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SPECIFIC CONDITIONS FOR TOPOGRPAHY AND CARTOGRAPHY WORK ON THE - HARAMAIN HIGH SPEED RAILWAY PHASE 2

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1 OBJECTIVE

The objective of this document is to establish the necessary conditions for the selection of one well known and prestigious companies to carry out the CARTOGRAPHY AND TOPOGRAPHY WORK to support INECO, in all the areas of work related to the HARAMAIN HIGH SPEED RAILWAY PROJECT PHASE 2, at the same time as establishing the main legal principles that need to be taken into consideration.

2 SCOPE AND DESCRIPTION OF THE WORK TO CARRY OUT

The work area described is understood to be that between PK 0+000 and PK 470+000 of the platform (except the part between PPKK 190+000 – 290+000), and the track to KAIA airport (approximately 6 Km in length), located around PK 92+500.

- Basic new network for the building of the track.
  - Planimetric observation through GPS.
  - Link to the Project Reference system.
  - Calculation of observations and network adjustments.
    - Altimetry methods through geometric levelling.
- Checking the existing topography network, with vertex named GMN (located approximately every 100 Km), C (located every 10Km) y BM (located every 500m).
  - Observation through GPS.
    - Planimetrical
    - Altimetry
  - Calculation of observations and network adjustments.
- Measurement of gauges of the possible interferences on the plan such as electrical networks etc.(PK 1+000 – PK 449+000)
- Measurement of data for installations and signalling through tachometric surveys.
  - Tachometric surveys on a scale of 1/500, with bends each 0,5 m (0+000 – 470+000) at isolated areas.
- Measurement of data for the building of the track: PK 0+000 – 190+000 and PK 290+000 - 449+000:
  - Check the Surveyed Bases.
  - Densification of the network of the Surveyed Bases if required.
  - Transversal profiles for the building of the track including the tipping points and singular elements.
  - The systematic measuring of the transversals every 200 metres on straight lines and every 100 metres on bends, using the correct number of points required so that the transversal is completely defined, so that two points are taken at both parts of the natural area.
  - Geometrical definition of the structures in the plan, and handing over of sheets and sketches.
  - Three dimensional geometric definition of the structures found in the plans and situated using absolute coordinates
  - Observation and calculation of Feno markers.
  - Longitudinal drain of the plan, Situated using absolute coordinates, section and longitudinal profile with points every 20 metres.

The scope indicated could be, if required, modified with the established limitations in section 6.

- Measurement of the data of the possible interferences in the plans, such as electrical networks, etc.

2.1 GEODESIC REFERENCE SYSTEM AND COORDINATE REFERENCE SYSTEMS

"Geodesic reference system" established which has a Datum SGD 2000 (Saudi Geodetic Datum 2000), epoch 2004.0, as set out in the ITRF 2000 (International Terrestrial Reference Frame -2000), and uses the GRS80 ellipsoid as a reference (Geodetic Reference System 80), and Geodesic frame of reference of the la Departure vertex network.
The cartography will be in the Universal Transverse Mercator UTM (U.T.M.), zone 37.
To obtain the altimetry datum ortometric altitudes will be used at the Departure Network, as obtained by MONRA.
All the cartography will be referred to as a unique system of coordinates, although it will be carried out in two separate zones. In this case it will be represented in a unique zone that will make up the most of the work carried out.
In the case of having to carry out cartography in two separate zones within the same work, it will be necessary to get the explicit authorisation of the Contract Director who will dictate the rules required to guarantee the continuity of the work to change the zone.
The same Geodesic reference system will be used in all complimentary work as that used in all the work done.
For that reason the same Geodesic network will be used as with the Geosdesic system, both in the planimetry and altimetry, in this case of the Surveyed Bases.

2.2 TOPOGRAPHY FIELD AND OFFICE WORK

2.2.1 NETWORK ON THE EXISTING PLATFORM

The existing Topographic network of the platform must be observed and checked, both in the planimetry and altimetry, through the carrying out of an intensive study with the idea of using it as the departure point of the Basic Network.
It will also be necessary to observe a unique and continuous network of an area sufficient enough to control the work zone. Said network will be observed with an over abundance of observations, to such a point that it will be "adjustable" with least squares, with spatial concatenated triangles with the "GMN" vertex from the Geodesic network MONRA.
During the observation of the "BM" (signals mounted at ground level) and the "C", it will be necessary to have duplicated and independent stations, so to minimise and quantify the errors made by the station on the tripod which will mean a true test of the departure network.
The calculation must be carried out using the same Geodesic system of reference which was established in the Geodesic Network (MONRA), and coincides with that of the project and it is checked if using the geoide model "EGM96" and the ortometric altitudes are obtained in accordance with those of the network.
In the case of the coordinated altimetrics not agreeing to those indicated in the last paragraph, it will be necessary to calculate of the Transformation Parameters in Stepwise, separating the la planimetric transformation from the altimetric in each work area, with those being no bigger than 20 km, to make sure a precise altimetric of the said work including an overlapping strip of 1-2 km, in which 2 to 3 check-points will be included.
A comparative chart will be presented showing the coordinates obtained and the previous ones.

2.2.2 NEWLY IMPLANTANTED BASIC NETWORK

2.2.2.1 Planimetry:

Observation will be carried out through GNSS techniques using a minimum of six receptor, simultaneously, using a triangulation between the Network vertex that we observe.
The observation conditions will be the following:

- Number of satellites equal to or more than 5.
- GDOP les or equal to 5.
- Mask of elevation more than 15 degrees from horizontal.
- Minimum observation time: 20 minutes.

The observations will be concatenated, with a continuity so that no independent groups of vertexes will be observed, rather the whole network consisting of a group of interrelated observations that together allow for the carrying out of calculations in a concatenated way.

All observations made through the use of GPS receptors will be post-processed and analysed statistically through the use of the correct software, preferably LEICA Geo Office.

In this way an analysis can be made of the results obtained and conclusions can be given about the precision of each base line and point that is observed.

To achieve this:

- A study will be carried out of the base lines, modifying if necessary the periods of time that are common between receptors and eliminating the satellites that do not achieve the required geometry or those that affect the quality of the calculation.
- The "offset" values should be taken into account in the centres indicated by the constructor.
- All the base lines will have resolved all ambiguities during the process.
- A concatenated calculation will be carried out from the "GMN" vertexes of the Geodesic Network MONRA, and will be included in the "C" vertexes (located every 10Km) and "BM" (located every 500m), in a way that interrelated observations can be carried out creating a homogenous triangulation that covers all the plan..
- A minimum quadratic adjustment of all the Basic Network together, in which points are fixed on the vertexes GMN, C and BM. From this adjustment the definitive planimetric coordinates will be obtained for the Network.

At the moment of calculating the parameters of the transformation through the correct software, those geodesic vertexes that damage the calculation of the results in the post process will be rejected this choosing the best possible configuration.
Stepwise transformations will be used to obtain the coordinates.

2.2.2.2 Altimetry:

The ortometric level of the network vertexes is obtained through geometric levelling that will start and finish on the vertexes defined by the Technical Director (once the results of the Topographic Network of the Surveyed Bases of the existing platform are checked).
The concatenation of the levelling will be measure through double levelling rings (in both directions), which not have a maximum will distance of more than 1.5 km.
The observation methodology will be the mid-point and the maximum distance of levelling that is less than 70 metres. The maximum difference between the levelling at the front and at the back must be presented in the calculations lists and should be no more than 3 metres.
The tolerance allowed for levelling work will be $5*\sqrt{K}$ mm, with K being the length expressed in kilometres.
This tolerance will be applied in both the individual calculation of each ring that forms part of each line of levelling (the closure error of each ring will be less than said tolerance), as for the total of all levelling lines (the closure error of all levelling lines must be less than the tolerance).
At the same time, an analysis will be presented in the report of the results obtained, specifying the compensation criteria used in the compensation of the closure error.

2.2.2.3 Calculation:

All observations carried out using GNSS receptors will be post processed and analysed statistically through the correct software.
An analysis of the results obtained will be carried out with conclusions presented about the precision of each base line and each point that is under observation. To achieve this:

- A study of the base lines will be carried out, modifying if necessary the periods of time between receptors and the elimination of satellites that do not meet the geometry required or that damage the quality of the calculation.
- The "offset" values should be taken into account in the centres indicated by the constructor.
  All the base lines will have resolved all ambiguities during the process.
- A concatenated calculation will be carried out at the coordinates WGS-84, starting from the coordinates of the vertexes defined by the Technical Director.

Once the vertex process and the calculation of the closures of the spatial triangles are carried out, a calculation will be made, along with a block compensation, of all the observations using the least squares methodology while defining as fixed the coordinates of the departure vertexes as defined by the Technical Director.

All the adjustment process of the network will be carried out using the system reference WGS84, in 3D, through the correct software used for the Design and Adjustment of Geodesic Networks. The observations will be adjusted using precisions with 95% levels of accuracy.
The planimetric coordinates adjusted from each one of the vertexes (WGS-84-UTM-Zone 37) will be obtained applying the UTM projection to the geographical coordinates.
The adjusted coordinates will be obtained from each vertex as well as the corresponding quadratic errors.
With this data along with the ortometric altitudes taken from the geometric levelling a non gravimetric geoide can be calculated, not for the whole project that will enable us to transmit the ortometric height to all the topography done using GNSS techniques.
The following information will be passed on:

- Work reports containing:
  - Technical memorandum
  - Graph showing GNSS observations taken from a base of existing cartography.
  - Sketches of the levelling area.
  - Individual outline for each vertex with an identification number, map of area, sketches, photo, geographic and UTM coordinates and ortometric at the foot and ortometric and ellipsoidal at the head according to the format provided by the Technical Director.
  - Individual outline for each part of levelling added every 1 Km, with an identification number, map of area, sketches, photo, geographic and UTM coordinates and ortometric according to the format provided by the Technical Director.
  - Description of the tools used.

- RINEX data from the field work.
- Observation data from the levelling work.
- Digital file with the process calculation report and the results obtained.

2.2.2.4 Analysis and justification of the results obtained:

The calculations to carry out will clearly show us the errors obtained as well as the error ellipses, compensation method and justification of it as well as the definitive results.
At the same time a results analysis will be presented of the accuracies obtained in each work compared to the levels required by the current document.

2.2.3 CHECKING THE EXISTING NETWORK

2.2.3.1 Observation:

The merits of the vertexes in the existing network will be checked within the work area. To do that a minimum of six GPS receptors will be used simultaneously, placing two receptors in two vertexes of the new topography network and the other four will be placed in the rest of the vertexes that belong to the existing project network. This observation method will allow us to carry out a triangulation of the vertexes and give us a large amount of observations.
A first observation will be carried out by placing two GPS receptors on the two GMN vertexes located in the work area, and the other four in the “C” vertexes, while carrying out an observation, based on the distance in which they are located, of at least 3 hours.
Afterwards a triangulation of the BM vertexes will be carried out in which the “C” vertexes will be included and the new topographic network vertexes. The observation will be carried out using GNSS techniques and the relative static technique. The observation conditions will be the following:

- Number of satellites more or equal to 5.
- GDOP less or equal to 5.
- Mask of elevation more than 15 degrees from horizontal
- Minimum observation time: 15 minutes.

2.2.3.2 Calculation:

All observations carried out using GNSS receptors, will be post processed and analysed statistically through the correct software.

An analysis of the results obtained will be carried out with conclusions presented about the precision of each base line and each point that is under observation.

- For the calculation of the base lines the coordinates of the vertexes GMN will be taken as the departure coordinates of the vertexes.
- The "offset" values should be taken into account in the centres indicated by the constructor.
  All the base lines will have resolved all ambiguities during the process.
- A study will be carried out of the base lines, modifying if necessary the periods of time that are common between receptors and eliminating the satellites that do not achieve the required geometry or those that affect the quality of the calculation.

The data processing, calculations of base lines and adjustment of the Basic Network through the least squares method will be carried out using LEICA Geo Office software.
Once the vertexes and calculations of closures of the spatial triangulation process are finished, the calculation and the block compensation of all observations will be carried out using the adjustment method for least squares.
The observations will be adjusted using precisions with 95% levels of accuracy.
The planimetric coordinates adjusted from each one of the bases of Topographic Network (WGS-84-UTM-Zone 37) will be obtained applying the UTM projection to the geographical coordinates if they exist within the Reference System WGS-84-UTM-Zone 37.
The adjusted coordinates will be obtained from each base as well as the corresponding quadratic errors.

To transmit the ortometric height to the bases of the Topographic Network the geoide EGM96 model will be applied to the ellipsoidal heights calculated, while checking the levels between the bases.
The following information will be presented:

- Work report containing:
  - Technical report.
  - Analysis of the differences found.
  - Description of the tools used:
- RINEX data from the field work.
- Digital file with the process calculation report and the results obtained.

2.2.3.3 Analysis and justification of the results obtained:

The calculations to carry out will clearly show us the errors obtained as well as the error ellipses, compensation method and justification of it as well as the definitive results.
At the same time a results analysis will be presented of the accuracies obtained in each work compared to the levels required by the current document.

2.2.4 TACHOMETRIC SURVEYS

The different areas of work will be defined with an adequate number of points that narrow down the geometry, with a focus on obtaining a cartographic product with an adequate level of detail to meet the scale defined by the Contract Director.
Special attention will be paid to the correct geometric definition of those details that are highlighted by the Contract Director.

2.2.4.1 Observation Methodology

The points that will make up the different parts of the work: Topographic surveys, as well as the densification of the network of the Surveyed Bases if required, this will be defined by the location of the vertexes through a method that guarantees the quality of the accuracy of the conclusion.

Observation through the classic methodology:
If the Total Station form of observation is chosen, the maximum distance of radiation will be that whereby the required level of accuracy can be obtained from the coordinates of the points.

Observation using GPS methodology:
If the GPS methodology is chosen, the observation of the points will be carried out in real time (RTK) for the surveys and in Relative Static for the densification of the network of the Surveyed Bases, observing at each point the time necessary to attain the quality required. The observations must enable the presentation of a list of results complete with reasons.
The maximum distance permitted for the base lines between the receptors stationed at the Surveyed Bases, and those located in the points to be observed, must be 5 kilometres in RTK and 10 kilometres for the Relative Static.

2.2.4.2 Altimetry of the Tachometric Surveys.

The altimetry reasoning for the points will be carried out from the existing Network through classic Topography using the Total Station or through the GPS methodology.
Obviously these observations will be the same to provide these points as well as the planimetric coordinates and the height.
In the case of carrying out the observations through the GPS methodology, the geoidal model that most adjusts to the work area, and the most up to date, will be used.

2.2.4.3 Calculations

- **Methodology using GPS Techniques:**

All observation carried out using GPS receptors will be statistically analysed using the correct software.
In this way an analysis of the results can be obtained with conclusions about the accuracy of each point observed.

- **Analysis and justification of the results obtained through classic topography:**

The topographic work carried out to determine the points belonging to the different surveys, through classic topography, will be compensated using the most convenient method available; always after the measurements taken have sufficiently respected the fixed accuracy required.
At the same time an analysis will be presented on the results of the accuracies obtained in each work and compared to those required in the current document.
In the case of errors being greater than allowed by the tolerances, the observation should be repeated in either planimetry and/or altimetry.

- **Absolute accuracy of Topographic surveys**

In the case of tachometric surveys on a 1/1000 scale, admissible errors for the surveys reach a limit of errors 7 cm. in absolute values for the coordinates x e y, y at 8 cm. and established as an absolute height level.
And in the case of tachometric surveys on a 1/1500 scale, the errors must be within a limit of 5 cm. in absolute values for the coordinates x e y, y at 8 cm. and established as an absolute height level.

2.2.5 BUILDING OF THE TRACK

It will be necessary to take transversal profiles every 20 m between PPKK 0+000 to 190+000 and PPKK 290+000 to 449+000, so that the platform can be completely defined.

- The planimetric coordinates will be taken using GNSS, and then calculated in and adjusted in the psot process.
- The height will be taken using the total station, starting from the closest base and will be checked and compared with the previous or posterior base whenever possible. The distance when taking the height should be the least possible.
- All the information must be registered in a field data file with the calculation handed in during the post process along with the original observation files, so that all work can be approved.

The following six (6) points will be observed when defining the platform:

- The edge of the platform that coincides with the axis of the track.

- Two points at ± 1.747 m from the axis (this position coincides with the active side of the inside rails).
- Two points on the edge of the platform.
- One point under the track at 5.80 m from the edge.

2.2.5.1 Observation of settlements on the platform

Observations using Feno markers will be used to measure the settlements on the platform, they will also use a DNA03 level and Invar measuring system.
The points to observe are located 100 metros above the platform and the references every 500 or 250 metres.
The total number of points to take will be 745 Feno markers or something similar.

2.2.6 INSTALLATIONS AND SIGNALLING

It will be required to take data of measurements of the crossing of the power lines cables in each area in accordance with the specifications in APPENDIX 2.
The measurement of data for installations and signalling will be carried out through tachometric surveys on a 1/500 scale, with level bends at every 0.5m, of the areas indicated in section 2, to do this the following elements need to be acquired:

- Foot/Head of the platform slope.
- Existing transversal drainage works in the area.
- Existing paths in the area or serving the platform.
- Supports for the power lines in the area.
- Existing piping and pipelines in the area.
- Indication of existing borders, fencing, building, vegetation, etc. In the area.
- And any other existing significant elements in the area.

2.2.7 OTHER METHODOLOGIES

The use of new technologies not included in this document remain available on the approval of the Director of Contracts, by a presentation with the sufficient technical documentation that backs up the methodology to be used or that improves on the results obtained by the methods previously mentioned.

2.3 DOCUMENTATION TO BE PRESENTED

The contractor must present all works using a structured plan provided by Ineco in which all technical requirements are included in report form as well as all the formats to follow. Said report will be presented in both English and Spanish, and digitally, in both open format and as a PDF. The report in English must be presented as a literal translation of the Spanish version and therefore needs to be previously approved by the Technical Director.

2.3.1 Classic Topography:

Detailed presentation of the observation methodology, calculation and compensation.

Field data:

- Field observations in the correct format to enable use with the corresponding programmes.

Calculations:

- Calculations of coordinates, using the corresponding methodology.
- Calculations of closure errors and compensation of the same if they correspond.
- Presentation of final coordinates together with the presentation of the final qualities obtained.

Analysis of the results corresponding to the accuracy required.

Tools used:

- Authorized calibration instruments.
- Producer technical characteristics detailed on the each measuring instrument used.

2.3.2 GPS techniques:

Detailed presentation of the observation, calculation and compensation methodology.

Field data:

- Field observations in the correct format to enable use with the corresponding programmes.

Tools used:

- Producer technical characteristics detailed on the each measuring instrument used.

Calculations:

- Presentation of final coordinates together with the presentation of the final qualities obtained.

Analysis of the results corresponding to the accuracy required.

3 RESOURCES REQUIRED

The contractor must provide all its **own resources** materials, technicians and personnel necessary to carry out correctly the work, without resorting to the use of external companies.
In the case of the supplier collaborating with local companies, a letter of collaboration must be presented together with all work certificates for similar work done.

3.1 HUMAN RESOURCES

The contractor must provide all the personnel necessary to carry out correctly the work. The work must be by engineers specialised in Topography with at least 5 years of experience in this type of work, the assistants do not require this experience.
A CV must be supplied of the engineers that are proposed to carry out the work, along with all necessary visas. If the CV or the correct papers are not supplied for all workers the presentation of the offer will not be valid.

3.2 TECHNICAL RESOURCES AND MATERIALS

To carry out the work described the following equipment will be used:

- Double frequency GPS, with all the necessary elements to carry out the work.
- Total Station with an angular accuracy 0.5” and Electronic Distance **Measuring** (**EDM**) devices of 0.6mm + 1ppm with “lock” prism recognition system. All the necessary elements will be included to carry out all the work.
- Leica Level DNA03 or similar.

Companies must include in the offer the series number of the equipment that will be used in the work.
The contractor must supply all the resources and equipment necessary for the correct execution of the work.

4 TERMS AND CONDITIONS

The awarded concessionaire must be certified for the development, at minimum, of all work indicated and required in this document and in accordance with current legislation.
The awarded concessionaire must obtain all permits and licences of the personnel used in the carrying out of the work as well as cover all the payments of all taxes, deposits, compensations and indemnities that may occur and these should be understood to be as included in the price of the offer.
All the rules, instructions, recommendations and current official tenders established by Ineco shall be applied to any study drawn up within this current contract.
The general terms and conditions of contract published in the Ineco contracting profile (www.ineco.es) and (www.contrataciondelestado.es) shall be applicable, as well as these specific terms and conditions.
Work shall be invoiced in accordance with what is finally carried out.

The non completion of the dates agreed with the contractor will carry with it a penalisation of 1% for each day that the presentation of documentation is delayed without any justification, except in the case where the conditions to carry out the work are the optimal ones that will guarantee the minimum parameters.
Under no circumstance will the penalisation for delays reach 20% of the total amount in the budget, as when this limit is reached proceedings will be started on the resolution of the contract.
Any penalisation for the non completion of the different phase dates are accumulative, that is to say, any delay at the beginning of the work should not have any repercussion on the beginning of the following phases (the consultant should therefore make available all the necessary resources to compensate the initial delay.
Under no circumstance will Ineco be obliged to spend the full amount of its budget or wait the full time frame, as it is limited to the real requirements of the company.

5 DURATION OF WORK

The maximum time allowed for the carrying out of work in the current Tender is agreed in accordance with the following sections:

SECTIONS	Length (Km)	Reception of Platform
PK 1+300 a 75+000 (Area 1)	73´700	End of 2014
PK 75+000 a 109+250 (Area 2)	34´256	End of 2014
PK 109+250 a 191+300 (Area 3)	82´050	3rd quarter 2014
PK 180+000 a 190+000 (Área 4) PK 291+300 a 375+000 (Área 5)	10’000 83´700	1st quarter 2014
PK 375+000 a 449+000 (Area 6)	74´000	2nd quarter 2014

The beginning of the work described in the current document is expected to be the 7th of January 2014.
Ineco will fix the maximum time available to carry out the work assigned to each awarded concessionaire for each area and this will depend on the availability and performance of the teams proposed.

The said dates can be subject to the final dates of the reception of the platform.

6 MAXIMUM TENDER AMOUNT

The maximum price for the tender will be **SIX HUNDRED THOUSAND EUROS (600.000,00€)**, VAT not included.
This Price is estimated for the benefit of this tender but is not contractually binding. During the duration of the contract the prices should stay the same as those offered as the maximum price.

7 TECHNICAL SOLVENCY

The minimum criteria that offers must meet are:

7.1 REFERENCES

A signed draft by a person legally responsible for the company in which the main services or works carried out in the last **four (4) years** that includes a description of the work, Price, dates, public or private benefactors,
Underlining the Works similar to those described in the conditions here of which at least one (1), will correspond to works done outside of Spain with budget equal to or greater than ONE HUNDRED TWENTY THOUSAND EUROS (120.000€), VAT not included, which will have the corresponding certificate as provided for by the contracting company.

7.2 TECHNICAL AND HUMAN RESOURCES AND MATERIALS

The company must be able to certify the availability of the resources required in point 3.

8 ECONOMIC AND FINANCIAL SOLVENCY

In the case of not being registered at the time of presenting the offer, the economic and financial solvency of the contractor must provide and renew every six months:

Reports from financial institutions with which the participant has possessed significant assets or liabilities throughout the last three fiscal years, which indicates, at minimum, the following:

- Compliance with credit transaction repayment obligations.
- Global evaluation of the entity

- Official certificate indicating full compliance with all tax obligations.
- Official certificate indicating that all current social security payments are complied with.
- Official certificate indicating that all civil responsibility is met with a current insurance policy.

9 VALIDATION CRITERIA

In the first phase the offers received shall be classified in accordance with the technical and economic evaluations thereof, with the four companies with the highest score resulting from the sum of the two evaluations being selected.
The scoring applied shall be 80 points for the economic evaluation and 20 points for the technical evaluation.
Once all the offers are validated in the first phase Ineco may require additional information or improvements in the offers from the best placed companies thus proceeding to a second phase of validation.
The scoring applied in this second phase will be 100 % economical, except in the case that some technical solution put forward provides a better solution for Ineco. In this case the tender process would start again with the new technical requirements and the companies selected would again be validated using 80 points for the economic evaluation and 20 points for the technical evaluation, with the best positioned company being awarded the tender.

9.1 EXCLUSIONARY CRITERIA

All offers with respect to any clause in this document and especially the following shall be rejected:

- Not being registered as a provider of Ineco, or by defect agree to do so within fifteen (15) days from whenever Ineco may require it to be done.
- All offers that reach a technical validation of less than 50% of the points scored.
- Do not make available the resources in point 3.
- Do not complete the solvency requirements established in sections 7 and 8.
- Non compliance of visa requirements for the country in which the work described in the current contract is carried out.

Also considered motive for exclusion are those companies that do not present a certificate proving references of the following works:

- Cartography work for railway line projects of more than 70 km.
- Observation Works, materialisation and calculation of networks using GPS techniques.

9.2 TECHNICAL EVALUATION CRITERIA

Evaluation criteria shall be in accordance with the following:

9.2.1 References:

Fifteen (15) points shall be awarded to companies that have done similar jobs in the geographical area with the technical references to show for work on lines, in addition to those requested for technical solvency, with certificates proving the success of the work done provided by the contracting company, with work done on railways attaining the maximum points.
The following criteria will be taken into account when awarding the points:

- Similar line work: **one (1) point for work carried out on lines. Two (2) points if in addition the work is based on railways, up to a maximum of ten (10) points.**
- Similar work in the area: **one (1) point for each job done in the area up to a maximum of five (5) points.**

9.2.2 Improvements:

Five (5) points will be awarded to any improvements that can be proven, made to those requirements detailed in the technical conditions.
An improvement will be considered to be all those works that guarantee an improvement in the required accuracy or if the cartography product offered is better than that which is asked for with regard to the degree of detail of the elements (ditch , inclines, berms, or other individual elements …), or a combination of both **(maximum 5 points)**.

9.3 ECONOMIC EVALUATION CRITERIA

The calculation of economic tenders shall be carried out using the following formula:

$$\textbf{Economic points (PE)} = \frac{\textbf{70} \cdot \textbf{Floor of the offer}}{\textbf{Floor of the lowest economic offer}} + \textbf{30}$$

Any offer 20% less than the average of those offered will be considered disproportionate.
Any offer considered to be a risk to the terms required will be rejected.

Those offers that are considered to be a risk will not be used to determine the economic floor of the offer.

10 CONTENT OF TENDERS

The documentation must provide sufficient information to be able to evaluate solvency and comply with all present requirements and specifically that indicated in the following points:

10.1 TECHNICAL TENDER

Each bidder shall submit a Work and Execution Plan in which clearly and concisely describes the methodology to follow for the development of the work, consistent with the human and material resources proposed and the indications detailed in these Technical Conditions.

The methodology to follow for the development of the work should contain at least the following points:

- Checking and measurement of the old existing Platform Network.
- Observation of the new Basic Network.
- Geometric levelling of the Basic Network.
- Calculation of the new Basic Network.
- Tachometric surveys.
- Data collection for the building of the track and installations and signalling.

In the offer a chronological plan with the dates and work completed should be presented for each of the stages required as set out in this document, together with one global time frame for the totality of the work.
All improvements and technical proposals should be included in the same document.
The content of the offer should be no more than a **40 pages** (*Arial 11 pt, justified, multiple double spaced 1,2, with spacing between previous and next paragraph, leaving a space between paragraphs).*
In calculating the total page numbers all the documentation will be taken into account within the technical offer, with exception of the certificates presented as references of work previously completed.

10.2 ECONOMIC TENDER

The economic tender must be signed by the legal representative of the company making the offer and it should include the Total Cost of the work proposed for the complete time period, with said values presented as figures both with and without IVA (VAT).

In APPÉNDIX 1 the following should be included:

- Graph of guideline measurements to use as a base for an economic proposal, including the unit price of each of the units required to carry out the project without going above the value given in section 6 of this document.
- Graph of units that presents a proposed unit price.

11 SUBMISSION OF TENDERS

All tenders shall be submitted in digital format to the following address: ofertas@Ineco.es.

The file that contains the economic tender must be identified as **O.E.- 20130918-00595 PROVEEDOR** and the file that contains the economic tender must be identified as **O.T. 20130918-00595-PROVEEDOR**.

It may also be submitted in CD format to:

Unidad de Compras y Contratación (Ineco)
Paseo de la Habana 138
28036 Madrid

In both cases, the dossier number indicated on the Ineco website must be referenced.
The technical tender, professional solvency of the company and economic tenders must be submitted on separate files, without the technical tender referencing the economic tender.
The solvency will be presented together with the requested technical documentation
In the event of non-compliance with any of the requirements established in this section with regards to submitting tenders to a different address than that indicated, the bidder may be excluded from this tender.