Habitat Management
&
Biodiversity Strategy

at

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Version	Date	Author	Checked	Approved
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The opinions and information contained within this report were gathered using due skill, care and diligence. The report complies with the Biodiversity Code of Practice for Planning and Development (BS42020:2013) and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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Contents

1.0 Introduction

The purpose of this strategy is to set out a framework for enhancing biodiversity and managing post development habitats on the Chapel Street/ Market Street, site in Glossop.

This report aims to satisfy the pre-commencement requirements for full planning permission given by High Peak Borough Council.

Condition 33 -

> *"No development shall take place until a biodiversity enhancement strategy to include details of nesting and roosting provision for birds and bats has been submitted to and approved in writing with the Local Planning Authority. The development shall be carried out in full accordance with the approved details."*

This strategy is developed in conjunction with the following supporting surveys and reports that have been prepared for the development:

- Phase 1 Habitat Survey Report (Environmental Services, August 2014).
- Bat Absence Presence Survey Report (Environmental Services, October 2014).
- Bat and Bird Box Location Plan (Environmental Services, June 2015).

1.1 Aim

The aim of the Habitat Management and Biodiversity Strategy (HM&BS) is to focus attention on sustainable ecological management, maintenance and enhancement of the wildlife value of the site. The focus of this strategy is therefore to allow any populations to be maintained and habitat managed to allow any habitat to continue, with the addition of enhancements within the development to potentially increase the areas biodiversity.

The proposed development site comprises an area of mixed ruderal, scrub and open areas of amenity grassland and bare earth between the centre of Glossop and Glossop Brook. The site entrance slopes down gradually to the north where the site narrows. There is also a steeper section down to the subterranean garage in the south east corner of the site. The main species expected to be impacted on by the proposed development are bats in the form or foraging habitat, and birds in the form of foraging and nesting potential. Enhancements for the site and its management will be aimed at sympathetically enhancing the site ecological value in reference of the surrounding area providing habitats of ecological value within the development scheme.

In addition to this Strategy there is a desire to promote an understanding and appreciation of biodiversity based upon embedding the principals within grounds maintenance contracts. The aims of this strategy are to maintain and enhance the nature conservation value of the site and to ensure that specific targets are set in terms of improvements with particular reference to the following objectives:

- To enhance the area within the curtilage of the new development relevant to the local environment;
- To enhance the biodiversity value of habitats on-site by creating and maintaining new habitats;
- To improve the biodiversity value of the site by introduction of a variety of wildlife refugia and nesting boxes;
- To improve the quality and diversity of habitats by new planting aimed towards invertebrates, birds and bats;
- To monitor the efficacy of this strategy by undertaking biological recording of habitats and species.

Limitations and constraints comprise of the relative lack of current ecological features. Ecological enhancements are limited by the current low ecological value of the site with scattered mature boundary trees as the main features. Creation of new habitats are likely to be of low value due to the size of the development allowing only very small habitat fragments. Consequently ecological enhancements are based on species which can disperse easily including bats, birds and invertebrates.

2.0 Summary of Works

2.1 Prior to Commencement of Works

1) All retained trees to be protected to BS.5837 (2012), Trees in relation to Design, Demolition & Construction.

2) No tree works are to be undertaken until the bird nesting season is completed, (March - September inclusive). If this is not possible, then all areas of vegetation to be removed are to be inspected for active nests by as suitably qualified ecologist immediately prior to removal.

3) Due to the sites position immediately adjacent to a water course, all precautionary measures should be taken during the demolition and construction phase of the development in accordance with the Environment Agency Publication; "Working at construction and demolition sites" Pollution Prevention Guidelines 6 (2014) (PPG6).

2.2 Prior to completion of construction works

1) Landscape planting as per approved Landscaping drawings to be completed prior to completion of the Project.
2) Upon completion of building works artificial refugia will be installed according to the Ecological Design Strategy Plan including:
    - 6 x Bat boxes, Schwegler 1FN or similar (building integrated or wall mounted)
    - 2 x Bird Nesting Boxes Schwegler 1B (tree mounted)
    - 2 x Invertebrate boxes

The above shows minimum numbers to be installed as detailed in Section 3.0. All ecological refugia should be installed on completion of building works. Locations are shown on the Habitat Management and Biodiversity Strategy Plan (see Appendix 1).

3) Set up and undertake initial Ecological Monitoring of the birds and bats using the boxes on the site.

4) At all times during construction: Mammal ladders to be placed in all open trenches that cannot be covered at night by plywood sheeting to allow mammals to exit trenches. (Planks of wood are usually sufficient such as scaffolding planks laid at no more than 30º).

5) New shrub planting to replace trees scheduled for removal.

6) Finalise a lighting scheme, which minimises the impact of external lighting upon bats using the site and adjacent water course.

2.3 Summary of Works to be undertaken as part of Ground Maintenance Works (5 years)

1) Management of new native species shrubs.
2) Existing shrub management.
3) Tree management.
4) Ecological monitoring.

3.0 Habitat Management and Biodiversity Strategy

The strategy is broken down into 3 sections which address the following:

- Ecological Refugia Actions.
- Habitat Management,
- Proposed Landscaping Works.

3.1 Artificial Ecological Refugia and Special Provision for Bats and Lighting

Artificial Ecological Refugia	Target Note See Plan 1	Description	Notes for Site	Date for Implementation
6 Bat Boxes	1	6 Bat boxes will be installed on site including 4 x integrated into, or mounted on the proposed building facing SE and SW, an additional 2 x boxes installed mounted on the retaining wall of the Glossop Brook. Boxes are suitable for use by all local bat species included in the local BAP.	Located in the building an inaccessible height beyond reach of predators (away from ledges etc).	To be installed on completion of building works
2 Invertebrate Boxes	2	2 Invertebrate boxes to provide over wintering sites for specific species such as lacewings, ladybirds, solitary wasps, bumblebees and red mason bees, which are essential in pollination and pest control roles within many ecosystems. In addition invertebrate populations provide a food source for LBAP bird and bat species.	Invertebrate boxes to be hung from trees or hidden in hedges and shrubs throughout the landscaped areas.	To be installed on completion of building works

Artificial Ecological Refugia	Target Note See Plan 1	Description	Notes for Site	Date for Implementation
2 Bird nesting boxes	3	2 Bird nesting boxes are too be erected on the retained mature trees on site - Schwegler Nest Boxes Type 1B suitable for use by a range of small passerine species including LBAP and UK BAP priority species. - Boxes should be sited facing any direction except due south at a height of between 3m and 6m in a sheltered area with clear access to the entrances.	Locate in inaccessible areas at height beyond reach.	To be installed on completion of construction.

Artificial Ecological Refugia	Target Note See Plan 1	Description	Date for Implementation
Bats, Bat Boxes and Lighting		All external lighting will be controlled with photocell and timer combination to adjust the 'lit time'. 1. Areas of the site which have bat and bird boxes installed must avoid direct illumination. Wherever possible lighting will be kept at low levels and landscape features used to provide indirect lighting. 2. Light sources will be selected from these which emit small or moderate amount of ultra violet. Where this is not possible additional filters and/ or accessories will be used to minimise the impact. 3. The luminaries with adequately controlled beam distribution will be selected to eliminate or reduce light spillage. Lighting of the seating area facing the stream illumination should be towards the seating area rather than from the building out towards Glossop Brook. This is to maintain the current light levels along the Brook. 4. We have specified the use of Narrow Spectrum Lights with no UV content, Low pressure sodium and warm white LED and Directional downlights - illuminating below the horizontal plane which avoids light trespass into the environment. The lighting should be limited to the circulation areas and car park and should include directional lighting onto these areas to prevent light spill. Using Variable Lighting Regimes (VLR) to suit both human and wildlife use of the site, involves switching off or dimming lights for periods of the night, e.g. 12.30 – 5.30am to prevent light spill onto Glossop Brook (Appendix 3). Prior to installation Environmental Services will visit site and liaise with the lighting designers with regard to the specific location of the proposed bat boxes and ensure that the boxes and suitable corridors will not get direct illumination. We will record on a site plan showing the lighting the proposed location of bat boxes prior to installation and this will be agreed with all parties.	To be installed prior to Completion of Building phase

Note 1: All bat, bird and invertebrate boxes can be supplied ready built. The boxes can be installed with a CCTV camera providing the opportunity to observe activity within the boxes. Building installed boxes must be placed by the building contractors.

3.2 Proposed Landscaping

Category	Aims	Scheduled Management Operations and Biodiversity Enhancement Period for Implementation: 1-5 year period	Ecological Enhancement and Opportunities
Retained and newly planted Trees & Shrubs	- To maintain the long term value of the trees bordering the site	- Following completion of all works, the Tree Survey should be updated to provide the client with a complete schedule of trees. An on-site inspection of all trees should be carried out followed by any remedial works required to remove or tidy up any damaged limbs following construction works. - Annual safety inspections and report on condition of trees by arboricultural advisor. Implementation programme of recommended tree work to comply with British Standard B.S. 3998: 2010 'Recommendations for tree work' or as amended.	- Landscaping - new tree and shrub planting providing additional shelter, blossom and fruit using native species.
New trees & Shrubs	– New tree planting to mitigate against the tree removals undertaken to allow for this development – Establish trees with good canopies and root systems – Provide conditions that will ensure survival of trees – Provide benefits for wildlife which is also visually appealing	– Maintain weed free area to a min diameter of 1m around trees through the use of herbicide. – Investigate failure of tree growth, followed by remedial actions and replacement. – Aeration of compacted soils. – Inspect for pests, diseases and followed by remedial action. – Check tree stability. Check tree ties and loosen if required annually. – Remove stakes and ties after 2 years subject to inspection. – Fertilizer application in April of the second and fourth years. – Planted trees to be subject to annual formative pruning and shaping of canopy as required. Remove dead wood and encourage balance growth and maintain screening. – Watering as required to field capacity, during the dry months. – Use of a variety of native species	– Within areas that have been cleared, planting of groups of indigenous native tree species to the perimeter of the site.

Category	Aims	Scheduled Management Operations and Biodiversity Enhancement Period for Implementation: 1-5 year period	Ecological Enhancement and Opportunities
Amenity Shrub	– Establish successful plant cover – Control competition from weeds – Provide conditions that will ensure that plants survive and thrive – Species used for food plants for insects.	– Use of weed control measures such as residual and spray herbicide applications that are specified close to a water course and mulch reinstatement. – Use of slow release fertilizer and residual herbicide applications where appropriate. – Inspection for pests, vermin and plant diseases followed by remedial actions. – Formative and seasonal pruning of stem, foliage and flowering bud wood. – Extension or strengthening of fencing or other barriers where planting is becoming eroded trampled or damaged. – Re-balancing of growth, removal of over-vigorous species. – Replanting of failed stock or redesign /re-specification of failed areas. – Watering as required to field capacity during the dry months. – Removal of litter	– Monitor habitats for potential bird nesting, invertebrate, bees and bat foraging. – Programmed selective pruning and height management required for site access. – Gap filling and inter-planting to maintain vegetation cover.
Grassland and Bulbs	– Establish successful plant cover. – Enhance the sites biodiversity. – Provide net enhancement for species present on the site. – Enhance sites appearance.	– Seed beds to be prepared in accordance with good horticultural practice or suppliers recommendations after land alteration has taken place. – Inspection for pests, vermin and plant diseases followed by remedial actions. – Extension or strengthening of fencing or other barriers where planting is becoming eroded trampled or damaged. – Replanting of failed stock or redesign /re-specification of failed areas. – Watering as required to field capacity during the dry months. – Removal of litter.	– Monitor habitats for potential bird, bees and bat foraging. – Programmed selective pruning and height management. – Gap filling and inter-planting to maintain vegetation cover.

4.0 Biological Monitoring and Review

We recommend that Ecologists are appointed to co-ordinate the monitoring regime; this could include monitoring bats and bird boxes, evaluating the habitats and mitigation success. Environmental Services Ecologists or other appointed ecologists could attend site every year, to provide a brief and undertake monitoring. Appointing suitably qualified ecologists to supervise monitoring will provide regular updates to the Local or County Authority Ecologist on the implementation of this strategy as required.

5.0 Conclusion

This plan and strategy aims to enhance the development site, adding features that will aid biodiversity of the site. The proposed strategy outlined in this document is made in line with pre-commencement planning condition 33 the full planning permission granted by High Peak Borough Council.

The proposals have been informed by the ecological and arboricultural surveys undertaken as part of the planning application and the landscaping outline proposals from The Planning Bureau Ltd.

Appendix 1

Biodiversity Plan

T1

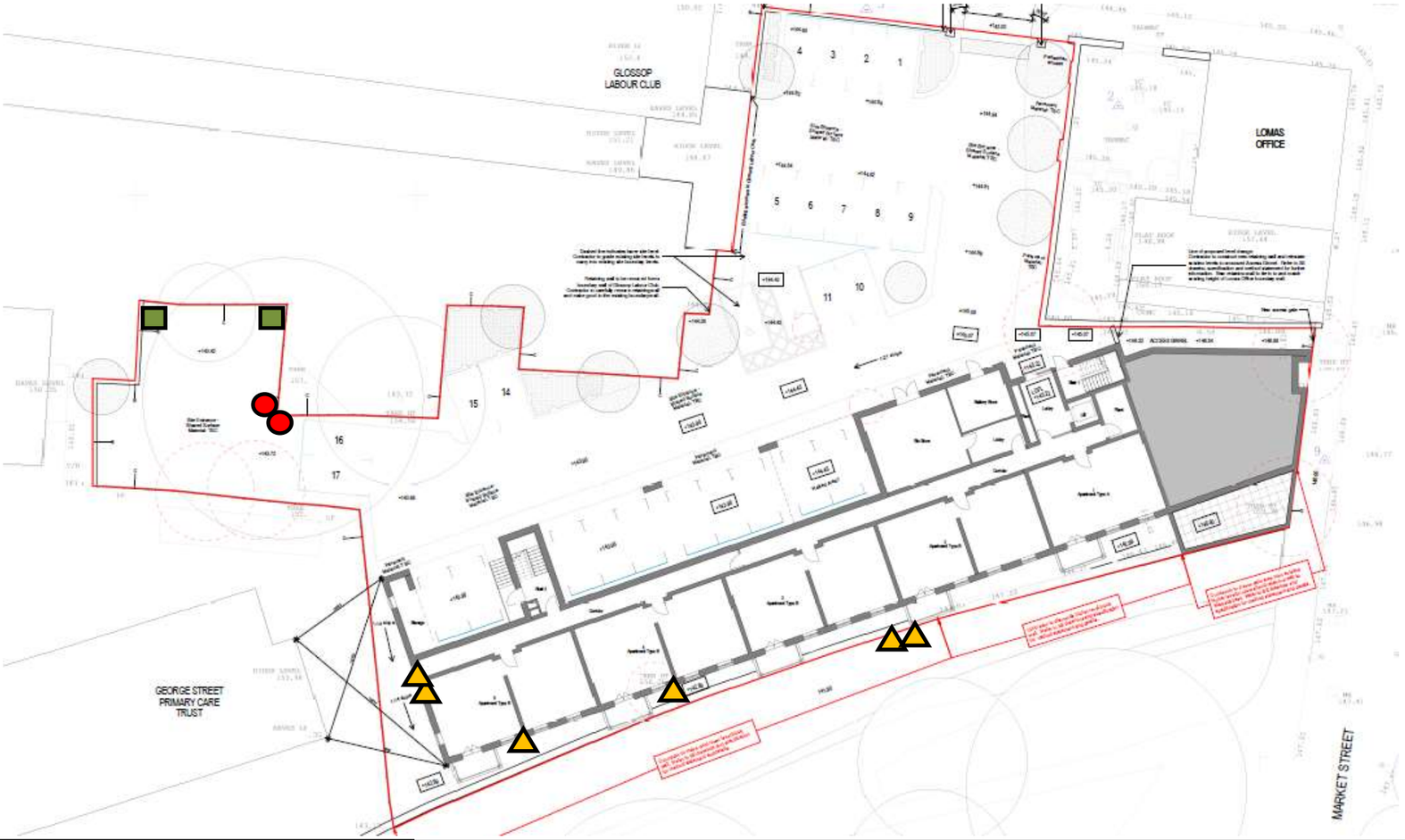
Bat Boxes (Building) 6 No.
Located on the building as indicated, erected 6x Schwegler 1fr bat tubes facing southeast and southwest at a height of between 4.5m and 6m above ground level.

T2

Bird Nest Boxes 2 No.
2 x Schwegler 1B nest boxes Located on trees surrounding the development. Erected avoiding south facing aspects, at a height between 4.5m and 8m above ground level.

T3

Invertebrate Brick 2 No.
Distributed throughout the amenity planting as illustrated within a shaded area, none height specific



Guidance notes:

- Built-in Schwegler 1fr bat tubes must be factored into construction phase to be fully concealed. External mounting of boxes is also possible.
- Bat boxes to be mounted on southeast and southwest facing walls, away from external lighting sources with clear access to box entrances.
- Bird boxes and invertebrate bricks to be erected upon completion of building works.

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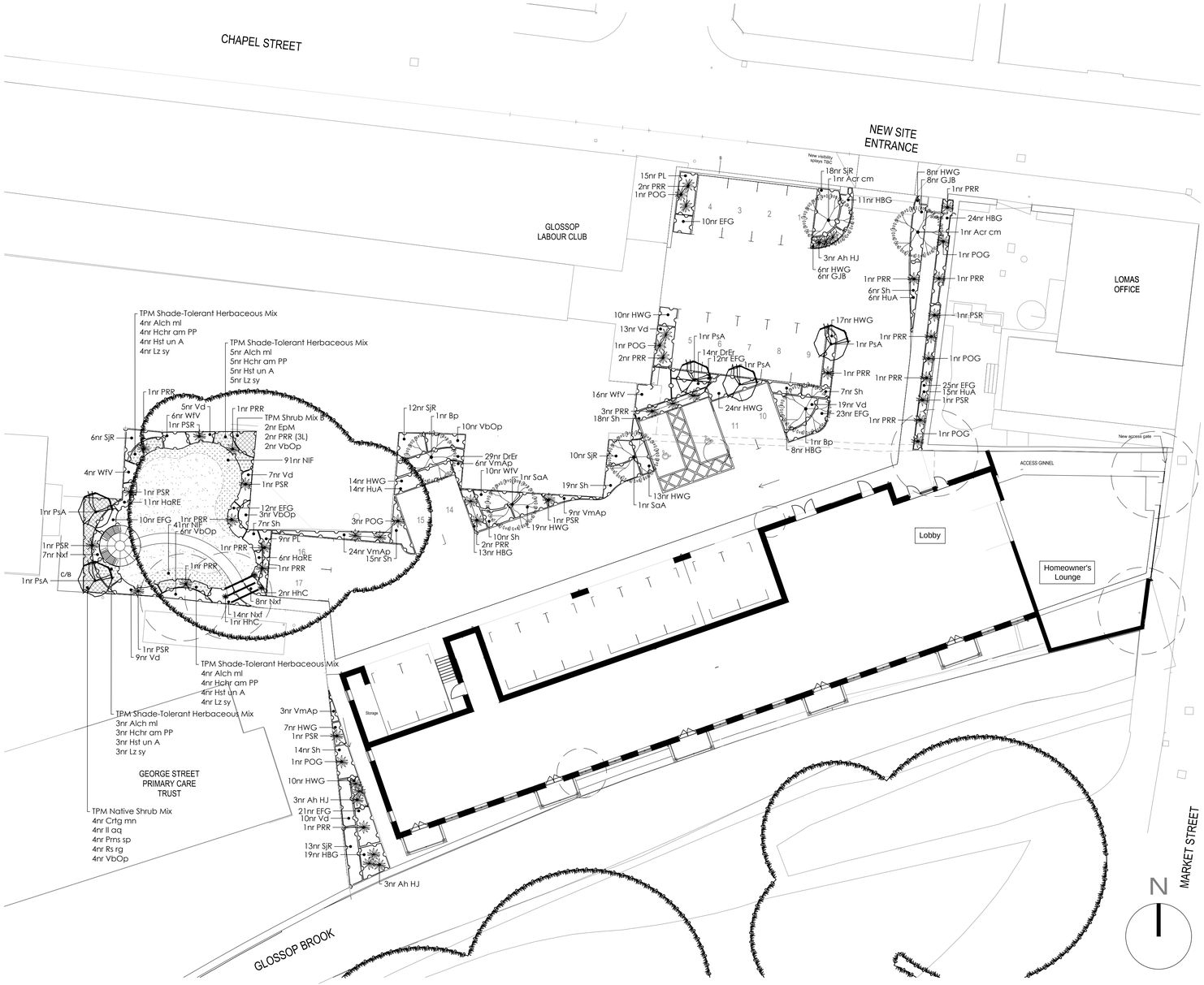
The aim of the biodiversity plan is to ensure that there is no net loss of biodiversity associated with the new development. Mitigation enhancement associated with the protected species surveys, tree survey and the biodiversity plan will ensure that the development impacts positively on the surrounding environment.

Landscape Planting

The use of wild flower seed mix (suitably sourced) and indigenous species of trees and shrubs used to landscape

Appendix 2

Landscaping Planting Scheme



LEGEND - Soft Landscaping

Existing Trees to be retained
as agreed with the Landscape Architect

Existing Trees to be removed
as agreed with the Landscape Architect

Proposed ornamental trees
Trees in soft landscaping to be planted as 12-14cm girth. Heavy standards with a double timber stake secured with a rubber tree tie.

Proposed ornamental trees
Trees in soft landscaping to be planted as 10-12cm girth. Selected standards with a double timber stake secured with a rubber tree tie.

Proposed ornamental shrub beds
Beds to be planted with 3-5L shrubs at 3-5 per sq.m and 10-15L specimen plants.

Proposed native shrub mix
To be planted with 3-5L shrubs and bare root stock at 2-3 per sq.m in groups of 5

Proposed herbaceous mix
Beds to be planted with 3-5L shrubs at 5 per sq.m

Proposed bulb planting
Area to be planted with bulbs

Proposed grass
Area to be laid with turf

NOTES ON PLANTING

1 Topsoil shall be spread to min 450mm depth over planting beds and 150mm depth over turf areas and graded to fall.

2 Herbicide and Cultivation: Topsoil to be treated with an application of herbicide *prior to* planting, where necessary, strictly in accordance with the Control of Pesticides Regulations1986 (or otherwise updated/ superceded legislation), and following manufacturer's instructions by qualified staff. The topsoil shall then be cultivated to 150mm depth.

3 Container Grown Shrubs, Transplants and Whips: Shrubs and transplants shall comply with the National Plant Specification and shall be planted in pits 300 x 300 x 200mm depth, and the backfill shall include 3 litres Peat Free Tree and Shrub Compost. Specimen plants to be planted in a pit 400 x 400 x250mm depth with 5 litres Tree and Shrub Compost. Hedgerow planting to be planted in a double staggered row at 300mm centres.

4 Herbicide: Spot treat with herbicide throughout the maintenance period in accordance with the manufacturer's instructions.

5 Bark Mulch: On completion of all planting works all shrub areas are to be spread with 50mm depth of 10-35mm grade ornamental maritime bark mulch.

6 Position of Plants: Final position of trees and shrubs subject to confirmation of service location and approval of statutory undertakers.

7 TREES - SELECTED STANDARDS Tree pits for selected standards to be 600x600x600mm backfilled with good quality topsoil. Stakes to be 65mm diameter treated softwood driven firmly into the ground. Stakes to be 600mm above ground level and fixed to tree with suitable rubber tree tie.

TREES - HEAVY STANDARD: Tree pit 1000x1000x900mm depth with a 150mm depth of clean stone to the base and 750mm depth good quality topsoil. Stakes to be 2nr 100mm diameter with cross bar, treated softwood driven firmly into the ground. Stakes to be 1000mm above ground and fixed to tree with suitable rubber tree tie. For the larger trees 20-25cm girth installed an irrigation pipe (to wrap around the rootball of the tree) and secure the end of the pipe to the tree stake.

8 Watering: Plant only into moist soil and water thoroughly to the full depth of soil immediately after planting. Water regularly through the establishment period (minimum 3 months) to prevent dehydration. The 20-25cm girth trees should be watered through the irrigation pipe to ensure that the water gets down to the rootball. These trees should be watered regularly throughout spring-summer during the first 2 years to ensure that the tree root system establish well.

Artisan Legacy Report

Herbaceous

Nr	Code	Plant Name	Height/Spread/Grade	Girth	Age	Root	Container	Habit	Form	Density/m2
9	Ah HJ	Anemone hybrida 'Honorine Jobert'	8-10cm			C	3-4L			0.00
43	DrEr	Dryopteris erythrosora	8-10cm			C	3-4L			5.00
14	GJB	Geranium 'Johnson's Blue'	8-10cm			C	3-4L			5.00
35	HuA	Hosta undulata 'Albomarginata'	30-40cm			C	3-4L			5.00
132	NlF	Narcissus 'Ice Follies'	12-14cm			Bulb				7.00
29	Nxf	Nepeta x faassenii				C	3-4L			5.00

Shrub

Nr	Code	Plant Name	Height/Spread/Grade	Girth	Age	Root	Container	Habit	Form	Density/m2
113	EFG	Euonymus fortunei 'Emerald Gaiety'	30-40cm (D)			C	3L	Bushy		5.00
17	HaRE	Hebe albicans 'Red Edge'	20-22cm			C	3L			5.00
75	HBG	Hebe franciscana 'Blue Gem'	30-40cm			C	3L			4.00
3	HhC	Hedera helix 'Caecilia'	60-80cm		1+1 or 1/1	C	5L	Branched, Bushy		0.00
128	HWG	Hebe 'White Gem'	30-40cm			C	3L	Bushy		5.00
24	PL	Prunus lusitanica	40-60cm			C	3L	Bushy		4.00
9	POG	Pyracantha 'Orange Glow'	80-100cm			C	5L	Leader with laterals		0.00
23	PRR	Photinia x fraserii 'Red Robin'	120-150cm		3x	C	10-12L			0.00
9	PSR	Pyracantha 'Saphyr Red'	70-80			C	5L	Leader and laterals		0.00
96	Sh	Sarcococca humilis	30-40cm			C	3L			4.00
59	SjR	Skimmia japonica 'Rubella'	40-60cm			C	3L	Bushy		3.00
19	VbOp	Viburnum opulus	40-60cm		1+1	C	3L	Branched		3.00
63	Vd	Viburnum davidii	30-40cm			C	3L	Bushy		3.00
42	VmAp	Vinca minor 'Atropurpurea'				C	3-4L			5.00
36	WfV	Weigela florida 'Variegata'	40-60cm			C	3L	Branched		3.00

Tree

Nr	Code	Plant Name	Height/Spread/Grade	Girth	Age	Root	Container	Habit	Form	Density/m2
2	Acr cm	Acer campestre	350-425cm	12-14cm	3x	B			Heavy Standard	0.00
2	Bp	Betula pendula	350-425cm	12-14cm	3x	B			Standard (Heavy)	0.00
5	PsA	Prunus subhirtella 'Autumnalis'	300-350cm	10-12cm	2x	B			Standard (Selected)	0.00
2	SaA	Sorbus aucuparia 'Asplenifolia'	350-425cm	12-14cm	3x	BR			Standard (Heavy)	0.00

TPM Planting Schedule (Mix)

TPM Native Shrub Mix

Nr	Code	Plant Name	Height/Spread/Grade	Girth	Age	Root	Container	Habit	Form	Density/m2	Mix (%)
4	Crtg mn	Crataegus monogyna	40-60cm		1+0	B			Seedling	3.00	20.00
4	Il aq	Ilex aquifolium	60-80cm			C	3L	Leader with laterals		3.00	20.00
4	Prns sp	Prunus spinosa	60-80cm		1+1	B		Branched		3.00	20.00
4	Rs rg	Rosa rugosa	60-80cm			B				3.00	20.00
4	VbOp	Viburnum opulus	60-80cm		1+1	B		Branched		3.00	20.00

TPM Shade-Tolerant Herbaceous Mix

Nr	Code	Plant Name	Height/Spread/Grade	Girth	Age	Root	Container	Habit	Form	Density/m2	Mix (%)
16	Alch ml	Alchemilla mollis	20-30cm			C	3-4L			5.00	25.00
16	Hchr am PP	Heuchera americana 'Plum Pudding'				C	3-4L			5.00	25.00
16	Hst un A	Hosta undulata 'Albomarginata'	30-40cm			C	3L			5.00	25.00
16	Lz sy	Luzula sylvatica				C	3L			5.00	25.00

TPM Shrub Mix B

Nr	Code	Plant Name	Height/Spread/Grade	Girth	Age	Root	Container	Habit	Form	Density/m2	Mix (%)
2	EpM	Elaeagnus pungens 'Maculata'	30-40cm			C	3L	Branched		3.00	33.33
2	PRR (3L)	Photinia x fraserii 'Red Robin'	60-80cm		1+1 or 1/1	C				3.00	33.33
2	VbOp	Viburnum opulus	40-60cm		1+1	B		Branched		3.00	33.33

Rev C: Landscape layout adjusted in line with architects revised layout - 100615 KD
Rev B: Landscape layout adjusted in line with architects revised layout - 080415 KD
Rev A: Modify tree species in line with comments from planning officer

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Client
McCarthy & Stone

Project
Later Life Housing
Chapel Street, Glossop

Description
Landscape Layout

Status
For Approval

Scale@A1	Drawn	Ckd	Date
1:200	KD	DC	Dec 14

Job number	Drawing number	Revision
2106	01	C

Appendix 3

Lighting Recommendations.

Using guidance from Bats and Lighting (E Stone, 2014). To create as low as possible negative impact on commuting and foraging bats along the Glossop Brook we would recommend using light sources externally on buildings and communal areas taken from the following list,:

- Narrow Spectrum Lights with no UV content
- Low pressure sodium and warm white LED*
- Directional downlights - illuminating below the horizontal plane which avoids light trespass into the environment.

* low relative attractiveness for insects compared to white light and therefore minimal impact on bats insect prey (Eisenbeis 2009).

- Avoidance wherever possible of blue-white short wavelength lights: these have a significant negative impact on the insect prey of bats. Use alternatives such as warm-white (long wavelength) lights as this will reduce the impact on insects and therefore bats; and
- avoid lights with high UV content: (e.g. metal halide or mercury light sources), or reduce/completely remove the UV content of the light. UV has a high attractiveness to insects leading to direct insect mortality at street lights thereby reducing the availability of insect prey (Frank 2006; Bruce-White & Shardlow 2011). Use UV filters or glass housings on lamps which filter out a lot of the UV content.

Other options include Variable Lighting Regimes (VLR) to suit both human and wildlife use of the site. VLR involves switching off or dimming lights for periods of the night, e.g. 12.30 – 5.30am. This technology could also be used to create a lighting regime that switches off lights during periods of high bat activity, such as commuting or emergence. Lights can also be dimmed (e.g. to 30% power) for periods of the night to reduce illumination and spill.