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A plan in place? Celtic field habitation at Westeinde (prov. Drenthe, The Netherlands)

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1. Introduction

As part of a long-term research project on the use-histories of Celtic fields (Dutch: raatakkers) in the Netherlands, the site of Westeinde - Noormansveld has been investigated between 2014 and 2016. Since the 1950’s, the site has been known for the presence of a group of barrows (suspected to be Iron Age cinerary mounds, but none had been excavated). In 1999, a restoration project aimed at clearing the barrows from trees and restoring their original contours (many had been disturbed in their centers) discovered and mapped pronounced banks in the vicinity of this barrow cluster. Newly available, high-resolution LIDAR data indicates that these banks were actually part of a much larger Celtic field complex of 34 hectares (fig. 1, B).

Due to a fruitful cooperation of the estate owners (Vereniging Natuurmonumenten; mr. R. Popken), the municipal and provincial authorities (ms. M. Nieuwenhuis and mr. W.A.B. van der Sanden respectively) and the Groningen Institute of Archaeology (mr. S. Arnoldussen), the Celtic fields and barrows of Westeinde - Noormansveld could be subjected to small scale test-trenching as part of the Groningen University’s archaeological training dig in 2014 and 2015. In 2016, the project partners agreed to use mechanical stripping in test-trenches of a plot that – based on earlier corings and test-pits - had been considerably disturbed by recent agriculture. The objectives of this campaign were twofold: from a heritage management perspective it was worthwhile to determine if and to what extent features may have been preserved regardless of the evident levelling visible in LIDAR plots of the ploughed field. Secondly, within the context of the Celtic field research programme interest lay primarily in investigating possible interrelations of habitation and agriculture, as a local amateur archaeologists (ms. S. van der Meulen) had found various later prehistoric remains from the field when it was still regularly ploughed.

2. Celtic fields and houses: an awkward relationship?

Despite the fact that artist reconstructions often convey an unproblematic integration of domestic life and agriculture within the Celtic fields (fig. 2), we argue that this relation is in reality poorly understood. The depicted artist’s reconstructions show houses neatly slotted into sufficiently large parcels, even with room to spare for the outbuildings close by. The orientation of the farmhouses of the reconstructions

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Fig. 1. Location of Westeinde - Noormansveld in the Netherlands (A; the shaded areas are regions with documented Celtic field complexes, Westeinde is indicated with a red star), (B) the extent of the Celtic field banks(brown thick lines) and locations of the barrows (red circles) in relation to the excavation trenches (blue outlines) and (C) inset of the Westeinde house-site.

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matches those of the local field plots, and the Celtic field plots act as de facto house-sites or farmyards for the houses contained within them. In general terms, this is what archaeologists take to be true as well: Iron Age habitation is assumed to have been placed in, and periodically shifted within, the confines of the Celtic field system they exploited (e.g. Gerritsen 2003: 172; Spek et al. 2003: 143; Harsema 2005: 548; Meylemans et al. 2015: 207).

Remarkably, even a cursory glance at the available evidence for settlement-Celtic field interrelations suggest that this is not as clear-cut as archaeologists generally assume. The oldest site for which an overlapping of house-sites and Celtic field plots was uncovered, is the site of Wekerom - De Vijfsprong. This site was excavated by F.C. Bursch in the war years, yet never published by him (Van Klaveren 1986; Arnoldussen & Scheele 2014: 14). Bursch’ documentation suggests that the morphology and thus the true nature of the site was not yet understood, as he depicts the Celtic field’s field plots as oval embanked plots. Later analysis of aerial photographs and LIDAR data have confirmed that here too a more or less rectangular system of embanked fields must have been in place (Brongers 1976: 147; Oude Rengerink 2004: 24-26). Unfortunately, it is difficult to re-align the 1940’s excavations with the pattern of Celtic field banks as reconstructable from the LIDAR data and aerial photographs (Arnoldussen & Scheele 2014: 15). Moreover, no stratigraphic relations were documented for the houses and banks, as a result we can only note the peculiar overlap of house plans with reconstructed Celtic field banks (fig. 3, A). Verwers’ interpretation (1972: 146-147) that a Celtic field was constructed on top of a previous settlement site, cannot be checked. What is noteworthy, though, is that for the types of houses uncovered at Wekerom (Type Wekerom or Dalen; Arnoldussen & Scheele 2014: 19; Waterbolk 2009: 64), radiocarbon dates spanning the period 400 BC – 0 AD have been obtained (Waterbolk 2009: 64; Schabbink 2013: 24 note 1). For the banks at Wekerom, the incorporated ceramics hint at construction around the Late Bronze Age or Early Iron Age (Arnoldussen & Scheele 2014: 80), but the OSL dates obtained for the Wekerom banks suggest that bank construction may have started at the end of the Middle Bronze Age and was well underway by the Early Iron Age (Wallinga & Versendaal 2013a: 6). This indicates that at Wekerom, habitation is much more likely to have followed than preceded Celtic field usage.

At the site of Peelo - Kleuvenveld, three Iron Age house plans and several granaries were excavated. The northwesternmost house was radiocarbon-dated to the period of c. 710-450 cal. BC (Kooi 1997: 422). The two other houses could only be dated based on typological grounds: we feel that the Early Iron Age date initially (Kooi & De Langen 1987: 58(158) proposed for both houses fits the evidence best (cf. Water-
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Fig. 3. Overview of excavated Celtic fields with Iron Age habitation (A: Wekerom - Lunteren: after Van Klaveren 1986; Arnoldussen & Scheele 2014: 15 fig. 8), B: Peelo - Kleuvenveld (after: Kooi & de Langen 1987; Kooi 1997), C: Hijken - Hijkerveld (after: Harsema 1974; 1991: 23 fig. 2; Arnoldussen & De Vries 2014: 101 fig. 12), all to the same scale). White areas and outlines represent the excavated areas, the locations of reconstructed and observed Celtic field banks are depicted in halftone brown. Iron Age houses and outbuildings are depicted in red and the black polylines represent fence lines (note that for Peelo and Hijken barrows also present have been omitted from the plans).

bolk 2009: 49; 53 fig. 31; 54; 56 fig. 32, contra Kooi (1997: 434) who postulated a Late Iron Age date for the northernmost house, yet see Kooi 1997: 459). Two of the Kleuvenveld houses are situated amidst Celtic field banks, which were – in absence of dating evidence – assigned a generic Iron Age date (Kooi & De Langen 1987: 55(155); 60(160); Kooi 1997: 418). Kooi and De Langen (1987: 61(161)) noted that the orientation of some of the easternmost granaries matched those of the Celtic field banks nearby, implying a (temporal) association, but they postulated that the house-sites could either have been spared during later Celtic field development or alternatively have been constructed within a pre-existing Celtic field (loc. cit.). In the later publication by Kooi (1997: 463) a functional relation (i.e. implying contemporaneity) for the Early Iron Age house-sites and fields is implicitly suggested (Kooi 1997: 462 fig. 39, 463). Either way, the placement of two of the Peelo - Kleuvenveld house-plans does deviate from the reconstructions presented in fig. 2: the houses are placed in small plots and partly overlap with the locations of the banks.

A similar observation – of seemingly illogical placement of Iron Age house plans with regards to the bank locations – could be documented at Hijken - Hijkerveld (fig. 3, C: Harsema 1991; Arnoldussen & De Vries 2014). Save for one house (H18; datable to the Middle to Late Iron Age: Arnoldussen & De Vries 2014: 99; Arnoldussen & Brusgaard 2015), all Iron Age houses could be dated to the Early to Middle Iron Age (based on pottery and radiocarbon dates (Arnoldussen & De Vries 2014: 93). For Hijken, an important observation is that between the Iron Age houses, networks of wattlework fences were discovered, which in various locations overlapped with Celtic fields banks as visible through soil discoloration at the time of excavation (op.cit: 101 fig. 12). Possibly, the fence lines formed a blueprint for the systems of banks (Harsema 1980: 20-21; 1987: 39), but
the fieldwork notes suggest some fence lines topped banks as well (Arnoldussen & De Vries 2014: 100). Unfortunately no stratigraphic information or dating for the Hijken Celtic field (banks) is available. georeferencing of the legacy data is difficult (loc. cit.). Regardless of the exact ages of the banks, again the positioning of the houses in relation to the banks is peculiar: four house-plans overlap with documented banks and three more houses overlap with the locations of banks based on aerial photographs. Moreover, only few (three?) houses appear to be conveniently situated amidst fields, yet locations overlapping with banks appear to be more common here.

The three examples discussed above show clear similarities. First, absolute dates are scarce for both houses and Celtic field banks alike. The latter could be dated by OSL at Wekerom, and suggested that habitation here was much younger than the start of Celtic field bank development. For Peelo and Hijken, contemporaneity was suggested, irrespective of the awkward placement of houses in relation the Celtic field banks. There is evidence to suggest that the dates obtained for bank development at Wekerom are not unique: the Celtic field of Zeijen – Noordse veld was also subjected to OSL dating which indicated bank construction after the end of the Middle Bronze Age-B and continuing throughout the Iron Age (Wallenga & Versendaal 2013b: 6). At Someren - De Hoen- derboom, AMS and OSL dates confirm bank development between the end of the Middle Bronze Age-B and the Late Roman period (not yet published). If we assume that the few obtained dates are representative for the development of Celtic field banks in general, the above examples suggest that the habitation traces date to the developed or final use-phases of the Celtic field system. In other words: if Celtic fields banks were used for both agriculture and habitation, the actual discovery of a house plan situated within visible traces of a Celtic field complex is not common (e.g. De Wit et al. 2003: 141; Schrijer & De Neef 2008, 78). At the most southern end of trench 24, the remnants of a small house were uncovered. The feature density was low, which allowed for good recognition and registration of the features. The uncovered house plan measured roughly 12.5 by 7 meters (fig. 4). The outer posts (rafter supports placed outside the wall proper) were evenly spaced with at least one recognisable entrance on the northern long side of the house. The entrance in the southern wall was less clearly recognisable, because of possible renovations of this entrance. In contrast to the easy recognition of the house plan as a whole, the interpretation of the inner structure was less evident. It seems that the inner structure combined a two-aisled and three-aisled arrangement of roof-bearing supports. The roof-bearing posts in the smaller part of the house displayed a T-shaped arrangement, whereas the larger (byre?) part of the house was both two- and three aisled.

Although the house plan was clearly recognisable as such, it was built in an uncommon way. That is to say, the house plan itself did not fit well within the present house typologies of the northern Netherlands (Huijts 1992; Waterbolk 2009). Even though some characteristics of the Westeinde house are also seen with traditional types, its attribution to a specific type remained problematic. The evenly spaced posts placed outside the wall (supports for beams on which the rafters rested), for example, are a feature of the Een-type (traditionally dated into the Early Iron Age: Waterbolk 2009: 54, 56, fig. 32), but the house plan lacks the systematic three-aisled, inner configuration of roof-bearing posts that Een-type houses usually have. In the same way, the combination of a two- and three-aisled plan is characteristic of the Dalen- and Diphoorn-types (traditionally dated into the Middle to Late Iron Age: Waterbolk 2009: 64, fig.40-41), but the Westeinde house plan does not have the associated double wall posts typical for these two types. This is all the more remarkable, as the evenly spaced wall posts indicate a well thought out plan and not an ad hoc solution.

Based on the ceramics recovered from the postholes of the house plan, a terminus ad post quem in the Late Bronze Age or Early Iron Age seems likely. As all fragments from the postholes were small (10 gram or less), the possibility remains that the ceramics were mere inclusions of material already present at the site when the house was built. In one of the central posts (S84; find no. 1265), two potsherds were found with a sharp angular pot profile. Just above the offset a horizontal row of fingertip or nail imprints was applied (fig. 5: v1265). This type of decoration is often found in Urnfield contexts (e.g. Kooi 1979: 34, fig. 24.113, 60, fig. 51.109). An urn from Oosterwolde (province of Drenthe) with similar shape and decoration was ^14C-dated to 1111-834 calendar BC (GrN-10441: 2805 ± 55 BP; Lanting & Van der Plicht 2003: 217). In the unpublished settlement site of Welsum, a pit was found with sherds of a biconical vessel with similar deco-
Fig. 4. Feature types (top) and depths (bottom) for the remains of the Westeinde house plan (for the location of the house see Fig. 1).
rations, that was dated to between 1277-918 cal. BC (GrN-7600: 2905 ± 65 BP; Lanting & Van der Plicht 2003: 204). This combination of vessel type and decoration is thus found from the Late Bronze Age onwards. Other ceramics associated with the house could not be identified as specific vessel shapes. The properties of the fragments (granite temper, a smoothed or polished surface and thoroughly fired) suggest a dating somewhere in the period Late Bronze Age to Mid-iron Age (Taayke’s (1995: 71-72) G0/G1-types). Charred material from the central posthole was carbon-dated (S 32; find no. 1264). Unfortunately, the samples must have contained older material as the 14C-date was between 3090 and 2910 cal. BC (Beta-45440: 4380 ± 30 BP).

As mentioned above, the Westeinde house plan cannot easily be placed within the traditional typological framework. The parallels found either came from the southern parts of Drenthe or – even further south – from the province of Overijssel. At the excavation of Zwinderen - Kleine Esch (Van der Velde et al. 1999), a house was excavated which was comparable in size and construction to the Westeinde house, as it had both evenly spaced wall posts and similar inner structure (structure 5: Van der Velde et al. 1999: 71-73). Waterbolk (2009: 56, fig. 32e) interpreted it as an Een-type, but attribution is not completely convincing. The house itself did not yield any datable finds, but in the same trenches finds from both the Middle Iron Age and 4th and 5th century AD were found (Van der Velde et al. 1999: 71, 76). From Raalte-Jonge Raan (province of Overijssel) another similar structure was found (house 3: Groenewoudt et al. 1998: 36-37). Its wall construction is similar to that of the Westeinde house, although the house plan from Raalte - Jonge Raan is slightly larger (16 meters prior to extension). Again, the configuration of the roof-bearing posts represents a combination of both two- and three-aisled building techniques. Ceramics found in a pit inside the Raalte - Jonge Raan house suggest a dating at the start of 1st century AD. This is confirmed by 14C-dates of charred cereals from the same pit, which date between 94 cal. BC and 118 cal. AD (1990 ± 40 BP: GrA-9449; Groenewoudt et al. 1998: 25, fig. 3.3). Based on these examples, it becomes evident that these small houses are not typical for just one period or sub-period. Rather, it seems that there was a continuation of a more generic Iron Age building tradition that co-existed with other – better recognisable – house types.

The Westeinde house plan is not unique in its deviation from the traditional house typology, as house plans at other sites also do not always fit neatly. For example, at Hijken - Hijkerveld a number of Early to Middle Iron Age houses showed general traits of an Iron Age building tradition without a precise correspondence to a type (Arnoldussen & De Vries 2014: 92-95). Similarly, the northermost Early Iron Age house-sites of Angelslo - Emmerhorst yielded two similar house-plans that could not easily be fitted within the traditional typologies (Kooi 2008: 335 fig. 4; 361, cf. Huijts 1992: 62-65). Another example is Structure 6 at Borger - Daalkampen Klokbeke (Van der Meij 2010: 25-27), which also showed traits of two different types. This presence of characteristics of different house types made the excavator even raise the question what constructive elements should be decisive in the attribution to a type (Van der Meij 2010: 26). The solution to this problem lies in the recognition that houses are composites of constructive elements (e.g. wall, roof-carrying construction, entrances; cf. Arnoldussen 2008: 192-198). Constructional elements may co-occur in standard ways that makes a "type" recognisable, but sometimes elements are found in more unique configurations as seems to be the case at Westeinde.

Close to the Westeinde house, two granaries were found. The granary closest to the house (granary 1, fig. 1C) had a similar orientation as the house itself. The carbon-dates of charred material from one of the postholes (S19, find no. 1136), however, dated to between 1745 and 1620 cal. BC (Beta-45441: 3390 ± 30 BP). Considering the conformity in orientation of granary 1 and the house, the dated material represents unintentionally incorporated evidence of Middle Bronze Age activities in the area and has little relevance to the structure into which it became incorporated.

During the campaign of 2016, a total of 1456.6 grams of ceramics were recovered from 49 features. The average weight of the ceramics per feature was less than 30 grams. One pit (S5, find nos. 826, 1121, 1188, 1191 and 1281) stood out from the other features as it contained nearly half of all ceramics found (717 grams). The pit was round and shallow (diameter 80 cm, maximum depth 15 cm) with a flat base. The fill of the pit was homogeneous and with a high amount of charcoal. The original function of the pit remains unclear, but its fill comprised several layers of dark and light grey material, which may have been charcoal and ash, suggesting the incorporation of remains from a hearth or cooking pit. The lack of burned sand underneath the pit at least indicates that the pit was not used for cooking with large open fires.

After the primary use of the pit, the content must have at least partially been removed. A band of dark and more humic material can be seen several centimetres inwards from the edges of the original pit. Remarkably, these humic layers are also visible at the vertical edges of the pit. This suggests that material was placed against the walls of the pit, which was then burned (cf. the sanitation of silo pits through burning; Arnoldussen 2008: 263 note 296). From three different segments of the pit, samples were taken and sieved. Except for one charred grain of Emmer wheat, no botanical remains of plants – other than small fragments of charcoal – were found in the fill of S5.

The finds from S5 consisted of 55 potsherds, with a total weight of 717 grams. Apart from three fragments that will be discussed below, the remaining fragments seem to have belonged to the same (type of) vessel. A large rim fragment could be reconstructed, consisting of 15 sherds. The vessel has a small, thick rim (fig. 5, top). The upper part of the body of the vessel is smoothed, almost polished, while the lower part of the body is smitten (besmeten). The tempering of the pot – fine stone grit temper with only minor inclusions of an organic temper – and polished surface at the neck of the vessel suggest a Middle Iron Age date (Taayke’s G3-type; Taayke 1995: 16). The shape of the vessel is less conclusive,
because it has characteristics of both the G3-type (Middle to Late Iron Age: Taayke 1996: 182, fig. 10.d) and the G5-types (Early Roman period: loc.cit.). The Westeinde vessel from S5 has the simple, thick rim of the G3 type, but its dimensions (diameter at the rim: 27 cm) are uncommonly large (pers. comm. E. Taayke, December 2016). While shape and size are fitting for the younger G5-type, the vessel lacks the protruding and faceted rim of the G5-type.

The other three fragments are rim fragments belonging to an open shaped vessel or bowl. The bake of the rim fragments comparable to that of the vessel discussed earlier: a fine stone grit temper, with only minor incorporations of an organic temper. The top of the rim is decorated with fingertip imprints (fig. 5, lower left). Bowls decorated with fingertip impressions are not commonly found, although some examples are known. For example, fragments of similar type of bowls were found at Zeijen - Witteveen (Waterbolk 1977: 17 (189), fig. 8.23-25) and further north in the terp region, from the earliest phases of Ezinge (Nieuwhof 2014: 38, fig. 5.1602-14). This type of decorated bowls is also known from Oss-Ussen, in the southern parts of the Netherlands (Van den Broeke 2012, 46-50, esp. fig. 3.5.4-5 and fig. 3.6.7, 3.6.13). The bowl fragments from Zeijen and Ezinge date into the Middle Iron Age. In similar vein, in Oss - Ussen the bowl type is commonly found up to the second half of the Middle Iron Age, after which there is a steep decrease in numbers. The type does show a small revival in the Roman period, although without the fingertip imprints on the rim (Van den Broeke 2012, 46 fig. 3.5 nos. 4-5). A carbonised Triticum grain was submitted for AMS dating, but unfortunately did not yield sufficient carbon to allow dating. A provisional dating into the Middle Iron Age is suggested here.

All but six ceramics sherds clustered in the northernmost part of the pit (fig. 6, top). The majority of the fragments were found in the upper 10 centimetres of the fill. Ten sherds were found just on top of the charcoal rich layer. What stands out is the different degrees of weathering of the sherds that cannot be explained by usage (i.e. differential use-wear) of the pot. The lower sherds of the refitted fragment show quite extensive wear, as the originally present smitten surface was completely erased from the vessel (see fig. 6, inset). Adjacent sherds show no traces of such weathering. It is also not likely that these differences were caused by – different – geochemical processes because all fragments were found in the same fill of the pit. This is important, as it suggests that individual sherds may have had different use lives prior to them being placed in the pit. Differences also exist between what fragments were found where. All small sherds were found in the upper fill, whereas the relative larger fragments were all found at the bottom. The fact that they were not found in articulation argues against the rim fragment being broken under pressure of the fill. The sherds ended up being deposited in the pit, although restricted to one specific locale within the pit.

Fig. 5 Part of the ceramics recovered from the pit (S5: v1191) and from a roof-bearing post of the house (S84: v1265), all to the same scale.
Fig. 6. Pit S5 with the ten pottery fragments found just on top of the charcoal rich layer (top). Refitted fragment of a large G3-vessel (bottom left) and differences in weathering on adjacent sherds (bottom right). Numbers in top and bottom photo are corresponding and referring to the same sherds.

4. A plan in place: the implication of the Westeinde house-site

The excavation of Westeinde can be added to the list of settlement sites that do not neatly fit with the present models of Iron Age habitation. This ill-fit holds for the present understanding of both Iron Age house building traditions and the ways houses are placed within Celtic field systems. The Westeinde house was probably built during or after the Late Bronze Age. Although it cannot be dated more precisely at the moment, it is dissimilar to any later prehistoric house plan that has been uncovered in the region thus far. Even though the house is unique in its construction, its constructional elements are also not completely alien to the region. Different characteristics of the house can be recognised across several other later prehistoric structures. In this way, the Westeinde house-plan shows once more that it is impossible – and possibly even unhelpful – to describe all house-plans according to traditional typologies.

The absolute dates obtained for the Westeinde house and outbuildings could not confirm contemporaneity between the house and the nearby outbuildings. Two scenarios remain possible: in the first scenario a small farmstead with house and
two outbuildings was situated amidst the Celtic field. In the second scenario the outbuildings and farm did not belong to the same phase. In both cases, this means that not all domestic activities were restricted to one and the same plot. Even if the house and granaries were contemporary, a nearby uninhabited field plot at some distance of the house comprised a pit containing pottery and a well (fig. 1C). Even though at this moment their temporal association with the house could not be confirmed, the pit and well are found outside the confines of a "single-plot" farmstead within the Celtic field. Evidently, the Westeinde excavation results contradict the existing image of a domestic unit within a otherwise fully agricultural system, as portrayed in figure 2. Activities of a domestic nature (cooking, fetching water) may have been spread across various Celtic field plots and were not restricted to the single plot containing the house proper. This also challenges the existing image of what exactly comprises a farmstead. The importance of easy access to outbuildings may have been the reason these were located close to the house, but this may have been different for wells and cooking pits. In addition to this, the farmstead may not have been a clearly defined and demarcated unit, but rather a more loosely structured zone around the house within which all necessary elements (shelter, drinking water, etc.) for daily life could be found. The Westeinde site is no exception in this, as other Celtic fields show similarly dispersed domestic elements (e.g. Sellingen: Van Giffen 1939 and Gees: Waterbolk 1989: 290, fig. 2).

The similarity in orientation of the house-plan and one of its outbuildings (granary 1; fig. 1, C) to the general orientation of the system of banks supports a certain degree of contemporaneity, but still allows a sequence in which later Iron Age habitation was slotted into a cultural landscape mark-up of considerably older age – which nonetheless still provided visual clues as to its dominant axis of orientation. This conformity of house-orientation and bank-orientations is also visible at Wekerom, Peelo and Hijken (fig. 3), and several other sites (e.g. Sellingen, Zeijen - Noordesveld; Van Giffen 1939: fig. 3a; Waterbolk 1977). Seemingly paradoxically, whereas the orientation of the banks is respected and mirrored by the houses, their location is not. At Westeinde, Sellingen, Hijken, Peelo and Wekerom, some of the house-plans overlap with the location of banks, but due to absence of stratigraphic information their phasing cannot be determined. In a general sense, with OSL and radiocarbon dates suggesting a start of the bank construction from the end of the Middle Bronze Age-B onward (Wallinga & Versendaal 2013a-b), it seems plausible that the houses were built after bank construction – as several Early (Hijken, Peelo) to Middle/Late (Vaassen, Wekerom) dates for the houses have been proposed. Clearly, micro-topographic differences in height did not render such locations unfit for habitation, and one may wonder whether bank locations were favoured as house-sites (albeit that the overlap of house-plans and banks could have been better had prehistoric communities strived to place all houses on bank apexes).

Estimating the number of house-plans potentially present within the given Celtic field complex is difficult. One could argue that the location of the test-trenches at Westeinde uncovered only 7 fields sufficiently extensively to decisively argue whether or not they contained houses. At Vaassen and Peelo, c. 8 and 5 field plots were sufficiently investigated with test-trenches to determine the presence or absence of houses (found in 1 and 3 field plots respectively; Brongers 1976: 44-45 fig. 4; Kooi & De Langen 1987: 58(158)). Similarly, the excavations at Wekerom - Lunteren uncovered 5 houses within the 21 field plots investigated (Arnoldussen & Scheele 2014: 15 fig. 8). At Hijken, no less than 8 house-sites were found within 19 investigated field plots (Arnoldussen & De Vries 2015: 101 fig. 12). At Selleningen, Van Giffen uncovered a house-plan underneath the bank subdividing two field plots (Van Giffen 1939: 90). These few cases suggest that the ratio of field plots with (Iron Age) habitation versus total of field plots ranges between 0.11 and 0.5, with a mean of 0.24 for those site with more than 5 field plots investigated (st.dev. 0.12). In other words, for every inhabited plot there were four plots not inhabited. Extrapolating this ratio of 0.24 for the Westeinde Celtic field complex, suggests that the over 200 field plots of Westeinde (fig. 1, B) may harbour 40 to 50 of such house-sites. Taking into account the estimates for required areas of arable for 5-8 person Iron Age households practising mixed agriculture (1.73 - 2.4 ha; Fokkens 1998: 144 Tab. 27; Woltering 2000: 343 Table 18), the modelled "carrying capacity" of the 34 ha Westeinde complex is 12-19 house-sites, which means that several Iron Age use-phases with contemporary house-sites are to be expected. Unfortunately, due to the small number of fields presently investigated at Westeinde such extrapolations must presently remain very tentatively.

References


