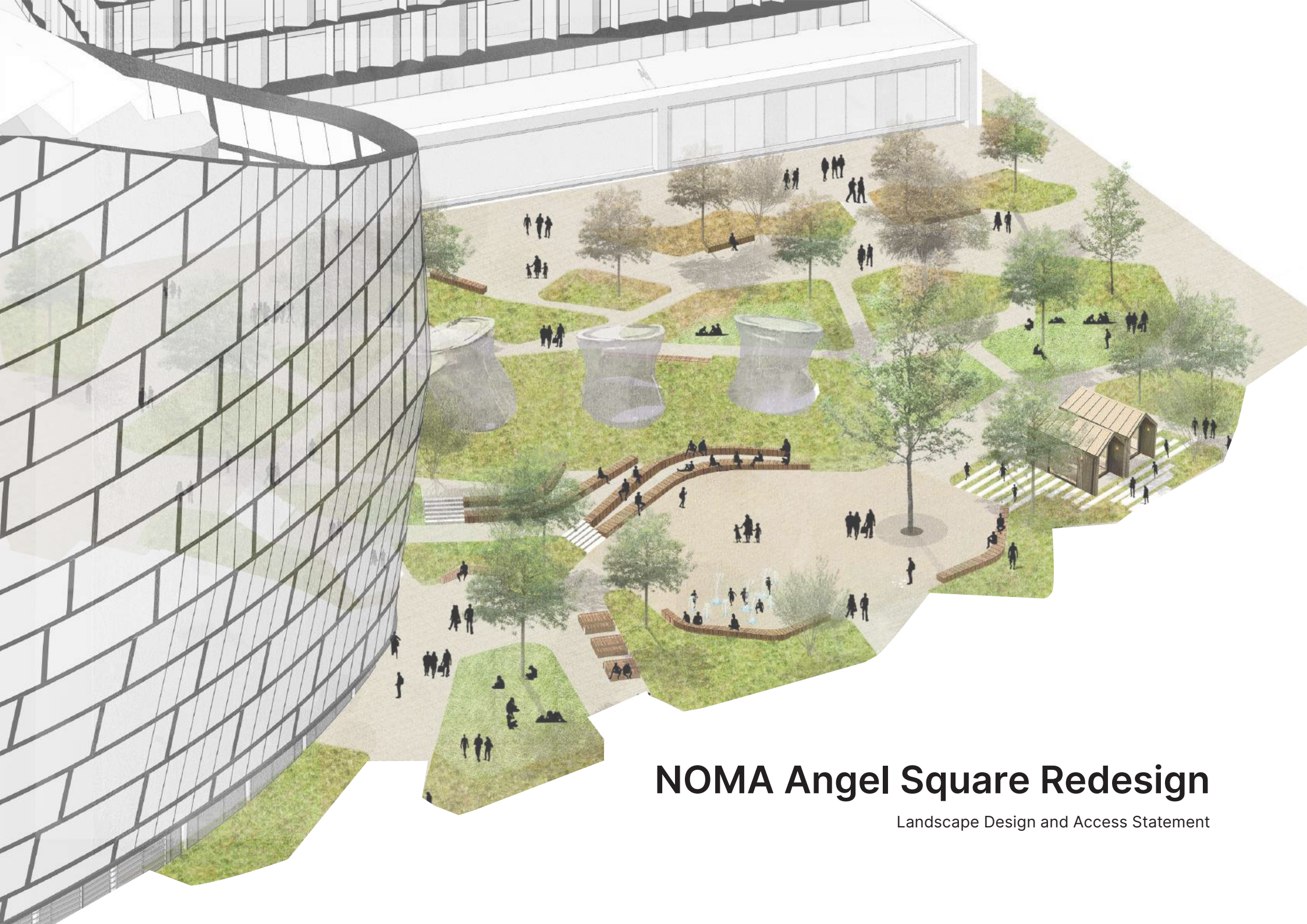




NOMA Angel Square Redesign

Landscape Design and Access Statement

Document Control

<u>File Name</u>	<u>Prepared by</u>	<u>Checked by</u>
2962-ID-011-01-Design Access Statement	EKH	SAB

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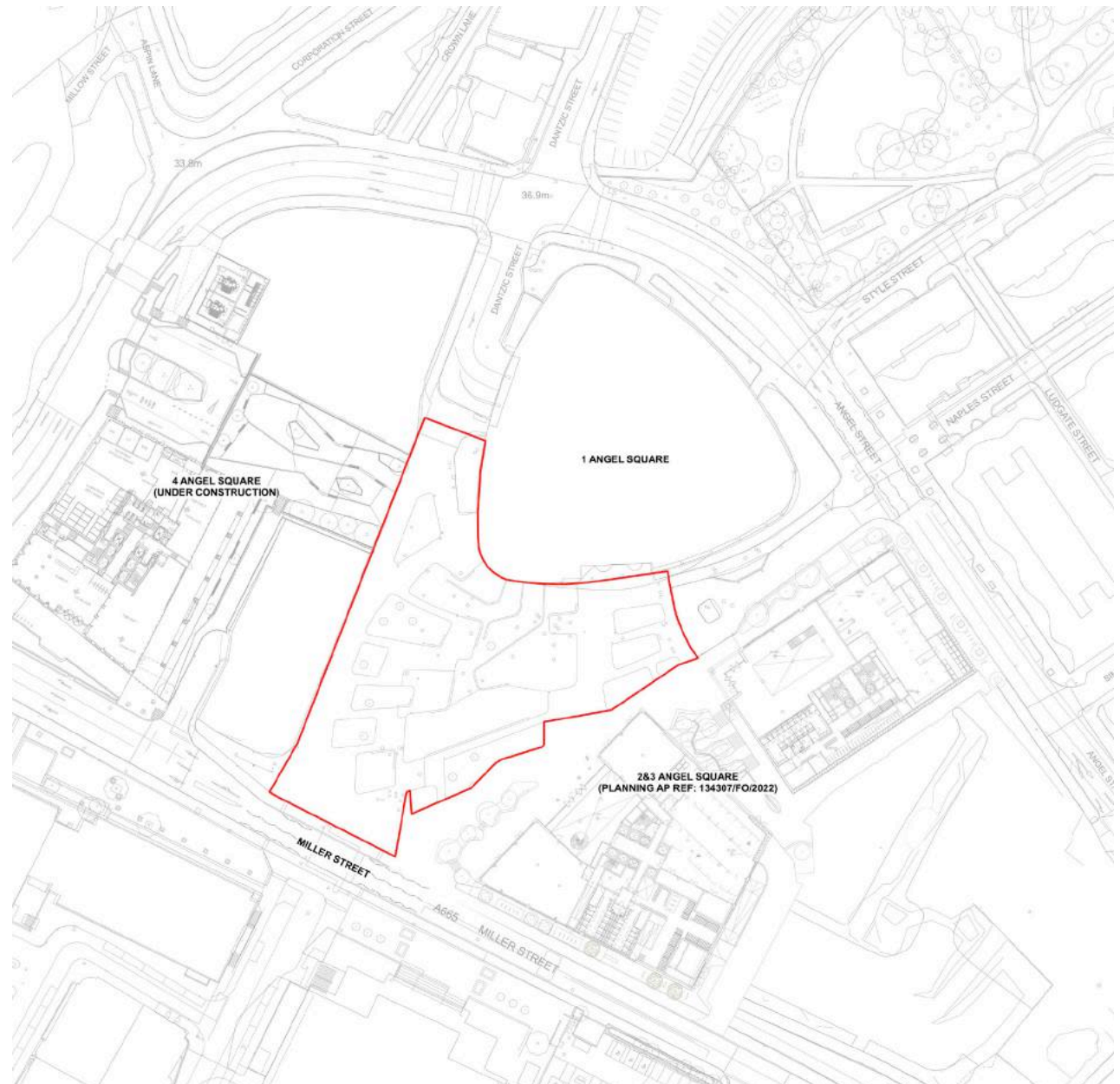
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Introduction

This Design and Access Statement has been prepared by Planit-IE on behalf of NOMA (GP) Ltd to support the full planning application public realm improvements to Angel Square, NOMA.

It provides an overview of the process and approach to the public realm design improvements to Angel Square during RIBA Stage 2.

Planit-IE has worked closely with the other members of the design and client team to establish the baseline conditions, challenges and opportunities within the public realm. The result of that collaboration has directly influenced the design rationale, vision and public realm design proposals found within this report.



Redline boundary



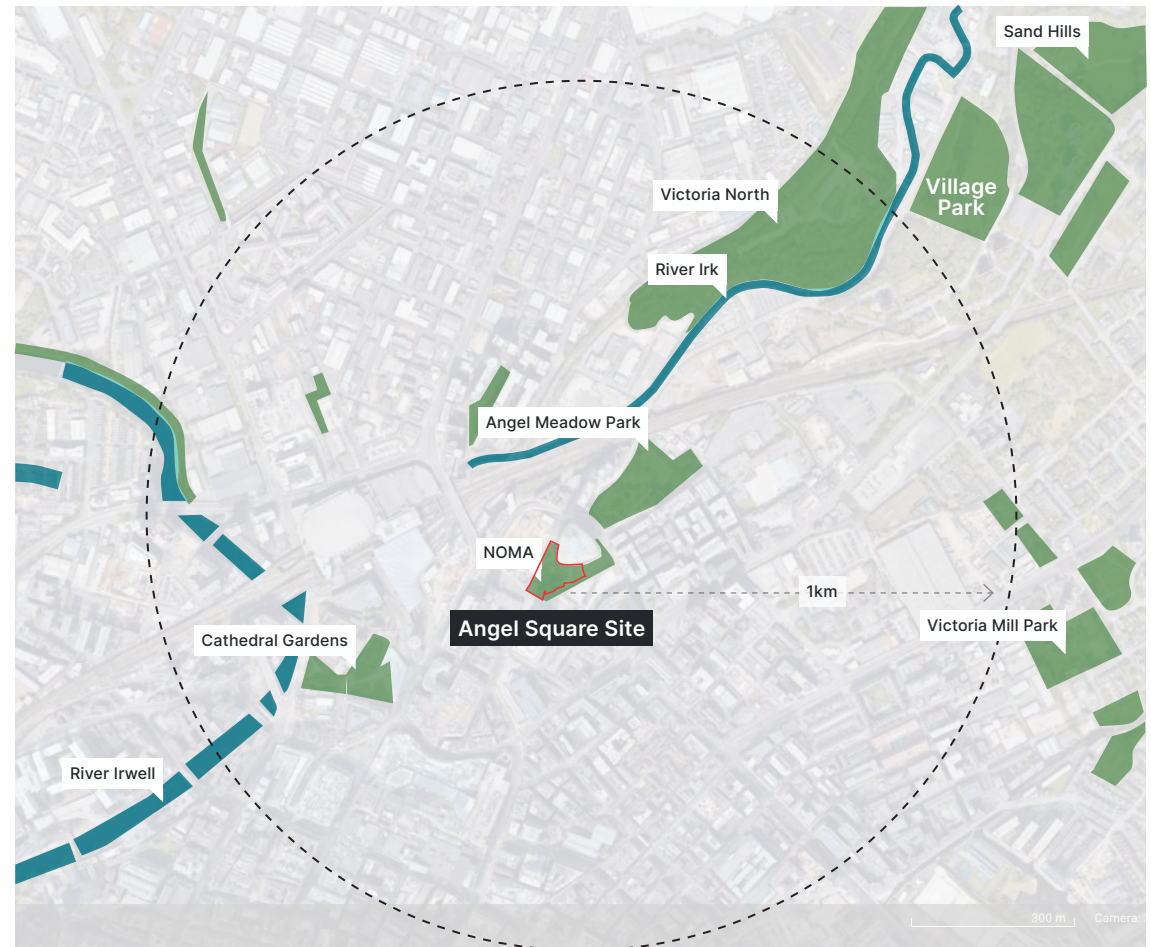
Existing site plan

The Wider Green Network

NOMA is a gateway into the city from the north and sits adjacent to Angel Meadow Park which, combined with Angel Square, provides important greenspace to the local community. There is an opportunity for Angel Square to contribute further to the green character in this part of the city, and to enhance connections through to the city centre.

The site location presents a fantastic opportunity to provide better connections both physically and functionally between the city centre and the expanding neighbourhoods to the northeast along the Irk Valley and Victoria North (formerly known as the Northern Gateway).

There are also close links to nearby transport hubs, green space and heritage sites. Within a 1km radius of the site there are a series of green spaces and parks, adding to the series of interconnected greenspaces in line with Manchester City Council's Green Infrastructure Policy EN 9.



Wider Green Network Diagram



City Context

NOMA sits at a strategically important position in Manchester and the approach to the city centre from the Irk Valley, close to the rapidly regenerating northern city centre districts and the proposed Northern Gateway masterplan, now renamed Victoria North.

There are high quality residential-led developments currently on site close by, at Victoria Riverside and Meadowside, as well as future proposed development sites to the north and east.



City Context Diagram



Existing Site Context

The adjacent aerial image shows the current site as it appears today. The site is an existing area of public realm with hardstanding and planting split across two levels.

The perimeter of the site is bound by a low level timber post and rail fence to the east, 1 Angel Square to the north and the future site of 2&3 Angel Square to the south east (refer to diagram below).

Immediately to the north of the square is Angel Meadow park and the Meadowside development plots that surround it. The park has undergone a series of improvement works over the last ten years.

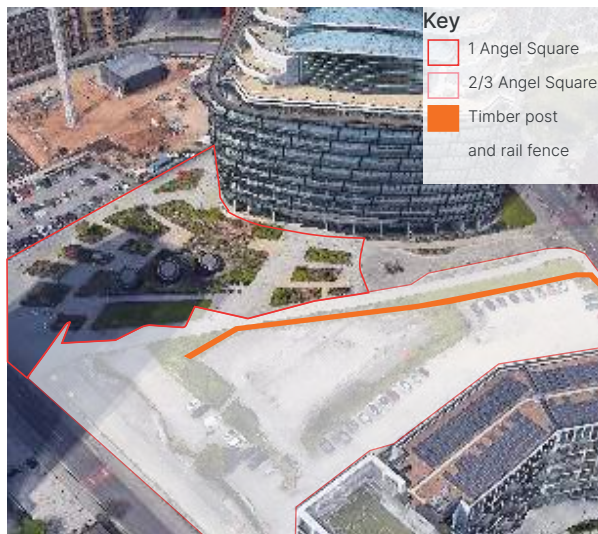


Diagram showing boundaries of 1 Angel Square and 2/3 Angel Square



Heritage Assets

The NOMA Angel Square Site itself is not located within a conservation area, nor are there listed buildings within the red line boundary. However, the Site is located within close proximity to several conservation areas including Shudehill, Cathedral, Smithfield and Ancoats Conservation Areas, and is located close to a number of listed buildings, principally associated with the NOMA historic estate.

A Written Scheme of Investigation (WSI) for an archaeological evaluation has been prepared by Salford Archaeology (Miller 2019). In summary, archaeological remains of workers' housing and industrial buildings, particularly cellar dwellings, may survive in-situ within the footprint of the proposed development site.

Any archaeological remains that do survive may be removed during the course of the public realm works and thus a programme of archaeological monitoring during any intrusive groundworks will be required.

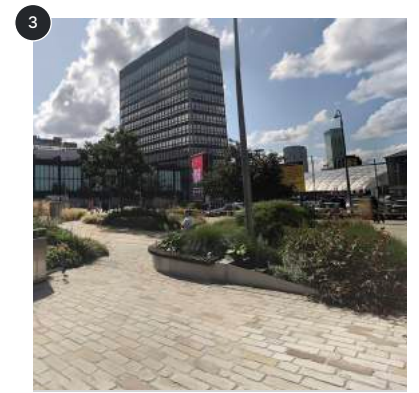
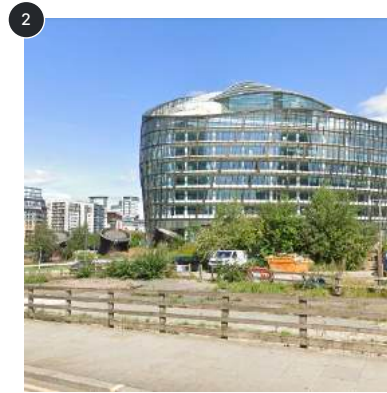
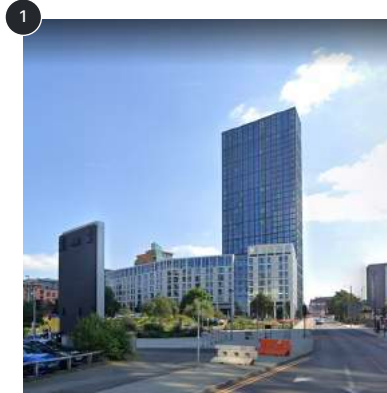
The location of the listed buildings within 300m of the Site are shown on the diagram on this page.

Key	
	Grade II Listed Building
	Cathedral Conservation Area
	Shudehill Conservation Area
	Smithfield Conservation Area
	Site Boundary

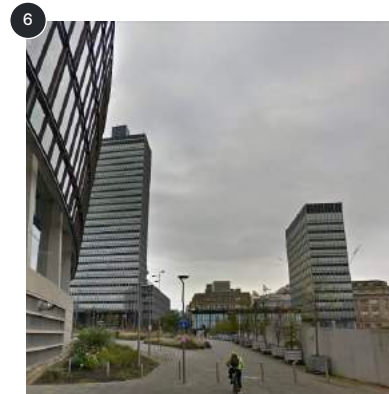
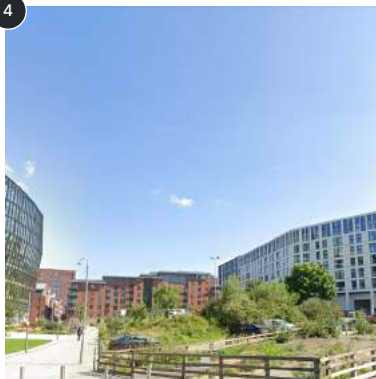
	1 New Century House		10 Smithfield Market Hall, Grade II listed
	2 Old Bank		11 Holyoake House, Grade II listed
	3 New Century Hall		12 29 Swan Street, Grade II listed
	4 Redfern		13 City Building
	5 The Tower (CIS)		14 NO.29 Shudehill
	6 Hanover		15 No.46. Hare and Hounds Public House
	7 Dantzie		16 Charter Street Mission
	8 Federation		
	9 Cooperative Wholesale Society, Corporation Street		



Existing Site Photos



Location Plan



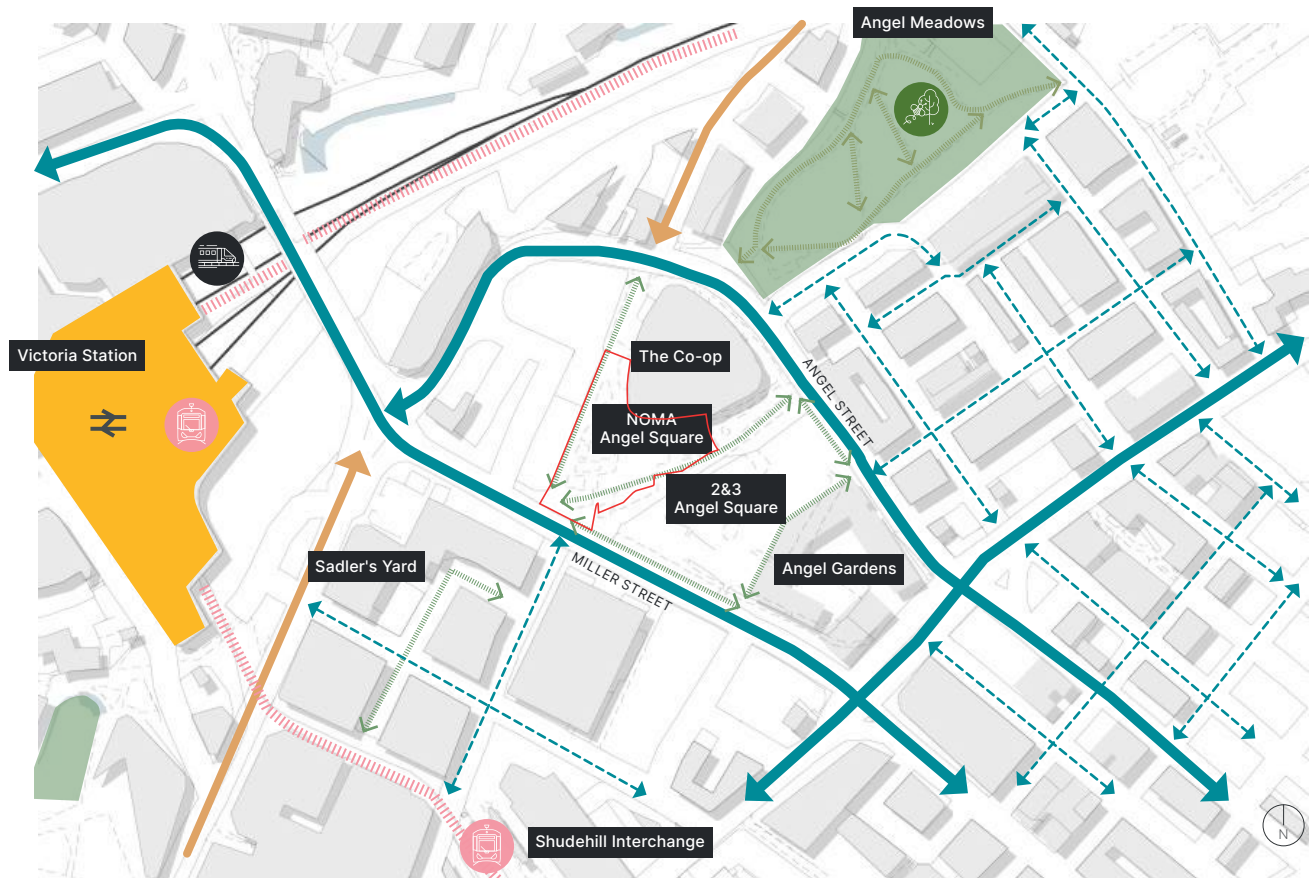
Existing Movement and Connections

The adjacent diagram highlights the existing movement and connections in and around the 2&3 Angel Square site including:

- Primary vehicle routes to Miller Street and Angel Street.
- The key pedestrian routes through NOMA connecting to the city retail core, including routes through Angel Square and along Thread Street.
- Site is highly accessible on foot and by public transport, and in close proximity of Manchester Victoria Station and Shudehill Interchange.
- Connections to the north through Angel Meadow Park and the adjacent residential neighbourhood.

Key

- Site Boundary
- Park
- Train Station
- ➡ Primary vehicle route
- ➡ Secondary route
- ↔ Local routes
- ➡ Pedestrian route
- ||||| Metrolink
- Trainline
- Metrolink stop



Map of existing movement and connections

Existing Site Ecology

The Ecological Survey and Assessment undertaken by ERAP provides the following summary of the existing site:

- The site comprises landscape planting, and area of amenity grassland and hard standing.
- The proposals will have no adverse effect on statutory or non-statutory designated sites for nature conservation.
- Only common and widespread plant species were found. None of the habitats present are representative of semi-natural habitat. The NVC communities present are typical of the geographical area and conditions present. No Priority Habitats are present.
- In terms of each habitat's importance in a geographical context, the landscape planting and amenity grassland are of 'local' importance as they contribute to the diversity of habitats within the local area. The hard standing is not considered to hold any importance in terms of its geographical context.
- The trees and shrubs are suitable for use by nesting bird species. Measures for the protection of nesting birds are presented at Section 5.2 of this report. No other protected species have been detected.
- The proposals will secure an opportunity to implement beneficial measures such as habitat creation that will safeguard habitats for wildlife such as birds and bats, with the aim of providing a net gain in biodiversity in accordance with the principles of the NPPF.
- It is concluded that the proposals are feasible and acceptable in accordance with ecological considerations and relevant planning policy. The proposed enhancements to the public realm areas will provide an opportunity to secure ecological enhancement for wildlife associated with urban areas..

The ERAP report concludes that the proposals are feasible and acceptable in accordance with ecological considerations and relevant planning policy. The proposed enhancements to the public realm areas will provide an opportunity to secure ecological enhancement for wildlife associated with urban areas.

The proposals will include recommendations from the report such as bee hotel locations and a mix of planting known to be of value for the attraction of wildlife including native species.

Key to Map Symbols

- Site boundary
- Broad-leaved trees
- Young trees and shrubs
- Amenity grassland
- Introduced shrubs and ornamental planting
- Bare ground and hard stand
- Individual buildings

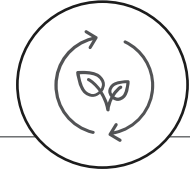


Phase 1 Vegetation and Habitat Map, extracted from Ecological Survey and Assessment produced by ERAP

Design Principles

A series of design principles have been developed for the public realm to NOMA Angel Square that are aligned to the wider vision for the NOMA neighbourhood.

Sustainability



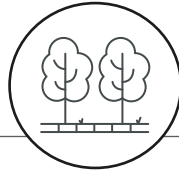
Deliver public realm which aligns to NOMA's Sustainability ambitions, through increasing tree cover and creating a net gain in biodiversity.

Connection



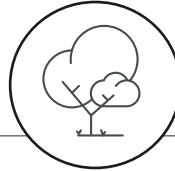
Create an attractive green link through the northern part of the NOMA

Streets and Spaces



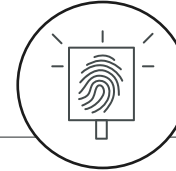
Make a very green place that is walkable, encourages active travel and grounds the new buildings within the public realm

Heritage



Celebrate the area's rich background of industrial and archaeological history

Identity



Enhance the green heart of NOMA whilst creating an area of public realm in its own right

Nurture



Create a place for participation and nurture, offering opportunities for community engagement through horticulture

Site Constraints

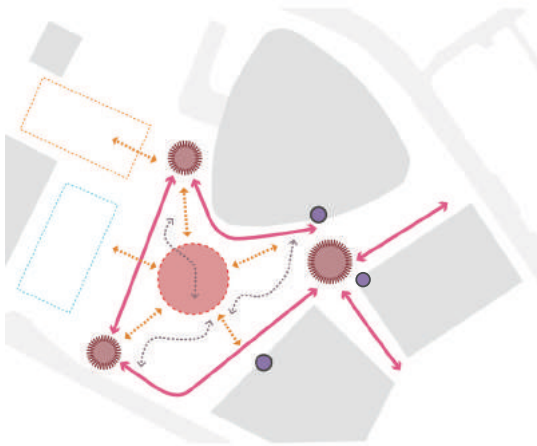
Numerous existing site constraints have been considered in the development of the design proposals. These include services within and surrounding the site, the future plots and the existing infrastructure of 1 Angel Square.

1. Interface to arrival spaces
2. Underground services zones
3. Existing services within Angel Square
4. Attenuation tanks - (location approximate and subject to further survey work).
5. Challenging levels
6. 1 Angel Square Basement extents
7. Earth tubes and associated vents
8. Wind mitigation consideration
9. Dantzig Street - to remain adopted with requirement to keep public access across space



Site Constraints Plan

Design Drivers



Circulation routes

1. Defining key routes
2. Highlighting main entrances
3. Connecting to the central space
4. Creating secondary routes



Dwell areas

1. Crafting a new flexible space
2. Forming a comfortable sense of enclosure
3. Addressing the active building façades
4. Defining peripheral sub-spaces



Spatial plan

Landscape Masterplan

KEY

1. Flexible event space
2. Future community space through the recycling of existing materials in the NOMA estate
3. The Gardens
4. Tiered seating
5. Existing Earth Tubes
6. Water Feature (final location subject to intrusive review of services on site).
7. The NOMA tree
8. New stepped access route
9. 1 Angel Square entrance space
10. 2&3 Angel Square Public Realm
11. Table and chairs sun spot
12. Informal garden routes



Stage 2 Masterplan



Illustrative Axonometric



Axonometric View

Levels and Accessibility

The existing level changes on site currently cut off key circulation routes to the wider area. A new stepped access is proposed adjacent to 1 Angel Square to improve this. Moreover, all other routes maintain flush access based around key desire lines through the site so that level access across the site is retained.

Where required all steps will have the appropriate tactile paving, contrasting nosing and handrails installed in accordance with Design for Access 2 guidance.

Frequent areas of seating will be provided. These will include a variety of typologies which will be designed to incorporate backrests and armrests and be set at an appropriate level from the ground to be accessible to all.

KEY

-  Primary circulation
-  Secondary circulation
-  Stepped access
-  Key existing and future entrances
-  Key cycle route through site
-  Existing cycle stands relocated
-  Proposed Bee Network Cycle Station



Drainage

The new proposals offer the opportunity to integrate a more sustainable approach to drainage in the form of rain gardens. These are able to collect surface rain water as well as improve the biodiversity of planting on site.

Attenuation is proposed in the form of an underground attenuation tank. As the location, size and condition of the existing public realm attenuation tank is unknown, it is not proposed to reuse the tank. The proposed geocellular tank has therefore been sized to accommodate the whole Angel Square site. The overall need for the attenuation tank, the size and location are all therefore subject to change as a result of future survey work.

Illustrative Imagery - Rain Gardens



Indicative Location of Rain gardens



Site wide drainage strategy

The Secure Line

The proposed secure line to the site restricts vehicular access and will largely follow a similar approach to the existing. This will include a mix of bollards and integrated furniture elements along with the new buildings at 2&3 Angel Square. Drop bollards will be used to provide access for maintenance.

-  Existing bollard line
-  Existing secure line updated to a mix of planters, street furniture and bollards
-  Drop bollards.



Miller Street

Secure Line

A mix of bollards, furniture and additional trees in planters create a secure line to Miller Street whilst maintaining a welcoming approach that considers key desire lines through the site.

The elements will be rated to a PAS68 level or acceptable equivalent when integrated as part of a furniture element.



Circular planters with wide edges that can be sat on



Miller Street secure line

Way Finding + Power

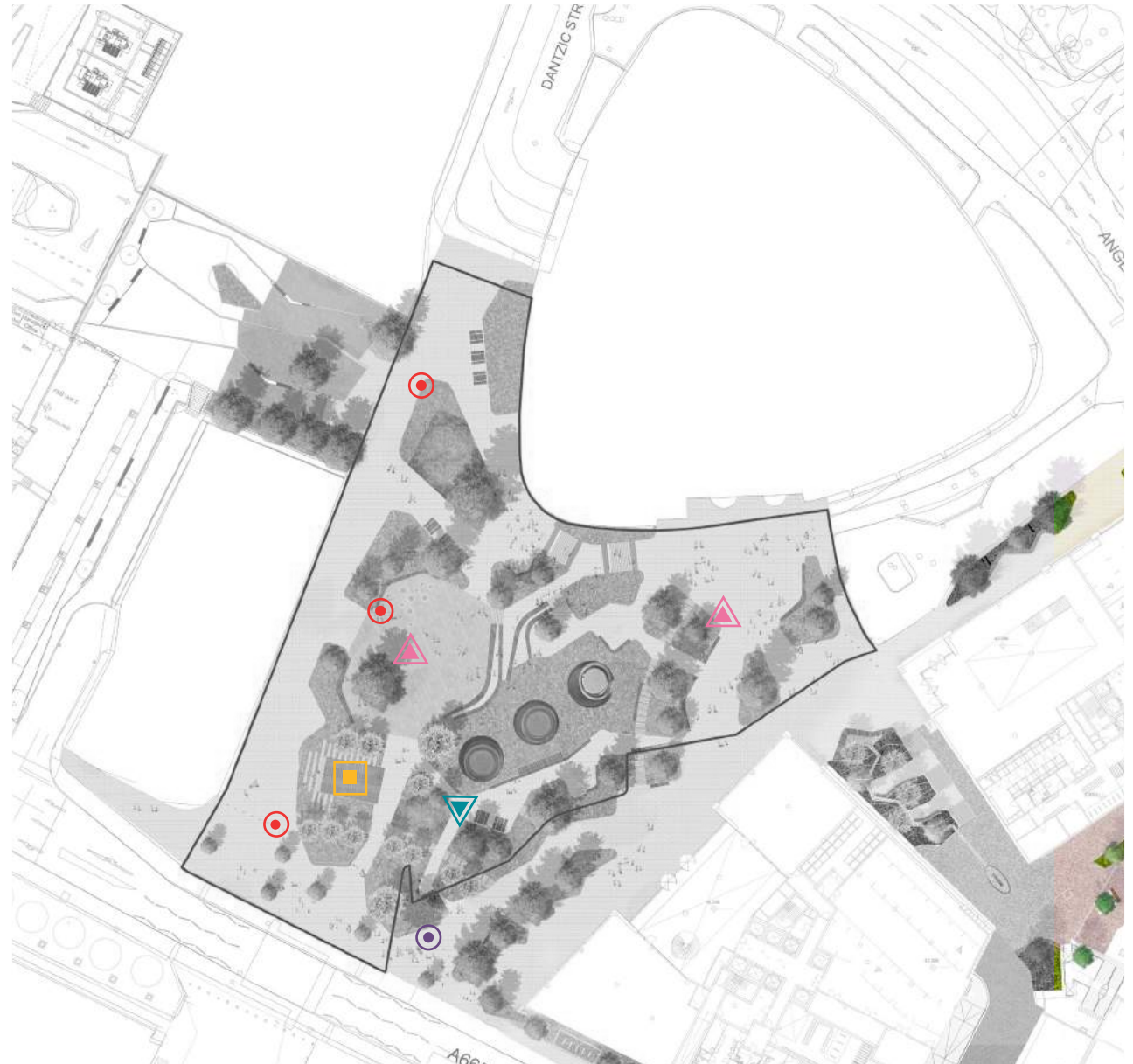


Example of totem in NOMA



Example of totem in Angel Gardens

-  Existing NOMA totem
-  NOMA totem
-  Pop up power points
-  Watering maintenance tap
-  Future proof for power and water.



Arboricultural Impact Assessment

An Arboricultural Impact Assessment has been undertaken by Bowland Tree Consultancy and has identified 7no Category 'B' Trees of 'Moderate Quality'. The remainder of the existing trees (2no) have been designated as Category 'C' Trees of 'Low Quality'. A total of 6 trees are proposed to be removed as part of the works, to be replaced with 36 new semi-mature trees with a diverse mix a species across the space.

Two trees to the south of the site boundary will be removed as part of works for 2&3 Angel Square.

TREE RETENTION AND REMOVAL

-  Existing Trees To be removed
-  Existing Trees To be retained
-  Root Protection Area of Retained Trees
-  Category B (moderate Quality)
-  Category C (low Quality)
-  Category U (unsuitable for Retention)

T3 Tree Reference Code To Tree Survey

Tree Condition Survey
Refer to:
Arboricultural Impact Assessment in Relation to
Proposed Landscaping of Public Realm at Angel
Square, Manchester-Bowland Tree Consultancy Ltd
(August, 2022)



Flexible event space

A flexible space is proposed to the centre of Angel Square. This will include a new playful water feature along with the 'NOMA' tree, an extra special mature specimen, to highlight the space and create instant impact.

The water feature would be integrated within the paving as shown in reference image below, so in order to not detract from the design when it is switched off. The area will allow for small temporary events such as markets or community get togethers.

The final location of the water feature is subject to a detailed and intrusive review of the service constraints within the central space to locate a suitable location for the storage tank.



Zoom in to NOMA tree area



NOMA Feature Tree



Temporary Small events



Playful Water Feature

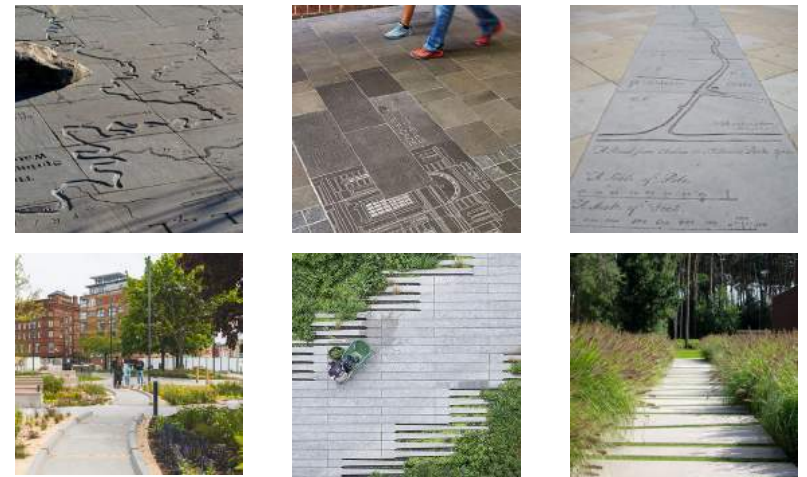
The Gardens

Surrounding the flexible space will be a collection of green spaces which will form a new 'City Garden' to be managed by the Plant NOMA initiative. This creates an opportunity for the surrounding communities to come get involved and engage with the space. Plant NOMA will form a programme that will appeal to the wider communities creativity and, unlike other public spaces, allow individuals to place their stamp on their surroundings and claim their stake in their city.

The Gardens



Plant NOMA at Sadler's Yard



Garden Paths - quirky and varied

Hardworks Materials

The proposed hard landscape material palette takes reference from the surrounding NOMA public realm delivered as part of recent schemes including Angel Gardens and Sadler's Yard. Where possible the aim will also be to re-use and re-cycle elements found within the existing areas of Angel Square.

A combination of locally sourced Yorkstone, Cumbrian stone and European granite will provide a coherent material that will cohesively slot into the character of the NOMA estate.

Key

-  Natural Stone Slab Paving
-  Natural Stone Paving, a mix of granites and yorkstone.
-  Natural Stone Paving, yorkstone
-  Natural Stone Informal Paths, granite
-  Natural Stone Steps units, granite



Surrounding Materials



Angel Square Existing - natural stone (yorkstone)



Thread Street - Dutch clay



Sadler's Yard - natural stone (granite and Burlington cumbrian stone)

Street Furniture & Wayfinding

The street furniture and wayfinding proposals include a palette that is coherent with the character and design language that has been delivered within high quality public realm schemes across the wider NOMA neighbourhood, such as the Angel Gardens and Sadler's Yard public realm schemes, and includes the following elements:

- Timber seating elements, standalone and integrated into planter edges
- Natural stone and steel edges
- Cycle stands (8 existing stands relocated and a new provision for 10 bee network cycle hire stands).
- Litter bins
- Bespoke wayfinding totems
- Bollards

The waste bins around the public realm are emptied by the existing maintenance team's groundsman every day. The bin bags are taken from the bins and, using a trolley, placed in the Estate wheelie bin (mixed waste) which is stored within Federation loading bay. This bin is 1100 litres and is collected twice a week (Weds and Fri).



Steel tree planters and planter edges



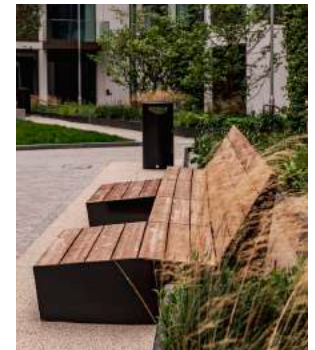
Stainless steel bollards



Tiered seating



NOMA wayfinding totem



Standalone seating elements



Stone planting edge with timber seating

Public Realm Lighting

For NOMA's Angel square, the light colour temperature will enhance the circulation of the public space and define the different areas where visitors can relax, enjoy and move through safely after dark.

A hierarchy of “brightness” is proposed according to the uses and way in which people will navigate through the spaces.

A good balance of light and shadow is important and neither of the two should be misplaced. In this way, space users will enjoy brighter spaces as well as more quiet ones. This balance will also enhance visual stimulation, offering users a space where they can enjoy, spend time outdoors and socialise, increasing the sense of local community and the feeling of being in a city living room outdoors.

Detailed lighting proposals will be developed further during RIBA Stage 3 and 4 and will address the recommendations of the Crime Impact Statement in order to provide well illuminated footpaths and circulation routes, as well as Ecological Survey and Assessment recommendations to ensure there is not excessive artificial light spill.



Illustrative imagery:



Feature lighting example (Sadler's Yard)



Lighting columns



Furniture lighting



Tree uplighting

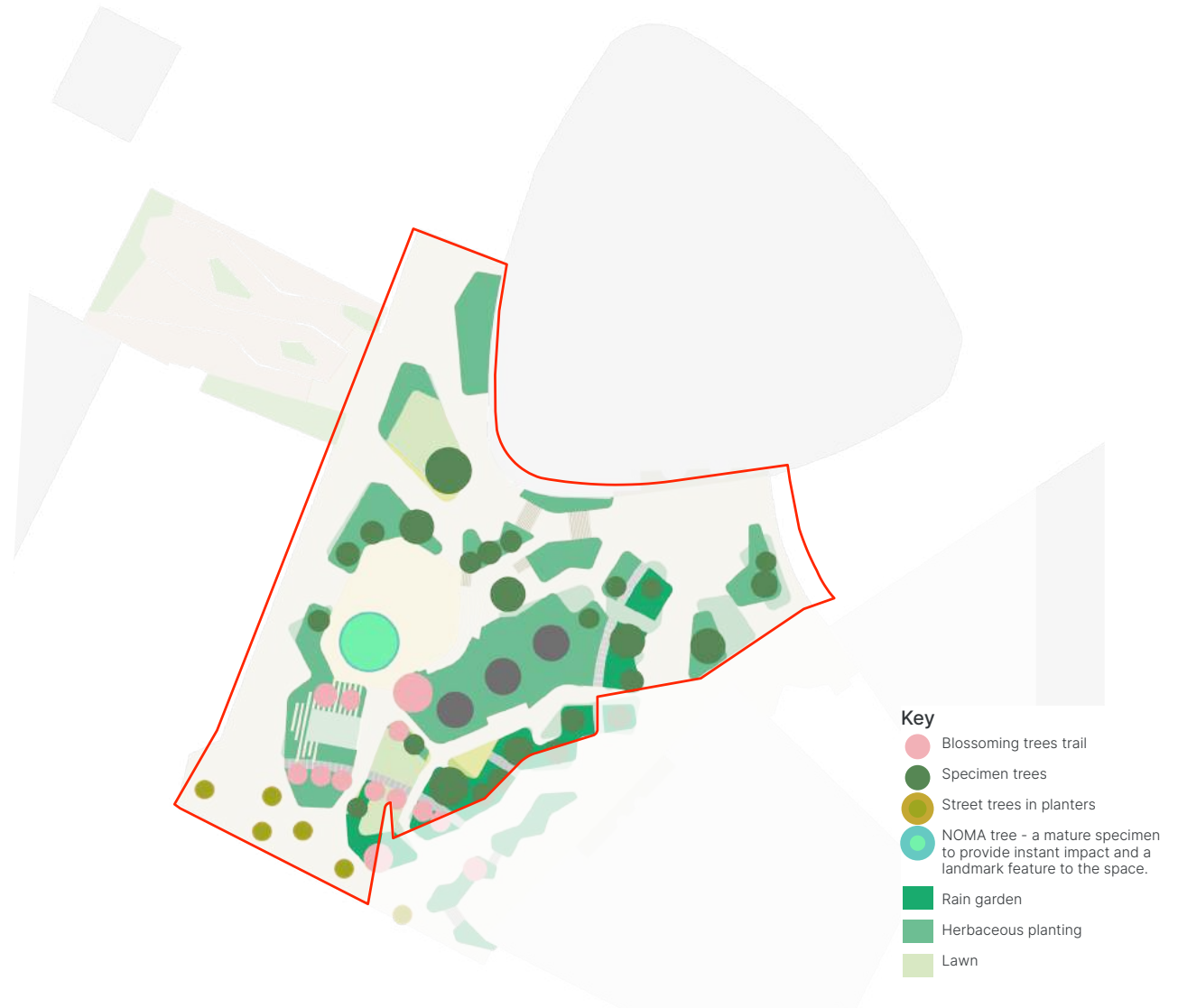
Planting Strategy

The proposed tree strategy introduces 36 no. new high quality semi mature trees, which is above the required 3:1 replacement ratio within the design planted in soft landscape with additional underground support systems to ensure growth, and amenity value to the users.

Tree planting on the scheme is driven by a number of objectives. The desire to create a green external spaces which is more relative to human scale, linking into future plans for the wider green network and improving the biodiversity on site.

An area of land adjacent to the temporary NOMA Pavilion Marketing Suite has been set up as a container tree nursery to grow trees for both 2&3 Angel Square and Angel Square.

Along with providing much better chances of success and fast establishment for the trees when finally planted, there are the added benefits of the temporary tree nursery as part of the meanwhile use public realm and setting for the temporary NOMA Pavilion Marketing Suite.



Tree Planting Proposals

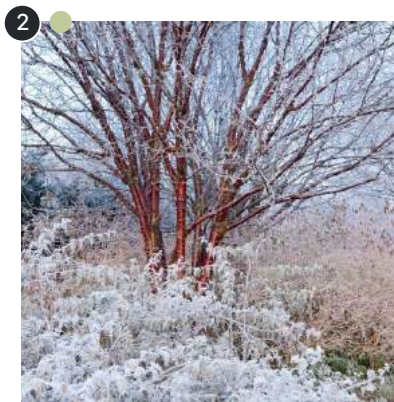
The Blossom Trail

In collaboration with the National Trust the new proposals to Angel Square are proposing a trail of Blossom trees. These will be selected to maximise diversity impact and seasonally interest. An example of some of the species proposed are outlined below. The detailed specification will continue to be developed alongside the National Trust.

Fruiting trees will be incorporated in appropriate areas where they will drop into soft landscaping and be managed by the on site Plant NOMA team.



Prunus x subhirtella



Prunus serrula



Prunus serrulata



Malus baccata
'Street Parade'

Tree Planting Proposals

Across the rest of the site a variety of trees are proposed to suit the urban condition, areas of rain gardens and site constraints to create a comfortable, green sense of enclosure on site.



Quercus palustris



Gleditsia triacanthos



Corylus columna



Liriodendron tulipifera



Acer campestre

Planting Proposals

Plant NOMA

Plant NOMA are a new initiative that have taken charge of the planting maintenance of the NOMA estate. Instead of a standard maintenance approach to the landscape Plant NOMA are slowly nurturing a landscape of horticultural significance.

The detailed planting plans for the area will be worked up with Plant NOMA who will engage with the surrounding communities to create a new city garden in the estate.

Plant NOMA currently works with organisations such as -

- The National Trust
- The Princes Trust
- New Islington Free School
- Manchester Metropolitan Uni
- The RNIB

The initiative also has around 100 hours of volunteering each week. The pool of volunteers are made up of NOMA estate occupiers and local residents and will expand as the community develops.

As part of the continued design process Plant NOMA will hold workshops with key stakeholders and the surrounding community to ensure Angel Square is:

- Horticulturally significant
- Educationally beneficial
- Ecologically robust
- Societally useful



Crime Impact Statement

This development has been assessed against the principles of 'Crime Prevention Through Environmental Design' to reduce the opportunities for crime and the fear of crime. The following areas have been identified as key elements to incorporate into the design. Further information can be found in the full Crime Impact statement in section 3.3

Access to Angel Square from surrounding roads will be restricted with bollards rated to BS PAS 64 or similar products, to prevent unauthorised vehicles from entering the space.

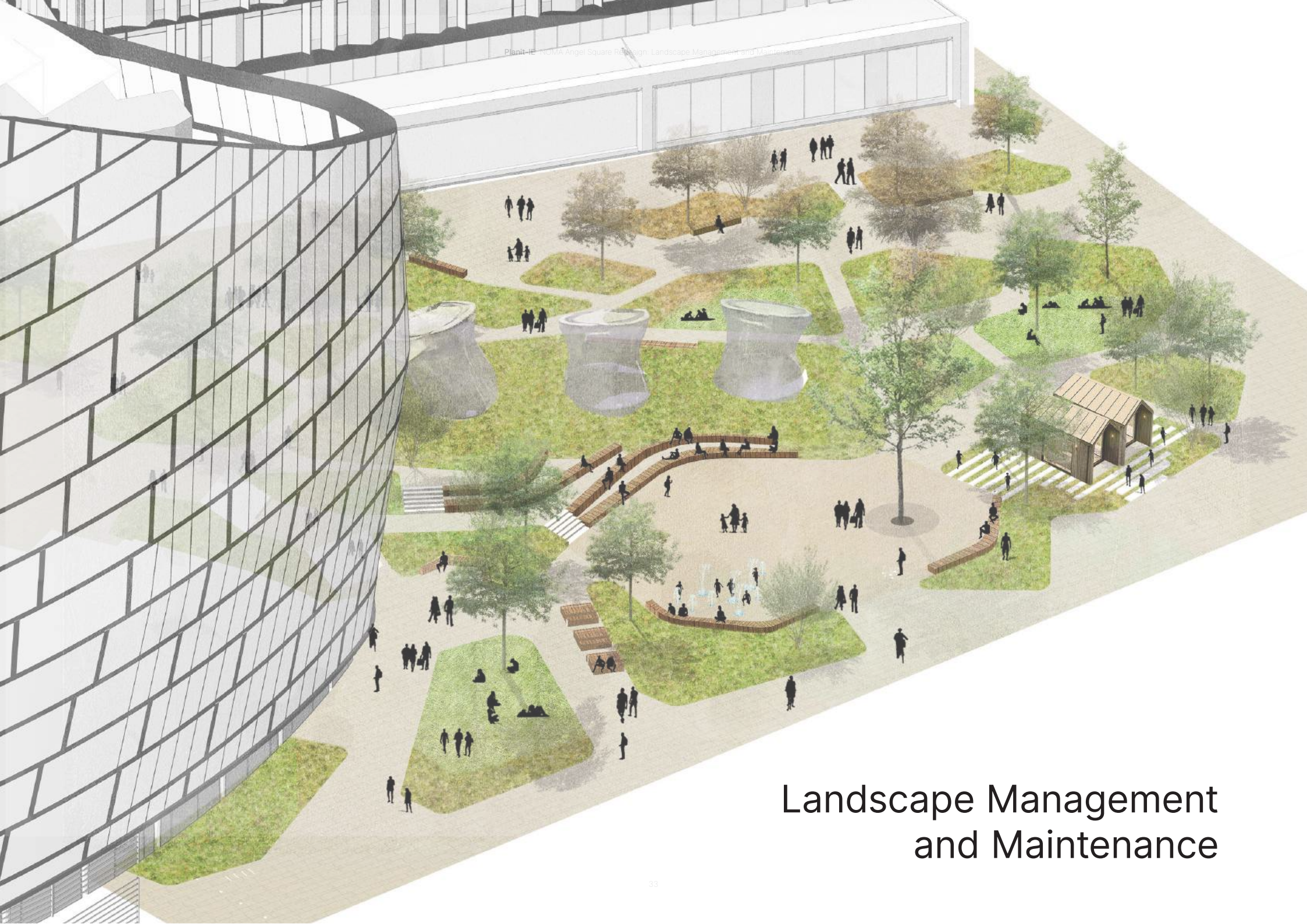
Proposed planting will be kept below 1 metre in height and trees will have a minimum 2.4m lifted crown to maintain sightlines through the space.

Seating, tables and cycle stands are proposed in well lit, visible locations with all footpaths illuminated to a safe lux level and adequate in width for users to pass with plenty of space.

Materials used in the public realm are selected for their robustness/longevity. Maintenance of newly installed features will be incorporated into the management & maintenance procedures.



— Secure line



Landscape Management and Maintenance

LANDSCAPE MANAGEMENT PLAN | PRINCIPLES

Maintenance of the space will be undertaken by the contractor who has undertaken the works for the first year then by Plant NOMA following this.

There should be a commitment to the ongoing high quality management and maintenance of the public realm. The long-term success of any landscape is reliant upon a detailed understanding of the parts and how they go together but this is just the start of the journey and perhaps the most important aspect, invariably overlooked, is to ensure that there is a defined and committed programme of maintenance.

BRIEF

- The brief below describes the framework:
- The management plan will cover a time period of 5 years
- The Management Plan must give consideration to environmentally sensitive design and management
- The conservation of existing features will be a prime consideration
- The Management Plan will seek to provide a net increase in the nature conservation value of the site

MONITORING

The Management Plan's life span has been divided into key stages of 5 yearly intervals. These will be used as the basis for developing the plan and setting reviewing targets.

Monitoring is of fundamental importance, since this is the means by which the success of the plan will be measured. It is therefore important to establish standardised survey and monitoring methods, which enable valid year on year comparisons to be made. There will be a need for flexibility during its implementation. The Management Plan must be an evolving one, able to adapt to the specific needs of the space.

MANAGEMENT PRINCIPLES

Softworks:

- To prescribe all necessary management and maintenance principles and management tasks to enable successful establishment and ensure the continued maturing of all landscape elements.
- To ensure the continuing health of existing vegetation
- To ensure the successful integration of existing and proposed vegetation
- To ensure that the management and maintenance regime is appropriate to the site
- To provide a mechanism for the ongoing monitoring and reviewing of the management plan and the specific maintenance operations contained therein.

A number of separate, yet inter related, vegetation types exist and are proposed for the site:

- Proposed herbaceous planting
- Proposed tree planting

Hardworks:

- To put in place procedures for regular inspections of all paved areas.
- To outline specification and sources of materials for repair/reinstatement (NBS Spec Public Realm)
- To establish winter maintenance procedures
- To put in place procedures for cleaning

SOFTWORKS | MAINTENANCE

A Health and Safety plan is an important consideration for any area of public realm. The landscape maintenance team will be expected to produce a risk assessment and method statement for the maintenance of the planting areas.

Highways

Maintenance works associated with works adjacent to highways will need to be considered as part of the general management and maintenance procedures

Chemicals

Chemicals generally should be restricted in use. All chemicals, herbicides, pesticides and fertilisers, should be approved by English Nature and should be used, stored and disposed of in accordance with EN guidelines and COSHH Regulations 2002.

MAINTENANCE OPERATIONS

Set out in the tables overleaf are the maintenance operations that should be carried out over the next 15 years in order to achieve the design objectives. They have been set out in a format that can be easily followed by all parties, ensuring that the Management Plan exists and a working document and not an archived report. The management prescriptions are flexible such that each section can be changed and updated on an annual basis, allowing targets to be set, progress monitored and accurate reporting made.

PROJECTED MAINTENANCE

The tree species have been carefully chosen for their suitability to the location. Formative pruning has already been carried out on the nursery and this will produce suitable growth and canopy shape for the space provided. Where possible, pruning should be carried out in the dormant season to avoid excessive sap loss.

Irrigation

Manual irrigation of the trees and shrub areas particularly during the first 3 years will be fundamental to their long term successful establishment.

NUTRITION

The tree pits have been backfilled with a suitable growing medium containing nutrition sufficient for the initial period of establishment.

After three years it would be advisable to apply an application of fertiliser in the Spring as a top dressing. A broad spectrum fertiliser such as HortiTop Complete (available from Hortifeeds) would be suitable. A routine soil test carried out every 2 years would establish the need for any supplementary fertiliser.

SOFTWORKS | PLANTING PLAN

MANAGEMENT PRINCIPLES

Proposed individual trees:

- To ensure satisfactory establishment and continuing health.
- To maintain the plants in a healthy condition and develop the site tree structure.
- To ensure the successful establishment and continuity of the overall design concept.
- To establish a valued and appropriate amenity.

Amenity grass:

- To ensure the successful establishment of the sward
- To maintain a healthy and attractive sward that is fit for purpose and anticipated use
- To prevent the spread of woody vegetation from structure planting and ornamental shrub areas
- To control undesirable herbaceous species
- To maintain the integrity of the grass mix specified and remove any non-native self seeded material

Ornamental and herbaceous planting:

- To ensure satisfactory establishment and continuing health
- To maintain plants in a healthy and attractive condition
- To ensure the successful establishment and continuity of the overall design concept.
- To establish a mechanism for the replacement of any failing plant or one which has reached maturity
- To ensure planting within public areas is maintained below a maximum height of 1m to meet the guidance set within Secure by Design with the exception of wall mounted climbers.

MANAGEMENT PRINCIPLES

Proposed Rain Gardens:

- To ensure satisfactory establishment and continuing health
- To maintain plants in a healthy and attractive condition
- To ensure the successful establishment and continuity of the overall design concept.
- To establish a mechanism for the replacement of any failing plant or one which has reached maturity
- To ensure planting within public areas is maintained below a maximum height of 1m to meet the guidance set within Secure by Design with the exception of the green wall and the screening hedging zones.



- Key**
- Proposed tree planting
 - Lawn
 - Herbaceous planting

SOFTWORKS | TREE WORK

MAINTENANCE OPERATION

- **Identification:** Before starting work agree which trees are to be removed or pruned
- **Protection:** Avoid damage to neighbouring trees, plants and buildings
- **Standards:** To BS 3998 and Health & Safety Executive (HSE) 'Forestry and arboriculture safety leaflets'
- **Removing branches:** Cut as shown in Arboricultural Association Leaflet No 8 'Mature tree maintenance'. Cut vertical branches similarly, with no more slope on the cut surface than is necessary to shed rainwater
- **Appearance:** Leave trees with a well balanced natural appearance
- **Chain saw work:** Operatives must hold a Certificate of Competence
- **Tree work:** To be carried out by an approved member of the Arboricultural Association

ADDITIONAL WORK

- Defective, diseased, unsafe or weak parts of trees additional to those scheduled for attention: Give notice if detected.

PREVENTION OF WOUND BLEEDING

- **Standard:** To BS 3998, clause 8.

PREVENTION OF DISEASE TRANSMISSION

- **Standard:** To BS 3998, clause 9 and Appendix B.

WATER RESTRICTIONS

- **General:** If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.

Maintenance Operation Number	Prescription	Year (s)	Season	Frequency (per year)
	TREE PLANTING			
	Maintenance during defects liability period of 5 years after planting whichever is the greater	1 – 5	As required	2 March - September
	To establish new planting, maintain a 1m diameter weed free area around all trees within grass. Trees within self bound gravel should be maintained totally free of weeds.	1 – 5	Spring - Autumn	1
	UNDERGROUND TREE GUY WIRES			
	Inspection / maintenance times: Quarterly and after strong winds Operations: Replace or re-secure loose or missing guy wires Adjust to suit stem growth and to provide correct and uniform tension	1 – 5	Throughout year	2
	Apply granular fertiliser according to manufacturer's recommendations	1 – 5	Spring - Autumn	Bi-annual
	Ensure trees remain firmly bedded after disturbance and re-firm as necessary	1 – 5	As required	1
	Control all pests and diseases as necessary	1 – 5	As required	To be determined
	Prune in accordance with good horticultural practice, thin, trim and shape as appropriate. Eg. Removing branches: Do not damage or tear the stem. Wounds: Keep as small as possible and cut cleanly back to sound wood. Cutting: Make cuts above and sloping away from an outward facing healthy, angled so that water will not collect on cut area. Larger branches: Prune neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide. Tools: Use clean sharp secateurs, handsaws or other approved tools. Disease of infection: Give notice if detected. Growth retardants, fungicide or pruning sealant: Do not use unless instructed			
	Prune all trees annually as needed to maintain a minimum 2.2m clear stem and desired form.	1 – 5	Autumn - early Winter	1 As required
	Watering – Regular checks using a moisture probe testing during the first two years after planting on a monthly cycle during the summer months of May-September	1 – 2	Monthly	24
	Water as necessary to ensure healthy growth	3	As required	As required
	Replace dead or damaged trees to original specification. Remove within 1 month or as soon as possible and replace within the next available planting season	1 - 5	Autumn	1
	Top up mulching to original specification annually	1 - 5	Spring	1
	Autumn LEAF REMOVAL			
	Collect accumulations of drifted leaves from the vicinity and from paved lawn area Arising: Remove	1 - 5	Autumn/Winter	As required

SOFTWORKS | HERBACEOUS PLANTING

MAINTENANCE OPERATION

- **Duration:** Defects Liability Period or 5 years, whichever is the greater.
- **Weed control:** Keep planting beds clear of weeds by applying herbicide.
- **Watering:** As necessary to ensure establishment of planting
- **Soil condition:** Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.

Maintenance Operation Number	Prescription	Year (s)	Season	Frequency (per year)
	HERBACEOUS PLANTING			
	Maintenance during defects liability period or 5 years after planting whichever is the greater			
	• Maintain weed free area to the surface of all planting areas	1 – 5	March / October	9
	• Application of granular fertilizer (15:15:15)	1 – 5	Spring	1
	• Ensure plants remain firmly bedded after disturbance and re-firm as necessary	1 – 5	As required	Each maintenance visit
	• Re-firm plant supports and replace as needed	1 – 5	As required	Each maintenance visit
	• Prune as necessary to encourage healthy growth as illustrated on the drawings: Prune herbaceous perennials as required to maintain form and supply supports as needed during the growing season.	1 – 5	Spring/Summer	1
	• Prune hardy herbaceous perennials in autumn retaining feature flower heads or seed heads to provide interest through the winter months	1 – 5	Autumn	1
	• Prune tender perennials and borderline hardy perennials in spring once the risk of frost has passed (April / May). This is to protect the growing crown during winter.	1 – 5	April/May	1
	• Cut back early flowering perennials near to ground level after flowering to encourage fresh foliage and later summer flowering. Cut back again in spring.	1 – 5	Summer & spring	2
	• Control all pests and diseases as necessary	1 – 5	As required	As required
	• Replace any dead/ under performing plants. Where planting continually fails to establish, undertake investigations to ascertain any underlying cause.	1 - 5	March/October	As required
	• Watering – Regular checks using a moisture probe testing during the first year after planting on a monthly cycle during the summer months of May-September. Plants under the platform cover to be checked weekly during long periods of hot weather.	1	May/September	5
	• Water as necessary to ensure healthy growth. Water as necessary to ensure healthy growth. If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.	1 – 5	As required	As required
	• Top up mulch planting to original specification at the start of each year after the cutting back of tender perennials.	1 – 5	Spring	1
	• Divide large groups of perennials every 3 years:	3	Spring/Autumn	1
	• Divide summer flowering plants in spring or autumn providing that the ground is dry enough to work.	3	Summer	1
	• Divide spring flowering plants in summer after flowering.			

MAINTENANCE OPERATION - RAIN GARDENS

Maintenance Operation Number	Prescription	Year (s)	Season	Frequency (per year)
	Maintenance during defects liability period or 5 years after planting whichever is the greater			
	- Maintain weed free area to the surface of all planting areas (Note: planting bed 3: enherited case of horsetail - special regular weed killer application will be required over the duration of a few years to eradicate weed permanently and prevent from spreading) - Application of granular fertilizer (15:15:15) - Ensure plants remain firmly bedded after disturbance and re-firm as necessary - Re-firm plant supports and replace as needed - Prune as necessary to encourage healthy growth as illustrated on the drawings: Prune herbaceous perennials as required to maintain form and supply supports as needed during the growing season. - Prune hardy herbaceous perennials in autumn retaining feature flower heads or seed heads to provide interest through the winter months - Prune tender perennials and borderline hardy perennials in spring once the risk of frost has passed (April / May). This is to protect the growing crown during winter. - Cut back early flowering perennials near to ground level after flowering to encourage fresh foliage and later summer flowering. Cut back again in spring. - Control all pests and diseases as necessary - Replace any dead/ under performing plants. Where planting continually fails to establish, undertake investigations to ascertain any underlying cause. - Watering – Regular checks using a moisture probe testing during the first year after planting on a monthly cycle during the summer months of May-September. - Water as necessary to ensure healthy growth. Water as necessary to ensure healthy growth. If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding. - Top up mulch planting to original specification at the start of each year after the cutting back of tender perennials. - Divide large groups of perennials every 3 years: - Divide summer flowering plants in spring or autumn providing that the ground is dry enough to work. - Divide spring flowering plants in summer after flowering. - Replant areas of poor vegetation growth, alter plant types to better suit conditions, if required	1 – 5 1 – 5 1 – 5 1 – 5 1 – 5 1 – 5 1 – 5 1 – 5 1 – 5 1 – 5 1 1 – 5 1 – 5 3 3 1 – 5 1 – 5	March / October Spring As required As required Spring/Summer Autumn April/May Summer & spring As required March/October May/September As required As required Spring Spring/Autumn Summer As required As required	9 1 Each maintenance visit Each maintenance visit 1 1 1 2 As required As required 5 As required 1 1 1 monthly

MAINTENANCE OPERATION – SWALE

Maintenance Operation Number	Prescription	Year (s)	Season	Frequency (per year)
	- Inspect inlets, outlets and overflows for blockages and clar if required - Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours - Inspect inlets and facility surfaces for silt accumulation, establish appropriate silt removal frequencies - repair erosion or other damage by replanting - relevel uneven surfaces and reinstate design levels - scarify and spike topsoil layer to improve infiltration performance, break up slit deposits and prevent compaction of the soil surface - remove build up of sediment on upstream gravel trench, flow spreader or at top of filter strip - remove and dispose of oils or petrol residues using safe standard practices - catch pits, inlets and outlest: inspect, remove silt and debtris. If next to lawn strim 1m round for access - silt management: inspect swales for silt accumulation, excavate silt, stack and dry within 10m of the SuDS feature, but outside the design profile where water flows, spread, rake - remedial work: inspect SuDS systems regularly to check for damage or failure, undertake remedial work as required. All damage to be made good to design profile unless there is a design flaw. - filter strips and swale: where there is a build-up of silt on the filter strip, swale, under-drained swale or at inlets, i.e. 50mm or more above the design level, then remove and spread on site. Undertake when ground is damp in autumn or early spring and transplant turf and overseed to original design levels. Spread excavated material on site above SuDS design profile, e.g. top of banks, in accordance with E.A. Waste Exemption Guidance.	1 –5	As require	monthly or as required
		1 –5	half yearly	2
		1 –5	remedial action	As required
		1 –5	remedial action	As required
		1 –5	remedial action	As required
		1 –5	remedial action	As required
		1 –5	remedial action	As required
		1 –5	remedial action	As required
		1 –5	As required	monthly
			As required	As required
			As required	As required
			As required	As required

HARDWORKS | MAINTENANCE OPERATIONS

MAINTENANCE OPERATIONS – HARDWORKS

Surfaces need to be maintained such that they provide a safe passage for all pedestrians and highway users. It is also essential that areas, which have been subject to major investment, are protected and sustained through an effective maintenance regime. The success of any streetscape project will greatly depend on the attention given to maintenance.

It is important that paved surfaces are regularly inspected so that defects can be identified and rectified. Typically, early life maintenance or aftercare of new works will be the responsibility of the Main Contractor that delivered the works. The maintenance and defects liability period will generally be 12 months. The Main Contractor should visit the site at regular intervals during the maintenance period, to inspect all paved areas, and to undertake any remedial works. At the end of the maintenance period the contractor will be required to undertake remedial works to the satisfaction of the Client.

PAVING DEFECTS - RIGID

Common defects - Paved roads deteriorate in a variety of ways, depending upon the type of construction and cause of distress. When deterioration presents a safety hazard then maintenance becomes essential. Timely maintenance, in some instances can prevent deterioration progressing to a state where reconstruction is required. The majority of failures tend to be confined to the surface layers of paved roads, i.e. they concern the bedding and jointing that surrounds stone elements.

Descriptions and illustrations of common defects are given below:

Punching - Vertical downward movement occurs in and around wheelpaths. Punching shear is resisted by both the joints and bedding. The lower of the two

capacities, joint shear or bed bearing will control the elements resistance to punching. The defect occurs in flexible and rigid surfacing. Localised or isolated areas of punching are likely to be due to poor workmanship. More widespread punching is more likely to be due to under design.

Progressive cracking - Debonding of the jointing material from stone elements commonly leads to progressive cracking. The continuous action of heavy vehicle tyres on the elements dislodges and pulverises sufficient quantities of the jointing material to cause a breakdown of the joint matrix. Inappropriate design and poor workmanship are likely causes. Factors likely to have contributed to this type of failure are:

- poor compaction of the bedding
- inadequate moisture content in stabilized bedding
- depth of elements
- low jointing strength
- early pavement trafficking
- inappropriate laying pattern

Movement - If the homogeneity of the upper layer is broken, it is impossible to control lateral movement with joint widths $\geq 10\text{mm}$. Once the surface matrix is broken, it allows the tyre interaction of the traffic to move the setts in angular directions, thus perpetuating the breakdown of the rigid surface. Ingress of water then adds to the problems. Rutting is common and depending on the construction of the pavement the underlying layers of the structure will gradually deteriorate.

Broken or damaged elements - Apart from being unsightly, cracking and spalling can become a hazard if it creates a trip. Spalling occurs during transport and laying, but can less commonly be a fault in the material. It can result during

manufacture, impact loading, abrasion and weathering. Inappropriate size or depth of element results in fracture under loading.

TREATMENT OPTIONS

Maintenance treatment will depend on the type of defect and what has caused the deterioration. For some surfacings, topping up of jointing may be all that is required, but poor surface profile may require a site investigation to provide information on the condition of the pavement at depth. Suitable strategies can then be formulated based upon informed engineering judgment.

The table on the next page summarises some common defects, resulting problems and treatments.

HARDWORKS | TREATMENTS

Defect	Problem	Treatments	
Rigid		Temporary	Long-term
Expansion and contraction joint cracks	Cracking	Monitor/method statements from bedding and jointing material supplier required	Deep water ingress can lead to structural faults.
Debonding of jointing material	Initiation of failure mechanism	Monitor / investigate	Replace jointing or reconstruct if poor design
Broken or damaged elements	-	-	Replace or reconstruct
Missing elements	Trip, water ingress	Fill holes	Replace element
Rocking elements	Hazard to users	Relay	-
Spalling of arises or surfaces	Unightly trips	-	Replace
-	Loss of stability, water ingress	Fill wide gaps if hazard	Relay elements and strengthen edge restraint if necessary
Depressions and bumps (macadam)	Hazard for users	Fill or ramp. Contact undertaker if cause is failed reinstatement	Relay
Rutting (meacadam)	Hazard for users	Monitor, warn users	Relay
Slippery surface	Hazard for users	Warn users or restore texture	Clean, restore texture or renew surfacing
Surface contamination	Hazard for users and unsightly	Clean or neutralize	Replace surfacing if necessary

Guidance: To ensure the chosen treatment is cost effective, consideration should be given to the maintenance history of the paved surfacing, its future use and the likely failure mechanism.

HARDWORKS | MAINTENANCE

LIFTING, REPAIR AND RELAYING

Relaying elements of flexible construction should be carried out in the same way as new construction (Refer to NBS specification). Additional guidance for flags is given in BS 7533-7:2010. Removing a damaged single element prior to relaying can be difficult, particularly if it is small element, as breaking it out may disturb adjacent modules. It may be necessary to consider relaying all elements, which abut the damaged area, or to relay a full line of elements back to an edge restraint. If the surface has poor profile, elements will need to be lifted over the whole of the affected area. In all cases a complete renewal of the bedding material should always take place. An experienced paver is required to execute a good reinstatement.

Joint repairs

Where elements are part of a rigid construction and degradation of the cement mortar joint has occurred, it will be necessary to refill the joint. If necessary the joint should be raked out, which is time-consuming and costly. It may be more appropriate to use a small hand-held grinder with an attachment to remove the dust and debris, in a controlled manner, into some form of hopper. Once the joints have been cleaned out they can be refilled with a mortar appropriate to the trafficking category. Care is required to confine the mixture to the joint and prevent staining of the surface. Trafficking should only be allowed once the mortar has gained the appropriate strength.

Sealing

Proprietary sealing agents are commonly used on paved surfaces, to reduce moisture penetration of the laying course material, and minimise staining from spillages. The paving surface must be completely dry and clean before any sealer is applied with the manufacturer instructions adhered to at all times. Whilst such products may offer certain advantages, careful consideration must be given to the suitability of the sealant and any subsequent effect on the colour appearance and slip/skid resistance of the paving.

CLEANING

Generally

The following recommendations deal with vehicles and associated equipment for use on paved footways/footpaths/pedestrian areas and roads:

- The equipment should be purpose designed to sweep the particular area and surfacing product. If there is any doubt, the vehicle manufacturer should be consulted.
- Where possible, low ground pressure tyres should be fitted to reduce the risk of breaking or cracking of flags.
- Tyres should be inflated according to the manufacturer's recommendations, again to ensure minimum weight distribution per square mm.
- Polypropylene, not wire, brushes should be used.
- Sweeping brush pressures should be set to the minimum required to suit the particular task, i.e. surfaces swept regularly will require a lower setting than those swept infrequently or those covered with heavy deposits.
- When sweeping, engine revolutions should be set at the minimum required to maintain vacuum (suction) pressure.
- Operators, including reliefs, should be trained to manufacturers' recommendations and tyre and brush pressures should be regularly checked.
- Advice should be given to operators that, when equipment is stationary or left unattended, suction, brush rotation and water jetting equipment should be switched off to avoid the risk of damage to the area below the stationary equipment.
- In new or re-laid areas, agreement should be reached on a period of manual cleaning (at least four weeks) to allow the paving to settle and the joints to seal. This period may be reduced by using either a water-based bonding agent or elastomeric prepolymer sealant and by agreement with the cleansing authority

on an appropriate sweeping regime.

- Following the use of mechanical cleaning operations, re-sanding of the joints in flexibly laid areas may be necessary.

The Use of Power Washing Equipment on Paved Areas

To aid in the removal of surface staining power washing equipment is often considered. Whilst such techniques offer certain benefits, particularly for larger areas, it is important that care is taken in their use to avoid damage to the structural integrity of the paving.

When using any form of Power Washer the following guidelines should be strictly adhered to:

- The power washer should be used on a setting, which is sufficient to remove the dirt without causing any further distress. A low-pressure setting is recommended.
- Do not direct the power lance directly down on to the paving, as this can result in loss of jointing material.
- Ideally a spraying movement should be adopted holding the power lance at a shallow angle, not greater than 30° across the diagonal (i.e. not parallel to joints).
- Certain high-pressure jetting machines have been known to mark / damage the surface of certain types of paving material. It is therefore prudent to carry out a small test area before commencing on a larger area.
- The area should be inspected after cleaning to ensure that joints are full.

General Dirt and Detritus

To remove general dirt and detritus, regular brushing is recommended. If detritus reduces the intensity of the colour of the material then this can be reestablished by scrubbing with a mild detergent e.g. washing up liquid, and hot water.

Ensure all the detergent has been thoroughly washed from the surface on completion of the cleaning and the resulting run-off is carefully channelled to either drainage points or containers where it can be safely disposed of.

Moss, lichens and algae

Moss, lichen and algae can be prevalent on hard surfacing where the area is heavily shaded, is under trees or is not laid to an adequate fall. If such growths do occur and are considered undesirable then the area should be treated with a proprietary weed or moss killer used in accordance with the manufacturers' instructions. Such products take some days to be effective and are most effective when applied during a spell of dry weather. The washes work best if any thick growths are scraped off first and the wash is well brushed in. Some treatments leave a residue to discourage the re-growth of the moss and algae but this will only be of limited value if the surrounding conditions leave the paving damp and in shade.

Rust Stains

Initially action must be taken to eliminate the sources of staining. To remove the rust stain, the surface should first be wetted with clean water and then the affected area treated with a 7 to 10% dilution of Hydrochloric acid solution.

Guidance on the safe use of chemical treatments (Acid Washing) is given later in this document.

HARDWORKS | MAINTENANCE

Oil Stains

Oil can penetrate readily into hard surfacing materials, but it should not stain if any spillages are removed promptly with an absorbent material e.g. paper towels, cloth or absorbing granules. Do not attempt to wipe the stain as this will drive the oil into the surface of the units and spread it over a wider area.

If the stain persists then an emulsifying degreaser should be employed. Brush the cleaner onto the affected area, leave for a period of time according to the manufacturers instructions and then wash the emulsified oil away with plenty of clean water.

Alternatively the surface can be scrubbed with a detergent and hot water taking care to ensure that the strength of the detergent is not detrimental to the appearance of the paving. However, for persistent oil staining, steam cleaning may have to be considered.

Bitumen Stains

Fresh bitumen should be allowed to cool down before removing it with a paint scraper or similar. If it is particularly resistant, the use of ice to make the bitumen brittle may be required prior to scraping it from the paving. Any residue should be removed with an abrasive powder and finally the whole area rinsed with clean water. Certain proprietary cleaning agents are available to remove bitumen but these should be tested on an inconspicuous area of paving first.

Graffiti and Paint Stains

Both paint and graffiti are difficult to remove from most hard surfacing materials. Fresh wet paint should be soaked up with an absorbent material without wiping the paint, as this will spread the stain. It should then be treated with a suitable solvent such as white spirit and then the area washed with a de-greasing agent taking care in the disposal of the run-off material.

Dried paint should be scraped off as far as possible and then an appropriate paint remover applied.

Paint manufacturers may often be able to give more detailed advice on the removal of paint and graffiti. Therefore they should be consulted directly for specific recommendations.

Epoxy and Polyester Stains

Areas of solidified epoxy or polyester resin can be removed by carefully burning off the area with a blowtorch. Care must be taken not to inhale any fumes given off.

If, after burning, a black stain remains, this can be removed by scrubbing with detergent and hot water. For larger areas grit blasting may have to be considered, however the effect of such treatment on the micro texture of the surface should be carefully considered. Again it is advised that a small area be tested before any large-scale operations are undertaken.

Smoke, Fire and Tobacco Stains

Normally such stains can be removed by scrubbing with detergent and hot water. Where the stains persist, a mixture of scouring powder and household bleach can be used. It is important the bleach is washed from the area with clean water once cleaning is completed and the run-off carefully disposed of.

Beverage Stains

These can normally be removed by scrubbing the stain with detergent and hot water. If the stain is persistent, apply a household bleach solution and then rinse the area with clean water taking care to dispose of the run-off safely.

Chewing Gum

Chewing gum is a particularly difficult substance to remove from hard surfaces.

Newly discarded gum can be scraped off by using a mechanical scraper but hardened gum can only be removed by both freezing the gum and chiselling it from the surface of the paving or utilising a hot water/steam cleaner.

For specific advice on chewing gum removal it is recommended that specialist contract cleaning companies be contacted directly for further details.

Scuff Marks from Vehicle Tyres

These can normally be removed by steam cleaning, or by scrubbing the area with detergent and hot water.

It is important that prior to any acid cleaning being undertaken, the paving is checked to ensure that any signs of vanadium staining have thoroughly weathered away before acid cleaners are applied.

If some form of chemical treatment is required to remove more stubborn vanadium staining, then this should be undertaken using an organic acid that will not have the aforementioned effect of “fixing” the stain to the paving.

- With deeper stains, the degree of acid treatment may result in an acid etched appearance.
- Protective clothing (gloves, boots, goggles etc.) should be worn at all times when using chemicals and the appropriate first aid measures must be available on-site.
- Take care to ensure that surrounding materials and landscaping are protected. Soft landscaping and exposed metals can be severely affected by chemical treatments.
- It is better to treat several times with the correct dilution than to use concentrated acid, which may damage the surface of the unit.
- When diluting acids, always add acid to water and not water to acid.

Acid Washing

Stubborn and persistent stains that will not generally weather away naturally will require the application of a specific acid cleaning treatment to remove them.

Prior to any acid cleaner being applied, the surface must be thoroughly wetted with clean water to prevent the acid being absorbed directly into the paving. A dilution of 7 to 10% of hydrochloric acid should then be prepared and applied to the affected area.

As the staining begins to dissolve, some frothing may be apparent, which should be followed by agitation of the surface using a stiff bristle brush to completely remove all trace of the stain.

Once this process is complete the whole surface should be rinsed thoroughly with clean water, taking care to dispose of the run off safely. In the vast majority of cases, one treatment will be sufficient; however, in some cases re-treatment may be required.

When using any form of chemical treatment the following guidelines should be strictly adhered to:

General Cleaning

An annual detergent wash is also recommended.

Drainage Channel

An annual detergent wash is also recommended.

