



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 A 4.4 – Civil Part

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1 APPLICATION OF THE SOLUTION IN THE TENDER DOCUMENTATION

The tender documentation determines the functional specification of the LOT OB 2, including the definition of the location, maximum built-in dimensions which shall be met. In addition, the tender documentation and the current documentation for the building permit represent the proposed technical solution of the LOT OB 2, the OB 2 CONTRACTOR's flexibility in applying their technical solution, in the design and selection of specific equipment according to their technical and habitual practice, as well as their experience. The OB 2 CONTRACTOR can also offer the LOT OB 2 more technically advanced and efficient for the CLIENT in such a way that it will meet the requirements stated in the Tender Documentation and the requirements, statements, and opinions of the State Administration Authorities.

2 THE SCOPE OF THE CIVIL PART OF THE LOT OB 2

Within the scope of the LOT OB 2 there are all building structures for the K20 boiler house and the E1A existing boiler house, see the list of building objects in Annex A1, incl. its necessary adjustments for the installation of new technology within the LOT OB 2, ensuring the construction preparedness for the LOT OB1, the LOT OB5, the LOT OB6, the LOT OB7 in the scope of the K20 boiler house and in the scope of the E14 boiler house.

The scope of the LOT OB 2 is valid for the level above 0.0 m.

The K20 and E1A Boilers

1. Support structures of the K20 boiler and the K20 boiler house
2. Modifications of the supporting structures of the E1A boiler house and K80 and K90 boilers
3. Inner non-load-bearing building structures
4. Gas explosion / positive pressure release surfaces in the boilers cladding
5. Preparation of supporting structures for belt transport and connection of bridges for belt transport (LOT OB 1)
6. Perimeter walls, plasters, acoustic insulation of the vertical dividing structures of the boiler houses
7. Roof incl. drainage, floors
8. Stairs, ladders, elevators
9. Waterproofing and thermal and acoustic insulation
10. Hole fillings
11. Surface finish
12. Technical and sanitary installations for a level above 0.0 m and their connection to underground technical and sanitary installations
13. Air conditioning and heating of the K20 building (except for the ventilation / air conditioning of the fuel passage transport in the area to E1A - OB1).
14. Electrical part of the civil installations
15. Modifications of the E1A building in accordance with the fire safety solution based on the newly installed technology
16. The construction of new and modification of the existing steel structures of pipe bridges of the flue gas pipe, ash pipes up to the dispatch silos, including possible modifications of the supporting structures of the existing flue gas pipes of gas boilers due to the connection of the K20 boiler into the stack.

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17. Temporary structures

The table of the supply scope and a scope of the CIVIL PART of the LOT OB 2.

SO 201.1	K20 (LOT OB 2) Boiler House	The boundary between the civil part of LOT OB 2 / LOT OB 6 delivery is the floor level ± 0.000 m For drainage, the boundary between the civil part of the LOT OB 2 / LOT OB 6 is the level of a modified terrain	The Superstructure – the SO civil structures above a floor level ± 0.000m	LOT OB 2 Delivery: - complete scope of the civil part of the superstructure: The Note: The civil part scope includes all the necessary building structures and technical equipment of the building (the roof drainage, building electrical installation, lightning conductor, sanitary and technical installation, air conditioning/ventilation, etc.)
SO 201.2	K20 (OB 6) Boiler House	For the lightning conductor, the boundary between the civil part of the LOT OB 2 / LOT OB 6 is the level of the test clamp approx. 1.5 m above a modified terrain	The Substructure – the SO civil structures below a floor level ± 0.000m	The LOT OB 6 delivery: - the complete delivery of the substructure The Note: a part of the building delivery includes all the necessary building structures and technical equipment of the building (sanitary and technical installations, grounding network, etc.)
SO 202.1	The auxiliary systems downstream the K20 boiler – exhaust gases cleaning - see the SO 201 (LOT OB 2)	The boundary between the civil part of the LOT OB 2 / LOT OB 6 is the floor level ± 0.000m For drainage, the boundary between the civil part of the LOT OB 2 / LOT OB 6 is the level of a modified terrain	The Superstructure – the SO civil structures above a floor level ± 0.000m	The LOT OB 2 delivery: - the complete delivery of the superstructure The Note: The scope of the civil part includes all necessary building structures and technical equipment of the building (the roof drainage, building electrical installation, lightning conductor, sanitary and technical installation, air conditioning/ventilation, etc.)
SO 202.2	The auxiliary systems downstream the K20 boiler – exhaust gases cleaning - see the SO 201 (LOT OB 6)	For the lightning conductor, the boundary between the civil part of the LOT OB 2 / LOT OB 6 is the level of the test clamp approx. 1.5 m above a modified terrain	The Substructure – the SO civil structures below a floor level ± 0.000m	The LOT OB 6 delivery: - the complete delivery of the substructure The Note: As a part of a building delivery there are all necessary building structures and the construction technical equipment (sanitary and technical installation, grounding network, etc.)

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SO 203	Modification of the K80/K90 boiler house	The boundary between the scope of the civil part of the LOT OB 2 / LOT OB 6 is the floor level $\pm 0.000\text{m}$ For drainage, the boundary between the scope of the civil part of the LOT OB 2 / LOT OB 6 is the level of a modified terrain For the lightning conductor, the boundary between the scope of the civil part of the LOT OB 2 / OB 6 is the level of the test clamp approx. 1.5 m above a modified terrain	The Superstructure – the SO construction above a floor level $\pm 0.000\text{m}$	The LOT OB 2 delivery: - the complete delivery of the superstructure The Note: The scope of the civil part includes all necessary building structures and technical equipment of the building (the roof drainage, building electrical installation, lightning conductor, sanitary and technical installation, air conditioning/ventilation, etc.)
SO 204.1	Outside flue gas piping - foundations and construction (LOT OB 2) – the superstructure	For drainage, the boundary between the scope of the civil part of the LOT OB 2 / LOT OB 6 is the level of a modified terrain	Superstructure – the SO construction above the level of the modified terrain, or upper level of foundation structures	The LOT OB 2 delivery: - the complete delivery of the superstructure The Note: The scope of the civil part includes all necessary building structures and technical equipment of the building construction (drainage, building electrical installation, lightning conductor, etc.)
SO 204.2	Outside flue gas piping - foundations and construction (LOT OB 6) – the substructure	For the lightning conductor, the boundary between the scope of the civil part of the LOT OB 2 / LOT OB 6 is the level of the test clamp approx. 1.5 m above a modified terrain	Substructure – the foundation structures and the SO structure under the level of the modified terrain, or upper levels of the foundation structures	The LOT OB 6 delivery: - the complete delivery of the substructure The Note: As a part of the scope of the civil part there are all necessary building structures and technical equipment of the building construction (grounding network, etc.)
SO 205.1	Ash removal system - pipe bridge and foundations (LOT OB 2) – the superstructure	For drainage, the boundary between the scope of the civil part of the LOT OB 2 / LOT OB 6 is the level of a modified terrain	Superstructure – the SO construction above the level of the modified terrain, or upper level of foundation structures	The LOT OB 2 delivery: - the complete delivery of the superstructure The Note: As a part of the scope of the civil part there are all necessary building structures and technical equipment of the building construction (drainage, lightning conductor, etc.)
SO 205.2	Ash removal system - pipe bridge and foundations (LOT OB 6) – the substructure	For the lightning conductor, the boundary between the scope of the civil part of the LOT OB 2 / LOT OB 6 is the level of the test clamp approx. 1.5 m above a modified terrain	Substructure – the foundation structures and the SO structure under the level of the modified terrain, or upper levels of the foundation structures	The LOT OB 6 delivery: - the complete delivery of the substructure The Note: As a part of the scope of the civil part there are all necessary building structures and technical equipment of the building construction (grounding network, etc.)

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For building electrical installations, the delivery boundaries are marked on the OB2_A112.08 single-pole diagram.

Note: for the connection of installations, a mutual overlapping of the installations is assumed at the points of continuity between the individual OBs, so that the connection of the relevant internal installation (mainly water piping, sewerage systems, grounding) is carried out properly and in accordance with valid technical standards and legislation.

3 GENERAL PROFESSIONAL REQUIREMENTS FOR THE LOT

The OB 2 CONTRACTOR will design and implement the CIVIL PART in accordance with the applicable legislation of the Czech Republic, especially in accordance with Act No. 183/2006 Coll. (The Building Act), as amended, and its implementation Decrees, in accordance with Decree No. 268/2009 Coll. Decree on technical requirements for constructions, according to valid fire protection, OHS, environmental protection regulations, according to valid standards ČSN, EN and in accordance with the building permit and the conditions issued for the building permit by the relevant state administration authorities or network administrators.

Subject of the CIVIL PART is: all design, preparatory, implementation and auxiliary works related to the delivery and assembly of the complete LOT OB 2, as a whole. The main works are listed in individual points.

The OB 2 CONTRACTOR shall carry out in particular:

- 1) the detailed local survey of connected existing engineering networks,
- 2) the construction and technical survey of all existing building and engineering objects, construction structures or their parts related to the subject of the LOT OB 2. Based on the findings of the construction and technical survey, the OB 2 CONTRACTOR will propose and implement the relevant modifications, repairs or demolition of existing building and engineering objects, structures or their parts which are necessary for the implementation and faultless function of the LOT OB 2 in the required quality and service life,
- 3) the establishment of the CONSTRUCTION SITE FACILITY assigned to OB 2 CONTRACTOR, its operation during the implementation of the LOT OB 2 and its removal after the completion of the LOT OB 2, with the possibility of using the objects and areas shown in the A 114.01 Annex – The Coordination situation,
- 4) the building readiness of the OB 2 SITE, transport routes before the LOT OB 2 starting,
- 5) the transport of material from demolition works and dismantling,
- 6) removal works, demolition, building objects dismantling, structures and routes impeding the LOT OB 2 construction,
- 7) the complete construction of all building objects (SOs) listed in chapter 6, incl. all related technologies (building environment technology or technical building equipment - HVAC), based on the purpose and needs of the given operation (fire, hygiene, safety, and operational requirements). These are mainly internal distributions of fire water, drinking water, sewerage systems, sanitary technology, high-current electrical distributions (including operational lighting, emergency lighting, socket distributions, grounding, and lightning conductors), air conditioning and heating, including related measurement and control systems,
- 8) the delivery and installation of a steel structure of service walkways and platforms, staircases, ladders, railings,

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- 9) the delivery of sanitary appliances for the BUILDING OBJECTS with sanitary appliances, furniture, equipment with fire safety function and other necessary accessories for the given object functioning,
- 10) necessary lifting equipment for repairs and maintenance, hoisting tackle grooves, etc.,
- 11) all scaffolding works,
- 12) ensuring the access to the PLANT's operated technologies if the access to them will not be possible due to the LOT OB 2 execution.

4 THE SPECIFIC TECHNICAL LEVEL REQUIREMENTS

4.1 The OB 2 CONTRACTOR obligations in relation to the external environment aggressiveness

The CONTRACTOR will draw up a Protocol on the determination of external influences (Protokol o určení vnějších vlivů) for all spaces and rooms of BUILDING OBJECTS, according to the ČSN, as amended.

When designing a concrete anti-corrosion protection system, the OB 2 CONTRACTOR is obliged to base it on an assumed service life of 25 years.

4.2 Obligation of the OB 2 CONTRACTOR with respect to the PLANT existing objects

When working in the neighbourhood of any existing buildings, these buildings must not be endangered or damaged by this construction activity. The OB 2 CONTRACTOR will ensure the temporary separation of adjacent existing buildings from the OB 2 SITE premises in such a way as to prevent damage to existing building objects and technology and to enable the operation of existing technology, independently of the LOT OB 2 execution. After the LOT OB 2 completion, the temporary partition will be removed. All temporary partitions will be solved depending on the nature of spaces being separated and on ongoing construction or assembly works, by means of temporary fixed partitions, tarpaulin walls, mobile walls, fencing or other suitable means. The separation of spaces will be carried out mainly, but not exclusively, in the premises of boiler houses K80 and K90, in the machine room, on outdoor communication areas, etc.

4.3 Building solutions in the field of noise emission

Noise due to technology and operation inside the buildings will be reduced by building structures in such a way that the guaranteed noise parameters, defined in document A.6 Guaranteed values, are observed. This damping must also include individual building openings and penetrations of service technologies, HVAC distribution, as well as windows, gates, doors, ventilation grilles, etc.

All cladding of boiler houses shall simultaneously respect the requirements of fire safety and thermal protection of buildings.

4.4 Execution of BUILDINGS and their parts

The design of all building structures will be carried out by the OB 2 CONTRACTOR in accordance with the standards and regulations in force in the Czech Republic, including regulations for ensuring fire safety and operational regulations related to work safety.

When designing structures, local conditions, geological conditions, climatic conditions, environmental corrosion load, etc. are to be taken into account.

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During the design and implementation of constructions, the OB 2 CONTRACTOR shall respect the protective zones of the PLANT existing technical infrastructure, in particular gas pipelines, water piping, sewerage systems, product pipelines and cable and outdoor lines.

As for the individual technological equipment is concerned, the OB 2 CONTRACTOR shall always determine a route that shall be used during assembly, disassembly, and transport, during repairs and equipment replacements. The bearing capacity of surfaces and structures must correspond to the weight of the individual parts of the technology that shall be transported.

As for the building structure is concerned, the OB 2 CONTRACTOR shall ensure the necessary load bearing capacity of the individual floors of the BUILDINGS and their parts, in accordance with the requirements for the location of the technology, for the transport of individual parts of the technology during repairs and replacements.

All entrances to building objects and their parts will be made in such a way as to allow trouble-free operation of the technology, possibly its disassembly and assembly, including transport outside the building objects.

All operational buildings in which inspection patrolling activities must be ensured will be equipped with staircases with exits on all floors, in justified cases to less frequented places via a fixed ladder (e.g. steel structures of flues, an ash silo, etc.).

In accordance with the OHS regulations, safety showers, wash basins, eye wash basins, including drinking water supply will be installed in places where it is required.

4.4.1 Load-bearing structures

The load-bearing superstructures of the BUILDING OBJECTS will be executed by the OB 2 CONTRACTOR as skeleton steel structures or reinforced concrete monolithic or assembled, or possibly as a combination of wall systems of reinforced concrete monolithic or assembled. It is necessary to take into account the requirements for the stability of buildings, technological, fire-protection and technical, as well as architectural requirements. The implementation of these structures shall allow trouble-free disassembly and reassembly of the main technological elements, i.e., for example, hand holes and sufficiently large and load-bearing transport routes must be designed in a suitable way, including equipment with lifting devices (hoists, grooves), etc...

In case of a brick structure the OB 2 CONTRACTOR will use system lintels instead of wall openings. In the case of openings with larger spans, any lintels made of steel rolled profiles will be used.

The load-bearing capacity of individual floors must allow safe transportation of the heaviest components of the equipment, except in the case that it will be possible to transport these parts by installed cranes or suspended single-girder hoists to a place with sufficiently load-bearing floor structure or to the outside of the building. Floor areas with increased load capacity for transporting heavy loads will be marked on the floors. All floor surfaces will have a load-bearing capacity visibly marked by the OB 2 CONTRACTOR.

When designing and manufacturing any reinforced concrete structures, the particular care is to be taken to ensure that the structures have sufficient covering thickness of concrete and thus sufficient corrosion resistance. When executing concreting, masonry, and other wet processes in difficult climatic conditions (low temperature, high temperature, wind, etc.), all care will be taken to use a suitable technological procedure taking into account the relevant conditions.

4.4.2 The perimeter walls, roof, vertical dividing, and filling space structures

New perimeter walls, roofs, vertical dividing, and filling space structures will be designed and implemented by the OB 2 CONTRACTOR in such a way that the heat losses of the objects correspond to the standard requirements for nominal spaces and that the cladding of the object meets the

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requirements of the fire engineering design of the building and noise protection and thermal insulation properties.

The cladding will also be chosen with regard to the necessary fire resistance of the structures, the distance between new and existing buildings, the design of fire protection strips, etc.

As for cladding, all facade elements will be implemented as follows:

- 1) Steel skeleton structures will be covered with facade sandwich panel systems. The walls of buildings that are directly connected to an access road for cars will be equipped with socle with a height 1,500 mm – as a minimum - in reinforced concrete sandwich design with an insulation,
- 2) Brick structures will be provided by the OB 2 CONTRACTOR with external coloured plaster (the colour solution in accordance with the ITS) and an external facade insulation system, according to the requirements for buildings thermal and technical conditions,
- 3) Reinforced concrete structures will be provided with an external protective coating by the OB 2 CONTRACTOR for premises and spaces with increased requirements for thermal and technical and acoustic properties,
- 4) The weather-proof insulation facade system will be implemented on the basis of mineral fibres with respect of fire safety,
- 5) The roof structures of the buildings will be designed by the OB 2 CONTRACTOR in such a way that their load-bearing capacity corresponds to the requirements of applicable standards for snow, wind, and accidental loads from operators, respecting thermal and technical and noise parameters, fire safety criteria, architectural and operational requirements. The roof constructions will be made as a single-walled, pitched to the roof drains or spouts and will be drained by internal or external downspout pipes. In areas with high internal humidity, water vapour condensation will be assessed both on the surface and inside the roof and ceiling structures. The roofs of the buildings will be equipped around the entire perimeter with sufficiently high attic gables, railings, or their combination in accordance with valid ČSN EN. In the case of higher buildings (with two or more floors), the entrances to the roofs will be made from an internal staircase at a safe distance from the edge of the fall. The waterproofing material will be chosen by the OB 2 CONTRACTOR, so that its service life is at least the same as the service life of the building. The use of plasters with a waterproofing function is not allowed. If devices with the necessary periodic inspection are placed on the roofs, a footbridge with a floor made of reeds and a railing on both sides will be built to reach them. The use of skim coat with a waterproofing function is not allowed. If devices with the necessary periodic inspection are placed on the roofs, a footbridge with a floor made of reeds and a railing on both sides will be built to reach them.
- 6) Vertical dividing and filling structures, used to separate individual spaces or fire sections in building objects, can be made of traditional masonry materials, assembled from silicate, plasterboard, sandwich panels, simple ones, of steel or aluminium sheets. They shall meet especially fire-technical, thermal-technical, architectural, and acoustic requirements. Constructions will be statically assessed,
- 7) Dimensional masonry structures will be statically assessed for stability under wind overpressure loading when large openings are opened.

According to the acoustic study, the requirement for the overall acoustic soundproofness of the perimeter cladding and the roof of both boiler houses is set at $R_w = 25$ dB, as a minimum.

4.4.3 Locksmith structures

For all Locksmith constructions, the OB 2 CONTRACTOR will use metal material in a maintenance-free and permanent colour design.

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4.4.4 Chemical insulation

The chemical insulation is based on the need to protect the used building materials and constructions against the effects of the environment, groundwater, and chemical substances from operation. The individual insulations must be designed by the OB 2 CONTRACTOR in such a way that they can withstand the impacts of the environment on the individual operations over a long period, at least for the lifetime of the LOT OB 2.

4.4.5 Acoustic insulation

The acoustic insulation inside the building object will be based on an assessment of the noise level of individual technological equipment and premises. According to acoustic calculations, materials will be used for the internal structure of the building, so that the noise in protected areas, such as offices, control rooms, break rooms, etc., reaches the maximum values allowed by applicable legislation. This also applies to noise entering these premises through external and internal windows.

The OB 2 CONTRACTOR will design and execute the LOT OB 2, so that the noise during the operation of the equipment in individual building objects does not exceed the hygienic noise limits, according to the Government Regulation No. 272/2011 Coll., on the protection of health from the adverse impacts of noise and vibration, as amended, and that the requirements for the soundproofing of the perimeter cladding and its parts are complied with, and that air and footfall sound insulation among rooms with permanent staff are observed, according to ČSN.

The OB 2 CONTRACTOR will design and execute the LOT OB 2 in such a way that the noise parameters defined in the document A.6 - Guaranteed values - are met.

On brick structures, the OB 2 CONTRACTOR will perform interior and exterior plastering, including any external facade weatherproofing insulation system; in the interior spaces, the OB 2 CONTRACTOR will carry out final adjustments in the form of paintings, tiling and suspended ceilings. The suspended ceilings in designated areas will meet acoustic and fire protection requirements. Steel structures will be provided with coatings for the outdoor environment, indoor environment, or hot-dip galvanized. The external load-bearing steel structures will be hot-dip galvanized.

4.4.6 Plasters

Light plaster surfaces are preferred because they improve the level of lighting intensity and its uniformity.

4.4.7 Floors

The wear layers of the floors will be selected by the OB 2 CONTRACTOR, according to:

- 1) the purpose of individual building objects, so that they can withstand the appropriate load over a long period,
- 2) the requirements for the bearing capacity of individual layers with regard to operational loads,
- 3) the fire resistance and other required fire properties, especially in the areas of escape routes,
- 4) the abrasion resistance,
- 5) the desired appearance,
- 6) requirements for easy maintenance and cleanability,
- 7) requirements for antistatic properties,
- 8) requirements for possible resistance to chemical substances.

The construction of floors must be operationally resistant to all materials, fillings of the technology and chemicals used during the operation of the technology and the building object cleaning.

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When handing over the LOT OB 2, the CONTRACTOR will prove the anti-slip properties of the floor surface with a manufacturer's certificate according to valid ČSN 74 4505 - Floors - Common Provisions, both when the surface is dry and when the surface is wet.

4.4.8 Waterproofing

The OB 2 CONTRACTOR will mainly use bituminous-modified asphalt strips as a material from which the OB 2 CONTRACTOR will perform insulation against water and moisture. For reinforced concrete structures below the groundwater level, the use of the principle of white tanks will also be accepted.

All realizations of waterproofing constructions must respect the hydrogeological conditions of the CONSTRUCTION SITE and the requirements of ČSN. The waterproofing of underground spaces must provide the necessary protection against the penetration of groundwater into a building object.

4.4.9 Hole fillings

The OB 2 CONTRACTOR in BUILDINGS will use such hole fillings which will correspond with their parameters to the valid legislation and valid standards in the given field. This means, in the area of mechanical resistance under standard load, in the area of thermal technical and noise parameters, fire safety criteria and operational requirements.

Doors and gates will be designed according to operational requirements and the type of premises. Depending on their width and operating conditions, internal doors and gates will be made by the OB 2 CONTRACTOR as opening single-leaf or double-leaf (up to a maximum width of 1,600 mm). Other internal doors of larger dimensions, frequently opening or large-sized gates with a width of more than 1,600 mm leading to the outdoor area, will be made by the OB 2 CONTRACTOR as sectional ones, with an electric drive or sliding ones. A back-up gate drive with a handle/ a crank will also be fitted on the fire emergency routes. Panic fittings will be installed in the doors on the escape routes. Doors for the normal passage of people or on escape routes will be realized outside / next to the gates.

4.4.10 Surface treatment, special coatings of building structures

Special coatings mean fire-resistant sprays in accordance with the fire safety solution of the building construction, anti-reflective, anti-corrosion on steel structures exposed to increased corrosive effects, chemically resistant according to specific environmental conditions.

4.4.11 Loads

The OB 2 CONTRACTOR designs and implements supporting structures for permanent loads, such as the structure own weight and forces from supported structures. They will also be designed for random loads. These are mainly climate loads, technology loads, loads from people and materials. In addition, it is necessary to take into account loads from cranes and hoists, as well as other utility loads. As for as technological devices, pipelines, cranes and hoists are considered, it is necessary to take into account both vertical and horizontal effects. The equipment may generate dynamic load components, these load components must also be taken into account. In places where cars will move, the structures must also be sized for their impact, or they must be protected against this impact by another structure, for example guardrails. The load will be determined in accordance with ČSN EN 1991 Actions on structures (Eurocode 1).

4.4.12 Settlement of buildings

The OB 2 CONTRACTOR will design and execute the LOT OB 2 in such a way that settlement of building objects does not lead to damage or loss of functionality of the LOT OB 2. The OB 2 CONTRACTOR shall therefore, among other things, construct all underground networks that pass into building objects or are in contact with objects in such a way that underground utility networks are not

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damaged due to objects settling or their functionality is not threatened. The OB 2 CONTRACTOR shall also implement the connection of rainwater drains – a drainpipe - to horizontal sewerage systems with a suitable design solution.

During the course of construction, the OB 2 CONTRACTOR will measure the settlement of building objects in order to:

- 1) obtaining documents on the behaviour of subsoil, on the impact of the building construction and equipment on other objects,
- 2) comparison of actual settling against the resulting data from the static calculation,
- 3) monitoring the state and function of the safety of building objects.

During the construction, the OB 2 CONTRACTOR will continuously measure and evaluate the verticality of the building objects.

The OB 2 CONTRACTOR always comments on the measured values and evaluates their impact on the functionality of the building objects.

The OB 2 CONTRACTOR will ensure surveying in the scope given below in the text:

- 1) upon completion of all BUILDINGS foundations,
- 2) when handing over all the technological bases for the technology assembly,
- 3) 3 months before the end of the EXTENDED WARRANTY PERIOD of all foundations of BUILDINGS that are a part of the CIVIL PART.

The OB 2 CONTRACTOR comments on the measured values and evaluates their impact on the functionality of building objects and equipment.

The implementation and handing over all results of geodetic measurements of the BUILDINGS settlement will be incorporated into the Plan of inspections and tests by the OB 2 CONTRACTOR. Stabilization of geodetic marks is the subject of the LOT OB 2.

4.5 Auxiliary steel structures

The OB 2 CONTRACTOR will design auxiliary steel structures used for the people in all buildings. The OB 2 CONTRACTOR shall supply auxiliary steel structures such as service platforms, stairs, ladders, support stands, etc. fully prefabricated and shall include all anchor and connection bolts and other completion materials. On walkable surfaces, the OB 2 CONTRACTOR will use connecting elements that do not protrude above the walkable surface. Platforms, stairs, ladders will be marked with safety elements in yellow in contrast to black colour, according to ČSN ISO. The load-bearing capacity of the platforms will be visibly written in a table being placed directly on the auxiliary steel structure or directly on the platform and will be determined demonstrably on the static calculation basis. This also will be applied to all suspensions and possible mounting hinges for hoisting tackles made by the OB 2 CONTRACTOR.

The OB 2 CONTRACTOR will design other auxiliary structures, serving as supporting structures for the technology, according to the specific requirements of the technology. A certificate will be issued by the OB 2 CONTRACTOR for each material used. All platform railings and access ladders shall also meet the requirements of the relevant ČSN. The platforms will be equipped with a kick plate.

Auxiliary steel structures must be provided with corrosion protection. The walking parts of operating platforms and stairs will be equipped with zinc-plated grates. The entire outdoor steel structure (SS) system will be hot-dip galvanized.

The load-bearing capacity of the walkable parts of the structures within the LOT OB 2 will be at least 500 kg/m². If the structure will be used to store or transport a heavier load than 200 kg, the required

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load capacity will be determined by the technology designer and confirmed by static calculation according to the methodology of valid ČSN EN.

Auxiliary platforms and ladders must be made to all fittings, I&C field instrumentation, flanges for emission measurement, fire detectors and other fire safety equipment and classified technical equipment to ensure permanent access for carrying out regular inspections, repairs, revisions, and service operations.

All load-bearing steel structures and elements of technology along which the transport route runs must be designed to withstand any collisions of vehicles in accordance with applicable standards, or they will be protected by the OB 2 CONTRACTOR from an impact. The OB 2 CONTRACTOR will design a protection according to the permitted speed in the PLANT premises, as well as the direction of impact and the weight of vehicles.

4.6 Implementation of steel structures

The Project Documentation, including the Implementation Documentation, will be prepared by the OB 2 CONTRACTOR for all steel structures. This documentation will be handed over to the CLIENT after the structure has been assembled, including a static calculation in which the connections of the individual elements must also be assessed. The second limit state of steel structures deformation shall also be assessed in the static calculation. Dynamically stressed structures shall also be assessed for fatigue.

The OB 2 CONTRACTOR will assess the expected operating conditions and propose a classification of the execution of steel structures according to EN 1090-2. Application categories, production categories and consequence classes are also important for appropriate classification.

S235 steel will be preferred for the production of any auxiliary steel structures.

All exterior steelworks and all floor gratings (interior and exterior ones) shall be hot-dip galvanized and shall be rated for the required load and shall be firmly fastened to the steelworks. The OB 2 CONTRACTOR can provide internal steel structures only with a coating. The load-bearing capacity of the floor gratings will be confirmed by the manufacturer. Not only platforms edges will be lined, but also all penetrations through the step gratings and floors. The height of the kick plate will be 150 mm above the walkable surface. The height of the handrail will correspond to standard requirements. The minimum height will be 1,100 mm.

4.7 Requirements for materials and products

Only products and materials may be used whose properties, due to their suitability for the given construction, will guarantee that the LOT OB 2 will meet the requirements for mechanical strength and stability, fire resistance, hygiene, environmental protection, and safe use during its service time, with the proper execution and normal maintenance in terms of the Building Act.

4.8 Ventilation, heating, cooling

The OB 2 CONTRACTOR will design and install a heating system that will ensure tempering of all BUILDINGS or spaces to the temperature required by the installed equipment, even in the event of a complete failure of the main technology. This temperature must also be sufficient for a new cold start of the technology. The design of the system will comply with applicable standards.

Air conditioning will be designed and installed by the OB 2 CONTRACTOR in the premises of substations and server rooms. In technological spaces requiring cooling or air conditioning, the OB 2 CONTRACTOR will design and install a device ensuring the temperature according to the needs of the installed equipment and its safe operation.

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The OB 2 CONTRACTOR will propose ventilation of all closed spaces of BUILDINGS in accordance with applicable hygiene regulations and the needs of the technological equipment installed. According to a proposed method of ventilation, the OB 2 CONTRACTOR installs the appropriate active or passive air-conditioning equipment. The function of the air-conditioning equipment will be to ensure the required air exchange, the possible supply of technological (combustion) air, the removal of heat and smoke depending on the fire safety solution. Unventilated closed spaces are not allowed.

In accordance with the CLIENT's operating practice, it is required to be equipped with cooling of electrical substations, rooms of the I&C systems.

K20 boiler house

Air conditioning, cooling and heating systems according to the requirements of the technology for maintaining the environment in the K20 boiler house are as follows for:

- the boiler house,
- the compressor station,
- the FC room 690V,
- 6kV/0.42/0.69kV substation,
- the main technical room,
- the electrical distribution point,
- the cable compartment,
- the I&C substation.

The existing building of the boiler house E1A

As a part of the scope of construction there are any adjustments to the air conditioning system within the E1A boiler house in accordance with the technology requirements and with the design proposal of the OB 2 CONTRACTOR and any increase in thermal load or other requirements and the current technical condition of the ventilation and the cooling system.

A possible solution is described in the Annexes of the Documentation for Building Permits.

4.9 Sanitary and technical installations

4.9.1 Fire and industrial water distribution

They will be solved according to the requirements of the fire safety solution, in accordance with valid legislation and ČSN and EN standards.

4.9.2 Drinking water distribution

As a part of the LOT OB 2 there are drinking water distributions inside the boiler house above the level of 0.0 m.

4.9.3 Sewage water system

As a part of the LOT OB 2 there is a sewage water system that is also brought down to the level of 0.0 m, to the connection point with the OB 6. The sewage water system will be led as a part of the OB 6 to the existing on-site sewage water system of the PLANT.

4.9.4 Rainwater sewerage

As a part of the OB 2, rainwater from all roofs of the BUILDINGS, outdoor technological equipment will be led to the level of 0.0 m, to the connection point with the OB 6. It will be led to the rainwater sewer in the PLANT premises as a part of the OB 6.

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4.10 Building electrical installations

Building electrical installations, indoor and outdoor artificial lighting systems, lightning conductors, grounding, and all low-current distributions will be designed in accordance with applicable legislation and ČSN and EN standards.

4.11 General requirements for the LOT OB 2 fire protection

On the basis of the designed technical solution, the OB 2 CONTRACTOR will prepare a fire safety solution, which will be incorporated into the detail design documentation. The fire safety solution proposed by the OB 2 CONTRACTOR must be in accordance with the building permit, with the statement of the Fire and Rescue Service and with the statements of other state administration bodies concerned.

The OB 2 CONTRACTOR shall ensure that the fire safety solution of the LOT OB 2 is based on Act No. 133/1985 Coll. on fire protection, as amended, Decree No. 246/2001 Coll. on establishing the conditions of fire safety and the performance of the State Fire Supervision (the Decree on fire prevention), and Decree No. 23/2008 Coll., as amended, and the requirements of technical standards.

The internal and external fire hydrants, stable extinguishing equipment, equipment for removing heat and smoke in case of fire, the EFAS (electronic fire alarm system) and other fire protection systems and equipment will be designed and implemented by the OB 2 CONTRACTOR, according to the fire safety solution.

4.12 Ensuring LOT OB 2 from the point of view of the OHS

All building objects built as part of the LOT OB 2 shall meet the legislative and other requirements given by the legislative framework of the Czech Republic and technical standards ČSN and EN.

Furthermore, the LOT OB 2 must meet the requirements given below in the text:

4.12.1 Roadways

Roadways for vehicles must be designed, so that the smallest ground clearance above the roads and the smallest ground clearance corresponds to the largest possible dimension of a part being transported, in accordance with maintenance regulations.

4.12.2 Infrastructure networks

When pipe and cable routes pass above roads, the smallest underpass height must correspond to the largest possible dimension of a transported part, in accordance with maintenance regulations.

4.12.3 Stairs, ladders, railings, and platforms

All types of dedicated stairs must have a minimum width of 1000 mm (exceptionally 800 mm) and the pitch angle must not exceed 45°.

Ladders must be used as little as possible. In any case, their use is subject to the consent of the CLIENT.

All covers for inspection and access, all valves, flaps, measuring points, test sockets and all places where maintenance is supposed shall be easily accessible from galleries and platforms.

A minimum head-height of 2,100 mm must be ensured on all platforms, walkways, and stairs. If special cases would force a reduction of this amount, this reduction is subject to the consent of the CLIENT.

All platforms, galleries and stairs must be sized for such loads that could occur during normal operation or during repairs.

The maximum opening in the floor grating can be 30 x 30 mm.

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4.12.4 Assembly holes

All assembly holes must be secured against a possible fall of persons. In case of assembly holes that are covered during normal operation, these holes must be equipped with a portable guardrail which must always be installed when such assembly hole is uncovered.

4.12.5 Access and entrances to building objects

All entrances to buildings must be designed, so that the smallest clear height and the smallest clear width of the entrance opening correspond to the largest possible dimension of a transported part in accordance with maintenance regulations. These approaches and inputs must not be restricted by pipe or cable routes.

4.12.6 Classified technical equipment

In addition to the basic overview of generally binding legal regulations relating to safety and health at work, the following conditions also apply to classified technical equipment:

To ensure their safety, stated in the following Government Regulations:

- 1) Government Regulation No. 192/2022 Coll. for classified pressure equipment,
- 2) Government Regulation No. 193/2022 Coll. for classified lifting equipment,
- 3) Government Regulation No. 190/2022 Coll. for classified electrical equipment,
- 4) Government Regulation No. 191/2022 Coll. for classified gas facilities.

4.12.7 Safety notices, paints, signs, tables, and inscriptions

All places with possible danger for operators and unauthorized persons must be properly marked with safety messages, safety paints, signs, tables, and inscriptions in accordance with Government Regulation No. 11/2002 Coll. which determines the appearance and location of safety signs and the introduction of signals in valid wording and related technical and other regulations.

4.12.8 Requirements for protection against dangerous touch voltage and effects of static electricity

They will be solved in accordance with valid legislation and ČSN and EN standards.

4.12.9 Requirements for protection against explosions of dust, flammable gases, and vapours

The OB 2 CONTRACTOR shall solve the protection of equipment and building objects against the explosion of natural gas, dust from wood chips, dust from plant pellets and flammable vapours in such a way that all risks are excluded. Automated safety and signalling shut-off systems and ventilation systems must be installed which shall deal with the safe removal of released gases or vapours.

The explosion protection of the equipment must be:

- 1) passive (e.g., with the use of exhaust surfaces according to ČSN 73 5120 - Boiler houses with the capacity of 3.5 MW and more. Common provisions),
- 2) active, (e.g., by installing gas appearance detectors linked to successive equipment and devices, automatic explosion and fire suppression devices, etc.).

4.12.10 Risk of burns due to high temperatures

To avoid the possibility of burns, all these equipment and devices will be insulated, so that the surface temperature does not exceed 50°C. The measures will fully correspond to NV No. 178/2001 which

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establishes the conditions for the health protection of employees at work. Thermal protection will be applied in areas accessible to workers.

4.12.11 Pipeline insulation

Piping distributions of drinking water, domestic hot water (DHW), cooling distribution systems, or other distributions that are required by applicable legislation, will be provided with thermal insulation to reduce heat loss and prevent moisture condensation on the pipeline surfaces. The insulation will be designed and implemented in accordance with the relevant ČSN.

4.13 Ensuring the LOT OB 2 in terms of work hygiene

4.13.1 Work and auxiliary spaces and their hygiene and sanitary equipment, natural and artificial lighting, ventilation, and heating

The OB 2 CONTRACTOR will deliver the WORK in such a way that the requirements for work and auxiliary spaces and their hygienic and sanitary equipment, for their natural and artificial lighting, ventilation and heating which are contained in particular in Government Regulation No. 361/2007 Coll., as amended, where the conditions for the health protection of employees at work are determined.

4.13.2 Anti-noise and anti-vibration measures

The OB 2 CONTRACTOR will design and implement the appropriate anti-noise and anti-vibration devices and measures, so that the LOT OB 2 meets the requirements for health protection against the adverse effects of noise and vibration contained in Government Regulation No. 272/2011 Coll. on protection of health from dangerous effects of noise and vibrations, as well as in ČSN 73 0532.

4.13.3 Protection against radiation emitted by radon and other natural radionuclides and protection against ionizing radiation being emitted by the LOT OB 2 technical equipment

The OB 2 CONTRACTOR will design and implement the relevant measures and equipment, so that the LOT OB 2 meets the requirements for protection against radiation emitted by radon and other natural radionuclides, as well as for protection against ionizing radiation producing by the technical equipment of the LOT OB 2 which are contained in Act No. 18 /1997 Coll. on principles of the peaceful use of nuclear energy and ionizing radiation and in Decree of the State Office for Nuclear Safety (SÚJB) No. 307/2002 Coll. on radiation protection.

4.13.4 Protection against poisons and other substances harmful to health

Workplaces with a possible occurrence of poisons and other substances harmful to health must meet the requirements set out in Regulation of the EP and the EC Council No. 1907/2006 (REACH) and in accordance with Act No. 356/2003 Coll., as amended, on chemical substances and chemical preparations.

As a part of the LOT OB 2 execution the "Plan for securing OHS, FP and EP" will be prepared for particular workplaces (a building object, a space) and their activities, including the activities of subcontractors.

In case of carrying out fire hazard activities or activities in a fire hazard area, "The Integration in the category of activities with increased fire hazards" the resulting FP documentation will be elaborated.

In the event that there could be a threat to the environment due to activities or the handling and storage of chemical substances, a "Small Emergency Plan" will be elaborated."

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4.14 Connection points

Within the LOT OB 2, the existing site networks will be used for connection to water supply, sewerage systems, public lighting, and electricity.

The list of connection points is given in Annex A1 – The WORK scope.

4.15 Description of demolitions and removal works

The implementation of the LOT OB 2 will follow up with the execution of foundations for the new boiler house K20, which is a part of delivery of the LOT OB 6 – “The Construction” and which will precede execution of excavations, demolitions, and relocation of networks on the site of the new K20 boiler house. Prior to the LOT OB 2 execution, the demolition of some neighbouring buildings will be carried out - see Annex A114.01 – “The Coordination situation”.

There is no need to cut down any trees due to new structures.

5 DESCRIPTION OF A POSSIBLE TECHNICAL AND LAYOUT SOLUTION

The overall layout solution of the proposed technical solution of the LOT OB 2 is of the OB 2 CONTRACTOR responsibility. The possible layout solution within the technical concept can be seen from Annex A114.01 – “The Coordination situation of the Construction” and from the description give below in the text.

5.1 SO 201 – The Boiler House K20

As a part of the LOT OB 2, the superstructure of a new K20 boiler building will be built. The foundation structures for this building are supplied by the LOT OB 6. The boiler house is used for the purpose of placing the K20 boiler and related technological equipment. The supporting structure of the boiler house consists of a steel skeleton and a steel supporting structure of the boiler. The roof consists of steel open-web girders. The building is of a rectangular shape with external dimensions of 63.21 x 26.30 m and a roof hip ridge height of +50.58m. The building object is sheathed with facade sandwich panels, and it is abutted on the shorter side to the facade of the existing bunker building which has a roof edge height of +28.50 m. This dividing wall between the boiler house and the bunker building has a specified fire resistance of min. 90 min. (including media penetrations). Besides the boiler, the building also has a compressor station, a transformer station, a FC room, a technical room, etc.

For a detailed solution of the boiler house layout, see the drawing part A 4.1 – “The Machine Section”.

The access to the technological platforms on the individual floors is possible via steel stairs or a freight lift. In the highest part of the roof there are conveyors for wood chips (it is the OB1 delivery part) which further pass into the boiler houses K80 and K90.

The CIVIL PART also includes the delivery of the HVAC construction distributions. These are construction HVAC distributions, heating and cooling, electric wiring including operational and emergency lighting, lightning conductors. And furthermore, the internal distributions of sewage (possibly even rainwater) systems and drinking water for eye showers and fire sprinkler water distributions. The internal wiring of the installations will be connected to the site networks at handover points near the building object. All modifications and adaptations of the area networks concerned are the subject of the LOT OB 6 delivery.

The boiler room K20 will be connected by a new flue gas piping (a part of the PS 203) to the existing stack and by a new piping to the ash removal (a part of the PS 204) located on the piping bridge (a part of the OB 6 delivery).

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5.1.1 Air conditioning and heating

The air-conditioning system will ensure a sustainable microclimatic environment for the operation and shutdown of the installed technology in the building objects SO 201 + SO 202, the Boiler house K20, in the area of the boiler house E1A.

The spaces for transporting fuel to the boiler houses, both in the K20 boiler building and in the E1A above the level of the operational storage tanks, are ventilated within the OB1.

In the main area of the K20 boiler house, there will be two methods of ensuring climatic microclimatic conditions:

- Natural ventilation by aeration

Natural ventilation by aeration will be ensured during the boiler house proper operation. Some ventilation openings will be made in the lower and upper parts of the building object which will ensure the natural flow of air through the building, the removal of the heat load generated by the installed technology and the supply of combustion air to the boiler.

- Decentralized heating

If the boiler is shut down during winter months, the temperature in the boiler house shall not fall below 5°C. During the time when the internal heat gains for heating the interior environment are not available, the space will be heated by a decentralized circulating hot air unit. Heating of the circulating air will be electric, or the possibility of using the waste heat from the compressor station in the building may be considered.

5.2 SO 202 – The auxiliary system downstream the K20 boiler section - flue gas cleaning

The flue gas cleaning technology (a part of the PS 203) is located in the part of the K20 boiler house. A solid pollutant filter, a smoke exhaust fan and other related technologies will be installed here. The removal of ash from the filter for suspended particulates will be solved by a new pneumatic transport to the existing ash silo, the removal of bed ash through a separator into a container (a part of the PS 204).

5.3 SO 203 – Modification of the boiler houses K80 and K90

In the existing building objects, within the CIVIL PART, some modifications to the steel structure will be carried out due to some technological modifications of the K80/90 boilers for wood chips fuel and for the installation of new wood chips conveyors (as a part of the LOT OB 1). The modification includes the partial dismantling of the supporting structures of the roof, the supporting elements of the boiler house and the bunker structure, depending on the specific solution of the OB 2 CONTRACTOR and the technological equipment of the boiler house. The overall operation of the boiler house will not be interrupted. New conveyors, or transport bridges will lean against the existing supporting structures of the boiler house frame which will be reinforced with a new steel beam. In the area of conveyors, the roof will be adjusted, and a part of the existing outdoor staircase will be removed (lowered). The cladding from sandwich panels will be added, as well.

For a detailed solution of the boiler house layout, see the drawing part A 4.1 – “The Machine Section”.

The CIVIL PART also includes the delivery of the HVAC construction distributions. These are construction HVAC distributions, heating and cooling, electric wiring including operational and emergency lighting, lightning conductors. And furthermore, the internal distributions of sewage (possibly even rainwater) systems and drinking water for eye showers and fire sprinkler water distributions. The internal wiring of the installations will be connected to the site networks at handover points near the building object. All modifications and adaptations of the area networks concerned are the subject of the OB6 delivery.

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The spaces for transporting fuel to the boiler houses, both in the E1A boiler building object and in the K20 boiler house above the level of the operational storage tanks, are ventilated within the LOT OB 1.

6 ANNEXES

A 114.01 – Coordinating situation

7 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
BWTP	Biological wastewater treatment plant
BEP	BIM Execution Plan
BIM	Building Information Modelling/Management
RR	Routine repair
OHS	Occupational safety and health
BaA	Baltic after the Alignment
DHW	Domestic heat water
CE	Conformité européenne
CCTV	Closed Circuit Television
CEMS	Emission monitoring system
CDE	Common data Environment
No.	Number
ČBÚ	Czech Mining Office
CR	Czech Republic
ČSN	Czech Technical Standard
ČGS	Czech Geological Survey
ČÚBP	Czech Occupational Safety Office
DOSS	State Administration Bodies Concerned
WRW	Waste rainwater
DPS	Documentation required for building construction execution
DSP	Documents required for building permit
DSPS	Documentation of the actual state of construction
WCh	Wood chips
EIA	Environmental impact assessment
EIR	Exchange Information Requirements
EMC	Electromagnetic compatibility
EMS	Environmental management system
EN	European standards
EFAS	Electronic fire alarm system

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Abbreviation	Text
ES	European Community
EU	European Union
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
CHOPAV	Protected area of natural water accumulation
IAPWS	International Association for the Properties of Water and Steam
IEC	International Electrotechnical Commission
IFC	Industry Foundation Classes / format
IPPC	Integrated permission
IO	Engineering object
I/O	Input/output signals
ISO	International organization for Standardization
IT	Information Technologies
ITS	Internal technical standards
ITE	Individual tests
k.ú.	Cadastral territory
KV	Comprehensive testing
LV	Low-voltage
FWT	Feed water tank
NV	Government Regulation
BO	Business Package
SS	Steel structure
EP	Environmental Protection
parc. No.	Parcel number
PAC	Preliminary Acceptance Certificate
PED	Pressure Equipment Directive
P&I	Piping and instrument diagram
BC	Belt conveyor
PD	Implementation documentation
SIT	Schedule of inspection and tests
FP	Fire protection
POBC	Plan and organization of the building construction
PRE-BEP	Design plan of BIM implementation
PS	Operational file
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
SCR	Selective catalytic reaction
CGM	Combustible gas mixture
SEE	Stable extinguishing equipment

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Abbreviation	Text
SIL	Safety Integrity Level
I&C	Instrumentation and Control system
SNCR	Selective Non-Catalytic Reduction System
SÚJB	Decree of the State Office for Nuclear Safety
SNIM	3D model of non-graphic information standard
SO	Building object
CfW	Contract for work
SP	Building permit
CM	Construction management
QMS	Quality management system
SW	Software
CS	Control system
TR	Technical regulations
HVAC	Heating, ventilation and air conditioning
SP	Solid pollutants
ÚŘ	Territorial management
ÚSES	The concept of the territorial system of ecological stability
VaK	Waterworks and Sewerage Systems
HV	High-voltage
VOC	Volatile organic compound
ACS	Air-conditioning system
HP	High-pressure
W	Witness Point
WF	Workflow