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CLAPHAM COMMON

Clapham Common 2021.Docx

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CLAPHAM COMMON

1 INTRODUCTION

1.1 General

This report is intended to provide a general appraisal of the condition, management requirements and likely tolerance of use of an area of Clapham Common. It is concerned with a substantial part of the park, generally situated towards its eastern end, and which has, over recent years, been used for numerous outdoor events. Those events have taken place during both the summer and winter and can be very damaging to the ground cover resulting in a reduction in the overall value of the site as public open space. Following these events is has been necessary to carry out extensive and intensive renovation works with the aim of restoring the former condition of the surface.

More recently, works were undertaken with the aim of improving the capacity of the site to tolerate these events. By improving the resilience of the surface, the aim was to reduce the extent of damage caused, thereby reducing the degree of renovation works required to restore the park to a satisfactory condition for the ongoing use by the general public.

It is the purpose of this report to assess the quality and suitability of the works undertaken and to provide recommendations on how the greatest advantage may be obtained in the future from the surface in its present condition.

The site was investigated on 12 August although similar investigations had been carried out by Agrostis on several occasions since January 2017. Information from all of these visits is brought together here, where appropriate.

1.2 Contacts

The report was commissioned by Claire Horan, Senior Events Officer - EventLambeth

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1.3 Extent of the site

The whole park is shown in the Google Earth view in Figure 1-1. This is formed from imagery taken 11 April 2020 and the approximate perimeter of the area with which we are concerned is indicated.

Figure 1-1 Clapham Common from Google Earth, 11 April 2020

The 'Event area', as we shall refer to it here, is shown in the same Google Earth imagery in Figure 1-2. This comprises approximately 77 000 m^2 (7.7 hectares, 19.0 acres, 0.077 km^2).

Figure 1-2 Approximate outline of Event area

2 EXISTING CONDITIONS

2.1 Geology and soils

Geology

The British Geological Survey provides the following descriptions of the solid and superficial or drift geology of the site.

Solid geology

London Clay Formation - Clay and Silt. Sedimentary Bedrock formed approximately 34 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas.

Drift geology

Lynch Hill Gravel Member - Sand and Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by rivers.

Soil type

The Soil Survey of England and Wales has no category for soils in this vicinity due to its urban nature. Most of London's parks are in fact on predominantly made ground with landfill constituting the usual subsoil.

2.2 Soil profile

Excavation in 2017 revealed an organic, coarse sandy loam topsoil that extended to between 150 and 200 mm.

Figure 2-1 Topsoil profile

This overlay a subsoil composed of sand, gravel and clay intermingled with a great deal of landfill material including bricks, glass etc. Excavation by hand beyond around 400 mm was not possible due to the nature of this material.

Figure 2-2 Soil profile

2.3 Infiltration rate

Infiltration rate was measured, in 2017, using a set of 3 double ring infiltrometers (see **Error! Reference source not found.**). The data are shown in Table 2-1, adjusted to a standard 10 degrees Centigrade.

Height (mm)			Time			Adjusted infiltration rate (mm/hr)
Start	Finish	Fall	Start	Finish	Diff	
70	81	11	12:57:30	13:57:30	01:00:00	14
53	80	27	12:57:30	13:57:30	01:00:00	33
70	85	15	12:57:30	13:57:30	01:00:00	19
						22

Table 2-1 Infiltration rate (adjusted to 10 C)

The rates of infiltration recorded indicate a reasonably free-draining overall condition and there is no reason to suppose that this feature will have altered a great deal since that time.

2.4 Slope and undulation

The site slopes generally downwards to the north, falling by around 2.5 metres between the highest (to the south) and lowest (to the north) points. The slope is fairly continuous over the Event area at approximately 1 in 84, or 1.20 %.

In the earlier assessments, undulations and depressions had given rise to numerous low spots which retained water for lengthy periods and which in turn affected the grass cover. On the occasion of the most recent investigation, no such features were encountered.

2.5 Ground cover - historic

Following the various events that have taken place on the site over the last few years, numerous over-seeding operations have been carried out. As far as I am aware, the site was never 'sprayed off' with total herbicide prior to any of these operations, so the ground cover that exists now will be a combination of the 'original' species with those that have been sown. The distribution of the more recently sown grass will be related to the extent of bare ground present on each occasion and into which it had been sown. So, the most intensively damaged areas will contain the greatest abundance of newly sown grasses.

A substantial loss of ground cover had been experienced following an event that took place over the winter of 2018/19. An aerial view of the Event area in January of 2019 is shown in Figure 2-3. This indicates perhaps 70 % loss of ground cover across the area.

Figure 2-3 Eastward view over the Event area, 17 January 2019

By the end of the following April, renovation works had restored the ground cover to the extent shown in Figure 2-4.

Figure 2-4 Ground cover restoration by 27 April 2019

2.6 Recent developments

The Event area had gone on to support a number of later events until it was eventually fenced off for 9 months from September 2020 to June 2021. During this period, extensive ground improvement works were undertaken. Those works included:

- Koro treatment
- Over-seeding
- Top dressing
- Verti-draining
- Eathquake aeration treatment
- Sand/soil mix distribution

Koro treatment involves the very intensive scarification, the operation amounting to a 'plaining off' of the surface including grass and accumulated fibre layers.

Earthquake aeration involves a deep slitting action with a vibrating blade.

A number of drain lines were also incorporated. Their locations are shown in the plan and aerial view from the day of the investigation in Figure 2-5. The appearance of the drain lines is shown in Figure 2-6.

Figure 2-5 Drain lines incorporated and, R, their approximate location

Figure 2-6 Appearance of drain lines

These drain lines were associated with a system of 'vertical drains' whereby the pipework connected to a series of vertical columns excavated to varying depths and intended to facilitate the dispersal of water to deeper layers of the soil profile. It is assumed that linear aeration treatments, such as Earthquake, were oriented so as to discharge into these drain lines.

2.7 Ground cover – summer 2021

The works had resulted in a generally substantial restoration of ground cover across the site. A photograph compiled from 9 images of the eastern part of the Event area, that most intensively used, is shown in Figure 2-7 which illustrates this. The white flecks are artefacts of the compilation process.

Figure 2-7 Compilation photo of eastern section of Event area

The only area of persistent bare ground was noted in the vicinity of the entrance to the north. This had been used as a storage/compound area for the contractors undertaking the work and is shown in Figure 2-8.

Figure 2-8 Compound area to the north of the Event area

Ground cover across the site was observed and noted specifically at the locations shown in Figure 2-9 (Q42, Q58 etc).

Figure 2-9 Quadrat photo locations

Images of the quadrats at each of these locations are provided in APPENDIX 1 – QUADRATS. Examples are reproduced in Figure 2-10.

Figure 2-10 Quadrats 35 and 55

The quadrats showed the percentage ground cover indicated in Table 2-2. These gave an average ground cover of 88 %. In general, the shortfall in ground cover was of the form associated with recently sown grassland at the height of summer. It was noted that verti-draining had very recently been completed over some of the area.

Quadrat	Ground cover (%)
35	100
46	98
52	75
55	70
42	90
58	95
49	65
17	95
23	90
59	90
36	95

Table 2-2 Ground cover in each of quadrats (%)

2.8 Soil texture and structure

Soil samples were taken from the top 50 mm of the soil profile. Areas sampled included the amended area, to which sand/soil had been added and worked into the surface, unamended areas of the Event site and the sports pitches outside of the event site to the west.

Data on organic matter content and soil structure are indicated in Table 2-3 and on soil texture in Table 2-4.

	Field VMC (%)	Bulk density	Total porosity	pH
Amended	36.95	1.35	46.38	6.40
Unamended	31.41	1.36	45.84	6.20
Sports	32.60	1.35	45.96	6.90

Table 2-3 Soil structural characteristics and pH

	Sand	Silt	Clay	Organic
	%			
Amended	67	19	14	6.8
Unamended	62	24	14	6.9
Sports	71	18	11	7.6

Table 2-4 Soil textural characteristics and organic matter content

The ameliorative operations appear not to have made any marked difference to the sand content or structural aspects of the soil. The only significant feature of these data from a comparative point

of view is that the football pitches to the east contain a greater amount of organic matter in the surface. The values themselves, however, all show quite favourable characteristics. The soil structure, whether it has been improved by the work or not, is good; a total porosity of 46 % is very desirable.

Overall the soil is capable of supporting a reasonably vigorous and healthy ground cover provided the appropriate maintenance practices are carried out. Germination and establishment, as has been observed previously, should not be hindered by soil-related phenomena in general.

Figure 2-11 Eastern end of Event area from the south

3 DISCUSSION

Considered overall, the works undertaken recently have been very successful. Ground cover has been almost fully restored, levels are satisfactory and the condition of the soil, including infiltration rate, is good. These criteria are fundamental for the accommodation of intense levels of wear as would be brought about by the various events that are held on the site.

The case of the disappearing sand suggests that the material may have been blended with the existing topsoil to an excessive degree, effectively diluting it with the soil. While sand is almost always beneficial, it is most effective when concentrated near the surface of the profile. The blending process should ideally be kept to the minimum necessary to ensure good germination and establishment of subsequently sown seed. In circumstances where irrigation can be liberally and regularly applied, no blending at all is necessary and the greatest advantage of a substantial sand layer in the immediate surface may be obtained. In this case, irrigation is difficult to achieve and so it would have been prudent to incorporate a degree of blending. What would represent a suitable degree of blending is difficult to communicate without appropriate guidance on site and at the time. Soil structure and texture remain satisfactory, however, and so no harm has been done.

Being located at the base of the slope against the basketball courts to the east, the newly installed drain line will serve very effectively as a catchwater, intercepting surface runoff from the adjacent higher ground.

The western spur from this serves a less obvious purpose but will no doubt be helpful. In general, and apart from specific interception as with the eastern catchwater, pipe drains incorporated into the body of the site are unlikely to be hugely effective. This is because the great majority of the water arriving at the surface should percolate directly through to the subsoil. The exception may be in relation to an area to the south, indicated in Figure 3-1. Following the winter event of 2018/19, this area was very wet. Interestingly, the Google Earth image gives a suggestion of a linear feature in this locality, possibly an old land drain. This is an area to watch over the winter and, if a similar situation occurs, the installation of a carefully-located catchwater or similar drain may be appropriate to intercept the outpourings of this feature before they affect the wider site downstream of it.

Figure 3-1 Potentially persistently wet area

Other specific issues pertaining to the site in its present state include, of course, the need to re-establish ground cover on the entrance area, something it is understood is already in hand. More generally, a lighter over-seeding would be appropriate if resources allow, with the aim of raising the average ground cover, to the east especially, from the 88 % recorded here to closer to 100 %. Such over-seeding would ideally be timed for September/October – ie on receipt of this report, when there is no need to be concerned with irrigation but when soil temperatures remain sufficiently high to facilitate successful germination.

Having created a full and healthy ground cover and with the improved soil conditions that now exist, the intensity of maintenance required of the site should be determined on the basis of how much wear it is envisaged it should be subjected to. Renovation works will always be necessary in the immediate aftermath to almost all events but the aim of general maintenance should be such that those renovation operations need not be quite so extensive, expensive and disruptive as they may have been in the past. From my own experience, I would place the level of maintenance that the site should receive at that of a lower division football ground. Such grounds are usually established on natural soil profiles and do not have readily available irrigation systems but are nevertheless subject to periods of intense wear and compaction. It is the equivalent approach to their maintenance that is described in the following recommendations.

4 GENERAL MAINTENANCE

A suitable and ongoing maintenance programme should be all that is required to constitute a 'pre-event preparation' programme. Appropriately maintained, the site should be able to deliver a satisfactory surface for both winter and summer events without the need for any specific preparatory operations to be undertaken.

4.1 Mowing

Mowing should be undertaken using a cylinder gang mower of an appropriate size, preferably a self-propelling unit.

Mow up to three times a week, depending on the extent of growth taking place and at a standard height of 25 mm during the growing season. Keep the height of the sward down at or near this right through the winter by mowing as often as surface conditions allow and as the growth requires.

During periods of very vigorous growth, typically in late May or June, there is merit in lowering the height of cut slightly, say to 20 mm. This will help increase sward density and limit weed ingress. Areas subjected to intensive over-seeding or renovation should not be mown in this way and during periods of intense heat the more regular and greater mowing height should be adopted.

Vary the direction of mowing where possible. This is not simply to prevent a nap forming in the turf but also to limit localised compaction and turning wear. Watch out for accumulations of clippings that could smother the grass if left for more than a day or two. Remove these or otherwise break them up if they develop.

4.2 Aeration

Aim to verti-drain the site up to four times, between October and April. Use the largest available tines, preferably new ones with the machine set to achieve maximum heave. Reduce forward speed to achieve the greatest density of perforation. Ground conditions must be sufficiently firm to allow this but surface disruption may be corrected by carrying out a light rolling afterwards.

There may be a temptation to use a linear aerator such as the 'Ground Beaker' or 'Earthquake' on occasions and as an alternative to the verti-drain. This certainly achieves a good aeration effect but the procedure should not take place beyond the end of January at the latest. The slits created by these machines will tend to gape open in an unsightly and possibly hazardous manner as the soils dry in the spring.

4.3 Fertiliser

Start the growing season in mid-March with an application of a 12:6:6 granular fertiliser. These are widely available and a stock should be obtained for occasional stimulation of growth during the growing season when necessary. Apply at 35 to 50 g/m^2.

Follow this with an application of a 20:10:10 fertiliser in late April at 35 g/m^2. This will stimulate a great deal of grass growth which will need to be controlled by regular and frequent mowing throughout May and into June.

Through the remainder of the playing season two more applications of a 12:6:6 fertiliser, again at 35 g/m^2, will be appropriate. Apply before rain if possible.

It is particularly important that the site is able to take advantage of periods of mild weather during the winter. For this they will require the application of a slow release fertiliser in October or November. Suitable products may include Scotts Sierrablen Plus Stress Control (15:0:23) and Headland Xtend (22:2:8).

Note that *controlled release* products may be used for these applications during the growing season. These release nitrogen at a rate extended by the different particle sizes of the material, it taking longer for nitrogen to emerge from a large particle than a smaller one. The process is less temperature dependent than chemical *slow release* fertilisers and hence the prolonged effect can be maintained during warm periods. All such products are expensive, however, and the autumn treatment would be the one to retain if resources are limited, as they undoubtedly will be.

4.4 Weed Control

This should be carried out, if necessary, as soon as warmer temperatures return in the spring and begin to stimulate growth. Herbicide effectiveness is greatest during periods of vigorous growth. It may for example be enhanced by pre-treating the surface with fertiliser. Suitable herbicides must be applied strictly according to regulations and by a qualified person.

4.5 Over-Seeding

If general over-seeding becomes necessary, outside of the post-event renovation operations, I would favour the incorporation of fescues and smooth-stalked meadow-grass before August with fescues and dwarf perennial ryegrass being used in spring and late summer/autumn.

The operation may be made more successful if a hollow corer, rotary or, ideally, punch action, could be passed over the site prior to seeding. Sowing should then be accomplished using a disc seeder set to penetrate around 8 mm and making two or three passes at slight angles to one another.

General over-seeding should achieve an overall rate of 18 g/m^2 increasing to 25 g/m^2 in the more obviously thinner areas.

4.6 Divot Repair

This must be accomplished on an ongoing basis through the season as damage to the surface occurs during day to day use. Ideally, use a 60 : 40 blend of suitable sand and soil, or a proprietary rootzone material. Seed should be blended generously with the sand:soil mix at the time of application. The use of pure sand would not normally be advisable as this will not promote the maximum germination of grass seed. For these operations, use a seed mix containing 80 dwarf perennial ryegrass and 20 % fescue.

4.7 Top Dressing

In order to bring about a continual improvement in the performance of the site in the face of intensive usage, it would be advantageous to apply a medium coarse, lime free sand top dressing once each year. The whole site would of course benefit from this but, more economically, the same treatment may be applied to those areas that are known and anticipated to be most in need of this additional support.

Top dressings should take place at a rate between 6 and 10 kg / m^2 during the growing season, typically in September. Brush or drag mat the material into the surface after spreading.

4.8 Maintenance Calendar

A suggested maintenance programme is provided in Table 4-1. This is of course entirely flexible as it should be in response to varying ground and weather conditions and the demands of the site.

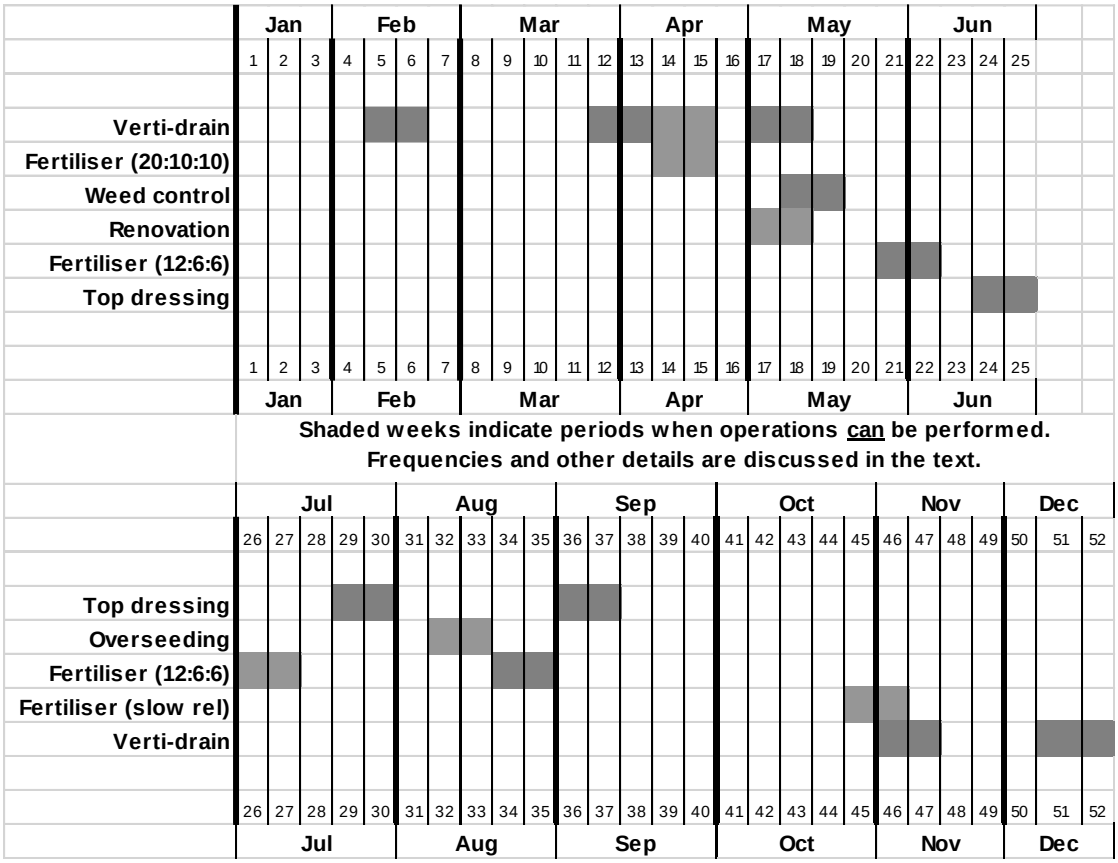

Table 4-1 Calendar of regular maintenance work

4.9 Advisory Support

Some very technical information has been presented in this report, particularly in relation to the selection of materials such as fertiliser, seed etc. Agrostis is on hand at all times for telephone/email advice so consideration of materials that have been sourced may be given rapidly.

Less predictable factors, such as the weather and the intensity of use, will always have an effect and good management will facilitate variation in the programme in response to these factors. In order to monitor this, the managers of the site should consider once or twice annual advisory visits at contrasting times of year in order to optimise the programme.

5 EVENT MANAGEMENT AND RENOVATION

Events tend to result in a mosaic of varying consequences for the ground cover arising as a result of footfall and item placement. This ranges from entirely unaffected retention of the existing conditions (probably over the great majority of the area) to small, isolated areas of possibly total ground cover loss. An important aspect of the planning of the events will be the location and extent of any ground protection, trackways etc, that are to be incorporated.

Renovation work will generally consist of compaction relief and soil preparation followed by the establishment of grass from seed. Subsequently the affected areas will need to be protected and maintained appropriately until they reach a state whereby they may be re-incorporated into the wider maintenance programme as described above.

5.1 Compaction relief

Where the ground is protected by appropriate trackway, and if the conditions remain dry throughout the period of the event, it is unlikely that compaction will be a significant problem. The most vulnerable areas will be where people congregate for longer periods, for example in front of stages and in the vicinity of the bars. In general, therefore, the laying down of as much ground protection as is possible will minimise this phenomenon. Ground protection cannot be located throughout the entire site, however, and some such disruption must be anticipated. The degree of that disruption will be related to the extent and duration of footfall taking place on them.

Figure 5-1 Intense footfall damage on close-mown area of amenity turf (Heaton Park, Manchester)

It follows, therefore, that the most intensive compaction relief operations will need to be carried out on those areas of the heaviest footfall. The verti-drain is undoubtedly the most effective means of relieving compaction in the aftermath of such circumstances. During the summer months, however, the ground may not be sufficiently penetrable with this machine until more moist conditions develop in the autumn. An example is shown in Figure 5-2 of a verti-drain fitted with 12 mm solid tines. Note that 18 or 25 mm tines would be more appropriate in this situation and the machine should be set to maximum heave action to achieve the greatest compaction-relieving effect.

Figure 5-2 Verti drain with 12 mm tines

5.2 Soil preparation

An extremely effective method of both relieving compaction and improving soil conditions in advance of the sowing of grass seed is the hollow coring of the areas concerned. Hollow corers are slower than verti-drain machines and so a more judicious selection of the areas to be treated may need to be employed. However the consequences for ground cover recovery are significant.

For the purposes, use a punch action aerator fitted with 18 mm cores and set to achieve the maximum density of perforation. Allow the cores to dry at the surface and break these up, if necessary, using a chain harrow or scarifier with blades set high.

To accelerate the re-establishment from seed it will usually be necessary to apply a pre-seeding fertiliser. Typically these are of analysis 7 : 7 : 7 or similar and the granular product should be distributed over the area to be seeded at a rate of 35 to 50 g/m^2.

5.3 Over-seeding

Given that the ground surface will usually be reasonably intact, a disc, as opposed to a dimple, seeder should be used to incorporate seed. Over-seeding should be accomplished with such a machine set to penetrate around 8 mm and making two or three passes at slight angles to one another.

General over-seeding should achieve an overall rate of 25 g/m^2 increasing to 35 g/m^2 in the thinner areas and 50 g/m^2 in areas of total ground cover loss.

A typical seem mix might consist of species composition (by weight) similar to that indicated in Table 5-1.

Perennial Ryegrass	Slender creeping red fescue	Chewing fescue
60	20	20

Table 5-1 Seed species and percentage (by weight)

The seed mix should be dominated by appropriate sports turf cultivars though I would favour the additional incorporation of smooth-stalked meadow-grass, up to 20 %, if sowing in July.

All cultivars of each species should of course be suitable for incorporation into sports turf. Seed mixtures should comply with the minimum standards set out in the Seed Regulations at the time of sowing.

5.4 Post-establishment maintenance

Unless ground cover has been reduced to less than, say, 80 % it may not be essential to close or fence off affected areas during the renovation procedure. In these situations, adequate recovery should be achievable within the general recommendations described above. Where ground cover losses have been more extensive, protection from further foot traffic should be put in place.

When the grass is no more than an average of 40 mm long, mowing should be carried out using sharp front-mounted rotary mowers. No more than 25 mm of the foliage should be removed. Repeat mowing on four further occasions with the blades set to cut at 30 mm allowing the grass to grow no taller than 40 mm with each topping.

The suitability of fertiliser applications will depend upon the time of year. Assuming renovation work is to take place during the growing season, at an appropriate stage during the rotary mowing period, supply and evenly apply a granular fertiliser with an analysis of 12:6:6 or similar. The fertiliser should be applied at a rate of 35 g/m^2 during a period when rainfall can be expected in the following 24 hour period.

Repeat this fertiliser on one further occasion prior to the removal of the fencing and the resumption of general maintenance practices.

5.5 Event management

Items of ground protection itself will have detrimental consequences for the underlying vegetation, albeit mainly of a temporary nature. The extent of this is related to the exact form of the protection used, and the length of time over which it is laid down. It has been observed that where even a small gap exists between the item placed on the ground and the ground itself, the damage to the vegetation is greatly reduced. This is due, presumably, to the additional air circulation that can be achieved in the immediate environment above the vegetation.

A scattering of smaller areas showing a range of consequences can be expected in association with the various structures and objects that are located across the site.

Figure 5-3 Ground conditions on removal of protection after about 16 days (Victoria Park, Tower Hamlets)

The extent of damage caused by item placement is also a function of the length of time over which it is laid down. If the event is of relatively short duration, items such as trackways and flooring may result in the weakening and etiolation of grass due to lack of sunlight rather than their death. Consequently, a full recovery can be expected to take place over most of these areas commencing as soon as the items are removed. Nevertheless, last minute laying down and prompt removal of items is to be encouraged in the interests of the ground cover.

Figure 5-4 Localised consequences of prolonged item placement (Victoria Park, Tower Hamlets)

Signed:

Dr Tim Lodge
Consultant

20 September 2021

6 APPENDIX 1 – QUADRATS

Figure 6-1 Quadrats 35 and 46

Figure 6-2 Quadrats 52 and 55

Figure 6-3 Quadrats 42 and 58

Figure 6-4 Quadrats 49 and 17

Figure 6-5 Quadrats 23 and 59

Figure 6-6 Quadrats 36