schedule for the Procurement Procedure

The proposed schedule for the Procurement Procedure is as follows:

No.	Action points	Date
1.	Publication of Announcement of Contract (at www.TenderNed.nl)	16 February 2026
2.	Closing date for submission of questions by Tenderers	5 March 2026, 11:00 CET
3.	Issue of (final) Information Notice	12 March 2026
4.	Closing date and time for submission of Tenders	30 March 2026, 11:00 CET
5.	Notification of Award Decision	20 April 2026
6.	Closing date for submission of supporting documents by intended beneficiary	27 April 2026
7.	Closing date for submission of challenges	11 May 2026
8.	Final award	12 May 2026

The dates are indicative. TNO reserves the right to change the dates, subject of course to the minimum periods as laid down in the Dutch Public Procurement Act [*Aanbestedingswet*]. Affected enterprises will be notified of any change in the schedule via TenderNed.

2.2 Tender conditions

As part of the Procurement Procedure, TNO applies the following conditions.

2.2.1 Agreement

Submission of the Tender implies that the Tenderer agrees to the terms and conditions of the Procurement Procedure and agrees to the contents of the Tender Documents, including any unwelcome answers in the Information Notice.

2.2.2 Formats

The Tenderer should use the formats as included in the Annexes to this Procurement Guide. It is expressly not permitted to make changes to these formats, unless TNO has expressly stated otherwise.

2.2.3 European Single Procurement Document (ESPD)

The Tenderer must submit an ESPD as specified in the instructions given below. The Tenderer must use the ESPD as appended in Annex A01. For legally valid signature of the ESPD, see Section 2.2.20 of this Procurement Guide.

To access and complete the ESPD electronically, the Tenderer must only use the Adobe Reader software program, preferably the latest version. Opening the ESPD in a program other than Adobe Reader may result in the ESPD appearing different from the version pre-filled by TNO and/or showing errors. Submission of an ESPD that differs from the version as provided by TNO with the Procurement Documents will render the Tender invalid, unless TNO considers this disproportionate in a specific case. The responsibility for opening the ESPD in the prescribed manner and submitting the correct version thereof rests with the Tenderer.

2.2.4 Precedence of Procurement Documents

In the event of discrepancies between the contents of the various Procurement Documents, the following order of precedence applies during the Procurement Procedure, in descending order of prevalence:

- Information Notice(s): from most recent to least recent;
- Procurement Guide's Programme of Requirements;
- The Price Sheet (Annex A03);
- Announcement.

2.2.5 Contact person and communication

All communication relating to the Procurement Procedure, with the exception of Section 2.3 "Further Information (questions)", will take place via TenderNed only and in the manner specified in this Procurement Guide.

If direct contact with TNO is specified/necessary, communication will take place exclusively with the TNO contact person stated below, in writing at all times, via the TenderNed messaging module.

Name : R.M. Peddemors
Position : Procurement Advisor
Department : Procurement
Postal address : PO Box 96800, NL-2509 JE The Hague

Tenderers cannot derive any rights from verbal statements, undertakings and suggestions made by TNO employees and/or consultants in relation to the Procurement Procedure and/or the Procurement Documents. Tenderers may only rely on information provided in writing by or on behalf of TNO.

On penalty of exclusion, enterprises may not contact persons other than the contact person with regard to the Tender, unless TNO considers this disproportionate in a specific case. Nor is it permitted, on penalty of exclusion, to communicate with the contact person in any way other than via TenderNed, unless TNO considers this disproportionate in a specific case.

An instruction regarding digital procurement via TenderNed can be found by selected bidders in TenderNed's support environment (<https://www.TenderNed.nl/cms/help>). If you have any questions or are unclear about the operation of TenderNed (for example, if you are unable to log in or submit documents) or if TenderNed malfunctions, the TenderNed service desk can be contacted from 8.30 a.m. to 4.30 p.m. on working days on 0800 - 836 33 76 or via servicedesk@TenderNed.nl.

2.2.6 Language

Tenders must be written in the English language. Tenders in languages other than English will be excluded from participation. Official documents that cannot be submitted in the English language may be written in the language of the document's country of origin. Upon request, the Tenderer shall arrange a translation by a sworn interpreter-translator. The costs incurred shall be borne by the Tenderer.

2.2.7 Single Tender

An enterprise may only be involved in one (1) Tender: either as an independent Tenderer, a member of a Combination, or a subcontractor or Third Party. With regard to enterprises belonging to the same group as referred to in Sections 2:24b and 2:24c of the Dutch Civil Code, more than one company from the group may submit a Tender, provided that the enterprises demonstrate, at TNO's request, that the Tenders have been drawn up independently and autonomously.

Where this cannot be demonstrated by all the Tenderers concerned, all the Tenders emanating from enterprises belonging to the same group will be excluded.

2.2.8 Combination

A Combination of enterprises may submit a Tender jointly as a single Tenderer. To do so, the following conditions must be met.

- All members of the Combination shall submit their own completed and validly signed ESPD. This states that registration takes place in Combination and, if selected, registered.
- The ESPD specifies which member of the Combination will fulfil the role of coordinator. The coordinator is the only member with which TNO corresponds regarding the Procurement Procedure and, where applicable, the Contract. The coordinator must have the power to legally bind all members of the Combination in respect of the Procurement Procedure and, where applicable, (the award of) the Contract.
- All members of the Combination must individually declare in their own ESPD whether they are subject to Grounds for Exclusion (see Section 5.1). The members of the Combination will each be assessed individually against the Grounds for Exclusion. If one or more Exclusion Grounds apply to one or more members, the entire Combination will be excluded.
- The Combination as a whole will be assessed against the Suitability Requirements, subject to any exceptions referred to in Section 5.2. In the ESPD, the Combination members declare how the Combination meets the Suitability Requirements. If the Combination as a whole does not meet all Suitability Requirements, the submission of the Combination will be laid aside.

By submitting the Tender, the Combination members declare that all the participants in the Combination are jointly and severally liable for the fulfilment of the obligations arising from the Procurement Procedure, as well as from any performance of the Contract. By submitting the Tender, the Combination members declare that the coordinator is authorised to validly represent the Combination and the individual Combination members in all matters relating to the Tender and, in the event of the award of the Contract, the Contract.

2.2.9 Subcontracting

A Tenderer may use one or more subcontractors to carry out the work. A cooperative venture in the form of a main contractor and subcontractors may tender as single Tenderer. The main contractor shall remain at all times responsible and liable for all work, including any work performed by a subcontractor. TNO recognises the following subcontractors:

Reliance on subcontractor to meet Suitability Requirements

Where the Tenderer relies on the financial and economic standing and/or technical and professional competence of a subcontractor to meet the Suitability Requirements, said subcontractor shall also be deemed a Third Party. In this case, the Tenderer must follow the instructions as described in Section 2.2.10 concerning reliance on the resources of a Third Party or Parties. All Third Parties must be listed in Section IIC of the ESPD (Annex **A01**).

Deployment of subcontractor to perform the contract

Where a Tenderer meets the specified Suitability Requirements independently but wishes to use one or more subcontractors to carry out the work, the Tenderer need not disclose the identity of the subcontractor(s) in the Tender. While the Tenderer must tick the box in its ESPD, Part IID, to indicate that it intends to use subcontractors, their names need not be disclosed at this time. However, the Tenderer must do so not later than seven (7) calendar days after the provisional award, as TNO has to pre-approve the subcontractors to be used. If the Contractor wishes to replace a subcontractor during performance of the Contract, this will only be possible subject to TNO's prior consent in writing.

If a Tenderer wishes to use a subcontractor, a completed ESPD (Annex **A01**; parts IIA, IIB and III) must be submitted not later than seven (7) calendar days after the provisional approval of said subcontractor, as well as the supporting documents relating to the Grounds for Exclusion (Section 5). Where a subcontractor is subject to one or more Grounds for Exclusion and said subcontractor has not given convincing reasons in the ESPD why it should nevertheless not be excluded (see Section 5), the subcontractor will not be approved. Otherwise, approval of a subcontractor will not be unreasonably withheld.

If a Tenderer intends to use multiple subcontractors, a completed and duly signed ESPD (Annex A01) must be submitted from each subcontractor. The subcontractor has only to complete parts IIA, IIB and III of the ESPD. These ESPDs will be appended to the Tender.

The subcontractor's ESPD (Annex **A01**) must be duly signed. For signing authority, please refer to Section 2.2.20.

If the Tenderer does not intend to use subcontractors

The Tenderer should indicate its intention not to use subcontractor(s) by ticking only the "no" box in Part II D of the ESPD (Annex **A01**).

2.2.10 Reliance on Third Party resources?

The Tenderer may rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties.

If the Tenderer relies on the financial and economic capacity of a Third Party or Parties, both the Tenderer and the Third Party or Parties on whose financial and economic capacity the Tenderer relies will be jointly and severally liable for the obligations arising from the Procurement Procedure and for the obligations arising from the performance of the Contract, if awarded to the relevant Tenderer.

If the Tenderer relies on the technical and professional competence of a Third Party or Parties, said Third Party or Parties should also be involved in the performance of the Contract, if awarded to the relevant Tenderer.

No reliance on Third Party resources

If the Tenderer does not rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, it should complete Part II C of the ESPD (Annex **A01**) to indicate that it does not rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, by ticking the "no" box.

Reliance on Third Party resources

A) Requirements for submitting a Tender

If the Tenderer does rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, the Tenderer should complete Part II C of the ESPD (Annex **A01**) to indicate:

1. that it is relying on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, by ticking the "yes" box
2. the Suitability Requirements for which it relies on the Third Party or Parties and,
3. for each stated Suitability Requirement for which it relies on a Third Party or Parties, and the Third Party or Parties it relies on for that purpose.

In addition, if the Tenderer relies on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, it shall submit the following:

4. a separately completed and duly signed ESPD (Annex **A01**) from each Third Party on whose financial and economic standing and/or technical and professional competence it relies, in which the Third Party completes Parts II A, II B and III in respect of the Third Party itself. The ESPDs of the Third Party or Parties must be duly signed as referred to in Section 2.2.20.

Additional requirement for submitting a Tender in the event of reliance on technical and professional competence of a Third Party or Parties

5. If and insofar as the Tenderer relies on the technical and professional competence of a Third Party or Parties, the Tenderer must submit a list of reference projects completed by the Third Party or Parties on whose technical and professional competence the Tenderer relies, in addition to any list of its own reference projects to be submitted by itself with its Tender. If and insofar as the Tenderer submits reference projects of a Third Party or Parties, it must also use the format for reference projects (Annex **A03**) for this purpose.

B) Requirements for intended beneficiary relying on a Third Party or Parties

The Tenderer to which TNO intends to award the Contract on the basis of the Award Decision and which relies on the financial and economic standing and/or technical and professional competence of a Third Party or Parties must submit at TNO's request within the period specified in Section 7.1 of the Procurement Guide:

1. a declaration by said Third Party or Parties stating that the Tenderer can actually access the resources of the Third Party or Parties relied upon. If the Tenderer relies on the financial and economic standing of a Third Party, it shall submit a declaration in the format provided in Annex **B01**. If the Tenderer relies on the technical and professional competence of a Third Party, it shall submit a declaration in the format provided in Annex **B02**;
2. any evidence as referred to in Section 5.1, which allows the Third Party or Parties whose suitability the Tenderer relies on to demonstrate that the Grounds for Exclusion do not apply to the Third Party.

Additional requirement for intended beneficiary in the event of reliance on financial and economic standing of a Third Party or Parties

3. The Tenderer to which TNO intends to award the Contract on the basis of the Award Decision and which relies on the financial and economic standing of a Third Party or Parties must, at TNO's request, submit within the period specified in Section 7.1 of the Procurement Guide, in addition to the documents referred to above under B) (regarding "*Requirements for the Intended Beneficiary*"): the documents that will be substituted for those that the Tenderer must submit to prove that it meets the Suitability Requirements regarding financial and economic standing.

2.2.11 Variants

Offering variants and/or alternative Tenders is not permitted and they will therefore be disregarded.

2.2.12 "Or equivalent"

The technical specifications are formulated as much as possible on the basis of EU and other standards, performance requirements and functional requirements. Where the Procurement Documents, including the Annexes, nevertheless refer to brand names, patents, types, manufacturing processes, etc., the Tenderer should read "or equivalent" after the relevant phrase.

Tenderers are free to provide an equivalent product, service or type of work. If they do so, the Tenderers must justify in or with their Tender why they are offering an equivalent product, service or type of work. It is up to TNO to assess whether the latter are actually equivalent. TNO reserves the right to have their equivalence assessed by a third party if necessary.

2.2.13 Rights reserved by TNO

1. TNO reserves the right to stop the entire Procurement Procedure temporarily or permanently. If TNO decides to discontinue the Procurement Procedure, legal protection is guaranteed in accordance with paragraph 2.4 of the Procurement Guide.
2. TNO reserves the right at all times to subject the data and statements provided by Tenderers to further investigation and verify their accuracy (or have them verified), as well as to approach any references provided, without prior notification thereof to Tenderer. The results thereof will be considered in the assessment of the Tender.

The Tenderer is aware that if at a later stage it is found that incorrect and/or incomplete information has been provided and/or that requirements set out in the Procurement Documents are not or no longer being met, the Tenderer will be excluded from further participation in the Procurement Procedure or agreements already made may be cancelled and contracts dissolved. In such cases, TNO cannot be held liable for the consequences thereof for the relevant Tenderer and TNO will not be obliged to reimburse any costs and/or any loss or damage of any kind.

2.2.14 Confidentiality

The Tenderer will observe strict confidentiality in respect of all information that is or becomes known to it through TNO. It will not make the information available to Third Parties and will only disclose it to its staff, including consultants, subcontractors and Third Parties, insofar as this is necessary for the submission of the Tender or – if and insofar as applicable – the performance of the Contract.

TNO acknowledges the confidentiality of the Tenderer's Tender and will not disclose to Third Parties any information known to it from this source. It will be necessary to disclose information from the Tender, where appropriate, in the context of justifying the Award Decision. The Tenderer recognises this and agrees accordingly.

2.2.15 Distortion of competition

Distortion of competition will result in exclusion. If TNO suspects that distortion of competition has occurred, it will give the relevant Tenderer(s) the opportunity to demonstrate that it has not been guilty of distorting competition. If TNO deems that the Tenderer has failed to do so, the Tenderer will be excluded from further participation in the Procurement Procedure.

2.2.16 Withdrawal by Tenderer

Any Tenderer who has submitted a Tender may withdraw it until the closing date for tenders. After that moment, the period of validity starts. The Tender is irrevocable during the period of validity.

2.2.17 Period of validity

The Tenderer upholds its ninety (*e.g. 90*) calendar days from the closing date for submission of the Tender (Section 2.1). The period of validity is automatically extended until the final conclusion of the Contract with the first-ranked Tenderer.

If summary proceedings are instituted against the Award Decision, the period of validity will be automatically extended by a period of thirty (30) calendar days from the date of the decision of the preliminary relief judge.

TNO may request Tenderers to extend the period of validity. Tenderers cannot derive from this any right to be awarded the Contract.

2.2.18 Contract terms

The Contract will be awarded in accordance with:

- Procurement documents
- General Purchasing Conditions of TNO, February 2022, as included in Annex **C03**, except insofar as they are explicitly deviated from in the Procurement Documents.

In accordance with Section 2.3 of this Procurement Guide, Tenderers may submit text and amendment proposals for this Contract and the General Purchasing Conditions of TNO. The final Information Notice will respond to these proposals or add the final Contract and General Purchasing Conditions of TNO.

The general terms and conditions (including terms of supply) or terms and conditions of Third Parties (including subcontractors and auxiliary persons) used by the Tenderers, both during this Procurement Procedure and also, in the event of award, during the performance of the final Contract and any contracts to be concluded under its terms, are expressly rejected by TNO. If they declare their own terms and conditions applicable, this will render their Tender invalid.

In the final Information Notice, TNO will indicate where final changes have been made. Acceptance of these amendments to the Framework Agreement/Acceptance of the Final Contract and General Purchasing Conditions of TNO is a minimum requirement. Failure to comply with these conditions will result in the Tenderer's exclusion from further participation in the procedure.

2.2.19 Conditional Tender

TNO will exclude conditional Tenders from further participation in the Procurement Procedure.

2.2.20 Legally valid signature

The Tender must be validly signed. "*Validly signed*" means that the ESPD has been signed by the duly authorised representative(s) of the Tenderer as stated in TenderNed. A validly signed ESPD means that the Tender as a whole has been validly signed, unless a separate valid signature is required for one or more documents. TNO would point out that the trade register may state that two or more persons are joint authorised representatives, or that a representative is authorised only up to a certain monetary value. This has implications for the authority to sign and Tenderers should anticipate this.

The authority to sign should be evidenced by an extract from the trade register. It is also possible for the Tender to be signed by a proxy. In this case, a power of attorney must be issued by a legally authorised representative of the Tenderer, as evidenced by the trade register, or the power of attorney must be recorded in the trade register.

The extract or the power of attorney need only be issued to TNO if a request to that effect has been made by TNO, as specified in the requirements set out in Section 7.1 of the Procurement Guide.

A Tender not validly signed shall be deemed not to have been made and shall be invalid.

This provision also applies to the ESPD submitted by members of a Combination and/or for the Third Party or Parties on whose standing/experience/resources the Tenderer relies. In their case too, only the ESPD need be validly signed and this signature will also serve as a valid signature for other documents completed and submitted by them.

Electronic signature

Signature in the form of an electronic signature is also permitted. The following requirements apply in this regard: an E-recognition tool ("eHerkenning" in Dutch) with at least security level 4 (EH4) must be used.

2.2.21 Reimbursement of expenses incurred in submitting the Tender

Any expenses incurred by Tenderers in preparing and submitting the Tender will not be reimbursed.

2.2.22 Statement of prices and expenses

Prices and costs must be stated in euros excluding VAT and will be fixed for the term of the Contract unless otherwise specified. TNO hereby explicitly states that no price negotiations will be entered into as part of this Procurement Procedure.

2.2.23 Publicity

No publicity will be given to the Procurement Procedure by the Tenderer or by partners and/or subcontractors to be engaged by the Tenderer except with TNO's consent in writing. All information on the Tender will be treated confidentially by Tenderer and the parties to be engaged by them.

2.2.24 Intellectual property

Subject to exceptions as specified in the Dutch Copyright Act [*Auteurswet*], no part of the Procurement Documents may be reproduced (other than for the purpose of submitting a Tender) in any manner whatsoever without TNO's consent in writing. Tenders and all Annexes submitted by Tenderers as part of the Procurement Procedure will become TNO's property upon receipt.

2.2.25 TNO logo

The TNO logo may not be copied, altered or otherwise used on documents submitted by the Tenderer as part of the Procurement Procedure.

2.2.26 TNO Supplier Code of Conduct

TNO expects its suppliers, and therefore also its Tenderers, to endorse the TNO Supplier Code of Conduct, 2024 (Annex C02).

2.3 Further information (questions)

The Procurement Documents shall be prepared with the utmost care. Tenderers may request further information on the Procurement Procedure and/or the Procurement Guide up to the closing date and time "closing date for submission of questions" as stated in the schedule in Section 2.1. Said further information may, for example, address any lack of clarity, ambiguities, discrepancies. Further information should be requested within the time limit and in the manner described in this section. Questions and comments not submitted on time and/or correctly will in principle not be dealt with in the Information Notice, except in cases where this is deemed necessary and/or desirable at TNO's sole discretion.

Moreover, at the time of the above deadline, Tenderers will have the opportunity to ask reasoned questions on, or propose text or amendments to the General Purchasing Conditions of TNO, Annex **C03**. Text proposals will serve only to improve the Contract and must not affect its essence. TNO would point out that it reserves the right at all times to accept or not to accept these text or amendment proposals.

If the Tenderer fails to raise questions about and/or challenge to (lack of clarity, ambiguities or discrepancies in) the Procurement Procedure and/or the Procurement Guide and/or in the manner described in this section, or does not do so in a timely manner, it will forfeit its right to challenge any deficiencies identified at a later stage, e.g. in interlocutory proceedings.

Questions and/or comments should be communicated **exclusively** to the TNO contact person (see Section 2.2.5) using the "Template for Tenderer Questions" in Annex **C01** ("editable" MS Excel file) prepared by TNO. Using the "pull-down" menu in this Excel file, the Tenderer should indicate which section of the Procurement Guide the question relates to. Once completed, Annex **C01** should be submitted via [the TenderNed messaging module](#).

TNO is therefore **not using the question module in TenderNed** for the Information Notice. Questions submitted in this question module will not be considered.

The TNO contact person will compile the questions and/or comments, along with their responses, in anonymised form within one or more Information Notices. The final date for asking questions is included in the schedule in Section 2.1. The Information Notices will be published at www.TenderNed.nl as per the schedule in the table in Section 2.1.

All the questions and their answers should be considered an integral part of this Procurement Guide. The basic premise is that the Procurement Guide will be deemed final after publication of the last Information Notice.

TNO may decide to hold one or more additional briefing rounds. Parties will be informed of this in the Information Notice. Questions and comments submitted as part of an additional briefing round may relate solely to the contents of the immediately preceding Information Notice. Questions and comments that do not relate to the immediately preceding Information Notice may be disregarded by TNO – without notice.

The responsibility for submitting questions and/or comments in a timely and correct manner rests with the Tenderer. Questions raised after the expiry of the deadline will in principle not be answered in the Information Notice unless answering is necessary, in TNO's opinion, for the submission of a proper Tender.

TNO would advise Tenderers to wait until the last Information Notice is published before submitting their Tender as the Information Notice may contain further clarifications and amendments to the Procurement Guide that are relevant to the preparation of the Tender.

TNO would expressly remind Tenderers that it can answer their questions in confidence (Section 2.53(3) Aw). If a Tenderer does not wish to have a question answered in the Information Notice, the Tenderer must give reasons as to why a public answer would damage its legitimate economic interests. TNO will take a decision on whether or not to answer a question in confidence based on these reasons. If TNO decides not to do so, it will notify the questioner accordingly, giving reasons. The questioner will then have the option of withdrawing or submitting its question for the Information Notice.

2.4 Applicable law and disputes

This Procurement Procedure is governed by the laws of the Netherlands. The Preliminary Relief Judge at the District Court of The Hague shall have exclusive jurisdiction to settle disputes relating to the present Procurement Procedure.

Tenderers should bring their challenges to all or part of the Procurement Procedure, to all or part of the information provided or to other aspects relating to the Procurement Procedure to the attention of the TNO contact person (see Section 2.2.5) at the shortest possible notice.

The period within which legal action must be taken against the Award Decision and/or the Procurement Procedure is twenty (20) calendar days from the date of the Award Decision. Any summons should be served within this period, which is a (contractual) expiry date, at TNO's address. If this objection period, also expiry date, is exceeded without legal proceedings having been commenced by service of a summons, any right to do so shall (inadmissible) lapse. The standstill period is automatically extended to the next working day if the standstill period ends at the weekend, on a public holiday or a so-called "notice-free day" [when bailiffs cannot issue writs].

A Tenderer wishing to initiate summary proceedings is requested to request foreclosures from TNO.

If a summons has been served within the standstill period, the relevant Tenderer is requested to send a copy of the served summons via TenderNed to the contact person for the Procurement Procedure no later than two (2) working days after service. This is because the processing of documents within TNO can lead to delays in processing the summons.

If a Tenderer institutes summary proceedings in a timely and valid manner in respect of the Award Decision and/or the Procurement Procedure, the Tenderer to which the contract has been provisionally awarded shall intervene in the summary proceedings. If the Tenderer to which the Contract has been provisionally awarded does not intervene, said Tenderer shall exercise the right to institute court proceedings or third-party proceedings in the event that the judgment in the first-instance summary proceedings orders the amendment or revocation of the Award Decision. This is because it is important for all the parties to obtain clarity as soon as possible and put all the arguments on the table in the first instance. If the standstill period is exceeded, this situation cannot be remedied.

Any Tenderer that has instituted summary proceedings is obliged to provide a copy of the summons when requested to do so by other Tenderers so that said Tenderer(s) can determine whether intervention is appropriate. Of course, it is up to the Tenderer that initiated the summary proceedings to determine whether or not confidential business information will be disclosed at that stage and, if so, which. If the Tenderer that initiated the summary proceedings does not (expeditiously) provide a copy of the summons to the Tenderer requesting it, TNO reserves the right to provide a copy of the summons itself. In doing so, TNO will determine at its own discretion whether confidential business information will be deleted and, if so, which.

If summary proceedings have been instituted in a timely and legally valid manner and the judgment does not oppose the conclusion of the Contract, TNO will be free to enter into the Contract. TNO is not obliged to await any appeal or proceedings on the merits. In other cases, TNO will consider the next steps to be taken based on the judgment in first instance.

2.5 Submission of the Tender

2.5.1 Digital tendering

The Tender consists of the completed and, where necessary, validly signed Annexes **A01 to A04**, the formats of which are appended as Annexes to the Procurement Guide. When the ESPD is validly signed, the Tender as such is also validly signed. The absence of a legally valid signature on the ESPD will render the Tender invalid.

For legally valid signatures, see Section 2.2.20.

For this Tender, TNO is using a digital procurement system via TenderNed. The Tender must be uploaded to the TenderNed digital vault not later than the date and time specified in the schedule in Section 2.1 under "Closing date for submission of Tenders". After uploading, the Tenderer will receive a transaction code via SMS. This code must be entered in TenderNed. The Tender is not actually submitted until the correct transaction code has been entered. The SMS code must therefore be entered within the tendering period for the Tender to be deemed complete and correct.

Tenders received late and/or Tenders not deposited in the digital vault and/or Tenders submitted by means other than via TenderNed will not be considered and will therefore be excluded from participation. Tenderers will remain at all times solely responsible for submitting their Tender on time and in the correct manner.

Tenderers are strongly advised to take careful note of the guide provided by TenderNed for the digital submission of Tenders, particularly as regards placing documents in the digital vault. In doing so, uploading should be completed with the tendering wizard (authorisation by SMS code).

Tenderers are advised to start uploading documents in good time. If a Tenderer experiences problems with the system due to a malfunction of TenderNed, the TNO contact person (Section 2.2.5) and TenderNed should be contacted without delay. In the event that a TenderNed malfunction actually occurs, as a result of which the submission of Tenders is not possible, shortly before the closing date and TNO has not taken note of Tenders that have been uploaded to the TenderNed digital vault on time despite the malfunction, TNO will extend the closing date for submission of Tenders pursuant to Section 2.109 Aw.

TNO further advises Tenderers to take note of the content of Section 2.109a Aw and, in accordance with the provisions of that section, to be prepared to submit the encrypted version of their Tender in a timely manner if occasioned by TenderNed malfunctioning.

2.5.2 Sending and grading Tender

The Tender consists of the following documents. Documents in **Part A** relate to the Tenderer. Documents in **Part B** relate to either Third Party(ies) whose experience/resources the Tenderer appeals to under the Eligibility Requirements and/or the Declaration of Willingness of Tenderer for the required insurance. The documents under **Part B** need to be submitted only if Third Party(ies) are invoked or if Tenderer is not (yet) in possession of either the insurance company's policy or satisfactory statement within the stipulated timeframe.

Part A Submission of the Tender

The Tender, under penalty of invalidity, must consist of the following components.

- | | |
|------------------|--|
| Annex A01 | The Tenderer's ESPD, "European Single Procurement Document" (ESPD)
<i>If applicable, this format should be multiplied in proportion to the number individual Combination members; the individual Third Party or for the benefit of one or more subcontractors to be used for the work).</i> |
| Annex A02 | Reference Projects |
| Annex A03 | Format for Price Sheet |
| Annex A04 | Compliance with Requirements |

The above sheets must be completed in full. Only the ESPD need be validly signed.

Gather the pdf files, Annexes **A01** to **A04**, as separate "loose" files into a compressed file (zip file) named: "....."_part A. The Tenderer should replace the dotted line with all or part of its company name. Upload this compressed file to TenderNed's digital vault.

Part B Submission of supporting documents

- | | |
|------------------|--|
| Annex B01 | Declaration re. use of Third Party Fin. and Econ. Capacity |
| Annex B02 | Declaration re. use of Third Party Techn. and Prof. Competence |
| Annex B03 | Declaration re. Insurance Policy |

The above sheets must be completed in full. Only the ESPD need be validly signed.

Gather the pdf files, Annexes **B01** to **B03** as separate "loose" files into a compressed file (zip file) named: "....."_part B. The Tenderer should replace the dotted line with all or part of its company name. Upload this compressed file to TenderNed's digital vault.

3 Assessment of Tenderers and Tenders

3.1 Assessment team

A team of subject-matter and process experts has been constituted to conduct a qualitative assessment of the Tenders (assessment of the Tenders on the qualitative Award Criteria). The assessment team assesses the quality of the Tenders without having any knowledge of the financial part of the Tenders.

The members of the assessment team assess, on a strictly personal basis and independently, the elaboration of the qualitative (sub-sub-)award criteria for the Tenders. For these criteria, see section 6.1.2 and its elaboration in Chapter 8. In a meeting of the individual assessors, the average of the individual scores is then determined.

The average of the individual scores then determines the overall score for a sub-sub-award criterion. Average scores are rounded to one decimal place.

In the announcement of the Intention to Award, TNO will state the numbers of completed points per (sub-)sub-award criterion. The total score for sub-award criterion: Quality has been arrived at by totalling unrounded scores on the sub-sub-award criterion, after which this total score is rounded to a whole number for the purpose of said announcement.

3.2 Assessment procedure

The assessment procedure is as described in the following sections.

- Section 4** : concerns the assessment of the timeliness, formal requirements and completeness of the Tender submitted.
- Section 5** : concerns requirements formulated in respect of Grounds for Exclusion and Suitability Requirements. If one or more Grounds for Exclusion apply and/or if a Tenderer fails to meet the Suitability Requirements, the Tenderer will be excluded/the Tender will be invalid.
- Section 6** : concerns the description of the assessment by TNO of the Tenders against the Award Criterion. The Award Criterion is assessed by allocating points to the Tender
- Section 7** : concerns the assessment of supporting documents and other documents requested by TNO from the intended beneficiary.
- Section 8** : this describes the assessment carried out by TNO in respect of the Minimum Requirements. This involves assessing TNO's requirements for the performance of the Contract, i.e. the Programme of Requirements ("PoR"):

TNO assesses and ranks the Tenders on the basis of the Award Criterion: Best Value for Money (BVM), see Section 6 in this regard.

TNO may ask the Tenderer for clarification with regard to the submitted Tenders up to the end of the Procurement Procedure. The Tenderer is deemed to be willing and able to answer questions within 48 hours of sending the questions. If questions are not answered (in a timely manner), TNO may interpret the Tender in any manner it sees fit, based on the documents known to it.

4 Assessment of timeliness, formal requirements and completeness

4.1 Assessing timeliness of submission

The Tender must be submitted in a timely manner, i.e. within the tendering period (see Section 2.1). Tenders not submitted in a timely manner are invalid and TNO will discard them.

4.2 Assessing for other formal requirements and completeness

Tenders submitted by means other than through TenderNed will not be assessed and will be discarded. The foregoing is subject to any malfunctions of TenderNed, recognised as such by TenderNed.

The Tenders will be assessed as regards completeness and the formal requirements applicable in the Procurement Procedure, including at all events the legally valid signature. Tenders that are incomplete and/or fail to meet all the formal requirements will be declared invalid by TNO and discarded. Missing answers, documents, or data will result in exclusion if there is no rectifiable omission. Tenderers are reminded that TNO is not obliged to have deficiencies rectified. TNO has the discretionary power to offer a rectification option.

If – for whatever reason – a question cannot be answered or the requested data cannot be submitted in full or at all, this must be explicitly stated at the time of the Tender, together with reasons. Depending on the nature of the deficiency, TNO will assess whether the Tender is invalid, in which case it will be discarded, or whether the deficiency is amenable to rectification.

Deficiencies for which TNO offers a rectification option must be rectified within the timeframe as stated in the relevant request from TNO. If a deficiency is not rectified within the notified period or at all, the Tender will be invalid after all.

5 Assessment of Grounds for Exclusion and Suitability Requirements

5.1 Assessing Grounds of Exclusion

The Tenderer will be assessed in terms of the Grounds for Exclusion listed in the ESPD (Section III). The Tenderer declares in the ESPD whether the Grounds for Exclusion used are applicable or not at the time of tendering. Where one or more Grounds for Exclusion apply, the Tenderer will generally be excluded. The Tenderer will have the opportunity to give reasons in the ESPD why it should not be excluded after all because of self-cleansing measures or at least why exclusion would be disproportionate. TNO will take these reasons into account in its decision on the final exclusion of the Tenderer. The reasons must be included in or appended to the ESPD. Tenderers may not continue to submit and/or alter the reasons once the tendering period has elapsed.

If the Tenderer is a Combination and a Ground for Exclusion applies to any of the participants in that Combination, the Combination as a whole will be excluded. Each Combination member must submit its own legally signed ESPD.

If the Tenderer relies on the suitability of a Third Party or Parties as described in Section 2.2.10 of the Procurement Guide and a Ground for Exclusion applies to one or more Third Parties, TNO will reject its reliance on the suitability of the Third Party or Parties in question. If the Tenderer, whose reliance on a Third Party or Parties has been rejected, fails – after having been given the opportunity to do so by TNO – to rely (in a timely manner) on the resources of a substitute Third Party or Parties, or if the Tenderer does rely on a substitute Third Party or Parties but fails to comply fully or at all with the requirements set for that purpose, the Tenderer will be excluded from participating in the Procurement Procedure. The substitute Third Party or Parties must be proposed within seven (7) calendar days of a request to that effect from TNO, submitting all the documents requested in the Procurement Documents for that purpose. Proposing a substitute Third Party is not considered an amendment to the Tender. If a Tenderer is permitted to propose a substitute Third Party, the Tenderer may only substitute the Third Party while submitting the relevant documents in this connection. Other parts of the Tender, including, but not limited to, the elaboration of the award criteria remain unchanged.

The completed and validly signed ESPD will suffice in the first instance as evidence that the Grounds for Exclusion do not apply to the Tenderer. At TNO's request, the Tenderer to which TNO intends to award the Contract will provide – by the date specified in Section 7.1 of the Procurement Guide – the supporting documents referred to in section 7.1. If the Tender is submitted in Combination, all the Combination members must submit the supporting documents listed below. If the Tenderer relies on the standing/resources/experience of one or more Third Parties, then the supporting documents listed below from each Third Party should be submitted.

Tenderers are reminded that it may take several weeks to obtain some supporting documents. Tenderers are therefore advised to request the supporting documents at the earliest possible stage so that they can be supplied in a timely manner – in response to any request from TNO. TNO would point out that any Tenderer relying on a Third Party is itself responsible for the timely submission of supporting documents in respect of the Third Party's ESPD. TNO therefore advises Tenderers to inform, in a timely and appropriate manner, Third Parties on whose suitability they rely which documents may be requested by TNO in the event of award to the Tenderer and the time required to obtain these documents.

Failure to obtain supporting documents in a timely manner or at all remains at the Tenderer's risk. If the supporting documents are not supplied in a timely manner and/or complete, the Tenderer will still be excluded. If a supporting document has not been obtained in a timely manner, but has been requested in good time and the failure to obtain it is not due to a circumstance within the Tenderer's sphere of risk, the Tenderer will not be excluded. To this end, the Tenderer must demonstrate that the relevant supporting document has been requested not later than two (2) working days after publication of the announcement of the Procurement Procedure.

5.2 Assessing Suitability Requirements

The Tenderer must, at the time of Tendering, possess a certain minimum level of expertise and ability to perform the contract: the Suitability Requirements.

The Tenderer will be assessed on the Suitability Requirements. If the Tenderer relies on the suitability of a Third Party or Parties as referred to in Section 2.2.10 of the Procurement Guide, TNO will assess whether the Third Party or Parties meets the specified Suitability Requirements, for which the Tenderer relies on said Third Party or Parties.

The Suitability Requirements refer to the required financial and economic standing, technical and professional ability and professional competence that the Tenderer must meet in order to be eligible to submit a Tender.

The Tenderer must meet all the Suitability Requirements at the time when the Tender is submitted. If the Tenderer fails to meet all the Suitability Requirements, with or without relying on one or more Third Parties, the Tender will be invalid.

If tendering in Combination, the Combination as a whole must meet the Suitability Requirements and in principle not all the individual Combination members. However, this may be different for a specific Suitability Requirement.

5.2.1 Financial and economic standing

5.2.1.1 Insurance

The Tenderer must be insured against business liability and/or professional liability, with as per the annexed General Purchasing Conditions, cover of at least €1,250,000 per loss-causing event or series of related events, or be willing and able to arrange said insurance cover in the event of an Intention to Award. The Tenderer is responsible for ensuring that, if awarded Contract, it remains insured at least in accordance with this requirement during the term of the Contract. The Contractor will inform TNO without delay of any changes to the insurance policies. If the Contractor's insurance does not or no longer meets this Suitability Requirement during the term, TNO will be entitled to dissolve the Contract without notice of default or judicial intervention and without being liable to pay compensation to the Contractor.

Ticking the "yes" box in Part IV of the Tenderer's ESPD (Annex **A01**) will suffice in the first instance as evidence that the Tenderer meets this requirement.

At TNO's request, the Tenderer whose Tender was ranked first will provide the evidence of insurance within the set timeframe as referred to in Section 7.1. This supporting document comprises a policy showing the required insurance cover, the insurance contract, the policy schedule or a satisfactory declaration from the insurance company showing that the Tenderer is insured as required in the Procurement Documents. If a group policy is submitted, the Tenderer must supply a copy thereof to demonstrate that it is jointly insured.

If the Tenderer does not (or not yet) have the insurance company's policy or satisfactory declaration in its possession within the set timeframe, it should sign a Declaration of Readiness instead (Annex **B03**). By signing this declaration, the Tenderer declares that it will provide a copy of the policy or of a satisfactory statement by the insurance company within seven (7) calendar days after the notification by TNO that it intends to enter into the Contract with the Tenderer under the suspensive condition of the required insurance, based on the assessment of the supporting and other documents already submitted (see Sections 7.1 and 7.2). Said notification will be issued by TNO only after the standstill period has expired without summary proceedings being instituted or – where summary proceedings have been instituted – the relevant judgment states that the Award Decision can be upheld. The Contract will not be entered into until such time as evidence of the Tenderer being adequately insured has been received. If the Tenderer is unable to provide the required insurance policy or a satisfactory declaration from the insurance company within the set timeframe, the Contract will not be concluded and TNO will retain the right to award the Contract to the Tenderer which would be ranked in first place after the number one was eliminated in accordance with the assessment system, and which has stood by its Tender.

5.2.2 Technical and professional

Competence requirements state the degree to which Tenderers may be considered capable of performing the actual activities under the present Contract as required.

5.2.2.1 Reference projects

The Tenderer should demonstrate experience in the required core competences by providing details of reference projects. The Tenderer should cite one reference project for each core competence. The Tenderer may cite the same reference project to fulfil the different core competences.

As evidence that the Tenderer has experience in the core competences listed below, the Tenderer shall cite the required reference projects immediately upon submission of the Tender. To this end, the Tenderer should submit a fully completed Annex **A02** for each core competency. If the Tenderer uses one reference for multiple core competences, then a completed Annex **A02** must be submitted for each core competence. The completed Annex **A02** must show that the reference project cited fulfils all aspects of the core competence. Additions or amendments to the details in Annex **A02** are not permitted after the expiry of the tender date.

If the Tenderer relies on the technical and professional competence of a Third Party or Parties, the Tenderer shall submit for each core competence for which it relies on the relevant Third Party or Parties an Annex **A02** fully completed by said Third Party or Parties.

If a project is cited that has not yet been (fully) completed, only the actual results achieved under the current Contract may be stated and a forecast of results is not sufficient.

TNO has identified the following core competences that correspond to the desired experience in key areas of the present Contract.

Core Competence 1: The tenderer has experience in carrying out InSAR projects with deformation measurement based on InSAR time series techniques. The tenderer has experience with acquisition planning, incidence angles, image modes and tasking constraints. The tenderer has demonstrated experience with InSAR core processing – e.g. advanced co-registration and sub-pixel alignment, time series in urban areas, phase unwrapping, atmospheric, DEM and orbital error mitigation, sub-pixel scatterer localisation. The Tenderer has experience in error modelling and uncertainty quantification, validation against external datasets and quality control procedures for QC of interferograms, coherence, phase unwrapping, residuals and time series. The tenderer demonstrates this core competence with one reference assignment with a client (not TNO).

Reference project: The Tenderer must have delivered a project that fulfils Core Competence 1: During the five (5) years prior to the date of the Call for Tenders, the Tenderer has completed a project that demonstrates core competency 1, and had a

contract value of at least € 50.000, excluding VAT. The project should have been delivered in accordance with the conditions agreed at the time, including the completion date and budget.

TNO reserves the right to check references with the referee without involving the Tenderer. TNO assumes that the Tenderer has informed the referees accordingly. The information obtained by TNO from the referent will be taken into account in the assessment of the Tender.

If the Tenderer has not demonstrated in its Tender that it has the required experience in all the core competences, this will result in the Tender being rendered invalid.

Core Competence 2: The tenderer has experience in carrying out at least one (1) building or infrastructure assessment project deformation measurement based on InSAR techniques based on high-resolution satellite images (3x3m). The tenderer has experience in differential settlement analysis, long-term stability monitoring at the scale of single building and building blocks, separation of scatterers on buildings vs ground with tags/labels, handling layover mechanisms in high-resolution and outputs that explicitly give relative displacement between building measurement points (separately for PSI and DSI) and nearby ground measurement points (separately for PSI and DSI). The tenderer should also have familiarity with data integration to extract accurate building assessment such as LOS-to-3D motion decomposition using multiple viewing geometries, 3D building models, DEM/DSM quality and height errors and their impact on PS positioning.

Reference project: The Tenderer must have delivered a project that fulfils Core Competence 2: During the five (5) years prior to the date of the Call for Tenders, the Tenderer has completed a project that demonstrates core competency 2, and had a contract value of at least € 50.000, excluding VAT. The project should have been delivered in accordance with the conditions agreed at the time, including the completion date and budget.

TNO reserves the right to check references with the referee without involving the Tenderer. TNO assumes that the Tenderer has informed the referees accordingly. The information obtained by TNO from the referent will be taken into account in the assessment of the Tender.

If the Tenderer has not demonstrated in its Tender that it has the required experience in all the core competences, this will result in the Tender being rendered invalid.

Core Competence 3: The tenderer has experience in developing or deploying GIS-based platforms capable of visualising InSAR data, and with interactive temporal and spatial time series analysis while addressing the needs of stakeholders. The solution should allow interactive exploration of deformation data including map-based visualisation, time-series analysis, and integration with geospatial layers.

Reference project: The Tenderer must have delivered a project that fulfils Core Competence 3: During the five (5) years prior to the date of the Call for Tenders, the Tenderer has completed a project that demonstrates core competency 3. The project should have been delivered in accordance with the conditions agreed at the time, including the completion date and budget.

TNO reserves the right to check references with the referee without involving the Tenderer. TNO assumes that the Tenderer has informed the referees accordingly. The information obtained by TNO from the referent will be taken into account in the assessment of the Tender.

If the Tenderer has not demonstrated in its Tender that it has the required experience in all the core competences, this will result in the Tender being rendered invalid.

5.2.3 Professional competence

By completing the ESPD (Annex A01) and ticking the "yes" box in Part IV, the Tenderer declares that it is registered in the professional or trade register in accordance with the regulations of the Member State in which it is based.

At TNO's request, the Tenderer to which TNO intends to award the Contract within the period specified in Section 7.1 of the Procurement Guide will provide relevant evidence:

- for enterprises based in the Netherlands, an extract from the trade register of the Chamber of Commerce must be submitted, which is not more than six months old at the time of submission of the Tender. For enterprises based outside the Netherlands, a similar document should be appended in accordance with the applicable regulations of the relevant country in which the enterprise is based;
- where the Tenderer is a partnership or general partnership, the Tenderer shall submit the extracts of those that form the partnership/general partnership (if recorded in the trade register) as well as a declaration signed by all the partners showing the power of representation for the purposes of this Tender;
- where the Tenderer is a Combination, the Tenderer shall submit extracts from all participants in that Combination, and;
- where the Tenderer submits a Tender relying on the standing/capacity/experience of one or more Third Parties, the Tenderer shall submit extracts from all Third Parties or subcontractors, as the case may be.

5.2.4 Legal suitability to perform an assignment

On 8 April 2022, the EU adopted a fifth sanctions package regarding the Russian war in Ukraine (Council Regulation 2022/576). In that package, contracting authorities are prohibited from granting assignments to (1) natural persons with Russian nationality or legal entities established in Russia, (2) legal entities that are owned for 50% or more by one of the natural persons or legal entities referred to under (1), and/or (3) natural persons or legal entities acting in the interests or on the instructions of a natural person or legal entity referred to under (1).

TNO applies the above requirements as a suitability condition for this Procurement Procedure. A Tenderer will be legally unsuitable to perform the assignment (Section 2.90(4) of the Dutch Public Procurement Act (*Aanbestedingswet*)), and its Tender will be invalid, if:

- 1) the natural persons have Russian nationality or the legal entities are domiciled in Russia; and/or
- 2) they are legal entities that are owned for 50% or more by natural persons or legal entities referred to under (1); and/or
- 3) they are natural persons or legal entities acting in the interests or on the instructions of a natural person or legal entity referred to under (1).

The Tenderer must therefore demonstrate in its Tender that:

- 1) the Tenderer does not have Russian nationality and/or is not domiciled in Russia; and
- 2) the Tenderer is not owned for 50% or more by a natural or legal person referred to under (1); and
- 3) the Tenderer is not acting in the interests or on the instructions of a natural or legal person referred to under (1), including the payment of monies to a natural or legal person referred to under (1), whether or not it is legally obliged to do so and whether or not it is actually possible at present.

If one or more of the above three (3) requirements cannot be demonstrated, the Tender will be invalid.

Where the Tenderer tenders in Combination, this requirement shall apply to all the individual Combination members. Where the Tenderer relies on the standing/resources/experience of one or more Third Parties, this requirement shall also apply to the Third Parties on whose standing/resources/experience the Tenderer relies. If the Tenderer wishes to use one or more subcontractors during the performance of the Contract, the Contractor will have to demonstrate – for that subcontractor – that it meets this requirement at the time a subcontractor is presented to TNO for approval.

Ticking the "yes" box in Part IV of the Tenderer's ESPD (Annex **A01**) will suffice in the first instance as evidence that the Tenderer meets this requirement.

To this end, the Tenderer to which TNO intends to award the Contract within the set timeframe as referred to in Section 7.1, shall provide the means of proof relating to this Suitability Requirement. This concerns the following documents:

- a) a recent (not older than six (6) months from date of Tender) extract from the trade register reflecting the most recent state of affairs; and
- b) an up-to-date report on the holding structure (where the Tenderer is part of a holding structure) showing the direct and indirect ownership relationships of the Tenderer; and
- c) a copy of the Tenderer's current articles of association.

In addition, the Tenderer shall declare categorically not to supply products - including semi-finished and finished products - listed in Annex XVII of the European Commission Regulation (EC) No 833/2014 on Russia Sanctions. When supplying products covered by this Annex XVII, the Tenderer shall provide as proof a Mill Test Certificate (MTC), or similar certificate such that it meets the requirements and obligations to establish the country of origin.

The Tenderer must continue to meet the Suitability Requirement. TNO will be entitled to verify this during the term of the Contract. If it becomes apparent during the term of the Contract that the Contractor does not meet – or no longer meets – the Suitability Requirement, TNO will be entitled to terminate the Contract with immediate effect, without being liable to pay damages to the Contractor and without the necessity of a notice of default or judicial intervention.

6 Assessment of Award Criterion

TNO assesses and ranks the Tenders based on the Award Criterion: Best Value for Money (BVM). The Tenderer with the highest overall score is deemed to have submitted the 'Most Economically Advantageous Tender' and is therefore provisionally awarded the contract.

6.1 Award Criterion: Best Value for Money (BVM)

This criterion is divided into the following sub-award criteria, with the corresponding weighting factors, where the assessment of the sub-award criteria: Price (TP, Total Price) and Quality is scored by setting a number of point scores to be achieved.

Award Criteria	Max. points score
Price (TP, Total Price)	500
Quality	500
Total	1000

The Tender with the highest total points score will be designated as Best Value for Money "BVM", on the basis of which TNO intends to award the Contract. See also Section 6.2 Award.

Point scores for each sub-award criterion will be rounded to one (1) decimal place. Total points are scored for each sub-award criterion by adding up unrounded point scores. In the announcement of the Intention to Award, TNO will state the rounded points scores allocated to each (sub-)sub-award criterion.

If the Tenderers with the highest Total Score have an equal Total Score, the Contract will be provisionally awarded to the Tenderer with the highest score for the sub-sub-award criterion Preference 8.2.3 - InSAR approach to building analysis. If these scores are also equal, a draw will be held among the Tenderers with equal scores which are eligible for award. The protocol for the draw, if any, will be shared with the Tenderers among which lots will be drawn.

If, after the provisional award, the Tenderer with the highest score nevertheless proves to be invalid/is excluded from the procedure, the Tenders will be reassessed on the basis of the Award Criterion: Price, after which a new total score will be determined. TNO will award the Contract again based on this reassessment. This is to avoid what is referred to as the "ranking paradox".

6.1.1 Sub-award criterion: Price TP (Total Price)

To determine the sub-award criterion: TP (Total Price), TNO asks the Tenderer to use the Price Sheet prepared by TNO (in MS Excel) according to Annex **A03** for its price proposal. This Price Sheet should be completed and appended to the Tender. The Tenderer should strictly follow the outline of the Price Sheet and complete it in full. If the Price Sheet has not been submitted in full and/or correctly or at all, TNO will declare the Tender invalid and exclude it from further participation in the Procurement Procedure. Changing the format and layout of the Price Sheet (Annex **A03**) will also invalidate the Tender.

The distribution of the maximum number of point scores to be achieved for TP is given in the table below:

Criterion	Max. points score
Price TP	500
Total TP	500

When completing the Price Sheet, the following Minimum Requirements apply:

- 1) Prices and expenses should be stated in euros excluding VAT, and to two (2) decimal places;
- 2) Only the unit prices and fees included in the Price Sheet will be assessed in the way described and apply during the performance of the final Agreement. Prices stated elsewhere in the Tender do not create any rights or obligations between TNO and the Tenderer during the performance of the final Framework Agreement;
- 3) The prices/rates listed in the Price Sheet are all-inclusive. This means that all the costs/services/obligations/etc. required for the performance of the Contract in accordance with the contract terms have been factored into the prices and rates. During the performance of the Contract, the Contractor shall not be entitled to any other and/or additional remuneration other than that in accordance with the Price Sheet.
- 4) The Price Sheet should include prices on all the required items. The Tenderer shall use the Price Sheet prepared by TNO unchanged;
- 5) The Tenderer is solely responsible for stating figures and adding them correctly;
- 6) The prices quoted by the Tenderer should be based on the Procurement Documents without reservations of any kind;
- 7) Specific Minimum Requirements or additional instructions relating to the Price Sheet are included in the "additional instructions" tab and are accepted by the Tenderer without reservations of any kind;

- 8) The prices and rates quoted in the Tender shall apply in the event of final award on commencement of the Contract and shall be fixed for the duration of the Contract.

The value of the lowest TP (Total Price) is determined on the basis of the cumulative costs in the Price Sheet defined by TNO.

The Tenderer with the lowest TP, being the lowest total price calculation, will be awarded the full number of points, set by TNO at 500 points. For the remaining Tenderers, the number of points to be obtained will be determined on a pro rata basis, with points deducted from the maximum number of points to be obtained.

Total points for TP (Total Price) are calculated according to the following formula:

$$\text{Total Points} = 500 - \left\{ \frac{(I - LI)}{LI} \times 500 \right\}$$

Where:

Number of points = number of points obtained for sub-award criterion TP

I = Tender with "TP"

LI = Tender with the lowest "TP"

If $I \geq 2 \times LI$, then zero (0) points are awarded for sub-award criterion TP.

The total score is rounded to whole points.

6.1.2 Sub-award criterion: Quality

Section 8, the Programme of Requirements and Preferences (hereinafter "PoR"), of the Procurement Guide describes the requirements to be met by the performance of the Contract.

The PoR also contains a number of preferences with regard to the quality of the requested service/supply. These preferences are set out in the form of a questionnaire. By filling in the preferences section and answering questions, Tenderers can differentiate themselves in terms of quality.

The Tenderer is asked to provide notes for each preference/question, answering the subject-matters listed in the questionnaire.

The Tenderer shall answer the open questions clearly, unambiguously and point by point.

When elaborating an answer for each open question, the Tenderer should respect the set maximum number of A4 pages (font size at least 10 points and line spacing at least 1.5). Tenderers should bear in mind, when elaborating the preferences, that said answers become part of the Contract and must therefore be capable of fulfilment by the Tenderer.

TNO bases the assessment of the answers on the set maximum per answer. This means that Annexes or references to them should not form part of the answer in order to "get round" the set maximum number of A4 pages in this way. However, illustrations, diagrams, organisational charts and sample reports can form part of the answer. Annexes should not form part of the answer and will not be included in the assessment. If the set maximum is exceeded, the excess number of A4 pages will not be included in the assessment. Any part of the elaborated answer that exceeds the maximum will not become part of the Contract.

The elaboration of the preferences will be assessed in absolute terms. It is therefore possible that more than one Tenderer has the same score for the relevant answer to the question asked.

The answers to the questions and therefore the compliance with preferences should be structured in the manner and order as specified in Section 8 and can be submitted using the Tenderer's own A4 format, subject to the aforementioned requirements. The distribution of the maximum number of points to be achieved for sub-sub-award criterion: Quality is shown in the table below.

Section 8 Sub-sub-award criterion: Quality	Max. points
Preference 8.2.1 - Project Plan	70
Preference 8.2.2.1, Preference 8.2.2.2 and Preference 8.2.2.3 - SAR acquisition, processing of SAR to InSAR and InSAR time-series:	
- Preference 8.2.2.1 - SAR acquisition, processing of SAR to InSAR and InSAR time-series	30
- Preference 8.2.2.2 - SAR acquisition, processing of SAR to InSAR and InSAR time-series	50
- Preference 8.2.2.3 - SAR acquisition, processing of SAR to InSAR and InSAR time-series	50
Preference 8.2.3 - InSAR approach to building analysis	150
Preference 8.2.4 - Data visualisation & stakeholder iteration	150
Total	500

The assessment of the answers to the questions as posed under the preferences in the PoR is carried out in the manner described in Section 3.1. As stated in Section 3.1, the average of the individual scores determines the corresponding total score. The average is determined by first determining the score per assessor (percentage * maximum score) and then averaging that score across all assessors (individual scores summed/number of assessors).

Each percentage referred to in the table equals a percentage of the maximum score per preference.

Valuation	Score	Notes to valuation
No/poor answer	0%	<i>No answer given or answer is not good, i.e. it is not in accordance with TNO's (minimum) preference(s)</i>
Unsatisfactory answer	20%	<i>Answer is not complete (the preference is not fully elaborated), not sufficient, not satisfactory, i.e. it is not fully in line with TNO's preference(s)</i>
Satisfactory answer	50%	<i>Answer is sufficient, satisfactory, adequately reflects TNO's preference(s)</i>
Good answer	85%	<i>Answer is good, i.e. the answer accurately reflects TNO's preference(s)</i>
Very good answer	100%	<i>Answer is outstanding, i.e. the answer exceeds TNO's preference(es)</i>

The following questions will be considered when assessing compliance with the preferences:

- Is the answer specific, realistic, achievable, effective, complete and consistent?
- To what extent does the answer reflect TNO's situation and the Programme of Requirements and Preferences? Does the Tenderer address the requested elements, subject-matters and aspects as stated in the relevant preference/question and the Programme of Requirements and Preferences?

The assessment will be based on the overall impression given by the answer given. The preference does not involve separate assessment aspects or criteria.

6.2 Award of Contract

6.2.1 Notification of the Award Decision

All Tenderers will receive from TNO, expectedly on the date referred to in the schedule under Section 2.1, the notification of the final result of the assessment of the Tenders and the intended Award Decision.

In this notification of the Award Decision, TNO will indicate the Tenderer to which it intends to award the Contract, as well as, for unsuccessful Tenderers, reasons for their rejection.

6.2.2 Challenge

If a Tenderer disagrees with the Intention to Award as notified by TNO, it will be given the opportunity to challenge the Intention to Award within twenty (20) calendar days after the date of publication of the Intention to Award in the manner described in Section 2.4 of the Procurement Guide.

6.2.3 Final award

Once the standstill period has expired without summary proceedings having been instituted or, if summary proceedings have been instituted in a timely manner, the judgment in first instance does not oppose final award, TNO will contact the successful Tenderer as soon as possible to proceed with the award, except where a situation exists in which summary proceedings have

been instituted in a timely manner. No final award will be made until the Contract has been validly signed by both Parties. If this is not the case, there is no question of TNO being bound in any way.

Kick-off meeting

TNO may intend to hold a kick-off meeting before the final contract is awarded. The Kick-off meeting objective is to cross-check and clarify (if any need) the Supplier proposed design including the complete set of compliance against customer applicable documentation at the issue that is relevant for the contract/kick off.

Digital Signature of Contract

To this end, TNO signs its Contracts using a so-called advanced digital signature tool, known as ValidSign. On receipt of the provisional award, the Tenderer is requested to provide the e-mail address and personal mobile phone number of the organisation's authorised signatory. The telephone number is needed to make the Contract legally binding (using SMS authentication).

On receipt of the final award, the Tenderer receives an e-mail containing a link to the documents to be digitally signed and clicks on "sign the documents" and is automatically redirected to ValidSign where the signature fields are visible. To sign, the Tenderer clicks "click to sign" and then "confirm". Once the documents have been digitally signed by the Tenderer and TNO, the Tenderer can download the digitally signed documents within a timeframe of thirty (30) days.

Progress meetings

After the Contract award, the Tenderer is required to participate in regular progress meetings. These meetings shall be held on a biweekly basis. The purpose of these progress meetings is to ensure effective communication, monitor the progress of the Contract, address any issues or concerns, and deadlines are being met. Each progress meeting shall include, but is not limited to, the following agenda items:

- Review of the current status
- Discussion of completed and upcoming tasks
- Identification and resolution of any issues or risks
- Review of timelines and milestones
- Any other relevant topics as agreed upon by both parties

The Tenderer must ensure that key personnel, including the project manager and relevant team members, attend these meetings. TNO will also designate representatives to attend the meetings.

7 Assessment of supporting and other documents from intended beneficiary

7.1 Requesting supporting and other documents from intended beneficiary

The Tenderer to which TNO intends to award the Contract must submit the supporting documents for the ESPD and any other documents and/or data within seven (7) calendar days after the date of TNO's request.

The following supporting documents must be supplied to TNO by the Tenderer to which TNO intends to award the Contract within seven (7) calendar days after the date of the request:

- Certificate of Conduct for Procurement (not more than two years old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- Declaration of Payment Behaviour from the Dutch Tax and Customs Administration (not more than six months old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- Extract from trade register (not more than six months old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- ISO 9001 Certification or similar measures;
- ISO 14001 Certification or similar measures;
- Insurance policy or Declaration of Readiness as to insurance (Annex **B03**);
- If applicable: Declaration as to Reliance on Financial and Economic Standing of Third Party or Parties (Annex **B01**);
- If applicable: Declaration as to Reliance on Technical and Professional Competence of Third Party or Parties (Annex **B02**).

Certificate of Conduct

The Certificate of Conduct (GVA; Dutch: Gedragsverklaring Aanbesteden) is a statement from the Minister of Security and Justice. The GVA indicates that an investigation into the natural or legal person concerned has not resulted in any objections in connection with the application and tendering for public contracts, special sector contracts, concession agreements for public works and/or services or competitions. After a provisional award, the provisionally awarded tenderer(s) must submit a valid GVA as proof that the grounds for exclusion do not apply to them.

TNO will request the intended beneficiary to submit the supporting documents. TNO will assess the following aspects of these documents:

- ascertain whether supporting documents submitted by Tenderer are submitted in a timely manner
- assess whether all the supporting documents requested by TNO have been submitted and whether the supporting documents received are complete. The absence of all or part(s) of supporting documents and/or other data will result in exclusion if there is no rectifiable omission. Depending on the nature of any deficiency, TNO will assess whether, as a result of that deficiency in the supporting documents, the Tender is invalid after all and will be disregarded, or whether the deficiency is amenable to rectification. The offer of rectification is a discretionary power of TNO and not a (legally enforceable) obligation.
- assess whether the Tenderer demonstrates through the supporting documents submitted that it complies with what it has declared through its Tender.

If the supporting documents are not, not completely and/or not timely received, or if the supporting documents show that the information in the Tender is incorrect, the Tenderer will be excluded after all/the Tender will be disregarded after all. If this is the Tenderer with the lowest price, the score for the sub-award criterion on Price (TP) will be recalculated, after which a new ranking will be determined. If this was not the Tenderer with the lowest price, the ranking order will be maintained and the Contract will be provisionally awarded to the Tenderers ranked in order of succession.

TNO is also entitled to verify the Tender from the Tenderer to which it intends to award the Contract. If this verification shows that the Tender contains inaccuracies or cannot be fulfilled, the Tender will be disregarded after all. If this is the Tenderer with the lowest price, the score for the sub-award criterion on Price (TP) will be recalculated, after which a new ranking will be determined. If this was not the Tenderer with the lowest price, the ranking order will be maintained and the Contract will be provisionally awarded to the Tenderers ranked in order of succession.

7.2 Contract subject to condition precedent

If the Tenderer is unable to provide a copy of the policy, nor a satisfactory statement from the insurance company, within the timeframe referred to in the previous section, but has signed the Declaration of Readiness in accordance with Annex **B03** then TNO will notify the Tenderer after a positive outcome of the assessment of the other (supporting) documents and after the standstill period has expired without summary proceedings having been instituted or – where summary proceedings have been instituted within the standstill period – the relevant judgement shows that the Award Decision can be upheld, that TNO will enter into the Contract with the Tenderer subject to a condition precedent. This condition precedent implies that the Contract will only actually be entered into if, after a timeframe of seven (7) calendar days (see Section 7.1), the Tenderer provides TNO with a copy of the required insurance policy or a satisfactory statement from the insurance company showing that the Tenderer is insured as required in the Procurement Documents. The Contract will not be entered into until after receipt of either document.

If the Tenderer is unable to provide the required insurance policy or a satisfactory statement from the insurance company within the set timeframe, the Contract will not come to fruition and TNO will retain the right to award the Contract to the Tenderer which would be ranked in first place after the number one which was eliminated in accordance with the assessment system.

8 Programme of Requirements

TNO will assess all Tenders against the Minimum Requirements which relate to the manner in which the Contract itself is to be performed. The Minimum Requirements imposed by TNO itself are listed in this Chapter: the **Programme of Requirements and Preferences (PoR)**.

By submitting a Tender, the Tenderer indicates his unconditional acceptance of all Minimum Requirements, including the TNO General Purchasing conditions (Annex **C03**).

Tenders which do not comply unconditionally with all minimum requirements are deemed invalid and will be excluded from further consideration.

As stated in Para. 6.1.2 of these Tender Instructions, this PoR contains, in addition to the minimum requirements, a number of requests regarding the quality of the requested service/delivery, called preferences.

The Tenderer demonstrates the ability to meet the requirements and preferences by means of his answers to the various questions, which must be structured in accordance with the instructions given in Chapter 8. The Tenderer may use their own A4 format for this purpose.

Activities further to the Contract must be performed in full accordance with the Tender Documents and the Tender submitted by the Tenderer. TNO wishes to stress that the requirements listed in the PoR form binding Contract conditions. Any amendments to the PoR made during the term of the Contract are to be implemented within the framework provided by the Contract. TNO will ensure that there is no material alteration to the Contract or the obligations it imposes on either party.

In the following paragraphs, the Requirements and Preferences are described. The requirements are also listed in Annex **A04** and should be confirmed by using Annex **A04**.

8.1 Requirements

Aspect 'Acquisition of SAR imagery'	
Number	Requirement Description
Requirement 8.1.1	The Tenderer shall provide (acquired by Tenderer) high-resolution Synthetic Aperture Radar (SAR) imagery in X-band with a spatial resolution better than five (5) metres, covering the defined Area of Interest (AOI; see annex C05) for the period 2015–2025, and tight orbit-tube satellite control to keep the perpendicular baseline small enough for high-quality repeat-pass InSAR (perpendicular baselines $\leq \pm 250$ m).
Requirement 8.1.2	The acquired imagery by the Tenderer needs to be aligned with the project objectives of section 1.6 and technical requirements listed under 8.1. The Tenderer shall ensure that all delivered SAR data and derived products meet the defined resolution, spatial and temporal coverage requirements. Satellite track selection over the AOI shall be justified. As part of processing, the best-available orbit (e.g. precise above restituted) shall be utilised and delivered as part of ancillary SAR data.
Requirement 8.1.3	TNO shall be the license holder of the SAR imagery. TNO shall be the end user of the SAR imagery. The Tenderer shall act as the value-adding entity, responsible for the processing, analysis, and delivery of SAR-derived products and associated metadata.
Requirement 8.1.4	The Tenderer shall ensure that all SAR data and derived products are delivered with all original SAR metadata exactly as provided by the respective satellite mission or data provider, including all ancillary track, calibration, and processing information supplied at the time of image acquisition or purchase.
Requirement 8.1.5	The Tenderer shall explicitly state issues or constraints concerning data availability, data gaps, archive completeness, or licensing conditions.
Requirement 8.1.6	The Tenderer needs to use full satellite temporal sampling of the SAR imagery in agreement with the project objectives. TNO reserves the rights to replace the temporal sampling from full satellite temporal sampling to half or one third of the full satellite temporal sampling (see Preference 8.2.2.1) and Annex A03, Format for Price Sheet.

Aspect 'Provided datasets from TNO'	
Number	Requirement Description
Requirement 8.1.7	The AOI is provided via a shapefile. The Tenderer shall confirm coverage completeness and the results of the full tracks shall be provided.

Aspect 'Provided datasets from TNO'	
Number	Requirement Description
Requirement 8.1.8	The provided " Actueel Hoogtebestand Nederland " (AHN4) Digital Elevation Model (DEM) and Digital Surface Model (DSM) with the higher resolution available (0.5 m) shall be used by the Tenderer during the execution of the contract.
Requirement 8.1.9	GNSS data provided for quality control (QC) shall be used for applied methods such as referencing, validation of velocities and time series (trends, seasonality, time series behaviour) whenever applicable and proposed by the Tenderer. (See preference 8.2.2.3).
Requirement 8.1.10	Provided building shapefiles shall be used to support measurement point classification, geocoding and other methods proposed by the Tenderer.
Requirement 8.1.11	Provided Corner reflectors (CRs) location for QC or geocoding shall be used when applicable and justified. The CR IDs shall be traceable in the QC report.

Aspect 'InSAR processing	
Number	Requirement Description
Requirement 8.1.12	The Tenderer shall perform Persistent Scatterer Interferometry (PSI) and Distributed Scatterer Interferometry (DSI) on the full Area(s) of Interest (AoI), in accordance with the requirement specifications and the delivery schedule.
Requirement 8.1.13	All purchased for TNO SAR acquisitions between 2015 and 2025 must be used. Any dropped acquisitions from the purchased for TNO catalogue shall be explicitly documented and justified (e.g., quality issues, conflicts with layover/shadowing, atmosphere).
Requirement 8.1.14	The Tenderer shall provide a substantiated justification if oversampling is applied, including a detailed explanation of the oversampling methodology, selected oversampling factors, implementation approach and parameters used, and their impact on data quality. Similarly, a decision not to apply oversampling shall be formally justified. Oversampling for the purpose of artificially increasing point density is not considered an advantage for the purpose of this tender; oversampling is acceptable to enhance georeferencing accuracy and shall always be justified and methods explained. (See preference 8.2.2.2).
Requirement 8.1.15	The Tenderer shall optimise co-registration methods for the dataset. All SAR images shall be accurately co-registered in both range and azimuth directions. The methods, parameters, performance of the co-registration shall be reported and supported by intermediate results by means of figures.
Requirement 8.1.16	<p>The georeferencing and geolocation steps shall be optimised to minimise geolocation errors in complex urban environments, particularly for high-resolution data.</p> <p>The Tenderer shall deliver a detailed and justified description of the georeferencing methodology used. This description must include:</p> <ul style="list-style-type: none"> - the full methodological approach applied during georeferencing and geocoding; - all assumptions, models, sensor parameters, and reference datasets used; - any correction procedures applied to reduce geolocation inaccuracies; - an explanation of how the proposed approach ensures consistency and robustness in building-scale deformation monitoring. <p>The Tenderer shall deliver the geolocation accuracy, preferably expressed using three-component error ellipses. If this is not feasible, the Tenderer explain why it is not feasible and shall deliver error bars for the east and north components. Geolocation accuracy shall be reported in both reference systems: ETRS89 (EPSG:4258) and RD (EPSG:28992).</p>
Requirement 8.1.17	<p>The Tenderer shall perform topographic corrections using the provided DEM (AHN4). The Tenderer shall estimate and report all residual height errors, including the influence of the DEM's resolution, accuracy, and any limitations relevant to the processing area.</p> <p>The methodology used for topographic correction shall be fully documented, including:</p> <ul style="list-style-type: none"> - DEM used and its specifications; - all assumptions, methodologies and parameters applied during the correction; - DEM errors: the procedure used to estimate residual height errors and the magnitude and distribution of the remaining residuals. - DEM error corrections: document the impact, and deliver the correction as a data layer to the L2 products. (See Annex C04).
Requirement 8.1.18	The Tenderer shall apply appropriate atmospheric corrections to mitigate tropospheric delay effects. Given the relatively small image footprint, tropospheric contributions are expected to be the primary atmospheric factor influencing the interferometric phase; these effects shall therefore be corrected accordingly.

Aspect 'InSAR processing	
Number	Requirement Description
	<p>The Tenderer shall deliver a clear and detailed description of the applied atmospheric correction methodology, including:</p> <ul style="list-style-type: none"> - the model(s), data sources, and auxiliary information used to estimate tropospheric delays (e.g., GACOS, ERA5, pyAPS, etc.) shall be delivered to ensure reproducibility; - all assumptions and parameter settings used in the correction process; - the procedure for assessing residual atmospheric effects after correction; - the magnitude, spatial distribution, and potential impact of remaining residuals. <p>All atmospheric correction methods, assumptions, and residuals must be documented in the proposal, and shall demonstrate that the applied approach is robust, repeatable, and suitable for producing accurate and reliable deformation estimates for the scope of this project.</p>
Requirement 8.1.19	<p>The processing workflow shall minimise phase-unwrapping errors and shall support the reliable detection of linear, seasonal, and exponential deformation components. The applied methodology must capture both spatial and temporal variations in building deformation behaviour to ensure representative, consistent, and high-quality Level-2 datasets.</p> <p>The Tenderer shall specify and justify the chosen phase-unwrapping method. This justification shall include:</p> <ul style="list-style-type: none"> - a transparent description of the unwrapping methodology; - all underlying assumptions and parameters; - an explanation of how the addresses building-related deformation characteristics and monitoring requirements; - any thresholds applied to filter points (accept/reject criteria) after unwrapping, including the rationale behind these thresholds; - procedures for detecting and correcting unwrapping errors, including automated and manual steps and their validation.
Requirement 8.1.20	<p>The Tenderer shall ensure that the relative geolocation accuracy of the Level-2 products does not exceed $\pm 0.15 \times \text{SAR resolution}$ of the SAR ground-range resolution for all measurement points with temporal coherence above 0.5.</p>
Requirement 8.1.21	<p>The Tenderer shall specify and describe in the report the measurement point quality parameters used to generate Level-2. Additional point quality parameters may be introduced with justification.</p>
Requirement 8.1.22	<p>The Tenderer shall specify what is the spatial Datum of the deformation products. The Tenderer shall also deliver the noise assessment of the reference area.</p>
Requirement 8.1.23	<p>The Tenderer shall deliver the velocity accuracies per measurement point.</p>
Requirement 8.1.24	<p>The Tenderer shall ensure that the velocity accuracy for the total period (~10 years) is below 2 mm/year, for temporal coherence above 0.5 and under 2km spatial scale.</p>
Requirement 8.1.25	<p>The Tenderer shall deliver the time series accuracies per measurement point.</p>
Requirement 8.1.26	<p>The Tenderer shall assess the possibility of using the provided GNSS network velocities for spatial reference and validation. The deformation time series must be referenced in the line of sight of the satellite for individual tracks. The Tenderer must suggest methods include referencing based on stable reference areas or multiple stable reference points.</p>
Requirement 8.1.27	<p>The Tenderer shall:</p> <ul style="list-style-type: none"> - report the handling of measurement points detected in multiple frames/tracks/overlaps, especially for Level-3 products; - ensure consistent measurement point IDs and avoid duplicates especially for Level-2 products. - justify any spatial/temporal filtering, smoothing, or rejection of data/images due to distortions or anomalies; - preserve traceability, and allow reproducibility.
Requirement 8.1.28	<p>The Tenderer shall classify measurement points (scatterers) into ground-level and elevated taking into account AHN4 accuracy in thresholds and uncertainties.</p>
Requirement 8.1.29	<p>The Tenderer shall deliver the accuracy of the estimated heights, and report corresponding methodologies to estimate height accuracies.</p>

Aspect 'InSAR processing'	
Number	Requirement Description
Requirement 8.1.30	The Tenderer shall deliver velocity and acceleration estimates for the full period (2015-2025), velocity of the last 6 months (estimated from the last image acquisition), annual velocities, acceleration and other estimated parameters as specified in Annex C04.
Requirement 8.1.31	<p>The Tenderer shall, at minimum (see preference 8.2.3), deliver the following structural deformation parameters for each requested building and its surrounding (see section 1.6.2 for tilt and curvature definitions and conventions and Annex C04 for specification of variables and file structure):</p> <ul style="list-style-type: none"> - Tilt: <ul style="list-style-type: none"> o Tilt components in x and y o Magnitude and direction of tilt; o Associated uncertainty; - Curvature: <ul style="list-style-type: none"> o Directional curvature components in x and y. o Mixed curvature components; o Total mean curvature; o Associated uncertainty; - Surface displacements around each building <ul style="list-style-type: none"> o Estimation of the surface displacements around the building; o Detection of surface displacement anomalies in the immediate vicinity of the building.
Requirement 8.1.32	The tenderer shall ensure transparency and reproducibility of results (tilt, curvature and other agreed metrics) per building.
Requirement 8.1.33	The Tenderer shall deliver accuracies of the Level-3b products ensuring that accuracy is sufficient to assess damage at the property level.
Requirement 8.1.34	The Tenderer shall report on the maximum achievable resolution possible of the Level-3b products to distinguish between ground level and building level.

Aspect 'Deliveries and format of deliveries'	
Number	Requirement Description
Requirement 8.1.35	The Tenderer shall provide all data products in the mandatory formats defined in Requirement 8.1.37. Supplementary formats may be supplied, but they shall not replace or modify the mandatory formats. All datasets shall be delivered in open, non-proprietary formats suitable for long-term archival and interoperability with standard geospatial information systems.
Requirement 8.1.36	The Tenderer shall deliver Level-1 (SLC), Level-2, and Level-3 datasets in selected formats including metadata following INSPIRE conformance and read-me file. (See 1.6.1 Product level definition and Annex C04).
Requirement 8.1.37	<p>The Tenderer shall deliver all products in the following mandatory formats:</p> <ul style="list-style-type: none"> - Level-1 (SLC): Focused Single Look Complex data in slant-range geometry, delivered in the standard SLC format as supplied by the SAR mission. - Level-2 (LoS Time Series): A tabular geospatial database, provided at minimum as CSV, containing all measurement points with full displacement time series, velocity, acceleration, and error metrics for both ascending and descending tracks (as defined in Annex C04). - Level-3a (Vertical/Horizontal Displacements): A multi-band GeoTIFF, in gridded form, where stacked bands represent all vertical and horizontal displacement layers, velocities and other relevant quality layers (as defined in Annex C04). - Level-3b (Tilt/Curvature Parameters): A tabular geospatial database, provided at minimum as CSV. Each record shall represent one building footprint and shall include but not limited to: <ul style="list-style-type: none"> o tilt parameters (in vertical and horizontal directions and magnitude); o curvature parameters; o differential deformation metrics; o uncertainty measures associated with the estimated parameters; o summary statistics.
Requirement 8.1.38	The Tenderer shall deliver the Level-2 and Level-3 datasets in the required formats (as specified in requirement 8.1.37) and in another format justifying the choice regarding interoperability (OGC/GeoTIFF/CSV), performance, and querying capabilities. An additional format is required and shall be proposed by the Tenderer for Level-2, Level3a and Level-3b (e.g., GeoPackage, Parquet). Additional formats shall be strictly supplementary to the mandatory format delivery (See Preference 8.2.2.3) and the definition of this format shall be agreed in kick-off meeting.

Aspect 'Deliveries and format of deliveries'	
Number	Requirement Description
Requirement 8.1.39	<p>All Tenderer-defined variables shall align with the data model and conventions specified in Annex C04. TNO may request amendments to optimise the delivered output towards the project's intended results.</p> <p>In addition to the variables specified in Annex A04, the Tenderer may propose additional variables where relevant to the proposed approach (see Preference 8.2.2.3). For each proposed variable, the Tenderer shall deliver a complete specification in the tender submission, including:</p> <ul style="list-style-type: none"> - the variable name (Header) to be used in the delivered CSV file; - a clear and concise Description of the variable and its purpose; - the corresponding Unit of measurement or notation. <p>All proposed variables shall comply with the naming conventions, formatting rules, and data structure requirements described in Annex C04.</p>
Requirement 8.1.40	<p>The Tenderer shall deliver Level-2 products with the following naming convention:</p> <p><projectName>_<satelliteCode>_<acquisitionMode>_<orbitDirection>_t_<orbitNumber>_<firstAcquisitionDate>_<lastAcquisitionDate>.<extension></p> <ul style="list-style-type: none"> - 5 digit project name LMBRG (Limburg) - 3 digit satellite Code (example given): SE1 (Sentinel-1) RS2 (RadarSAT-2) TSX (TerraSAR-X) CSM (COSMO-SkyMed) ERS (ERS) - 2 digit acquisition mode : IW (Interferometric Wide) XF (Extra Fine) S3 (Standard Mode 3) SM (Stripmap) SL (spotlight) - 3 digit orbital direction: ASC (ascending mode) DSC (descending mode) - 3 digit orbital number - 1 digit decomposition direction H (East-West direction) V (vertical direction) - Start date (first acquisition): yyyymmdd - End date (last acquisition) : yyyymmdd <p>Example: LMBRG_TSX_SL_ASC_t_095_20150101_20251231.csv</p>
Requirement 8.1.41	<p>The Tenderer shall deliver Level-3a products with the following naming convention:</p> <p>< projectName >_<satelliteCode>_grd>_<firstAcquisitionDate>_<lastAcquisitionDate>.<extension></p> <ul style="list-style-type: none"> - 5 digit project name LMBRG (Limburg) - 3 digit satellite Code (example given): SE1 (Sentinel-1) RS2 (RadarSAT-2) TSX (TerraSAR-X) CSM (COSMO-SkyMed) ERS (ERS) - Start date (first acquisition date): yyyymmdd - End date (last acquisition date) : yyyymmdd <p>Example: LMBRG_TSX_grd_20150101_20251231.</p>
Requirement 8.1.42	<p>The Tenderer shall deliver Level-3b products with the following naming convention:</p> <p><projectCode>_<satelliteCode>_grd_<firstAcqDate>_<lastAcqDate>_<buildingID>_statistics.csv</p>

Aspect 'Deliveries and format of deliveries'	
Number	Requirement Description
	<ul style="list-style-type: none"> - 5 digit project name LMBRG (Limburg) - 3 digit satellite Code (example given): SE1 (Sentinel-1) RS2 (RadarSAT-2) TSX (TerraSAR-X) CSM (COSMO-SkyMed) ERS (ERS) - Start date (first acquisition date): yyyyymmdd - End date (last acquisition date) : yyyyymmdd - The building identifier must follow this exact format: <postalNumber>-<postalLetters><unique5digitCode> <p>Where:</p> <ul style="list-style-type: none"> - <postalNumber> = the 4-digit postal code number of the building (e.g., 1234) - <postalLetters> = the 2 letters of the postal code (e.g., AB) - <unique3digitCode> = a 5-digit sequential identifier (00001–99999), assigned in order of request by the Contracting Authority (not by the Tenderer's internal ordering). <p>Example: LMBRG_TSX_grd_20150101_20251231_1234-AB-00001.csv</p>
Requirement 8.1.43	The Tenderer shall deliver a .pdf file for each building with the same name convention as in Requirement 8.2.42, but with a pdf extension.
Requirement 8.1.44	<p>The Level-3b .pdf per building products delivered by the Tenderer shall include:</p> <ul style="list-style-type: none"> - One record per building; - All computed deformation parameters; - Summary statistics and uncertainty metrics; - Relevant figure(s) of the building and its surrounding in which the selected deformation parameter(s) are clearly visualized (figure shall be of sufficient resolution and annotated or color-coded to ensure an unambiguously representation of the selected parameter(s). The selected parameter(s) to be featured in this figure shall be defined during the iterative process with TNO (see requirement 8.1.46).
Requirement 8.1.45	<p>The Tenderer shall deliver complete and standards-compliant metadata for all delivered products. Metadata shall include all mandatory INSPIRE elements and all conditional elements applicable to time-series surface displacement datasets, specifically:</p> <p>The metadata shall include all mandatory and conditional elements required under INSPIRE, such as:</p> <ul style="list-style-type: none"> - Identification metadata (file identifier e.g., requirement 8.2.40-8.2.42 , language, metadata date, contact point); - Dataset description title (title, abstract, temporal extent, keywords, access, usage constraints) - Spatial extent (Geographic bounding box of the processed AOI); - Temporal and spatial resolutions; - Data quality and lineage (processing chain, inputs, uncertainties); - Conformance statement to INSPIRE.
Requirement 8.1.46	The Tenderer agrees, at any point in time in the process of the contract realisation to iterate with TNO concerning the Level-3b data products.

Aspect 'Reporting and Quality Control'	
Number	Requirement Description
Requirement 8.1.47	<p>The Tenderer shall deliver a detailed technical report covering all processing steps, assumptions, selected configurations, and any proprietary methods applied. The report shall ensure reproducibility and full understanding of the processing chain (as described in requirements 'InSAR processing').</p> <p>The Tenderer shall justify the end-to-end methods used for PSI and DSI and generation of Level-3 products. The report shall include at a minimum:</p> <ul style="list-style-type: none"> a) The Tenderer shall report on the processing chain and ensure transparency considering: <ul style="list-style-type: none"> - Data sources: satellite sensor, acquisition mode(s), track(s)/frame(s), polarisation(s), incidence angle range, temporal coverage, archive. - Auxiliary data: DEM(s) and version(s), geoid/ellipsoid model, reference frames, GNSS tie points (if used), atmospheric or meteorological datasets, orbit products and quality level. - Software and versions: proprietary or open source; exact version numbers; reproducibility strategy. - Processing steps (PSI and DSI, distinctly detailed): coregistration, interferogram network design, phase filtering, atmospheric phase screen (APS) estimation, unwrapping, time-series inversion, geocoding, spatial Datum, outlier handling, and other Level-2, Level-3a and Level-3b variables as described in Annex C04. b) The Tenderer shall report on PSI and DSI processing and ensure transparency, considering: <ul style="list-style-type: none"> - Interferogram network topology (e.g., Delaunay, SBAS constraints, temporal and perpendicular baselines, coherence thresholds); - Scatterer selection or identification criteria (e.g., amplitude dispersion index, multilooking parameter for DSI, type of multilooking and number of brothers if adaptive multilooking is used, temporal coherence, Kolmogorov-Smirnov tests for DSI, covariance-based DS detection, super-pixel strategies); - Phase filtering and unwrapping methods and tuning; - APS/stratified troposphere mitigation approach (e.g., spatio-temporal filtering, external models, GNSS constraints); - Time-series inversion model (linear, piecewise-linear, seasonal terms, trend + periodicity, stochastic noise model assumptions) - Spatial Datum or reference strategy (reference point/area selection, stability test, reference frame realization, tie to external geodetic datum); - Velocity and horizontal deformation parametrization; - Outlier detection and robustness; - Uncertainty quantification (e.g. propagation from phase noise to displacement, covariance modeling, confidence intervals); c) The Tenderer shall report on the parametrization and ensure transparency, considering: <ul style="list-style-type: none"> - All key thresholds and hyperparameters (e.g., coherence thresholds, amplitude dispersion index cut-offs, temporal/perpendicular baseline limits, multi-looking factors, phase-linking settings, APS filter window sizes); d) The Tenderer shall report on the Level-3 products and ensure transparency, considering: <ul style="list-style-type: none"> - Estimation of Level-3a and Level-3b deformation products derived from the Level-2 displacement time series; - All processing steps, algorithms, and assumptions used to generate these products shall be fully transparent and detailed in the accompanying technical report; - The mathematical definitions used for the Level-3b products (e.g., plane fitting, curvature tensors, gradient analysis, and other defined parameters as in Preference 8.2.3); - Spatial sampling strategy, interpolation scheme, outlier detection, indicator of confidence and uncertainty metrics; - Additional parameters as appropriate (e.g., max differential displacement), and spatial scale over which curvature and tilt are estimated.
Requirement 8.1.48	<p>The Tenderer shall deliver a detailed QC report describing the QC procedures applied, including mitigation of unwrapping errors, temporal consistency analysis, GNSS comparison, atmospheric correction precision, geolocation accuracy, ground-height classification, and anomaly analysis resourcing to statistical metrics. Identified issues shall be clarified prior to acceptance.</p> <p>The QC report shall include at a minimum:</p> <ul style="list-style-type: none"> - Coregistration, interferogram: registration residuals, spectral diversity metrics, interferogram counts per point, coherence statistics, unwrap success rates; - Time-series: temporal coherence distributions, phase residual statistics, covariance or variance components, stability tests for reference points; - GNSS: line-of-sight and vertical/horizontal component handling, comparison metrics (bias, RMS, correlation); - Corner reflectors: methodology and uncertainties;

Aspect 'Reporting and Quality Control'	
Number	Requirement Description
	<ul style="list-style-type: none"> - Spatial Consistency: cross-track/ascending-descending cross-checks; - Uncertainties: decomposition (atmosphere, DEM, orbit, decorrelation), and coverage maps of per-point uncertainty; - Acceptance accuracies to be met and reported (see requirement 8.1.20 and 8.1.24); - Methods for estimated accuracies and uncertainties (see requirement 8.1.14, 8.1.16, 8.1.17, 8.1.20, 8.1.24, 8.1.28, 8.1.29, 8.1.33).
Requirement 8.1.49	The Tenderer shall deliver technical reports on buildings and their surroundings. Each building report shall be concise, with and limited to 1–2 pages.
Requirement 8.1.50	The quality report shall be independently readable, delivered as a searchable PDF, managed under version control, and adhere to a single structure and index. Any deviations or additional processing steps shall be clearly motivated.
Requirement 8.1.51	The Tenderer shall deliver a processing report including an overview of all used datasets, data gaps, feasibility analysis, visualization of AOI coverage, processing methods with assumptions, list of external data sources, and key intermediate results.
Requirement 8.1.52	The Tenderer shall describe the overall QC process, requested analyses, validation and verification of interim results, and demonstrate compliance with the required quality standards.
Requirement 8.1.53	The Tenderer shall deliver detailed reports in pdf format per building, adhering to the specified format, accessibility, and documentation requirements.
Requirement 8.1.54	The Tenderer shall maintain and deliver a logbook summarizing deviations from the Project Quality Plan, incidents affecting planning or quality, and corresponding corrective actions.
Requirement 8.1.55	The Tenderer shall support the assessment and acceptance procedure by verifying completeness of reports and datasets, documenting datasets and assumptions used, demonstrating achieved accuracies, performing cross-comparison with NAP datasets, checking point density and outliers, and conducting random time-series inspections. Non-compliant deliverables shall be redelivered.
Requirement 8.1.56	The Tenderer shall prototype the building report and agrees, to co-design and conduct one (1) to three (3) iteration cycles with TNO as part of the implementation process.
Requirement 8.1.57	The Tenderer shall generate and deliver up to 2000 building-level PDF reports (the "Building Reports") during the contract term. The reporting workflow may be automated following a requirements iteration and sign-off with TNO.

Aspect 'Data visualisation & stakeholder iteration'	
Number	Requirement Description
Requirement 8.1.58	The Tenderer shall design, build, host and maintain an accessible and interactive online portal for processed interferometric SAR (InSAR) outputs such as (e.g., but not limited to persistent scatterer points, distinction between persistent scatterers and distributed scatterers, displacement time series, velocity field maps, curve-fit parameters, and a searchable and downloadable database of building reports), for a contract period of five (5) years. The portal shall support limited user access, reproducible figures, and spatial and temporal queries.
Requirement 8.1.59	<p>The online portal needs to deliver the following functionalities:</p> <ul style="list-style-type: none"> - Viewer of the persistent scatterer points and distributed scatterers, with visual distinction between both, including: <ul style="list-style-type: none"> o Displacement time series (graph with a fitting model capabilities and model residuals); o Spatial field PS/DS coverage with possibility to choose which variable to display (map with legend); o Uncertainty metrics; o RMSE; o Curve fit parameters (fit surface and equation); - Search and filtering capabilities (building ID, address, geographic extent, parameter thresholds); - Description of the dataset layers with units and basic explanation - Reports per building (PDF) with accessibility from the portal limited to a select user group; - Building footprints; - Ability to export data and figures; - Figures reproducible from archived analysis (building report figures);

Aspect 'Data visualisation & stakeholder iteration'	
Number	Requirement Description
	<ul style="list-style-type: none"> - The use of temporal and spatial queries within the portal will be determined through an iterative process between the contractor and TNO (see requirement 8.1.56).
Requirement 8.1.60	The Tenderer should integrate into the portal as a quick view summary when clicking on the requested building information.
Requirement 8.1.61	The Tenderer shall prototype the visualizer and agrees, at any point in time in the process of the contract realisation, to iterate and co-design with TNO as part of the implementation process.

8.2 Preferences

Number	Explanation and scoring aspects	Points of attention	Objectives of TNO
Preference 8.2.1 Project Plan Max 70 points	<p>Tenderer shall deliver a Project Plan with a description of all logical steps to obtain the objective of the Project and will address at least the following components:</p> <ul style="list-style-type: none"> - Project management: Describe the project management process used and/or project management methodology used. - Risk management: Describe technical and non-technical (personnel) risks and how this is managed. - Data management: Describe the applied method for managing and securing the data obtained. - Technical assessment: Describe the technical approaches with respect to the objectives of section 1.5 and 1.6 taking into account: <ul style="list-style-type: none"> o Acquisition of high-resolution (lower than five meters) X-band SAR imagery; o Processing of Level-2, Level-3a and Level-3b products; o Quality control; o Creation and maintenance of the online portal. - Time schedule: Illustrate the work in a time schedule (e.g. Gantt chart or comparable) in which regions, milestones timing and tasks are visualised including preparation time. <p>Aspects that will be focused on during assessment are (non-exhaustive):</p> <ul style="list-style-type: none"> - Presence in the Project Plan of at least the above mentioned components: Project management, Risk management, Data management, Technical description for the proposed products and Time schedule; - Technical description for the proposed tasks. Focus will be on the connection of the descriptions to the described fit for purpose goals in the Tender document; - Time schedule: the time to create the requested products and the availability of the online portal. <p>The complete answer for Preference 8.2.1 must not exceed the maximum of 4 pages A4. If the answer is longer than 4 pages, the excess pages will not be included in the assessment.</p>	<p>The extent to which the project plan contributes to the objectives of the project. Over-all quality of the project plan including, completeness, clarity and consistency of the Project Plan</p> <p>The extent to which the measures in the project plan are substantiated.</p> <p>The matter of detail that is provided, and adherence to the components that are described.</p>	<p>The Tenderer shows a clear understanding of all technical and organisational aspects of the project and shows they can handle uncertainties and risks of the project.</p>

Number	Explanation and scoring aspects	Points of attention	Objectives of TNO
Preference 8.2.2.1 SAR acquisition, processing of SAR to InSAR and InSAR time-series Max 30 points	<p>The Tenderer shall deliver an elaboration of the possible ways to tackle the topics of requirements 8.1.1 to 8.1.6 concerning the acquisition of the X-band high-resolution (lower than five meters) SAR imagery. The Tenderer shall consider for each of the following aspects that will be focused on during assessment are (non-exhaustive):</p> <ul style="list-style-type: none"> The proposed high-resolution SAR satellite mission(s) by the Tenderer, need to demonstrate suitability, be clear and evidence-based with respect to the project objectives and technical requirements as stated in section 1.6. The completeness of aspects such as spatial resolution, acquisition mode, incidence angle range, revisit characteristics, licensing conditions, data continuity and long-term archive availability (to ensure possible continuation of the project) will be evaluated. Other aspects concerning the imagery selection given the project objectives will be evaluated: <ul style="list-style-type: none"> Single co-polar (HH or VV) selection must be justified with respect to coherence, scattering characteristics, and target observability in the AOI; Beam choices and layover/shadowing analysis shall be provided; the Tenderer shall justify incidence angle range and acquisition geometry for urban targets. The Tenderer shall specify perpendicular baselines used per track and per pair set in the proposal, including rationale for baseline optimisation to balance decorrelation and sensitivity to deformation; Satellite track selection over the AOI shall be justified based on maximizing the AOI coverage. As part of processing, best-available tracks shall be utilised and delivered as part of ancillary SAR data; The Tenderer is requested to propose a temporal sampling approach that is feasible within the project constraints and optimises the expected processing performance, and propose how to deal with possible gaps in imagery; The tendered shall provide a comparison when using all available acquisition data as well as half of the observations for meeting the project objectives. <p>If multiple commercial SAR constellations can meet the specified requirements (see requirements 8.1.1 to 8.1.11), the Tenderer shall identify all the above criteria and the Tenderer's preferred SAR constellation and why.</p> <p>The complete answer for Preference 8.2.2 must not exceed the maximum of 2 pages A4. If the answer is longer than 2 pages, the excess pages will not be included in the assessment.</p>	<p>Tenderer delivers clarity, transparency and justification for the chosen image products.</p> <p>Tenderer delivers a clear justification for the chosen SAR data sources, demonstrating understanding of cost–benefit considerations. Ensuring that the proposed SAR data density, resolution, track selection, polarisation and temporal sampling are appropriate and proportional for the monitoring objectives.</p> <p>Tenderer demonstrates the reliability of imagery acquisition, including mitigation strategies for possible limitations.</p>	<p>The tenderers shows how to acquire consistent, high-quality SAR coverage over the Area of Interest (AOI), South Limburg.</p> <p>The tenderer shows a clear understanding of acquiring fit to purpose imagery with adequate spatial and temporal resolution to support deformation monitoring, ensuring revisit frequency and acquisition planning meet product requirements.</p>

Number	Explanation and scoring aspects	Points of attention	Objectives of TNO
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<p>Preference 8.2.2.2</p> <p>SAR acquisition, processing of SAR to InSAR and InSAR time-series</p> <p>Max 50 points</p>	<p>The Tenderer shall deliver an elaboration on proposed methods to tackle the topics of requirements 8.1.13 to 8.1.20 concerning the processing of Level-1 into Level-2 products..</p> <p>The proposed methodologies for processing shall be described:</p> <p>Oversampling: Tenderers are requested to state whether oversampling is required to meet the project objectives and to deliver full justification for their chosen approach (see Requirement 8.1.14).</p> <p>Unwrapping: Regarding requirement 8.1.19 it is important for TNO to know the used phase-unwrapping methodology details. For this Preference the Tenderer shall specify the phase-unwrapping method used and shall deliver a clear and detailed justification for its selection. This explanation shall include:</p> <ul style="list-style-type: none"> - A comprehensive and transparent explanation of the proposed unwrapping methodology, including any assumptions underlying the chosen approach.; - This description shall detail how the method accounts for building-related deformation characteristics and fulfils the monitoring requirements of the project; - proposed procedures for detecting and correcting unwrapping errors, including automated and manual steps and their validation. <p>Geolocation: Regarding requirement 8.1.16 TNO expects the Tenderer to achieve the required accuracies and to expand on the proposal on how it will perform relative geolocation, including:</p> <ul style="list-style-type: none"> - methodological approach for georeferencing and geocoding; - assumptions, models, and how the reference datasets will be used; - possible additional correction procedures applied to reduce geolocation inaccuracies; - approach to geolocation accuracies (requirement 8.1.16 and 8.1.20), ideally with error ellipses (3 components) or the error bar of the east and north component if the Tenderer cannot deliver full error ellipses. - an explanation of how the proposed approach ensures consistency and robustness in building-scale deformation monitoring. <p>Atmosphere: The tenderer shall specify which atmospheric correction methodology for mitigating tropospheric delay effects will be applied in this project, and justify the choice based on scientific, technical, and operational considerations (see Requirement 8.1.18).</p> <p>The complete answer for Preference 8.2.1 must not exceed the maximum of 3 pages A4. If the answer is longer than 3 pages, the excess pages will not be included in the assessment.</p>	<p>Tenderer provides clarity, transparency and justification for the chosen SAR processing techniques mentioned in the explanation and scoring aspects .</p> <p>Tenderer delivers transparent and detailed InSAR processing and internal QC procedures, including, but not limited to the proposed approaches to estimate and correct for possible sources of nuisance, resource to external datasets and know-how to improve the mentioned methodological steps (e.g. oversampling, unwrapping, geolocation, atmosphere).</p> <p>Tenderer explains how to quantify uncertainties at each processing stage, demonstrating how these uncertainties propagate through the workflow into the final deformation products.</p>	<p>The tenderer shows a clear understanding of processing SAR imagery for the purpose of deformation monitoring, ensuring product requirements.</p> <p>Tenderer implements robust techniques, including the use of state-of-the-art algorithms on the most important steps of InSAR processing, providing references, and clear explanations on the adopted methodologies for oversampling, unwrapping, geolocation and atmospheric corrections aligned with the project objectives.</p>
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Number	Explanation and scoring aspects	Points of attention	Objectives of TNO
Preference 8.2.2.3 SAR acquisition, processing of SAR to InSAR and InSAR time-series Max 50 points	<p>The Tenderer shall deliver an elaboration of the possible ways to tackle the topics of requirements 8.1.21 to 8.1.34 concerning the Level-2, Level-3a and Level-3b products. The Tenderer shall consider for each of the following aspects that will be focused on during assessment are (non-exhaustive):</p> <p>The Tenderer shall propose and justify the end-to-end methods to be used for PSI and DSI. The proposal shall include, at a minimum:</p> <ul style="list-style-type: none"> - Processing method to derive PSI and DSI with clear methodology (e.g., if DSI explain which type of multilooking will use); - Quality metrics for the derived time series, estimated velocities and accelerations; - Spatial Datum selection for the time series deformation; - Methods for accuracies assessment on: velocity, geolocation, heights, time series; - Methods for providing error bars to point measurements on velocity, geolocation, heights, time series; - Validation: The Tenderer shall deliver a validation methodology framework taking into account the use of existent GNSS data, Lidar-derived DEM and available surface elevation model and possible CRs. <p>Concerning the Level-2, Level-3a and Level-3b products:</p> <ul style="list-style-type: none"> - The Tenderer shall deliver the Level-2 in table format presented in comma separated values (.csv) format (See requirement 8.1.37). The Tenderer shall propose other file formats and justify the choice regarding interoperability (OGC/GeoTIFF/CSV), performance, traceability, advantages querying the portal, speed while meeting the overall objectives of the project (see requirement 8.1.38). - TNO welcomes the Tenderer's insights and proposed methodology for ground and height classification of the measurement points. - In addition to the variables specified in Annex A04 (Deliveries and format of deliveries'), the Tenderer may propose additional variables where relevant to the proposed approach (See requirement 8.1.39). This especially concerns, but not limited to Level-3a and Level-3b products. Suggestions on Level-2 products will also be evaluated. All proposed variables shall comply with the naming conventions, formatting rules, and data structure requirements described in Annex C04. (See requirement xxx Deliveries and format of deliveries'). For each proposed variable, the Tenderer shall deliver a complete specification in the tender submission, including: <ul style="list-style-type: none"> o the variable name (Header) to be used in the delivered CSV file; o a clear and concise description of the variable and its purpose; o the corresponding Unit of measurement or notation. <p>The complete answer for Preference 8.2.1 must not exceed the maximum of 3 pages A4. If the answer is longer than 3 pages, the excess pages will not be included in the assessment.</p>	<p>Tenderer provides clarity, transparency and justification in describing the processing pipeline, the chosen InSAR processing techniques mentioned in the explanation and scoring aspects, how to handle multi-year time series and varying coherence, and suitability for delivering Level-2, Level-3a and Level-3b products, quality metrics (for time series velocities and accelerations), quantifying uncertainties at each processing stage, how these uncertainties propagate through the workflow into the final deformation products and how accuracies will be computed per parameter.</p> <p>Tenderer defines the deformation reference system, how the spatial datum selection will be done, and how it will handle reference point/area stability, Datum propagation (across tracks, level products) and regional trends.</p> <p>Tenderer provides a framework for validation with external data and proposes a robust ground-height classification technique.</p> <p>Tenderer justifies choices of other file formats in addition to the mandatory CSV, and proposes additional variables with alignment with the project objectives completing the specification of each additional variable with compliance with the naming conventions and structure of Annex C04.</p>	<p>Tenderer shows a clear understanding of processing InSAR time series for the purpose of deformation monitoring, ensuring product requirements.</p> <p>Tenderer presents a robust and transparent:</p> <ul style="list-style-type: none"> - workflow for generating both Persistent Scatterer Interferometry (PSI) and Distributed Scatterer Interferometry (DSI) outputs. - approach to quantifying quality and reliability of deformation outputs - definition of datum selection - approach to accuracy estimation - scientifically defensible uncertainty quantification - justification of choice for other file formats - robustness of the ground and height classification <p>relevance of the additional proposed variables</p>

Number	Explanation and scoring aspects	Points of attention	Objectives of TNO
Preference 8.2.3 InSAR approach to building analysis Max 150 points	<p>The Tenderer shall deliver an elaboration of the possible ways to tackle the topics of requirements 8.1.31, 9.1.32, and 8.1.37. Concerning the approach to building derived metrics.</p> <p>The Tenderer shall consider for each of the following aspects that will be focused on during assessment are (non-exhaustive):</p> <ul style="list-style-type: none"> - Methods for tilt and curvature estimation (provide formulas if necessary); - Applicability to both PS and DS; - Other metrics or methods the Tenderer can propose to assess building vs ground stability; - Methodologies on differentiating building from ground displacements; - Accuracy estimation methodologies of tilt and curvature given the purpose of this tender; - Describe the ability to handle sparse or unevenly distributed scatterers; - Discussion of assumptions (e.g., interpolation model, spatial sampling). <p>The complete answer for Preference 8.2.1 must not exceed the maximum of 3 pages A4. If the answer is longer than 3 pages, the excess pages will not be included in the assessment.</p>	<p>Tenderer provides clarity, transparency of the mathematical formulas and justification for the estimation of tilt parameters and curvature, and proposals of other complementary metrics mentioned in the explanation and scoring aspects .</p> <p>Tenderer delivers transparent and detailed procedures, parameters (size of the areas used for computation), accessible description of the algorithmic choices, including uncertainty estimation.</p> <p>The completeness and profoundness of the analysis</p> <p>The ability of the Tenderer to be able to understand how these metrics affect building stability estimation.</p> <p>The ability of the Tenderer to provide additional metrics such as differential settlement indicators, building-to-ground displacement ratios.</p> <p>Relevance of proposed metrics to building safety and long-term deformation risk.</p> <p>Tenderer ensures reproducibility and processing transparency, clearly documenting software, algorithms, processing chains, intermediate products, and logs.</p> <p>Tenderer quantifies uncertainties at each processing stage, demonstrating how these uncertainties may influence the building stability assessment and interpretation.</p>	<p>Tenderer shows a clear understanding of estimating the tilt and curvature parameters and proposes robust, scientifically sound methods to derive tilt and curvature from the estimated deformation data.</p> <p>Tenderer expands beyond minimum requirements by proposing meaningful extra metrics, especially for building stability assessment.</p> <p>Tenderer ensures that tilt/curvature estimates are meaningful and reliable within the project context.</p> <p>Tenderer rigorously describes the interpolation and numerical differentiation approaches and uncertainties possible affecting the results.</p>

Number	Explanation and scoring aspects	Points of attention	Objectives of TNO
<p>Preference 8.2.4 Data visualisation & stakeholder iteration</p> <p>Max 150 points</p>	<p>The Tenderer shall deliver an elaboration of the possible ways to tackle the topics of requirements 8.1.58 to 8.1.61 concerning the data visualization and stakeholder engagement. The Tenderer shall consider for each of the following aspects that will be focused on during assessment are (non-exhaustive):</p> <ul style="list-style-type: none"> - Description, when possible with images, on how the Tender proposes to display the Level-2, Level-3a, and Level-3b products; - Besides the features mentioned in the requirements regarding the user interface, which other features does the Tenderer see useful and offer to be featured based on the project objectives; - How will the distinction between persistent scatterers and distributed scatterers be presented in the portal; - Other aspect such as querying capabilities, downloading, system architecture, how Level-2 and Level-3 data are ingested into the system, capabilities to add additional data layers, supported files for additional data layers, flexibility in displaying different zoom levels; - uncertainty measures associated with the estimated parameters; - Approach for co-design sessions with TNO; - Methods for testing prototype interfaces with actual stakeholders. <p>The complete answer for Preference 8.2.1 must not exceed the maximum of 4 pages A4. If the answer is longer than 4 pages, the excess pages will not be included in the assessment.</p>	<p>Tenderer provides clarity, transparency and justification on the functional requirements of the visualizer, e.g., data layers, interaction and query capabilities, analytics, exporting capabilities, access and roles, performance relating to the loading of the data, and availability, accessibility and maintenance, mentioned in the explanation and scoring aspects .</p> <p>Visual clarity such as symbols, colours, transparency, or texture differences.</p> <p>Interpretation support such as legends, metadata explanations.</p> <p>The ability of the Tenderer to be able to show how their development is of added value, e.g. Innovative user interface elements the Tenderer suggests based on project objectives (e.g., smart filters, dashboards, alerts, comparison tools).</p>	<p>Tenderer shows a clear understanding of how the visualizer shall be used for the purpose of deformation monitoring, ensuring product requirements.</p> <p>Tenderer allows the stakeholders to easily identify deformation patterns, risks and trends for the whole area, and for the requested buildings.</p> <p>Tenderer ensures that the visualisations are accessible and scientifically sound.</p> <p>Tenderer ensures that the Portal outputs must help stakeholders, and shall prioritise building assessments and uncertainties interpretation.</p> <p>Tenderer shows that the portal allows fast querying, downloading and navigation in an intuitive way.</p>

9 List of Annexes

All the Annexes appended to the Procurement Documents are published with the Procurement Guide at www.TenderNed.nl.

The Annexes are divided into three (3) main groups, namely:

A) Submission of Tender:

- Annex A01** The Tenderer's ESPD, "European Single Procurement Document" (ESPD)
 - *If applicable, this format should be multiplied in proportion to the number individual Combination members; the individual Third Party or for the benefit of one or more subcontractors to be used for the work).*
- Annex A02** Reference Projects
- Annex A03** Format for Price Sheet
- Annex A04** Compliance with Requirements

B) Submission of supporting documents:

- Annex B01** Declaration re. use of Third Party Fin. and Econ. Capacity
- Annex B02** Declaration re. use of Third Party Techn. and Prof. Competence
- Annex B03** Declaration re. Insurance Policy

C) Additional information:

- Annex C01** Tenderer's questions (Information Notice)
- Annex C02** TNO Supplier Code of Conduct, 2024
- Annex C03** General Purchasing Conditions of TNO, February 2022
- Annex C04** Specification of Variables and File Structure
- Annex C05** Area of Interest (AOI)

Additional note on Section 2.2.2 Formats

Some of these Annexes are accessible in "editable" MS Excel or MS Word versions. This is with the aim of simplifying the preparation of a Tender by the Tenderer and therefore also forms the basis for the assessment procedure as described in Section 3.

Some documents may be, partially, secured to prevent inadvertent and unintentional changes being made to the documents and texts (including format texts).

Changes to the formats are not permitted. The premise for these documents is that the text (including format text) as contained in the Procurement Guide and published on www.TenderNed.nl will be the authoritative text at all times.