SIEMENS REAL ESTATE

Biodiversity at
Siemens Campus Erlangen

SIEMENS

SIEMENS CAMPUS ERLANGEN – A SPACE FOR THE FUTURE

Sustainable, environmentally friendly and diverse – environmental aspects have a key role to play in the design and transformation of Siemens Campus Erlangen.

Alongside modern buildings and energy technology, environmentally friendly construction, innovative district cooling and heating concepts, and the use of renewable energies, protecting and preserving diversity of flora and fauna are vitally important. Not only will existing trees be retained, but new native pines, oaks, and poplars will be planted, as well as ginkgo trees, which cope particularly well with the climate conditions prevailing in present-day urban areas.

The Erlangen Campus is a carbon-neutral site and as such dovetails neatly with Siemens AG's declared environmental targets.

SIEMENS CAMPUS ERLANGEN –
BIODIVERSITY AS A TARGET

The three aspects of biodiversity (also known as biological variety) are closely interlinked: Diversity of flora and fauna, genetic diversity within species, and ecosystem diversity, which includes symbiotic communities, habitats such as forests and oceans, and also urban areas.

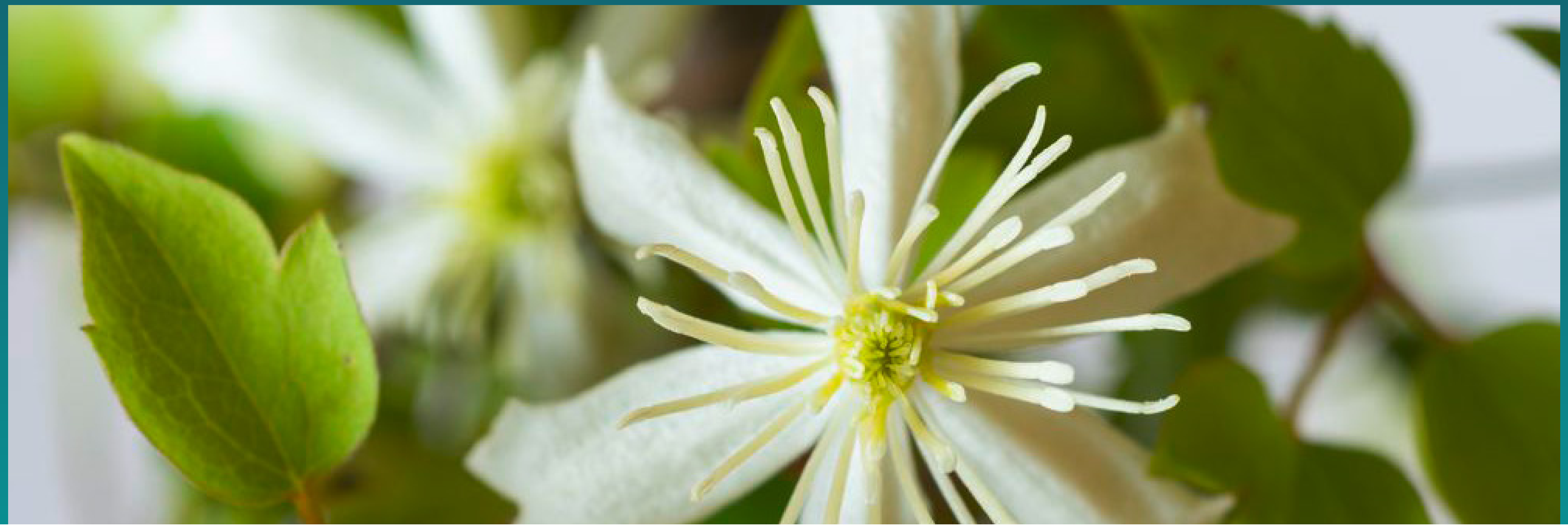
Many factors were considered when designing Siemens Campus Erlangen. The number of climate-related stress factors that impact nature in the city are on the rise, so a broader range of suitable tree species has been chosen for the campus as part of a sensitive and forward-thinking approach.

There can be no denying that the more diversity we have in place, the more stable the resulting ecosystem will be.

This is one way of avoiding tree diseases and other problems, along with their associated costs. Then again, natural resources like water can be used sparingly and conserved within the ecosystem by a well thought-out design for external spaces, incorporating the choice of plants used. By focusing on extensification of outdoor spaces, maintenance costs can also be reduced.

In other words, not only do measures along these lines play a part in environmental diversity and sustainability in Germany, they also lead to savings in the medium and long term.

When designing Siemens Campus Erlangen, the following measures were taken to ensure that campus life fulfills the environmentally friendly and sustainable brief:



BIODIVERSITY -
SIEMENS CAMPUS ERLANGEN – MEASURES

CLICK ON THE TEXT
TO JUMP TO THE SELECTED SECTION

GREEN CORRIDORS – EAST-WEST GREEN CORRIDOR
OVERVIEW

PARKLIKE VIBE
(SCOTS PINES, RED OAKS,
PIN OAKS, ROUGH GRASSLAND)

Two green corridors divide the entire campus in the east-west direction as landscaped green axes, connecting all other green spaces. This provides an almost parklike vibe thanks to a loose tree structure made up of pines and oaks, underplanted with generous areas of rough grassland. This structure is underpinned by footpaths linking the various areas across the campus. Paved areas of varying sizes and the seating areas outside cafés and restaurants make this an inviting space to linger and spend an hour or two.

To reduce microclimate issues in built-up areas ,and ensure a natural balance, the selected tree species are primarily chosen for their proven resistance to extreme climate events and local conditions (notably heat and drought, but also waterlogging). They include:

Pinus sylvestris (Scots pine)
Quercus palustris (Pin oak)
Quercus rubra (Red oak)
Populus tremula (Trembling poplar or aspen)

GREEN CORRIDORS – EAST-WEST GREEN CORRIDOR
IMPRESSIONS

DIVERSITY OF FLORA AND FAUNA
The parklike landscaping provides an inviting space to linger with its trees, footpaths and small paved areas off the east-west corridors.

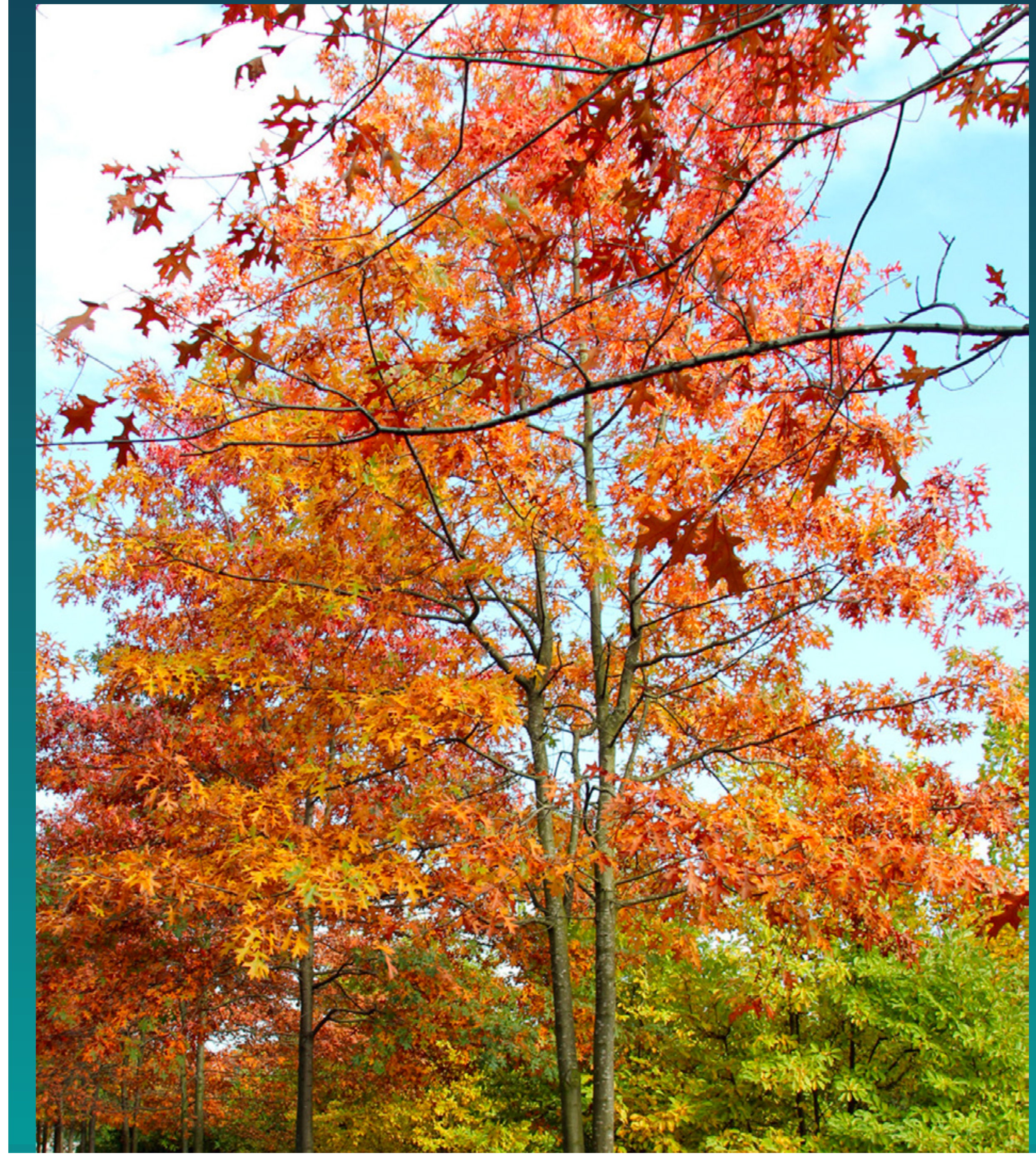
The green corridor provides scope for both **pedestrians and bicycles**, with a variety of pleasant areas to stop and chat, as well as offering considerable potential to achieve the ultimate aim of **diversity of flora and fauna** on the campus.

GREEN CORRIDORS – EAST-WEST GREEN CORRIDOR
PLANTING

SCOTS PINE [1]
[Pinus sylvestris] Approximately 20-30 meters tall, these pines can live for up to 500 years. They are particularly good at colonizing niches such as open areas on sandy soil.

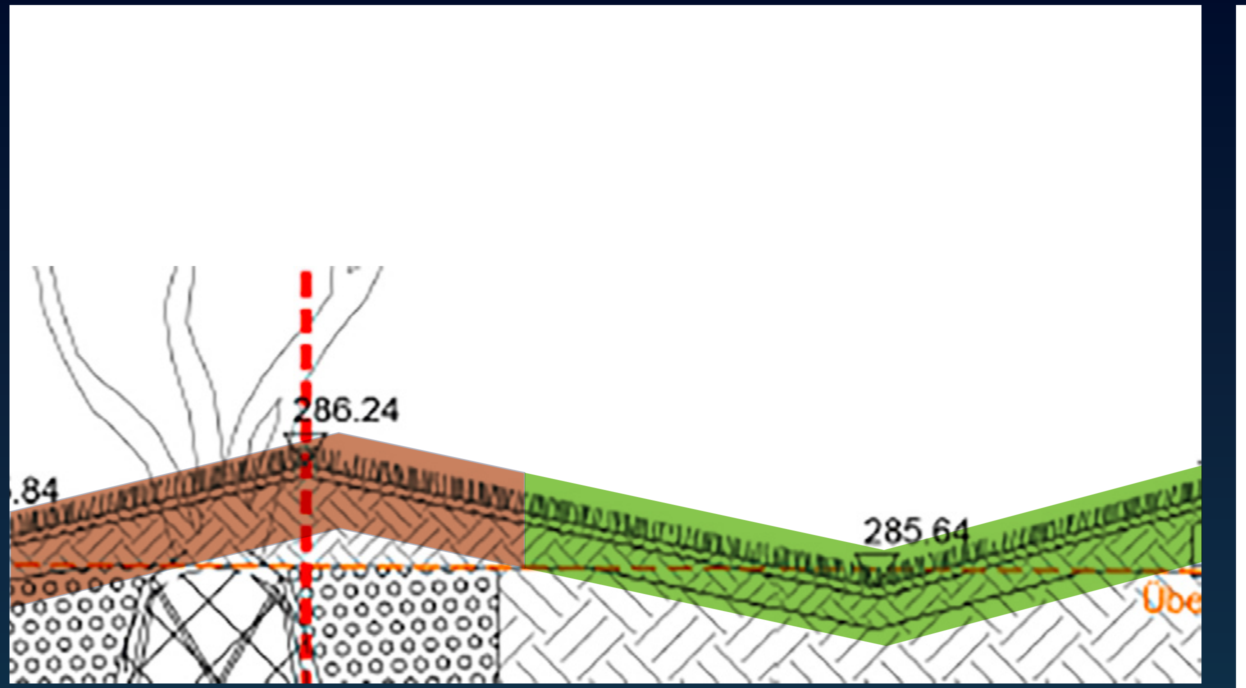
PIN OAK [2]
[Quercus palustris] is a low-maintenance tree and, despite what another of its common names (swamp oak) suggests, it doesn't have particularly demanding water requirements, so is ideally suited to an urban environment and extremely frost-hardy.

RED OAK [3]
[Quercus rubra] can withstand heat and drought, and displays excellent frost hardiness. It can tolerate urban environments and emissions, and even shrugs off cold-weather salt applications.



LANDSCAPE ARCHITECTURE
NEW OPPORTUNITIES

Rough grassland (raised areas)
Damp grassland (hollows)



Rough grassland (raised areas)

Damp grassland (hollows)

THE CHALLENGE

Landscape architects working on the Siemens Campus Erlangen project had a range of challenges to contend with. Even in the very early planning stages, it was decided to avoid impermeable surfaces wherever possible. Water-permeable paving and surfaces have a vital role to play in keeping the site as green as possible. The design team also sought to halt the current decline in insect populations by making sure that the Siemens campus doesn’t have traditional lawned areas. Instead, the site features meadow planting and extensive areas of vegetation, which can be managed much more effectively, bringing ecology and economics into harmony.

The landscapers also faced other new challenges and opportunities. As a result of climate change, for example, European deciduous trees are finding it harder and harder to cope with the current weather conditions: hence the need to switch to species that are better suited to the climate. Open spaces also need to change and become more extensive than was previously the case.

Local conditions are another key factor, especially as Erlangen is renowned for having a relatively thin layer of topsoil, consisting of the virtually impermeable sand and clay soil so typical of this region. This meant that rainwater management was a primary concern right from the outset. Heavy rainfall needs to be captured and this is achieved by creating hollows in the ground to provide seasonal damp areas to encourage a variety of flora and fauna. However, these structures also retain water for use by the plants in this area. The selection of seeds chosen for meadow sowing is geared to this design.

WILDFLOWER MEADOWS
SPECIES LIST


Yarrow


Greater musk mallow


White campion

RAISED AREAS

DRY AREAS ROUGH GRASSLAND

Grass seed Regional mix UG 12
Rough grass type, alkaline-rich
70% grasses – 30% wildflowers
Sowing rate 5 g/m²

Grasses:
Agrostis capillaris – Common bent 5.0%
Anthoxanthum odoratum – Sweet vernal grass 10.0%
Briza media – Quaking grass 6.0%
Bromus hordeaceus – Soft brome 8.0%
Helictotrichon pubescens – Downy oat-grass 4.0%
Poa angustifolia – Narrow-leaved meadow grass 17.5%
Poa pratensis – Smooth meadow-grass 17.0%
Trisetum flavescens – Golden oat-grass 2.5%

Legumes:
Lotus corniculatus – Common bird's-foot-trefoil 0.5%
Medicago lupulina – Hop clover 1.0%
Trifolium pratense – Red clover 1.5%

Wildflowers:
Achillea millefolium – Common yarrow 1.0%
Agrimonia eupatoria – Common agrimony 2.0%
Campanula rapunculus – Rampion bellflower 0.2%
Campanula rotundifolia – Common harebell 0.1%
Centaurea cyanus – Cornflower 1.0%
Centaurea jacea – Brown knapweed 1.0
Cichorium intybus – Chicory 1.0
Daucus carota – Wild carrot 1.0
Echium vulgare – Viper's bugloss 3.0
Galium album – White bedstraw 1.0
Galium verum – Lady's bedstraw 1.5
Knautia arvensis – Field scabious 0.5%
Leontodon hispidus – Rough hawkbit 0.5%
Leucanthemum ircutianum – Oxeye daisy 1.5%
Malva alcea – Greater musk mallow 1.0%
Origanum vulgare – Wild marjoram 0.1%
Papaver rhoeas – Field poppy 2.0%
Pastinaca sativa – Parsnip 0.5%
Plantago lanceolata – Ribwort plantain 1.0%
Sanguisorba minor – Salad burnet 2.0%
Silene alba – White campion 1.5%
Silene vulgaris – Bladder campion 2.0%
Solidago virgaurea – Goldenrod 0.5%
Thymus pulegioides – Broad-leaved thyme 0.1%
Tragopogon pratensis – Meadow salsify 1%

HOLLOWS

DAMP AREAS
DAMP MEADOWS

Grass seed Regional mix UG 12
Damp meadows
70% grasses – 30% wildflowers
Sowing rate 5 g/m²

Grasses:
Agrostis capillaris – Common bent 7.5%
Alopecurus pratensis – Meadow foxtail 2.0%
Anthoxanthum odoratum – Sweet vernal grass 11%
Arrhenatherum elatius – False oat-grass 2.5%
Bromus hordeaceus – Soft brome 10.0%
Cynosurus cristatus – Crested dog's tail 5.0%
Festuca pratensis – Meadow fescue 2.0%
Phleum pratense – Timothy grass 2.5%
Poa palustris – Swamp meadowgrass 5.0%
Poa pratensis – Smooth meadow-grass 17.5%
Poa trivialis – Rough meadowgrass 5.0%

Legumes:
Lathyrus pratensis – Meadow vetchling 1.0%
Lotus pedunculatus – Greater bird's-foot-trefoil 1.5%
Trifolium pratense – Red clover 1.5%

Wildflowers:
Achillea millefolium – Common yarrow 1.0%
Angelica sylvestris – Wild angelica 0.5%
Betonica officinalis – Betony 1.0%
Carum carvi – Caraway 1.0%
Centaurea jacea – Brown knapweed 2.0%
Cirsium oleraceum – Cabbage thistle 2.0%
Crepis biennis – Rough hawksbeard 1.0%
Daucus carota – Wild carrot 0.5%
Epilobium hirsutum – Great willowherb 0.5%
Filipendula ulmaria – Meadowsweet 1.5%
Galium album – White bedstraw 1.5%
Lychnis flos-cuculi – Ragged robin 3.0%
Lythrum salicaria – Purple loosestrife 1.0%
Papaver rhoeas – Field poppy 2.0%
Pastinaca sativa – Parsnip 0.5%
Plantago lanceolata – Ribwort plantain 1.0%
Prunella vulgaris – Common self-heal 0.5%
Ranunculus acris – Meadow buttercup 1.5%
Rumex acetosa – Common sorrel 1.0%
Sanguisorba officinalis – Great burnet 1.0%
Silene dioica – Red campion 2.5%


Meadow buttercup


Red campion


Purple loosestrife

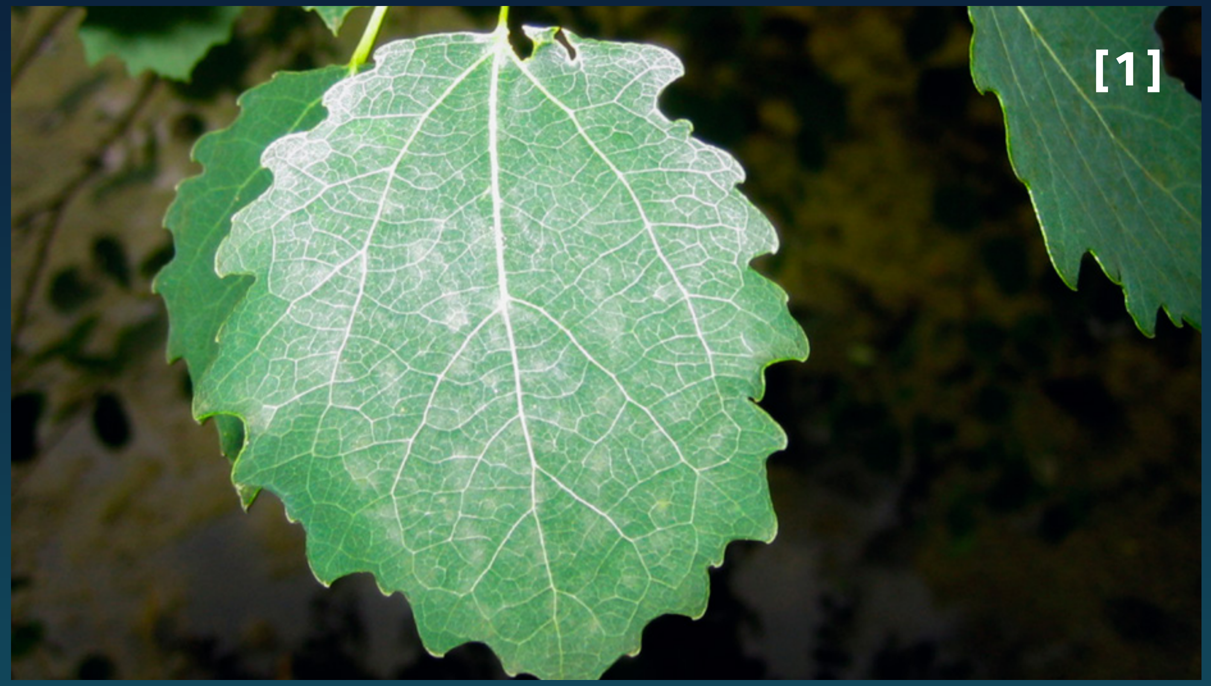
GREEN VERGES
GREEN ROUTES

SILVER LIME
Not only is the silver lime [Tilia tomentosa 'Brabant'] able to withstand persistent dry conditions, it also copes well with heat. In the top third of its crown, where the tree experiences the highest temperatures and exposure to the sun, the silver lime turns the pale underside of its leaves to face the sun, allowing them to reflect the sun's rays and acting as a self-cooling mechanism. It is also an important source of food for bees.

RED CAPPADOCIAN MAPLE
The red Cappadocian maple [Acer cappadocicum 'Rubrum'] is also ideally suited to cultivation as a drought-resistant urban tree, especially as it is renowned and loved for its impressive red fall color.

ELMS now include a number of varieties that have demonstrated resistance to Dutch elm disease over recent years. In the hot summer of 2019, for example, horticulturalists in Düsseldorf observed that Ulmus 'Rebona' kept all its leaves even after weeks of drought.

GREEN VERGES
PLANTING





SILVER LIME [1]
is frost-hardy, tolerant of urban climates and emissions, and much more drought-resistant than other lime species.

ULMUS REBONA [2]
is a fast-growing, medium to large elm with a robust habit and the ability to tolerate an extremely wide range of growing locations. This makes it an undemanding tree and particularly suitable for challenging sites.

CYPRESS OAK [3]
loves hot, sunny conditions and is extremely well suited to urban environments and tolerant of emissions, as well as being very wind-resistant and frost-hardy. As such, it is the ideal tree for the narrow planting strips in front of the parking garages.

SHARED SPACES
TREES OF THE FUTURE

Trees of the future

Urban trees are exposed to a whole range of challenges, ranging from extreme temperatures and limited water supplies, to reduced oxygen levels in the soil and pollution caused by cohabiting shared spaces with both people and vehicles. The trees selected must therefore be adapted to these specific and extreme site conditions.

The answer lay with what are known as the 'trees of the future'. These trees are perfectly attuned to the requirements of the cities of the future: in other words, they display high levels of drought tolerance and heat resistance, while also being frost-hardy with little likelihood of succumbing to pests or diseases.

The following species were chosen from the list of potential trees of the future to populate the shared spaces at Siemens Campus Erlangen.

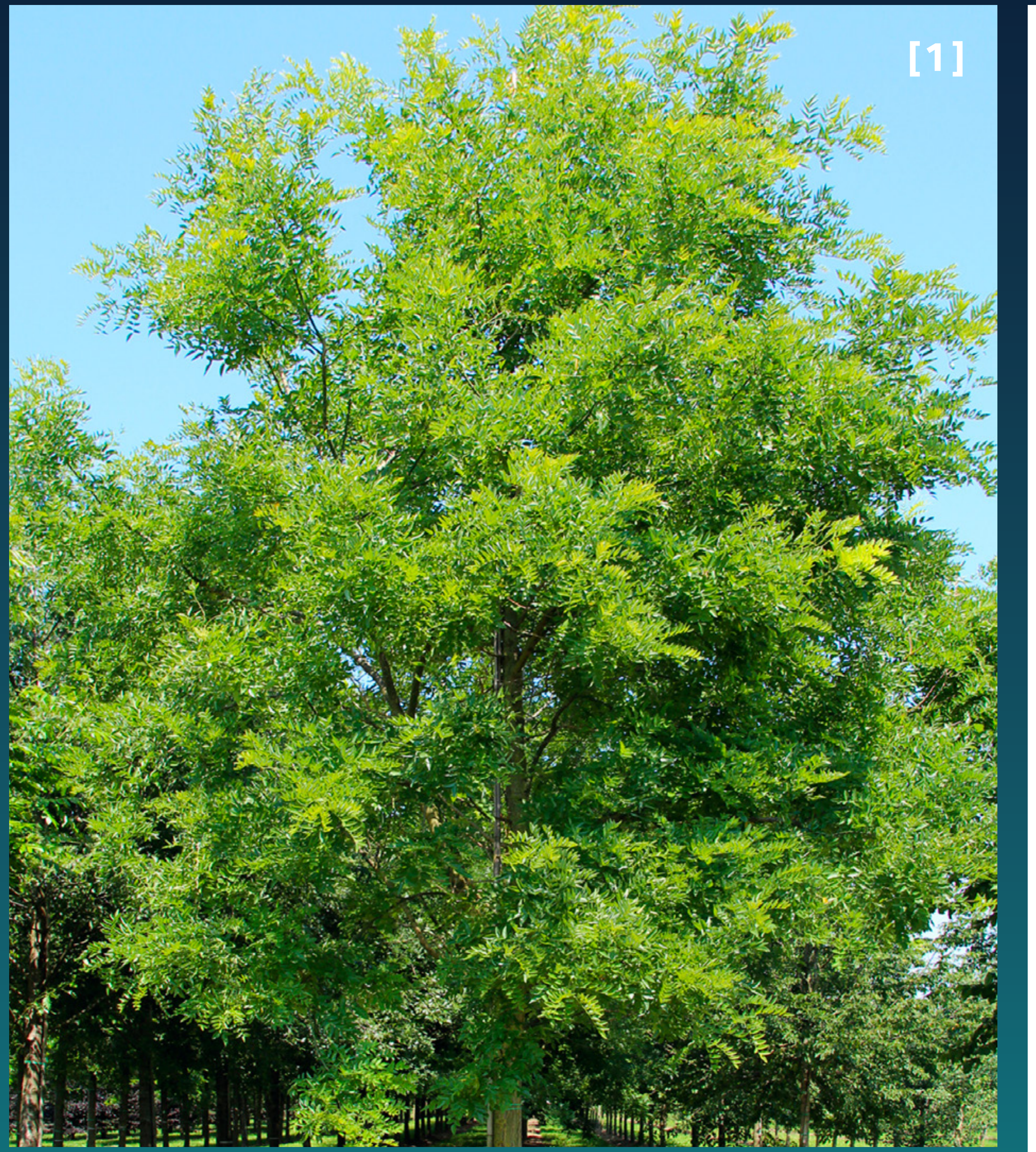
Planting

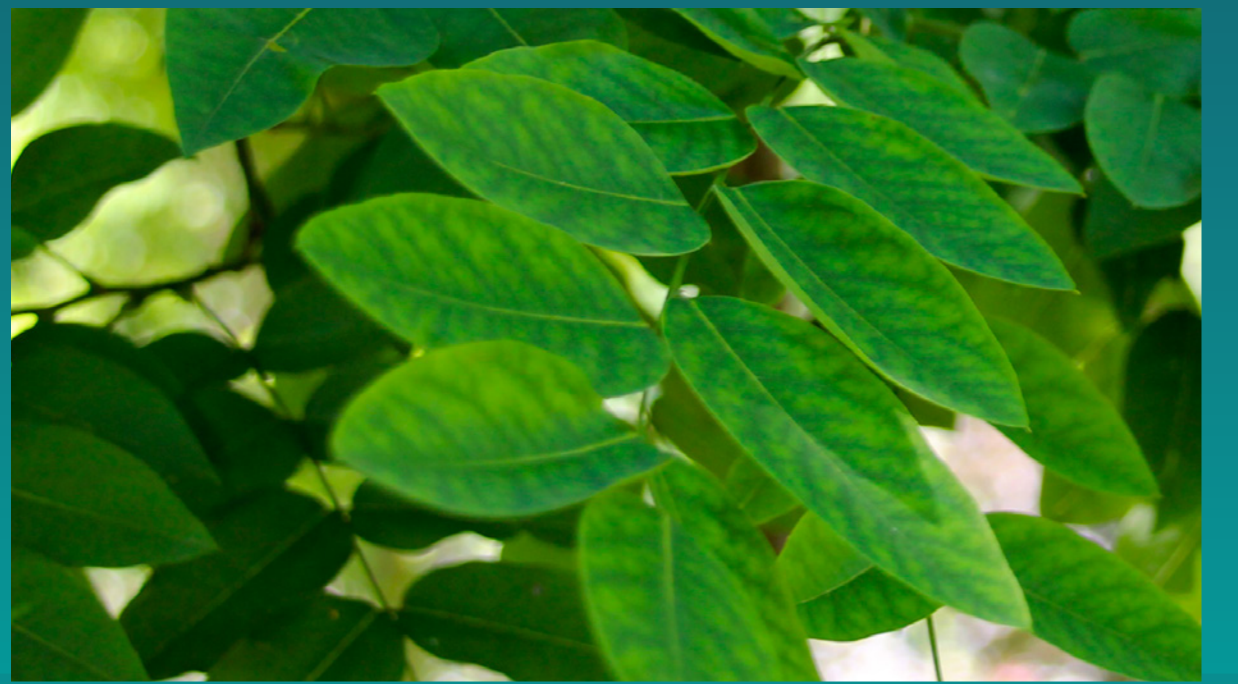
- *Acer cappadocicum „Rubrum"* *(Red cappadocian maple)*
- *Sophora japonica „Regent"* *(Japanese pagoda tree)*
- *Quercus robur „Fastigiata Koster"* *(Cypress oak)*
- *Pinus sylvestris (Scots pine)*

Underplanting

- *Carpinus betulus (Hornbeam)*

SHARED SPACES
PLANTING





JAPANESE PAGODA TREE [1]
can be rather frost-tender in its early years, but develops frost-hardiness as it ages, with the ability to withstand heat and drought. It is also regarded as extremely well suited to urban environments and tolerant of emissions.

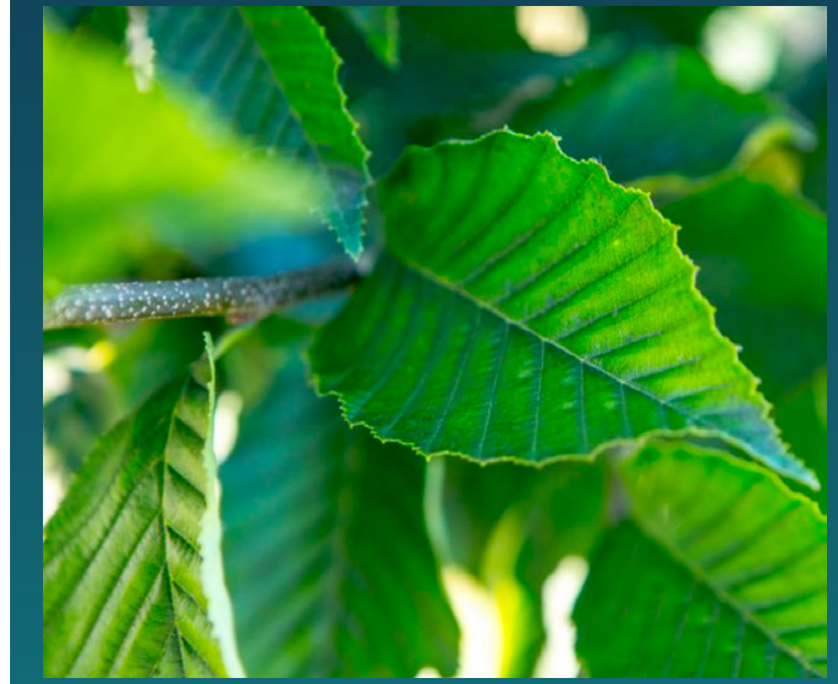
ULMUS REBONA [2]
is a fast-growing, medium to large elm with a robust habit and the ability to tolerate an extremely wide range of growing locations. This makes it an undemanding tree and particularly suitable for challenging sites.

CYPRESS OAK [3]
loves hot, sunny conditions and is extremely well suited to urban environments and tolerant of emissions, as well as being very wind-resistant and frost-hardy. It is the ideal tree for the narrow planting strips in front of the parking garages.

SHARED SPACES
OLD AND NEW

The trees planted are geared to the existing specimens (particularly pines and oaks), backed up by a few additional key species. The cypress oaks from the road to the parking garages are continued up to the new central reception building, alternating loosely with large-crowned pagoda trees and pines.

SHARED SPACES
UNDERPLANTING



HARMONIOUS, UNIFORM AND VARIED

The tree grates in the shared spaces are planted with blocks of clipped hornbeam hedging. Alongside their environmental attributes, these hedges also serve to provide a visual border to the space. They define a clear boundary from the traffic area, resulting in an overall harmonious appearance.

Uniform paved areas will be provided in front of and between the buildings themselves to permit access by bicycles, delivery and fire service vehicles. Curb edgings were deliberately omitted in these areas to convey the effect of a uniform surface. Driving routes and parking areas are identified by aluminum studs, providing a subtle visual demarcation which is still clearly identifiable. The green corridor is clearly visible as a no-go area for all types of traffic.

Carpinus betulus - Hornbeam

PAVED AREAS ON GÜNTHER-SCHAROWSKY-STRASSE
GREEN STREETSCAPE

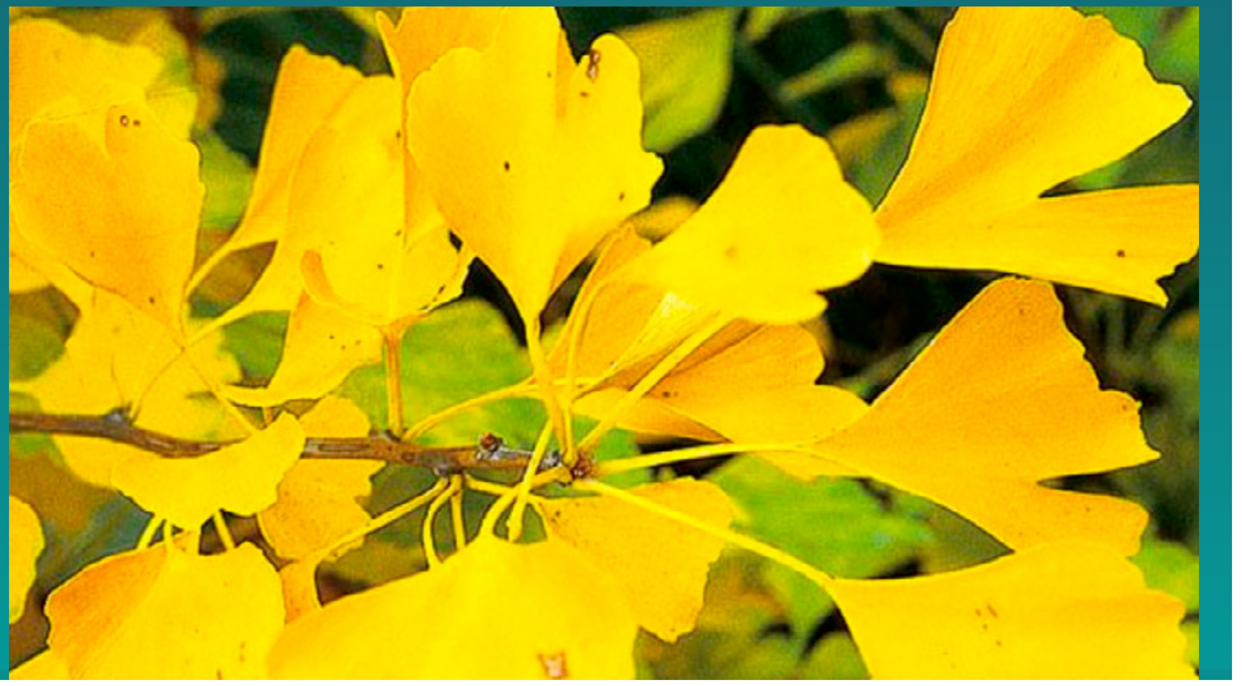
Paved areas on Günther-Scharowsky-Strasse

Extensive new planting areas are planned all along Günther-Scharowsky-Strasse. These center around two tree species:

GINKGO BILOBA
(MAIDENHAIR TREE/GINGKO)
PINUS SYLVESTRIS
(SCOTS PINE)

The gingko is regarded as the living fossil of the tree world. It is the only remaining representative of an order that existed millions of years ago. Despite first impressions, it is a conifer, not a deciduous tree. It can grow in almost any climate across the world and has also proved itself to be extremely resistant to air pollution, heat, and pest damage. In fact, the gingko was the first plant to start growing again after the atomic bomb devastated Hiroshima. The gingko is a bewitching sight in fall with its vivid golden seasonal hues harmonizing beautifully with the local pines.

PAVED AREAS ON GÜNTHER-SCHAROWSKY-STRASSE
PLANTING



GINKGO [1]
has earned its reputation as a slow-growing species with an extremely robust habit and marked resistance to a wide range of adverse environmental conditions.

SCOTS PINE [2]
can grow to approximately 20-30 meters in height and live for up to 500 years. They are particularly good at colonizing niches such as open areas on sandy soil.

PERIPHERAL AREAS
OVERVIEW

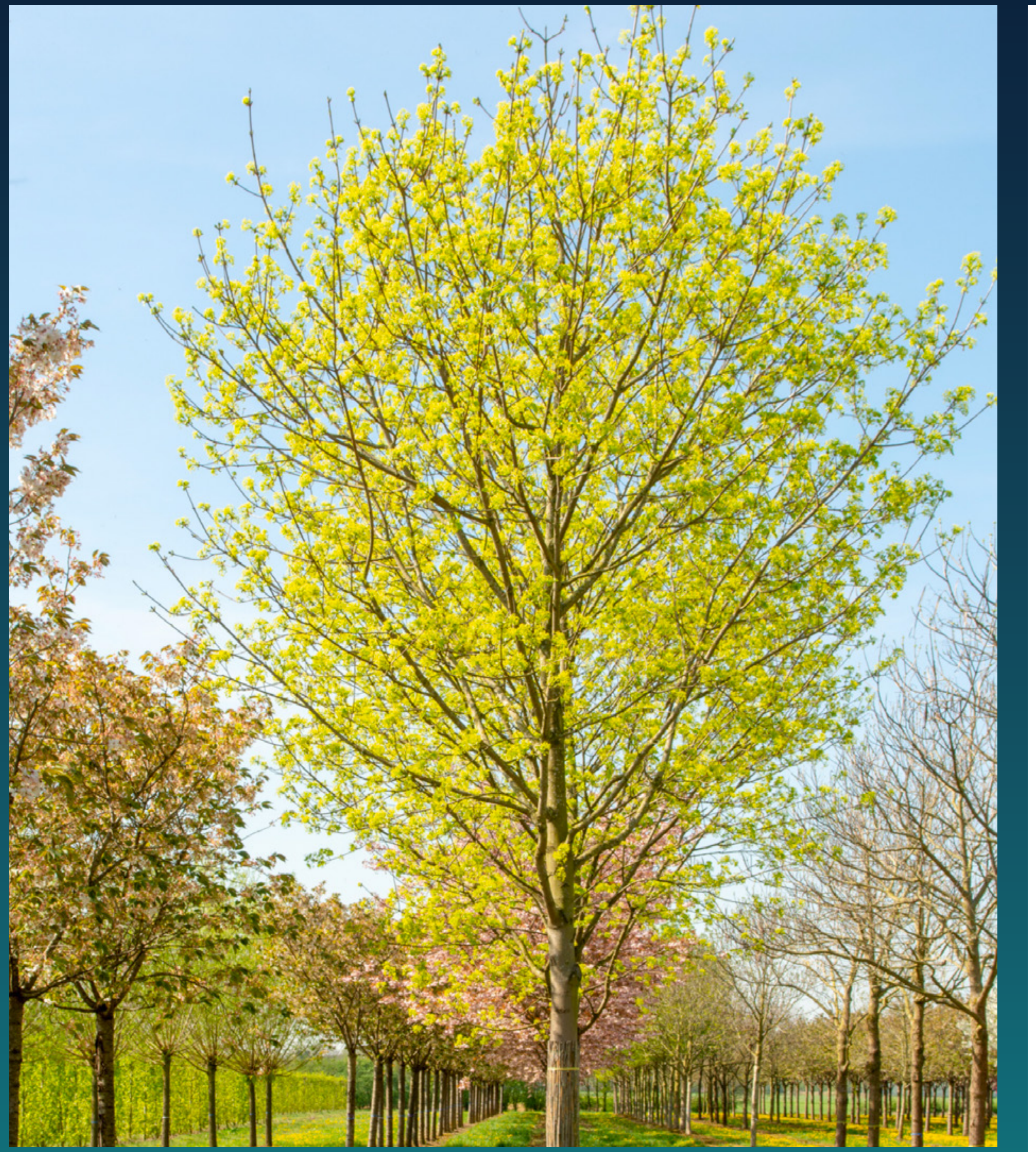
Peripheral areas

PERIPHERAL AREAS
at Siemens Campus Erlangen are planted with typical deciduous trees and conifers of the region.

These include:
- *Acer campestre 'Queen Elizabeth' (field maple)*
- *Acer platanoides 'Eurostar' and 'Farlake's Green' (Norway maple)*
- *Pinus sylvestris (Scots pine)*
- *Ostrya carpinifolia (Hop hornbeam)*

FIELD MAPLE
is one of the best known indigenous tree species and is known to tolerate dry soil and impermeable surfaces with ease. The Norway maple is also particularly suited to planting in an urban environment. Its bright red shoots make it an extremely decorative choice, even before its leaves start to form at the start of the growing season.

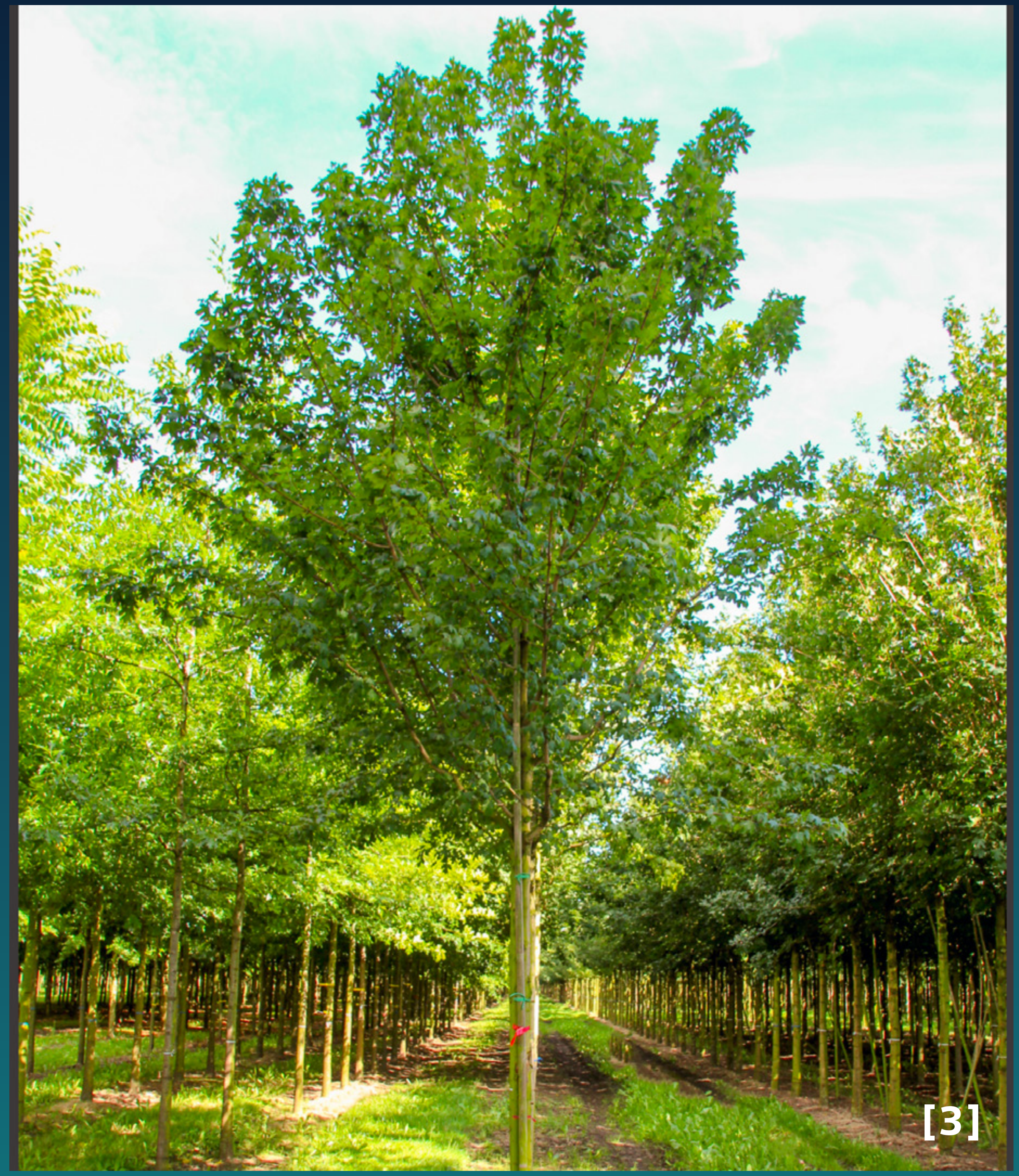
PERIPHERAL AREAS
PLANTING



NORWAY MAPLE [1]
is heat and drought-resistant. It has extremely striking yellowish-green flowers that appear in profusion in early spring when most other trees are still bare.

HOP HORNBEAM [2]
may not be good for brewing beer, but it is a very heat-resistant specimen that features on the trees of the future list. It is also frost-hardy and grows back well after clipping.

FIELD MAPLE [3]
is not only frost-hardy, but also drought-resistant, able to withstand applications of grit or salt in winter and well suited to urban environments. It can also tolerate detrimental air emissions (from traffic, industry etc.).



FRUIT TREES
OVERVIEW

■ *Fruit trees*

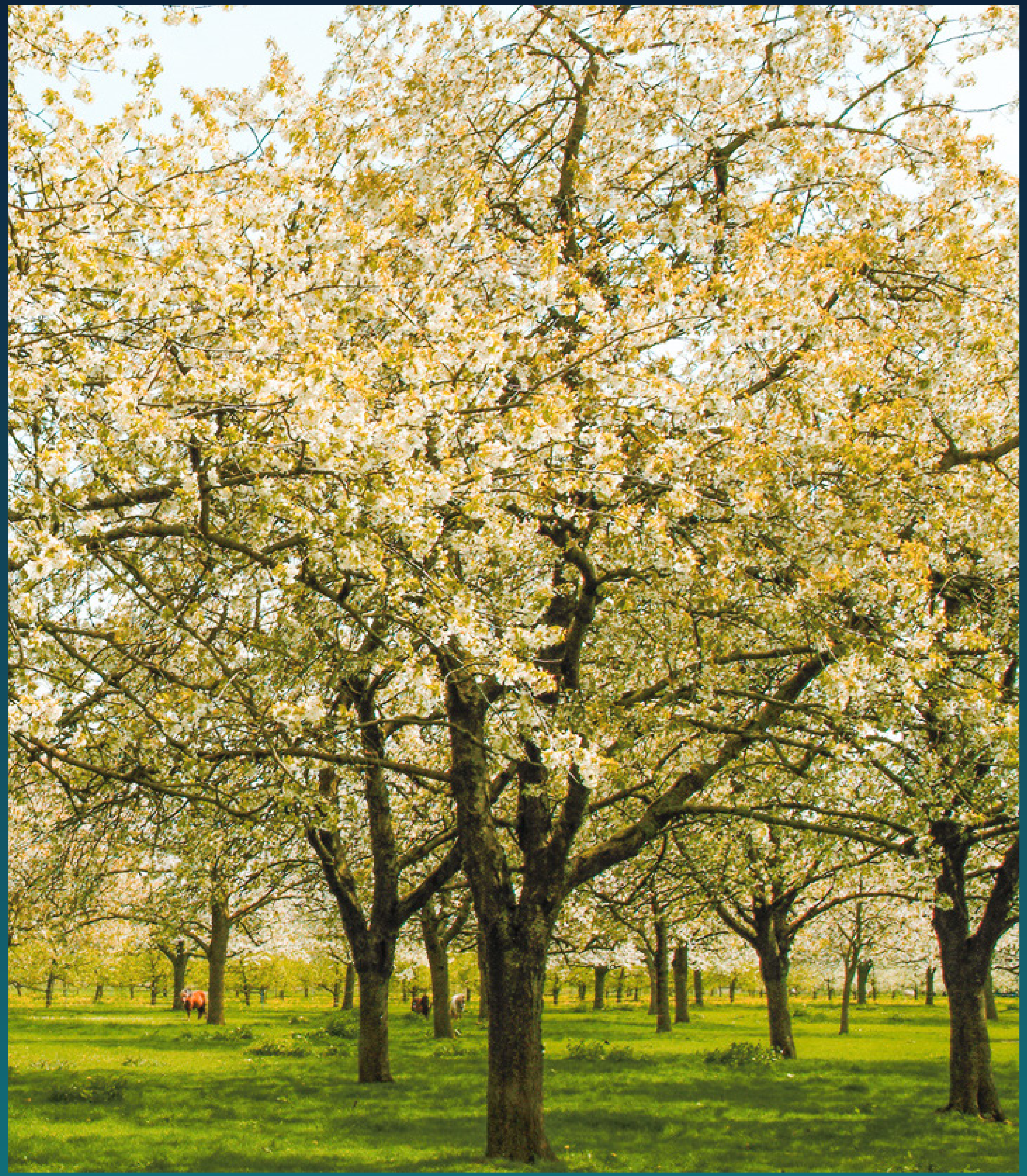
There has been a dramatic decline in bee and insect populations not only here in Germany, but also across the globe. One way of getting to grips with the problem is by planting trees that act as a food source for bees. These are the kinds of trees that provide particularly generous quantities of the pollen and nectar that bees need to survive. Typical bee-friendly trees include the **following fruit trees, which are planted on the campus site**:

- *Malus communis (Apple)*
- *Malus sylvestris (Crab apple)*
- *Prunus avium (Wild cherry)*
- *Prunus domestica (Plum)*
- *Pyrus communis (Pear)*
- *Pyrus pyraster (Wild pear)*

Fruit trees provide an important habitat for many insect species. Wherever possible, dead branches should be left in situ on the tree or, at the very least, on the ground to promote this function and create a more natural impression.

Another fruit meadow is also planned on the North-South corridor in the next stage of the campus project.

FRUIT TREES
PLANTING



CRAB APPLE [1]
is a wild European apple that has been in existence for many years and is the perfect food source for bees with its generous, loosely rounded crown and whitish-pink blossom.

PLUM [2]
is also a good tree for bee meadows. Its side shoots extend out from the leader to form a loose but spreading crown. It is covered in white blossom, which goes on to form the much-loved fruit.

PEAR [3]
is also attractive to bees. In Germany, the fruit is often turned into pear schnapps.

GREEN FACADES ON ALL PARKING GARAGES
OVERVIEW

Green facades on all parking garages

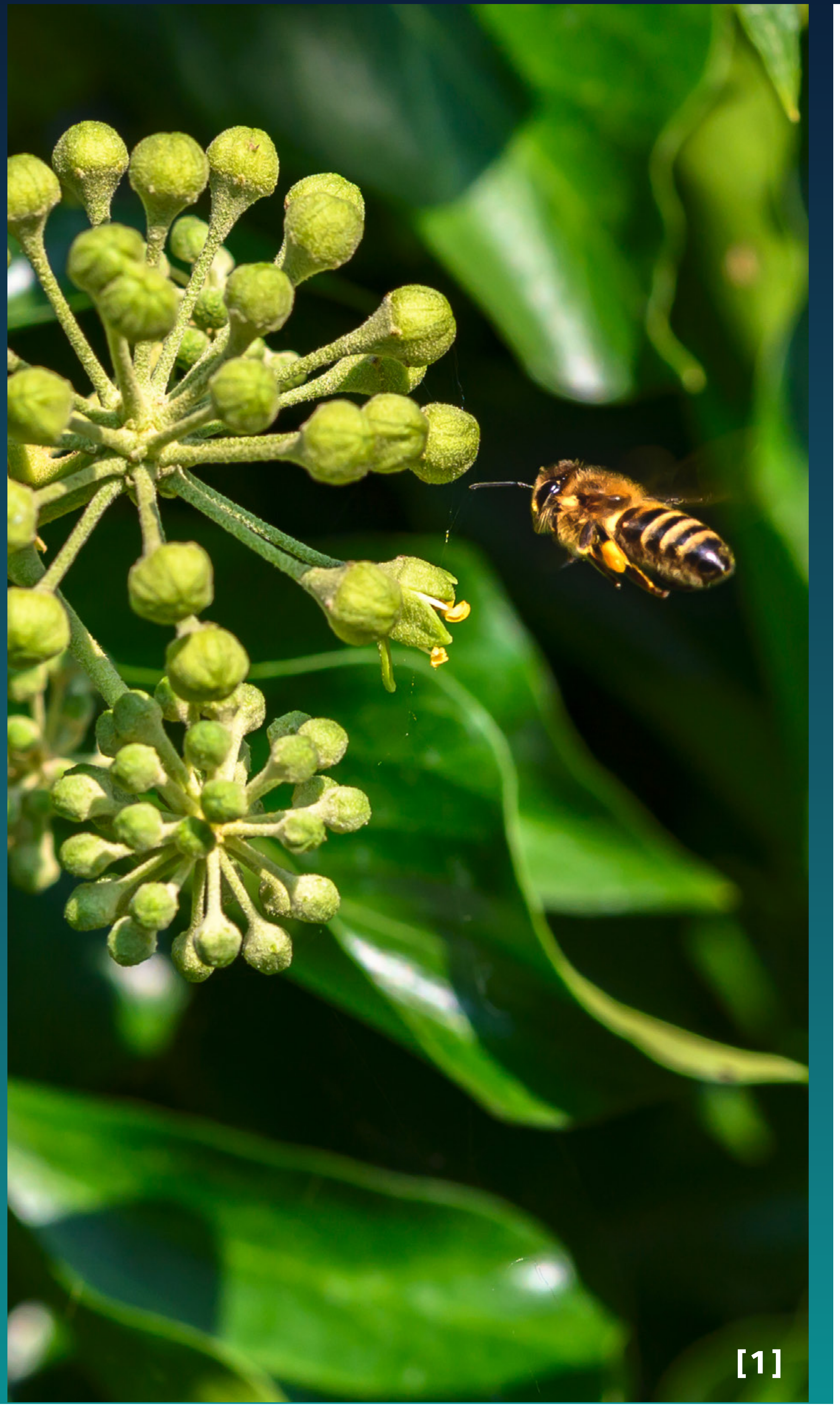
The constant expansion and densification of urban areas means that town planning needs to be well thought-out as towns increasingly have too few green spaces. Impermeable surfaces and facades also radiate considerable quantities of heat, causing temperatures to rise, especially in hot summers.
A careful choice of colors for building facades and clothing walls with creepers and climbing plants to create so-called green walls are efficient ways of addressing this problem.
The creepers and climbing plants selected for the facades of the parking garages at Siemens Campus Erlangen are ideally suited to the height of the parking garages (some 23 meters) and the specific nature of the site.

The intention is to have a mix of evergreen climbing plants (e.g. Hedera helix - Ivy) combined with a variety of seasonal climbers. The planting will also be enhanced by different types of flowers to provide optimum results in terms of appearance and environmental benefits by using a diverse range of species.

PLANT SELECTION:

- *Parthenocissus quinquefolia 'Engelmannii' (Virginia creeper)*
- *Parthenocissus tricuspidata (Boston ivy)*
- *Polygonum aubertii/ syn.: Fallopia aubertii (Russian vine)*
- *Aristolochia macrophylla (Dutchman's pipe)*
- *Clematis montana 'Rubens' (Mountain clematis)*
- *Clematis vitalba (Old man's beard)*
- *Hedera helix (Ivy)*

GREEN FACADES ON ALL PARKING GARAGES
PLANTING WITH CLIMBERS

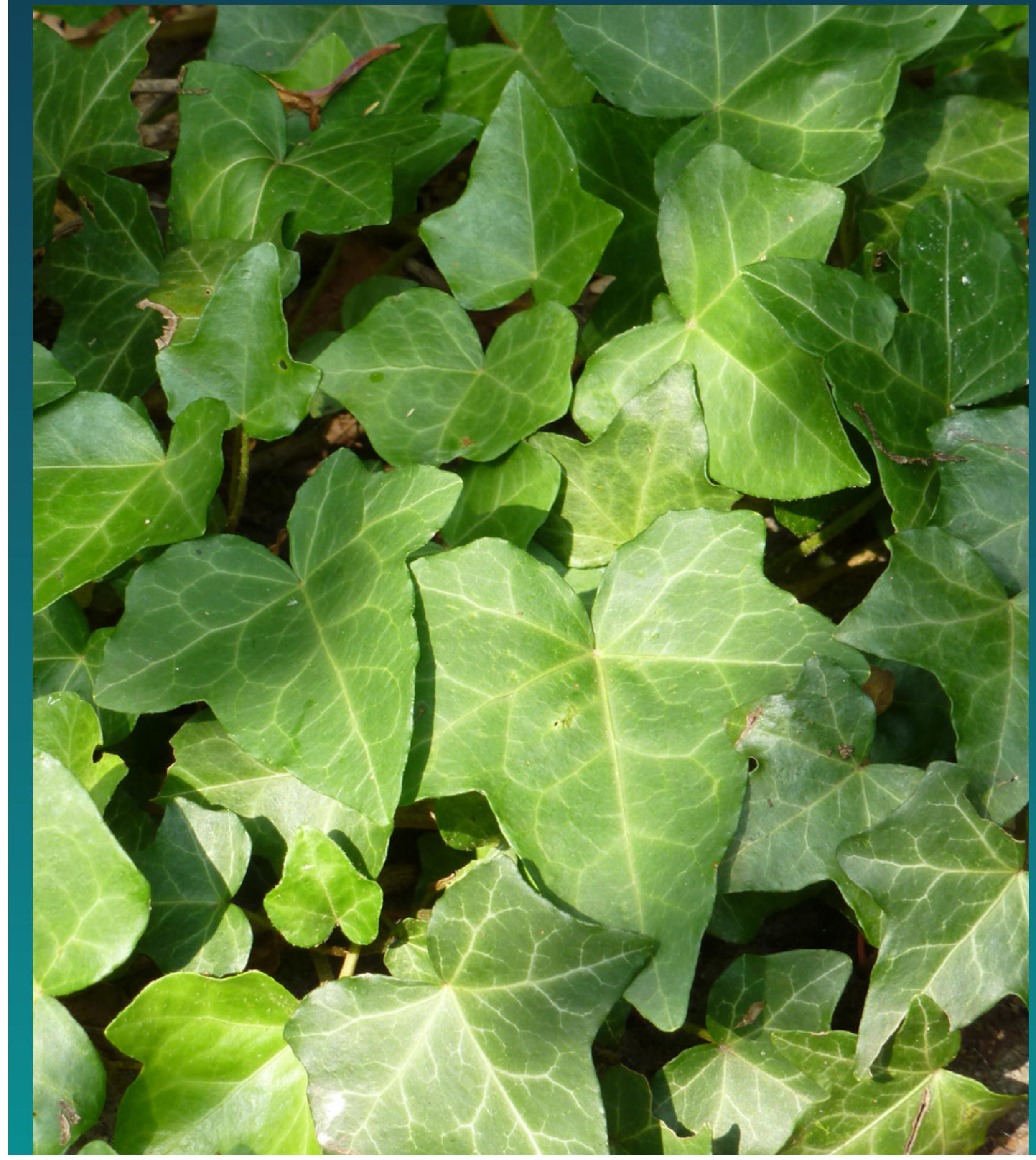

[1]

IVY [1]
is probably the best known of all evergreen climbing plants. As a self-clinging climber with adhesive aerial roots, ivy can scramble to an average height of up to 30 meters.

VIRGINIA CREEPER [2]
and its cousin Boston ivy spread rapidly and can reach heights of around 15 to 20 meters over time. Its brilliant scarlet leaf color in fall is particularly attractive.

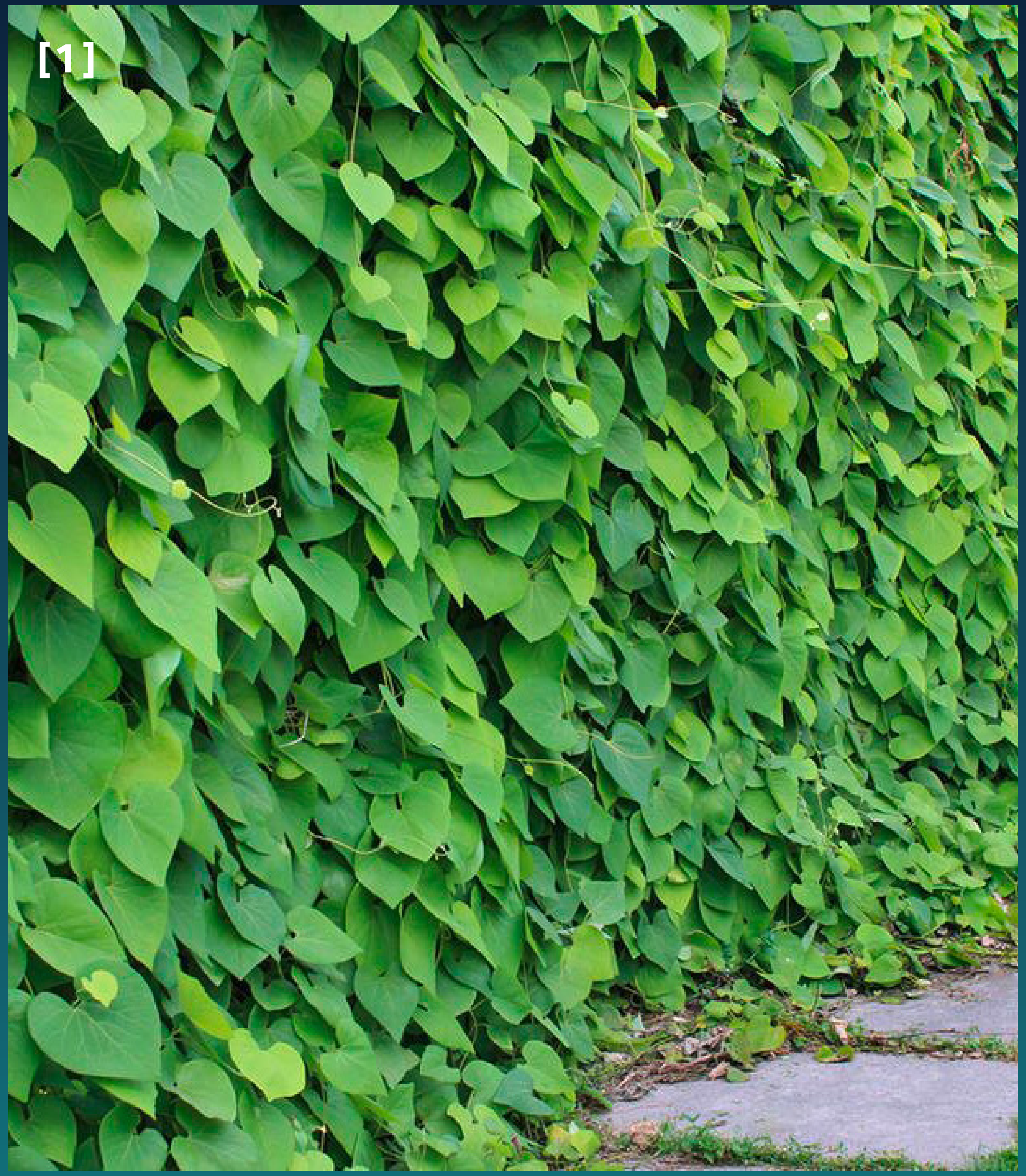
RUSSIAN VINE [3]
is a particularly fast-growing and undemanding climber with striking white flower panicles between July and September.

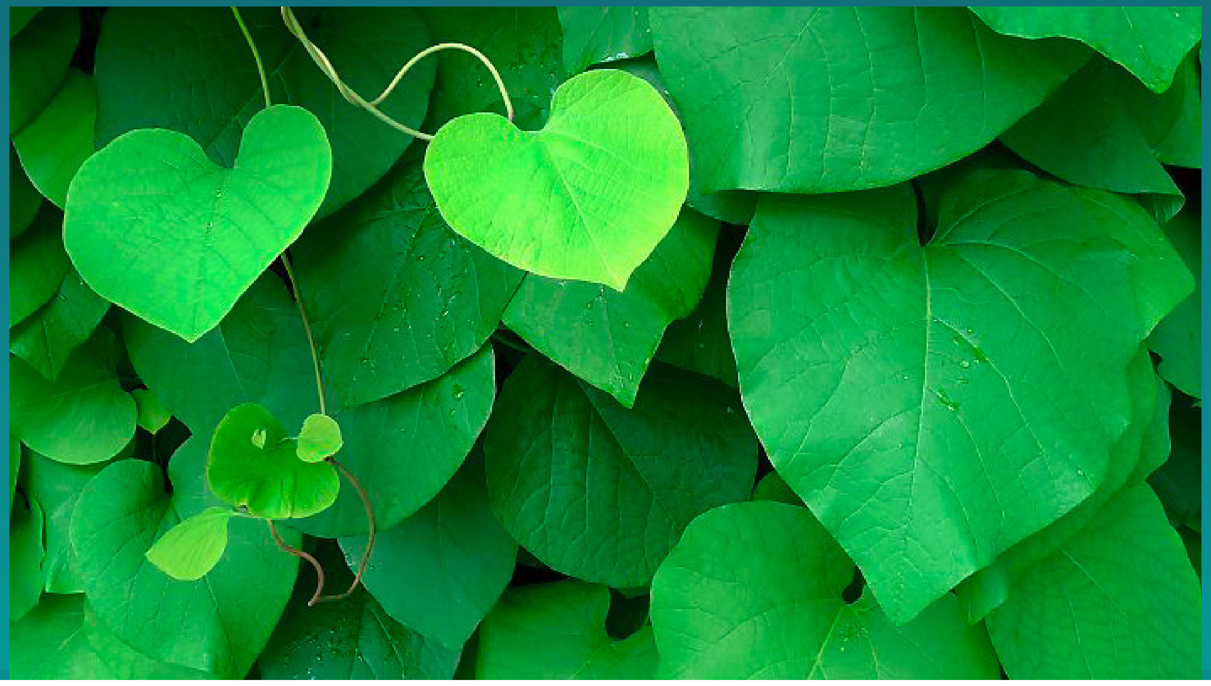

[2]

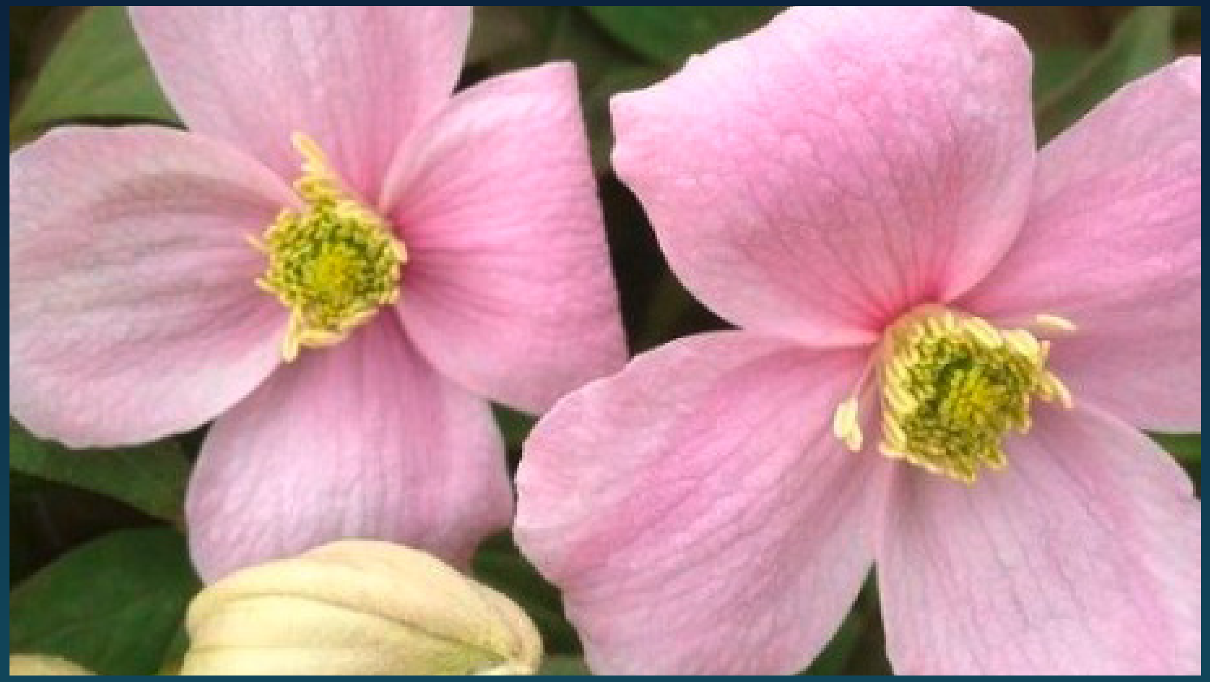


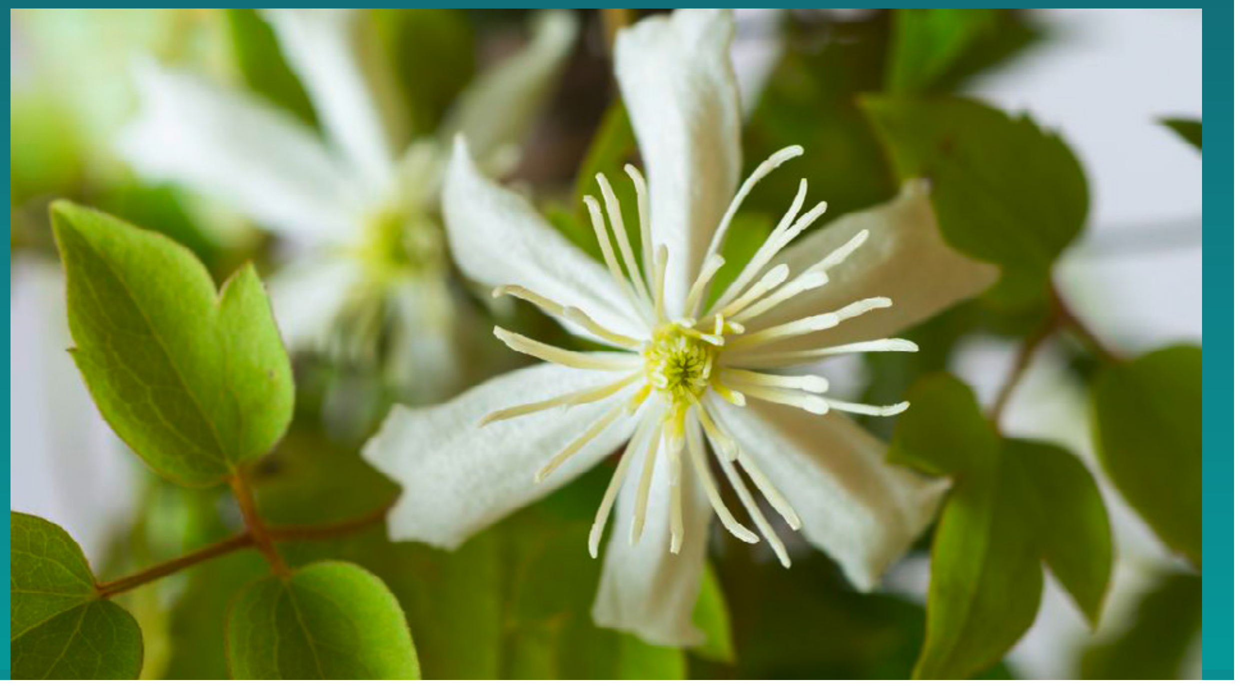

[3]

GREEN FACADES ON ALL PARKING GARAGES
PLANTING WITH CLIMBERS









DUTCHMAN'S PIPE [1]
is a vigorous twining vine that can reach heights ranging from 10 to 20 meters. It is also hardy with excellent heat resistance, is well suited to urban environments, and is a good source of food for insects.

CLEMATIS [2]
can also grow up to 10 to 20 meters. Its attractive and decorative flowers with four large pink petals appear from May to June.

OLD MAN'S BEARD [3]
is known as the wild relative of garden clematis species and is found growing in our native wood-lands. It is extremely tough and covered in a pro-fusion of small creamy-white flowers when in bloom.

GREEN ROOFS ON ALL OFFICE BUILDINGS

OVERVIEW

GREEN ROOFS have **many environmental, but also structural benefits**, as they also provide extra insulation and are therefore able to compensate for significant temperature fluctuations both on and inside the building. At the same time, green roofs reduce the run-off coefficient and help retain some of the accruing rainwater. Roofs are constructed as rainwater-retaining surfaces. Any collected rainwater gradually evaporates from the substrate as it becomes saturated with moisture, and from the leaf surfaces of the plants. In the event of heavy rain, water runs off the roof surface gradually to prevent flooding. As a result, water, a natural resource in its own right, is recycled as part of the natural water cycle rather than being discharged into the sewage system.

The cooling effects of evaporation also have a positive impact on the microclimate, especially on hot summer days.

Extensive green roofs on the buildings at Siemens Campus Erlangen are created using a single-layer technique involving a volcanic lava substrate which is suitable for use with the photovoltaic systems fitted to the roofs. The substrate installation height is at least 8 to 10 cm, but the thickness of the layer structure depends on the roofs' individual static load-bearing capacity.

GREEN ROOFS ON ALL OFFICE BUILDINGS
INTENSIVE AND EXTENSIVE

GREEN COURTYARDS
BUILDING COURTYARDS

Each courtyard in the office buildings is planted with one or two trees, individual shrubs, and groundcover plants. They are surrounded by a six-meter wide paved surface to allow the facade to be cleaned when necessary. Seating structures can be included in the courtyards at a later date (see picture below) to make them an even more pleasant place to linger.

More trees can also be included in suitable locations to enhance the courtyards further down the line.

GREEN COURTYARDS
BUILDING COURTYARDS

In some cases, the paved areas in the courtyards will be linked by diagonal paths and seating structures provided around the edges. The polygonal green spaces will be overplanted with deciduous trees to provide an inviting overall impression along with individual shrubs.

The basic structure of the underplanting consists of a compact flat planting profile with evergreen groundcover shrubs or grasses. Flowering perennials and bulbs may emerge from the gaps between these plants.

Sample planting scheme for the reception building courtyard:

Individual shrubs
- *Euonymus alatus 'Compactus'* *(Compact winged spindle)*

Groundcover shrubs
- *Ilex meserveae 'Blue Prince' (Blue holly 'Blue prince')*
- *Lonicera nitida 'Maigrün'* *(Shrubby honeysuckle, woodbine 'Maigrün')*

Perennials and grasses
- *Euphorbia martinii (Spurge)*
- *Thalictrum hybrid 'Elin' (Meadow rue)*
- *Veronicastrum virginicum 'Lavendelturm' (Culver's root)*

Bulbs
- *Allium 'Mount Everest' (Ornamental onion)*

PLANTING STRIPS AROUND BUILDING FACADES
OVERVIEW

Planting strips around building facades

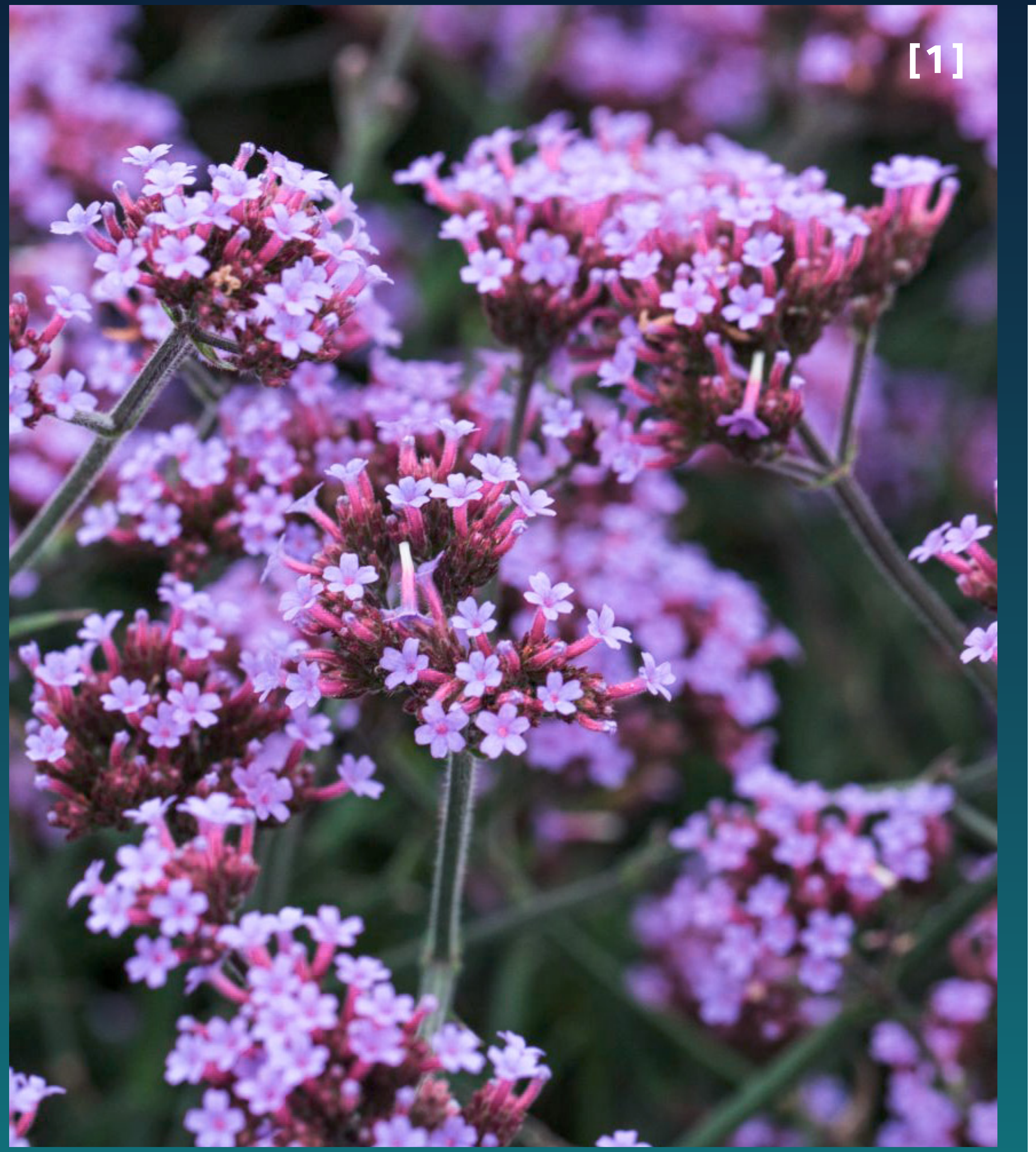
Some of the building facades at Siemens Campus Erlangen are also framed by green planting strips. The quickest and simplest means of creating these strips is by mixed planting schemes to form a diverse and dynamic perennial community. The permanent framework of this kind of planting scheme is established by using larger, long-lived perennials and grasses. Fast-growing filler plants provide useful flowers and cover any gaps in the first few years. The species used are geared to the aspect of each facade and have a range of aesthetic qualities:

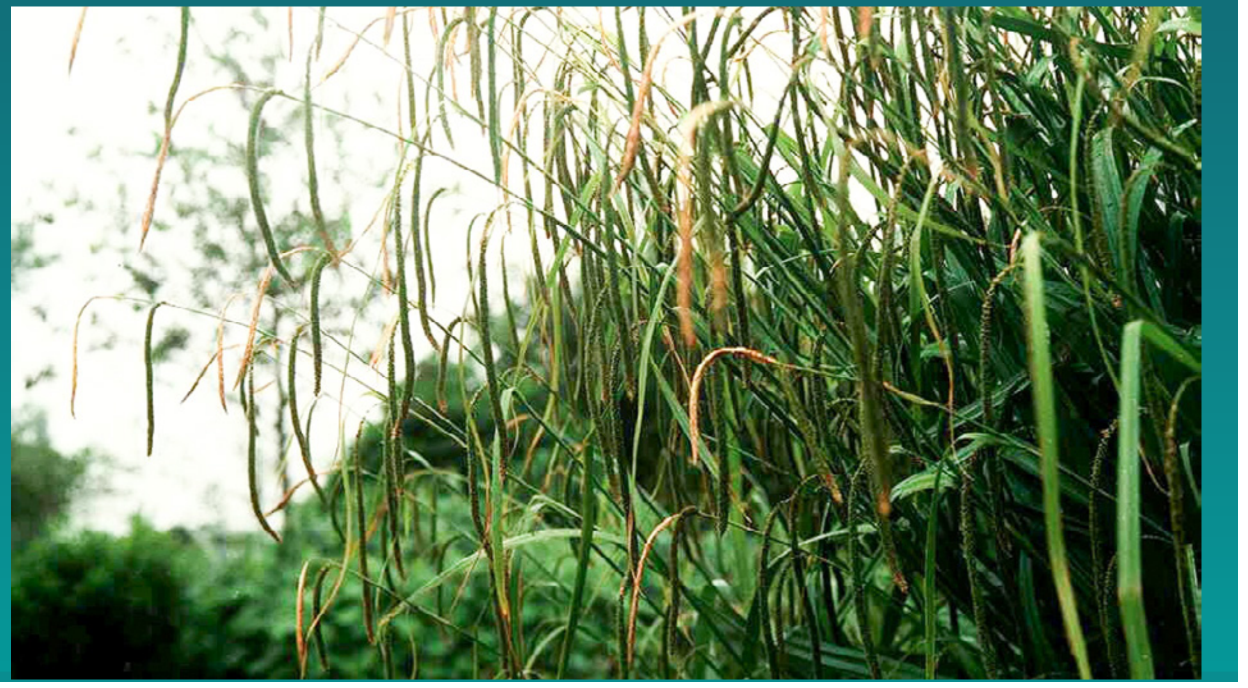
North side of buildings – shade
- *Geranium macrorrhizum (Balkan cranesbill)*
- *Carex pendula (Pendulous sedge)*
- *Deschampsia cespitosa 'Bronzeschleier' (Tufted hair grass)*

East side of buildings – sun/semi-shade
- *Verbena bonariensis (Purpletop vervain)*
- *Sedum telephium 'Herbstfreude' (Stonecrop)*
- *Bistorta amplexicaule 'Atropurpureum' (Red bistort)*
- *Deschampsia cespitosa 'Goldschleier' (Tufted hair grass)*

West side of buildings – semi-shade
- *Anemone hupehensis 'September Charm' (Japanese anemone)*
- *Bistorta amplexicaulis 'Atropurpureum' (Red bistort)*
- *Deschampsia cespitosa 'Bronzeschleier' (Tufted hair grass)*

BUILDING FACADES
PLANTING

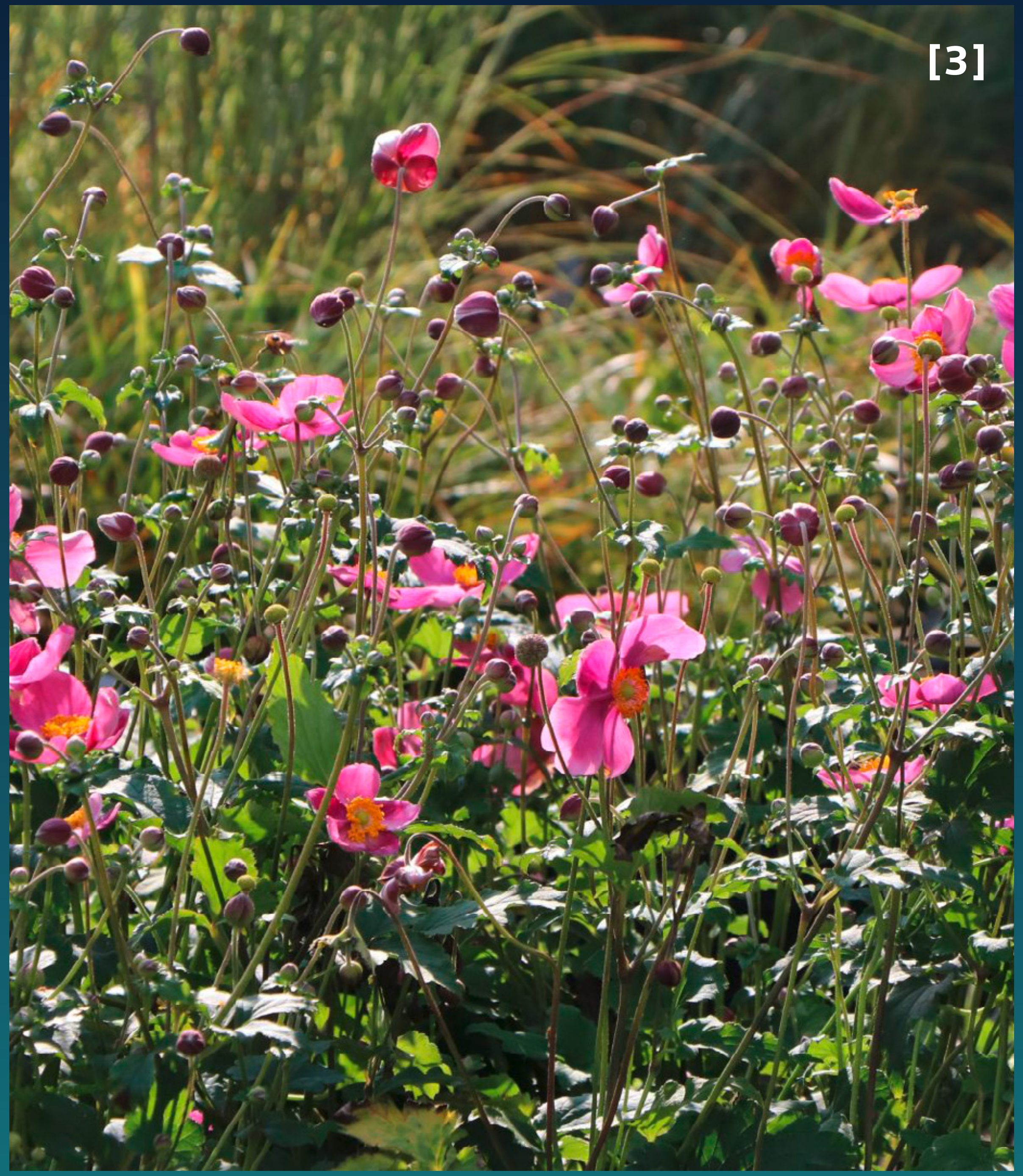




PURPLETOP VERVAIN [1]
is an annual or biennial plant which is hardy under certain conditions but propagates by self-sown seedlings. The purple flower heads make the plant a favorite food source for bees.

RED BISTORT [2]
is hardy, not particularly fussy where it grows, and has tall upright stalks bearing long red flower spikes at their tips. It spreads by means of underground rhizomes.

JAPANESE ANEMONE [3]
is a favorite late-blooming perennial guaranteeing plentiful fall color thanks to its large pink blooms. It is hardy and also attractive to bees.



ACCESS AREAS FOR FIRE VEHICLES
OVERVIEW

Access areas for fire vehicles

GRASS PAVERS TO PROVIDE A POROUS YET REINFORCED SURFACE

Emergency access routes at Siemens Campus Erlangen are laid with grass pavers. This reduces the amount of impermeable surfaces and contributes to an overall green impression.

Proposed species for sowing paver joints:

- *Achillea millefolium (Common yarrow)*
- *Festuca rubra commutata 'Livista' (Chewing's fescue)*
- *Festuca rubra 'Rubra Maxima' (Creeping red fescue)*
- *Lolium perenne 'Esquire' (Perennial ryegrass)*
- *Lolium perenne 'Troya' (Perennial ryegrass)*
- *Poa annua 'Anna' (Annual bluegrass)*
- *Poa pratensis 'Miracle' (Kentucky bluegrass)*

PROTECTED POND HABITAT
OASIS HABITAT

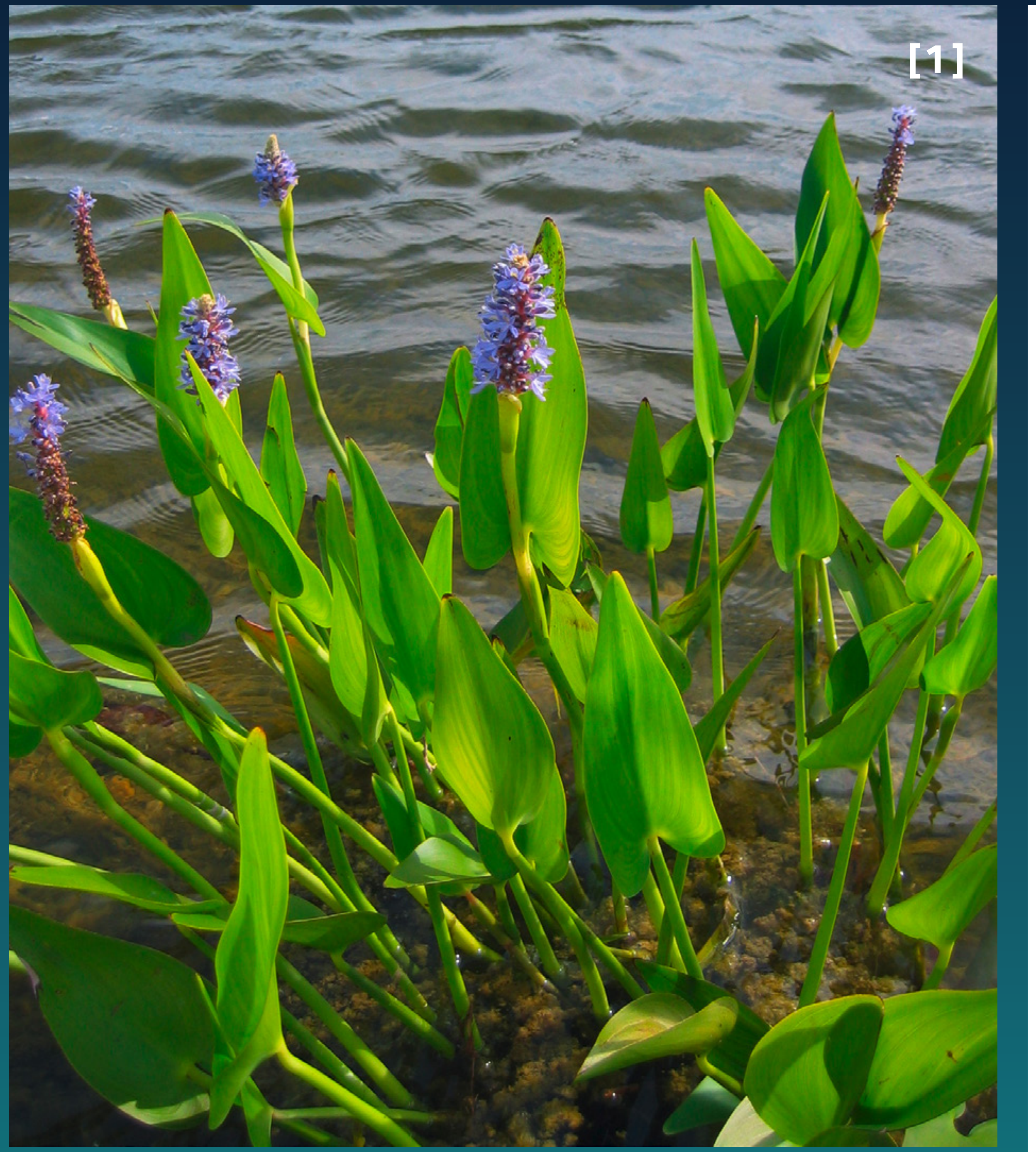
PROTECTED OASIS

The pond on Siemens Promenade is the central protected feature at Siemens Campus Erlangen along with the two existing buildings. During construction work, the pond area will be filled in, asphalted over, and used as a storage area for construction equipment. Once building work comes to an end, the original architectural pond will revert to being a green oasis at the heart of the new Siemens Campus. It will retain its protected rectangular shape but will also be surrounded by bog plants and aquatic species. The intention is to have diagonal walkways to make the pond surface more accessible and enjoyable.

Suitable plants:

- *Pontederia cordata (Pickerel weed)*
- *Nymphaea alba (European white waterlily)*
- *Iris laevigata (Water iris)*
- *Hippuris vulgaris (Mare's-tail)*
- *Butomus umbellatus (Flowering rush)*
- *Typha latifolia (Bulrush)*
- *Menyanthes trifoliata (Bogbean)*

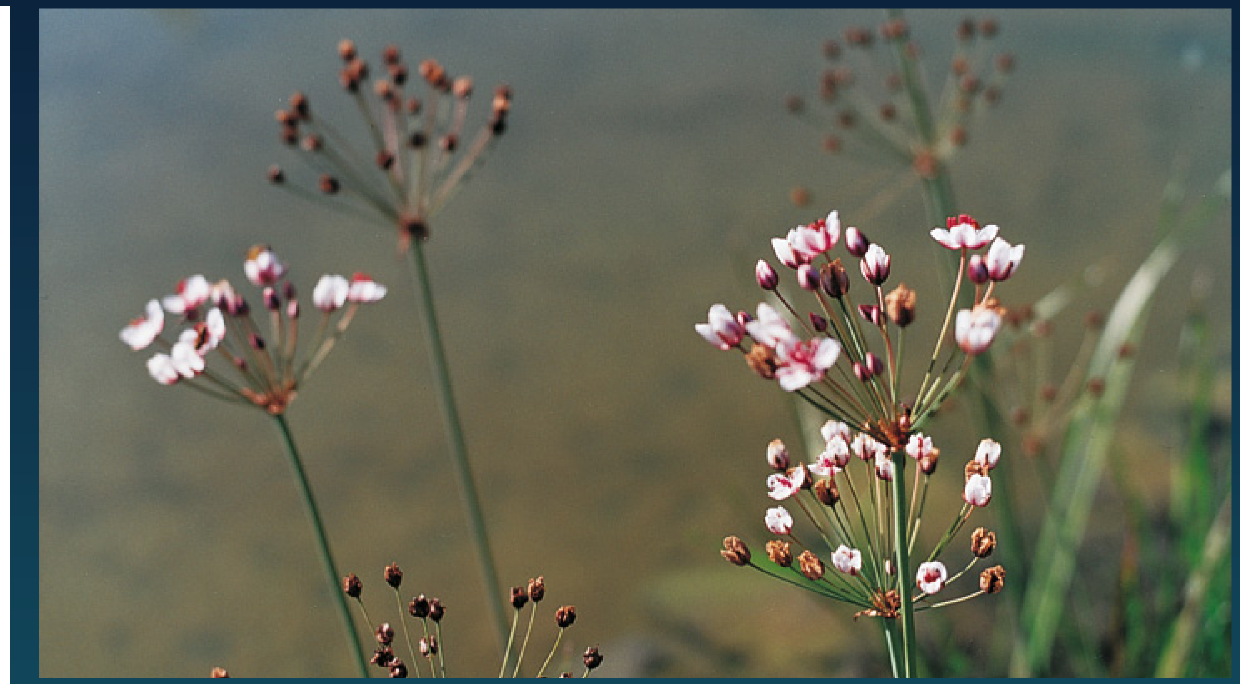
PROTECTED POND HABITAT
PLANTING

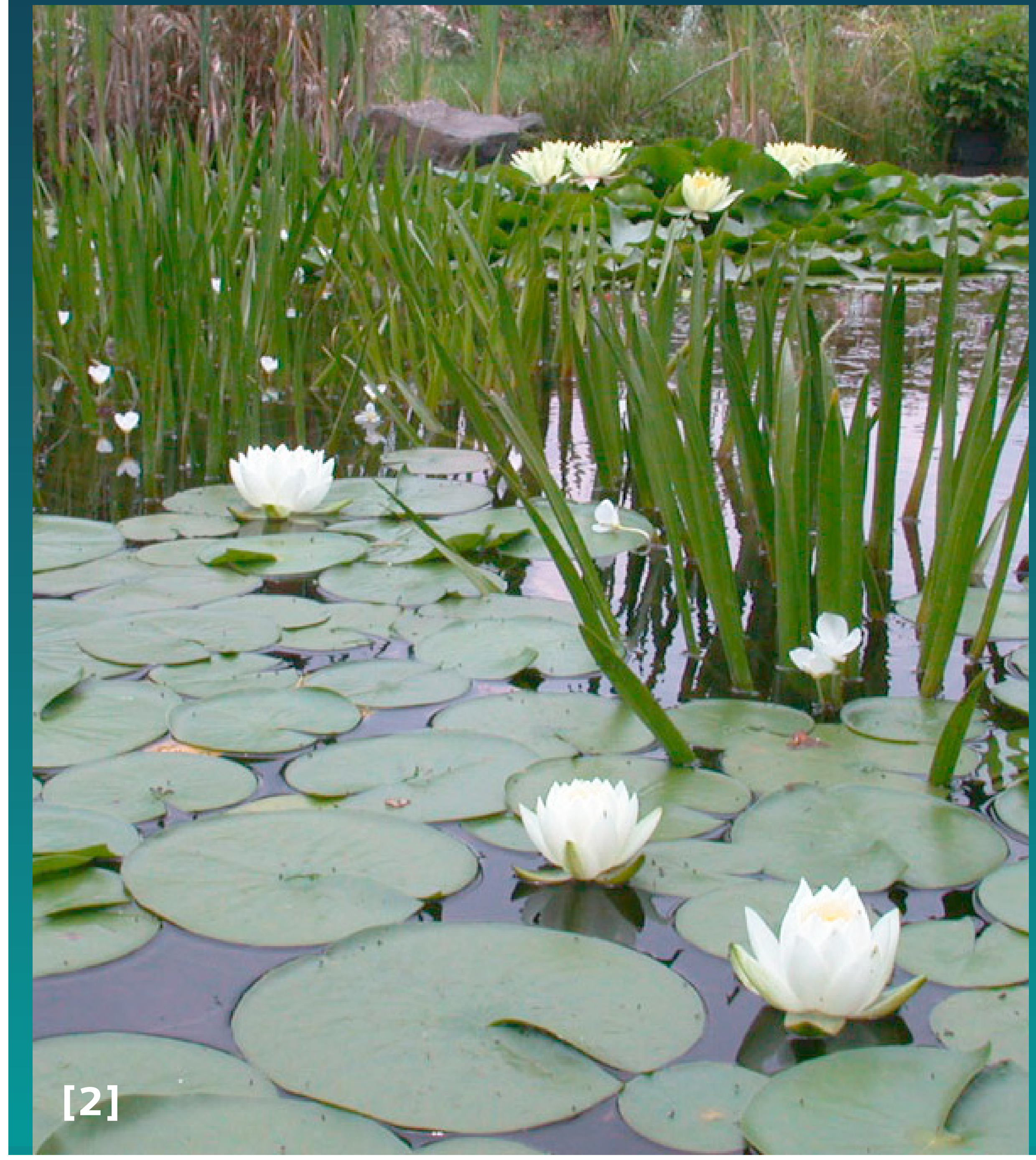

[1]

PICKEREL WEED [1]
is an attractive and robust pond plant with a long flowering season. Its decorative purple flower spikes brighten up the shallow margins of the pond.

EUROPEAN WATERLILY [2]
is particularly well suited to larger bodies of water on account of its vigorous habit and the amount of space it needs.

WATER IRIS [3]
removes excess nutrients from the water and acts as an oxygenating plant, improving water quality in the process.




[2]


[3]

DIVERSITY OF FAUNA AND FLORA

BEEHIVES AND INSECT HOTELS

NEW HABITAT FOR INSECTS

To increase biodiversity, the campus will have special nesting opportunities for a variety of insect and animal species. These include **beehives and insect hotels**.

The first beehives are already in situ on the railway embankment. More hives are planned for the small woodland area to the north-east of the orchard meadow (see model on the left). The hive's busy bees will be able to find everything they need to make honey in the immediate vicinity of their new accommodation. The diversity of the proposed planting scheme is an important factor in this aspect of the project.

More than thirty insect hotels are also planned on the campus site in addition to the beehives themselves (see plan). They will provide a habitat for a wide range of insect species and make a positive contribution to preserving our insects.

DIVERSITY OF FAUNA AND FLORA
NESTING BOXES


Black redstart


Common pipistrelle


House sparrow

FOR BIRDS AND BATS

As well as providing insect habitats, the campus will also offer existing and new nesting boxes for a range of bird and bat species.

New nesting boxes for bats and birds that nest in buildings:
Wherever possible, suitable nesting boxes will be provided on the upper facade region or on the roof structures of all new buildings to maintain the populations of bird (such as black redstarts and house sparrows) and bat species (common pipistrelle) that live in crevices in buildings. The actual design, form, and numbers of these nesting boxes will depend on the species and have been agreed with the relevant authorities and experts to make sure every detail is correct.

Replacing nests and breeding cavities:
Before the necessary clearing work could begin, ten bird nesting boxes were positioned on the trees to be retained within the scope of the development plan or in adjacent areas. These were intended for species such as the common redstart, spotted flycatcher, and tree sparrow. Thirty bat boxes were also provided, including ten cavity boxes and twenty crevice boxes, intended for the common pipistrelle.

DIVERSITY OF FAUNA AND FLORA
DRY-STONE WALLS

Natural dry-stone walls

Wall lizard

Sand lizard

Fire salamander

FOR LIZARDS AND AMPHIBIANS

Dry-stone walls are a welcome habitat for many animal species with their numerous nooks and crannies. They offer ample spaces for creatures to take cover, lay eggs, and overwinter in an environment with plentiful food sources.

In other words, they represent **a valuable habitat** with optimum conditions, not only for certain insects, but particularly for many reptiles and amphibians. The intention is therefore to construct low dry-stone walls of varying lengths in a range of locations along the railway line, behind the parking garages, in water-bound areas, and, in some cases, along pathways in the vicinity of the green East-West corridor. Compared to other areas of the campus, these sites are particularly suitable because they have relatively sparse tree cover and any inhabitants will be subject to minimal disruption from passers-by.

Sunny meadow areas provide ideal conditions for cold-blooded animals like lizards. As their body temperature is dependent on the surrounding environment, one of their favorite pastimes is a spot of sunbathing, basking on sun-warmed rocks. Dry-stone walls therefore provide these species with countless opportunities to find their own little patch of sunlight.

DEADWOOD MANAGEMENT
FOOD AND NESTING OPPORTUNITIES

Deadwood collection site

DEADWOOD IS FULL OF LIFE

'Deadwood' may sound like a waste product with absolutely no value. It has long been regarded as such and systematically removed from woodland and forests. It is often used as firewood or cleared simply to keep woodland 'tidy'. In times gone by, it was generally thought that a well-managed wood should look neat and tidy.

The various types of deadwood serve a wide range of purposes in woodland. Deadwood offers an **ideal habitat** for any number of animal, plant and fungi species, playing an important role in ensuring diversity of flora and fauna in the process. It acts as a food source, breeding site, and even as a resting place or safe haven.

Many insects feed on deadwood during their larval stage, for example. Beetle larvae in particular are dependent on deadwood because they are unable to digest fresh wood. These larvae in turn represent an important food source for birds, amphibians, and other animal species. Insects also use deadwood as a prime habitat. If you look closely, you will find tunnels burrowed by ants and other insect species in dead tree trunks.

Old cavities or hollows in dead trees also offer ideal nesting opportunities, to say nothing of perching places or breeding sites, for birds. They can even become hunting habitats or singing vantage points, leading to further gains in the diversity of flora and fauna.

The intention is to collect all deadwood accruing on the site and deposit it in two areas designated for this purpose (see site plan, left).

RETAINING EXISTING TREES
OVERVIEW

OLD AND NEW

The tree species planted on the campus include **local tree varieties** and existing trees (pines and oaks). Other key species will also be introduced. The design brief seeks to **maintain the existing habitat and tree stocks wherever possible**. These existing structures offer considerable potential for Siemens Campus Erlangen and will therefore be incorporated in the design of new plantings wherever this is feasible.

Developing **new, interlinked green spaces and habitats** will provide replacements for any trees lost as a result of the construction works, reinforcing the environmental credentials of the area as a whole.

MAINTENANCE CONCEPT FOR GREEN SPACES
KEY MEASURES

1. Newly planted trees:
Newly planted trees are only cut back as required (dead or crossing branches), but otherwise fertilized once a year and watered ten times a year as part of the development and maintenance care program.

2. Existing trees:
Existing trees in green spaces will be thinned out as required to avoid posing a hazard to traffic. Wherever possible and appropriate, any deadwood in the trees will be left in situ for use by insects, bats, and birds. Existing trees alongside roads and pathways must be cut back at regular intervals to avoid posing any danger to traffic. They must observe a height restriction of 4.5 meters.

3. Climbing plants on parking garages:
Climbing plants are maintained at regular intervals. Loose shoots and tendrils are secured to the trelliswork – this is particularly important in the initial stages of growth. Later, any dead parts of the plant are cut back and the necessary ventilation cross-section left clear. To prevent damage to building structures, regular checks are carried out to assess whether sensitive parts of the facade and the roof drainage system (downpipes) are becoming overgrown with creeping plants.

4. Planting areas (planting strips around office buildings):
As part of development and maintenance care, dry and dead parts of plants will be removed over the course of approximately ten maintenance visits a year, during which the soil will also be watered and worked. Fertilizer will be applied annually.

5. Hedging in shared spaces and hedges around seating areas in the green corridor (hornbeam):
Hedges will be clipped twice a year as part of development and maintenance care and watered approximately 10 times a year, with fertilizer applied once a year.

6. Wildflower meadows (dry and damp rough grassland):
These areas are only mowed twice a year to create a species-rich meadow made up of grasses and wildflowers. Any clippings are removed to further deplete the nutrient levels in these areas. Recommended mowing times are June to July before the peak flowering period for grasses and in late summer after flowering (around October). This encourages the grasses and flowers to self-seed and prevents shrubs or trees growing too tall. Fertilizer is not required. Wildflowers that also germinate in these areas, even though they are not part of the original seed mixture (see species list), may further enhance the diversity of flora. Only invasive species (e.g. giant hogweed, Himalayan balsam, Canadian goldenrod, Japanese knotweed, etc.) or native species like stinging nettles or blackberries, which soon take over, need to be removed as soon as possible.

7. Grass areas (functional turf) along the access roads (Halskestrasse, Schuckertstrasse, parking garage access roads):
Functional turf areas are mowed eight times a year and fertilized once a year. Grass areas will be watered as required, approximately eight to ten times a year.

8. Grass areas in the vicinity of fire vehicle access areas (grass pavers):
The grass in the joints between pavers is mowed eight times a year and fertilized once a year.

9. Pond surface:
Any dead shoots from reed plants are cut back at the end of winter. Leaves from the surrounding trees will be scooped out as required to guarantee good water quality. Any sludge at the bottom of the pond is also removed on a regular basis to reduce the level of nutrients. There are currently no plans to have fish in the pond. As the pond doesn't have a natural water supply, a circulation pump is recommended.

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