



# TENDER DOCUMENTATION FOR SELECTION OF THE CONTRACTOR

Refurbishment of the Combined Heat and Power Plant  
in Mladá Boleslav

Business Package OB 2

## BOILER HOUSES

# VOLUME III

*TECHNICAL REQUIREMENTS*

Annex A7 Documentation Requirements

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## 1 LIST OF ABBREVIATIONS

Note: Sorted alphabetically according to the Czech version.

Abbreviation	Text
AŘ	Administration procedure code
I&C	Automated management of technological process
ATEX	ATEX Directions (Atmosphères Explosibles) for equipment and protective systems intended for use in areas with explosion hazards
BAT	Best Available Techniques
BEP	BIM Execution Plan
BIM	Building Information Modelling/Management
RR	Routine repair
OHS	Occupational safety and health
CE	Conformité européenne
CCTV	Closed Circuit Television
CEMS	Emission monitoring system
CDE	Common Data Environment
No.	Number
CR	Czech Republic
ČSN	Czech technical standard
DiBIM	Digital Information Modelling, a part of the BIM, the “BIM model” – a structured and object-oriented representation of a building or a part thereof
DOSS	State administration authorities concerned
DPS	Documents required for building construction
DSP	Documents required for building permit
DSPS	Documents of as-built condition of the building construction
WCh	Wood chips
WRW	Waste rainwater
EIA	Environmental impact assessment
EIR	Exchange Information Requirements
EMC	Electromagnetic compatibility
EN	European standards
EFAS	Electronic fire alarm system
FAC	Final Acceptance Certificate
FAT	Factory Acceptance Test
FC	Frequency converter
GO	General overhaul
H	Hold point
HMG	Time schedule
HAZOP	Hazard and Operability Study
HW	Hardware
IAPWS	International Association for the Properties of Water and Steam
IEC	International Electrotechnical Commission

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<b>Abbreviation</b>	<b>Text</b>
IFC	Industry Foundation Classes/format
BIM	Building Information Modelling – a shared digital representation of the physical and functional characteristics of buildings or their parts serving for the examination of their properties and for specified purposes, which also include digital building model(s) (DiBIM), documents and documentation associated with all phases of the lifecycle of a building
IO	Engineering object
I/O	Input/output signals
ISO	International organization for standardization
IT	Information Technology
ITS	Škoda's internal technical standards
ITE	Individual tests
k.ú.	Cadastral territory
KKS	Unified designation system, element codes according to Ško-Energo methodology
KV	Comprehensive testing
LV	Low voltage
FWT	Feed water tank
NV	Government decree
BO	Business package
SS	Steel structure
parc.No.	Parcel number
PAC	Provisional Acceptance Certificate
PED	Pressure Equipment Directive
P&I	Piping and instrument diagram
BC	Belt conveyor
PD	Implementation documentation
SIT	Schedule of inspections and tests
PMNC	Responsible project manager, CDE manager
POBC	Plan and organization of the building construction
PRE-BEP	Design plan of BIM implementation
PS	Operational file
SCR	Selective catalytic reduction
CDM	Combustible dust mixture
SEE	Stable extinguishing equipment
SIL	Safety Integrity Level
I&C	Instrumentation and Control system
SNCR	Selective non-catalytic reduction
SNIM	3D model non-graphic information standard
SO	Building object
CfW	Contract for work
SP	Building permit
QMS	Quality management system
SW	Software
MS	Management system

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Abbreviation	Text
SP	Solid pollutants
ÚSES	Territorial system of landscape ecological stability
HV	High voltage
VOC	Volatile organic compound
ACS	Air-conditioning system
HP	High pressure
W	Witness / Inspection Point
WF	Workflow

## 2 PURPOSE OF THE DOCUMENTATION PROCESSED WITHIN THE CONTRACT

THE DOCUMENTATION processed under the CONTRACT must be delivered by the OB 2 CONTRACTOR in such a scope, quantity, terms, and quality to enable:

- Obtaining all permits, consents and opinions of state administration authorities which are necessary for the implementation and operation of the Work, according to the applicable legislation,
- Assessment of the Work basic solution, its division into time periods in accordance with the periods of time and assessment of its compliance with the CONTRACT requirements and the conclusions or requirements of this building construction legislative negotiation,
- Coordination of the Work with other parts of the building construction and with concurrent operation and other activities in the CLIENT's premises at the construction site,
- The Work quality assurance,
- The Work execution, its assembly, and its putting in commission,
- The CLIENT's personnel training,
- The Work operation, maintenance, and repair,
- Documenting the Work completed stage.

Throughout the execution of the Work the OB 2 CONTRACTOR will keep a database of submitted documentation. This database will be processed in computerized form in accordance with Chapter 4 below and will contain the following data, at least:

- Document / drawing number,
- Document / drawing name,
- Date of issue and number of the last valid revision,
- Document / drawing status in accordance with an approval procedure,
- Date of approval, as for approved documents,
- Document author,
- Documentation type (Project documentation for the building construction execution, Documentation of the as-built condition of the building construction, etc.).

The current version of the database will be handed over to the CLIENT together with each submitted documentation (including the documentation part or its revision).

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### 3 BIM (BUILDING INFORMATION MODELLING / MANAGEMENT)

By using the BIM method in the project, the CLIENT will fulfil the requirements of the "Concept of BIM introduction in the Czech Republic" (Decree of the Government of the Czech Republic No. 682 of 25/09/2017) and applicable standards (especially ČSN ISO 19650).

The exchange of information throughout the design and construction phases will take place in the Common Data Environment (CDE). The relevant program has been selected by BCDE from Bentley. BIM objectives in terms of CDE use:

- Communication centralization and information sharing,
- Information and its metadata archiving,
- Digitization of existing processes of information transfer and communication within the project,
- Introduction of working procedures within CDE.

Objectives of the BIM project during the Work execution:

- Records of building construction progress:
  - electronic records of the building construction progress,
  - visualization of actual performed works,
  - use of BIM models for communication and decision-making at site meetings,
  - elaboration of a current BIM model, updating BIM models in accordance with changes of the project,
- Record of changes/electronic record of changes during building construction execution:
  - quality inspection tools/electronic record of defects and backlogs during execution, OHS, acceptance and others,
- Obtaining an information model for management and maintenance.

#### 3.1 Information model / Documents required for building construction execution (DPS)

The information model of the Documentation for building construction execution will be used for these activities:

- Visualization
- Project documentation processing (the drawing part of PD and the specifications will be generated from DiBIM),
- Spatial coordination,
- Surface area form (with links to the elements of the DiBIM model),
- Time schedule (simulation with links to the elements of the DiBIM model).
- Review of the proposal and the PD by the CLIENT

The aim of the use of the DiBIM during the preparation of the DPS is to improve the quality of the proposal and the PD, which will minimize any extra works to be performed by the building contractor and prevent the occurrence of ad hoc situations in the course of the construction, resulting from any ambiguities or incompleteness of the PD.

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### 3.2 Information model /Documents of as-built condition of the building construction (DSPS)

Information model of the Documents of as-built condition of the building construction will be used for the following activities:

- Project documentation processing (drawing part of PD),
- Spatial coordination,
- Surface area form (with links to the elements of the DiBIM model),
- Administration and maintenance,
- Filling the CAFM system with valid data of the implemented elements of the building and constructions.

### 3.3 Positions and Responsibilities

Positions shall be clearly defined together with the responsibility scope. The BEP (BIM Execution Plan) document contains a definition of positions as well as responsibilities of the parties involved. These positions go beyond normal powers of project roles.

The CLIENT selects the BIM project manager and the Data Environment Manager. The OB 2 CONTRACTOR designates the BIM Coordinator. The CLIENT requires the OB 2 CONTRACTOR to draw up a matrix of responsibility.

Position	Description
<b>Project manager</b>	The Person responsible for managing the project on the CLIENT's part
<b>BIM project manager</b>	<p>The Person responsible for BEP adherence to the project by the CLIENT. Its activities are as follows:</p> <ul style="list-style-type: none"> <li>• processing and updating the BIM execution plan (BEP) in cooperation with the BIM coordinator,</li> <li>• monitoring compliance with the BEP document by all participants,</li> <li>• checks of data transmitted by the OB 2 CONTRACTOR, according to BEP,</li> <li>• final checks of information models before handing over the completed building construction to the CLIENT,</li> <li>• related services, the need of which will arise following the BEP adjustment during the project execution,</li> <li>• active participation in solving problems and proposing their solutions,</li> <li>• he/she is directly responsible for project management on the part of the CLIENT.</li> </ul> <p>He /she does not approve or discuss the OB 2 CONTRACTOR'S questions regarding the technical solution from the point of view of the project solution.</p>
<b>Data Environment Administrator</b>	<p>Responsible person delegated by the CLIENT, whose activities are as follows:</p> <ul style="list-style-type: none"> <li>• management of a common data environment for the entire project team (including the CLIENT) during the project</li> <li>• training of users.</li> </ul>
<b>Project chief engineer</b>	The person responsible for the technical solution of the given part on the part of the OB 2 CONTRACTOR.



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Position	Description
<b>BIM coordinator</b>	<p>Person responsible for BEP observance by the OB 2 CONTRACTOR whose activities are as follows:</p> <ul style="list-style-type: none"> <li>• management of the project team according to the agreed EIR (Exchange information requirement) and the BEP,</li> <li>• checking information models filling up, evaluating the correctness of the data contained in the information model and handing over the BIM to the project manager,</li> <li>• active submitting proposals of BEP changes,</li> <li>• active participation in solving problems and proposing their solutions,</li> <li>• checking the project goals fulfilment, according to the project milestones,</li> <li>• responsible directly to the chief engineer of the project</li> </ul>
<b>Lead model maker</b>	<p>Responsible person delegated by the OB 2 CONTRACTOR responsible for the models of the given part. His/her activities are as follows:</p> <ul style="list-style-type: none"> <li>• management of model makers to the extent defined by the BEP,</li> <li>• creating project standards that complement the missing standards in the BEP and submitting them for approval to the BIM coordinator,</li> <li>• he/she is responsible for the correctness of the information model for the given profession.</li> </ul>
<b>Model maker</b>	<p>A person delegated by the OB 2 CONTRACTOR. His activities are as follows:</p> <ul style="list-style-type: none"> <li>• responsibility for a given model/set of models</li> </ul>

### 3.4 Common data environment (CDE)

During the implementation of the Work, common data environment meeting the criteria of ČSN EN ISO 19650 standard will be used. The CDE is operated by the CLIENT for the entire duration of the project and provides the necessary number of licenses to other users. In the PRE-BEP document, the OB 2 CONTRACTOR will put intended users on his part in the list of CDE users. The final number of licenses will be approved in the BEP document, as agreed with the CLIENT.

All data exchange between the OB 2 CONTRACTOR and the CLIENT will be carried solely through the common data environment. The CDE will be only one source of information that collects, maintains and spreads important documents approved.

#### The process of collaboration

In the BEP document, it is necessary to define the processes within the CDE (e.g. approval of documentation, handover of a model, etc.) in the form of simple diagrams. In this context, considerable cooperation of the OB 2 CONTRACTOR is required when setting up any processes associated with the BIM method:

- preparation of standard designation of all files,
- submitting proposals for appropriate adjustments for joint cooperation within the CDE,
- design of approval workflows.

The CONTRACTOR is responsible for updating the CDE entries related to documents presented by him during the entire implementation of the project. All CDE entries must have correctly filled metadata and all annexes must bear correct names in accordance with the valid BEP.

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The owner of the Documentation and of the BIM models is the CLIENT, to whom the CONTRACTOR shall hand over the completed BIM model including all data without any restrictions, also in the source format of the tool in which the model has been created so that the CLIENT may fully use and updated the model during the entire service life of the building.

In addition to complete project documentation and to operating and controlling documents of the project, the CDE must also contain documents, photos, technical sheets, sampling protocols, certificates, directions for use, manuals, initial revision, guarantee sheets, operating codes, a manual for use of the building and other submitted operating documentation.

### **3.5 Model information requirements**

One of the basic steps of using the BIM method is the creation of an information model. It is not necessary for all the information to be in only one model, on the contrary, it is desirable to have several models.

The information model ensures the consistency of information, and it is the source of project documentation (a ground plan, a section, a view, etc.). It is not desirable for the PD production to modify locally displays of given views (the ground plan, the section, the view, etc.) and supplement or modify the display, so that only a part of the goal for the project documentation production is met.

Each model consists of individual elements that are defined graphically. The elements have parameters assigned to them. The definition of elements and their assigned parameters are described in the BEP.

All information provided at the PD output will be registered in the BIM model solely in parameters of individual BIM model elements.

PD outputs – drawings, specifications. etc., will be generated to the maximum possible extent from the BIM model, both in the geometric form and descriptive data. BEP will specify which part of the PD (e.g. situation, some details, connection scheme, etc.) will not be generated from the BIM model.

The BIM must be consistent – the same elements will always be modelled in the same manner in the entire BIM model and in individual partial BIM models.

#### **Graphic detail**

The requirements for the graphical form of the elements in the model are described verbally in the BEP. It is not the purpose of the definition of graphic details to replace valid standards and practices for solving graphic outputs (especially requirements for the form of drawing documentation).

Graphic similarity must correspond to the project phase, to the scale of the created outputs and to structures required for the specification and coordination of elements.

Each element must have the actual size and approximate shape which will allow to identify at first glance the purpose of the element. In particular, its shape must capture the actual necessary space occupied by the real installed building part.

The required service space of end elements of the building technology (TZB) and its individual equipment will be represented in geometric form.

#### **Information detail**

Requirements for information detail define the parameters attached to individual elements. These parameters serve as a carrier of non-geometric information of the elements. The CLIENT defines the minimum level of information details.

Non-graphic information presented by the models in individual phases and parts of the project must contain all information necessary for the elaboration, coordination and control of the project documentation. The models must contain in values of properties (in attributes) of individual elements

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specifications required for the proposal and supply of parts of the building, particularly for the elaboration of the bills of quantities and budgets.

The model elements must contain information used in their designation and recording in the PD so that they can be always identified directly in the model without the necessity of inspecting the documentation.

The DSPS must contain all information available to the building contractor concerning elements, equipment and parts of the building which are necessary for the operation and proper maintenance of individual building elements.

The OB 2 CONTRACTOR will ensure preparation of a data standard at the SNIM level (3D Model Non-Graphic Information Standard). The scope of attributes of the proposed elements must make it possible to provide complete specification of the elements, which is required for the elaboration and issue of the PD. In addition to the specification parameters required for the PD, the envisaged scope of attributes required for the operation of the equipment is approx. 15-20 parameters per element for each language. The expected range is about 15 - 20 parameters/element. These parameters will be agreed upon with the CLIENT and will be attached to the BEP document. The OB 2 CONTRACTOR can add other parameters to the elements, as needed. New parameters can only be introduced during the creation of the model by the responsible persons specified in the BEP.

The general scope of recorded parameters required for the operation of the equipment is presented, for instance, in the files of Annex A13, „PA7-2\_S350\_3\_asset\_elektro\_objekty.xlsx“

All building elements and thus also all elements of the BIM models will be designated by a unique KKS code. The KKS marking will be created in accordance with the KKS and ED methodology for Ško-Energo, s.r.o. Parts 1 to 6 (except Part 3) (annexes A13 to the documentation).

The BIM model will not contain invalid and non-authenticated information. The contractor shall be responsible for the updating and correctness of all information included in the model.

Where required by chap. 16.1., the attributes will be recorded in the BIM models in bilingual form. This applies to both their names and registered values of the element properties.

### **Dials**

Some attributes of the model elements may only acquire rep.-determined values. Lists of those values are called Dials and form an integral part of the data standard.

Dials are administered in the course of the PD delivery by the BIM coordinator of the CONTRACTOR. The dials are subject to review, coordination and approval with the CLIENT.

The value dials will be kept in bilingual form, in the Czech and the English language.

## **3.6 Data protection**

Data protection can be defined as guarantee against threats, risk minimization and the complex of administrative, technical, logical, and physical measures to prevent and detect unauthorized use of data. When maintaining project data protection, it is necessary to keep in mind the protection of the infrastructure of the information systems storing data in their electronic form against relevant threats, such as unauthorized access, malicious software (viruses, trojan horses), system failures, etc.

The basic security attributes are:

- Confidentiality

Confidentiality is ensured by the ability to ensure that the necessary level of secrecy is enforced at all times when data is processed, and that unauthorized disclosure is prevented. Such a level of confidentiality should persist both during data storage in the systems and during its transmission or delivery to the addressee. Various situations leading to confidentiality violation can occur, for example, during an attack, when mechanisms ensuring confidentiality will be overcome by monitoring network

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traffic, detecting keystrokes over the shoulder or from data on the screen, theft, or even social engineering. Confidentiality can be further violated in a situation where users, for example, intentionally or by mistake disclose sensitive information by not encrypting it before sending it to another person, succumb to social engineering and entrust trade secrets, or neglect special precautions when processing sensitive data.

- Integrity

Integrity is maintained when it is ensured that the data is accurate, with guaranteed content and measures are taken against its unauthorized change. Hardware, software, and communication means must work in such a way that they store and process data correctly and accurately, transferring it to the desired destination without unwanted changes. The systems and the network must be protected from external interference or contamination of the original information. The integrity can be violated by an attacker, for example, with a computer virus, using a trojan horse, i.e. a fake program or application that only behaves correctly on the outside, through a back door into the system, the so-called back door method, which can lead to subsequent contamination of the original data. Users can also violate integrity through their own error or maliciousness, for example by deleting important configuration files when freeing up used disk space or by entering numbers in accounting by mistake or on purpose, etc.

- Availability

Causing the unavailability of data is a popular method of attackers who try to affect productivity or completely disable the given system. Therefore, availability must be ensured by the reliable and timely disposition of data and resources to authorized individuals. Information systems and networks must have data capacity sized to provide sufficient performance in a defined time, they must be able to recover from outages in a transparent and fast manner, so that productivity is not negatively affected. Furthermore, bottlenecks must be reduced, redundant mechanisms must be introduced. Availability can, for example, be disrupted by an error in the device or an error in the software, which is why backup devices are used for the possibility of quick replacement of critical systems, as well as training of employees to carry out the appropriate intervention to bring the system to its functional state.

All project participants must set the degree of protection of data assets in such a way, that all risks are minimized, if possible.

In advance, all public channels for information exchange are excluded as communication channels.

### 3.7 Tools

The CLIENT does not prefer any specific tool platform for processing information models BIM authorized software tools listed in BuildingSmart.org will be used as the basic modelling SW. For the creation of information models, it is necessary to select a tool that enables the creation of elements that are represented by their 3D graphics and connected information. The final program will be selected by the CLIENT after coordination with all OB CONTRACTORS. In the BEP, it is necessary to submit a clear and specific list of all used tools and describe their use on the project. The OB 2 CONTRACTOR will also submit a list of office applications used. The OB 2 CONTRACTOR must choose tools for effective information sharing. It is the OB 2 CONTRACTOR's responsibility to ensure the compatibility of all tools used.

Only one version of the selected SW tool will be used in one project (such as Version 2024). The used SW tool version is subject to the CLIENT's approval.

### 3.8 BEP

As a part of the tender process, the OB 2 CONTRACTOR will draw up a "Design plan of the BIM Implementation (PRE-BEP)" based on the EIR document and the PRE-BEP template which will be a part of a tender. After evaluation of the tender procedure, the OB 2 CONTRACTOR will be selected. The

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BIM coordinator will develop a BIM execution plan (BEP), in cooperation with the BIM project manager in a given period from the effective date of the CfW. Possible comments of both parties related to the project processing using the BIM method will be communicated in the BEP.

As a part of the BEP proposal presented for approval, the OB 2 CONTRACTOR will submit a representative sample of the BIM model data, which will capture all essential requirements concerning BIM that are defined in EIR for the purpose of assessment of the proposed principles of the BIM solution. This sample will be presented in all output forms and formats required in EIR, which will be defined in the BEP.

The BIM coordinator is obliged to keep the BEP up-to-date and, if necessary, update it immediately or call a meeting to discuss its change.

It is possible to change the technical solution (in the sense of using more modern approaches and procedures), but it is not possible to change goals, chapters, etc. The BEP must respect TD and EIR requirements and must be based to the maximum possible extent on the PRE-BEP submitted in the bid.

All BEP changes must always be approved by the CLIENT's BIM project manager.

#### **4 SCOPE OF DOCUMENTATION PROCESSED WITHIN THE CONTRACT**

As a part of the CONTRACT, the OB 2 CONTRACTOR will supply at least the following documents:

- Rules of administrative procedure,
- BEP – BIM implementation plan,
- Pilot project,
- Documentation of the management and quality assurance of the WORK including the following items:
  - quality plan,
  - schedule of inspections and tests,
  - testing programs,
  - document part.
- Project documentation for building construction execution (project),
- Plan of inspection of the building construction,
- Project of building construction organization (POBC),
- OHS plan,
- Supplier documentation,
- Marking register,
- Documents,
- Risk and availability analysis, including SIL analysis,
- Accompanying technical documentation,
- Project for start-up and trial run,
- Warranty measurement project,
- Operational and maintenance regulations,
- Documentation for the CLIENT's personnel training,
- Documentation of as-built condition of the building construction,

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- Documents for a request to change the building construction before its completion.

All this in the structure and implementation, as required in in this Annex, in the text below. At the same time, the text contains detailed requirements only for those types of documentation that are not detailed in other parts of the CONTRACT (e.g. time schedules).

All documentation submitted by the OB 2 CONTRACTOR will be processed in full accordance with the internal regulations of the CLIENT and will be processed in a clear and legible form and in accordance with standards and good engineering practice.

## 5 RULES OF ADMINISTRATIVE PROCEDURE

The Administrative procedure code (AŘ) establishes binding rules for communication between the OB 2 CONTRACTOR and the CLIENT and the rules for dealing with documents processed as part of the performance of the work.

It defines the organizational charts of the OB 2 CONTRACTOR and the CLIENT, procedures for the exchange of documents between the OB 2 CONTRACTOR and the CLIENT, the issuance, archiving, distribution, revision and shredding of documents.

The administrative procedure code will be processed in accordance with the CONTRACT.

In particular, the administrative procedure code will contain the following chapters:

- 1) Introductory Provisions,
- 2) Basic provisions,
- 3) Organizational chart of the CLIENT's construction group for the project implementation,
- 4) Organizational chart of the OB 2 CONTRACTOR's construction group for the project implementation\*\*,
- 5) Scope and character of cooperation with the CLIENT's consultants,
- 6) Addresses, identification, contact persons and connections of CLIENTS, CONTRACTORS, and consulting companies,
- 7) Correspondence procedures and rules of mutual communication,
- 8) Binding rules for BUILDING SITE and building site rules,
- 9) Important numbers of the CLIENT's telephone lines,
- 10) Final Provisions,
- 11) Annexes.

### **Program for approving and handing over project documentation for building construction execution**

The OB 2 CONTRACTOR will elaborate a Program for approval and handing over the PROJECT DOCUMENTATION, according to which they will submit it gradually to the CLIENT for approval of the individual parts of the PROJECT DOCUMENTATION processed or provided by the OB 2 CONTRACTOR.

## 6 DOCUMENTATION OF QUALITY ASSURANCE AND QUALITY CONTROL

The quality assurance system shall be based on the international standards ISO 9000 to 9004 being applied to the specific conditions of the CHP plants. Compliance with these standards is also required from the OB 2 CONTRACTOR.

The OB 2 CONTRACTOR must submit the quality assurance and management program for this building construction for approval, together with principles of activities determined for design, construction and technological preparation of the building construction, production, delivery and their verification, production controls, testing and inspection, types and dimensions of samples that shall be taken, method

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of data recording, names of authorized inspection organizations, handling, storage, packaging, preparation and training of workers and service.

The accent is put especially on the level of technical preparation of the building construction, such as the detail of elaborating the building construction schedule, including its preparation, calculations, reliability indicators documenting necessary or required to achieve the set parameters of the building construction, principles for stage controls of design, construction and technological documentation, for the project external examinations (opponency) and principles of change management of these documents. It will also be specified who gives suggestions and methods of their submission, the form of issuing and archiving changes, downloading invalid documents, etc.

Handing-over information and data will be planned by the CONTRACTOR and will take place in accordance with ČSN EN ISO 19650 – information management.

The quality inspection program will also include the participation of the CLIENT in external examination processes, documentation checks, the method of documenting the CLIENT's participation in approval processes, other possibilities for the CLIENT's engagement in the technical preparation of building construction, the number, and places of allocation of individual copies of documentation, etc.

The documentation of the QUALITY PLAN includes:

- quality plan,
- checking and testing,
- test program,
- documentary part.

## 6.1 Quality plan

The QUALITY PLAN of the Work must be prepared by the OB 2 CONTRACTOR in accordance with the ČSN ISO 10005 standard.

It sets out a summary of measures to ensure the implementation of the Work in all its parts in a required quality. It serves to ensure the quality of the Work corresponding to the CLIENT's requirements.

The QUALITY PLAN will include a list of individual activities affecting the quality of the Work.

The responsibility of the Management will be stated, including the definition of the rights and obligations of the workers entrusted with quality management. The QUALITY PLAN must verifiably ensure that the requirements. It will also determine the type of standards used, technical conditions and regulations for conducting inspections, types of quality records, who conducts the tests and participation in these tests.

The QUALITY PLAN will be prepared for the entire scope of the Work and must contain the quality inspection procedure for all activities within the scope of the Work execution.

The QUALITY PLAN will address how these activities are ensured in the individual phases of execution, i.e. in particular during:

- designing (design solution),
- commercial provision of the material purchase,
- own production,
- construction work and assembly,
- commissioning.

## 6.2 Schedule of inspections and tests

The OB 2 CONTRACTOR will prepare the inspection and test plan.

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These are in particular:

- inspections and tests during the acceptance of material and subcontracts of mass-produced equipment,
- inspections and tests during the production of individually produced equipment,
- inspections and tests of finished products, FAT,
- inspections and tests of building construction parts,
- inspections and tests during acceptance for assembly,
- individual tests (ITE) as a part of the assembly completion,
- inspection and testing during COMMISSIONING, i.e.:
  - preparation for trial run,
  - trial run
  - Guarantee Measurement A,
  - comprehensive test,
  - Guarantee Measurement B.

The inspection and test plan of will have a hierarchical structure – the Schedule of inspections and tests for the Work (hereinafter referred to as the framework SIT) will be prepared for describing the method of dividing the tests of the Work into coherent time phases according to the above breakdown and further elaborated in the form of partial SIT for individual time phases and PS/DPS /SO.

Inspection and test plans will contain in particular:

- item name, drawing number, continuity with the superior QUALITY PLAN, clear principles for the inspected product identifying (product number, etc.),
- understandable differentiation of the phase of input, interoperation and output controls and tests, name of the responsible employee of the OB 2 CONTRACTOR who will carry out (evaluate) the inspection, including the degree of his/her independence,
- individual inspections and test operations must be arranged in sequence as they chronologically follow in the actual Work (technological) procedures, indicating:
- technically clear specifications of a concrete inspection, including the scope,
- inspection method, regulations for its implementation (inspection procedure), including criteria for evaluating the results of a successful inspection or test (the regulations for implementation must respect all principles for the professional implementation of the relevant inspection method, in case of doubt, the matter will be the subject of a professional specialized inspections by the CLIENT, or it must be suitably proven by the OB 2 CONTRACTOR). The stated criteria for evaluating the results of an inspection or test can be stated either directly in the own Inspection and test plan or in the follow-up test program,
- a clear way of recording the result (finding) of the inspection, test, and its evaluation,
- a place for recording witnesses (W - witness) or detention (H - hold) points of CLIENT's inspection, or an authorized independent third party.

For individual inspections and tests, it will be indicated for which tests the OB 2 CONTRACTOR is obliged to call the CLIENT.

#### **Quality control of the BIM model**

The quality of the model forms part of the CONTRACTOR's responsibilities, i.e. it is checked by the BIM coordinator of the CONTRACTOR. Such control will be carried out on an ongoing basis, at least before each handing-over of the model to the CLIENT.



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The CONTRACTOR will provide in the BEP a detailed definition of the scope, frequency and evaluation methods of controls of the model and procedures applied in remedial measures.

The controls will be planned at least in the following areas:

<b>Control</b>	<b>Description</b>
<b>Visual</b>	Finding that there are no non-planned model elements and that the model complies with the assignment
<b>Spatial</b>	Control of duplicate elements, same elements at the same place – errors in the bill of quantities
<b>Collision</b>	Searching for places of two colliding elements - hard and soft collisions are distinguished
<b>Requirements</b>	Assurance that the BEP, BIM standards and EIR and TD requirements have been met
<b>Graphic details</b>	Individual elements are modelled consistently and in the relevant category. The elements are classified in a logical manner by the building facilities and floors (no element across more than one floor has been found. etc.). Each element belongs to the appropriate floor
<b>Information detail</b>	Each elements contains all required parameters filled in accordance with EIR. Elements are classified in accordance with the KKS.

## **Collisions**

Basic collision types:

**hard collision** – direct geometric sharing of the same space by several components – e.g. a sewage pipe passing through a steel girder

**soft collision** – the distance between components is less than their geometric tolerance or protection zone – e.-g- free space require for their maintenance or installation

Collision penetration tolerance is 30mm – corresponding to the construction accuracy – may be adjusted in the BEP in exactly specified cases, if so agreed.

Example:

**A collision is** – e.g. pipeline vs. reinforced concrete wall, pipeline vs. load-bearing structure, pipeline vs. pipeline

**A collision is not** – pipeline vs. plaster board wall, pipeline insulation vs. pipeline insulation

## **6.3 Programs of tests**

Test programs will be developed for all tests required by the CONTRACT.

The GUARANTEE MEASUREMENT PROGRAM, TEST A and TEST B will also be processed according to the same criteria (for each test separately), which will form a separate documentation.

For each test specified in the inspection and test plan, the OB 2 CONTRACTOR will prepare a separate document, which will contain in particular:

- the purpose of the test,
- the values to be demonstrated and the parameters to be achieved,
- a description of the preparation and the test procedure, including the test schedule,
- a list of the inspected and the tested equipment or a device, or its parts or the whole unit,

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- preparedness requirements:
  - construction and technological parts of WORK incl. electrical systems and the instrumentation and control system (I&C),
  - connected to existing technological equipment inclusive of existing electrical systems and I&C systems,
  - related technological equipment, electrical systems supplied within other PARTS OF THE BUILDING CONSTRUCTION,
  - other low-current equipment,
- requirements for personnel to perform the tests,
- a line diagram showing individual activities with the time evaluation and follow-up of individual activities, or professions (construction, mechanical, electrical, I&C),
- list of documents and standards, according to which the test or inspection will take place,
- measurement methodology and method of evaluation,
- success criteria,
- list of all devices used during testing or inspections and their calibration protocols,
- draft sub-protocols evaluating the course of a test or an inspection,
- draft of the final record of the test or inspection.

The scope, conducting and quality of tests or inspections must correspond at least to the requirements of the CONTRACT and the requirements specified in the applicable standard for the given equipment.

The number of the relevant and valid standard will be indicated for each relevant tested or inspected equipment or a device.

#### **6.4 QA/QC Part**

The documentary part of the Work quality assurance system will include records from all inspections, tests, acceptance tests performed, in particular:

- test and inspection protocols,
- building readiness protocols,
- quality records in accordance with the QUALITY PLANS to the extent agreed in these programs, i.e. documents concentrated on the quality of elements and equipment and activities affecting quality, on properties of materials, welds or elements and equipment and on the results of activities carried out in order to evaluate the condition and ensure the quality of the equipment,
- certificates of production organizations concerning the quality and properties of materials and records containing results of tests with the scope and detection of permissible deviations, in accordance with the requirements of the QUALITY PLAN,
- as well as certificates, quality documents and declarations of conformity for all construction materials used in accordance with the applicable legislation given by Act No. 22/1997 Coll., on technical requirements for products, with all related, later, amending or implementing regulations, laws or decrees,
- reports on the results of acceptance, input, pre-assembly and pre-operation checks and inspections, including reports on balance, measurement of frequency characteristics, etc.,
- certificates of the quality and completeness of assembly work, which includes reports on the results of pre-assembly and assembly inspections or technical conditions,

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- certificates of impermeability and watertightness of pits built,
- records and protocols and evaluation of cleaning processes,
- test records (calibration curve) documentation of setting or adjustment, and or metrological check,
- records on the alignment /orientation of the equipment installed,
- reports on the initial revision of electrical, pressure, gas and other reserved equipment,
- records of tests carried out, opinions of supervisory authorities and other documents, the documentation of which by OB 2 CONTRACTOR follows from the regulations and orders of state authorities and ČSN,
- keeping records of the boiler and its accessories protection settings (e.g. pressures in the combustion chamber, safety valves)
- records on the protection setting of new or enlarged electrical switchboards / switching stations,
- records on transformer tests performed,
- records and evaluation of COMPREHENSIVE TEST,
- certified copies of permitted exceptions of the ČSN and regulations,
- declaration of conformity according to Act No. 22/1997 Coll. including documents on the used method of conformity assessment and supporting documents to the extent agreed in the CONTRACT and including the EMC certificate,

all other certificates and other documents required for granting the approval of the authorities for the operation of the WORK.

## **7 PLAN AND ORGANIZATION OF THE BUILDING CONSTRUCTION**

As a part of the building construction preparation, the OB 2 CONTRACTOR prepares the Plan and organization of the building construction (POBC), based on the specific conditions given by the construction site, their own proposal for the building construction solution and the proposed construction process.

### **7.1 Contents of POBC documentation**

The documentation deals with the fundamental conditions for building the SITE FACILITIES, the implementation of the building construction, the impact of the building construction on the current operation, the surroundings and the environment, the protection of the population health, as well as the internal and external traffic solutions related to the building construction, land take and other possible elements influencing the progress of the Work execution.

The documentation will work up conditions of occupational safety and health protection during the WORK execution.

The construction organization project will address at least the following main issues:

- characteristics of the construction site,
- capacity and use of existing or newly built buildings for the purposes of construction site equipment,
- provision of water and energy supply to the building site, sewerage connection from building site facilities, building site drainage, telephone,
- expected number of workers needed during construction and their social security,
- data concerning special measures, or methods of execution requiring safety measures,
- the impact of the construction on the environment and methods of limiting or eliminating undesirable effects,

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- requirements for temporary take of areas in the PLANT building with determination of expected dates of such a take,
- the effect of the building construction on the PLANT operation, with the indication of possible reduction of operation,
- the determination of building objects and equipment, or their parts that must be put into operation or use preliminary,
- the time course of cleaning up of the building site equipment,
- the time and implementation plan of the execution - it will be elaborated and updated through the BASIC WORK IMPLEMENTATION SCHEDULE. The DETAILED WORK IMPLEMENTATION SCHEDULE (Execution schedule) will be drawn up in accordance with the BASIC WORK IMPLEMENTATION SCHEDULE, with the main construction milestones, taking into account the time continuity in the process of demolition works and the link to existing operation, while respecting the principles contained in the indicative schedule and will also take into account time requirement of the other OB CONTRACTORS,
- delivery assurance plan,
- delivery marking conditions, packaging, storage principles,
- assembly documentation - the assembly and testing plan (linked to the quality management plan and the COMMISSIONING project) will contain all data and information necessary for possible execution of assembly by an independent assembly organization,
- winter measures,
- effects of building constructions on environment,
- ways of handling waste,
- occupational safety and health protection.

The project of development organization will also include the site facilities.

The situation of the building site facilities will be presented in the scale of 1:500 and will include in particular:

- location and height marking of all existing facilities, i.e. including underground engineering networks and other covered facilities according to data provided and verified by their administrators and including named spaces,
- marking of the building construction perimeter and the temporary perimeter of the BUILDING SITE outside the building site area,
- position and height marking of the planned building construction, including its connection to the current PLANT facilities and equipment, any relocations of underground or above-ground distribution networks,
- areas on which landfills, and temporary SITE FACILITIES can be built,
- as well as entrances to the main and side BUILDING SITE,
- water and energy supplies to the SITE, including distribution points, sewerage connection from BUILDING SITE facilities, drainage, telephone connection.

The graphic processing of the overall situation of the building construction will be elaborated in a manner corresponding to the relevant ČSN to enable a clear distinction of plotting any proposed building constructions and the existing state, as well as of the marking other data being parts of the Work.

The POBC documentation is also subject appropriately to all requirements of chap. 3. A partial information model of the site facilities that will be prepared for the POBC part "Construction organization plan" will serve primarily for coordination purposes.

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## 7.2 OHS Plan

In accordance with the requirements of Act No. 309/2006 Coll. on further requirements with regard to the Occupational safety and health and ensuring safety and health protection during activities or providing services outside labour relations (Act on Ensuring Other Conditions of Safety and Protection health at work) The OB 2 CONTRACTOR shall prepare a Draft plan for safety and health protection at work on construction sites, in the sense of Government Decree No. 591/2006 Coll., on further detailed minimum requirements for safety and health protection at work at construction sites, other necessary data as a basis for the development of the OHS chain processed by the OHS coordinator, established by the CLIENT to Act 309/2006 Coll.,

The draft Occupational safety and health plan at work on the building site and other necessary documents will describe provisions and principles of compliance and prevention of health and safety during construction works.

The draft plan will be based on specific conditions on the building site, on specific technological procedures, types of work and activities by which the OB 2 CONTRACTOR will achieve implementation and close interconnectedness to the project of the development organization.

## 8 TECHNICAL ASSESSMENT OF EXISTING K80/K90 BOILERS

A preliminary analysis of the condition of boilers and other equipment connected with the current and future operation of boilers, including equipment outside the boiler house, which have an impact on the functioning of the OB 2 LOT, will be carried out. As a part of this report, a detailed survey of the equipment will be performed at the OB 2 CONTRACTOR's expense as agreed with the CLIENT. In the course of such inspection, the CONTRACTOR will be also permitted to inspect for a period of 10 days the interior of the boilers. The costs of cleaning, construction of scaffolding and other pre-approved requirements will be paid by the CLIENT. Not later than within 2 months before the schedule inspection date, the CONTRACTOR must present to the CLIENT his requirements that are subject to approval. The preliminary inspection dates are as follows:

- K80 – July 2025
- K90 – August 2025

The report will include condition assessment, a rough estimate of residual lifetime of important components, proposed modifications and risks. The report will be made within two months after the completion of the inspection, unless agreed otherwise. Key conclusions of this report will be written in the Czech language.

## 9 INTRODUCTORY PROJECT

The content of the Introductory Project consists of the following items, at least:

### 9.1 Accompanying report

The accompanying report will be processed in aggregate for the entire building construction and will respect the data in the documents submitted by the CLIENT. It will contain in particular:

- identification data,
- basic data characterizing the building construction and its future operation,
- an overview of the initial documents and the fulfilment of binding conditions stated there.

### 9.2 Complete solution of the Work

It will be processed completely for the entire Work and will include:

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### **Summary technical report**

It clarifies the overall solution of the work and contains:

#### **The development area and the architectural and technical solution of the building construction**

Evaluation of the building site, evaluation and results of the conducted surveys and the consequences resulting from the surveys for the solution of the building construction,

- the principles of the overall architectural and visual design of the building construction,
- principles of the overall technical solution of the building construction,
- spatial technical conditions and principles of solving connection of the building construction to all types of engineering networks (necessary for the scope of the OB 2 LOT), energy and connecting networks in relation to balances to needs and existing facilities,

#### **Mechanical and technological equipment**

- Description of the overall technological solution with clarification of functional links of individual operating files and links to existing PLANT facilities and equipment.

#### **Electrical equipment**

- basic technical solution, purpose, and connection to the system,
- overall concept of earthing and protection against electric shock,
- fire prevention measures as for electrical equipment,
- complete list of electrical appliances.

#### **Process control system**

- description of the control system and its functions,
- automation level of process control.

#### **Energies balance and how to achieve it**

- electricity,
- heat,
- steam,
- compressed air.

#### **Balance for the UNIT and for the PLANT**

- drinking water,
- industrial water,
- hot water,
- treated water (demineralized water, softened water),
- rainwater,
- sewage water.

#### **Communication devices**

- overall solution concept

#### **Environmental care**

- impact of construction on the environment,

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- description of the technical solution of the building construction from the point of view of environmental care,
- characteristics of production technology (operation),
- sources, types, properties and quantity of harmful substances and other possibilities of health endangering,
- method of disposal, utilization and removal of waste materials and energies.

#### **Taking care of work safety and technical equipment**

- Description of the technical solution of the work in terms of work safety and technical equipment

#### **Fire protection**

- technical solution of building construction and operation from the point of view of fire protection

#### **Anti-corrosion protection**

- description of solutions of anti-corrosion protection of metal structures and technological equipment

#### **The KKS code marking system used**

- the regulation for marking the building construction equipment with the correct KKS code which will be compatible with the current KKS methodology used at the heat and power plants.
- the KKS marking will be created in accordance with the KKS and ED methodology for the equipment of Ško-Energo, s.r.o. Parts 1 to 6 (METHODOLOGICAL GUIDELINE MP 815\_03/002 – Annex A13, except for 3, which is irrelevant for the LOT),
- All KKS and cable codes created in accordance with this Methodology, including documentation which includes KKS codes,
- The investment server EDMi of Ško-Energo, s.r.o. will be used for the administration of the KKS codes of the LOT.

#### **List of connection points**

- containing boundaries and a marking system,
- connection description.

#### **Drawings**

- the general overall situation of the building construction (development plan) with a scale of 1:500,
- basic functional technological scheme,
- overall one-pole scheme,

### **9.3 Documentation of operational files (PS)**

#### **Mechanical-technological operational files (PS)**

The documentation for individual PS will contain the following basic documents:

- technical report,
- diagrams /schemes,
- other drawings.

#### **1. The technical report will include:**

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- Basic data, which will contain data used for calculation, dimensioning and solution of systems.

File description:

- PS purpose,
- dimensioning criteria,
- parameters,
- calculation results,
- norms, standards,
- composition of the file,
- layout,
- list of equipment and devices,
- equipment data sheet,
- list of main pipeline branches,
- list of main functional fittings,
- list of connection points,
- list of control circuits,
- list of electric appliances,
- list of sensors.

## 2. Schemes

The schemes will include the following documents:

- PS overview scheme,
- overall overview scheme diagram with project boundaries marked.

## 3. Other drawings

These documents will be included in the drawings:

- basic layout M1:100 with drawn main aggregates incl. of their code designation excluding an error in identification with multiple aggregates,
- spaces intended for the installation of electrical equipment, components of the measurement and the control system and for the main cable routes,
- main pipeline routes according to the list of pipeline branches,
- project boundaries,
- necessary sections (with similar data).

## **Instrumentation and Control system (I&C)**

### 1. Technical report

The I&C technical report will contain the following items

- description of the control system and its function, the level of automation of process control,
- technical data relating to individual parts of the system (subsystems), their functional use, the method of interconnection and communication,
- links and communication with follow-up systems,
- method of solving connections to the power part, to technological equipment, to the control system of the heating plant, etc.,
- description of methods of the process controlling and monitoring, operator communication with the system, historical data safekeeping, etc.,
- technical specification of main components,
- system structure and function,



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- standard type solutions of chains for measuring physical quantities, chemical analysis, etc. incl. brief specifications of the devices in individual types of circuits,
- list of measured and calculated values,
- list of active members,
- description of sequential control algorithms,
- description of control circuits.

## **2. Schemes**

The schemes will include the following documents:

- continuous and sequential control algorithms,
- block diagrams of control circuits,
- coordination drawings and information, such as type schemes solving connections to power distributors and actuators.

## **3. Other drawings**

As a part of these drawings, the layout of the main cable routes will be processed.

### **Electrotechnical equipment**

#### **1. Technical report**

The technical report will include:

- basic technical solution, purpose, and connection to the system,
- total installed and maximum contemporary input (power),
- selection of current systems and voltage,
- results of calculations of short-circuit and voltage ratios at substations.
- choice of protection of large and important aggregates,
- a description of control, measurement, and signalling,
- descriptions of the device's function,
- overall concept of earthing and protection against electric shock,
- technical specifications of the main devices.

#### **2. Schemes**

The schemes will include the following documents:

- electrical drawing documentation,
- overall single-pole scheme,
- single-pole schemes of all switchboards,
- schemes of protection connections,
- type schemes of the control of all types of outlets.

#### **3. Other drawings**

As a part of these drawings, the layout of the main cable routes will be processed.

### **Construction part**

The following documents will be processed for each building object (SO):

- technical report,
- preliminary static calculations,

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- drawings.

### 1. Technical report

The technical report will contain the following basic chapters:

- foundation structures,
- superstructure,
- profession,
- water, sewerage system,
- air-conditioning system (ACS),
- heating,
- lighting,
- plug-in circuit,
- low current,
- Electronic fire alarm system (EFAS) +fire protection equipment.

### 2. Preliminary static calculations

These are calculations for building construction foundation and design of steel structures.

### 3. Drawings

Drawings will include the following items:

- layout drawings of the construction-architectural solution, in the case of a manufacturing unit it is combined with steel structures with the M1:100 scale,
- professional drawings with a schematic marking of the relevant profession, with the M1:200 (M1:100 scale).

## 10 DETAIL DESIGN DOCUMENTATION

Project documentation for building construction is the documentation in the sense of the Building Act No. 183/2006 Coll. as amended by Act No. 350/2012 Coll. and Decree No. 499/2006 Coll. (on construction documentation) as amended - contains all information and documentation required for the execution of the work, including data and details of the technical solution, conditions for the implementation of all works and links to other PARTS OF THE BUILDING CONSTRUCTION and to the currently operated facilities of the PLANT.

The Project documentation for the building construction execution comprises in particular:

- approved documentation for a building permit, including conclusions, comments and requirements of the authorities concerned,
- a CONTRACT, including all Annexes,
- principles for equipment marking, using the KKS system,
- required changes during the PROJECT processing approved by the CLIENT.

During the PROJECT processing the OB 2 CONTRACTOR will collaborate closely with the CLIENT or with a third party authorized by the CLIENT, so that the PROJECT is coordinated with the existing PLANT.

The minimum scope of documentation concerning professions can be found in the following chapters.

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## 10.1 Mechanical and technological equipment

The basic structure of the documentation of the mechanical and technological part for the building construction execution is given below in the text.

**Technical report** containing:

- a description of the overall technological solution, including a description of the purpose, function, capacities and parameters of the technological equipment,
- functioning principles with specification of functional links to the CLIENT's existing equipment,
- implementation procedures, conditions for the WORK execution, relationships with any neighbouring operated equipment and the WORK other parts,
- values of total electricity consumption,
- requirements, or conditions for the equipment operation, including the definition of emergency operating conditions, principles for maintenance carrying out,
- specification and balance of auxiliary materials and energies,

data and parameters of the main machines and technological equipment, including pipelines and fittings, including in particular:

- main dimensions of the equipment,
  - basic construction material,
  - material of individual parts,
  - nominal parameters of the main equipment and operating ranges, incl. utmost limits for protection settings,
  - equipment overloading,
  - description necessary for understanding the function and technical solution,
  - specific requirements for transport and storage,
  - requirements and conditions for commissioning,
  - methods of protecting the surface of machines and technological equipment, incl. material specification.
- data and parameters of pipelines and fittings:
  - nominal parameters (in the case of fittings, also the parameters of the actuating members),
  - results of technical calculations of main transport routes,
  - solving the dilation of pipeline routes,
  - pipeline positioning, data on forces to individual supports (particularly for high-pressure pipelines),
  - data on routes sloping,
  - data on routes draining and venting,
  - security of routes, safety valves setting and adjusting,
  - requirements and conditions for commissioning,
  - protection of internal and external surfaces of pipelines and fittings.

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- The list and description of all connection points, incl. connection points on the CLIENT's equipment,
- other data that proves the technical level, functionality and safety of the solution, such as:
  - description of the boiler design,
  - description of the combustion process,
  - combustion control method,
  - method of boiler output control,
  - execution of air and combustion fans.
- Environmental care:
  - the effect of use and operation on the environment, resources, species, properties, quantity of harmful substances and other possible threats,
  - the method of disposal, utilization and removal of waste materials and energy and the method of disposal or reduction of hazardous effects on the environment arising due to the operation, construction, spatial and acoustic solutions, protection against noise from production or operating facilities, data on daylighting and insolation, other negative effects on environment acting on the building construction, and solutions for protection against them,
  - method of waste disposal,
  - taking care of the safety of work and technical equipment,
  - characteristics of production technology and operation,
  - sources of threat to workers' health and safety,
  - method of limiting risk influences,
  - safety zones, internal communication, and escape routes,
  - protection of workers and the working environment from the effects of pollutants,
  - technical equipment and areas for service, maintenance, and repairs,
  - storage of dangerous substances and handling of them
- fire prevention measures:
  - technical solution of building construction and subsequent operation from the point of view of fire prevention measures (including fire alarm, etc.),
  - characteristics of building constructions and operations from the point of view of fire prevention
- anti-corrosion protection solutions - description of internal and external anti-corrosion protection solutions for structures and technological equipment,
- method of assembly.

**Lists and specifications will include:**

- Specifications of all material deliveries, incl. spare parts for commissioning, with KKS codes and all the data needed for equipment identification and additional ordering of spare parts,
- a list of machines and equipment with all the necessary data and parameters, particularly:
  - item number and code designation,

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- name,
- type,
- producer,
- name, parameters of machines and equipment,
- - total weight (weight of the heaviest piece).
- a list of pipelines, valves, and fittings, including control ones, with all the necessary data and parameters:
  - number and code,
  - items,
  - type,
  - producer,
  - number of pieces (operational and spare ones),
  - total weight, weight of individual parts,
  - nominal parameters (for fittings, also parameters of actuating members).
- specification of steel structures,
- specification of the insulation used for individual parts of the equipment, indicating their type and dimensions,
- specification of used coatings, or other surface treatments,
- colour and marking of machines, equipment, pipe and cable routes

#### **Results of technical calculations - balance**

The part of calculations and balances will include particularly:

- calculation results of all important parameters, such as:
  - pressure losses in the main steam pipeline routes,
  - balance charts for the entire technology, containing especially media parameters and material flows for calculation and different operating conditions, always for each fuel and fuel combination separately,
- standard strength analyses of the main pipeline routes in accordance with the standard.

#### **Drawings**

The drawing part will include, at least:

- technological diagrams with all measurement points drawn (P&I diagrams), including sampling for control measurements,
- technological diagrams of partial machines or groups (a boiler, fuel system and ash system, compressed air system with all measuring points drawn (P&I diagrams), including sampling for control measurements,
- layout drawings, which shall necessarily contain:
  - arrangement and location of machines and equipment, including channels, bridges, etc., indicating dimensions, especially the dimensions that must be observed in terms of the equipment location and operational safety,
  - arrangement of lifting equipment,

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- marking of security zones for the classification of premises according to ČSN 33 2000-5-51 ed.3,
  - foundation plans for anchoring to the construction part and plans for equipment placement,
  - drawing documentation of the boiler in a sufficient number of floors and in a sufficient number of sections,
  - assembly documentation with all necessary data for assembly
  - checks and measurements during and after assembly,
  - assembly of parts with clearances marked,
  - aids, special tools and preparations for assembly, inspections and measurements,
  - documentation for assembly of all parts,
  - drawing documentation for mounting detectors and sensors of measuring circuits,
  - other drawings, necessary for coordination and proper execution of assembly,
  - design documentation of machines and equipment starting with the drawing of the main assembly, drawings of major assemblies and sub-assemblies and drawings of parts of machines and equipment,
  - all drawings will be with a scale of 1:50 and will contain the characteristic dimensions of the equipment
- isotherm drawings of pipe branches.

Layout drawings will be prepared and subdivided appropriately, and available in sufficient number, so that the arrangement of machines and equipment within the scope of deliveries are clearly defined.

## 10.2 Construction part

will be processed separately for each construction/engineering object, including construction changes that are part of the Work.

**Technical report** will include:

- the building object's purpose,
- functional solution,
- description of the technical solution, data on the decisive construction and physical,
- constructions according to purpose, surface treatment,
- an overview of the technological equipment located in the building object,
- characteristics of the premises environment,
- protection from noise and other negative influences,
- corrosion protection,
- solutions for fire protection.

**Drawings** will include:

- floor plans of the floors concerned, indicating:
  - decisive interior spaces and main structures,
  - outlines of the main equipment.

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- Construction drawings of building structures,
  - Reinforcing plans,
- additional drawings as required (details of specific required building reconstruction, etc.),

#### **Technological procedures during construction works**

#### **Documentation of temporary objects on the building site equipment**

#### **Documentation of the necessary renovation of existing and permanent building objects for the purposes of construction site equipment**

**Documents and calculations** will be submitted within the agreed scope. The calculations will be prepared in accordance with the relevant technical standards.

### **10.3 Control and management system**

The documentation will be prepared as a whole, but divided into separate volumes as follows:

- the documentation of the field instrumentation and cabling
- the documentation of HW control system,
- the documentation of SW control system.

#### **Technical report**

The technical report will include, as appropriate, in particular:

- the documents from which the project came, changes against the entered data and the project,
- markings and type documents used,
- description of the control system, including its automation and description of individual parts, characteristics of operation and environment,
- description of technological equipment,
- description of the overall solution, with clarification of functional links between individual technological nodes and links to the existing equipment of the CLIENT,
- main parameters of individual systems in relation to technology,
- a list and description of all connection points on the CLIENT's equipment,
- other data that will enable to assess the technical level, functionality and safety of the technical solution, voltage system, information on how to ensure the required values of EMC resistance, maintenance requirements, colour solutions of cabinets, desks, and control room panels
- descriptions of individual devices supplied
  - the way information is presented on operator station screens (marks used, assignment of colours to variable states, dynamic changes, etc.),
  - the method of solving the malfunction signal,
  - data on the radiated power of supplied devices and on the method of ensuring the ambient conditions,
  - care for the environment,

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- - construction, spatial and acoustic solutions, protection against noise from production or operational equipment, data on daylighting and insulation,
- other negative effects of the environment acting on the building construction and the protection against them,
- method of waste disposal,
- taking care of work safety and technical equipment:
- characteristics of the technology of production and operation,
- sources of threats to the health and safety of workers,
- the method of reducing risk influences,
- safety zones, internal communication, and escape routes,
- protection of workers and the working environment against the effects of harmful substances,
- technical equipment and areas for operation, maintenance, and repairs,
- storage and handling of dangerous substances.
- field instrumentation,
- description of the cabling solution, types of cables used, cross-sections of the cable cores and the way they are connected,
- the method of solving connections to field instrumentation, the power part, to existing control systems, untouched by the implementation of the new I&C, etc.,
- calculations and possibly also drawings of the throttle members,
- take off lists,
- list of measurement circuits.

#### **Documentation of hardware management files (MS)**

The documentation will contain detailed information incl. drawings related to the supplied HW instrumentation, cabinets, system configuration, layout, and use of individual modules, etc.

Minimum scope of documentation

- description of the system and its individual parts, including a description of the function,
- data on the type and technical parameters of individual components,
- description of diagnostics of HW resources,
- methods of solving connections to surrounding devices, including communication connections,
- description of the internal cabling solution, types of cables used, the cross-sections of the cable cores and the way they are connected,
- list (specification) of all supplied hardware, including spare parts for commissioning, with all technical data and data required for equipment identification and spare parts ordering,
- lists of inputs and outputs of automation stations,
- list of action members controlled by supplied systems,
- list of cables (power, communication, etc.)



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### **Documentation of software management files (MS)**

The SW documentation will contain information on the application software of the systems in a sufficiently detailed scope, so that persons other than the OB 2 CONTRACTOR can understand the programs and modify these programs after the OB 2 CONTRACTOR's responsibility has expired.

This documentation includes particularly:

- basic description of the objectives of the programs, their possibilities, and limitations,
- description of functional block diagrams for measurement, signal processing, regulation, logic control and protection,
- description of process control and monitoring methods, operator communication with the system
- storage of historical data, etc.
- libraries of standard and user function blocks used in control algorithms
- description and internal structure of these blocks,
- algorithms of binary control and regulation, including verbal description,
- configuration of images on monitors,
- configuration of fault and status messages and events, incl. form design for display and printing,
- message configuration incl. draft form for printing,
- configuration of historical data storage,
- information about sampling periods, periods for data storage - process and individual variables and algorithms,
- description of all SW applications in the project, including a description of their use,
- description of the system's diagnostic functions, including automatic tests,
- any other information about software that has been specially created or modified for this Work,
- documentation of the interface to other systems installed in the PLANT.

The following items shall be stated in the documentation:

- method and extent of device testing,
- criteria for success in tests and exams,
- methodology and tools for maintaining SW products throughout their lifetime,
- method of securing SW products against accidental interference and unwanted or unauthorized interventions.
- Lists:
  - lists of signals (I/O), including measurement range of signal and fault levels (limit settings),
  - list (database) of all calculated quantities, including physical units and calculation principle
  - list (database) of communicated signals.
  - signalling and fault levels (limit settings),

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- drawing part:
  - technological schemes with drawn measurement points (PI diagrams),
  - drawings of connecting cabling to the HW of the supplied control system, incl. terminal connection,
  - construction drawings of instrument frames, cabinets, etc.,
  - layout drawings of the location of all connected sensors incl. frames for primary devices, cable routes, etc. with all necessary sections and details with a scale of 1:50,
  - schemes of a typical chain solution for measuring physical and chemical quantities and connecting electrical appliances,
  - line schemes for connecting sensors and electrical appliances to the control system (each circuit on a separate drawing),
  - terminal schemes of individual cabinets, switchboards, and junction boxes.

#### **10.4 Electrical part**

**The technical report** for this part will include in particular:

- purpose of building construction, overall solution, and integration into the distribution,
- an overview of the starting documents,
- changes against the entered data,
- scope of the projected equipment,
- markings and type documents used,
- voltage systems, power supply equipment,
- protection from electric shock,
- overvoltage protection,
- grounding and shielding overall concept,
- determination of spaces according to the action of external influences,
- basic technical solution, purpose, and connection to the system,
- total installed and maximum current power consumption (power),
- balance for individual operating modes on individual switchboards,
- results of short-circuit and voltage ratio calculations,
- description of the solution and calculation of electrical protections,
- description of the layout solution,
- description of control, measurement, and signalling,
- equipment function descriptions,
- descriptions of individual equipment supplied,
- description of colour solution, corrosion protection,
- construction works,
- solutions for cabling and main cable routes,
- occupational safety and health,

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- fire protection measures for electrical equipment and devices,
- equipment maintenance requirements,
- references to valid and used ČSN and IEC or other standards,
- taking care of work safety on technical equipment:
  - characteristics of the technology of production and operation,
  - sources of threat to workers' health and safety,
  - the method of reducing risk influences,
  - safety zones, internal communication, and escape routes,
  - protection of workers and the working environment from the effects of pollutants,
  - technical equipment and areas for service, maintenance, and repairs,
  - storage of dangerous substances and handling of them
- fire protection:
  - technical solution of construction and subsequent operation from the point of view of fire protection (including fire alarm, etc.)
  - characteristics of building objects and operations in terms of fire protection

**Drawings** for this part will include:

- layout drawings concerning the location of the whole delivered equipment with a scale of 1:50 (switchboards, transformers, generators, socket distribution, lighting, etc.), incl. underlying frames,
- cable routes etc. with all the necessary sections and details,
- dimensional drawings of all parts of the equipment with marking of connection points, anchoring and attachment,
- construction drawings of a generator, transformers, switchboards, cabinets, frames, etc., including anchoring,
- single-pole connection diagram,
- wiring diagrams of electrical protections and measurements,
- control diagrams of all outlets,
- internal and external wiring drawings for all terminal blocks of all switchboards and equipment,
- principle scheme of protection against electrical shock
- drawings of connecting cabling between individual components of the supplied equipment and cabling to external equipment, incl. terminal connection,
- disposition of cable routes,
- drawing documentation for construction works.

**The lists and specifications** for this part will include:

- specification of all material deliveries, incl. of spare parts for commissioning with all technical data, KKS codes and data needed for equipment identification and additional ordering of spare parts,

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- list of electrical appliances incl. codes, designations, names, output, active power, producer's name, type, rated voltage, rated output, cut-in current, type of operation, control method, power switchboard code, control type scheme code,
- list of cables incl. all data on lengths, connection points, cable types, cross-sections.

## 11 PROJECT FOR START-IP AND TRIAL RUN

The project for the first commissioning will be processed for the period from the END OF ASSEMBLY until the end of the trial run, i.e. for each part:

- Preparation for TRIAL RUN,
- TRIAL RUN,
- GUARANTEE MEASUREMENT A,
- COMPREHENSIVE TEST,
- GUARANTEE MEASUREMENT B.

The project includes functional tests, including their preparation, and describes the conditions, test media, temporary measures and the test procedure together with the desired results.

The project will include chiefly:

- specification of the default parameters of the supplied device required for the first run-in,
- updating the equipment inspection and testing plan for the period from completion of assembly to comprehensive testing and follow-up test programs,
- special cleaning operations for the pressure system of the boiler and the pipe distribution:
  - construction parts,
  - linked technological devices,
  - Instrumentation and Control system (I&C),
  - electrical equipment,
- description of the preparation and procedure of the first run-in,
- list of operating materials and energy required for the first start-up,
- personnel requirements for putting individual files into operation,
- line diagram showing individual activities with time evaluation and continuity of individual professions (construction, mechanical, electrical, I&C),
- in-service test program,
- program of process adjustment and optimization.

The part of the start-up project concerning preparation of TRIAL RUN will be based on the execution of relevant individual tests and will deal with the gradual commissioning of individual functional units and operational sets in a logical sequence.

The part of the start-up project concerning TRIAL RUN will deal with the gradual verification of all parameters and functions of the equipment in the scope and quality given by the CONTRACT..

The part of the start-up project concerning the COMPREHENSIVE TEST section will address, among other things:

- the operation of the equipment in the specified operating modes,
- alternating main and backup devices,

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- defining the conditions and criteria for the success of the comprehensive exam.

The project will also specify the requirements for the cooperation of the CLIENT, including successive suppliers performing functional tests (energy, media, operating personnel, etc.), in accordance with the provisions of the CONTRACT.

## 12 PROJECT OF GUARANTEE MEASUREMENT

The GUARANTEE MEASUREMENT PROJECT will contain, in individual parts, projects for measuring all guaranteed parameters according to Annex No. A6.

The GUARANTEE MEASUREMENT PROJECT for the measurement of individual guaranteed parameters will mainly include, but it will be not limited to:

- A list of tests and checks that will be conducted, incl. stating the objectives of the tests or checks,
- standards according to which the evaluation will be carried out
- methodology for measuring guaranteed values and method of evaluation,
- a description of the measurement methods used,
- a list of the used measuring devices, indicating their accuracy classes and calibration curves,
- a list of measuring points,
- the complete set of a complete set of correction curves and other correction documents,
- a list of measurement points with markings in the schemes,
- method of taking measurements and connection points of the guarantee measurements,
- time schedule of the measurements and tests performed,
- requirements for the cooperation of the operator,
- a part of the GUARANTEE MEASUREMENT PROJECT will also include drawing documentation covering:
  - scheme of measuring points (drawn in the schemes),
  - scheme of measuring points (drawn in the schemes),
  - measurement structure diagram.

THE GUARANTEE MEASUREMENT PROJECT will also set requirements for the tests staffing and requirements for the cooperation of the CLIENT, including successive suppliers in taking of guarantee measurements (energy, media, operating personnel, etc.) in accordance with the provisions of the CONTRACT and Annex A6

The GUARANTEE MEASUREMENT PROJECT will be prepared separately for the GUARANTEE TEST "A" and GUARANTEE TEST "B", i.e. the requirement to carry out GUARANTEE MEASUREMENTS of individual guaranteed parameters will be respected as stipulated in the CONTRACT and in the Annex No. A6.

## 13 DOCUMENTATION FOR THE CHANGE OF CONSTRUCTION BUILDING PRIOR COMPLETION

In case of differences between the OB 2 CONTRACTOR's design solution and the current valid documentation for the building permit, the OB 2 CONTRACTOR will update the documentation for the building permit according to the Building Act.

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The OB 2 CONTRACTOR shall provide the CLIENT with all the documentation necessary for processing the request for changes to the building construction before its completion or for legalization of the completed building construction resulting from differences between the implemented project solution and the documentation for construction management (if there are such changes), or resulting from the Construction Act (Act No. 183/2006 Coll.) and its implementing regulations and decrees (primarily the Decree No. 499/2006 Coll.), including the necessary cooperation in negotiations with the government authorities concerned.

The statement of the Government authorities concerned and the request for a Building Permit is an issue of the CLIENT.

## 14 AS BUILT DOCUMENTATION

At the end of the execution of the Work, the OB 2 CONTRACTOR will prepare documentation of as-built condition of the building construction and submit it to the CLIENT.

The documentation will be processed in the scope and structure required in § 4 of Decree No. 499/2006 Coll. (on building construction documentation) and in Annex No. 13. DSPS detailed in accordance with DPS shall be prepared for the operation of the building /including all professional and operational parts).

The as-built documentation will contain all changes arising during the design works, construction, assembly and COMMISSIONING (changes to the executed WORK compared to the approved DETAIL DESIGN DOCUMENTATION).

All parts of this documentation will be marked on the title page as "The as-built Documentation as of:" with a red stamp and will be confirmed by the signature (in blue) of the responsible OB 2 CONTRACTOR'S REPRESENTATIVE.

The as-built documentation of the building construction will be provided with a stamp or a writing: AS-BUILT EXECUTION.

The as-built documentation will include a BIM model of the as-built construction (DiMS-DSPS) prepared in DPS detail.

The DSPS documentation prepared for the occupancy inspection of the building and the DSPS its operation (in DPS detail) will be prepared on the basis of the BIM model. The main geometry and all specification data included in the PD will be generated and taken over from the BIM model.

This BIM model will be filled with parameters and non-graphic data in accordance with as-built constructions and elements within the scope of information required for the operation and maintenance of the delivered building.

The creation of the 2D as built-documentation will be fully based by its content, classification and details on the Depositor's documentation; hence, it will be an update of the PD and the BIM models of the DPS so that DSPS may capture to the maximum extent the as-built condition.

The documentation will include changes resulting from the implementation project and information about actually built structures and elements. Neither the documentation nor the BIM model will contain any invalid and non-authenticated information. The CONTRACTOR is responsible for updating and correctness of all information provided in the models and the PD.

Where required by chap-16.1., the attributes in the BIM models will be recorded in bilingual form. This applies to both their titles and recorded values of the element properties.

### **Bm DSPS tolerance**

Tolerance means a difference between the actually implemented dimension and dimension specified in DiMS - DSPS.

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<b>BIM model (profession)</b>	<b>Tolerance</b>
Architectonic and civil engineering part	± 30 mm
Static	± 30 mm
TZB	± 30 mm
Landscaping	± 50 mm
Floor space	± 2 % (1 m <sup>2</sup> na 50 m <sup>2</sup> )

Notwithstanding the accuracy of the position and size, the order of plotting of the elements, particularly in TZB must always correspond to reality. For instance, the order of individual pipelines in the shaft must correspond to reality regardless of the compliance with the limit of tolerance.

## 15 OTHER TECHNICAL DOCUMENTATION

### 15.1 HAZOP

Before starting construction work on the LOT OB 2, the OB 2 CONTRACTOR will prepare a hazard and operability study (**HAZ**ard and **OP**erability studies).

The aim of the study is to identify unexpected and dangerous conditions that may occur during the operation of the projected technology. The results of the HAZOP study must be implemented further into other stages of documentation. This documentation must be approved before the Building Execution Documentation.

### 15.2 SIL Study

The OB 2 CONTRACTOR will work out the SIL Study (Safety Integrity Level) in accordance with the standard.

Based on the analysis of the sources and causes of any threats and their consequences, the possibility of avoiding dangerous events and the "probability of their undesirable occurrence", the SIL value is determined and some possible modifications afterwards. This documentation must be approved before the Building Execution Documentation.

### 15.3 Explosion protection documentation

In accordance with the requirements for ensuring safety and health protection when working in an environment with a risk of explosion according to NV 406/2004 Coll. relevant safety documentation will be prepared. This documentation must be approved before the Building Execution Documentation.

### 15.4 Fire safety solution

It includes the building construction fire safety solution (PBR) with its structuring given by Decree 246/2001 Coll., (i.e. the revision of the Fire Safety Solution prepared as a part of the Construction Management Documentation). The PBR will be discussed with the Fire and Rescue Service and its affirmative statement in relation to the PBR is a condition for the documentation approval by the CLIENT. This documentation must be approved before the Building Execution Documentation.

### 15.5 Marking register

The marking index will contain a list of all assigned KKS codes with the names of the equipment and the number of technological drawings on which the equipment is indicated.

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## 15.6 List of spare and rapidly wearing parts

The OB 2 CONTRACTOR will prepare and hand over in the given term:

- a list of spare parts for operation during the WARRANTY PERIOD,
- a list of rapidly wearing parts whose service life is shorter than the WARRANTY PERIOD,
- the list will include the specification of parts and their quantity, the specification will contain data for their order, and as for fast-wearing parts is concerned - with giving the recommended replacement cycles,
- a list of consumables.

## 15.7 Documents

The following documents will be submitted:

- an overview of the map and geodetic documents used.
- documents formed in the process of creating the PROJECT (e.g. approved exemptions from ČSN, certificates of conformity, etc.),
- a list of the existing chosen technical devices,
- a list of new chosen technical devices.

## 15.8 Accompanying technical documentation

Standard documentation of the products and materials used will be part of the equipment delivery - type projects, catalogues, certificates, etc.

All the accompanying technical documentation required for their transport, assembly, commissioning, operation, fault finding, and safe operation will be supplied for all supplied equipment and devices.

The accompanying technical documentation will include in particular:

- storage requirements,
- completed and confirmed sheets of technical data and other documents, the documentation of which results for the OB 2 CONTRACTOR from the regulations and orders of state authorities and ČSN,
- instructions for service, operation, repair, and maintenance of the equipment in the original language (in the language of a foreign supplier),
- translations of instructions for service, operation, repair, and maintenance of equipment into the Czech language,
- available technological procedures for assembly and disassembly from equipment manufacturers, including the corresponding drawing documentation,
- documentation for chosen technical equipment and devices required by applicable legislation,
- static calculations of steel constructions for auxiliary lifting equipment for assembly,
- technical conditions for delivery, installation, and operation of equipment in the original language (in the language of the foreign supplier),
- translation of the technical conditions for delivery, installation, and operation of equipment into the Czech language,
- documentation on the materials used, including the material of the main parts (chemical composition, mechanical values),
- lists and technical specifications of special equipment and preparations for repairs,



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- production scheme of the installed electric equipment (switchboards, panels, cabinets, etc.),
- production drawings – schemes of internal and external connections (current state),
- laying plans of cable or pipe distribution,
- calculation sheets of control valves and throttling devices (diaphragm, nozzles),

The mentioned documentation will be divided into separate volumes, consisted of the mechanical technology, I&C and electrical equipment.

Considering that the maintenance of the servo drives of the shut-off valves and fittings and the related electric wiring is also ensured as a part of the maintenance of the I&C, the relevant documentation will be designed in such a way that it can be worked out separately from the electrical documentation.

The accompanying technical documentation will also contain documents dealing with the assembly process, particularly with:

- pipe drawings with marking types and numbers of welds (current state),
- record sheets on welds indicating the type and numbers of welds, including a record of the evaluation of defectoscopic test and checks,
- a list of welders who welded the pipeline, with a record of the type and period of validity of their qualification authorization,
- a list of defectoscopy operators who performed the inspection, together with their qualification authorizations,
- diary about the progress of assembly work,
- documentation for checking the pipe material creep and the boiler pressure system
- results of material creep zero measurement,
- results of material creep first (basic) measurements,
- the results of check calculations of the service life of chosen pipes and parts of the pressure system of the boiler,
- documentation dealing with installation of hinges on individual pipeline routes,
- documentation for specific equipment or equipment in a specific environment according to ATEX, PED 68/2014/EC as amended and other applicable legislation,
- all other and different documents required for granting the approval of the authorities for the operation of the WORK, in particular records and protocols from official tests and checks of chosen equipment, verification of compliance with technical requirements for products (declaration of conformity of products), revision reports on electrical equipment.

## **15.9 Operating and Maintenance Regulations**

### **15.9.1 Operating regulations**

The operating regulations for the supplied UNIT technology, for the operational sets and for the individual specified equipment will be developed to enable the operator to conduct the operation safely in all normal operating conditions, and at the same time must provide the operator with sufficient information on what to do in emergency conditions. They will also contain instructions on how to operate the given technology as economically as possible.

In accordance with Government Regulation No. 378/2001 Coll. the operating regulation must contain for which employer or workplace it has been prepared, what it solves, a description of the technology and technological procedures, what and how employees must or, conversely, must not do, how to

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proceed in an unusual situation, who is responsible for operation, who is authorized to carry out inspections and to what extent and intervals, including the method of their recording, the list of required documentation and who keeps it and what methods are used. It is also appropriate to decide who should be acquainted with the regulation. It will also be indicated: who elaborated since it (team leader, i.e. senior employee), who approved it and since when it has been valid.

Operating regulations will be worked out in the following structure depending on the operation character:

- definition of basic concepts,
- list of abbreviations,
- brief technical description, designation of the equipment / device, its technical parameters,
- drawing documentation (schemes and dimensional drawings),
- connections to other devices,
- allowable deviations of parameters for normal operating modes,
- limit values for extraordinary operating conditions,
- limit values for fault conditions (protection settings),
- organization of work at the serviced equipment,
- workers responsible for operation and maintenance,
- service and inspection of the equipment being operated,
- handling of equipment,
- equipment and personnel safety, environmental protection (safety measures, fire prevention measures)
- operating maintenance (maintenance of equipment, inspection activities, defects and their elimination, employees of supplier companies),
- preparation for operation:
  - technological operation monitoring,
  - preparation of pipe routes and action members, description of the initial condition,
  - activation of blockades, protections, signalling and automatic control,
  - a list of all unlocking and locking conditions for individual devices.
- Methods of starting-up for:
  - Cold start, including start-up after a routine repair (RR) and the general overhaul (GO),
  - Warm start,
  - Hot start,
- commissioning (manual, automatic),
- inspection during operation,
- shutdown (operational, emergency),
- a precise verbal description of binary control algorithms and regulations,
- permissible ranges of regulated quantities,
- evaluation of failure states, setting of limit values and control circuits.

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### 15.9.2 Maintenance Regulations

The maintenance regulations will be elaborate in such a way as to be a basic aid for carrying out maintenance and spare parts sourcing, and operating personnel training.

Maintenance regulations shall include, but shall not be limited to:

- specification of main equipment needed for maintenance,
- accessibility and conditions of interchangeability of elements and nodes, including employment of lifting equipment for repairs and maintenance of the main machinery and equipment,
- principles of technological procedures and conditions for carrying out maintenance and repairs of main machinery and equipment,
- description of preventive and corrective maintenance, drawings, schemes, and diagrams needed for the maintenance of individual equipment,
- time schedules and regulations for regular checks and inspections and maintenance of individual equipment,
- lubrication plans, periods for refilling lubricants and oil changes, specifications for lubricants and oils,
- special assembly procedures when performing maintenance works,
- instructions for finding well-hidden defects,
- drawings specifying areas, spaces, and access routes for dismantling the main equipment and its nodes, including specifying storage spaces with load capacity markings.

For equipment that cannot be repaired without their putting out of operation or reducing the performance of the equipment, the maintenance regulations will contain an overview of all parts, indicating their service life in relation to the scheduled repair intervals – the routine repair (RR), the general overhaul (GO).

Considering the fact, that the maintenance of the servo drives of the shut-off valves and the related electrical installation is also carried out as a part of the maintenance of the Instrumentation and Control system (I&C), the above-mentioned documentation in the electrical part will be designed in such a way that it can be worked out separately. Operating regulations and documentation for maintenance will also be worked out separately for this part.

### 15.9.3 Proposal for changes to the operating regulations of the PLANT

A proposal for changes to the current operating regulations will be prepared and worked out to a reasonable extent (similar to the operating regulations of the UNIT), incl. continuation of current regulations.

The regulations will be approved by the CLIENT and implemented by him in the current operation of the PLANT.

### 15.9.4 Documentation for the CLIENT's personnel training

The CLIENT will receive all training materials in the Czech language from the OB 2 CONTRACTOR. The scope of this documentation will be specified in the Annex to the CONTRACT.

The operator's manual and the Operating and maintenance regulations of the equipment must be available well in advance for operators' training.

### 15.9.5 Documents for the WORK occupancy permit application

In connection with the application for the Work occupancy permit, the OB 2 CONTRACTOR shall in particular provide the CLIENT with:

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- The documentation of the current (as-built) state of the building construction, if it was not already handed over by the OB 2 CONTRACTOR during the trial run,
- The OB 2 CONTRACTOR's declaration of conformity to the Work as a whole (in accordance with ISO/IEC),
- The OB 2 CONTRACTOR's statement pursuant to § 156 of Act 183/2006 Coll., Building Act, as amended,
- Evaluation of trial run,
- Evaluation of the fulfilment of the conditions set by the Building Authority and the State Administration Bodies concerned claimed during the preparation and execution of the Work - by written statement of the OB 2 CONTRACTOR,
- Building object operating rules and regulations,
- Fire and evacuation plan,
- Specification of the waste types and quantities generated during the construction process and documentation of the method of their use or disposal according to Act 541/2020 Coll., as amended.

## 16 QUANTITY, FORM AND LANGUAGE OF DOCUMENTATION PREPARED BY THE OB 2 CONTRACTOR

The documentation will be prepared in a uniform and understandable form and in accordance with good engineering practice, including the as-built documentation, and according to standards, see Annex A13.

For the documentation provided by a sub-supplier of the OB 2 CONTRACTOR, the OB 2 CONTRACTOR will ensure unification of the form, content and marking of the documentation within the entire Work.

The drawings will be prepared with a scale according to the relevant technical standards. All drawings must be provided with a proportional scale. If the drawing is to be made a bit smaller, all other conditions must be observed. See Appendix A13 for details.

### 16.1 Documentation language

The documentation may be presented for revision in the English language. **All technical reports and operating regulations will be translated into the Czech language.** Booklets, drawings, lists and manuals may be in English (unless the supplier's original language is Czech). All underlying documents presented for revision to the state authorities must be in Czech.

Equipment and devices certificates will be delivered with a Czech translation.

A detailed specification of the language is provided in chapter 19.

In cases where a Czech language output is required in the output requirements, particularly in chapters 15.8, 15.9.4, 16.1, 18 and other) or the outputs are designated for the state administration authorities (the building authority, the DOSS – relevant state administration authorities, etc.) or where the outputs will serve for the operation and maintenance of the equipment and such outputs capture specification properties of the proposed parts of the building (elements and equipment), the properties and their values must be in the Czech language.

This means that all attributes of the BIM model elements affected by this will have their names and filled values recorded in the Czech language.

All other element attributes in the BIM models may be named in English and the values of those other attributes may be also stated in English.

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In all cases white the values of element attributes of the BIM model are captures in documentation outputs, (e.g. in drawings, reports, etc) and such outputs are required to be in the Czech language, those attributes must be also input in the source data of the BIM models in the Czech language (i.e. both the name of the attribute and its filled values).

Hence, it is recommended to keep all necessary attributes in the BIM models in the bilingual form so that two attributes will be recorded in the model for each specification value, one in English and one in Czech, unless resolved in another system method by the SW tool in accordance with the BEP.

The relevant value dials will be recorded bilingually, in the English and the Czech language.

## 16.2 Quantity of Documentation

The whole project documentation will be prepared with the use of computer technology and will be handed over to the CLIENT in a digitally editable form.

A list of the documentation in an .XLS file will be handed over together with the documentation which will contain the following items, at least:

- Document name,
- the unique document number (each document must have its own number, e.g. for electrical drawings, the repeating drawing number is supplemented with the sheet number after the slash),
- the number of the superior document - as a rule, that is, the list,
- a file name, including the path.

**Number of copies of the documentation to be handed over: (unless agreed otherwise in the course of the project)**

Document name	No. of copies
Rules of administrative procedure	2
Pilot project	2
Documentation of quality assurance and the Work quality management	2
Project documentation for the building construction execution	2
Supplier (production) documentation	2
POBC project	2
Fire safety solution	3
Marking register	3
Documents and papers	3
Accompanying technical documentation	4
Start-up and Trial Run Project	3
Project of guarantee measurement	4
Operating and maintenance regulations	4
Documentation for the CLIENT's personnel training	3
Documentation of the current (as-built) building construction state with changes marked by hand	3

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Document name	No. of copies
Documentation of the current (as-built) building construction state – the final version	4
Documentation for the building construction changing before its completion	3

## 16.3 Documentation form

### 16.3.1 Printed form

Printed documents and drawings will be submitted in formats in accordance with ČSN standards. The A4 formats will be used for text documents, A4 formats and multiples of A4 format will be used preferentially for other documents. In the case of schemes and diagrams, the format size requirement is up to the A1format, with the requirement that they should be legible even when printed on the A3 format.

Larger formats will be used for drawings which will then be folded to allow them to fit into an A4 file.

If some project outputs are drawn into existing documents, their original format will be preserved.

The original of each drawing sheet will be made on quality material in the form of output from laser or inkjet printers or a plotter.

### 16.3.2 Electronic form

The documentation will be submitted simultaneously in two versions which are further named as an editable version and a viewing version (with pdf files). If the CONTRACTOR requires submission of the documentation solely in a non-editable version, such submission shall be subject to the CLIENT's approval.

The OB 2 CONTRACTOR shall deliver to the maximum possible extent electronic versions of documents in an "open" version, i.e. they will be able to be viewed, printed, copied, or edited.

The BIM models will be submitted both in the international exchange format IFC and in the native data format (i.e. in the source format of the SW tool in which the data have been created).

#### 16.3.2.1 Modifiable Version

Text documents will be submitted in the form of files and will be created using MS Word 2019 (and a later one).

The drawing documentation will be submitted in the form of files (\*.DWG) (the version AUTOCAD 2019 or a higher one), according to the CLIENT's documentation regulation, see Annex A13.

Databases, tables, lists will be submitted in the form of files (\*.xls) and created in MS Excel 2019 (or a later one).

The schedules will be created in the MS Project 2016 program (\*.mpp). At the same time, they will be submitted in \*.xls and pdf formats.

Graphical files (photographic documentation, if any, attached as supplements to the technical specification) will be created or transformed into \*.jpg or \*.png formats.

Scanned documents will be sent in \*.pdf format.

Disposition and construction drawings and EIC schemes will be in the \*dwg format.

Lists will be in the \*xlsx format.

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The BIM models will be submitted in the native format of the SW tool in which the data have been created, including all libraries and configuration files required for subsequent modification and supplementing of native data.

#### **16.3.2.2 Viewing version (pdf)**

In addition to the above-mentioned formats, the complete documentation will also be sent in \*.pdf format. The pdf files will be sorted into directories on the medium/ carrier, just as they are divided into folders (files) in the "paper" form.

The BIM models will be submitted in the international exchange format IFC under ČSN ISO 16739.

The BIM models will be exported into individual IFC files in accordance with the BIM model classification defined in the.

The IFC export will be always carried out from source data from primarily used BIM SW tool. Transmission of data between SW tools and their subsequent export to IFC is not permitted.

#### **16.3.2.3 Organization of electronic documents**

The documents created as part of the work will be handed over to the CLIENT through a portable platform or portable discs. Before making them, the OB 2 CONTRACTOR will send a sample to the CLIENT for legibility assessment. The sample must then be approved by the CLIENT.

The naming of electronic files and the arrangement of files on the media must allow quick, easy, and unambiguous identification of the file and its contents.

For this purpose, a directory arrangement with a clear name of the folders will be used.

Every file (included in the submitted documentation package) will be stored in xls format which will show the used directory structure, understandable names of individual files stored in individual folders and a brief description of the contents of the files.

#### **16.3.3 Descriptive fields of drawing documentation**

Each separately processed document will contain the following basic data about the design subject in the description field:

Construction place:	ŠKO – ENERGO, Mladá Boleslav
Document completeness:	Page/Total number of pages
Name of the building construction/ Work:	Refurbishment of the CHP Plant Mladá Boleslav
Building construction /Work Number, according to the CLIENT's records:	
Name of the OB 2 CONTRACTOR, alternatively also the Subcontractor:	

The document will be marked with the KKS code (it will be determined in cooperation with the CLIENT). The marking must correspond to the locally used KKS methodology in Annex A13.

The format and a form of a stamp used on drawings will be determined in the administrative regulations.

### **16.4 Authorization**

The whole documentation for execution or the implementation documentation will be provided with an authorization stamp and a signature in accordance with Act 360/1992 Coll. and the Building Act.

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The Authorized Documentation for execution, or implementation documentation will be available during the time of construction at the OB 2 CONTRACTOR's site.

The final documentation of the actual execution will also be provided with an authorization stamp and the signature in accordance with Act 360/1992 Coll. and the Building Act.

## 17 APPROVAL OF DOCUMENTATION

### 17.1 Documentation approval procedure

The OB 2 CONTRACTOR will prepare and submit the documentation to the CLIENT for approval gradually - within the agreed terms.

The OB 2 CONTRACTOR will submit the documentation for approval gradually, while respecting the deadlines in the time schedule specified in the Contract and the Chapter 16.

Unless agreed otherwise between the CLIENT and the CONTRACTOR under the Administrative Code, the following procedure shall be applied. To simplify the approval process, the OB 2 CONTRACTOR will convene consultations on the documentation in progress, at least at the start of works, once during works, and at the end of works. Handover at the end of works means at least 25 working days before the deadline for the documentation handing over, in order to maintain sufficient time for processing all comments and checking their integration.

The date of the consultation will be communicated to the CLIENT at least 10 working days before the date of the meeting and the program will be sent at the same time. The documentation for discussion will be attached to the program.

The documentation submitted for approval will be available in five (5) copies and one (1) in a digital form and will be equipped with a cover letter indicating the list of submitted documentation.

Every subsequent revision of the documentation will be submitted in one (1) counterpart in a digital form for re-approval. Changes to the previous approved versions will be made in the form of revisions (text part, lists) or highlighted with bubbles (drawings) in the documentation submitted for approval. Only the final documentation will be delivered in two counterparts in written form, unless stated or agreed otherwise, see chapter 16.2.

All communicated or approved documents shall be recorded by the CONTRACTOR on the CDE.

#### Date of the documentation approval by the CLIENT

Within ten (10) working days after the CLIENT verifiably receives any documentation for approval, they must either return the approved copy to the OB 2 CONTRACTOR or notify the OB 2 CONTRACTOR in writing that the document has not been approved and state the reasons.

In the event that the documentation or its complete part (e.g. PS, SO) submitted by the OB 2 CONTRACTOR for approval is incomplete, the CLIENT shall immediately notify the OB 2 CONTRACTOR of imperfections or deficiencies and invite them to complete it, because the CLIENT does not have the opportunity to properly check the documentation, the CLIENT shall immediately notify the OB 2 CONTRACTOR, so the above mentioned 10-day period will start running again after receiving the required explanatory documentation/information. The same procedure will be used if any documentation cannot be approved because errors, contradictions or deviations from the CONTRACT or other inaccuracies are found in it and the OB 2 CONTRACTOR is requested to modify the documentation and submit it for a new approval,

Changes compared to the previous version will be highlighted in the documentation submitted for approval, namely in drawings with revision marks, in text documents in the form of revisions, in the case of databases in the form of a list of changes.



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If the CLIENT does not approve the documentation for serious reasons, the OB 2 CONTRACTOR will correct the documentation and re-submit it for approval.

## 17.2 Categorization of Approvals

Each documentation will be delivered for approval by an Acceptance certificate, unless defined otherwise in a mutually agreed documents delivery schedule.

The document of the category "approved" means "was approved", and the approval refers only to the submitted document with the appropriate number and revision. The category "approved" entitles the OB 2 CONTRACTOR to carry out further works on the base of this relevant document.

The document of the category "**Unapproved**" means that the document could not be approved for reasons specified by the CLIENT. After completion/adjustment, the document must be sent by the OB 2 CONTRACTOR again for approval by the CLIENT. The Unapproved category does not entitle the OB 2 CONTRACTOR to carry out further works in the area to which the document relates.

The approval of the documentation by the CLIENT, whether with or without modifications, does not release the OB 2 CONTRACTOR from any of their obligations to fulfil all the requirements of the CONTRACT, nor it releases the OB 2 CONTRACTOR from the responsibility for correcting this documentation.

The time limits for the documentation handing over specified in the CONTRACT apply to the approved documentation. Any delay due to the OB 2 CONTRACTOR's failure to obtain the documentation approval within the expected time limits is entirely the responsibility of the OB 2 CONTRACTOR.

## 18 DATA PROVIDED BY THE CLIENT

In addition to the data, drawings and other documents that comprises the content of the CONTRACT, the selected OB 2 CONTRACTOR will receive the following documentation in one copy in the Czech language:

- The state authority-verified documentation for planning proceedings, the decision on the building construction placing,
- The state authority-verified documentation for building proceedings, building permit,
- The regulation for technical documentation, principles for equipment marking, using the KKS system – see Annex A13,
- Available surveys and targeting,
- Available documentation of the current (as-built) state, if the OB 2 CONTRACTOR builds on or adapts the existing equipment of the CLIENT,
- The CLIENT may also provide the OB 2 CONTRACTOR with additional documentation at the OB 2 CONTRACTOR's request if this documentation is available and if it is purposeful to clarify the input data.

The documentation handed over by the CLIENT will be submitted on the following dates:

<b>Document</b>	<b>The date of handing over to OB 2 CONTRACTOR</b>
The state-authority-verified documentation for planning proceedings, the decision on the building construction placing	upon signing the CONTRACT, or within 15 DAYS after signing the CONTRACT.
The state-authority-verified documentation for building proceedings, building permit	upon signing the CONTRACT, or within 15 DAYS after signing the CONTRACT.

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Document	The date of handing over to OB 2 CONTRACTOR
Available surveys and targeting	after signing the contract

## 19 DOCUMENTATION DELIVERY DEADLINES

The Documentation worked out by the OB 2 CONTRACTOR will be handed over by the CLIENT in the following (relative) terms. As regards documents and certificates that must be handed over not later than by the PAC date and during TRIAL RUN, if there occurs any fact that must be included in such documentation, it will be possible to carry out PAC on the basis of the previous version and such facts will be added not later than 2 months after the PC to the new updated PAC version.

Documentation	Preliminary/For information	Final	Approval process	Language
Administrative Code	ongoing	within 2 weeks after signing the contract	Review	ENG
BEP	5 weeks after signing the contract	on going	Review	CZE/ENG
Quality plan	6 weeks after signing the contract	13 weeks after signing the contract	Review	ENG
Construction organization project	ongoing	6 months after signing the contract or 1 month before the scheduled acceptance of the construction site (whichever date occurs earlier)	Approval	CZE
Introductory project	8 weeks after signing the contract	12 weeks after signing the contract	Approval	ENG
Underlying documents for OB 6 CONTRACTOR (load plans for K20 and pipeline bridges)	10 weeks after signing the contract (OB 1 must present underlying documents 5 weeks before that date)	18 weeks after signing the contract	Review	ENG/CZE
Underlying 1 6 CONTRACTOR	according to agreed time schedule	within 27 weeks after signing the contract	Review	ENG/CZE
Fire safety solution	24 weeks after signing the contract	3 months before PAC	Approval	CZE
Explosion protection documents	24 weeks after signing the contract	3 months before PAC	Approval	CZE
HAZOP + SIL study	24 weeks after signing the contract	38 weeks after signing the contract	Approval	CZE
Building execution documentation	ongoing	not later than 1 month before the start of the relevant SO/PS/IO	Approval	ENG/CZE
Start-up and trial run project	48 weeks after signing the contract	66 weeks after signing the contract	Approval	ENG/CZE

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Documentation	Preliminary/For information	Final	Approval process	Language
Guarantee measurement project	2 months before guarantee measurement	1 month before guarantee measurement	Approval	ENG/CZE
Operation and maintenance regulations	ongoing	not later than by the PAC date	Review	CZE
Personnel training documentation	ongoing	1 month before first ignition of solid fuel	Review	CZE
As-built documentation	1 month before trial run	not later than by the PAC date	Approval	CZE/ENG
Documents and certificates	ongoing	not later than before the PAC date (or 2 after PAC for certificates arising from results of TRIAL	Review	CZE
List of spare parts and special tools		not later than by the PAC date	Review	CZE/ENG
Accompanyin technical documentation	before trial run	not later than by the PAC date	Approval	ENG/CZE

## 20 DOCUMENTATION ACCORDING TO PAYMENT MILESTONES

The following document hadover milestones are prescribed in the payment milestones specified in the CONTRACT:

### **Documentation for the construction of the K20 foundation desk for the OB 6 CONTRACTOR**

This documentation means:

- Foundation loads of columns - certified for foundation detail design
- Foundation loads of equipment - certified for foundation detail design
- Description of connecting points of media passing across the foundation desk

### **Documentation for the proposal and implementation of connecting points between CONTRACTORS of the other OBs**

This documentation will include all data required for linking the OB 2 LOT to the other CONTRACTORS. This information includes:

OB 1 – information about layout of the conveyor spillway rooms to fuel silos in objects SO 201/202 and SO 203, including limiting factors related to the building, technological information concerning links of the fuel spillways to fuel silos, connection of electrical appliances located in those rooms, compressed air connections designated for technologies in those rooms,

OB 5 – basic data required for EFAS proposal,

OB 6 – load for proposal of foundations for pipeline bridges, including layout,

OB 7 –information about layout of electrical equipment and for DCS in substations SO 201/202.

If required, details of the documentation will be specified after signing the CONTRACT at site meetings and during coordination of the work with the other CONTRACTORS.

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**Building execution documentation** – described in the relevant chapter above.

## 21 ANNEXES

1. BIM/PRE-BEP Template for the OB 2 filled-in by the OB 2 CONTRACTOR

### ANNEX NO. 1 DRAFT OF PRE-BEP TEMPLATE

**The template will be filled by the OB 2 CONTRACTOR to start BIM within the project**

**The text written in red must be filled in by the OB 2 CONTRACTOR.**

The meaning Contractor hereinafter is the same as OB 2 CONTRACTOR.

#### 1 The basic identification data of the document

Client: ŠKO-ENERGO, s.r.o.

Contractor: **XXXXXXXX**

Contract No.: **XXXXXXXX**

This document was created in accordance with the documents "Concept for introducing the BIM method in the Czech Republic" (hereinafter referred to as the "Concept") according to Government Resolution No. 682 of 25/09/2017 and valid standards (especially ČSN ISO 19650).

#### 2 Communication and information sharing

The exchange of information throughout the design and construction phase will take place in the Common Data Environment (CDE). Goals of the BIM project from the point of view of CDE use:

- centralization of communication and information sharing,
- archiving of information and its metadata,
- digitization of existing processes of information transfer and communication within the project,
- implementation of work procedures within the CDE.

#### 3 Passportization

- the visualization/model will be the source of the building object's basic visualization
- the project documentation/ the drawing part will be produced from the information model,
- spatial coordination/coordination will be carried out using a model.

#### 4 Information models according to the stage of the project/documentation for the building construction execution (DPS)

- the visualization/model will be used for the creation of visualizations,
- the project documentation/ the drawing part of the PD will be produced from the information model,
- spatial coordination/coordination will be carried out using a model,
- the bill of quantities/the model will be a source for the bill of quantities,
- the time schedule/ a simulation will be performed on the model.

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## 5 Time schedule for handover of models

The contractor will complete the expected schedule for the models handing over.

## 6 Duties and responsibilities

As a part of the project processing, from the point of view of information modelling, it is necessary to define the duties/roles of individual participants, their job content and responsibility for the project.

Duties/roles shall be clearly defined along with the extent of responsibilities.

This document and all its annexes must be kept continuously up to date. If there is a need to change the document or its annexes, it is obligation of the responsible people below mentioned to submit proposed changes for approval.

Position	Description
Project manager	The Person responsible for managing the project on the CLIENT's part.
BIM project manager	<p>The Person responsible for BEP compliance in the project on the CLIENT's part. His/her activities are as follows:</p> <ul style="list-style-type: none"> <li>preparing and updating the BIM Execution Plan (BEP) in cooperation with the BIM Coordinator,</li> <li>monitoring compliance with the BEP document by all participants,</li> <li>checking data handed over by the CONTRACTOR, according to the BEP,</li> <li>final checks and inspection of information models before handing over the completed building construction to the CLIENT,</li> <li>related services, the need of which will emerge following the adjustment of the BEP during the project implementation,</li> <li>active participation in solving the problems that have arisen and proposing their solutions,</li> <li>he/she is directly responsible to the project management on the CLIENT's part.</li> </ul> <p>He/she does not approve and does not discuss the CONTRACTOR'S questions regarding the technical solution from the point of view of the project solution.</p>
Data Environment Administrator	<p>The responsible person delegated by the CLIENT, whose activities are as follows:</p> <ul style="list-style-type: none"> <li>Administration of the common data environment for the whole project team (including the CLIENT) throughout the course of the project,</li> <li>training of users.</li> </ul>
Chief project engineer	The person responsible for the technical solution of the given part on the CONTRACTOR'S part.
BIM coordinator	<p>The person responsible for BEP compliance by the CONTRACTOR, whose activities are as follows:</p> <ul style="list-style-type: none"> <li>management of project teams according to the agreed EIR (Exchange information requirement by the CLIENT) and BEP,</li> <li>checking the information models filling, evaluating the correctness of the data contained in the information models and handing over the BIM to the project manager,</li> <li>active submission of BEP changes proposals,</li> </ul>

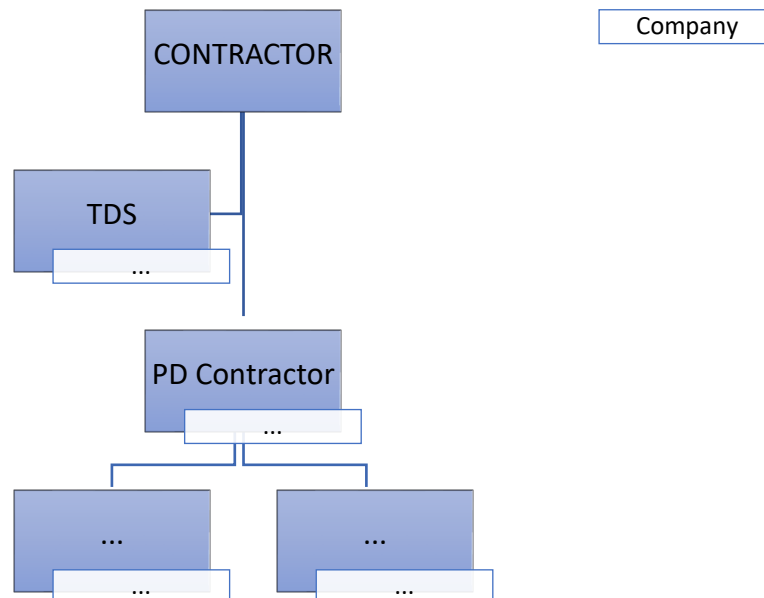
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	<ul style="list-style-type: none"> <li>• active participation in solving the problems that have arisen and proposing their solutions,</li> <li>• control of the project's goals fulfilment in view of the project milestones,</li> <li>• reports directly to the project's chief engineer.</li> </ul>
Lead Model Maker	<p>The Person delegated by the CONTRACTOR responsible for the models of the given part. His/her activities are as follows:</p> <ul style="list-style-type: none"> <li>• management of model makers to the extent defined by BEP,</li> <li>• creation of project standards that complement the missing standards in the BEP, and submitting them for approval to the BIM coordinator,</li> <li>• he/she is responsible for the correctness of the information model for the given profession.</li> </ul>
Model Maker	<p>A person delegated by the contractor. Its activities are as follows:</p> <ul style="list-style-type: none"> <li>• responsibility for a given model/set of models.</li> </ul>

The relationship matrix of responsibility within the BIM project is clearly shown in the following two schemes (company's, name's).

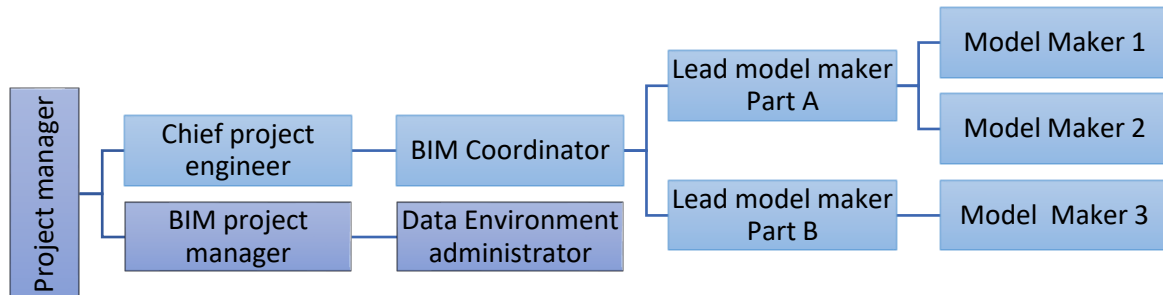
#### Company's scheme

Organizational chart of the OB 2 CONTRACTOR's structure with the division of responsibilities within the BIM project



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### Name Scheme



### Contact Persons

Position	Company /Organization	First name and Surname	E-mail	Phone
Project Manager	Completed by Client	Completed by Client	Completed by Client	Completed by Client
BIM Project Manager	Completed by Client	Completed by Client	Completed by Client	Completed by Client
Data Environment Administration	Completed by Client	Completed by Client	Completed by Client	Completed by Client
Chief Project Engineer	To be completed	To be completed	To be completed	To be completed
BIM Coordinator	To be completed	To be completed	To be completed	To be completed
Lead Model Maker	To be completed	To be completed	To be completed	To be completed
Model Maker	To be completed	To be completed	To be completed	To be completed
Others	To be completed	To be completed	To be completed	To be completed

## 7 Technological infrastructure

### Software tools

The list of tools used (including versions and data format) and their methods of application for the project processing.

Software tool	Tool short	Version	Data format
XXX	XXX	XXX	XXX
XXX	XXX	XXX	XXX
XXX	XXX	XXX	XXX

Project documentation and models will be handed over in a pre-agreed format by the CLIENT, according to the points mentioned below.

The following items will be used for the model handing over:

- Native format,
- Open format IFC.

### List of tools used.

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The List of modelled PS and SO with assigned tools in which they will be processed.

Overview of modelled PS and SO	Short of the SW tool
XXX	XXX
XXX	XXX
XXX	XXX

## 8 Units and coordinate systems

Units and coordinate systems are defined for all information models and will contain this information. Every and each model will also include a height setting.

The positioning system is used.

System of height coordinates.

Unit	Short	Min. number of significant digits
metres	m	0,00
XXX	XXX	XXX
XXX	XXX	XXX

## 9 Information model requirements

Models must be compact and built efficiently within the modelling tool. Within the project processing one model may not exceed 200 MB in size. Exceptions are possible after approval by the BIM project.

Every and each model is created by means of elements that are represented by their 3D graphics and attached information. The graphic detail of the elements generally needs to be chosen in such a way that it fulfils the specified goals and legislative requirements.

In general, it can be said that the model is created stepwise, according to the steps of the building construction execution and the interface of the structures corresponds to the real interface. If there are cases where this is not possible, these deviations need to be specified and clearly described in this document.

### Models nomenclature methodology

Each model will have a unique designation. In case of splitting models to more files, they must be clearly identifiable. The model's name contains the project identifier, the project stage, the documentation part and the PS/SO identifier.

The contractor will propose a nomenclature methodology.

### List of models

PS/SO Name	Model Name
XXX	XXX
XXX	XXX
XXX	XXX

### Axis system

The axis system will be located in the centre of the modelling tool space. Axes names will be the same in all models.



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### **Graphic detail of the model**

One of the basic steps of using the BIM method is the creation of an information model. It is not necessary for all the information to be situated only in one model, on the contrary, it is desirable to have several models available.

The information model ensures the consistency of information and is the source of project documentation (ground plan, section, view, etc.). It is not desirable for PD production to modify locally the projection of given views (ground plan, section, view, etc.) and supplement or modify the projection in such a way that only a part of the goal for the project documentation creation is fulfilled.

Each model consists of individual elements that are defined graphically. The graphic detail for the individual stages will correspond to Decree No. 499/2006 Coll., on the documentation of building constructions, as amended.

Other requirements for the creation of models are mentioned in the following subchapters, according to individual logical units. The requirements for the significant elements of the model are defined. Not all elements that make up the model are listed here. Unless defined otherwise, the OB 2 CONTRACTOR will supply the given elements in the model according to the general rules in this document and to the best of their knowledge and conscience.

During processing, the model may show deficiencies as far as graphical details is considered, but the graphical detail must never be an obstacle to the fulfilment of the objectives given by this document. The necessary details can be prepared within the 2D documentation.

Duplications of the same elements are not permitted, unless specified otherwise.

#### In general

The individual elements of the model must correspond to the real construction.

The BIM model must be consistent – the same elements will be always modelled in the same way throughout their entire BIM model and in individual partial BIM models.

Individual BIM model elements will be modelled by the relevant categories in accordance with the given SW (e.g. a wall will be modelled by a wall and not be a general model. etc.). Model categories of the relevant SW will be mapped to the appropriate IFC categories (IfcProductType) in accordance with the IFC definition, ČSN ISO 16739 (73 0109).

Elements having the same function in the object will be placed into the same IFC category (IfcProductType) in accordance with the IFC definition, ČSN ISO 16739 (73 0109).

Inclusion of elements in the universal category IfcBuildingElementProxy is not desirable and is subject to the CLIENT's approval in the BEP.

The initial export to IFC must include the entry of GUID in the BIM model parameters. Each subsequent export where GUID have already been included will adhere to the same value and will not be overwritten. Following each IFC export, the GUID must be also saved in the native data of the BIM model.

#### Groundwork

Groundwork models respect the designed shape of the structures and the geology and hydrogeology identified.

#### Foundation

Foundation footings, belts or slabs are modelled as objects corresponding to the drawing of shape in the relevant stage of the project documentation.

For deep foundations, the design dimensions of piles are defined for coordination. The reinforced cage or elements fitted for piles tests are not modelled. For special foundations (micropiles, land ties, nails),

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the length and diameter of a borehole, the length and diameter of a borehole, as well as the borehole root length and diameter are defined

#### Masonry constructions, concrete constructions, and reinforced concreting

Blocks of concrete monolithic constructions (pillars, walls, ceilings, overflow structures, etc.) will be modelled as complete units. Each dilatation unit will be modelled separately. There is no requirement to model the reinforcing bars setting.

#### Networks and relocations

The model will include the route of related networks and relocations. Network objects will be modelled in design dimensions. The model of network objects dimensionally corresponds to the project documentation.

#### Air conditioning

The expected shape will be modelled which will define the spatial requirements. HVAC components (fans, valves, intake vents - blinds) will be modelled with design dimensions defining the spatial requirements of these elements.

#### Openings fillers

The elements must correspond to the actual construction dimensions of the openings. The structure of filling (doors and windows) will correspond to reality. It is possible to simplify the frame profiles, the outer dimensions of the profiles must always be observed. Additional parts of the openings filling do not need to be modelled (door inserts, etc.).

#### Penetrations

All vertical and horizontal penetrations through constructions are modelled in real positions and sizes. The penetrations must clearly define the static and construction openings.

#### Pipes and pipe routing

The pipeline and the equipment placed on the pipeline must have realistic external dimensions.

#### Mechanical equipment and end elements

Mechanical equipment and end elements are modelled in realistic external dimensions.

#### Electrical installation

All models will respect the division into high-voltage current, low-voltage current, CCTV and IT (using parameters, model division, etc.). The models will contain the main cable routes, and all fitted elements (e.g. switch cabinets, sockets, switches, boxes, etc.). There is no requirement to model individual cables. The wiring diagram does not need to be solved in the modelling tool. Cable guards are parts of the model.

#### **Informational detail of the model**

Information detail requirements define the parameters attached to individual elements. These parameters serve as a carrier of non-geometric information of the elements.

The OB 2 CONTRACTOR can add other parameters to the elements, as needed. New parameters can only be introduced during the creation of the model by responsible persons specified in the BEP.

Geometric information will always be read from the model, it is not permissible to fill in this data manually. Non-geometric information are parameters filled in manually, semi-automatically or automatically and provide additional information about the element.

Model elements of the TZB will be mutually linked by the system tool "system" (or similarly in accordance with the used SW). Thanks to that, these elements will be combined into logical and technical units

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according to professions and functional branches. This functional link must be also recorded in the attributes of the relevant elements.

## 10 Handover of Information models

The models will be delivered with all the information and settings that are necessary for the production of project documentation according to the object composition, spatial coordination and other requirements as a part of an arrangement of this document.

Models will not contain working and temporary settings that could increase the data size of models, except for passing off milestones for collaboration purposes.

The model maker will provide the CLIENT with partial models of individual building objects and at the same time one overall model by means of only one file or a file referring to partial models.

All models will be handed over in the native formats of information modelling tools and the IFC format.

In cases required by chap. 16.1 of the EIR, the attributes in the submitted BIM models will be recorded bilingually (in Czech and English). This applies to both their names and to the recorded values of properties of the elements.

Dial values will be kept in bilingual form, in the English and the Czech language.

## 11 Method of coordination of information models

All models will be properly coordinated with each other. The coordination takes place in a pre-agreed and agreed software product, the results of coordination are transmitted through coordination protocols.

One coordination model of the building construction will be created for the whole building construction. This will consist of sub-models of individual SOs, PSs or sub-models of agreed parts (i.e. the scope of a sub-model may not always respect the division into SOs, PSs). This model is used for mutual coordination of sub-models, for collision detection, for displaying the entire building construction, for displaying individual stages of construction across the object structure, creating overall sections, etc.

The coordination model is a separate file that contains sub-models.

The models are handed over to the CLIENT coordinated, without obvious coordination defects and deficiencies.

## 12 Method of information exchange within the project

Data exchange will take place via the Common Data Environment (CDE).

The CDE is operated by the CLIENT throughout the duration of the project and provides a number of licenses to the OB 2 CONTRACTOR.

The exchange of data between the OB 2 CONTRACTOR and the CLIENT will take place exclusively via a common data environment. The CDE will be the only one source of information that collects, maintains, and send out important approved documents.

### Positions and duties within CDE

Position	Company / Organization	Name and Surname	E-mail	Authorization
Project Manager	Completed by Client	Completed by Client	Completed by Client	Completed by Client
BIM Project Manager	Completed by Client	Completed by Client	Completed by Client	Completed by Client
Data Environment Administrator	Completed by Client	Completed by Client	Completed by Client	Completed by Client

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Chief Project Engineer	To be completed	To be completed	To be completed	To be completed
BIM Coordinator	To be completed	To be completed	To be completed	To be completed
Lead Model Maker	To be completed	To be completed	To be completed	To be completed
Model Maker	To be completed	To be completed	To be completed	To be completed
Others	To be completed	To be completed	To be completed	To be completed

### Basic layout of folders

The OB 2 CONTRACTOR will propose a basic division of components according to their good practice.

### Document statuses

In accordance with ČSN EN ISO19650, the following statuses are recorded for all documents (without exception) within the CDE:

- Work in progress (the document is being developed / its revision is in progress) (
- Shared (the document is shared with the CLIENT / sent for approval by the CLIENT),
- Published (the document that passed the WF approval process and was approved by the CLIENT
- Archived (the document that passed the WF approval process and was not approved by CLIENT

The “archived” status is used for the purpose of preservation of an overview of all information containers that have been shared and published in the course of the information management process, and of audit records about their sequential evolution.

### Approval procedures (workflow)

They will be supplemented after the contract is signed.

### File marking system

All project documents will be marked in a unified manner and named in accordance with the Client's method (particularly in case of document shares through the CDE). The marking system principle is described in the form of an example in Annex A13, document „PA7-2\_2024-06-17 BCDE - značení dokumentace.xlsx“.

The marking system will be further specified with PMC's participation in the course of the preparation of BEP.

## 13 Bill of quantities / Dimension Statement

The Dimension statement will be created according to the selected price list system. The information model is the source of the data and manual calculations are minimized unless otherwise specified in exceptional cases. It is required to link the model to the creation of the Dimension statement in the main volumes, i.e. excavations, reinforced concrete structures. No binding is required for formwork calculation. A list of elements will also be generated from the model.

The dimension statements included in the list of works must match the dimensions included in the model.

## 14 Annexes

It will be supplemented in the BEP.