Bellway Homes West Midlands Ltd

CECILLY MILLS, OAKAMOOR ROAD, CHEADLE

ECOLOGICAL APPRAISAL

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FPCR Environment and Design Ltd
Registered Office: Lockington Hall, Lockington, Derby DE74 2RH
Company No. 07128076. [T] 01509 672772 [F] 01509 674565 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

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1.0 INTRODUCTION

1.1 This report details the results of an Ecological Appraisal undertaken for Bellway Homes West Midlands Ltd. by FPCR Environment and Design Ltd. of an area of land off Oakamoor Road, Cheadle (grid ref: SK01364371).

1.2 The site is situated to the north east of Cheadle town centre, north of Oakamoor Road, and is bounded by residential housing to the east, south and west, and by a playing field to the north. The site was dominated by two main habitats; a pasture field in the north of the site, and hardstanding comprising the former JCB factory in the south of the site. A tree lined brook was also present towards the east of the site.

1.3 This report summarises the results of ecological survey work undertaken across the site comprising a Phase 1 Habitat Survey (RSK, August 2017) and bat emergence survey (RSK, September 2017) (application ref: SMD/2017/0660), as well as updating surveys undertaken by FPCR in August and September 2019 to support a reserved matters application.

2.0 METHODOLOGY

Desktop Study

2.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations including:

- Multi Agency Geographic Information for the Countryside (MAGIC)[1]

2.2 Further inspection of colour 1:10000 OS base maps and aerial photographs from Google Earth (maps.google.co.uk) was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

2.3 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:

- 10km around the application area for sites of International Importance (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites).
- 2km around the application area for sites of National or Regional Importance (Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNR)).

2.4 The Countryside Officer at Staffordshire Moorlands District Council provided an overview of monitoring and management works undertaken along the adjacent brook section to the south, and previous survey effort conducted by RSK and submitted with the outline application was also considered and summarised within this report where appropriate.

[1] www.magic.defra.gov.uk

Field survey

Habitat Survey

2.5 The updating habitat survey was undertaken on 16th August 2019 by an ecologist from FPCR.

2.6 The site was surveyed using the standard Extended Phase 1 Habitat Survey Methodology as recommended by Natural England, which follows methods in the JNCC Handbook for Phase 1 Survey[2]. This comprised a systematic walkover of the site, mapping and broadly describing the principal habitat types and identifying the dominant plant species/communities present within each habitat type. Each habitat type was described based on botanical merit and target notes were used to highlight features or habitats of particular interest.

2.7 The standard survey methodology was extended to assess the potential presence of protected species within features such as trees or specific habitats considered for their ecological value and potential to provide suitable habitats for protected species.

2.8 Particular consideration using recommended guidelines was given to the potential presence of bats[3], birds, reptiles, great crested newt (GCN) *Triturus cristatus*, badger *Meles meles*[4], otter *Lutra lutra* and water vole *Arvicola amphibius*.

2.9 Consideration was also given to the presence of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981[5], however this survey does not comprise a comprehensive invasive plant survey and may not have detected emergent stands.

2.10 Hedgerows were surveyed individually using the Hedgerow Evaluation and Grading System (HEGS)[6]. This method of assessment includes noting down canopy species composition, associated ground flora and climbers, structure of the hedgerow including height, width and gaps, number and species of mature trees, and associated features such banks, ditches and grass verges.

2.11 Each hedgerow is given a grade using HEGS with the suffixes '+' and '-', representing the upper and lower limits of each grade respectively. These grades represent a continuum on a scale from 1+ (the highest score and denoting hedges of the greatest nature conservation priority) to 4- (representing the lowest score and hedges of the least nature conservation priority) as follows:

- Grade 1 – High to very high value
- Grade 2 – Moderately high to high value
- Grade 3 – Moderate value
- Grade 4 – Low value

2.12 Hedgerows graded 1 or 2 are considered to be a priority for nature conservation.

2.13 As part of the assessment all hedgerows were also assessed against the criteria to be classified as 'habitats of principle importance' as listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

2 JNCC. 2010. Handbook for Phase 1 habitat survey – a technique for environmental audit. Peterborough: JNCC
3 Collins, J. (ed.) 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust.
4 Harris, S., Cresswell, P. & Jefferies, D. 1989. *Surveying for badgers*. Occasional Publication of the Mammal Society No. 9. Mammal Society, Bristol.
5 Act of Parliament, 1981. The Wildlife and Countryside Act 1981 (as amended), London: HMSO
6 Clements, D.K. & Tofts, R.J. 1992. *Hedgerow Evaluation and Grading System* (HEGS): A methodology for the ecological survey, evaluation and grading of hedgerows.

2.14 Hedgerows were also assessed under the wildlife and landscape criteria of the Hedgerow Regulations 1997. This broadly follows the above methodology, although an average canopy species per 100m is calculated. This methodology is broadly consistent with that outlined in The Hedgerow Survey Handbook (DEFRA, 2007)[7].

Bats

Ground Level Tree Assessment

2.15 The tree assessments were undertaken from ground level, with the aid of a torch and binoculars where required. During the survey Potential Roosting Features for bats such as the following were sought (based on p16, British Standard BS 8596:2015[8]):

- Natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar.
- Man-made holes (e.g. cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems.
- Woodpecker holes.
- Cracks/splits in stems or branches (horizontal and vertical)
- Partially detached, loose or flaky bark.
- Cankers (caused by localised bark death) in which cavities have developed.
- Other hollows or cavities, including butt rots.
- Compression of forks with occluded bark, forming potential cavities.
- Crossing stems or branches with suitable roosting space between.
- Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
- Bat or bird boxes.
- Other suitable places of rest or shelter not listed above.

2.16 Certain factors such as orientation of the feature, its height from the ground, the direct surroundings and its location in respect to other features, may reduce enhance or reduce the potential value.

2.17 Based on the above, trees were classified into general bat roost potential groups based on the presence of these features. Table 1 broadly classifies the potential categories as accurately as possible as well as discussing the relevance of the features. This table is based upon Table 4.1 and Chapter 6 in the BCT Good Practice Guidelines[4].

2.18 Although the British Standard document groups trees with moderate and high potential, these have been separated in Table 1 (as per Table 4.1 in the BCT Guidelines) to allow more specific survey criteria to be applied.

7 DEFRA 2007. *Hedgerow Survey Handbook: A standard procedure for local surveys in the UK.*

8 British Standard 2015. BS 8596:2015 *Surveying for bats in trees and woodland – Guide*, October 2015.

Table 1. Bat survey protocol for trees

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers (where possible, health and safety constraints allowing) **and** nocturnal survey during appropriate periods (e.g. nocturnal survey - May to August) to inform on the licence. Works to tree(s) undertaken under supervision in accordance with the approved good practice method statement provided within the licence. **However,** where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.
High Potential	A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat. Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.	Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from Natural England will be required. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.
Moderate Potential	A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.	Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers **and / or** nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate. If a roost site/s is confirmed a licence from Natural England will be required.
Low Potential	A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential. Examples include (but are not limited to) loose/lifted bark, shallow splits exposed to elements or upward facing holes.	No further survey required but a precautionary working method statement may be appropriate.
Negligible/ No potential	Negligible / no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2017 affords protection to “breeding sites” and “resting places” of bats. The EU Commission’s Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places “where there is a reasonably high probability that the species concerned will return

Nocturnal survey

2.19 Two nocturnal surveys were undertaken of each of two mature alder *Alnus glutinosa* identified during the ground-based inspection to display features with moderate potential to support roosting bats, in accordance with Table 1. These comprised an emergence/dusk survey on 2nd September, and a pre-dawn roost survey on 19th September 2019. The trees were located sufficiently close such that two surveyors could monitor all features of interest simultaneously.

2.20 The surveyors used Wildlife Acoustics Inc. Echo Meter Touch® bat detectors in conjunction with android devices to detect and record bat activity to aid species identification.

2.21 Post-survey, bat calls were analysed using BatSound© Pro (Pettersson Elektronik) software package or AnalookW© (Corben C) software package by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed.

3.0 RESULTS

Desktop Study

Designated sites

3.1 There were no nationally designated sites within 2km or internationally designated sites within 10km of the site.

3.2 Two Local Nature Reserves (LNRs) were identified within 1km of the site as shown in Table 2.

Table 2. Local designated sites

Site Name	Designation	Description	Distance from Site
Cecilly Brook	A 1.25km section of the Cecilly Brook designated as a LNR in 2000. It is one of the most important sites for water voles in Staffordshire. Ancient flower rich meadows occur at Thorley Drive adjacent to Cecilly Brook (530m south of site) and are of county importance for their flora. Mature hawthorn-blackthorn hedges surround the fields with dog rose, elder and hazel. Ivy and honeysuckle provide rich nectar sources for invertebrates.	LNR	Partially on site (east of brook and largely corresponding with hard standing)
Hales Hall Pool	Supports greater tussock sedge and lesser reedmace. Tussock sedge forms bushy rounded tufts about 0.5m to 1m high. Lesser reedmace is now rare in this county and is similar to its relative the more commonly known bulrush. The site hosts a number of waterfowl that include moorhen, coot, great-crested grebe, reed-bunting, mute swans and mallard duck. During the summer months dragonflies and damselflies are also present at the site.	LNR	200m E

Previous survey work

3.3 The phase 1 habitat survey undertaken by RSK in August 2017 recorded a semi-improved grassland field compartment in the north of the site, an area of hardstanding in the south of the site, and small areas of tree cover in the east. The field compartment was bordered by a hedgerow to the northwest, a tree lined brook to the northeast and a line of scattered scrub to the south. The hardstanding area included rubble from recently demolished buildings. The small areas of tree cover in the east of the site were confined to the edges of the site and the brook.

3.4 Three trees adjacent to the brook in the south of the site were assessed in 2017 as having low-moderate potential to support roosting bats.

3.5 An emergence survey of these trees by RSK in September 2017 recorded no evidence of bats emerging from the trees, although a small number of common pipistrelle *Pipistrellus pipistrellus* were recorded foraging along the brook and commuting along tree lines and hedgerows on site.

3.6 Monitoring data summarised within the Cecilly Brook and Hales Hall Pool Management Plan 2014-2019 made reference to 44 moth species and 13 butterfly species recorded at Cecilly Brook and Hales Hall Pool. Aquatic sampling indicated a healthy diverse community dependant on good water quality. Fish species recorded by the Environment Agency included tench *Tinca tinca*, perch *Perca fluviatilis*, pike *Esox lucius*, roach *Rutilus rutilus*, bream *Abramis brama* and crucian carp *Carassius carassius*, but with very few small fish caught. Bullhead *Cottus gobio* and brown trout *Salmo trutta* have additionally been recorded within Cecilly brook (unknown date). Common toad *Bufo bufo*, and grass snake *Natrix helvetica* have been recorded locally, as have water vole, common pipistrelle, Daubenton's bat *Myotis daubentonii*, and noctule *Nyctalus noctule*. Bird species recorded breeding within the Cecilly Brook LNR include song thrush *Turdus philomelos*, house sparrow *Passer domesticus*, starling *Sturnus vulgaris* (all Red List), kingfisher *Alcedo atthis*, willow warbler *Phylloscopus trochilus*, dunnock *Prunella modularis*, bullfinch *Pyrrhula pyrrhula* and reed bunting *Emberiza schoeniclus* (Amber List). Furthermore, the SMDC Countryside Officer confirmed willow tit *Poecile montanus* (Red List) has recently been recorded using nest boxes provided within the LNR.

Field Survey

Habitats

3.7 The updated phase 1 habitat survey in 2019 recorded semi-improved grassland within the field in the north of the site, and areas of hard standing in the south of the site with tree and scrub cover along the eastern boundary along Cecilly Brook.

Semi-improved grassland

3.8 The field comprised a single compartment of semi-improved grassland bounded by hedgerow H3 to the northwest, by Cecilly Brook to the east, and by the former JCB factory site to the south. At the time of the survey in 2019 the sward was tall (c.0.5-1.0m) and with a greater degree of scrub encroachment along the eastern and north western boundaries than was recorded in 2017.

3.9 The composition of the grassland had remained largely unchanged since 2017, and still dominated by grasses including false oat-grass *Arrhenatherum elatius,* cock's-foot *Dactylis glomerata*, red fescue *Festuca rubra* and Yorkshire fog *Holcus lanatus* (Appendix A). Broad leaved herbs and ruderal species present throughout the sward comprised creeping thistle *Cirsium arvense*, cleavers *Galium aparine*, ribwort plantain *Plantago lanceolata* meadow buttercup *Ranunculus acris*, broad-leaved dock *Rumex obtusifolius*, and common nettle *Urtica dioica*.

Cecilly Brook

3.10 Cecilly Brook flows north to south along the eastern edge of the northern field entering the site approximately halfway along the site boundary at the north east corner of the former JCB factory area. The brook exits the site under the Oakamoor Road bridge.

3.11 The upper/northern section of the brook was generally fast flowing but variable, with natural meanders and natural dams formed by branches and vegetation. The channel width varied between 1-2m. The eastern bank was c.0.2-0.5m above the water level at the time of the survey, with evidence of recent flooding and overflowing of berm sections. The western bank began at a similar height in the north of the site gradually increasing to 2-3m at a bend in the brook, returning to 1-2m height at the road bridge across the brook.

3.12 The southernmost c.65m of the brook was historically channelized underneath the main factory building but was reopened on demolition of the building in 2016/2017. From the retained bridge over the brook south to Oakamoor Road this section of the brook remains channelized with steep to vertical concrete sides with limited ruderal species present.

3.13 The brook to the north of the bridge was more naturalistic in nature with tree and scrub cover heavily shading the majority of the watercourse, in some instances bridging over the brook. Himalayan balsam *Impatiens glandulifera* was present throughout this length of the brook and formed the dominant vegetation cover on several sections of the eastern bank.

Tree Cover

3.14 Where the Cecilly Brook enters the site there is a confluence where Palm Brook joins from the northeast. This area supports a mixture of species such as alder, crack willow *Salix fragilis* and sycamore *Acer pseudoplatanus* present and species such as bay *Laurus nobilis*, downy birch *Betula pubescens* and horse chestnut *Aesculus hippocastanum* planted for amenity value.

Tall Ruderal

3.15 There are the remnants of amenity planting mixed with ruderal species along the top of the banks of the channelized brook section. Sparse ruderal and amenity species growth was also recorded throughout the hardstanding area of the former factory site, with abundant rosebay willowherb *Chamaenerion angustifolium* and buddleia *Buddleia davidii*, and frequently recorded common ragwort *Jacobaea vulgaris*, nettle and broad-leaved dock.

Hard Standing

3.16 The southern part of the site comprised concrete hardstanding remaining from the demolition of the former JCB factory.

Hedgerows

3.17 Three intact hedgerows and a defunct hedgerow were recorded on site. Hedgerow H1 on the eastern boundary comprised a formal conifer *Cupressocyparis leylandii* hedgerow, whereas hedgerows H2 & H3 along the western site boundary comprised native species. A defunct hedgerow characterised as line of scattered scrub bisects the site dividing the pasture field from the former JCB factory area. A summary of hedgerows is shown in Table 3 below:

Table 3. Hedgerow summary table

Ref	Canopy Sp.	Height / Width (m)	Approximate Length (m)	Sp. per Av. 30m	Notes	HEGS Grade	Important under Hedgerow Regulations
H1	*Cl*	5 / 2	127m	1	Formal Conifer hedge	3+	NO
H2	*Cm, Ia, Sn, Fe*	6-8 / 4	55m	3	Lane hedgerow, unmanaged.	2+	NO
H3	*Cm, Fe, Ac*	2-6 / 3	167m	3	Forms parallel hedgerow with path between. Trees over growing from adjacent hedge.	-2	NO

Cl - *Cupressocyparis leylandii* conifer; Cm – *Crateagus monogyna* hawthorn; Ia – *Ilex aquifolium* holly; Sn – *Sambucus nigra* elder; Fe – *Fraxinus excelsior* ash; Ac – *Acer campestre* field maple.

Fauna

Badger

3.18 A survey of the site was undertaken to determine the likely presence / absence of this species from the site. No evidence of badger was recorded on site and it is therefore concluded that this species is likely to be absent from the site.

Bats

3.19 The previous surveys undertaken in 2017 identified three trees with low-moderate bat roost potential on site, however due to the further physical deterioration of these trees since then, the updating survey downgraded one tree to negligible bat roost potential and upgraded the other two trees to moderate bat roost potential. These comprised two mature alder located on the western bank of the brook, to the north of the on-site bridge (T1, T2, Figure 1).

3.20 The two updating bat surveys in 2019 recorded no evidence of bats emerging from or returning to either of the trees identified as having potential roost features present. A summary of the 2017 and 2019 survey findings is provided in Table 4. Further details of bat activity recorded during the 2019 surveys provided in Figure 2 and Appendix B.

Table 4. Tree bat roost survey results

Date	13.09.2017		02.09.2019		19.09.2019	
Survey	Dusk Emergence		Dusk Emergence		Dawn Re-entry	
Sunset/ Sunrise	19:27		19:59		06:49	
	Start	*End*	*Start*	*End*	*Start*	*End*
Duration	19:12	20:42	19:44	21:29	03:19	07:05
Temp ºC	13	10	15	15	8.5	8.5
Wind *BF*	1	3	0	0	1	1
Rain (1-10)	0	0	0	0	0	0
Cloud %	10	60	90	70	10	10
Summary	No emergence from trees. A low level of bat activity was recorded within the site, with a small number of Common pipistrelle observed foraging along the Cecilly Brook, and commuting along tree lines and hedgerows present on the site boundaries.		No emergence from trees. A low level of bat activity was recorded within the site, with several common Pipistrelle passes two noctule passes, and a single brown long-eared bat *Plecotus auritus* recorded at the end of the survey.		No re-entry into trees. Single passes by a common pipistrelle and a *Pipistrellus* sp.	

Nesting birds

3.21 Trees and scrub along the Cecilly Brook and hedgerows on site all provide potential bird nesting habitat suitable to support a range of garden and urban edge species.

Water vole

3.22 The upper section of the brook provides potential suitable habitat to support foraging and commuting among natural banks, as well as potential places of rest and shelter for water vole. The lower section with engineered banks between the on-site bridge and Oakamoor Road provides limited suitability for commuting only.

3.23 The 2017 surveys had highlighted the presence of water vole within Cecilly Brook and there are several records throughout the LNR. Burrows and feeding stations showing characteristics of water vole were noted towards the upper section of the brook within the site during the 2019 updating survey, though no droppings were recorded.

4.0 DISSCUSSION AND RECOMENDATIONS

4.1 The proposed development site currently has outline planning for the construction of 121 dwellings. In order to obtain reserved matters consent for the proposed development updating phase 1 and phase 2 ecology surveys were undertaken in 2019.

4.2 The updating phase 1 habitat survey determined no significant change in the habitats from those previously recorded in August 2017. Minor scrub encroachment on the edges of the field compartment and over shading of the poor semi-improved grassland verges in the east of the site were the only differences recorded.

4.3 The proposals necessitate the removal of the defunct hedgerow present to the south of the semi-improved grassland to enable extensive ground level remodelling. This loss was discussed with the Council's Arboricultural Officer at the pre-app meeting in May 2019, at which it was agreed this hedgerow was in very poor condition and not appropriate for retention[9]. The site green infrastructure will however encompass widespread scattered native shrub and other planting to provide alternative commuting/foraging/nesting habitat for a range of local fauna, and enhance connectivity to habitats to the east and neighbouring brook habitats to the north and south.

4.4 Cecilly Brook LNR partly extends onto the site, encompassing the brook channel and land to the east of Cecilly Brook. This area currently largely comprises hardstanding. Removal of the hard standing and bringing the area into management as native species-rich grassland with additional native shrub planting will provide biodiversity enhancement and an improvement to the connectivity and ecological function of the LNR. The brook will buffered from development and associated works except where reprofiling is proposed, either for reasons of enhancement of the currently unsuitable channelized section or for bank stability.

4.5 The 2019 site survey recorded water vole feeding stations and burrows north of the confluence with Palm Brook. The brook banks at this location will be regraded slightly as part of the proposed development and then seeded with a native grassland mix, therefore will continue to provide suitable forage for water vole. The naturalisation of Cecilly Brook will provide a net gain

[9] Confirmed in email of 02/07/19 from Steve Massey to Ben Haywood.

for water vole and provide enhancement of the brook as an ecological corridor of high value for numerous other species.

4.6 Recommendations to enhance the site value for water vole include:

- Removal of engineered banks and creation of re-engineered, landscaped banks that will improve habitat linkage to the south and provide new foraging habitats and opportunities for water voles to establish burrows. Provision of gabions will deliver further opportunities for burrow creation within and behind the structures.
- Naturalisation of the former engineered channel section via creation of a backwater, shallow scalloped bays, and deeper pools within the brook channel. The brook banks should include steep sections suitable to support water vole burrows, and more gently sloping sections that experience fluctuating water levels and support native wetland/grassland vegetation.
- Creation of seasonal pools adjacent to the brook corridor to provide increased habitat variety and refuge away from main watercourse.
- Clearance of areas ($\geq$50%) of the bramble scrub from the banks of the upper section of the brook, retaining only small patches, and annual scrub control thereafter.
- Crown thinning/removal of trees and shrubs to allow light to the steam for bankside grassland and aquatic vegetation establishment.
- Removal of woody vegetation will avoid the bird nesting season (March – August inclusive) or will be preceded by a nesting bird check by a suitably experienced ecologist. If active nests are found, the area will be left untouched and suitably buffered from works until all birds have fledged. Specific advice will be provided prior to undertaking the clearance.
- Himalayan balsam control to enhance establishment of new grassland of foraging value (Appendix C).
- Following removal of bramble and Himalayan balsam, over-seed with native grassland to encourage establishment of more suitable food plants for water vole.
- Provide 'dogs on leads' and water vole information signage to encourage the engagement of residents and help minimise disturbance to the watercourse.

4.7 The updated bat survey confirmed the likely absence of bats from the two trees with bat roost potential. No other trees or structures on site had potential to support roosting bats. The main features considered likely to be utilised by foraging bats comprised the hedgerows along the northwest and southeast boundaries, and the brook corridor on the eastern site boundary. As these features will be retained and the brook enhanced as a wildlife corridor the overall impact on bats resulting from the proposed development is considered to be neutral.

4.8 Additional recommendations to provide a net gain in the value of the site for bats are outlined below:

- Inclusion of bat boxes on suitable retained trees. Suitable designs include: Schwegler 2F, 1FF and/or 1FD box designs. To encourage occupation these will be arranged in groups of three on the same tree, located at heights at least 4m above ground and facing different directions, ideally southeast, south-west and north.
- Provision of hibernacula (minimum dimension 1m width x 2m length x c.0.7m above ground) within areas of enhanced green infrastructure east of the brook channel. These will be

designed to be suitable to support a range of terrestrial species including amphibians, reptiles and invertebrates.

- Creation of 'bee banks' in close proximity to the brook corridor and hibernacula. These will provide a variety of sloping aspects with open sunny areas for basking invertebrates (see the Buglife bee bank illustration and construction details[10]).
- Careful design of lighting strategy in accordance with guidance from the ILP[11]

4.9 To compensate for the loss of potential nest sites and provide long-term nesting opportunities for local bird species it is recommended a selection of bird boxes are provided on retained trees in the vicinity of the brook corridor. A selection of hole- and open-fronted designs should be provided for this purpose, to encourage a variety of species. Suitable box makes/models include, but are not limited to: Schwegler 1B, 1SP, 2M, 2GR, 1CGA and 3SV nest boxes, Schwegler 2B tree creeper nest box, and Vivara Pro Seville 32mm, Seville 28mm and Barcelona (open) nest box designs. Bird boxes suitable for use by willow tit (natural log boxes, bark boxes or other appropriate design) should additionally be provided low down on suitable trees within the brook corridor.

[10] Buglife 2008. Managing Aggregates Sites for Invertebrates – a Best Practical Guide. https://www.buglife.org.uk/resources/habitat-hub/aggregate-hub/bringing-aggregate-sites-to-life-and-resources/

[11] Institute of Lighting Professionals (ILP) and Bat Conservation Trust (BCT), 2018. Guidance Note 8 Bats and Artificial Lighting. [Available online: https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/]

APPENDIX A: Botanical Species List

Abundance is described on the DAFOR scale.
D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare. (LA = Locally Abundant)

Ruderal

Common Name	Scientific Name	DAFOR
Annual meadow-grass	*Poa annua*	O
Ash	*Fraxinus excelsior*	R
Broad-leaved dock	*Rumex obtusifolius*	F
Buddleia	*Buddleja davidii*	F
Common nettle	*Urtica dioica*	F
Common ragwort	*Jacobaea vulgaris*	F
Crack willow	*Salix fragilis*	R
Dandelion	*Taraxacum officianle* agg.	R
Evening primrose	*Oenothera biennis*	R
False oat grass	*Arrhenatherum elatius*	R
Fleabane	*Erigeron*	R
Rough hawkbit	*Leontodon hispidus*	R
Honeysuckle	*Lonicera periclymenum*	R
Perennial ryegrass	*Lolium perenne*	O
Rosebay willowherb	*Chamaenerion angustifolium*	A
Spear thistle	*Cirsium vulgare*	O

Field

Common Name	Scientific Name	DAFOR
Annual meadow-grass	*Poa annua*	F
Broad-leaved dock	*Rumex obtusifolius*	O
Common nettle	*Urtica dioica*	F
Common ragwort	*Jacobaea vulgaris*	R
Dandelion	*Taraxacum officinale agg.*	O
False oat grass	*Arrhenatherum elatius*	A
Meadow-grass sp.	*Poa* sp.	R
Meadow fox tail	*Alopecurus pratensis*	F
Marsh thistle	*Cirsium palustre*	LA
Meadow buttercup	*Ranunculus acris*	R
Meadow vetchling	*Lathyrus pratensis*	R
Perennial ryegrass	*Lolium perenne*	F
Red clover	*Trifolium pratense*	O
Red fescue	*Festuca rubra*	LA / F
Ribwort plantain	*Plantago lanceolata*	F
Sheep sorrell	*Rumex acetosella*	LA
Smooth tare	*Vicia tetrasperma*	R
Yarrow	*Achillea millefolium*	R
Yorkshire fog	*Holcus lanatus*	A

Tree Cover

Common Name	Scientific Name	DAFOR
Alder	*Alnus glutinosa*	A
Ash	*Fraxinus excelsior*	O
Bay	*Laurus nobilis*	R
Bramble	*Rubus fruticosus* agg.	A
Chickweed	*Stellaria media*	R
Cocks-foot grass	*Dactylis glomerata*	R
Common ragwort	*Jacobaea vulgaris*	R
Crack willow	*Salix fragilis*	O
Creeping buttercup	*Ranunculus repens*	R
Dandelion	*Taraxacum officinale* agg.	O
Downy birch	*Betula pubescens*	R
False oat grass	*Arrhenatherum elatius*	LF
Garlic mustard	*Alliaria petiolate*	R

Common Name	Scientific Name	DAFOR
Germander speedwell	*Veronica chamaedrys*	R
Giant hogweed	*Heracleum mantegazzianum*	LA
Hawthorn	*Crataegus monogyna*	R
Himalayan balsam	*Impatiens glandulifera*	A
Horse chestnut	*Aesculus hippocastanum*	A
Ivy	*Hedera helix*	O
Large-leaved lime	*Tilia platyphyllos*	R
Meadow buttercup	*Ranunculus acris*	R
Meadow fox tail	*Alopecurus pratensis*	LO
Pendulous sedge	*Carex pendula*	R
Soft rush	*Juncus effuses*	O
Strawberry	*Fragaria vesca*	R
Sycamore	*Acer pseudoplatanus*	F
Willow herb	*Epilobium* sp.	O
Yorkshire fog	*Holcus lanatus*	LO

Riverbank

Common Name	Scientific Name	DAFOR
Alder	*Alnus glutinosa*	LF/O
Annual meadow-grass	*Poa annua*	O
Ash	*Fraxinus excelsior*	F
Blackthorn	*Prunus spinosa*	LA
Bramble	*Rubus fruticosus* agg.	D
Broad-leaved dock	*Rumex obtusifolius*	R
Cleavers	*Galium aparine*	F
Clematis	*Clematis* sp.	R
Cocks-foot	*Dactylis glomerata*	LD/A
Common nettle	*Urtica dioica*	A
Crab apple	*Malus sylvestris*	R
Crack willow	*Salix fragilis*	F
Cranes-bill	*Geranium* sp.	R
Creeping buttercup	*Ranunculus repens*	O
Curly dock	*Rumex crispus*	R
False oat grass	*Arrhenatherum elatius*	F
Giant hogweed	*Heracleum mantegazzianum*	R
Golden ragwort	*Packera aurea*	R
Hairy willowherb	*Epilobium hirsutum*	O
Hedge woundwort	*Stachys sylvatica*	R
Himalayan balsam	*Impatiens glandulifera*	O
Ivy	*Hedera helix*	LA
Lady fern	*Athyrium filix-femina*	LF
Liverwort	*Marchantiophyta*	R
Rowan	*Sorbus aucuparia*	R
Sycamore	*Acer pseudoplatanus*	O
Yorkshire fog	*Holcus lanatus*	LA

Tall Ruderal Vegetation

Common Name	Scientific Name	DAFOR
Cleavers	*Galium aparine*	F
Common nettle	*Urtica dioica*	O
Cow parsley	*Anthriscus sylvestris*	O
Green alkanet	*Pentaglottis sempervirens*	R

Hedgerows

Common Name	Scientific Name	DAFOR
Hedgerow 1:		
Leylandii conifer	*Cupressocyparis leylandii*	D
Hedgerow 2:		
Ash	*Fraxinus excelsior*	F
Elder	*Sambucus nigra*	O
Hawthorn	*Crataegus monogyna*	A
Holly	*Ilex aquifolium*	A
Hedgerow 3:		
Hawthorn	*Crataegus monogyna*	D
Hedgerow 4:		
Ash	*Fraxinus excelsior*	R
Hawthorn	*Crataegus monogyna*	D
Holly	*Ilex aquifolium*	R

APPENDIX B: Bat Survey Data

Survey 1 (02.09.2019)
Surveyor location 1

Time of Contact	Plan ref.	Species	Behaviour	Passes
19:50	1	*Pipistrellus pipistrellus*	Foraging	Multiple
20:09	No visual	*Pipistrellus pipistrellus*	Commuting	1
20:14	No visual	*Pipistrellus pipistrellus*	Commuting	1
20:25	No visual	*Pipistrellus pipistrellus*	Commuting	1
20:29	No visual	*Nyctalus noctula*	Foraging	1
20:32	No visual	*Pipistrellus pipistrellus x2*	Foraging	1
20:39	No visual	*Pipistrellus pipistrellus*	Pass	1
20:45	No visual	*Pipistrellus pipistrellus*	Foraging	1
20:50	No visual	*Pipistrellus pipistrellus*	Foraging	Multiple
21:00	No visual	*Nyctalus noctula*	Foraging	1
21:00	No visual	*Pipistrellus pipistrellus*	Foraging	1
21:20	No visual	*Plecotus auritus*	Commuting	1
21:25	No visual	*Pipistrellus pipistrellus*	Foraging and social	Multiple

Surveyor location 2

Time of Contact	Plan ref.	Species	Behaviour	Passes
19:48	1	*Pipistrellus pipistrellus*	Foraging	Constant
20:02	2	*Pipistrellus pipistrellus x3*	Foraging	Constant
20:10	3	*Pipistrellus pipistrellus*	Foraging	Multiple
20:10	3	*Pipistrellus pipistrellus x2*	Foraging	Constant
20:21	No visual	*Nyctalus*	Foraging and social	1
20:21	No visual	*Pipistrellus pipistrellus*	Foraging and social	2
20:22	No visual	*Nyctalus noctula*	Pass	1
20:33	No visual	*Pipistrellus pipistrellus*	Foraging and social	Constant
20:38	No visual	*Pipistrellus pipistrellus x2*	Foraging	1
20:59	No visual	*Nyctalus*	Commuting	1
21:00	No visual	*Pipistrellus pipistrellus*	Foraging	Constant
21:14	No visual	*Pipistrellus pipistrellus x2*	Foraging and social	Multiple
21:17	No visual	*Plecotus auritus*	Commuting	1
20:18	No visual	*Pipistrellus pipistrellus x2*	Foraging and social	Multiple
21:25	No visual	*Nyctalus noctula*	Foraging	1

Survey 2 (19.09.2019)
Surveyor location 1

Time of Contact	Plan ref.	Species	Behaviour	Passes
05:25	No visual	*Pipistrellus pipistrellus*	Commuting	1

Surveyor location 2

Time of Contact	Plan ref.	Species	Behaviour	Passes
05:25	No visual	*Pipistrellus pipistrellus*	Commuting	1
05:47	No visual	*Pipistrellus pipistrellus*	Pass	1

APPENDIX C: Himalayan Balsam Control

Himalayan balsam *Impatiens glandulifera* is an invasive plant that forms dense stands that suppress the growth of other flora. It is an annual plant, therefore control methods should ideally be timed before the plants go to seed in summer.

Given the ecological sensitivity of the Cheadle Brook corridor mechanical removal rather than chemical control is proposed.

Protective clothing is required during removal operations to prevent contact with the sap.

Care will be taken to ensure water vole burrows are not damaged or disturbed.

Plants should either be pulled out by hand or cut as outlined below.

Hand Pulling

Himalayan balsam is shallow rooted therefore can be removed plant by plant via hand pulling.

Works should proceed in a downstream direction from the source of infestation, with the plants pulled from the base.

Excess soil should be removed prior to breaking the stem below the lowest node and crushing this lower section.

The process should be repeated regularly (ideally twice a month) during the summer months.

Cutting

Plants should be cut below the lowest node. These will regrow and flower later in the season, therefore a single cut is only effective if made very close to the soil level. Tools such as weed slashers, brushcutters, hedge cutters and scythes are all suitable for cutting Himalayan balsam.

Regular mowing will also control Himalayan balsam even if the cutting level is above the lowest node, provided the frequency is sufficient to prevent the formation of flowers and seeds. Mowing will only be effective however where ground conditions and tree/shrub cover permit good access.

General

Balsam is identified as a controlled waste therefore arisings including root plates and fragments must be sent to an authorised landfill site and transported using a use a registered waste carrier.

The Contractor shall ensure that all relevant staff and groundwork subcontractors can identify Himalayan Balsam and are aware of the need to control it. If at any time site personnel identify Himalayan balsam within the site boundary the site manager should be notified, and action taken to remove or eradicate the plant.

4.10 Following the removal of the Himalayan balsam on site, the plant will continue to be prominent along adjacent sections of Cecilly Brook and Palm Brook. Even with the complete removal of the plant from the brook corridor there therefore is high potential for future colonisation from upstream habitats. Following the initial control period suitable long-term monitoring (e.g. monthly site checks during the growing season, April-September) and management should therefore be implemented to ensure control of the species across the site. Any plants encountered should be hand pulled prior to going to seed and either incinerated or sent to an authorised landfill site.

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Key

- Site Boundary
- Himalayan Balsam

Phase 1 Habitats

- Broadleaved Parkland/scattered trees
- Built Environment: Buildings/hardstanding
- Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Other tall herb and fern - ruderal
- SI Poor semi-improved grassland
- Running water
- Scrub - dense/continuous
- Tree with bat potential
- Broadleaved trees
- Intact hedge - species-poor
- Hedge with trees - species-poor
- Defunct hedge - species-poor

FPCR Environment and Design Ltd, Lockington Hall, Lockington, Derby, DE74 2RH ▪ t:01509 672 772 ▪ f:01509 674 565 ▪ e: mail@fpcr.co.uk ▪ w: www.fpcr.co.uk
masterplanning ▪ environmental assessment ▪ landscape design ▪ urban design ▪ ecology ▪ architecture ▪ arboriculture

0 25 50 75 100 m

client: Bellway Homes West Midlands
project: Cecilly Mill, Cheadle
drawing title: PHASE 1 HABITAT PLAN

Scale @A3: 1:1250 | drawn: JEJ | issue: 1/11/2019
drawing / figure number: **Figure 1** | rev: **8957-E-01 Rev B**

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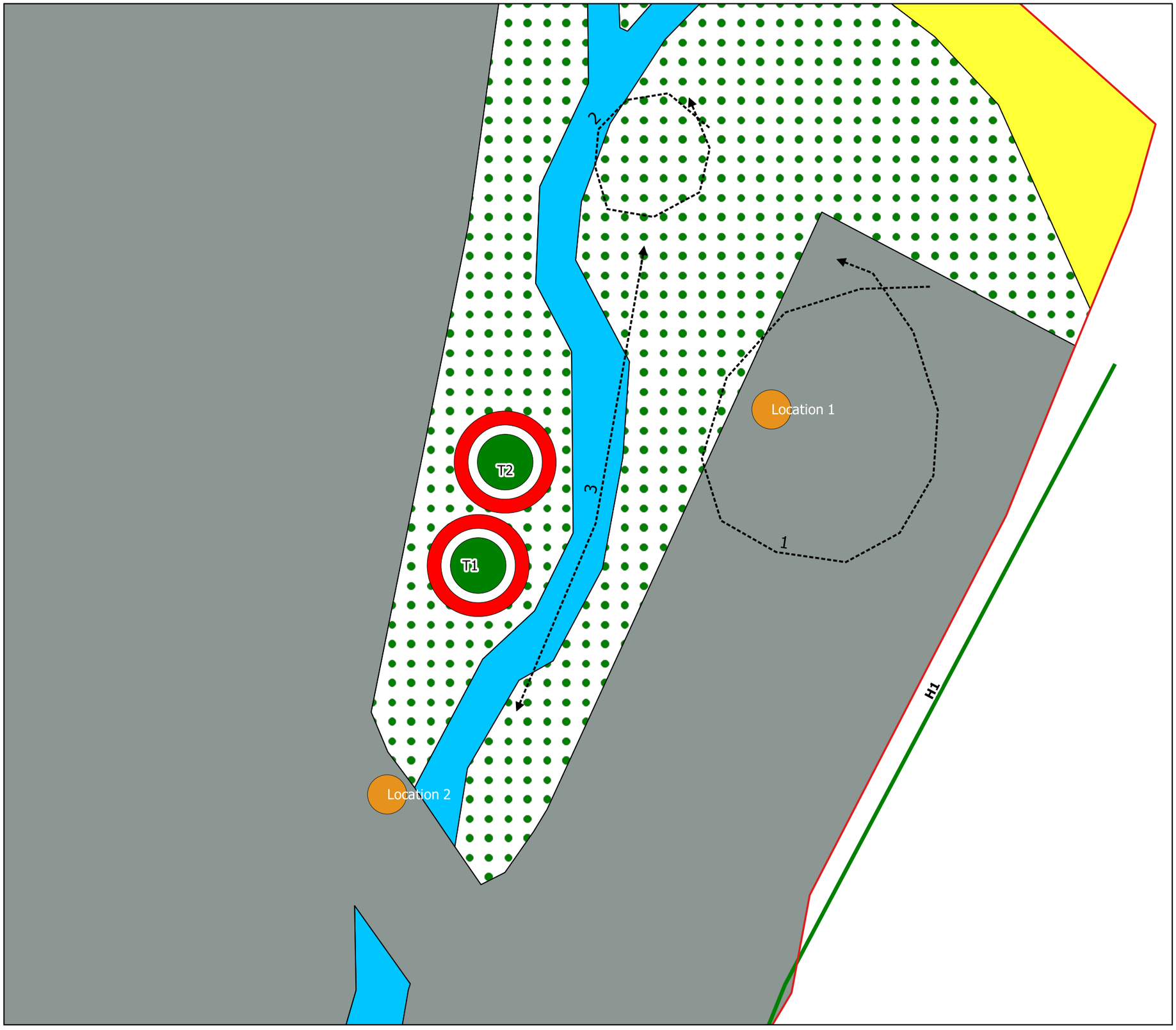
Key:

- Survey Location
- Tree with bat potential
- Flight line with ref. (see appendix B)



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0 10 20 m

client
Bellay Homes West Midlands Ltd.

project
Cecilly Mill,
Cheadle

drawing title
BAT EMERGENCE PLAN

scale @ A3
1:250

drawn
JEJ / AJR

issue
30/10/2019

Figure 2

rev
8957-E-02

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