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Legal aspects of Building Information Modelling: The 'Dutch approach' – An overview

dr. E.M. (Evelien) Bruggeman[1]

1 Introduction

This short article is about the legal aspects of Building information Modelling and the Dutch approach of this subject. But what is the Dutch approach? Can it be characterized in one word or a sentence? I am afraid not. In this article I will elaborate on both the practical aspects of BIM (how do we, the Dutch, use BIM), as well as the legal side of BIM.

First I will discuss a number of subjects regarding the use of BIM, and a number of BIM initiatives and approaches of the legal aspects of BIM in the Netherlands, in order to explain 'the Dutch Approach' (par. 2). Second, I will elaborate on the legal documents (par. 3). Finally, par. 4 and 5 will contain some thoughts on the future of BIM (from a legal perspective) as well as the future of the legal aspects of BIM and concluding remarks

2 What is the Dutch approach?

Maybe BIM in the Netherlands *can* be described in one word: diverse. There is no uniform way in which the Dutch use or approach BIM. BIM is used in a large variety of ways and with different purposes.

There are various ways to approach the subject of BIM, various ways of working with BIM and various ways to deal with the many legal aspects surrounding working with BIM. Like Miettinnen and Paavola summarized it years ago[2]:

> *'There is no single satisfactory definition of what building information modeling (BIM) is. Rather, it needs to be analyzed as a multidimensional, historically evolving, complex phenomenon.'*

In my opinion the Dutch excel in using a wide variety of forms of BIM, and BIM and its uses are evolving rapidly in the Netherlands. Nevertheless, I will set out the characteristics of the way in which the Netherlands, or the Dutch, have dealt and still deal with BIM. I my opinion understanding of the practical aspects of BIM is key in understanding the legal ones.

In this paragraph I will elaborate on the practical aspects of BIM: how do the Dutch approach BIM at the moment (par. 2.1) and what the major technical characteristics of the forms of BIM used in the Netherlands are (par. 2.2). Finally, I will discuss who the major players regarding BIM are and the once who will shape the future of BIM in the Netherlands in an important way (par. 2.3).

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[1] Director at the Dutch Institute of Construction Law (www.ibr.nl)

[2] Miettinnen & Paavola, 'Beyond the BIM Utopia: Approaches to the development and implementation of building information modeling', Automation in construction 43 (2014), p. 84-91.

2.1 Practical aspects of BIM

2.1.1 No top down approach

As said, implementation of BIM in the Netherlands is done in a variety of ways. This stems from the fact that there is no top down approach to BIM. The use of BIM or procurement of BIM is not in any way made mandatory by law or policy in the Netherlands. In fact, there even is no (central) government policy or guidline regarding BIM.

Defining this approach as a bottom up approach would be inaccurate, since a number of public authorities are demanding BIM in procurement, or at least at this point exploring the ways in which they wish to use and procure BIM. But there are different forces working the BIM field (so to speak) in the Netherlands, compared to the situation in the UK and the Digital Built Britain Initiative from 2015.[3]

2.1.2 Diversity in the uses of and demands for BIM

There are different uses of BIM and different demands regarding BIM, different ways of collaborating and different ways of procuring and contracting BIM.

People are working on and with BIM as a design tool, a tool to optimize the design process and to make people in the design phase work together more efficiently. The focus in those cases is on what I call 'classic' BIM models, 3D representations of the design. Those models and the extent in which those models are developed and how detailed they are, can vary greatly.

But BIM is also used differently, as a tool for asset management and maintenance. The ways in which BIM is used in those cases is fairly different. In this case, the focus is on other forms of BIM than the classic BIM model, simplified BIM-models containing only the necessary information are used. It is only about information necessary for said asset management and maintenance, and the focus is on linked data or just plain data. In a lot of cases the BIM model is only a means to connect data about the object.

Finally, BIM is used in an variety of collaborative an contractual forms; by means of bilateral or multilateral contracts.[4]

2.1.3 Learning by doing

The way in which of the Dutch approach the difficult subject of BIM could also be described by using the terms 'learning by doing'. The people exploring the possibilities of working with BIM, or people already actually working with BIM and organisations procuring BIM are not afraid to explore the unknown. Especially some government authorities and housing associations are willing to take a chance and are in some cases already fairly advanced in implementing BIM into their systems. Organisations are willing to look into the possibilities of using BIM, in adjusting BIM to their or their organisation's needs, and to just *start* with using BIM. Also, we did not have some discussions going on, contrary to what I have heard in Germany and Austria, about the question whether or not BIM and the demand for BIM in itself is discriminatory.

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[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/410096/bis-15-155-digital-built-britain-level-3-strategy.pdf

[4] And by using DBB (e.g. UAV 2012), D&B (e.g. UAV-GC 2005) or DBFMO contracts and the general terms used for architects an engineers (DNR 2012, translated as The New Rules 2012).

Although most contracting authorities and other employers are reflecting upon and thinking through their BIM requirements and are careful to make sure their demands comply with procurement laws, the Dutch, also do not seem to have any fear that demanding BIM in a procurement situation will lead to legal proceedings. On the contrary, we already have a couple of interesting cases available which feature BIM. Although we have not yet our own Trant v MottMacDonald[5], which was a case solely on the use of BIM and the CDE, we do have some case law examples which feature BIM in a 'supporting role'.[6]

2.2 Technical aspects of BIM

Besides the more policy related, or lack of policy related issues described above, there are some more technical BIM characteristics to take into account when talking about the legal aspects of BIM.

2.2.1 Focus on data instead of models

One of the main characteristics of BIM in the Netherlands is the focus on BIM data instead of BIM models. Especially by larger contracting authorities or those employers focusing on BIM as a tool for asset management and maintenance. Demanding this specific form of BIM, influences the content of, for example, an EIR. More on that subject later on.

In the past (and probably still today in some cases), the lack of experience in using BIM and the lack of knowledge about its potential, often resulted in a too elaborate BIM-model, or a model which was impossible to use for the employer (because of its size and the software used) or difficult to use because of the abundance of information available in the model. Nowadays, most contracting authorities recognise the potential of BIM, and more accurately of a fitting BIM, and are more selective in formulating their BIM requirements.

2.2.2 No central BIM

However, if the Dutch work with models, for example during the design phase, they do not, in my experience, work with or in a so called central BIM model. In the past this way of collaboration within BIM, was seen as the perfect way to integrate the work of all BIM-participants. However, in the Netherlands, the use of a central BIM model has never really caught on. If parties work together during the design phase of a construction project, most of the time they work in their own, so called aspect or reference models. Periodically, during predetermined moments in the design process, those aspects models or reference models are incorporated into one (so called) view model or coordination model. In this model, progress of the different actors can be compared and design choices can be adjusted and fine-tuned. During those clash (control) sessions faults or flaws can be detected and all parties involved can work on solving the problems between the different designs and models of the different parties working on the design. This process of 'uploading' models or versions,

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[5] The English Technology and Construction Court (TCC) Trant Engineering Limited vs Mott MacDonald Ltd [2017] EWHC 2061 (TCC).

[6] An overview in Dutch in the digital newsletter of the Institute for Construction Law (IBR), The Hague: Redactioneel: 'Jurisprudentie van de overheidsrechter betreffende BIM', Actualiteiten Bouwrecht, 6 februari 2018, Redactioneel: 'Jurisprudentie Raad van Arbitrage betreffende BIM', Actualiteiten Bouwrecht, 9 januari 2018.

instead of working in one central model or database, is also of influence on the (way in which we) use of the Common Data Environment (CDE) in the Netherlands.

2.2.3 Use of open standards

Furthermore, as is also the case in a large number of European countries, the focus is on the use of Open BIM standards.[7] Naturally, contracting authorities do not demand the use of certain types or brands of software, they focus on open standards and compatibility of the BIM data and models with those standards.
The exception to this rule can be found in those cases where BIM is solely used as a design tool and designing parties, the architect and the different engineers work together by using (often the same brand of) software. The recent development of a new EIR[8], aiming at defining the BIM needs of the contractor, shows that this also is disappearing: this EIR is also focussing on open standards and not on software.[9]

2.3 Major players in the field

When it comes to the major players in the field I think we can distinguish three types of players: first of all the large contracting authorities and second, the non-profit organisation BIM Loket (translated: 'BIM Counter or 'BIM Information Desk'). But maybe the most important driving forces in the Netherlands are the (often very young) individuals working within the organisations, at contracting authorities, at other employers, at architects offices and at contractors, willing to explore the possibilities and benefits of BIM. The driving force of those BIM enthusiasts can, in my opinion, not be underestimated. They, for example, worked together to draft the Dutch BIM Basic EIR.[10] I will discuss the other two major players in the following paragraphs.

2.3.1 Large contracting authorities

Most large contracting authorities use BIM as a tool for asset management and maintenance and therefore their BIM demands are different from those usually seen when BIM is used as a design tool or as a tool for collaboration. Those contracting authorities use detailed EIR's to state their BIM Requirements, stating exactly what kind of data they want, how they want it and when (more on that below).[11]

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[7] See for example: Rizal Sebastian (2011), 'Changing roles of architects, engineers and builders through BIM application in healthcare Building Projects in the Netherlands', Engineering, Construction and Architectural Management, Vol 18 Iss. 2, p. 181-182,

[8] ILS O&E, par. 3.1.4.

[9] ILS O&E, par 3.1.4.

[10] They, for example, worked together to draft the Dutch BIM Basis ILS (BIM basic EIR or Basic IDM see more in English here: https://www.bimloket.nl/BIMbasicIDM.

[11] See for example RVB BIM Norm versie 1.1 van 1 februari 2013 and EIR Rijkswaterstaat: Annex 5: ILS bij de DBFM Overeenkomst - Bijlage 9 deel 3 DBFM Management Specificaties versie 1.2_3 d.d. 1 juli 2016.

Rijkswaterstaat [12] has developed its own BIM tools such as an object type library (OTL), a database[13] and a BIM data room.[14] In the OTL, thousands of structures and their separate building parts are defined, for example bridges are first defined, for example cable-stayed bridge, suspension bridge, draw bridge etc., and then split up into or built up from several other objects, ranging from for example piers or foundation pieces, to lamp posts and other smaller objects. The objects are used to match information, such as material, supplier etc. The OTL is a template which sorts the information about the objects. The contractor transports the information into the database (a form of CDE) maintained by Rijkswaterstaat (called CMDB) by using the open standard COINS. Rijkswaterstaat uses its own database, not accessible for the contractor, but it provides instructions for contractors regarding the technical requirements for the BIM database maintained by the contractor. The Contractor transfers his BIM model or BIM data from his database (CMDB-ON) to the database from Rijkswaterstaat (CMDB-OG).[15]

Rijkswaterstaat has developed a standard EIR describing in detail which digital information must be handed over by the contractor and in which format. The requirements include general aspects of information deliverance (such as file formats, classification, structures and applicable standards) and requirements regarding the delivery of information packages, the process of delivery, the quality of the information, and the use of open standards. Furthermore, the EIR requires several data drops throughout the life cycle of the contract, whether it is during the construction or during maintenance. The EIR only contains information about the digital objects, it does not contain specifications about contract management or project management. After the tender stage, the EIR is an annex to the contract.[16]

The Province of Gelderland is following the Rijkswaterstaat approach, but amends it to its own need. There are also initiatives at this point to follow a more uniform approach for infrastructure projects on a provincial level and to design a 'uniform provincial EIR'. Although not all parties are in the same stage regarding the implementation of BIM as a tool for asset management, and it is already clear that the uniformity of the approach will be limited because of the different (information) needs and the vast diversity of IT-systems the provinces use, it does make clear that the provinces are aware of the necessity of BIM, or at least of the use of

[12] More on the BIM Rijkswaterstaat developed: Handbook for the introduction of Building information Modelling by the European Public Sector", EU BIM Task Group, 2017. Also: E.M. Bruggeman, Legal aspects of Building Information Modelling (BIM) in the Netherlands: the procurement of a work with a BIM component – Part 1 & Part 2, Construction Law International (13) 2018/2, p. 40-50 and Construction Law International (13) 2019/4, p. 56-64.

[13] Configuratie Management database, CMDB. This is their own database, not accessible for the contractor. Rijkswaterstaat provides instructions for contractors regarding the technical requirements for the BIM database maintained by the contractor. The Contractor transfers his BIM model or BIM data from his database (CMDB-ON) to the database from Rijkswaterstaat (CMDB-OG).

[14] In some cases in the tender stage a BIM data room is used to deliver the information required to make a bid in digital format.

[15] So also in this case, no central BIM model on shared CDE is used. Models and data are uploaded or sent to one another and versions can be easily identified.

[16] More on this EIR in Dutch: E.M. Bruggeman, Het aanbesteden van een opdracht met een BIM-component. Deel 1: Inleiding en de vraagspecificatie, TBR 2018/16

data, for asset management, maintenance and also for the procurement of maintenance works on infrastructure projects in the future.

2.3.2 The role of the Dutch BIM Loket

The BIM Loket Foundation was established in 2015 and is an initiative of a number of organisations active in BIM.[17] The most important reason for establishing the BIM Loket is to encourage the implementation of BIM in the Dutch construction sector, by promoting the use of open BIM standards.[18] The Dutch BIM Loket is the central point of contact for information about open BIM standards in the Netherlands. The management of these standards is gradually being transferred to the BIM Loket and the BIM Loket connects the relevant organizations in the Netherlands and coordinates and strengthens the mutual connection, both nationally and internationally. It is an independent, non-profit foundation and an important driving force in the development of BIM.

3 Legal documents on BIM in the Netherlands

Because of the 'learning by doing' mentality, the lack of central coordination of the BIM efforts, and, as it has been said by others, the lack of a standard or guideline like the British BS 1192 standards, the Dutch developed a vast number of BIM related documents with legal status. There are numerous BIM Protocols, BIM Execution plans and BIM EIR's available.

Conversely, I can be very short on the subject of construction contracts and BIM. As any other jurisdiction the Netherlands has a number of standard contracts and general conditions, some of which are already in place for more than 50 years. But at the moment there is not one contract model or set of general terms that does cover the subject of BIM or contains any provision on BIM. On the one hand, one could say that the classical construction lawyers are still lacking behind in comparison to the frontrunners designing and drafting the numerous other documents containing BIM obligations or requirements. On the other hand, it can be said that because of the wide selection of available documents dealing with BIM related matters, there is no immediate need for amending the existing the general terms; BIM related agreements are simply added to those existing general terms. That does, however not mean that adding such BIM terms to existing contract models and terms, goes smoothly, without problems or disputes, no. But at present, this is how it works.

Worth emphasising (again), is that no national legal standards comparable to the old BS PAS 1192 guidelines are used in the Netherlands, and no implementation of international standards has taken place in the Netherlands yet. In the past, a number of parties used the old British standards as a guideline, especially

[17] The BIM Loket is an initiative of knowledge organizations buildingSMART chapter Benelux, CROW, Geonovum, Chain Standard for Building and Installation, SBRCurnet, STABU, and the Building Information Council (BIR). The BIM Loket is located on the Construction Campus in Delft.

[18] https://www.bimloket.nl/BIMLoket

regarding the use of a CDE in compliance with the BIM level 2 requirements in the UK, but I think we can safely say that those standards never became common use in the Netherlands.
Regarding the new ISO 19650 standards it is worth to note that a group of Dutch BIM aficionado's (most of them affiliated with the BIM Loket) is now working on the conversion of the ISO 19650 standard into, first of all an European EN-standard and after that conversion into a Dutch NEN-Standard.

3.1 EIR's

Before I start explaining the ways in which EIR's are drafted and used in the Netherlands it may be useful to set out something on the nature and background of EIR's.

3.1.1 What is an EIR – nature and background of this document

Traditionally, as far as we can speak about tradition in this fairly modern field, EIR's are used by the employer to set out clearly to the contractor what models or data or information is required from the contractor upon delivery.[19] This is the 'classic' approach or definition of an EIR: It contains information needs stemming from and formulated by the employer.[20] As Holzer describes it clearly, the EIR needs to start with the 'end in mind'.[21] It contains the outcome of the BIM process, the models, data of information which need to be delivered at the end.[22] This view on the outcome of the BIM process, the data or models which needed to be delivered in the end, usually came from the employer and was usually laid down in an EIR.
However, the ISO 19650 standard changed the Employers Information Requirement into an Exchange information Requirement[23], which in my opinion suggests also a change of scope or nature of the EIR's currently used. The nature of the party which sets out the requirements does not need to be the employer anymore in order to fit the definition of an EIR. At the moment, an EIR document can contain information needs throughout the process by any party. It can be written or demanded by any partner in the supply chain. And this chance in nature and scope of EIR's is exactly what we also see happening in the Netherlands and on which I would like to elaborate a bit more in the next paragraph.

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[19] Art. 5.2.1 PAS 1192-2:2013: "EIRs are produced as part of a wider set of documentation for use during project procurement and shall typically be issued as part of the employer's requirements or tender documentation. The development of the EIR shall start either with the assessment of an existing asset, leading to the development of the employer's need, or directly with the employer's need if no existing asset or asset information model is to be considered." L. Ransijn en D. Spekkink, Onderzoek ILS'en in Nederland, BIM Loket Oktober 2019 (te downloaden via de website van het BIM Loket).

[20] Also: E.M. Bruggeman, Legal aspects of Building Information Modelling (BIM) in the Netherlands: the procurement of a work with a BIM component – Part 1 & Part 2, Construction Law International (13) 2018/2, p. 40-50 and Construction Law International (13) 2019/4, p. 56-64.

[21] D. Holzer, The BIM manager's Handbook, Southern Gate: Wiley 2016, p. 117 e.v.

[22] Also: Mosey et.al. Enabling BIM through procurement and contacts, A research report by the centre of Construction Law and Dispute Resolution, Kings College London, 2016, p. 23-24 and Handbook for the introduction of Building information Modelling by the European Public Sector, EU BIM Task Group, 2017, p. 62.

[23] Art. 3.3.6 ISO 19650-1:2018: Exchange information requirements (EIR) information requirements (3.3.2) in relation to an appointment (3.2.2).

3.1.2 EIR's in the Netherlands

As said before, especially the number of and variations in EIR's used in the Netherlands is stunning, compared to other in the Netherlands available documents such as protocols and execution plans, and compared to EIR's used in other countries.[24] There are a number of standard EIR's available at this point: Large contracting authorities have made their own EIR's, based on their information needs and their systems for maintenance and asset management. There are also several model EIR's available, made to be used as templates. As said before, it is suggested that the lack of national standards and legislation or standard contracts containing BIM provisions, is the cause of the Dutch proliferation of EIR's. In essence, everybody is inventing the wheel, in this case their own personal BIM requirements, over and over again. And this does not need to be a bad thing, To extend the metaphor, the Dutch are currently (re)inventing a couple of beautiful wheels.

Recent research shows the Dutch use a variety of EIR's and in a variety of ways. At the end of 2019, the Dutch BIM Loket identified 24 documents that were and are being used under the name EIR (ILS in Dutch) and categorized those EIR's. The inventory showed that EIR's are also (widely) used by contractors to display their information needs to other parties in the supply chain, and not only by employers in the traditional sense. [25] In addition, EIR's also appear not to reflect the information needs of a particular party, but specifies what information, when and in what form a commissioning party can expect, so they are used the other way around; parties using BIM, like architects, are defining for their employers what to expect regarding their digital deliveries.[26] As an example, the research of the BIM Loket cites the still-under-development "Gids ILS" translated as Guide EIR of the Royal Institute of Dutch Architects.[27]

The research of the Dutch EIR's by the BIM Loket shows that seven types of EIR are currently in use. There are only two types of EIR that are defined in the same way the ISO 19650 standard does, the other five appear to have been developed in practice and do not follow this official guideline. The following types of EIR's are distinguished:[28]

The two types of EIR's comparable to the definitions and types used in ISO 19650:
- type 1: EIR that is drawn up by the employer (A) and provided to the main contractors (B);

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[24] In Dutch the EIR is called an Informatie Levering Specificatie (ILS). Which is translated in the EU BIM Handbook as Information Delivery Specification (IDS), "Handbook for the introduction of Building information Modelling by the European Public Sector", EU BIM Task Group, 2017, p. 49.

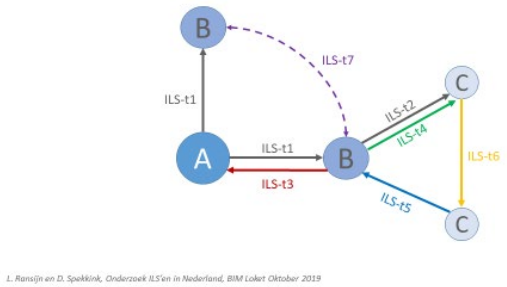
[25] L. Ransijn en Dik Spekking, Onderzoek ILS'en in Nederland, Oktober 2019, p. 2. Verwezen wordt naar het BIM Basis ILS en ILS Ontwerp & Engineering (zie de navolgende paragrafen).

[26] L. Ransijn en Dik Spekking, Onderzoek ILS'en in Nederland, Oktober 2019, p. 2.

[27] As said, this guide is intended for architects and can be used as a tool by them to communicate to their clients about what they can expect at what stage of the design of architects to whom they are commissioning a BIM assignment.

[28] L. Ransijn en Dik Spekking, Onderzoek ILS'en in Nederland, Oktober 2019, p. 6-7.

- type 2: EIR that is passed on to the contractors by the main contractor (B) within his team (C); this consists of the EIR of the employer, supplemented with the information requirements of the main contractor. And the five other types:
- type 3: requirements that the main contractor (B) sets for the employer's (A) data to be delivered to him (B) before the start of the project;
- type 4: information requirements that the main contractor (B) imposes on contractor(s) his team (C), regardless of the employer's information requirements;
- type 5: information requirements that (sub or ancillary) contractors (C) set for the input of the main contractor (B);
- type 6: information requirements that contractors (may) set themselves;
- type 7: information requirements that main contractors (can) set eachother (for example requirements set by a main contractor for information provided by an architect).



L. Ransijn en D. Spekkink, Onderzoek ILS'en in Nederland, BIM Loket Oktober 2019

A = the employer
B = main contractor
C= sub-contractors

It can be concluded that, understandably, EIR's are as diverse as the Dutch approach. But, why is it important for lawyers to learn about the diversity and nature of the existing EIR's? In my opinion, it is essential for lawyers to understand the scope and nature of BIM requirements laid down in an EIR. Those EIR's define the contractual obligations of the parties and are necessary to understand in order to properly draft contracts both for bilateral, multiparty (back-to-back, supply-chain or framework), integrated and collaborative forms of contracting.

3.1.3 Content of the EIR's - *From detailed and technical*

The EIR's most commonly used (by the larger contracting authorities) in the Netherlands are those from the Dutch Roads and Waterways Authority (Rijkswaterstaat)[29], Prorail (contracting authority regarding the

[29] The Dutch National Road and Waterways Authority (Rijkswaterstaat) has put out (through public procurement) at least 27 infrastructural projects with a BIM component and by using their own model EIR. The Government's Central Real Estate Agency has used their model EIR, named the RVB BIM norm, in a number of projects.

development and maintenance of railroads) and the Central Real Estate Agency (Rijksvastgoedbedrijf). Those EIR's are very detailed, and very technical. The problem stated in the Winfield-Rock report regarding the lack of (detailed) EIR's in the UK[30], is not something appearing very often in the Netherlands, especially not with those three large contracting authorities.

But in a broader sense, EIR's in the Netherlands come, like BIM, in different shapes and sizes. There is a differentiation in ways of describing the digital needs: using technical or functional requirements, or a mix of both. Furthermore, there is a differentiation in specification of the more technical requirements, ranging from very technical and detailed, to very simple output specifications aimed at 'bare' data regarding certain aspects of the physical building.[31] In my opinion, an elaborate very precise EIR is a good thing, first off all when it comes to meeting the demands of the Dutch Procurement Act and the EU Procurement Directive.[32] But also, a technical and precise EIR is necessary to make sure the demands of the employer are met.

But there are also examples of very short technical EIR's[33] and very short, functional demands for BIM (which could not even be called an EIR).[34] An example of the second one, short functional demands for BIM, is given in par. 3.2.5 about mistakes made in the past.
An example of the first one, a short and technical EIR, is the following. In April 2016, parties from both sides of the spectrum made, at the invitation of BuildingSMART (and the BIM Loket), basic agreements about the delivery of information and the structure of information models. This has resulted in the so-called BIM Basic EIR. In the meantime, the Basic EIR and the agreements made have been widely embraced by the construction industry and more than a hundred parties have "joined" the EIR and thus agreed to adhere to the agreements laid down in this EIR. This EIR contains a number of (mostly technical or practical) guidelines and agreements in which, among other things, the use of certain open standards. In addition to the included exchange standards, a number of practical agreements have been laid down to ensure that all parties (using all kinds of software) use the same terminology, structure and starting points with regard to a number of fixed subjects (included in the EIR).

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30 The Winfield Rock Report – Overcoming the legal and contractual barriers of BIM, February 2018, UK BIM Alliance, p. 30: "A common problem discussed was a lack of information in the EIR's or no EIR at all, with one consultant commenting "the client will often not have an EIR even or any idea beyond…we want BIM". This situation was worsened in the consultant's view, when there can be "immediate pressure to get the appointment…done and dusted" without this missing document and associated information being addressed."

31 This approach complies with the approach recommended in the EU BIM Handbook (p. 22) to protect against over-specified requirements that may incur additional costs and excess information.

32 According to art. 2.113 of the Dutch Public Procurement Act, it is the employer's responsibility to assess the candidates by using the specifications and requirements stated in the tender documentation. The tender documents usually contain a contract notice, a programme of requirements, the concept contract and the procedural provisions, including the grounds for exclusion, the evaluation system, and the award criteria (also see the Dutch source M.J.J.M. Essers & C.A.M. Lombert, Aanbestedingsrecht voor overheden, Den Haag: Sdu 2017, p. 183).

33 See also BIM Basis ILS (BIM Basic EIR)

34 Rechtbank Zeeland West Brabant 14 April 2016, ECLI:NL:RBZWB:2016:2285, more on this case in par. 3.1.5.

The BIM Basic EIR is a set of minimum agreements that parties must make in order to be able to work successfully (together) with BIM. In my opinion the BIM Basic EIR is not so much about an Information Delivery Specification from the employer, but it mainly contains the minimum set of agreements that BIM partners (architect, constructor, installer and contractor) must make. Practice shows that many of the agreements that are now included in the Basic EIR are usually laid down in a BIM Protocol or BIM Execution Plan. The latter in particular is the most obvious, since these kinds of practical agreements that mainly relate to the modelling process are only important for the BIM partners.

3.1.4 ILS O&E

Not a traditional EIR, but a beautiful example of pro-active contracting is another EIR initiative from all sorts of parties working in construction, the so called ILS Ontwerp & Engineering, translated as EIR Design & Engineering. The EIR Design & Engineering has been available since September 2019. This EIR is the initiative of employees of a number of developing construction companies, in collaboration with a group of advisers, architects and engineers. The EIR Design & Engineering specifies what information must be present at which point in the process. This EIR is a special EIR, in the sense that EIR O&E is not intended to be (just) added as a set of requirements to the contract conditions. It is merely a tool to arrive at a project-specific EIR that is related to the BIM Execution Plan and the contract. To achieve this, the EIR consists of cards or maps in which, through the entire process, the BIM tasks and BIM details or specifics are set out. Those cards are distributed among the parties working together in BIM and are used as a tool to start the conversation on the distribution of the tasks on the cards. The (mostly technical) details on those cards must be filled in, in advance (before concluding the contract) and in consultation with each other.[35] The way in which this EIR is structured, fits in nicely with the legal theory of proactive contracting, it invites parties to start a detailed conversation about the information needs of parties and the roles and responsibilities of the participants.

3.1.5 Mistakes made in the past about EIR's and BIM requirements

Although the examples discussed above show the Dutch are keen on thinking through their BIM needs and legal basis of working with BIM, there are examples of how not to state your BIM requirements. Vague BIM requirements are a phenomenon we have seen in the Netherlands also, for example in a case[36] in which the employer demanded an as-built BIM-model which could be remodelled to a BIM model suitable for 'for facility management'.[37] As part of the procedure tenderers were given the opportunity to submit variants regarding the delivery of BIM model, which could be used for facility management. A guide providing the details of the

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[35] The explanatory notes of the EIR show how and why the EIR must be completed jointly. https://www.bimloket.nl/upload/documents/downloads/ilsOenE/Gebruik%20van%20de%20ILS%20O&E.pdf

[36] Rechtbank Zeeland West Brabant 14 April 2016, ECLI:NL:RBZWB:2016:2285.

[37] In this lower court case a (so called) private procurement was put out to establish the engineering and construction of a hospital (the hospital was not a contracting authority as defined in the directive or Procurement Act, but did use a procurement procedure to obtain bids, it is, however, always the question with those kind of procurement procedures, to which extend the procurement principles apply).

as-built model, seemed available as part of tender documentation, but it only stated the requirements for the as-built models (if I understand the judgement correctly). It is not clear how detailed the guide was (we only have the court judgement as a source, not the entire legal file). However, it is clear, that it did not state any requirements for the facility management model which could be offered as a variant.

During the information stage of the procurement process, questions were asked about the features of the facility management model. The answers only stated that the model should not be 'unnecessary complex' and not contain 'redundant or unnecessary information'.
After awarding the contract to a winning combination of contractors and engineers, the consortium which became second in the procedure, starts a preliminary injunction against awarding the contract. They state a number of complaints about the procedure and the question whether or not the principles of procurement law are applicable in this case of private procurement, but, for more important is the part which deals with the submission of the variant of a BIM-model for facility management. It shows the lack of knowledge about BIM on both the side of the employer, the loosing and winning tenderers and the court. The losing tenderers state that the winners will not be delivering a BIM-model according to the so called 'BIM methodology' and that therefore the winning bid should be put aside as invalid.[38]

In this court case, in my opinion, two aspects were of interest. First of all the possibility to offer a BIM-model as an alternative or variant. Variants are taken care of in the directive in art. 45 of the Directive, and implemented in art. 28 of the Dutch Procurement Act. The offering of a BIM-model as a variant without specific requirements regarding the technical requirements of this model, makes it less easy to compare price, quality and functionality of the model during the assessment of the bid by the contracting authority. It therefore can be hard to objectively weigh the different aspects of the submitted BIM model as a variant. Off course, the use of variants in procurement law is meant to stimulate innovative or new solutions, and therefore, you must avoid being too descriptive in stating your needs. But I dare doubt if it is a fruitful way of obtaining a useable BIM model and whether or not comparison of the submitted variants, can be done in an objective way. In the procurement directive (2014/24/EU), under sub (48) the following is said about variants: "Because of the importance of innovation, contracting authorities should be encouraged to allow variants as often as possible. The attention of those authorities should consequently be drawn to the need to define the minimum requirements to be met by variants before indicating that variants may be submitted." This rule of thumb also applies to the demand for BIM models as variants: an employer should at least define the minimum requirements that must be met.
The second point of interest is the procedural aspect of this case. When starting a preliminary injunction because you are of the opinion that the submitted BIM-options of your 'colleagues' are not of the same quality, or even the requested or required quality, you should not simply state that the bidder is not able to deliver the

[38] The second place tenderer also states that, because of the award criteria used and the weighting of the BIM variant, they would probably have ended first, if they had not submitted their BIM facility model as a variant. I am guessing that the bid that came in second, had a much higher price on the BIM model, probably because it was a more elaborate or sophisticated model.

model according to 'BIM methodology', because practice shows that there is no such thing, at this stage of BIM developments. What exactly the 'BIM methodology' entails, was not made clear by the plaintiffs.

3.2 Protocols and Execution plans

Although not as diverse and available in the quantities the EIR's are, there is also a number of BIM Protocols and Execution Plans available in the Netherlands. It used to be the case that a BIM protocol was meant to be an annex to the contract which contains requirements and conditions with regard to the legal aspects of the application of BIM in a project. [39] As the Winfield Rock report stated[40]:

> *A BIM Protocol is intended to facilitate consistent contractual BIM terms across the design team for a project, such as with regard to the structure, coordination and use of project information. The Protocol sets out various aspects for the running of a BIM-enabled project, such as software choice, ownership or licences of models and data, filing naming conventions and provision of the common data environment ("CDE"). The Protocol enables contractual incorporation of BIM terms, allowing for legal implementation of the processes and procedures required to produce a model that adheres to the requirements of the EIR and BEP. It is intended to be incorporated into the building contract, as well as relevant appointments and sub-contracts.*

Complimentary to a Protocol, an Execution Plan is used. This Execution Plan is often concluded between the collaborating partners working together with or on BIM part of the project (of which the employer is often not part) and is an elaboration of the BIM requirements laid down in a protocol or EIR. The Execution Plan contains the translation of the BIM requirements into the BIM process for the partners working on BIM. An Execution Plan is the more detailed process or plan, focussing on who is providing the specific data. In the perfect situation the demands in an EIR result in a BIM Execution Plan which sets out the processes of the BIM trajectory to, in the end, get to delivery of the data or models set out in an EIR.
So in short, a protocol is a document concluded between an employer and a contractor, an execution plan is a document used by the parties working together on the BIM project, often without the employer. However, this is the accepted theory, the practice shows a wide variety of documents, protocols and plans that do not meet the format outlined here.

The widespread use of very elaborate EIR's made the Dutch reflect on the revision of the current set of available BIM documentation, and on the thought of just abandoning the BIM Protocol and working towards the situation in which we use an EIR as a way of communicating the BIM requirements, an Execution Plan as a document which is concluded between parties working on establishing the BIM output for the employer. If necessary, two or three articles could be added to form an annex to existing construction contracts, to contain the necessary contractual obligations regarding BIM, which cannot be dealt with in an EIR or Execution Plan. For example some additional agreements could be put in the annex regarding the ownership of the BIM model itself, the ownership of BIM data and maybe payment and penalty clauses regarding the (late or insufficient

[39] Art. 1.2 Nationaal Model BIM Protocol version 0.9.

[40] The Winfield Rock Report – Overcoming the legal and contractual barriers of BIM, February 2018, UK BIM Alliance, p. 29.

delivery of) BIM models of BIM data. So in the future, it is likely that we will work towards the situation of abandoning the use of a BIM Protocol and only work with a custom made EIR and Execution Plan and some model clauses to add to the construction contract. But we are not there yet and at the moment the Dutch BIM Loket offers two model documents that can serve to record the arrangements for working in and with BIM: The National Model BIM Protocol and the National Model BIM Execution Plan. Both documents are already available for several years.

3.2.1 National BIM Protocol Model

As with the Execution Plan, the BIM Loket makes two versions of the Protocol available. One offers a template which can be filled in by the project partners themselves, but contains no explanatory notes, the other version contains explanatory notes and instructions in addition to the template. This version can be used as a guide when filling in the template. The National Model BIM Protocol is divided into a number of chapters. It contains introductory provisions and definitions, the obligations of the employer (which includes that the employer appoints a so-called BIM director in his organisation who maintains contacts with the BIM director on the part of the contractor). The Protocol also contains a provision which states that the employer draws up an EIR containing the requirements for the digital structure, and reference is made to the EIR applicable to the project and this Protocol. The Protocol also contains the obligations of the contractor in which the emphasis is on the obligation of cooperation and coordination, a series of (extensive) provisions on intellectual property, licenses, copyrights, ownership of BIM and liability for (the accuracy of) the BIM data, it contains an optional delivery schedule in which per actor in the BIM process it can be included who is responsible for the delivery of which specific aspect model in which phase.[41]

3.2.2 National BIM Execution Plan Model

As already noted, in addition to the BIM Protocol, the BIM Loket offers the National Model BIM Execution Plan. And as is the case with the National Protocol Model, the BIM Loket also offers two versions of the Execution Plan. One can be filled in by the project partners themselves, but contains no explanation, the other version contains further explanations and instructions in addition to the template. This version can be used as a guide when filling in the template.

The BIM Execution Plan is divided into chapters. Each chapter contains its own topics. It contains introductory provisions and definitions, the project data and the names and functions of the individual BIM participants, a series of extensive provisions on the purpose and applications of the BIM model, the structure of the BIM process, the agreements on the form of the data and data deliveries, communication between project partners, data formats and technical (modelling) agreements and provisions about IT and security and risks.

[41] This appears to be a schedule that actually belongs in the Execution Plan, but it is conceivable that a client also knows how to be useful about the division of roles and responsibilities within the BIM team, or that the interim or final deliveries included in the schedule were part of the EIR or the tendering procedure, and the client for that reason wants to see the data deliveries in the protocol

The Dutch BIM Execution Plan is inspired by the BIM Execution Plans used in the United Kingdom. However, the Dutch not necessarily work with a pre- and post-tender BIM Execution Plan, like the models offered in the UK. Also, the model the BIM Loket makes available is more basic and not focused on the details of the BIM process as much as the English versions do.

3.2.3 BIM Execution Plan as part of the procurement process

And although we do not have a pre- and Post BEP model in the Netherlands, we do already have our first court case which shows the use of an Execution Plan as part of the award criteria in a procurement.[42] I have visited a number of government authorities with experience in procuring BIM projects, but none of them used BIM in the award phase (yet). However, this case shows how other contracting authorities use BIM in the award phase to their advantage. And although the actual dispute is not about the use of BIM, it shows how BIM can be used as a means to distinguish bidders on their ability to use BIM.

It is a European procurement procedure regarding the construction of a school. The award guidelines contained a very elaborate section on sub award criteria regarding the draft of an Execution Plan. This Execution Plan does not only consists of the execution of the BIM component of the tender, but also the coordination of the different sub- and ancillary contractors. In the Execution Plan, an emphasis must be laid on coordination and communication skills and or outline proposal. The judgement shows a very elaborate description of the different BIM requirements (technical, management, the use of a BIM Execution Plan and so on) and their weighting factor in the award phase.

The four subcriteria are 1) price, 2) execution plan, 3) the use of BIM and 4) planning). In more detail they entailed:

1) To make an Execution Plan which, amongst others, demands the appointment of a BIM coordinator and a proper job description, the use of BIM information in relation to the stream of traffic (surrounding the school and which has to continue during construction) and fire safety and construction process management by means of BIM.

2) The use of BIM and the production of an as-built model.

3) Furthermore, the bidder must assess the following topics in its bid

a) whether or not a BIM protocol will be drafted, aiming at collaboration between all parties,

b) whether or not specialised BIM subcontractors will be used for the production of the BIM model (if not, then a subcontractor of the employer's advisor must be contracted),

c) whether or not the subcontractors and engineers and installation companies have experience with using BIM,

[42] The lower court case of Rechtbank Gelderland 20 January 2014, ECLI:NL:2014:2898 Link to the full text (Dutch) of the court ruling can be found here: https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBGEL:2014:2898

d) which software will be used,

e) how information distracted from the BIM model will be transferred to subcontractors and suppliers,

f) how the bidder wants to communicate progress ad delay due to unforeseen circumstances (during construction).

Those subcriteria not only focus on the use of BIM, but also on collaboration and collaboration by means of BIM. The bidder can score points (between 1 and 10) on the three sub criteria. A higher score will result in a (fictional) discount on the price (ranging between 50.000 euro for 6 points and 250.000 euro for 10 points). The one with the lowest fictional bid will be awarded the contract.

In this case, one of the parties losing the bid, complained about the weighting system of the award criteria, but this does not affect the quite interesting examples the system provides us about the use of BIM in the award phase.

4 Future of BIM in the Netherlands - in which way are we moving?

Overlooking the field of construction law in the Netherlands, there are at the moment a view factors or developments which could be defining for the use and demand of BIM in our country. Those factors can be summarised under one single denominator: the need for correct information on assets and objects.[43]

In some cases it even develops into the need for correct information and automation or computerisation of the legal consequences of certain design choices. At the moment a group of public notaries and property developers are working on a BIM system for consumer construction projects in which they combine the use of BIM with the entire sales process of new dwellings to consumers. Their aim is to develop a system in which consumers can, to a certain extent, make their own design choices when purchasing a new dwelling. Those design options are gathered in a BIM model together with the legal and financial consequences of the changes made to the design and it automatically chances the contractual documents. So if a consumer for example chooses to add an extension to the ground floor, both the prices and the contractual consequences are taken into account immediately by the BIM system. The system provides information on prices, consequences for the construction period, adds the provided guarantees and limitations or exclusions of liability etc.

But developments expected to speed up the use of BIM are even seen in a broader field, transcending the world of BIM enthusiasts and touching upon the more regular construction activities and the more classic aspects of construction law. The need for correct information on objects can be summarized into four central themes or developments now playing an important role in discussions surrounding construction contract law and the construction industry in general.

[43] See, in Dutch: L. Boellaard & J.P. Bolhaar, Waardecreatie met BIM buiten de bouwsector, TBR 2019/43.

4.1 Revisions of the Dutch D&B contract (UAC-IC 2005)

The first development of importance for the further development and use of BIM has to do with the Dutch Design & Built model and therefore has a more legal background. For twenty years now, the Dutch use a contract model for Design & Built assignments called the UAV-GC in Dutch, translated as the UAC-IC in English, the Uniform Administrative Conditions for Integrated Contracts). This model is designed to cover both the design efforts as well the construction of the work/project. We are currently, for quite some time now, in the process of the revision of those general terms. This is a complicated process because the revision is done in joint collaboration with all parties involved (employers, contractors and engineers), and, as always, is very political because of the discussions surrounding the distribution of responsibilities and (therefore) liabilities. In the past, one of the main issues regarding this form of contract, proofed to be the need for correct information from the employer (on soil conditions, site conditions, conditions of existing buildings etc.) and in connection with this, the distribution of liabilities regarding the unknown conditions of a project.[44] The lack of (correct) information results in (roughly) four issues in the Netherlands in the past years: the unexpected (or sometimes disproportionate) emerging of risks resulting in a large number of disputes and sometimes in dissolving contracts as a final outcome, as well as the (unexpected) high prizing of unknowns (considered as risks) during the procurement phase and as a result also the failure to pass even the procurement phase (because of unexpected high prices or even the lack of tenderers).[45]

It is therefore that some governmental authorities already are choosing a different approach. There seems to be a shift in the way in which contracting authorities define their own responsibilities regarding the delivery of correct information. As a result, large contracting authorities and governmental agencies are already working on gathering information about their assets and in turn on correctly distributing this information to their contractors. The Dutch Roads an Waterways Authority (Rijkswaterstaat)[46] is one of those agencies working on BIM databases for their asset management. Also The Central Government Real Estate Agency (Rijksvastgoedbedrijf (RVB) in Dutch)[47] is acknowledging its responsibility as an employer by gathering more information on their assets themselves and distributing this information to their contractors, in addition they

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[44] On the issue of information from the employer under de UAC-GC 2005: R.G.T. Bleeker, W.J.M. Herber, B. van der Zijpp, UAV-GC 2005, Over problemen bij het werken met geïntegreerde contracten, IBR 2016, p. 19- 28, R.G.T. Bleeker, W.J.M. Herber, B. van der Zijpp, UAV-GC 2005, Over problemen bij het werken met geïntegreerde contracten, IBR 2016, p. 19-28, R.G.t Bleeker, Over de uitleg van enkele conflictgevoelige paragrafen, deel 1 TBR 2014/114. D.E. van Werven, de bodem in de UAV-GC 2005: goede grond voor herziening, in: A.G. Bregman, E.M. Bruggeman, A.M.B. Chao & N. van Wijk-van Gilst, Eindafrekening met pepernoten. Voor een onbetaalbare bijdrage aan het bouwrecht and beyond. Liber amicorum prof. mr. dr. Monika Chao-Duivis, Den Haag: Instituut voor Bouwrecht 2019, p. 781 e.v.

[45] B. van den Berg, Risicoreductie bij grote geïntegreerde contracten, in: A.G. Bregman, E.M. Bruggeman, A.M.B. Chao & N. van Wijk-van Gilst, Eindafrekening met pepernoten. Voor een onbetaalbare bijdrage aan het bouwrecht and beyond. Liber amicorum prof. mr. dr. Monika Chao-Duivis, Den Haag: Instituut voor Bouwrecht 2019, p. 149 e.v, D.C. Orobio de Castro, Naar evenwichtige voorwaarden bij het contracteren van infrastructurele projecten in Nederland, in: A.G. Bregman, E.M. Bruggeman, A.M.B. Chao & N. van Wijk-van Gilst, Eindafrekening met pepernoten. Voor een onbetaalbare bijdrage aan het bouwrecht and beyond. Liber amicorum prof. mr. dr. Monika Chao-Duivis, Den Haag: Instituut voor Bouwrecht 2019, p. 299 e.v.

[46] More on Rijkswaterstaat in English here: https://www.rijkswaterstaat.nl/english

[47] More on this agency in English here: https://english.rijksvastgoedbedrijf.nl/about-us

are at the moment investigating their (digital) information needs in order to process the gathered information digitally.

4.2 Safety of constructions

Another development which makes the use of BIM and the need for BIM even greater, has to do with building quality and building safety. At the moment two separate developments regarding this theme are taking place. The first is the already long pending introduction of a new act called the Act on Quality Assurance in Construction (more on this Act in par. 4.3). The second one has to do with the decade long problems the Dutch face regarding safety of buildings and site safety, which will be discussed in this pargraph.

In the last decade, The Netherlands has faced a number of accidents concerning both constructional safety of buildings itself as well as safety on and around construction sites.[48] Their where numerous incidents regarding collapsing buildings, but the actual collapse of buildings were not the only source of concern, as there were also numerous threats regarding constructional safety, e.g. the recent evacuation of dozens of existing buildings because of suspected problems with concrete wide slab floors.[49]
This longstanding problem regarding the safety of constructions has led to numerous discussions regarding the causes and solutions, but also to another, for BIM interesting development. The question emerged, whether or not contractors and/or employers should be obligated to correctly register their activities, to make sure there is an accurate design available of the building 'as-built' and information on the building materials they use(d). The discussions are comparable to those taking place in the UK after the Grenfell Fire and the Hackitt Report. However, they have not yet lead to an initiative like a digital building file. At the moment the construction sector in its entirety is struggling with the problem of safety in itself. A number of initiatives is expected to take place to tackle the problem of the lack of safety of our constructions in other ways. My expectation is also that in the upcoming years, this problem will lead to a digital building file with which construction and materials can be easily assessed. A development which will lead to the increased use of BIM.

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[48] See for an overview of the construction accidents investigated by the Dutch Safety Board (Onderzoeksraad voor Veiligheid) their English website https://www.onderzoeksraad.nl/en/sectoren/construction-and-service?filters%5Btype%5D=Afgeronde&s=A46A45EA2C8E917FC157CB50487B05F0258CA739.
Apart from construction safety, other concerns in the Netherlands include safety on construction sites and the immediate surroundings of the actual construction site, which pose a problem as well. There were accidents involving a collapsing bridge section during placement and its transport over the canal (Alphen aan den Rijn) and an accident involving falling building materials killing a passer-by (The Hague), and numerous other fatal accidents on or around the construction site itself The ministry of social affairs and labour registered 1464 accidents between 2008 en 2011 of which 49 were fatal: https://www.heijmans.nl/en/news/safety-construction-governance-code/ A number of accidents was investigated by the Dutch Safety Board, information in English can be found on their website.

[49] The Ministry of the Interior and Kingdom Relations issued information and instructions in October 2017 regarding the investigation of concrete wide slab floors delivered after 1999, after the collapse of the parking building at Eindhoven Airport. Also other problems occurred for example the closing of a highway bridge for heavy traffic because of appearing cracks in the construction, Merwedeburg in October 2016 https://www.rijkswaterstaat.nl/wegen/wegenoverzicht/a27/merwedebrug/index.aspx.

4.3 New Act on Quality Assurance in Construction

Alongside incidents and accidents mentioned in the previous paragraph, an ongoing discussion is taking place on improving efficiency in construction projects and reducing the costs of failure. As a result of this discussion, the design of a new act on quality assurance started almost a decade ago. This new act, called the Quality Assurance Act in Construction[50], is planned to come into effect on the first of January 2021. To achieve this massive system change, both the Housing Act and Civil Code are altered, and a number of general administrative regulations and ministerial decrees are, or will be, issued to fill in the details of the new system. It aims to achieve a shift from the existing (minimum) governmental oversight in construction projects to a private law system with oversight by independent, privately employed quality surveyors. To design a comprehensive system, other legislation beyond the Housing Act is altered, including the section in the civil code on the contract of works, is altered to introduce more liability on the part of the contractor and create more protection for consumers.

As a result of this new Act, contractors and quality surveyors are expected to record their activities, and preferably those recordings will be done digitally. This need for digitally enhancing the construction process will most probably also speed up the construction sector in adopting BIM. Additionally, contractors are expected to deliver an information file regarding the construction. Art. 7:765a CC will be added to the Civil Code and will place a duty on the contractor to deliver information on the structure to the employer. The article is placed in the section of the Civil Code applicable to all contracts for works (not only consumer contracts) and therefore has potentially large implications for the entire sector. However, it was not deemed compulsory, so parties still have an opportunity to derogate from the obligations laid down in the article.[51] In addition, questions were raised about lack of clarity surrounding the exact obligations of the contractor and the content of the file. It is however expected that a large number of employers will demand some sort of delivery file when this article comes into effect. What the exact content of the file will be, and if a uniform or model file will be created, remains to be seen. Also unclear is the format of the file, will it become a digital file or will information still be handed over on paper? It I expected that in the future this new obligation laid down in the civil code will lead to need for digital information and storage of information and therefore an increase in the importance of BIM.

4.4 Implementation of ISO 19650 through EN and NEN standards

And Finally, the existence of an international BIM standard at the moment, ISO 19650, is also expected to speed up the use of BIM. In the near future implementation of ISO 19650 into a national standard is to be expected. After this, modification, or updating of the existing protocols to ISO and EN and NEN standards and procedures is expected. This will most likely result in a Dutch model EIR which can be used as a template of

[50] Wet Kwaliteitsborging voor het Bouwen, in Dutch. Its initial draft can be found: Kamerstukken II 2015/16, 34 453, nr. 1.

[51] More on this article and the lack of clarity, in Dutch: E.M. Bruggeman & H.P.C.W. Strang, Wet Kwaliteitsborging behandeld in Tweede Kamer, BR 2017/52.

menu with different options and requirements to choose from and a new model Execution Plan, all compliant with ISO and EN and NEN standards.
What the future of the BIM Protocol will be is unclear at the moment, but is likely that not an entire protocol will be needed anymore, but that a few BIM provisions will be drafted. Provisions which do not belong in an EIR but are in essence provisions regarding data or models which belong in a contract. Those provisions could be added to construction contracts, for example as an annex, or incorporated into the contract.

5 Closing remarks

To summarize the above, in the Netherlands, there is not one approach of BIM, there is not one form of BIM, there is not one standard (contractual or otherwise) to follow regarding BIM. In a way this shows, in my opinion, that BIM can thrive without a top down approach. And maybe the way in which BIM finds its way in the Netherlands is exemplary for the way in which the Dutch behave: there is a lot of freedom and there is very often a lack of central coordination, supervision or in some cases, even a lack of vision by the government. Sometimes this can be a bad thing, experience with our safety of constructions shows, and sometimes this can lead to beautiful, organic developments, like what is happening with the use of BIM in the Netherlands at the moment and the developments regarding the legal aspects of working with BIM.