Grupa LOTOS S.A.	**TECHNICAL SPECIFICATION**	Spec. No. 6210
	Requirements concerning range of geodesic works and survey documentation submitted to Master Plan Office of Grupa LOTOS S.A.	

Introduce:

Polish law stipulates necessity of having professional powers to perform individual functions in geodesic and cartographic branch. (art. 42 Geodesic and Cartographic law).

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1 Subject of specification

The following specification defines minimum requirements concerning geodesic works on terrains which belong to Grupa LOTOS S.A. and geodesic documentation created as a result of this works, submitted to the archive resources of Master Plan Office of Grupa LOTOS S.A. Standard specify on what one should pay attention during geodesic works and which information should be included in documentation from this works in terms of existing Land Information System of Grupa LOTOS S.A..

2 Binding range

Specification applies by preparing calls for proposals as well as contracts for newly planned investment and modernization enterprises in Grupa LOTOS S.A. which geodesic works are a part of. To the activities and principles not covered by this standard are applicable provisions of the Regulation Ministry of Interior dated 09th November 2011, regarding technical standards on geodesic measurements situational and vertical, development and transfer of the results of these measurements to the national geodesic and cartographic resource.

3 Exemptions

Any exemptions from the hereby specification which, according to the bidder of the works, show more rational solutions should be submitted in a written form to be checked and approved by Grupa LOTOS S.A. before proceeding to execute the work.

Exemptions not approved by Grupa LOTOS S.A. in a written form are unacceptable.

The Contractor should also in a written form point out any ambiguity in this or any other Grupa LOTOS S.A. specification or a discrepancy with the relevant documents, and acquire a written explanation from Grupa LOTOS S.A..

4 Rules and Regulations

4.1 Geodesic and cartographic regulations Act dated 17th May 1989. (Dz.U. 2016.1629),

4.2 Building regulations Act dated 7th July 1994. (Dz.U. 2017.1332),

4.3 The decision of the Mayor of Gdańsk No. WG-III-6640.1.2014.BG dated 22th December 2014 and Governor of Gdańsk rural district No GiK.660.12.2015.MO dated 22th September 2015 to exclude from national geodesic and cartographic resource data about underground and aboveground networks belonging to the enterprise Grupa LOTOS S.A.,

4.4 MGPiB Ordinance about type and range of geodesic-cartographic documentation as well as geodesic procedures which bind in building engineering dated 21th February 1995. (Dz.U. 1995.25.133),

4.5 MSWiA Ordinance about technical standards on geodesic measurements situational and vertical, development and transfer of the results of these measurements to the national geodesic and cartographic resource dated 9th November 2011 (Dz.U. 2011.263.1572),

4.6 MAiC Regulation about database of topographic objects and master map dated 2th November 2015 (Dz.U. 2015.2028),

4.7 PN ISO-4463-3:2001P ”Measurement methods for building – Setting-out and measurement – Check lists for the execution of surveying tasks and measurement services,

4.8 PN-N-99310:2000P “Surveying – Setting out surveys – terminology”,

Due to the nature of plant land development the following shall be taken into account during geodesic measurements:

- for works related to railway infrastructure – recommendations included in Standard GK-1 “About the organization and railway geodesic surveys” introduced Resolution No. 8 of PKP Management dated 12th January 2016,

- for works related to industrial infrastructure – conditions included in Geodesic Instruction of Heavy Industry Department with attachment No. 9, being a part of Decree No. 19 of Minister of Heavy Industry dated 24th April 1974.

Above instructions are provided to contractors of geodesic works during obligatory registration of these works, described in p. 6.2, and on request to other interested parties. Scope of application of these instructions for particular geodesic works shall be each time agreed with Master Plan Team at the stage of registering geodesic works.

5 Definitions and signs

5.1 Survey documentation (Geodesic documentation) – Set of documents which arisen as a result of geodesic works, prepared and assembled in accordance to rules included in p. 6. of this specification.

6 Description

6.1 General rules of making geodesic works on Grupa LOTOS S.A. terrain are included in Regulation No. GLS/ZA/017/07/SK of the President of the Board of Grupa LOTOS S.A.

6.2 Before starting with any geodesic works on Grupa LOTOS S.A. terrains, executor of those works is requested to register (in form of written notification) at Master Plan Office. On this condition, all input data necessary to perform the geodesic works will be submitted to executor, as well as detailed technical guidelines on the applicable rules of performing geodesic works and presentation of data in the geodetic documentation created as a result of the work.

6.3 Registration of works and geodesic documentation for building objects shown in Land and Building Cadaster and infrastructures of Grupa LOTOS S.A. outside the areas specified in decisions in p.4.3, are subject to requirements specific to particular Geodesic and Cartographic Documentation Centers (in short PODGiK). Geodesic documentation concerning as-built data of infrastructures on these areas must be registered at PODGiK. Its copy together with a copy of an as-built map must be delivered to Grupa LOTOS S.A.

Master Plan Office.

6.4 Surveying the terrains of Grupa LOTOS S.A. should be carried out based on the execution network and benchmark network regularly distributed on the terrains of the company. Due to intensity and specificity of Grupa LOTOS S.A. plant development, which make satellite observations difficult, detailed setting out and as-built surveys shall not be performed by means of GPS RTK method. It is allowed to use the methods of measurement on some objects belonging to the company, after previous agreements with the manager of the Master Plan Office.

6.5 Geodetic survey objects belonging to the group 1 of precision measurement, should be doing with an accuracy of not less than 0.02m in relation to points of vertical network, and accuracy of not less than 0.05m in relation to points of horizontal survey control network.

6.6 Minimal requested scope for geodesic works on the Grupa LOTOS S.A. area is to perform survey:

6.6.1 Of situating all static elements of above ground land management (including surface objects such as outlines of tanks/vessels, columns, reactors, furnace casing, exchangers etc, which are positioned in foundation and pavements as well as by plinths, if their side size cross 25 cm). In case of works concerning construction of foundations, on which objects specified in p. 6.8 are to be placed, it is required to mark out projected axis. The executor of foundation works bears responsibility for the above works. Documentation of those actions shall meet requirements specified in p. 6.7.3.4,

6.6.2 Of all underground wire lines (including earthing) with their underground, ground and aboveground fittings and underground elements of ground land development (underground parts of buildings, structures, equipment and foundations as well as piling and sheet piling) and all clashes and approaches to existing elements of land management which appeared in excavation area,

6.6.3 Of aboveground parts of wire lines if:

6.6.3.1 they are a part of line including underground routes,

6.6.3.2 they concern wire lines on low pillars (does not apply to outlines of pipeline trenches or high racks),

6.6.3.3 they are horizontal parts of wires, which project beyond outlines of pipeline trenches, bridges and ducts.

6.7 In relation to regulations listed in standards mentioned in p.4 and specificity of data necessary to fill the digital master plan, the survey documentation must contain the following data:

6.7.1 Detailed report from field and office works,

6.7.2 Complete review sketches of geodetic control network used for measurements (together with its expansions) and numeric data concerning values of measured angles and lenght with necessary signs,

6.7.3 Inventory sketches with reference maps in accordance with the following rules:

6.7.3.1 sketches shall be done in colour, using the notation symbols from the Master Plan legend (attachment No. 1)

6.7.3.2 field sketches shall include references to archival numbers of the project and drawing and their revised versions (according to Grupa LOTOS S.A. specification) and departures from the project – deviations from planned values,

6.7.3.3 field sketches shall include points of measurement and geodetic control network, used for measurements, with their symbols,

6.7.3.4 inventory sketches of building objects with foundation shall include their complete cross-section with all dimensions and heights as well as special arrangement of anchors. There shell also be information about marking on the foundation projected axis and detailed height data with localization and information about benchmarks used for their implementation. For purposes of this specification plinths founded on trays or other paved surfaces are regarded as foundation,

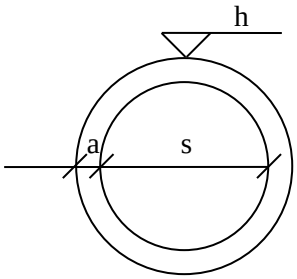
6.7.3.5 sketches as-built measurements of utility network shall include network type (see the legend in p. 8.1), diameter, kind and thickness of material, from which cable, pit or chamber is made,

6.7.3.6 elevations of pipe's bottom for sewerage network and elevations of pipe's top for other networks (In accordance to underneath legend) must be measured and show on the sketch. Characteristic points which were measured and heights of deflections of pipes, duct, and development trenches must be shown by the

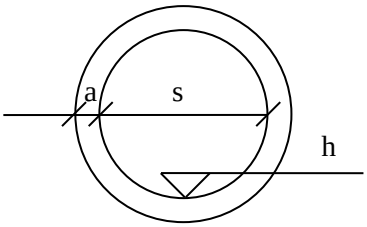
executor of works,

Legend

Water network, heat distribution network, process network, gas system and another.



Sewerage system



h –point of reported height

s – pipe's diameter

a – thickness of pipe's wall

6.7.3.7 on sewerage pipeline it's necessary to shown the destined flow of network - by arrow indicator (for example —— 4 > ———),

6.7.3.8 the sketches should be supplemented with sketches of pits and chambers together with in-takes, outlets and siphon trap as well as dimensioned, detailed vertical cross-sections sketches of surveyed pipelines connections to existing networks (requirement concerns pipelines of all network type),

6.7.3.9 collisions and approaches to existing elements of land management which appeared in excavation area must be measured and shown on the sketch,

6.7.3.10 piles and larsen left in the ground are subject of obligatory as-built survey with giving its length,

6.7.3.11 for concrete conduits, measuring their outline, and measuring their profile in characteristic points of their course are required,

6.7.3.12 wire lines with layer width up to 30 cm inclusive, can be shown based on measure of axis of bunch,

6.7.3.13 multilayered cable trenches shown as one external outline, should be measured separately and each height(s) of particular layer(s) for every type of network must be indicated,

6.7.3.14 pipe culverts and blocks of culverts shall be indicated with cross-section including their diameters, use of openings, heights of top and bottom of particular blocks, etc.

6.7.3.15 Pipe culverts made by controlled drilling require their location and height location, based on the drilling report referred to the geodetic inventory survey,

6.7.3.16 utility networks on low pillars (does not apply to pipeline trenches) and their parts projecting beyond outlines of pipeline trenches, bridges and ducts must be survey and shall be shown in the survey documentation as "above ground",

6.7.3.17 in case of utility networks, both underground and aboveground, it is necessary to determine the bend of aboveground route, which may be given in relation to elements of land management previously measured or existing on a map, e.g. axis of pipe rack supports,

6.7.3.18 during measurements of paved areas, such as roads, squares, trays, pavements, etc., detailed data on surface type shall be provided on sketches and in map of changes.

6.7.4 Record books and calculations of coordinates of minor control points and measured points (printouts should be prepared together with point's reference to particular sketches),

6.7.5 Altimetric survey registries and leveling calculations according to the rules p.6.7.4 ,

6.7.6 Summary list of coordinates of minor control points and measured points as *.txt files in No_X_Y_H_mp_mh format (with space character as delimited separator),

6.7.7 Review maps of field sketches,

6.7.8 Documentation of changes of development in area of conducted works prepared on the base of detailed map of the area,

6.7.9 All other documents resulting from of geodesic works (setting out sketches, check measurements of structure assembly, vertical measurements, surveys of displacements and deformations, surveys of groundmass etc.).

6.8 Documentation of geodetic control measurements of slender objects, steel structures, apparatus and devices (resulting from separate Standards) shall be completed and attached to the survey,

6.9 Documentation of geodesic works connected with setting out objects must be prepared

according to provisions of the decree mentioned in p. 4.5,

6.9.1 Documents stuck in the survey must be folded into A4 format or its multiple, matching the size of sheets with area covered by the survey. Except special cases, it is not allowed to stick folded documents in separate envelopes.

7 Related documents

Regulation No. GLS/ZA/017/07/SK of the President of the Board of Grupa LOTOS S.A. in the matter of: performing geodetic and cartographic surveys on the area of Grupa LOTOS S.A. in Gdańsk and areas related by technical infrastructure connections.

8 Attachments

8.1 List of chosen contractual signs concerning media notation and their ground fittings on the Master Plan

8.2 Survey documentation cover form

8.3 Sketch form

8.4 Survey register form

8.5 Acceptance protocol form for geodesic works

9 Card of changes

Item No.	Date	Description of changes	Change introduced by
1	21.06.2010	Requirements concerning range of geodesic works in Grupa LOTOS S.A. have been added, as well as national standards and geodesy regulations. New descriptive data in p. 6	S.Tanan

2	30.03.2013	New version of the document, due to the introduction of Regulation Ministry of Interior on technical standards geodetic situational vertical measurements and specify certain records.	S.Tanan
3	24.11.2017	Changes due to the edition of Ordinance No. GLS/ZA/017/SK, new regulations to the Geodesic and cartographic regulations Act and correction of descriptive data.	S.Tanan