LANDSCAPE PROPOSALS
The site is an existing unit on Wrexham Industrial Estate with hard standing access area and car parking and soft landscape area of grass and individual tree planting.

DESIGN AND PROPOSALS
The proposed development is for a n extending building footprint and car park area. There are existing trees at the site of one tree to the south, one group to the north within the existing car park area and part of a group to the east, will need to be removed to facilitate the temporary and permanent construction works. Existing trees to be retained will be protected for the duration of construction.
New tree planting will be undertaken to mitigate for trees removed. New native species scrub planting will also be carried out to enhance existing scrub areas and improve habitat connectivity. Wildflower planting to the edge of new scrub and hedgerows, will provide a transition area to the shorter grass at the edge of the hard standing. This area and longer areas of existing grass will provide cover and foraging habitat for amphibians, mammals and birds.
A Landscape and Ecological Management Plan will ensure the areas are maintained during establishment and thereafter to achieve the desired objectives for habitat and biodiversity enhancement.

GENERAL
All planting to comply with BS3936 Relevant parts for Nursery Stock.
All pre-planting, site preparation, planting and post planting maintenance shall be carried out in accordance with BS4428:1989 Code of Practice for General Landscape Operations and BS7370-4:1993 Grounds Maintenance.
All trees shall be positioned in accordance with BS5837:2012 Trees in Relation to Design, Demolition and Construction and BS 8545:2014 Trees: from nursery to independence in the landscape, Recommendations.
There are to be no trees planted within 5m of underground or overhead services or buildings.
Refer to the table for the planting schedule

SCHEDULE OF IMPLEMENTATION
The landscape reinstatement shall be carried out in the first available season after completion of construction, when weather conditions are suitable:
Soiling and seeding April - October
Planting October - March

SITE CLEARANCE
Prior to construction, topsoils will be stripped from the proposed construction area and stored for the duration of construction for reuse in reinstatement.
All tree roots within the construction area are to be removed and stumps ground out. No ground works or soiling will be undertaken within the Construction Exclusion Zone (CEZ), as defined by the temporary tree protection fence on the Arboricultural Method Statement 224/R/200.
All soiling works will be carried out in accordance with DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites and British Standards for Topsoil (BS3882:2015) and Subsoil (BS8601:2013) for the stripping, handling, storage and spreading of soils.

PROPOSED HEAVY STANDARD TREE PLANTING
1. Excavate planting pits 1000mm dia and 600mm deep; thoroughly break up sides and base to 250mm depth.
2. Retain subsoils for backfilling lower section of pit. Allow for adding a 125mm layer of angular 50-70mm non-calcareous gravel for tree pit drainage if waterlogging is an issue.
3. Drive two 75mm dia stakes 150mm into base of pit and cut off 600mm above ground level; plant trees and support with cross bar and webbing to hold tree in upright position. All stakes and bars to be to same orientation, parallel with site fence.
4. Mix excavated topsoils with proprietary tree and shrub compost at rate of 50/50 mix by volume to achieve total 300mm depth topsoil for backfilling; insert 4No slow release fertiliser tablets into backfill around roots per pit; backfill with subsoil up to 300mm below ground level with subsoils excavated from pit and then ameliorated topsoil in 150mm layers up to ground level.
5. Mulch base of trees to 1m diameter with 75mm depth medium grade bark.

PREPARATION FOR PLANTING
1. Areas of scrub planting in existing grass within root protection areas (RPA) and as underplanting - all grass areas to be cut as low as possible prior to planting. Avoid damaging roots that are at the surface in grass areas. Spread bark mulch over the area to be planted at least 6 months prior to planting to 100mm thick to kill off grass and avoid chemical treatment.
2. 6. Areas of scrub planting in existing grass not affected by RPA - rotovate soil in summer 6 months prior to planting. Cut down weeds every month and rotovate to control regrowth.

PROPOSED SCRUB PLANTING
1. Container grown shrubs to be as per schedule.
2. A clear area of 1.5m radius is to be left clear of new planting at the base of each tree.
3. Planting to consist of mixed native deciduous and evergreen species planted in locations shown.
4. Container grown shrub plants to be planted in pits 100mm wider and deeper than pot size.
5. Bare root plants to be planted in I, T, L or H shaped notch with all roots below ground and planted at same level as when in nursery.
6. All plants to receive Enmag slow release fertiliser at time of planting.
7. All evergreen species to be treated with anti-desiccant before and immediately after planting.
8. All plants to be fitted with cardboard or biodegradable guards.
9. Soils between plants to be raked on completion and all beds sown with a legume, clover and fescue grass mix to protect soils from erosion.

PROPOSED GRASS SEEDING TO AMENITY AREAS
Grass seed for reinstatement of verges to be a low maintenance fescue mix Germinal Amenity A16 Reclamation Country Parks mix or equivalent product sown at 25 g/m^2 (250 kg/ha)

40.0%	CORAIL STRONG CREEPING RED FESCUE (Festuca rubra rubra)
20.0%	JOANNA CHEWINGS FESCUE (Festuca Rubra Commutata)
17.5%	TETRIS SMOOTH STLK MEADOWGRASS (Poa pratensis)
15.0%	ABERFLEECE SHEEPS FESCUE (Festuca ovina)
5.0%	HIGHLAND BROWNTOP BENTGRASS (Agrostis castellana)
2.5%	ABERACE (SMALL) WHITE CLOVER (Trifolium repens)

1. Create a fine friable seedbed down to 150 mm in depth. Carry out two equal sowings at right angles to each other and diagonally to main axis. Broadcast manually or use seed drill, rake level and roll. Ensure good seed to soil contact.
2. Initial cut to 75mm and thereafter cutting height between 25 -75 mm
3. Regular cuts in summer to form 1m wide verge for footpath and paving edges.

AREAS OF GRASS FOR DIFFERENTIAL MOWING AND PREPARATION FOR WILDFLOWER SCRAPES
1. Existing grass to be allowed to grow long and wildflowers to establish to provide cover and foraging habitat, however to improve species diversity in early spring, grass is to be cut as low as possible (at least 25mm) and arisings removed.
2. The area is to be scarified with a power rake or chain harrow to degrade the existing sward and remove thatch. Arisings should be removed.
3. In areas for differential mowing, Yellow rattle (Rhinanthus minor) is to be sown over the scarified area at 2g/m^2 this will gradually reduce nutrient levels and grass vigour, allowing other wildflower and grass species to establish naturally. Yellow rattle should be allowed to flower and set seed before cutting, usually in July.

PROPOSED WILDFLOWER SEEDING FOR SCRAPES
General grass and meadow mix to be Emorsgate Basic General Purpose Meadow Mixture EM1 or equivalent product sown at 40kg/ha or 4g/m^2
Composition
EM1 is a complete mix composed of 10% native wild flowers and 90% slow growing grasses (by weight). MIX A
Wild flowers 10%
0.30% Achillea millefolium - Yarrow
1.50% Centaurea nigra - Common Knapweed
1.50% Leucanthemum vulgare - Oxeye Daisy
1.50% Malva moschata - Musk Mallow
3.00% Plantago lanceolata - Ribwort Plantain
1.00% Poterium sanguisorba ssp sanguisorba - Salad Burnet
0.20% Ranunculus acris - Meadow Buttercup
1.00% Rhinanthus minor - Yellow Rattle
Grasses 90%
9.00% Agrostis capillaris - Common Bent
31.50% Cynosurus cristatus - Crested Dogstail
27.00% Festuca rubra - Red Fescue
4.50% Phleum bertolonii - Smaller Cat's-tail
18.00% Poa pratensis - Smooth-stalked Meadow-grass

1. Remove weeds using repeated cultivation. Then plough or dig to bury the surface vegetation, harrow or rake to produce a medium tilth, and roll, or tread, to produce a firm surface.
2. Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown and can be applied by machine or broadcast by hand in two transverse directions to get an even distribution. Do not incorporate or cover the seed but firm in with a roll, or by treading, to give good soil/seed contact.

FIRST YEAR OF GRASS AND MEADOW MANAGEMENT
Most of the sown meadow species are perennial and are slow to establish. A flush of annual weeds, arising from the soil seed bank is anticipated soon after sowing. These weeds can look unsightly, but they will offer shelter to the sown seedlings and provide habitat and will die off by the end of the growing season. Annual weeds should not be cut until mid to late summer, especially if the mixture contains Yellow Rattle. The meadow should then be cut in early August, arisings removed and composted. This will reveal the young meadow, which can then be kept short by grazing or mowing through to the end of March of the following year. Dig out any residual perennial weeds such as docks.

MANAGEMENT ONCE ESTABLISHED
1. In the second and subsequent years EM1 sowings can be managed in a number of ways which, in association with soil fertility, will determine the character of the grassland. The best results are usually obtained by traditional meadow management based around a main summer hay cut in combination with autumn and possibly spring mowing or grazing.
2. Meadow grassland is not cut or grazed from spring through to late July/August to give the sown species an opportunity to flower. This will also benefit bulb areas to allow the foliage and flowers to die back prior to cutting.
3. After flowering in July or August take a 'hay cut': cut back with a scythe, petrol strimmer or tractor mower to around 50mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site. Mow or graze the re-growth through to late autumn/winter to around 50mm and again in spring if needed.

PROPOSED NATIVE SPECIES WILD FLOWER SEEDING TO BASE OF HEDGEROW
Base of hedgerow to be sown with Emorsgate Hedgerow Mixture EH1 or equivalent product sown at 40kg/ha or 4g/m^2
Composition
EH1 contains wild flowers and grasses that are tolerant of semi-shade and is suitable for sowing beneath newly planted or established hedges and on woodland edges, rides and glades.
Wild Flowers
0.10% Achillea millefolium - Yarrow
1.00% Alliaria petiolata - Garlic Mustard
0.50% Anthriscus sylvestris - Cow Parsley
1.50% Carex divulsa ssp divulsa - Grey Sedge
2.00% Centaurea nigra - Common Knapweed
3.00% Chaerophyllum temulum - Rough Chervil
2.00% Cruciata laevipes - Crosswort
0.20% Dipsacus fullonum - Wild Teasel
0.50% Galium album - Hedge Bedstraw
0.10% Geranium pratense - Meadow Crane's-bill
1.00% Geranium pyreniacum - Hedge Crane's-bill
0.30% Geum urbanum - Wood Avens
0.20% Knautia arvensis - Field Scabious
1.00% Leucanthemum vulgare - Moon Daisy
1.00% Malva moschata - Musk Mallow
2.00% Plantago lanceolata - Ribwort Plantain
3.00% Silene dioica - Red Campion
0.50% Silene flos-cuculi - Ragged Robin
0.10% Torilis japonica - Upright Hedge-parsley
Grasses
1.00% Agrostis capillaris - Common Bent (w)
2.00% Anthoxanthum odoratum - Sweet Vernal-grass (w)
1.00% Brachypodium sylvaticum - False Brome (w)
50.00% Cynosurus cristatus - Crested Dogstail
2.00% Deschampsia cespitosa - Tufted Hair-grass (w)
20.00% Festuca rubra - Red Fescue (w)
4.00% Poa nemoralis - Wood Meadow-grass
1. Sow directly to the base of the planted hedgerowafter raking soils to level finish.
2. Cultivation close to established trees and shrubs can be damaging to their root systems and disturbance should be kept to the minimum required to expose fresh soil.

Sowing
Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown and can be applied by machine or broadcast by hand. Do not incorporate or cover the seed but firm in with a roll, or by treading, to give good soil/seed contact.
First Year Management - as grass and meadows
Management Once Established
Hedgerows, woodland edges, rides, glades and other semi-shaded communities usually sit on the boundary between one habitat type (eg open grassland) and another (eg closed tree canopy). The management requirements of established hedgerow mixtures can be tailored to light levels and to fit in with adjacent vegetation types.

Zoned management of hedgerow margins frequently produces the best diversity of habitat structure: areas closest to the hedge or woodland boundary and those which are more shaded are left uncut in most years. Areas that are further from the margin and more open can be managed as grassland habitat. For example in a 6 metre sown margin the 2-3 metres against the boundary could be left uncut, the next 3-4 metres cut once or twice a year.

Hedgerow vegetation that is not mown or grazed each year will become rough and "tussocky" in character. It can form useful refuge habitat on corners and margins of a site. To control scrub and bramble development these tussocky areas may need cutting every 2-3 years between October and February. For wildlife this cutting is best done on a rotational basis so that no more than half the area is cut in any one year leaving part as a undisturbed refuge. Hedgerows and margins that are cut regularly can be managed as grassland.

ESTABLISHMENT MAINTENANCE .
1. All litter and arising stone larger than 50mm in any dimension to be removed from grassed areas.
2. Verify stakes and ties to upright position and loosen ties as necessary to allow continued healthy tree growth.
3. Remove weeds growing to base of tree stems by hand pulling. Replenish mulch to base of trees in year two of maintenance to suppress weed growth.
4. Refirm trees and plants to maintain upright growth in first two years of maintenance until established.
5. Prune establishing trees to remove weak or damaged branches and promote healthy growth.
6. Any trees or shrubs which are removed, damaged, dead or diseased within 5 years of planting will be replaced in the first available planting season with appropriate replacements of same or similar species and size of original plants.
7. Remove stakes and plant accessories after five years or when trees are self-supporting, whichever is the sooner.
8. Management of neutral grassland - Differential mowing regime - to be managed as short grass between August - February with cutting down to 75mm height; cutting to be suspended during May through to July/August with the area managed as a meadow allowing the grasses to grow tall, flower and seed from May through to July/August. The grass meadow should be cut back in late August/September and mowing may resume.
9. Legume and clover seeding should require little maintenance establishment.
10. Vigorous weeds should be hand pulled or cut with a hand-operated strimmer or similar to suppress growth.
11. Hedgerows will be maintained to encourage thickening growth and to reach the desired height gradually by increasing the cutting height of the hedge by small amounts each year. Incremental height increase is the key to the hedge management cycle, sympathetically allowing a hedgerow to progress slowly through its natural growth cycle without putting it under damaging stress. It also promotes a dense healthy hedgerow. Using this approach a hedgerow may take many tens of years to complete a full cycle of growth, and at all times during this remain dense, healthy and functional. The hedgerow will be maintained in accordance with the Hedgelink - Hedgerow Management Cycle, stages 1-10, with the aim to keep the hedgerow healthy at all times by allowing it to cycle between points 3 and 8. Side trimming of hedgerows in an 'A' profile to a promote healthy hedgerow base should be undertaken in January/February. Hedgerows will be cut along one side annually, alternating between the two sides of the hedgerow each year. The intention is to maintain the hedgerow according to the hedgerow cycle. The aim should be to keep the hedge in the green part (steps 3/4 to 8), periodically laying or coppicing it, with trimming at appropriate intervals in between. If the hedge is not permitted to go through this cycle, it will either, if cut too often, become short and gappy (steps 1 - 3) or, if neglected, develop into a line of trees (steps 8 to 10).
All hedgerow cuttings to be collected and removed.

PLANTING SCHEDULE

TREE PLANTING 12No. Planted at locations shown	Form	Age Condition/ Number of Times Transplanted	Girth cm	Overall or Minimum Height cm	Clear Stem cm	Root Condition		QUANTITY				
Acer campestre	heavy standard	2x	12-14cm girth	350-425	175-200	bagged		6				
Betula pendula	heavy standard	2x	12-14cm girth	350-425	175-200	bagged		3				
Malus sylvestris	heavy standard	2x	12-14cm girth	350-425	175-200	bagged		3				
								12				
SCRUB AND TREE UNDERPLANTING 200No. Planted at 1.5-2.0m centres								BED 1 519m2 % QUANTITY				
Acer campestre	transplant	1+1		80-100cm		bare root	7	14				
Betula pendula	transplant	1+1		80-100cm		bare root	8	16				
Cornus sanguinea	transplant	1+1		40-60cm		bare root	15	30				
Corylus avellana	transplant	1+2		60-80cm		bare root	15	30				
Crataegus monogyna	transplant	1+1		80-100cm		bare root	17	34				
Ilex aquifolium	2L pot minimum			40-60cm		container grown	15	30				
Malus sylvestris	transplant	1+1		60-80cm		bare root	5	10				
Rosa canina	transplant	1+0		40-60cm		bare root	7	14				
Sambucus nigra	transplant	1+1		60-80cm		bare root	5	10				
Viburnum opulus	transplant	1+1		60-80cm		bare root	6	12				
							100	200				
SCRUB PLANTING 825No. Planted at 1.5m centres							BED 2 203m2 %	QUANTITY	BED 3 71m2 %	QUANTITY	BED 4 211m2 %	QUANTITY
Acer campestre	transplant	1+1		80-100cm		bare root	5	4.06	5	1.42	5	4.22
Betula pendula	transplant	1+1		80-100cm		bare root	5	4.06	5	1.42	5	4.22
Cornus sanguinea	transplant	1+1		40-60cm		bare root	8	6.496	8	2.272	8	6.752
Corylus avellana	transplant	1+2		60-80cm		bare root	7	5.684	7	1.988	7	5.908
Crataegus monogyna	transplant	1+1		80-100cm		bare root	25	20.3	25	7.1	25	21.1
Ilex aquifolium	2L pot minimum			40-60cm		container grown	10	8.12	10	2.84	10	8.44
Malus sylvestris	transplant	1+1		60-80cm		bare root	3	2.436	3	0.852	3	2.532
Rosa canina	transplant	1+0		40-60cm		bare root	15	12.18	15	4.26	15	12.66
Sambucus nigra	transplant	1+1		60-80cm		bare root	3	2.436	3	0.852	3	2.532
Ulex europaeus	cell grown / 9cm pot					cell or container gorwn	3	2.436	3	0.852	3	2.532
Viburnum lantana	transplant	1+2		60-80cm		bare root	9	7.308	9	2.556	9	7.596
Viburnum opulus	transplant	1+2		60-80cm		bare root	7	5.684	7	1.988	7	5.908
							100	81.2	100	28.4	100	84.4
HEDGE PLANTING total 136m length Planted as double staggered row at 5 plants per linear metre (680 total)							%	QUANTITY				
Acer campestre	transplant	1+1		80-100cm		bare root	8	54				
Corylus avellana	transplant	1+2		60-80cm		bare root	13	88				
Crataegus monogyna	transplant	1+1		80-100cm		bare root	55	374				
Ilex aquifolium	2L pot minimum			40-60cm		container grown	10	68				
Rosa canina	transplant	1+0		40-60cm		bare root	7	48				
Sambucus nigra	transplant	1+0		60-80cm		bare root	5	34				
Viburnum opulus	transplant	1+1		60-80cm		bare root	2	14				
							100	680				

Drawing references

224/L/100	LANDSCAPE AND BIODIVERSITY PROPOSALS PLAN

OS LICENCE

Project	DRAGON PACKAGING WREXHAM INDUSTRIAL ESTATE	Dwg No	224/L/400
Title	SCHEDULE, SPECIFICATION AND IMPLEMENTATION PLAN	Scale	Date 03/05/2023

Revision	Date	Details	Drawn	Checked	Reviewed
P01.1	02/05/2023	FOR INFORMATION	MD	XX	XX

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