# LAND AT <br> HATCHWOOD PARK, MARCH, CAMBRIDGESHIRE (MAHG12) 

## GEOPHYSICAL SURVEY

Work undertaken for The Landscape Partnership

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## Report produced by

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## 1. SUMMARY

Detailed magnetic gradiometer survey was undertaken, on behalf of The Landscape Partnership, on 25ha of land at Hatchwood, March Cambridgeshire.

The magnetic survey identified evidence of medieval ridge and furrow agriculture along with post-medieval field and drainage systems. A number of discrete anomalies occurred across the site possibly representing pits of unknown date.

Iron Age and Roman remains are known to the east and southeast of the site. However, the easternmost fields within the survey did not produce useful data, as much of the ground was too rough to survey. The parts of the easternmost fields that could be surveyed showed strong magnetic disturbances (probably the result of buried machinery/fires/debris) which would have masked any features of Iron Age or Roman date.

Medieval remains, including a moated site and shrunken medieval village, lie to the south of the site. However no potential medieval remains beyond ridge and furrow agriculture were recorded during the survey.

Most of the features across the site appear to relate to agricultural land-use. A number of localised and very strong responses across the site suggest large buried metallic objects which probably represent discarded/buried farm equipment.

## 2. INTRODUCTION

### 2.1 Definition of an Evaluation

Geophysical survey is a non-intrusive method of archaeological evaluation which is defined as 'a limited programme of nonintrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site. If such archaeological remains are present Field Evaluation defines their character and extent, quality and preservation, and it enables an assessment of their worth in a local, regional, national or international context as appropriate' (IFA 2008).

### 2.2 Background

Archaeological Project Services was commissioned by The Landscape Partnership to undertake detailed magnetometer survey on approximately 25 ha of land. The survey was carried out between the $15^{\text {th }}$ of March and $3^{\text {rd }}$ of April 2012.

### 2.3 Topography and Geology

March is located approximately 38 km north of Cambridge and 23 km east of Peterborough in the Fenland Administrative District of Cambridgeshire (Figure 1). The Application Site is located to the southwest of the urban core of March centred on National Grid Reference TL 410 955. It is an irregular shaped area of land measuring approximately 700 m north-south by 1 km east-west. The Application Site is bounded by March western bypass (A141) to the west, extending south to the rear of properties along Knight's End Road and eastward to the developed area west of The Avenue (Figure 2).

March occupies a former island within the fenland, lying on the northern tip of a large peninsula between two major southern embayments of the fen. The pre-Flandrian bedrock of the area is Kimmeridge Clay, overlain by interglacial gravels (Hoxnian Phase) known as 'March Gravels' (flinty gravels with shelly fauna). Situated on the western edge of the low-lying island, which rises to $c .6 \mathrm{~m}$ OD, the Application Site lies between 0 m and 5 m AOD.

Soils in the area are recorded as Ashley Association fine loamy over clayey stagnogleyic argillic brown earths over aeolian drift incorporated into the surface of chalky till (BGS 1983; Hodge et al. 1984, 96).

Survey was undertaken over six land parcels (Fields 1-6) (Fig. 2).

### 2.4 Archaeological Setting

Geological and soil mapping of the area has suggested that during the prehistoric periods the site lay on the edge of March 'island', with a small extension of the surrounding fen protruding into the site.

Approximately 1 km northwest of the centre of the site, near Cherry Holt Farm, widely scattered waste flints and scrapers have been recorded, although most were found near the bypass (A141). A find of a Neolithic stone axe is also recorded in the vicinity. This prehistoric material was found by the former fen edge and other concentrations of prehistoric flint have been found in similar fen edge locations a little further north, by Gaul Road (Hall 1987, fig 20; Peachey 2009).

A large Bronze Age stone axe was found in the churchyard of St Wendreda, located just southeast of the Site. Prehistoric finds dating from the early Bronze Age, have also been recorded at the church hall. An
archaeological evaluation south of the church, at Jobs Lane, revealed features dating from the Bronze Age to the modern period, including a Bronze Age pit containing worked flint and Beaker pottery.

A concentration of Bronze Age flintwork was also recovered at Cherry Holt farm along with the Neolithic material.

At the south side of St Wendreda's Church, located just to the west of the Site, archaeological investigations revealed a late Iron Age pit, alongside features of later date. Residual finds of Iron Age date were also recovered. Artefacts of Late Iron Age date, comprising pottery and a possible loom weight, were also found immediately north of St. Wendreda's, during investigations at the church hall

A late Iron Age Iceni coin hoard was discovered at Field Baulk Farm, approximately 710 m east of the centre of the Site, where subsequent excavation revealed a curving ditch, possibly associated with a round house.

Iron Age-Roman remains have been recovered on the south side of St Wendreda's church and include a late Iron Age pit alongside features of a later date. Artefacts of late Iron Age date, comprising pottery and a possible loom weight, were also found immediately north of St. Wendreda's, during investigations at the church hall.

Approximately 750 m southeast of the centre of the Site at Wimblingdon Road, archaeological investigations identified a large number of late Iron Age and Roman remains including ditches, gullies, pits and post-holes thought to be associated with settlement dating from the $1^{\text {st }}$ century BC to early $3^{\text {rd }}$ century AD.

At the southern edge of the site by Hatchwood Farm a Roman coin hoard, recorded as a large pot full of coins, was found around 1820, however, it is likely that this indicates the general area (grid square) in which the hoard was reported, rather than a precise location. Two other Roman coin hoards, one alongside a silver vase, were reported to have been found somewhere in the grid square to the north of the site.

Approximately 590 m to the southeast of the centre of the Site, at Jobs Lane (south of St Wendreda's church), a Roman ditch was revealed during archaeological evaluation which identified a range of features from the Bronze Age to modern periods.

A small assemblage of Roman and undated finds was found at Holly Lodge Cavalry Park, 635 m to the east of the centre of the Site, comprising pottery, coins and metal objects including lead weights. An AngloSaxon bronze cruciform brooch of possible 6 th century date was also recovered here.

The place-name March is probably derived from the Old English mearc, meaning 'boundary' (Ekwall 1989, 314). March has been identified as one of the estates given to Ely Abbey c. 1000 AD by Oswy and Leofleda when their son, Aelfwine, was admitted as a monk (Pugh 2002). March is first recorded in the Domesday Book of 1086, indicating the settlement was in existence in the Late Saxon period.

Domesday records that March was held by the Abbey of Ely as a berewick of their manor of Doddington. Within this Ely holding were 12 villeins, each with 12 acres. The Abbot of St. Edmundsbury also held 16 acres in March. In this holding there was land for half a plough, meadow for 4 ploughs or oxen, and woodland for 4 pigs (Williams and Martin 2002, 525-6).

On the basis of the Domesday entry it has been tentatively suggested that there were two centres of settlement and that there was a dispersed pattern of occupation in the Ely holding (Cambridgeshire County Council 2002, 19).

Hatchwood is first mentioned in 1251 when Stephen of the Marsh held 80 acres in the marsh below Hachwood. Hatchwood manor, the first manor to be recorded at March, is first referred to in 1328 when it was held by Geoffrey de Coleville (Pugh 2002).

Cropmarks recorded in Field 7 at the southern end of the Site, to the northwest of Hatchwoods Farm, although undated, are thought to represent the remains of a medieval moated site or fishponds, and include evidence of ditches and enclosures. The site is now levelled and under crop. Later cartographic evidence shows a long trapezoidal earthwork containing a linear pond, which perhaps suggests that the feature was a fishpond.

The HER records the site of a shrunken medieval village to the south of the moat/fishponds where brick, 15th century pottery, shell, quern and bone have been found. This is thought to relate to part of Hatchwood manor or possibly part of Knights End manor.

Cropmark evidence (from aerial photographs) of ridge and furrow earthworks (remains of medieval cultivation) is recorded in the eastern part of the Application Site in Field 1 oriented on an east-west alignment.

Further evidence of ridge and furrow was observed on aerial photographs within the Site. It ran on an east-west alignment in part of Field 9, the western end of Field 6, the eastern end of Field 6 and in Field 3. Some north-south oriented cropmarks were
observed in Field 2 which although on a different alignment may still represent ridge and furrow agriculture. There also appeared to be some north-south aligned linear cropmarks in the western end of field 6 creating a cross hatch pattern.

Saint Wendreda's Church, a Grade I Listed Building, stands to the southeast of the Site. The church dates mainly from the 14th century but with some earlier elements. A Papal indulgence was granted in 1343 for the re-building of the church (Pevsner 2002, 437). The chancel was rebuilt in 19th century. Late Saxon and early medieval pottery found during archaeological investigations on Church Street are thought to indicate possible early medieval settlement associated with the church.

Post-medieval finds include $16^{\text {th }}$ century pottery sherds found at the southern edge of the application site together with medieval pottery.

## 3. AIMS

The aim of the surveys was to locate any features of possible archaeological significance within the proposed development area in order to inform management of the archaeological resource at the site.

## 4. GEOPHYSICAL SURVEY

### 4.1 Methods

Location of survey areas is shown in Figure 2. Ground cover was variable with some areas in better condition for survey than others. Field 1 had been very overgrown with long rough grass, brambles and shrubs, and although much of this had been cleared away and the grass
cut, areas of this field were still unsuitable for surveying, particularly at the southern and northern ends of the field owing to the quantities of dumped material, bonfire sites and metal debris which resulted in wide magnetic disturbances. Fields 2 and 3 had also been under long grass which had been cut, but contained rough areas of cleared brambles and patches of burnt ground. There were also large piles of cut brambles and trees which had to be avoided. Field 4 had been under long grass which had been cut to a suitable length, enabling the whole of the area to be surveyed. Conditions in Fields 5 and 6 were ideal as these were under a wheat crop which measured $c .0 .20 \mathrm{~m}$ in height. Fields 7, 8 and 9 formed part of the application area but were not included in the geophysical survey. Field boundaries were very overgrown throughout.

Survey was undertaken in accordance with English Heritage (2008) and IfA (2010) guidelines and codes of conduct.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd. Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.2 nanoTesla ( nT ) in an overall field strength of c. $49,000 \mathrm{nT}$ can be accurately detected using this instrumentation, although in practice instrument interference and soil noise can limit sensitivity.

The mapping of anomalies in a systematic manner allows an estimate of the type of material present beneath the surface. Strong magnetic anomalies will be generated by buried iron-based objects or by kilns or hearths. More subtle anomalies representing pits and ditches can be seen where they contain more topsoil which is normally richer in magnetic iron oxides
and provides a contrast with the natural subsoil (but this can vary depending on the nature of the underlying deposits). Wall foundations can show as negative anomalies where the stone is less magnetic than the surrounding soil, or as stronger positive and negative anomalies if of brick, but are not always responsive to the technique. It should be noted that not all features will be responsive and absence of anomalies does not necessarily indicate absence of archaeological features.

Magnetometers measure changes in the Earth's magnetic field. With two sensors configured as a gradiometer the recorded values indicate the difference between two magnetic measurements separated by a fixed distance. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame with a 1 m separation between the sensing elements giving $a$ strong response to deep anomalies.

## Sampling interval and data capture

Readings were taken at 0.25 m centres along traverses 1 m apart. This equates to 3600 sampling points in a full $30 \mathrm{~m} \times 30 \mathrm{~m}$ grid. The Grad 601 has a typical depth of penetration of 0.5 m to 1.0 m although a greater range is possible where strongly magnetic objects have been buried in the site.

Readings are logged consecutively into the data logger which is downloaded daily either into a portable computer whilst on site or directly to the office computer. At the end of each job, data is transferred to the office for processing and presentation.

## Processing and presentation of results

Processing is performed using specialist ArchaeoSurveyor software. This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic
processing of the magnetic data involves 'flattening' the background levels with respect to adjacent traverses and adjacent grids. 'Despiking' is also performed to remove the anomalies resulting from small iron objects often found on agricultural land. Once the basic processing has flattened the background it is then possible to carry out further processing which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The following shows the processing techniques carried out on the processed gradiometer data used in this report:

1. DeStripe (sets the background mean of each traverse within a grid to zero and is useful for removing striping effects)
2. Despike (useful for display and allows further processing functions to be carried out more effectively by removing extreme data values)
Parameters: X radius $=1 ; \mathrm{Y}$ radius $=1$; Threshold $=3$ SD; Spike replacement $=$ mean
3. Clip (excludes extreme values allowing better representation of detail in the mid range): -3 to $3 n T$ or -5 to $5 n T$.

### 4.2 Results

The presentation of the data for the site involves a print-out of the raw data as greyscale and trace plots (Figs 3-4, 7-8, 11-12, 15-16, 19-20, 23-24, 26-27; clipped to $+/-50 \mathrm{nT}$ for display but otherwise unprocessed), together with greyscale plots of the processed data (Figs 5, 9, 13, 17, 21, 25, 28). Magnetic anomalies have been identified and plotted onto interpretative drawings (Figs 6, 10, 14, 18, 22, 26, 30) and are described below. Overall greyscale and interpretative plots of the entire survey area (Figs 31, 32, 33) are also provided.

Field 1 (Figs 3-6)
The north and south parts of this field were until recently covered with thick brambles. These had been partially removed with a bulldozer, however the ground was still too rough to conduct the survey in these areas. There were also hollows (in the western part of the field) and an area of made ground (to the northwest) that was avoided as well.

## Modern/magnetic disturbance

This is evident across the majority of Field 1. During the survey large areas of burnt ground were noted along with metal debris, presumably derived from bits of discarded farm machinery etc.

## Iron spikes (discrete bipolar anomalies)

Iron items within the topsoil give a distinctive localised bipolar (strong negative and positive) response. Such items usually derive from relatively recent management or agricultural use of the land - broken or discarded pieces of agricultural machinery or other modern debris. These are fairly widely scattered across all of the survey areas without any notable concentrations and are not described further.

Field 2 \& 3 (Figs 7-10)

## Linear positive anomalies

A number of north-south oriented linear features A are evident in Field 2 and a similar east-west pattern in Field 3. These form a coherent pattern suggestive of ridge and furrow agriculture and have been observed previously as cropmarks from aerial photos.

An east-west oriented, positive linear anomaly was observed in the southern half of Field 3. A series of four faint east-west aligned positive anomalies were observed to the north of the southern anomaly. The fact that these are fairly evenly spaced and
on then same alignment suggests they may represent the remains of ridge and furrow agriculture. A faint somewhat sinuous linear anomaly runs off of the southernmost of the east-west anomalies on a northwest-southeast alignment. Another anomaly was also observed in the area on a northeast-southwest alignment and had a break in the centre of it. These latter anomalies are somewhat faint and irregular and could possibly be natural in origin.

## Discrete positive anomalies

A small number of discrete positive anomalies are evident in Fields 2 and 3 which may represent pit features. These appear to be of moderate size with the exception of a large $c .9 \mathrm{~m}$ wide anomaly that straddles the path which separates the fields from each other.

## Modern/magnetic disturbance

Considerable magnetic disturbance is evident in the northeastern and eastern edge of the field. There is also some disturbance at the south of Field 2 which might indicate the presence of a large buried metallic object.

## Field 4 (Figs 11-14)

Linear positive anomalies
A series of three east-west oriented parallel, faint linear anomalies $\mathbf{B}$ in the northeast area of this field probably represent the last remnants of ridge and furrow agriculture surviving in this field. They appear to extend in length up to a roughly north-south oriented linear anomaly, which may be an associated boundary or headland.

## Modern/magnetic disturbance

There is a substantial magnetic disturbance in the southeastern corner of this field which probably represents a large buried metal object.

Field 5, western area (Figs 15-18)

## Linear positive anomalies

A strong linear positive anomaly $\mathbf{C}$ aligned on a north-south orientation across the central area of Field 5 represents a former field boundary ditch. The earliest cartographic evidence of this boundary is observed on the $1^{\text {st }}$ edition OS map of 1887 (Fig 36). Linear anomaly D also represents a field boundary ditch which extends east from $\mathbf{C}$ and forms part of the same field system observed on the 1887 OS map (Fig 36). Both of these boundaries continue into Field 6 and have had their probable extent plotted on Figure 33.

Curving linear anomaly $\mathbf{E}$ in the eastern area of the field is somewhat fainter than the other two but also represents a former boundary ditch. This field boundary is older than C and D (which perhaps accounts for its fainter signal) and is depicted on a $17^{\text {th }}$ century map of the March area (Fig 34).

Two parallel linear anomalies, oriented on a roughly north-south alignment, at the central northern edge of Field 5 do not correspond to any boundaries observed in the cartographic evidence but may represent ditches, perhaps for drainage, although the easternmost of these seems to be slightly curved.

A roughly north-south oriented linear anomaly at the northeastern edge of Field 5 could also represent part of a former drainage pattern.

## Discrete positive anomalies

A single discrete positive anomaly was identified in this area and may represent a pit feature.

## Drainage features

A pattern of east-west field drains $\mathbf{F}$ is evident across the western part of the site, associated with field boundary $\mathbf{C}$ and
presumably draining the former parcel of land to the west of this field boundary shown on the $1^{\text {st }}$ edition OS map of 1887 (Fig 36). A fainter pattern $\mathbf{M}$ runs roughly north-south, closely parallel with $\mathbf{C}$ and again apparently relating to drainage of this land parcel (if not something more recent). At the westernmost edge and parallel to this pattern a stronger bipolar linear response $\mathbf{N}$ suggests a more substantial drain or pipe.

The positive linear anomalies running on a northwest-southeast alignment coming off curving field boundary $\mathbf{E}$ probably represent drainage associated with the earlier parcel of enclosed land depicted on the $17^{\text {th }}$ century map of the March area (Fig 34). Their alignment falls in with that of the possible ridge and furrow $\mathbf{G}$ (below) suggesting that they may have been inserted while this was still evident on the ground.

## Agricultural features

Curving positive linear anomalies $\mathbf{G}$ at the western edge of Field 5 suggest medieval ridge and furrow (and possibly continue faintly eastwards at the northern end), although they are quite closely spaced.

Field 5, northern area (Figs 19-22)
Linear positive anomalies
A strong linear positive anomaly on a northwest-southeast alignment $\mathbf{H}$ in the southern part of this field represents a field boundary which corresponds to an enclosed parcel of land depicted on the March rural tithe map of 1840 (Fig 35).

## Modern/magnetic disturbance

A strong linear bipolar response and wider area of magnetic disturbance occurs at the northern end of this field indicating the route of a gas pipeline line reportedly running through this area.

Field 6 (Figs 23-26)
Linear positive anomalies
Linear anomaly I represents a former field boundary ditch which demarcates two enclosed parcels of land in this field. The boundary ditch and enclosed land are depicted on the $1^{\text {st }}$ edition OS map of 1887. This ditch is part of the same field system as $\mathbf{C}$ and $\mathbf{D}$ in Field 5 (western area) and is part of the same boundary ditch. A number of strong positive responses occur within the ditch itself and probably represent discarded metal objects. The full probable extent of this boundary ditch is depicted in Fig 33 as well as on the 1887 map ( Fig 36 ).

Linear anomaly $\mathbf{J}$ is L shaped and also represents a former field boundary ditch enclosing a parcel of land. This field boundary is probably earlier in date than I as it probably corresponds to a former boundary depicted on a $17^{\text {th }}$ century map of the March area (Fig 34).

## Geological/drainage features

A series of field drains $\mathbf{K}$ oriented roughly north-south stop at boundary ditch I and are thus likely to be of the same date forming the drainage system for the trapezoidal piece of land depicted on the 1887 OS map (Fig 36).

## Modern/magnetic disturbance

A strong area of magnetic disturbance occurred in the southeastern area of the field and may represent a large buried metal object. Strong readings from within boundary ditch I were recorded in the same area and probably represent metallic farming equipment discarded at the side of the field.

Field 4, northern area (Figs 27-30)
Linear positive anomalies
A pattern of parallel NW-SW anomalies $\mathbf{L}$ probably represents former ridge and furrow cultivation in this area. The
alignment matches that seen further to the south in Field 4, but rather more coherent here. Strong anomalies $\mathbf{M}$ and $\mathbf{N}$ follow this same alignment. These reflect the position of a surviving earthwork bank and flanking ditches (see Fig 33) which relate to a former narrow land parcel shown on $19^{\text {th }}$ century mapping (see Figs $35-36$ ). The overall alignment suggests that some part of the earlier ridge and furrow pattern has been preserved or reused in setting out these fields. However, the highly magnetic nature of the response strongly suggests the presence of a modern pipe/drain along either side (or at the least the incorporation of considerable modern material into the fills). The northern response is much stronger suggesting something more substantial or less deep.

## Discrete positive anomalies

A single discrete positive anomaly $\mathbf{O}$ was also identified in this area and may represent a pit feature.

## 5. DISCUSSION

Magnetic survey on land at Hatchwood, March Cambridgeshire has identified remains of medieval ridge and furrow agriculture and post-medieval field and drainage systems. A number of discreet positive anomalies that may represent pits of uncertain date were also revealed.

Iron Age and Roman remains to the east and southeast of the site suggested that there may have been some potential for the discovery of remains of this date. However, the easternmost fields in the survey did not yield good results due to unsuitable ground cover and large magnetic disturbances resulting from dumped material, bonfire sites and metal debris that would have masked any archaeological features.

The majority of the features revealed during the investigation relate to postmedieval agricultural use of the land. A number of localised and very strong responses suggest large buried metallic objects, probably discarded farm equipment.

## 6. ACKNOWLEDGEMENTS

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## 7. PERSONNEL

Project coordinator: Tom Lane
Geophysical Survey: Andy Failes, Matt Berry, Bryn Leadbetter
Survey processing and reporting: Andy Failes

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## 9. ABBREVIATIONS

APS Archaeological Project Services
BGS British Geological Survey
EH English Heritage
IfA Institute for Archaeologists
HER Historic Environment Record


Figure 1 General location plan


Figure 2 - Survey locations


## Archaeological Project Services

Project Name: March Hatchwood Park (MAHG12)

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Figure 3 - Field 1: Unprocessed data trace plot


Figure 4 - Field 1: unprocessed data trace plot


Figure 5 - Field 1: processed data greyscale plot


Figure 6 - Field 1: interpratative plot



Figure 8 - Fields 2 and 3: unprocessed data trace plot


Figure 9 - Fields $2 \& 3$ : processed data greyscale plot


Figure 10 - Fields $2 \& 3$ : interpretative plot


Figure 11 - Field 4: unprocessed data greyscale plot


Figure 12 - Field 4: unprocessed data trace plot


Figure 13 - Field 4: processed data greyscale


Figure 14 - Field4: interpretative plot



Figure 16 - Field 5, western area: unprocessed data trace plot


Figure 17 - Field 5, western area: processed data greyscale



Figure 19 - Field 5, northern area: unprocessed data greyscale plot


Figure 20 - Field 5, northern area: unprocessed data trace plot


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Figure 21 - Field 5, northern area: processed data greyscale plot


Figure 22 - Field 5, northern area: interpretative plot

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Figure 24 - Field 6: unprocessed data trace plot


Figure 25 - Field 6: processed data greyscale plot


Figure 26 - Field six: interpretative plot


Figure 27 - Field 4 North: unprocessed data greyscale plot


Figure 28 - Field 4 North: unprocessed data trace plot


Figure 29 - Field 4 North: processed data greyscale plot


Figure 30 - Field 4 North: interpretative plot



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Figure 33 - Full survey showing ditches and drainage patterns


Figure 34 - Extract of 17th century map of March area, showing field boundaries E and J


Figure 35 - Extract of March rural tithe map of 1840, showing field boundary H
Fielo


Figure 36 - Extract of 1st edition OS map of 1887, showing field boundaries C, D \& I

