



Federal Ministry
for Digital
and Transport

Federal Trunk Roads BIM Masterplan

Framework Document: BIM Use Cases and Legal Framework Conditions –
version 1.0

Contents

Overview of the framework documents	4
1. Which design deliverables do contracting entities want to agree on?	6
1.1 Possible options	6
1.2 Provision of native data	8
1.2.1 Obligation to provide native data and scope	8
1.2.2 Consideration of the contractor's interests and general terms of business	9
1.2.3 Obligation to update the model?	10
1.2.4 Suggested clause	11
1.2.5 Storage of native data	11
2. Remuneration for BIM services	12
3. Settlement using the BIM method on the basis of actually executed quantities?	14
4. Integration of the BIM execution plan (BEP) in the tender documents	15
5. Product-neutral or specific invitations to tender for BIM services?	18
6. What special liability issues must be taken into account when planning with BIM?	20
6.1 Liability of the planner for the model	20
6.2 Liability of the overall BIM coordinator and BIM manager	20
7. Contractual models with BIM: implementation with a focus on cooperative partnership	22
Annex: Study clarifying fundamental legal issues in connection with the use of the BIM method in the Gauchachtal Bridge project	24

Overview of the framework documents

This framework document on BIM use cases and legal framework conditions constitutes part of the Model Guideline for BIM (MG BIM). The framework documents of the MG BIM define the consistent application of the BIM method and support the implementation strategy explained in the Federal Trunk Roads BIM Masterplan. They provide practically focused answers on the BIM-specific topics and issues that are necessary for a uniform understanding of BIM throughout Germany in the federal trunk roads sector.

The version 1.0 framework documents were designed to facilitate updates to a new version of the Model Guideline for BIM at the beginning of phase II of the BIM implementation strategy; the same will apply again later for phase III. Finally, the documents will be transitioned to the Model Guideline for BIM for the standard process.

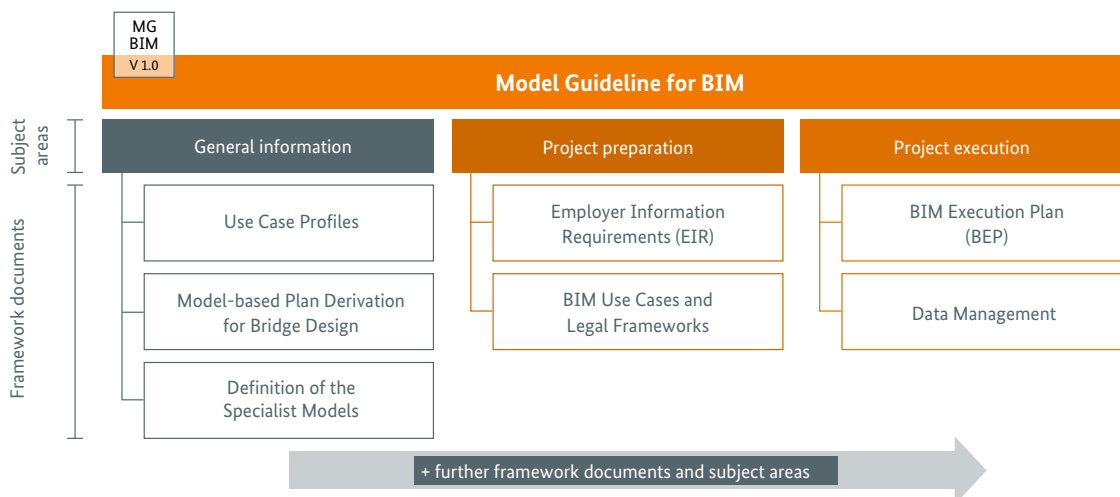
Framework documents are developed by the expert groups initiated by the Federal Ministry of Transport and Digital Infrastructure and in the expert groups established at the official meetings of the Federal Government and the federal states on BIM. In these groups, various technical experts – employees of the Federal Ministry of Transport and Digital Infrastructure, the Federal Trunk Road Authority, Federal Autobahn GmbH, German Unity Planning and Construction Company for Trunk Roads (DEGES), the federal state authorities with delegated powers, the Federal Highway Research

Institute (BASt) and the Road and Transport Research Association (FGSV) – are working with BIM Germany on the ongoing progress of the BIM implementation strategy for federal trunk roads. The lessons learnt from completed and ongoing projects, the proven BIM4INFRA2020 toolkits and input from the continuous participation of all stakeholders were taken into account. At the same time, general developments in the BIM method were considered for national and international standardization.

As a result, the documents present the respective state of the art and progress in standardization. Reflecting these increasing knowledge levels, the framework documents replace the thematically identical parts of the BIM4INFRA2020 toolkits and should be construed as recommendations for future projects and for a potential adaptation of various standards and guidelines.

Each framework document is assigned to a thematic category based on the project schedule and is thematically self-contained. Cross-references to other framework documents are explicitly highlighted. Further information on the framework documents can be found in the document entitled ‘Explanation of the Framework Documents’.

Version 1.0 of the Model Guideline for BIM comprises the documents shown in the figure.



Outline

This document is intended as an implementation recommendation, with the goal of supporting the public sector contracting entity as the BIM user in issuing legally compliant invitations to tender for building information modelling (BIM) services and also conducting the planning process in a legally compliant manner. Attention is mainly focused on defining the content of BIM services and their remuneration in the tender documents on the one hand and appropriately integrating BIM-specific contractual documents (here, the BIM execution plan in particular) on the other. The insecurity that still frequently affects public sector contracting entities regarding the type and scope of design deliverables is also addressed: From which service phase should BIM models be requested? Are IFC models sufficient, or should native data also be requested?

This is related to the question as to which procurement-related constraints must be observed if, say, a public sector contracting entity wants to stipulate the use of certain BIM software to ensure interoperability between those involved in planning and execution. Possible remuneration models for BIM-specific services are also examined to determine their suitability for use in practical applications. Yet another focus is on determining in what form the BIM execution plan (BEP) should be included in the tender documents (should [preliminary] BIM execution planning be performed by the contracting entity or the contractor?) and identifying the extent to which the BEP is to be kept flexible ('floating BEP'), also after a contract has been awarded.

The legal analysis also addresses the ubiquitous issue of the planner's liability when using BIM. If the liability regime basically stays unchanged for those who use BIM for planning purposes, then the additional planning roles associated with the use of BIM (BIM managers and (overall) BIM coordinators) must also be considered from a liability perspective. The analysis is rounded out by considering possibilities for combining the BIM approach with models for collaborative planning and execution (multi-party agreements, IPA, alliancing approaches). The aspects common to both approaches are presented and discussed, and initial suggestions made for integrating BIM into collaborative arrangements.

The following subject areas are covered:

- Possible design deliverables
- Remuneration for BIM services
- Invoicing specific executed quantities with BIM
- Inclusion of BEP in the tender process
- BIM services and product neutrality
- Liability of the planner when using BIM
- Implementing collaboration-orientated contractual models with BIM

1. Which design deliverables do contracting entities want to agree on?

Besides the ‘what’ of planning – which in Germany is typically defined by selecting schedules of services from the Fee Schedule for Architects and Engineers (HOAI) and supplementing them with BIM-specific services – the public sector contracting entity must also define the ‘how’, in other words the form in which it wishes to receive the results of planning work from contractors. In recent years, conventional paper-based planning documents have increasingly been supplemented by or even entirely supplanted by design deliverables in the form of data models. From a legal perspective – and especially from the viewpoint of the HOAI, which does not stipulate specific methods – there are no binding requirements in this regard. It is, however, necessary to clearly state the contractual requirements that the desired results – or deliverables – must meet. A practical example of this is provided by the study drawn up to clarify fundamental legal issues around the use of BIM in connection with the Gauchachtal Bridge project in the Black Forest (see annex).

1.1 Possible options

- **Provision of analogue 2D drawings:** Contracting entities used to insist on receiving 2D drawings across all planning phases. These were created using CAD programs and provided either on paper or digitally in the form of data records. The actual planning work was carried out exclusively on an analogue basis, and consequently the benefits of the BIM method (such as the use of geometrical and semantic models) did not yet come into play. Provision of 2D analogue data is still very widespread in practice, despite the fact that it falls short of meeting the requirements of modern, collaborative ways of working, which the Federal Government is also pursuing with its Road Map for Digital Design and Construction.
- **Provision of an IFC-based BIM model:** The agreement by the parties to use BIM as the planning method stems from an interest in obtaining a standardized model that has geometrical and semantic properties and is at least three-dimensional (in individual cases, further properties can already be added, for example costs per component and/or dates). The simplest way to obtain a model that is suitable for use by the contracting entity is to agree on a neutral format for communicating model data. The standard for this is the IFC (Industry Foundation Classes) format. The motivation for choosing a neutral data format is that it can be read by the contracting entity using any planning software. This corresponds to the approach taken in the public sector of using open formats in connection with the awarding of contracts, in order to prevent restriction of the market and the elimination of competition (‘openBIM’). The drawback of providing planning data in the open IFC format is that the information loses ‘intelligence’ as a result of converting proprietary (i.e. native) data formats to a non-proprietary format. The IFC standard is roughly comparable to the PDF file format, meaning that many data processing options may not be readily available to the contracting entity.
- **Provision of a BIM model with native data:** Finally, it is possible to agree on submission of a complete data model prepared using the contractor’s own proprietary software. This model contains all of the geometrical and semantic information that has played a role during the course of planning. As the IFC format was originally developed for structural engineering, the use of this neutral format in civil engineering in particular frequently still causes problems, which means it may be necessary to ultimately resort to native data.

Formats such as Ifc-Bridge and Ifc-Road are still under development. Against this backdrop, it is currently common in actual practice to request BIM models in IFC format while also asking for 2D plans derived from the BIM model, either in digital form or on paper, at least for the later service phases. In some cases, now only the later service phases as defined by the HOAI are supported by additionally provided paper plans. Exclusive submission of purely digital planning results is often prevented by the fact that public sector contracting entities require paper plans for signing off the budget documents at the conclusion of service phase 3 (outline design). The same statement applies to service phases 4 (approval planning) and 5 (detailed design). In these early days, in which the work processes have not yet been fully digitalized, the BIM method is only just becoming established in the German market and contractors have also not yet acquired many years of experience in this area, it is understandable that this approach is taken. It appears to be thoroughly justified and over time ought to strengthen confidence in the BIM method on the part of both contracting entities and contractors.

If the public sector contracting entity does not wish to completely dispense with the submission of 2D plans, the recommendation is to define a planning status up to which the provision of digital data (such as BIM models) appears to be justifiable and stipulate that, and by when, paper plans derived from the model must be provided. In an early phase of establishing the BIM method, it is acceptable to draw this line after service phase 3 (outline design), provided that it is possible to dispense with paper plans up to the budget documents. Whether or not plans can be submitted exclusively in digital form in service phase 4 (approval planning) will largely depend on the degree to which it is already possible to submit planning applications in digital form (cf. the research project of BIM Germany on digital planning applications at <https://planen-bauen40.de/bim-basierter-bauantrag/>). Currently, (public sector) contracting entities are also still holding off on insisting on the submission of planning results for service phase 5 (execution planning) in exclusively digital form in order to avoid overtaxing market players, allowing them to work with analogue plans to speed the progress made at construction sites. For preparations to award contracts, and especially for compiling a bill of quantities (service phase 6 b), however, the benefits of digital building models are clear, as the GAEB format (standardized by the German Joint Committee for Electronics in Construction) facilitates the transfer of individual components from plans to service items of the bill of quantities. This benefits not only contractors drawing up plans, but also the contracting entities, which have an interest in being able to verify error-free, complete transfer of execution plans to specifications. As a minimum, therefore, a digital model should also be requested parallel to this.

1.2 Provision of native data

This is separate from the question as to whether the public sector contracting entity requires a BIM model in IFC format or native data. This question must be answered in advance on a case-by-case basis for each individual project. The public sector contracting entity must determine the purposes for which it actually requires a particular BIM model and which data is needed in each case.

1.2.1 Obligation to provide native data and scope

If the parties do not make any arrangements on this, as a rule it is not possible to derive an obligation to provide native data from the defined schedules of services that ordinarily constitute the basis for contracting BIM services (such as the 'Schedule of Services for Planning BIM Projects' of the German Federal Chamber of Architects or AHO [German Committee of Engineers' Associations and Chambers on Fee Schedules] Volume 11). These refer neutrally to 'data models' and intentionally leave it up to the parties concerned to define the data to be provided in greater detail. There have not yet been any court decisions on interpreting clauses of this type.

At best, a parallel can be drawn to agreements on designing bespoke software, in connection with which it can be disputed whether there is an obligation to release the source code of the software. Where software agreements of this kind are concerned, court decisions are made on a case-by-case basis and hinge on whether the commissioning party requires the source code to maintain and update the program.

Applied to design deliverables when deploying the BIM method, the answer depends on the contracting entity's expectations of the model provided to it and the extent to which these expectations have been communicated to the contractor in the tender documents.

To avoid uncertainties of this kind, it should already be apparent from the tender documents whether the public sector contracting entity wishes to receive native data. In this connection, both the fact that native data is requested and the scope of the obligation to provide such native data must be unambiguously declared so that the bidder can factor this into its costing. In individual cases, native data can have a greater monetary value than the IFC model. Native data may contain the complete planning logic underlying the creation of the model. For example, the parameters of components can be read out. The public sector contracting entity can then use this data with appropriate planning software without any technical constraints, and not only for updating the planning for a specific project but also possibly in modified form for other projects. Above and beyond this, it may be possible to continue using native data if the planner is replaced or the structure involved is subsequently used for a purpose other than the originally intended one. It is therefore in the interests of all stakeholders in the planning process to clearly stipulate in advance the scope of delivery of native data and the contractor's remuneration.

Public sector contracting entities are currently not always able to consistently assess with conclusive certainty which native data records they will need in order to build and operate new facilities. They should therefore devote serious thought to these aspects prior to initiating contract award procedures. If uncertainties arise, they can negotiate the data to be provided for the specific anticipated BIM use cases with the bidders during the contract award procedure. This is quite possible within the scope of normal negotiations for awarding planning services in accordance with sections 73 et seqq. of the Ordinance on the Award of Public Contracts (VgV). At the same time, it should be clarified as thoroughly as possible, from the public sector contracting entity's perspective, whether it requires data for its BIM use cases and, if so, which data it requires.

In some cases, it can be in the public sector contracting entity's interest to receive a complete model with native data, but this greatly depends on the pursued applications. For example, in order to obtain a usable model for operations, the public sector contracting entity can contractually agree with the contractor on the delivery of an adjusted model that only reflects an updated planning status and is enriched with suitable data for operation. In the event of a public invitation to tender, however, the price list should then include a price for adjusting the data and supplying native data.

1.2.2 Consideration of the contractor's interests and general terms of business

Contractors often hesitate to divulge the native data that they use for planning. Handing over native data reveals their planning logic, including any object libraries used, and runs the risk that they will be plagiarized by third parties. Nevertheless, the contractor only enjoys intangible property rights in special situations in connection with the planning work to be handed over. Planners are entitled to copyright protection, irrespective of the planning methods and the data format used. Whether the data is provided in IFC format or natively is therefore in principle irrelevant to the contracting entity's use rights under copyright law. A high level of personal and intellectual creativity as expressed in the results of planning is the crucial criterion. In the case of buildings and structures and the designs on which they are based, however, this is only given if the building or structure stands out from the vast majority of everyday construction projects and attains a degree of individuality that surpasses the category of 'undemanding work' and recognizably bears the 'architect's signature'. Purely technical solutions, regardless of how innovative they may be, typically fall short of qualifying for copyright protection, as a result of which BIM models are only protected by copyright in exceptional cases. Moreover, even if copyright protection is relevant

for a BIM model in an exceptional case, the contractor must then also grant the contracting entity rights of use to it as laid out in sections 31 et seqq. of the Copyright Act (UrhG) when handing over the model, and the contractor must be appropriately remunerated for providing the native data pursuant to section 32 of the Copyright Act. This provides a legal basis for posing the question as to the value of the particular native data to be handed over, an issue which has not yet been resolved.

As a rule, classifying native data as 'business secrets' is also not an option. While native data of planning work carried out with BIM can definitely fall under the definition of section 2 (1) of the Act on the Protection of Business Secrets (GeschGehG), it depends on the individual case whether or not this regulation is actually applicable. As a rule, the criterion of 'appropriate measures by the rightful owner to preserve secrecy' is not relevant to planning work, as planners typically do not wish to keep the results of their work secret and instead provide them to the contracting entity.

Above and beyond this, however, the question arises whether the contracting entity can include a clause stipulating that the contractor must deliver native data as a rule. It is not possible to conclusively say whether such a clause is subject to the 'test of reasonableness' for standard business terms pursuant to section 307 of the Civil Code. Clauses defining 'whether or not and to what extent a contracted service is to be provided' are generally exempt from such tests of standard business terms. By contrast, clauses that 'deal with the ways in which services are provided and/or any modifications to services' are subject to tests. There are good reasons to regard a clause on supplying native data as defining how a service is provided and therefore subject to tests. A planning contract, being similar to a contract for works and services, primarily aims at achieving the agreed successful performance, namely planning that the contracting entity can use. Preparation of a BIM model that is then provided in a native

data record is not an essential prerequisite for successful performance. Rather, it involves a processing method for the planning contract that is agreed on by the parties and the relevant clauses are consequently subject to tests. Care should therefore be taken to ensure that an agreement on supplying native data adequately distributes the risks between the parties and appropriately takes their respective interests into consideration. This can be achieved by precisely defining the use cases for which native data is required and the extent to which their interests are balanced – for example, by means of additional remuneration.

1.2.3 Obligation to update the model?

1.2.3.1 No right to rectification arising from general rules?

When native data is provided, the question arises as to whether or not and if so to what extent each contractor is required to update this data. In actual practice, it is frequently a problem that native data is required in order to operate a finished structure, but specific technical and planning-related issues may not arise until years after the planning work has been completed and accepted and the BIM model handed over. By this time, it is highly probable that the native data is outdated and/or no longer readable because the proprietary software version used to create it is no longer available, having been replaced by a newer one. What is more, without a relevant contractual arrangement, the contractor then typically has no obligation to update any planning results. The contract with the planner only covers one-off provision of a planning result. Once the contractor has provided this result and the contracting entity has checked it and the model is free of defects at the time of acceptance, the contractor has fulfilled its performance obligation. If, accordingly, a (public sector) contracting entity specifies that data models in BIM format must meet certain requirements after completion of the construction work, for example within the scope of subsequent operation, these specific obligations must be contractually agreed. It is then necessary to clarify

whether fulfilment of these obligations should be subsequently verified. If no such requirement is specifically included in the planning contract and/or construction contract, then a contractor does not need to make any provisions to ensure the suitability of its data model for operating the facility after acceptance. Moreover, provisions should be made if native data is to be provided that can only be opened and edited using certain planning software. In such a case, the provision of executable software (including required updates) must be stipulated for certain time periods.

1.2.3.2 Necessity of a contractual arrangement

In connection with contracts for providing bespoke software, in many cases maintenance agreements are concluded for a fixed time period subsequent to acceptance of the software. This can also be applied analogously to BIM planning services: the contracting entity and contractor then contractually delimit in advance where the contractor's planning obligations end by formulating the BIM use cases as concretely as possible while specifically excluding updating and maintenance of the model from the preceding use cases. Subsequent to acceptance, the contract with the planner then transitions to a warranty phase that is limited to the original work done.

Updating of the model must then be regulated in a separate BIM use case. Based on this BIM use case, the parties should negotiate separate remuneration for these updates. It is necessary for the remuneration agreement to be concluded outside the system of the Fee Schedule for Architects and Engineers (HOAI), since it constitutes a separate service according to the logic of its schedules of services. In terms of remuneration, settlement in accordance with the HOAI can either be completely dispensed with while directly linking all work done to the BIM use cases, or else the remuneration for the extension of the BIM model would have to be arranged separately alongside the other remuneration agreements for the BIM use case of 'Updating the model'. In this connection, it would be possible

to define either maintenance intervals or specific maintenance cases.

1.2.4 Suggested clause

If provision of data in native formats is requested, it could be a good idea to include the following clause:

‘The contracting parties agree that the contractor must provide the planning results it is to deliver to the contracting entity in a neutral data format (IFC). The contractor additionally undertakes to provide the following plan formats (...) in paper form as per the contractual requirements (...).

The contracting parties also agree that implementation of the following use cases requires the provision of native data: (...).

To implement the above-mentioned use cases, the contractor therefore undertakes to provide data records in (...) format that are readable using the following planning software: (...).

- The contractor itself is responsible for obtaining an appropriate license for the planning software.*
- The contractor will make a license for the planning software (...) available to the contracting entity and ensure that this licence makes it possible to read all planning data until (...). The contractor bears the costs of any software updates within the aforementioned time period.*

The contracting entity undertakes to use the native data placed at its disposal exclusively for the project that is the subject of the contract and to require everyone involved in the technical planning work to use the native data exclusively for this purpose.’

1.2.5 Storage of native data

As an alternative to providing native data for planning purposes, the model of an ‘escrow’ agreement can be considered. It too originated with software agreements: native data is stored at a neutral location, with certain data only being released if and when the contracting entity actually needs it – possibly in return for supplementary consideration. It would be necessary to contractually agree beforehand on which native data packets will be issued from where they are stored when called and the price for doing so. Above and beyond that, it would be essential to appropriately agree on the degree to which the data is kept up to date. In particular, this can give the contracting entity additional security in the event of insolvency on the part of the contractor.

2. Remuneration for BIM services

In practice, there is still no comprehensive remuneration model for providing services with the BIM method. So far, the overall planning schedule of services defined in the Fee Schedule for Architects and Engineers (HOAI) has only included a few BIM-related services as special services within the scope of service phase 2. Although, against the background of the HOAI, the debate on the fundamental permissibility of using the BIM method has presumably been resolved through the reform of remuneration for architecture services and the abandonment of the mandatory fee structure, there are still no concrete remuneration models for practical use. Especially if practitioners voluntarily continue to calculate their fees based on the HOAI in many cases, which is to be expected, it will still be important to distinguish between basic services listed in the service catalogues of the HOAI and special services, which can include BIM services.

Despite the service definitions of the HOAI and (still) mandatory fee structure, the impression frequently arises in connection with use of the BIM method that payment for some services is shifted forwards (so-called 'front loading'), despite this being an undesirable practice due to the fact that remuneration is not yet due in the corresponding service phase. Whether or not this shift to earlier service phases occurs largely depends on how the planning sequence is defined in a given case. Although the schedules of services of the HOAI provide a framework, the parties involved must agree on the specific planning interfaces and progress stages. Agreeing to apply the BIM method can thus also lead to planning work being done in line with the actual intentions underlying the HOAI.

In any case, basing remuneration models for BIM services on the definitions of the HOAI will not be appropriate unless and until these comprehensively take account of the BIM method.

In the meantime, other remuneration models exist that are basically conceivable but practically suitable to varying extents:

- **Upward shifting of HOAI fees:** Contractually agreeing on remuneration according to HOAI and then shifting the fee bands upwards by a lump sum does not appear to be appropriate from a practical standpoint. Because, as shown, the schedules of services of the HOAI do not take into account use of the BIM method, it would be difficult to appropriately distinguish between other services provided by a planner and additional, specifically BIM-related services.
- **Time-based remuneration:** Agreeing on time-based remuneration is conceivable for BIM services and a fundamentally practicable approach. However, use of the BIM method will not motivate the parties to calculate planning fees exclusively on the basis of time spent. In individual cases, it can be problematic to distinguish between classic planning services and specific BIM planning services, making it necessary to precisely describe each case of BIM work to be remunerated when formulating a clause on time-based remuneration. Any special services required for BIM planning can then be appropriately covered by time-based remuneration. It should be taken into consideration, however, that the contracting entity will have no means of controlling costs charged on a time basis if there are no

clearly defined documentation obligations for correlating remuneration to performance results (deliverables). Particularly if the BIM method is extensively applied because there are a large number of use cases, exclusively time-based remuneration will therefore be less well-suited.

- **Data volume:** Departing completely from past models, the contractor's data volume could be taken as the basis. In other words, remuneration would be geared to the data volume that the contractor's planning work produces. However, this output-based model is not practicable in the context of today's technology. Planners have full control over the granularity of their planning work and therefore also the volume of generated data. A model with a greater data density is not necessarily better, and consequently the data volume is an inadequate approximation of the value provided.
- **Partial lump sums based on BIM use cases:** The amount of work done by the contractor work can be more reliably approximated to calculate remuneration by considering the individual BIM use cases as defined in the Employer Information Requirements (EIR). In the interests of delineating these use cases and thoroughly defining the work to be done by the contractor, however, they must already be completely differentiated in the tender documents (from

a legal perspective, the EIR constitute a static contractual component that may no longer be altered during the further course of the contractual relationship). It is then possible to assign partial lump sums (which reveal which work has been done using the BIM method and how to remunerate it more accurately than a list of different schedules of services in the HOAI) to individual BIM use cases. In future, it will be necessary to establish an empirical basis for deciding which lump sums should be agreed for which services. Appropriate preliminary values for work done must be determined on the basis of actual practice.

From a legal standpoint, linking remuneration to specific additional work done in the form of BIM use cases is an appropriate basis for remunerating BIM planning, which extends beyond classical planning services. Here the task for the future will be to precisely describe use cases and define the resulting processes and provided results in detail, in order to develop defined BIM maturity levels for appropriate pricing and procurement.

3. Settlement using the BIM method on the basis of actually executed quantities?

The question as to whether or not and if so to what extent the BIM method is compatible with the settlement rules of VOB/C (Part C of the German Award and Contract Procedure for Construction Services) was already investigated within the scope of the BIM4INFRA research project. The background is that a public sector contracting entity is bound by the requirements of VOB/C when issuing an invitation to tender and therefore strictly subject to the rules on overall measurements and lump sums stipulated in part 5 of each of the corresponding General Technical Contract Terms for Construction Works (ATV). However, use of the BIM method enables quantity take-off on the basis of specifically planned and executed quantities, which can be derived from the corresponding model. At that time, it was discussed whether it was necessary to include a flexibility clause along these lines in VOB/C as a prerequisite for applying the

BIM method. However, a survey of practical requirements revealed that software solutions able to convert specific quantities from a BIM model into VOB/C-compliant values had meanwhile become available. At this time it is therefore not absolutely necessary to include a flexibility clause in VOB/C or even to more extensively reform this regulation for public sector contracting entities. This is a satisfactory result because professional trade businesses and other smaller market players in particular will continue to rely on the VOB/C rules on overall measurements, and consequently uniform standards may also continue to be applied to public sector contracting entities.

As it is straightforward to convert between specific quantities in the BIM model and VOB/C-compliant quantities, this take-off model can continue to be used for awarding public contracts.

4. Integration of the BIM execution plan (BEP) in the tender documents

In addition to the Special Contractual Conditions for applying the BIM method (BIM SCCs), the public sector contracting entity must also formulate the Employer Information Requirements (EIR) in the invitation to tender. In classical terms, this would be the performance specifications, which specify the future contractor's performance obligations. The core of the EIR are BIM use cases, in other words the contractor's individual performance components in connection with planning using the BIM method. Contractors are meanwhile typically able to define these EIR, and especially the most common BIM use cases, with sufficient accuracy. Today the EIR are specified accordingly in connection with procurement and constitute an integral part of the contract.

In addition, in order to carry out the planning services it is necessary for there to be a BIM execution plan (BEP). It is also referred to as the contractor's specifications. Functionally, it constitutes a kind of project manual for executing the BIM. This document, which in its simplest form can be understood as the contractor's answer to the contracting entity's EIR, defines how the parties interact to execute the BIM-based planning process. The details of planning with the BIM method are described in it. Against this background, there are various ways to incorporate the BEP into tender documents:

- **BEP predefined by the contracting entity:** In exceptional cases, the contracting entity can set itself the goal of defining actual implementation of planning itself and in advance using BIM. This can have the advantage that the contracting entity retains responsibility for the planning process and is therefore able to control the contractor in considerable detail. This approach is rarely encountered in actual practice, however, as it is difficult for the contractor – not least because the BIM method is still relatively young – to specify appropriate terms in advance for all of the parties involved in planning. If static specifications are nevertheless made
- **in the BEP, any document provided by the contracting entity is an immutable part of the contract with which the contracting entity must comply.** Here there is a risk that, if planning has to be redone or there are other disruptions during the subsequent course of planning and construction, the contractors will be able to assert supplementary claims because the BEP drawn up in advance by the contracting entity failed to define the work at all or in the actually required form. In future, as the expertise and experience of all market players increases, it will be possible to expect that, increasingly, BEP predefined by the contracting entity will be applied when the contracting entity strives to closely control the planning work and is also better able to monitor all of the requirements when planning with the BIM method.
- **Preliminary BEP defined by the contracting entity:** These follow a similar logic. They too involve cases in which the contracting entity also wishes to incorporate the contractor's procedural competencies when evaluating a tender. In contrast to BEP produced by a contractor, however, here the contracting entity attaches importance to adherence to certain basic procedural assumptions. This can be the case if, for example, attention must be paid to certain processes due to interfaces to other parties involved in planning or construction (especially when separately contracting individual trades or combining several individual trades into contract packages without this being coordinated in any way by a general contractor or general planner). When using preliminary BEP defined by the contracting entity, the contracting entity drafts a BEP and requests the bidders to submit implementation proposals within the scope of competitive bidding. Their BIM competence can then be evaluated on the basis of the suggestions for changes that are submitted by individual bidders. Here too, the BIM expertise of the individual bidders can be considered despite the fact that the perspective is already somewhat

narrower owing to the contracting entity's upfront stipulations. Also in this contracting approach, the BEP can and should be conceived as a work in progress in order to perform its function as a project manual for executing the project with the BIM method.

- **BEP defined by the contractor(s):** Conversely, it is possible for the contracting entity to dispense with predefining BEP in the tender documents. Formulating the BEP is then defined as the contractor's obligation. Typically, such an approach is chosen if the intention is to contract a general planner to do the planning work or if the overall planner (which is traditionally responsible for overall coordination of the BIM work) is supposed to create the BEP for all of the planners involved in the project. The overall planner is also chosen for this if agile work methods are employed, for example if, within the scope of a 'bottom-up' approach, individual planners define their ideas for using BIM to implement the overall project. This entails a risk, however, of winding up with a BEP at the lowest level that all of the planners are able to implement. Generally speaking, a BEP defined by the contractor(s) has the advantage of providing the greatest possible flexibility, as the contractor is able to adapt the BEP to the respective circumstances. On the other hand, this means that the contracting entity loses control of the procedural planning approach with the BIM method. This can lead to difficulties if the contracting entity itself is responsible for interfaces with other stakeholders. Particularly when issuing invitations to tender for public contracts, retrospective formulation of the BEP means that a bidder is unable to demonstrate its BIM capabilities to the contracting entity by submitting a BEP until after being contracted. BEP created by a bidder after conclusion of the contract cannot serve as a criterion for evaluation, thus making it impossible to query BIM capabilities. In this constellation, there is then a tendency for attention to focus on price-based competition instead. This can be especially problematic if bidders lack significant relevant BIM capabilities as references, which still occurs frequently in the current market situation.
- **Bid BEP defined by the contractor(s):** In order to integrate the creation of EIR into the procurement procedure, preparation of a bid BEP can be included in the tender process. In the context of the negotiation process that is usual in actual practice, preceded by a bidder competition as per sections 73 et seqq. in conjunction with section 17 of the Ordinance on the Award of Public Contracts (VgV), the first step is to query how well each individual bidder meets the suitability criteria (suitability of the firm and relevant resources for executing an assignment using the BIM method). In a second step, the bidder competition, qualitative, assignment-specific quality criteria can be queried in addition to the price. Here it is possible to require the submission of a BEP for the tendered project and evaluate these. This has the advantage that comprehensive information relating to the procedural handling of a project with the BIM method is placed at the public sector contracting entity's disposal, enabling it to ascertain the relevant means of implementing the project against the background of its existing BIM expertise. The advantage of this approach is that the BEP, and therefore also the procedure to be applied for implementation, can be negotiated prior to awarding a contract. If the BEP defined by the contractor(s) has become an evaluation criterion, it must also be contractually agreed. This enables the public sector contracting entity to benefit from different solution approaches of the bidders. This is appropriate above all if the contracting entity still possesses little or no relevant BIM competence, and if the contracting entity has no interfaces of its own worth mention to other parties involved in planning (such as for contracting general planning services). In this case, however, the contract

award criterion of 'BEP quality' should be given an appropriate weighting relative to that of 'price'.

Regardless of whether the BEP is provided by the contracting entity or the contractor, it has to be stipulated whether the BEP should be a static, unchanging document – like the Employer Information Requirements (EIR) – or be dynamically updated over the course of the project ('floating BEP'). If the parties fail to reach an agreement on this, it will depend on the individual case and how the tender documents are interpreted. If the BEP is provided by the contracting entity as part of the tender documents, in case of doubt it should be defined as a contractual basis. In all other cases, it is not possible to stipulate this as a general rule. To retain the flexibility of a project manual for the BEP, it can be agreed that the BEP is to be updated by the contractor, possibly together with other planners involved.

In terms of public procurement law, all of the presented ways of integrating the BEP in the tender documents are admissible. To ensure that competition amongst bidders is as comprehensive as possible, it is advisable to either prescribe a preliminary BEP as a framework or else to request a bid BEP. The public sector contracting entity should clearly establish whether the BEP may be updated and stipulate this in a legally compliant manner.

A contract clause on integrating the BEP could be formulated more or less as follows:

The contracting parties agree that the BIM execution plan developed/co-developed by the contractor should be the basis for data-based planning and execution during the further course of the project. In respect of the involvement of other contractors in the planning and construction process as well as any additional or modified ancillary conditions, the need to update stipulations in the BEP may arise. The BIM execution plan underlying the contract will continue to apply until and unless such updating takes place.

To the extent that this is required or expedient for executing the project, the contracting entity may also unilaterally mandate updating of the BEP in a particular manner. The contractor must then implement the modified stipulations unless it is unreasonable to do so in individual cases. If the contracting entity's mandate results in significantly increased or reduced costs, an adjustment to the agreed remuneration may be demanded. If the contracting parties consensually alter the BIM execution plan, the remuneration remains unchanged unless, at the time of making the change, one of the contracting parties explicitly reserves the right to make such an adjustment.

5. Product-neutral or specific invitations to tender for BIM services?

Generally speaking, the public sector takes an 'openBIM' approach that is intended to ensure product- and manufacturer-neutral use of the BIM method as far as possible. The use of the IFC format attests to this. But especially in connection with the provision of native data created by a contractor using proprietary software, the contracting entity has a justified interest in the use by the contractor of a particular software solution for creating the model. In many cases, native data can only be read using the same software that was used to create it. The public sector contracting entity can therefore only derive a benefit from the handover of the native data if it has access to the same software program that was used to create the data. However, it would not be financially viable for the contracting entity to keep all of the commercial available software solutions on hand. Against this background, the question arises as to whether or not and to what extent the public sector contracting entity is entitled under procurement law to require the contractor to use a specific software solution for planning with BIM.

In terms of procurement law, it is true that the public sector contracting entity is free to decide which services it wishes to contract – the law does not regulate the 'what' of procurement but only the 'how'. Nonetheless, a public sector contracting entity may not stipulate in its invitation to tender, either openly or covertly, the use of a certain product. More precisely, the public sector contracting entity is basically not allowed to make specifications regarding a certain

fabrication or source, a particular process, brands, patents or types or certain origins (cf. section 31 (6) of VgV). A 'concealed' product specification is already given if, on the basis of a large number of detailed specifications, only the product of a single manufacturer fulfils the requirements of a particular invitation to tender.

However, public procurement law admits such a 'product-specific' invitation to tender if it is justified by the subject of the contract, amongst other reasons. In particular, this is the case if only the tendered product or process is suitable for meeting the public sector contracting entity's procurement needs. If the contracting entity has, for example, already developed its own modelling guidelines or catalogues of objects, these are automatically embedded in a certain software environment. In such a case, the contracting entity also has a justified interest in ensuring that the contractor's BIM planning work meshes with this environment, and consequently this constellation may be regarded as grounds to justify a 'product-specific' tender. It is also conceivable that the contracting entity has already invested in a 'common data environment' (CDE) that serves as a data platform and whose use should be required of all parties involved in the planning work. For this, however, judicial practice requires not only that such an objective justification exists, but also that it should be verifiably documented. In particular, it is also necessary to demonstrate that the product has not been arbitrarily chosen.

If, for example, a contractor prepares a bid based on quantities from the model that are carried forward to prevent information from earlier to later service phases from being lost, the bidder is indirectly also required to use certain software.

Generally speaking, the public sector contracting entity should exercise restraint in mandating the use of certain software, as this can have repercussions on the group of those interested in being involved in the planning work and thus restrict the market while driving up the price of the service.

In individual cases, it can make sense to prescribe the use of certain software to prepare the BIM model. Under public procurement law, such a prescription can be justified by the nature of the commissioned work if the contracting entity has a special interest in requesting the use of certain software due to preceding planning (for which a particular software or CDE was used). This public sector contracting entity must document this justification in the individual award report.

6. What special liability issues must be taken into account when planning with BIM?

The liability of a planner that created a model using the BIM method is not fundamentally different from that of a planner who has used conventional tools. The general principles applicable to the planner's verification and notification obligations, joint and several liability constellations and obligations arising from liability for defects are equivalent to those in the case of 2D planning.

6.1 Liability of the planner for the model

Generally speaking, the contracting entity is required to inspect and approve an architect's work in the sense of section 640 of the German Civil Code, in other words to accept the work as having been performed in an essentially defect-free manner. If the parties have agreed that the planning work should be done using the BIM method, the acceptance also extends to the BIM model. In our assessment, it is not necessary for the parties to have explicitly agreed to this, as the model is an integral part of the agreed work. The contracting entity should therefore be able to check, at the time of accepting the model, whether or not it is suited for the contractually stipulated use.

If the BIM model is faulty at the time of acceptance, in other words if its actual properties deviates from the agreed results, then the contractor must rectify this within the statutory limitation periods. The scope of the contractor's rectification obligations primarily depends on which use cases have been defined for the subsequent use of the BIM model. Requirements regarding the model's suitability for the contractually assured use follow from that, and

on that basis also any claims for defects. In view of the ever-improving digital tools available for auditing BIM models, in current practice it is not considered necessary to extend the statutory limitation periods. Whether or not and to what extent subsequent planners are required to check the results of previously involved planners must be contractually regulated as in conventional 2D planning.

A special constellation that frequently arises in practice is when the contractor makes use of special model databases for creating its own models, in other words predefined components or groups of components. As the contractor has accepted overall responsibility for the work, it is also liable if it uses a database without completely checking its contents. However, in view of the fact that, on the one hand, the use of preformulated components can enable both parties to work more efficiently and save time while on the other the contractor cannot realistically check all of a database's contents, the possibility of reducing the contractor's liability should be considered. However, this should be formulated in such a way as to allow the contractor to do so only if it exclusively consults sources known to be reliable and as a minimum performs spot checks to confirm the plausibility of planning decisions taken.

The subject of updates to the BIM model must be separated from the liability issue. After the final acceptance, the contractor is not required to carry out any additional planning work if its original work was free of defects. If it is necessary to update the model after its completion, this must be clearly stated in connection within the scope of the BIM use cases.

6.2 Liability of the overall BIM coordinator and BIM manager

Special considerations are now arising in connection with new roles that have been created for planning with BIM: the overall BIM coordinator, who is typically also the overall planner, and the BIM manager, who monitors contractually compliant execution of the planning process on behalf of the contracting entity. A practical example is provided by the study carried out to clarify fundamental legal issues in connection with the use of BIM in the Gauchachtal Bridge project (attached).

The liability of the individual stakeholders mainly depends on the tasks that are assigned to them. Both roles are meanwhile associated with schedules of services, although these are neither consistently defined nor well-established in the marketplace, making it impossible to speak of accurately fitting job definitions. When commissioning planning work with BIM, it is therefore essential to distinguish the associated schedules of services as precisely as possible.

In the vast majority of cases, the overall BIM coordinator is called upon to coordinate the individual specialist models used. This does not imply, however, responsibility for checking the content of these specialist models. Frequently, this can indirectly result in the overall BIM coordinator being identical with the overall planner, who – for example, in service phase 5 (execution planning) – is responsible for coordinating and integrating the results of other experts involved in the planning work. However, the extent to which this obligation also extends to checking submitted BIM specialist models is unclear. Although there is a general obligation to check them, in the case of 3D models the details of these checks are still largely undefined.

Going forwards, it is recommended that the schedules of services of the overall BIM coordinator and BIM manager should be defined even more precisely.

A clause governing liability between the contracting entity and contractor could read as follows: The contractor's liability is defined by the relevant statutory provisions.

The contractor undertakes to deliver data models that are free of defects. They must meet the requirements of the use cases on which the parties have agreed. To the extent that the contractor integrates third-party data records in the BIM model, they are obliged to check whether the data used is suitable.

The contractor must also process the digital data of other specialists involved in planning and check it for completeness and plausibility before using/ integrating it in planning work.

The contractor has unlimited liability up to the full amount of the liability insurance coverage agreed in the relevant contract and beyond that is only liable in cases of intent, gross negligence or violations of cardinal contractual obligations.

7. Contractual models with BIM: implementation with a focus on cooperative partnership

Contractual models designed to foster collaboration on a partnership basis, such as alliance models, are primarily based on a joint approach that, instead of promoting the frequently conflicting interests of the contracting entity, planners and construction firms, strives to complete the project while minimizing conflicts and involving all major stakeholders from an early stage on terms that are as equitable as possible. The contractual relationship is therefore not – contrary to the usual practice – concluded bilaterally but instead amongst all of the parties involved in the construction project. The executing trades are involved from an early stage, above all so that they can contribute their expertise from the planning phase onwards while, conversely, early participation in the planning work enables the firms that will do the actual construction work to gauge the important aspects of the project.

The contracts underlying these models deviate in diverse ways from the usual contractual models, for example:

- Project management and control are performed by bodies in which the various stakeholders are equally represented and decisions must be made unanimously. Any conflicts are resolved without recourse to courts of law.
- Remuneration of the stakeholders is based on work done during the planning phase, while during the construction phase, it is remunerated on the basis of reimbursing costs incurred, while the participants take a risk in respect of profits and general business expenditures but benefit if

the anticipated costs turn out to be lower than expected.

- Special measures are foreseen to limit liability, for example in connection with particularly innovative work and for planning errors.

In this context, the BIM method can be integrated to particularly great advantage, as models involving multiple parties focus attention on the same goals as those pursued with the BIM planning method. For example, both aim above all at transparent collaboration of the involved parties. Although generally speaking more than one data model is usually worked on within the scope of a ‘closed BIM’ approach, the BIM method is also based on the approach of regularly merging individual models developed by different specialist planners to create a coordinated model, primarily – but not exclusively – in order to identify and eliminate any clashes. The participation of the actual executing construction firms can also be valuable in this context; for example, it appears expedient to involve these, for example, from the start in formulating the BEP so as to avoid the usual delays and interface issues in the planning work that accompanies the project. The possibility could also be considered of sharing responsibility for BIM management and overall BIM coordination on a joint or equal basis or else assigning tasks to individual project stakeholders for them to complete on their own. As in the constellation with project implementation teams (PITs), a BIM implementation team comprising representatives of all of the contracting parties would also be deployed.

Not until a later time, after the initial insights gained from pilot projects have been evaluated, will it be possible to tell whether this will generally alter the roles of BIM manager and overall BIM coordinator. BIM coordination, including monitoring clashes, will presumably continue to be performed by the planners. BIM management, by contrast, could also be performed to a greater extent by the executing construction firms, if these submit their own project catalogues, for example. Where multilateral contracts are concerned, more extensive use of a closed BIM approach is also conceivable.

Going forwards, it is to be hoped that, in view of the enormous opportunities that the BIM method and cooperative partnership approaches offer for implementing construction projects, the envisaged goals can be attained and greater cost stability and adherence to deadlines achieved, especially in large projects.

Annex: Study clarifying fundamental
legal issues in connection with the use
of the BIM method in the Gauchachtal
Bridge project

Düsseldorf, 08.12.2020

BIM Germany - Clarification of legal issues in connection with the Gauchachtal Bridge

**Expertise for clarifying basic legal issues in connection with the use of the BIM method in
the Gauchachtal Bridge project**

for

the Freiburg Regional Commissioner's Office

on behalf of BIM Germany – Centre for the Digital Transformation of Construction

Submitted by

Dr Robert Elixmann, Lawyer
Dominik Gross, LL.M., Lawyer (LSE), Licence en droit

TABLE OF CONTENTS

- 1 SUMMARY
- 2 MANDATE AND ISSUES ADDRESSED BY THE EXPERTISE
- 3 FIRST GROUP OF QUESTIONS: LIMITS OF RESPONSIBILITY AND LIABILITY IN CONNECTION WITH BIM MODELS
- 3.1 QUESTION 1.1: IS IT LEGALLY IMPERATIVE/APPROPRIATE TO STIPULATE A LEVEL OF DEVELOPMENT (LOD) IN THE CASE OF BIM MODELS THAT ARE PROVIDED BY THE CONTRACTING ENTITY AS A BASIS FOR THE CONTRACTOR'S SERVICES?
- 3.2 QUESTION 1.2: SHOULD AN OLD BIM MODEL FROM A PREVIOUS SERVICE PHASE THAT IS KNOWN TO BE INCOMPLETE BE PROVIDED BY CONTRACTING ENTITIES TO BIDDERS TO HELP THEM CALCULATE? WHAT CLAIMS CAN A BIDDER ASSERT ON THE BASIS OF SUCH AN OLD BIM MODEL PROVIDED BY THE CONTRACTING ENTITY IN CONNECTION WITH PROVIDING ITS SERVICES AND THE REQUIRED CREATION OF A BIM MODEL? WHAT LEGAL RISKS EXIST IN THIS REGARD?
- 3.3 QUESTION 1.3: BIM MODELS IN THE CONTEXT OF REVIEW AND APPROVAL PROCEDURES CONDUCTED BY THE CONTRACTING ENTITY: SHOULD BIM MODELS BE REVIEWED IN THE SAME WAY AS THE EXECUTION PLANNING DOCUMENTS? WHO IS LIABLE FOR ERRORS IN A BIM MODEL THAT ARE NOT DETECTED DURING EXAMINATION OF THE BIM MODEL BY THE CONTRACTING ENTITY?
- 3.4 QUESTION 1.4: WHAT IS THE LEGAL STATUS OF 'BIM ROLES' AND WHAT RIGHTS AND CLAIMS CAN BE DERIVED FROM THEM? IN THIS CONTEXT, WHAT SHOULD ONE THINK OF THE PROCEDURAL MODEL OF REFRAINING FROM PRESCRIBING BINDING BIM ROLES IN THE EMPLOYER INFORMATION REQUIREMENTS (EIR) WHILE PROVIDING A MODEL BIM EXECUTION PLAN (BEP) INDICATING WHICH BIM ROLES THE CONTRACTOR SHOULD FILL IN ITS OWN BEP?
- 3.5 QUESTION 1.5: DOES IT MAKE SENSE TO EXPAND THE ROLE OF THE ZTV-ING COORDINATOR TO THAT OF A BIM COORDINATOR?
- 4 SECOND GROUP OF QUESTIONS: ARE SUPPLEMENTARY CLAUSES REQUIRED TO SECURE RIGHTS OF USE TO THE BIM MODELS CREATED BY THE CONTRACTOR?
- 5 THIRD GROUP OF QUESTIONS: PRESCRIBING SOFTWARE PRODUCTS AND PROCUREMENT LAW
- 5.1 QUESTION 3.1: CAN THE USE OF GROUPWARE BE CONSIDERED WHEN EVALUATING BIDS?
- 5.2 QUESTION 3.2: DOES THE CONTRACTOR REMAIN BOUND TO THE SOFTWARE INDICATED IN ITS BID IN THE PRELIMINARY BEP FOR THE REST OF THE TENDER PROCESS AND EXECUTION OF THE CONTRACT, OR CAN IT CHANGE THIS AT A LATER POINT IN TIME?
- 6 FOURTH GROUP OF QUESTIONS: VOB/C-BASED VS. DIGITAL INVOICING.....
- 6.1 QUESTION 1: IN A BIM PROJECT THAT FALLS WITHIN THE SCOPE OF APPLICATION OF THE HANDBOOK FOR THE AWARDING OF CONTRACTS AND THE EXECUTION OF ROAD AND BRIDGE CONSTRUCTION WORKS (HVA B-StB), IS IT IN PRINCIPLE POSSIBLE TO AGREE ON INVOICING CONSTRUCTION SERVICES ON THE BASIS OF QUANTITIES AND MASSES TAKEN FROM BIM MODELS?
- 6.2 QUESTION 2: IS AGREEING TO MODEL-BASED INVOICING OF CONSTRUCTION WORK COMPATIBLE WITH THE ROVISIONS OF HVA B-StB DISCUSSED BELOW, AND IF NOT, HOW WOULD THEY HAVE TO BE MODIFIED?

1 Summary

- (1) If BIM models are to be the basis for a contract, it is legally mandatory to indicate the quality of the BIM models. If BIM models are expressly provided for informational purposes only and have no contractual relevance, the contracting entity may also refrain from making a statement on their quality. As, however, it is ultimately up to the bidders to concern themselves with the BIM models, it is always expedient to describe the quality of the models being provided as precisely as possible.
- (2) If BIM models are the leading source of planning information, it makes sense for BIM models to also be subject to the contracting entities' review and approval procedures. As long as this cannot be implemented, it must be contractually stipulated whether or not and if so by when contractors must prepare and submit conventional planning drawings in addition to BIM models.
- (3) Specifying that the names of contacts for certain BIM roles must be provided is established practice and expedient, although this is not a legal requirement.
- (4) As a rule, there seems to be no point in expanding the role of the ZTV-ING [Additional Technical Terms of Contract and Guidelines for Civil Engineering Works] coordinator to that of a BIM coordinator.
- (5) There is generally no need for supplementary clauses to secure rights of use to prepared BIM models if copyright exploitation clauses like those called for in section 11 of the German General Terms of Contract for Freelance Services in Road and Bridge Construction are agreed.
- (6) If the preliminary BEP previously submitted by the contractor during the procurement procedure becomes part of the contract, the contractor is contractually bound to the services offered in it, including use of the indicated software, and deviations are generally only possible in agreement with the contracting entity. It would be admissible under procurement law to agree on such a deviation.
- (7) The legal options for agreeing with a contractor on model-based invoicing of construction services within the scope of application of Part B of the Contracting Regulations for Public Works (VOB/B) are narrowly delimited by mandatory requirements of procurement law.

- (8) What is more, agreeing on model-based invoicing is only possible if various provisions of the Handbook for the Awarding of Contracts and the Execution of Road and Bridge Construction Works (HVA B-StB) are overridden/disregarded.
- (9) It would be legally unproblematic for the contractual parties to agree on model-based invoicing for advance payments, however.

2 Mandate and issues addressed by the expertise

BIM Germany – Centre for the Digital Transformation of Construction (**BIM Deutschland**) is the German Federal Government’s single point of contact for information and activities related to Building Information Modelling (**BIM**). BIM Germany brings together activities, information and experiences related to the national and international use of BIM. BIM Germany advises the German Federal Ministry of Transport and Digital Infrastructure (**BMVI**) and the German Federal Ministry of the Interior, Building and Community (**BMI**) as well as their subordinate agencies on the use of BIM in construction projects. BIM Germany is run by a consortium that has a framework agreement with the Federal Government and has been separately contracted to provide services on the basis of the framework agreement’s conditions. Kapellmann und Partner Rechtsanwälte (**the lawyers**) also belong to the consortium. This legal expertise was elaborated by the lawyers as a service under the framework agreement funded by the Federal Government but on the basis of an independent relationship with the state of Baden-Wuerttemberg as client.

The background of this expertise is the forthcoming award of the detailed design work and execution, including BIM services, for the realization of the Gauchachtal Bridge to a contractor.

In support of the preparations for awarding this contract, this legal expertise addresses legal issues of general interest for contracting BIM services within the scope of contracting construction services by a public sector contracting entity, specifically within the scope of application of the Handbook for the Awarding of Contracts and the Execution of Road and Bridge Construction Works (**HVA B-StB**).

Questions are answered focussing on what is ‘legally possible’ for the project developer in relation to the contractor. It is not possible to completely and conclusively cover the question as to what is ‘legally permitted’ within the administration, as this is governed by administrative regulations.

3 First group of questions: Limits of responsibility and liability in connection with BIM models

3.1 Question 1.1: Is it legally imperative/appropriate to stipulate a Level of Development (LOD) in the case of BIM models that are provided by the contracting entity as a basis for the contractor's services?

First of all, it is generally **expedient** to specify, using LODs, the planning depth of supplied BIM models. In providing a BIM model, the contracting entity pursues a particular goal, namely to simplify the calculation or subsequent provision of the contracted service by the contractor. For these purposes, it is helpful for the contracting entity to inform the contractor about the nature of provided BIM models so that the latter will know what it is receiving, make use of the value added by the provided BIM models and not simply ignore the models when calculating and working on the project.

This goal is also served if the quality of the provided BIM models is described in the categories of the HOAI service phases. The most widely used approach, however, is to apply 'Level of Development' (LOD) or, as the case may be, 'Level of Geometry' (LoG) and 'Level of Information' (LoI) as the standard.

It is also **legally mandatory** to indicate the planning depth if the provided BIM models define the bindingly agreed planning interface between the planning work provided by the contracting entity and the planning and construction services provided by the contractor, in other words the **BIM models** are to constitute a **binding contractual foundation** and the contractor should base its work on these plans.

As a general rule, a public sector contracting entity awarding contracts for construction work

- may not require bidders to take any unusual risks

(cf. section 7, para. 1, no. 3 of Part A of the Contracting Regulations for Public Works (VOB/A), and

- is required to inform bidders of facts known to it that are relevant to calculation.

By way of example, cf. Düsseldorf Higher Regional Court, resolution VII-Verg 90/11 of 7 November 2011, cited in the Neue Zeitschrift für Baurecht und Vergaberecht 2012, 256.

If the contracting entity specifies BIM models as the basis of its invitation to tender without providing any information on the level of planning detail that the contractor can expect the BIM models to have, in practical terms this is equivalent to burdening the contractor with the risk that this planning work is defective and additional work will be required to repair it, the amount of which cannot be assessed in advance. If the entire invitation to tender is not about the contractor completely replanning the project in the sense of an invitation to bid for the role of general contractor, but if it actually presupposes a defined planning interface between the contracting entity and the contractor, then this approach amounts to a violation of the prohibition on imposing unusual risks as set out in section 7, para. 1, no. 3 of VOB/A.

If the contracting entity conceals deficits in BIM models known to it by not indicating the level of planning detail of the BIM models in the tender documents, it violates its obligation to inform the bidders of facts known to it that are relevant for calculating bids.

If BIM models provided in connection with an invitation to tender are **not intended to have any legal relevance**, with only concurrently provided conventional tender documents being binding for the bidder, this is **legally possible**. In this case, the BIM models must be provided together with an explicit declaration by the contracting entity that the models are provided solely for informational purposes and have no contractual relevance. In such a case, it is also legally possible to refrain from describing BIM models (which lay no claim to being binding in any case) in greater detail.

3.2 Question 1.2: Should an old BIM model from a previous service phase that is known to be incomplete be provided by contracting entities to bidders to help them calculate? What claims can a bidder assert on the basis of such an old BIM model provided by the contracting entity in connection with providing its services and the required creation of a BIM model? What legal risks exist in this regard?

In the light of what was said above, it is legally possible to provide an existing BIM model to the contractor for purely informational purposes while explicitly excluding any contractual relevance. We are unable to assess whether or not this is also expedient. The department of the contractor that is responsible for calculation will probably completely ignore a model that has only been provided for informational purposes and explicitly described as defective. The contractor's planning department may possibly construct a BIM model while directly referring to the bindingly agreed conventional planning work. It is therefore possible that providing a BIM model for purely informational purposes may neither positively influence the contractor's pricing process nor lead to more efficient implementation of the contract nor enable earlier detection of planning errors.

Provided that it is clearly stated in the tender documents that the provided BIM model is included for purely informational purposes, will not constitute part of the contract and is also defective, the bidder is not entitled to any protection on the grounds of legitimate expectations regarding the model's content.

If a BIM model forms part of an invitation to tender and neither its quality nor its legal relevance is explicitly restricted in the tender documents, the contractor may treat the BIM model as a basis for calculation. Errors in the BIM model that lead to a miscalculation, just like mistakes in plans provided as part of an invitation to tender, then justify claims by the contractor to supplementary compensation due to increased planning effort and/or altered or additional construction work.

3.3 Question 1.3: BIM models in the context of review and approval procedures conducted by the contracting entity: Should BIM models be reviewed in the same way as the execution planning documents? Who is liable for errors in a BIM model that are not detected during examination of the BIM model by the contracting entity?

BIM models should be the primary source of planning information for consistently implementing BIM in a project. It follows that BIM models are also subject to review and approval procedures conducted by the contracting entity. Possibilities for digitalization have been provided within the scope of approval procedures. For example, digital signatures may be used as defined in section 3a of the State Administrative Procedures Act (LVwVfG) [Baden-Wuerttemberg]. In the state of Baden-Wuerttemberg, since 2019 it has been possible to conduct the conventional planning permission procedure (not relevant here) with the aid of digitally submitted documents (in written form as defined in section 126 of the German Civil Code) according to section 53, para. 2 of the State Building Regulations of Baden-Wuerttemberg.

However, the use of BIM models in review and approval processes presupposes that the office responsible for performing reviews or issuing approvals is also able to use BIM models for this. The technical departments of some project developers may already be able to do this solely on the basis of BIM models. We are unable to assess, however, whether or not formal administrative procedures for approving plans that involve upstream agencies can also be carried out in practice using BIM models. We are sceptical.

For these reasons, it is still usual in BIM projects to prepare ‘conventional 2D plans’ parallel to BIM models and require contractors to submit 2D plans in addition to the BIM models. If parallel submission of plans as BIM models and 2D plans is required, this should be explicitly stipulated, particularly how often and when the contractor must submit 2D plans prepared in compliance with the relevant guidelines. Generating cross-sections and views from BIM models that satisfy the formal requirements to be met by drawings and plans for the construction of federal trunk roads requires significant amounts of time and effort, and a contractor must take them into account when calculating bids. It is not possible to easily generate them from BIM models simply by clicking with the mouse.

The suggested supplementary contractual terms prepared by the lawyers for BIM projects for federal transport infrastructure construction within the scope of the scientific advice and support commissioned for BIM4INFRA2020 projects contain the following rule on this:

‘To the extent that the contractor is contractually obliged to prepare or update geometric plans as BIM models, at the end of each service phase it shall provide the contracting entity with a BIM model and all planning results of any given service phase, also in conventional form as stipulated in the other contractual documents.’

(BIM4INFRA2020, Toolkits and Guidelines – Part 5, sample of special contractual conditions for BIM (BIM-SCCs), section 3, para. 2, Special Contractual Conditions for applying the BIM method (BIM-SCCs))

The easiest way to implement such an arrangement in the invitation to tender is to incorporate the BIM-SCCs developed by BIM4INFRA2020 (as an annex to the Special Contractual Terms). It would also be conceivable to insert a corresponding clause in the EIR.

The same legal principles apply both to conventional planning and to the contracting entity’s responsibility to check and approve plans based on BIM models. In line with general legal principles, the contractor is not entitled to monitoring of its provision of services. If the contracting entity requests the submission of plans for approval and subsequently approves them, this means only that it has no objections to the use of these plans which have been prepared in the contractor’s own responsibility. The contracting entity does not assume the contractor’s contractual responsibility to prepare technically correct planning documents.

Independently of whether or not a contracting entity approves plans, it has duties towards its contractual partner. Specifically, the contracting entity is obliged to inform the contractor of any identified or at least conspicuous defects in submitted plans and may (only) in these cases not simply watch idly while damage is growing due to continuing planning or construction work on the basis of defective plans.

The contracting entity is therefore not subject to any greater legal obligations in respect of reviewing and approving planning results in the form of BIM models. However, the contracting entity should ensure that its personnel responsible for approving plans possesses the required basic skills for operating viewers or other BIM software to ensure that completely obvious and conspicuous planning errors will be noticed.

3.4 Question 1.4: What is the legal status of ‘BIM roles’ and what rights and claims can be derived from them? In this context, what should one think of the procedural model of refraining from prescribing binding BIM roles in the Employer Information Requirements (EIR) while providing a model BIM execution plan (BEP) indicating which BIM roles the contractor should fill in its own BEP?

A ‘BIM role’ is understood first of all (free of legal interpretations) as a name for a **group of performance obligations** that are typically fulfilled in their entirety by an organizational unit of a project (a firm, a person or a department within a firm). For example, the role of ‘overall BIM coordinator’ is associated with providing services such as creating and updating the BEP, including contributions by other project participants, checking the BIM contributions of the other project participants and creating a coordination model at certain stipulated points in time. Creating and assigning roles can help structure and control the collaborative planning and construction process.

On this, see also Dengler/Elixmann/Petry in: Deutscher Verband für Projektmanagement in der Bau- und Immobilienwirtschaft (DVP), Projektmanagement und Building Information Modeling, Chapter 3, available at: <https://www.dvpev.org/de/dvp-pm-und-bim> (16 November 2020).

It is a very widespread practice in BIM projects to require contractors to fill certain BIM roles with specific individuals. For example, the contractor in charge of coordinating a BIM planning process is frequently required to choose a particular individual for the above-mentioned role of ‘overall BIM coordinator’. Other contractors chosen to prepare BIM models and support the BIM planning process are also required to specify a ‘BIM coordinator’ by name.

This approach has proved its worth. The skills of the employee chosen by the bidder for a particular role enable conclusions to be drawn on the bidder's ability to perform the obligations associated with that role during the bidding phase. In the later course of implementing the contract, the project participants then have a direct contact for the tasks associated with that role while working on the project. Many firms lack sufficient staff with specialized BIM skills. If assignment of the employees presented during the bidding phase to BIM roles is contractually pledged, the contracting entity then has at least some legal leverage in hand for taking legal action if the BIM roles are not filled as promised or if the assigned staff are withdrawn in the middle of the project.

However, it is not legally required but merely **a matter of expediency** whether a contracting entity prescribes BIM roles, asks to meet specific staff members for filling them during the bidding phase and then contractually requires that the roles must be filled with individuals in managerial capacities.

- The performance obligations associated with the BIM role can also be specified in the EIR as **abstract obligations**, separately from the contractor's staff structure.
- It is possible to specify in the EIR that certain BIM roles should be filled with particular individuals for implementing the contract, although their identities will not be revealed until **after conclusion of the contract in a BEP drawn up at the start of the project**. It should be kept in mind that it has hitherto not been standard practice in road construction to designate certain management personnel by name in the contract. The organization and structuring of personnel can be left to the discretion of the entrepreneur following the example of work and services contracts.

If, as touched on in the answer to question 1.4, there is no intention to fill certain BIM roles with named individuals during the bidding phase while specifying in the EIR that the individuals for filling BIM roles are to be designated in the BEP, this is an appropriate approach.

- This approach makes it possible to get an idea of the contractor's organizational structure during the implementation of the contract and find specific contacts for BIM.

- On the other hand, the contracting entity sacrifices the ability to check and evaluate the bidder's BIM competencies on the basis of the personnel presented for filling BIM roles during the tender process and contractually secure this personnel for the execution of the project.
- The last-mentioned drawbacks are offset by two benefits. One is that this type of tender avoids excessively restricting the bidder in terms of performance pledges and future deployment of personnel during the bidding stage. The other is that difficult issues can be avoided in connection with evaluation of the presented personnel.

3.5 Question 1.5: Does it make sense to expand the role of the ZTV-ING coordinator to that of a BIM coordinator?

No, it does not make sense.

According to part 1, section 2, no. 1.2, paragraph (9) of the ZTV-ING (Additional technical Terms of Contract and Guidelines for Civil Engineering Works), the ZTV-ING coordinator

'is an engineer to be designated by the contractor who is responsible for coordinating the structural and construction-related work and, vis-à-vis the contracting entity, is responsible for the contractually compliant, technically correct, punctual and complete preparation of the execution documents.'

The ZTV-ING coordinator is thus the contracting entity's main contact for ensuring contractually compliant preparation of the execution documents.

The BIM coordinator is usually the contracting entity's principal contact for ensuring contractually compliant preparation of BIM models, but only as regards data structuring and implementation of BIM use cases. It is about meeting requirements from EIR, fleshed out in the BEP. BIM models must comply with the modelling specifications of the EIR, be neatly modelled in line with general BIM modelling standards and implement the BIM use cases specified in the EIR. The BIM coordinator is not responsible for the technical and content-related quality of the BIM models, however. The BIM coordinator is an expert in creating BIM models but not necessarily for civil engineering.

The ultimate aim of BIM modelling is to support the planning process. BIM is another (better) way to visualize and design plans that makes it possible to structure and assess them better and link them with other planning approaches. But BIM modelling does not alter the fact that mastering the task of planning still calls for appropriate engineering expertise.

Due to the differing orientations of the roles of ‘ZTV-ING coordinator’ (focusing on technical content) and ‘BIM coordinator’ (focussing on technical form), it is not usually expedient to combine them. Generally, persons that assume the above-mentioned roles will have different skills. A ZTV-ING coordinator also plays a key role in ensuring flawless execution of construction work. It runs contrary to the purpose of distinguishing and filling different BIM roles if they are merged in the main individual responsible for project execution. The point of defining roles and contacts is to differentiate between tasks and structure processes.

4 Second group of questions: Are supplementary clauses required to secure rights of use to the BIM models created by the contractor?

As a general rule, when concurrently contracting planning services (here: execution planning services) and construction services, as a precaution it is advisable to agree on contractual clauses that guarantee the contracting entity’s rights to use any work done by the contractor that is protected by copyright. Part B of the Contracting Regulations for Public Works (VOB/B), which applies to public works, does not provide for such rights of use to be granted to contracting entities. The opposite is true: it clearly states – in section 3, para. 6, no. 1 – that documents of the contractor may only be used with its permission for any purpose that does not directly arise from the contract. This enables the use of documents prepared by the contractor for executing the specific construction work involved and monitoring this construction work, but does not grant any additional rights. Section 3, para. 6, no. 1 VOB/B does not make any distinction based on whether or not the contractor’s documents involve copyrighted content.

Havers, in: Kapellmann/Messerschmidt, VOB, 7th edition, 2020, section 3, marginal 60, VOB/B.

Here, too, the term ‘documents’ will have to be interpreted broadly and in a functional sense, thus covering all planning tools required by the contractor to perform its services.

Havers, in: Kapellmann/Messerschmidt, VOB, 7th edition, 2020, section 3, marginal 19, VOB/B.

It follows that ‘documents’ in the sense of section 3 VOB/B can also be BIM models.

Consequently, supplementary provisions going beyond the VOB/B are needed to secure for the contracting entity rights to use the contractor’s planning results, including BIM models. Against the background of section 3, para. 6, no. 1 of VOB/B, here it is not only about using copyrighted work results of the contractor but quite generally about all further use of the contractor’s work results.

To legally protect the contracting entity, it is sufficient to agree on a rights of use clause in the tender documents like that in section 11 of the German General Terms of Contract for Freelance Services in Road and Bridge Construction (**AVB F-StB**):

(1) The contracting entity may use and alter the documents for the work named in the contract without the contractor’s involvement. The contractor hereby transfers the sole right of use to the contractor’s copyrighted services and work results to the contracting entity.

(2) The contracting entity also has the right to edit, reproduce and modify, in whole or in part, the services and work results insofar as this is not associated with any distortion of the work and is reasonable for the contractor while duly considering its interests as author and proprietor.

(3) [...]

(4) The contracting entity is entitled to transfer its rights as per paragraphs 1 through 3 to third parties in whole or in part, to have third parties perform and execute them and to grant additional rights of use to third parties.

In the expertise ‘Arbeitspaket 3.2 – Vorschläge für die Vertragsgestaltung’ (Work Package 3.2 – Suggestions for Designing Contracts) of BIM4INFRA2020 (viewable in German at <https://bim4infra.de/>), it is noted that while the above-mentioned clause on rights of use is sufficient in principle, this very generalised and quite broadly formulated granting of rights of use according to section 11 AVB F-StB suffers from a certain residual risk of jurisprudence considering it to be too unspecific and therefore non-transparent. To safeguard the granting of copyrights, a supplementary copyright clause has been proposed in ‘Toolkits, Part 5, Sample of special contractual conditions for BIM (BIM-SCCs)’, which addresses the specific ways in which BIM models can be used and very explicitly establishes the rights of use that are needed in these cases:

‘The provisions in this contract on granting and transferring copyrights and other rights of use also apply to BIM models and other data created by the contractor. In particular, the contracting entity is authorized to use the data created by the contractor for further planning and execution of the construction project as well as for operating, converting and dismantling it, also without the latter’s participation. For these purposes, the data may also be updated or otherwise edited. The contracting entity can transfer these rights to third parties. Gross distortions are excepted.’

Also when contracting construction work involving BIM services, it is recommended to incorporate all of the Special Contractual Conditions for BIM (BIM-BVB) except section 1, which is only relevant to the applications covered by the HVA F-StB Handbook. A careful comparison with the EIR must always be carried out to avoid contradictions.

5 Third group of questions: Prescribing software products and procurement law

5.1 Question 3.1: Can the use of groupware be considered when evaluating bids?

The use of certain groupware can also be considered for evaluating a contractor’s bid. Alongside a price-based competition, public sector contracting entities are basically free to also consider quality criteria for choosing a contractor. Procurement law does not prescribe a limited catalogue of performance criteria.

Fandrey, in: Eschenbruch/Leupertz, BIM und Recht, 2nd edition, 2019, chapter 11, marginal 51.

It is merely necessary for the selected criteria to be objectively relevant to the subject of the contract (section 127, para. 3 of the German Act against Restraints on Competition). It is not difficult to meet this requirement when assessing a specific groupware, thus allowing it to be included in the evaluation. However, it must be clarified on a case-by-case basis whether it is appropriate for the contractor to provide the groupware. This is more likely if the groupware concerned supports specific BIM use cases. If, conversely, it is about providing a comprehensive cooperative platform in the sense of a project platform, then in the interests of data sovereignty in the project it is more likely that this key technology should be provided by the contracting entity.

5.2 Question 3.2: Does the contractor remain bound to the software indicated in its bid in the preliminary BEP for the rest of the tender process and execution of the contract, or can it change this at a later point in time?

If the preliminary BEP is included in the contract (which we assume, as it would otherwise make little sense to request it), then the contractor is contractually bound to provide the corresponding services, including use of the indicated software. This means that the contracting entity can insist that the offered software actually be used. It can only be changed by mutual agreement with the contracting entity. This means that if the contractor wishes to make a change, it has to reach an agreement by convincing the contracting entity that it makes sense to use the other software. Changing the software used would constitute a change to the contract, but an uncritical one in terms of procurement law due to its minor importance.

In terms of procurement law, it is up to the contracting entity to evaluate a preliminary BEP requested from the bidders. It would be possible for it to define differentiating substantive criteria and attach significant weight to the preliminary BEP in the sense of a quality competition when deciding who to award the contract to. However, experience has shown that this approach involves a major effort and difficult valuations on the part of the contracting entity. It would also be conceivable to leave the preliminary BEP out of the evaluation while nevertheless requesting and roughly reviewing it along the lines of a plausibility check.

6 Fourth group of questions: VOB/C-based vs. digital invoicing

6.1 Question 1: In a BIM project that falls within the scope of application of the Handbook for the Awarding of Contracts and the Execution of Road and Bridge Construction Works (HVA B-StB), is it in principle possible to agree on invoicing construction services on the basis of quantities and masses taken from BIM models?

As far as we know at this time, software for tendering, contracting and invoicing construction work already exists that is able to take quantities and masses from BIM models and convert the exact target quantities into VOB/C-compliantly calculated quantities (in other words, precisely calculated geometric volumes based on three-dimensional objects in the BIM model). However, we do not know whether software is also available that applies all of the invoicing rules relevant to bridge construction. If the invoicing software used is able to derive quantities and masses from BIM models while fully following the current sets of rules for invoicing construction work, it merely provides better technical support for invoicing construction work in compliance with existing rules. There is no need to alter the valid invoicing rules in order to use software of this kind. The contractor can be required, within the scope of the EIR, to carry out a model-based invoicing on this basis. The contracting entity would then have the data needed to receive and pay out invoices in line with the existing sets of rules.

However, 'model-based invoicing' can also mean that precise target quantities are taken from BIM models in 'unaltered' form and used as a basis for invoicing while disregarding the applicable regulations with their rounding, approximation and other simplification rules for the invoicing of construction services. Model-based invoicing in this sense is addressed in the following.

The legal options for agreeing with a contractor on model-based invoicing of construction services within the scope of application of Part B of the Contracting Regulations for Public Works (VOB/B) are narrowly delimited by mandatory requirements of procurement law.

What is more, agreeing on model-based invoicing is only possible if various provisions of the Handbook for the Awarding of Contracts and the Execution of Road and Bridge Construction Works (HVA B-StB) are overridden/disregarded.

It would be legally unproblematic for the contractual parties to agree on model-based invoicing for advance payments, however.

6.1.1 Limitations under procurement law on agreements for model-based invoicing

Under procurement law, public tenders, according to section 8a, para. 1 VOB/A, must be based on VOB/B as well as on VOB/C. Section 8a, para. 1 of VOB/A stipulates that:

‘It must be prescribed in the tender documents that Part B (VOB/B) and Part C (VOB/C) of the Contracting Regulations for Public Works will constitute parts of the concluded contract.’

As a general rule, VOB/B and VOB/C must also be integrated unchanged in accordance with section 8a, para. 2 of VOB/A. As we know, VOB/C is a collection of 66 individual DIN standards regulating different trades, one of which is DIN 18299 (General Rules Applying to All Types of Construction Work). Part 5 of each standard contains invoicing rules.

For VOB/C and thus also the invoicing rules contained in Part 5 of the corresponding General Technical Terms of Contract (ATV), section 8a, para. 3, second and third sentence of VOB/A stipulates that:

‘Contracting entities that regularly contract construction work may supplement them with Additional Technical Terms of Contract corresponding to their generally given circumstances. The contract specifications are to be supplemented and modified to meet the requirements of individual cases.’

Deviations from VOB/C in the form of Additional Technical Terms of Contract (ZTVB) are consequently **inadmissible under procurement law**. **‘Supplements’** are possible, however, as VOB/C basically must continue to apply unchanged.

Especially where the DIN standards called for by VOB/C are still incomplete – a case in point is bridge construction – Additional Technical Terms of Contract are necessary and therefore permissible.

Von Rintelen, in: Kapellmann/Messerschmidt, commentary on VOB Parts A/B, 7th edition 2020, Section 8a VOB/A, marginal 20; Bauer, in: HRR/Heiermann, VOB/A, Section 8, marginal 49.

No specific ATV for bridge construction currently exists alongside DIN 18299, which has the character of a generalised blanket clause. In principle this leaves a certain range of applications to which supplementary terms could be applied, which is broader in the case of bridge construction, for example, than in that of building construction. However, Part 5 of DIN 18299 already contains the following general invoicing clause:

'The work is to be determined on the basis of drawings, to the extent that the work done corresponds to these drawings. If no such drawings exist, the work must be measured.'

DIN 18299 does not cover model-based invoicing. Instead, it calls for work to be determined on the basis of 'drawings'. If no binding drawings exist for a BIM project, it could be argued that sentence 2 of the provision then applies, according to which the work is to be measured, which might be done in the form of 'digital measurements', although this would be a generous interpretation of the wording and vulnerable to corresponding legal risks if a bidder complained that Part 5 of DIN 18299 has been violated. The same applies if the meaning of 'drawing' is interpreted more broadly to also include BIM models.

In other words, assuming that stretching the wording in this way does not constitute a violation of DIN 18299, at least in the case of bridge construction there is leeway for defining model-based invoicing rules to fill the gap left by the lack of General Technical Terms of Contract.

When cautiously interpreting DIN 18299, model-based invoicing violates these General Technical Terms of Contract, so that strictly speaking it constitutes an impermissible deviation under procurement law.

While ZTV-ING, Part 4: Steel Construction, Composite Steel Construction, section 1 Steel Construction, no. 1, paragraph 8 also allows for the use of other methods besides VOB/C for invoicing, it should be kept in mind that ZTV-ING itself only constitute supplementary technical terms of contract that, because they lack the character of a legal norm, rank lower than VOB/C in terms of procurement law. Following ZTV-ING therefore does not guarantee that an invitation to tender will comply with procurement law.

6.1.2 Possibilities for agreeing on model-based invoicing within the scope of application of HVA B-StB

Various parts of HVA B-StB are incompatible with model-based invoicing of construction work. As these do not constitute mandatory requirements under procurement law, being instead merely administrative rules that a public entity must comply with vis-à-vis other government bodies when issuing an invitation to tender, in a BIM project it is legally permissible to apply provisions that deviate from those of HVA B-StB.

When seeking to contractually stipulate model-based invoicing, it is necessary to ensure that the invoicing rules are clear and understandable. The invoicing rules must adhere to the strict requirements for General Conditions of Business as per sections 305 ff. of the German Civil Code, because otherwise the contracting entity could be accused – even if the rules have originally been drawn up for a BIM pilot project – of also wanting to use the clauses in subsequent projects in the event that the pilot BIM project is successfully implemented, thus constituting an intention to reuse the clauses multiple times.

This means that, in the sense of section 305c, para. 1 of the German Civil Code, any agreement on (partially?) model-based invoicing must in any case not come as a surprise to the contractor. This would be the case if it significantly deviated from the other contracting party's expectations, so under the circumstances they do not need to consider this possibility.

German Federal Court of Justice, decision of 18 May 1995, IX ZR 108/94, NJW 1995, 2553.

This might already be satisfied by describing in detail in the Special Contractual Conditions concluded with the contractor not only use of the BIM method but also its consequences for invoicing.

In addition, clauses on invoicing must measure up to the standard of the review of subject matter. According to section 307, para. 1 of the German Civil Code, General Conditions of Business are ineffective if, contrary to the requirement of good faith, they unreasonably disadvantage the party contracting with the user. Section 307, para. 2, no. 1 of the German Civil Code further states that an unreasonable disadvantage is to be assumed to exist if a provision is not compatible with essential principles of the statutory provision from which it deviates. Agreeing on an invoicing method that deviates from the approximations and overall measurements of VOB/C will specifically not deviate from the legal standard but instead actually help to assert it. VOB/C itself does not have the force of law, constituting instead a General Condition of Business, the effectiveness of which is also called into doubt in the literature against the background of section 307 of the German Civil Code.

Kaiser/Leesmeister, Introduction to VOB/C, p. 45 f., marginal 134 on the effectiveness of section 5 of DIN 18300 (earthworks)

If, however, model-based invoicing makes it possible to determine quantities more precisely, then the contractor – in the standard price contract – should be paid for exactly the quantity that was executed. An unreasonable disadvantage is therefore not to be expected when applying a more precise invoicing method.

6.1.3 Model-based invoicing as the basis for payment of partial invoices

In terms of contract law, it is unproblematic to specify that partial invoices should be paid based on a BIM model. This invoicing mode could also be offered to a contractor after concluding the contract. For example, it could be made attractive to a contractor by agreeing to particularly quick checking of invoices. Another advantage of model-based partial payments could be that it is easier for the contractor to prove vis-à-vis the contracting entity the progress made.

Agreement to model-based invoicing of partial invoices is not likely to run contrary to VOB/B. According to section 14, para. 1, sentence 2 of VOB/B, for invoicing purposes it is only necessary to include ‘calculations of quantities, drawings and other documents required to demonstrate the type and scope of work done.’ BIM models could be interpreted as ‘other documents’. Moreover, only the ‘required’ documents need to be submitted, in other words documents in the sense of conventional documents could be left out entirely if the amount of work done is sufficiently clear with model-based invoicing.

According to court decisions, the payment of a partial invoice does not imply acknowledgement by the contracting entity of the status of work on which the partial payment is based, and the contractor retains – until the work done has been accepted – the burden of proof for its performance. This also applies to the process by which the contracting entity demands back excessive partial payments.

German Federal Court of Justice, decision of 11 February 1999 – VII ZR 399/97, NJW 1999, 1807 60.

For the final invoice, the conventional invoicing documentation could still be requested, with model-based invoicing constituting a simplified solution for use during an ongoing project. In this context, model-based invoicing can be implemented by both parties on a voluntary basis without requiring any contractual arrangements. Both parties would then be free to return to a contractually compliant ‘conventional’ invoicing mode at any time.

6.2 Question 2: Is agreeing to model-based invoicing of construction work compatible with the provisions of HVA B-StB discussed below, and if not, how would they have to be modified?

6.2.1 Section 1.3 (Special Conditions of Contract), para. 26: Invoicing with IT systems may be neither excluded nor made mandatory.

Model-based invoicing necessarily presupposes the use of computers with appropriate BIM software and therefore the use of IT systems. Consequently, the use of IT systems would have to be obligatory for model-based invoicing.

6.2.2 Section 1.4 (Contract Specifications), para. 17: The essential prerequisite for compiling a bill of quantities is correct and verifiable quantity take-offs. This must be done for all service items while applying the Rules on Electronic Invoicing of Construction Work (REB).

As far as we know, the Rules on Electronic Invoicing of Construction Work (REB) involve simplifications for determining quantities and masses and therefore provide results different from model-based quantity take-off.

It should therefore be clearly stated in agreements on model-based quantity take-off that section 1.4, para. 17 HVA B-StB will not be applied.

6.2.3 Section 3.2 (Invoicing), para. 4: The only documents to be recognized as the basis for the records of achievement are – [...] documents recognized by the contracting entity and contractor (e.g. execution drawings, part lists) that contain all information required for invoicing – [...] joint documentation (dimensions, hourly wage slips) and other records of achievement (e.g. weighing and delivery notes)

Ultimately, section 3.2, para. 4 of HVA B-StB repeats Part 5 of DIN 18299, according to which invoicing of work done as a rule should take place by making measurements using plans or, if this is not possible, directly on-site. BIM models are not mentioned there. Model-based invoicing thus deviates from this rule.

It should therefore be clarified in agreements on model-based quantity take-off that section 3.2, para. 4 of HVA B-StB is not applicable.

6.2.4 Section 3.2, para. 8: Measurements [...] bindingly establish the facts and become official documents by being signed.

This rule only very generally sheds more light on the legal consequences of signed measurement sheets and is not in opposition to model-based invoicing. Like in the past, with quantities for invoicing purposes being established using both planning documents and on-site measurements, this will also continue to be the case with model-based invoicing, especially when the construction work done deviates from the planning done in the BIM model.

6.2.5 Section 3.2, para. 36: If no disadvantages for the contracting entity are apparent, the data as built are taken as the basis for invoicing without remunerating additional work.

The provisions of section 3.2, paragraphs 34-36 of HVA B-StB address in general terms drawing-based invoicing ('planned construction') and how to deal with deviating real-world quantities ('actual construction'). Paragraph 34 explicitly addresses 'drawings'. Consequently, the provisions do not quite fit to model-based invoicing. The issue that planning quantities deviate from what is actually identified at the construction site arises in the same way with both model-based invoicing and conventional drawing-based measurements.

In the event that model-based quantity take-off is agreed, it would therefore be necessary to clarify that the provisions of section 3.2, paragraphs 34-36 apply analogously to the discrepancy between model-based invoicing (data as planned) and values measured on site (data as built).



Dr. Robert Elixmann
Lawyer



Dominik Gros, LL.M. (LSE)
Lawyer

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Invalidenstrasse 44
10115 Berlin

Authors

Andreas Meister (BMVI, Division StB 27)
Dominik Gross LL.M. (LSE) (BIM Germany)
Attorney Lisa Mathias (BIM.Hamburg)

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