



March 2023

Sandvik Osprey Ltd

Soil Resource Mitigation Strategy

at

Junction 38, M4, Margam

**Beechwood Court,
Long Toll, Woodcote,
RG8 0RR**

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1 Introduction

1.1 Reading Agricultural Consultants Ltd (RAC) is instructed by Sandvik Osprey Ltd to produce a Soil Resource Mitigation Strategy (SRMS) for land at Junction 38 of the M4 at Margam.

1.2 Planning permission (Application No.: P2021/1255) was granted on the 18th February 2022 for:

“Full planning application of the development of a metal processing facility totalling 28,500sq.m of floorspace comprising a powder processing plant (17,377sq.m), warehouse and store (5,428sq.m), office building (1,422sq.m), amenity building (776 sq.m), laboratory (200 sq.m), services building (470 sq.m), substation (107 sq.m), phase 2 (2,700 sq.m), CCTV, storage tanks and plant, parking, servicing and roads and associated works. (Additional and Revised information including details of diversion of water main, Boundary treatment and Acoustic Fencing details, external lighting scheme, revised Noise Impact Assessment, Revised Health Impact Assessment, Revised Heath Impact Assessment and Air Quality Clarification Information).”

1.3 The permission was granted subject to 35 separate conditions, of which Condition 11 states that:

“Prior to the start of development on site, full details of a Soil Resource Mitigation Strategy shall be submitted to and approved in writing by the Local Planning Authority. The submitted scheme shall include details of recording, handling, storage and re-use both on-site and off-site and shall detail where any grassland and scrub is to be removed, measures to ensure that vegetation is cut to c. 100mm in height one week prior to soil stripping. The vegetation shall be cut with hand-held machinery (e.g. strimmers and chainsaws) to reduce the risk of crushing. A further cut to approximately 50mm shall take place after a period of not less than 48 hours. After a further 48 hours an ecologist shall hand search remaining habitat for the presence of reptiles or amphibians prior to the topsoil stripping and root removal. The hereby approved development shall be carried out in accordance with the approved details.

Reason.

To ensure appropriate soil management measures are implemented on site and that the development would have no adverse impact upon the site’s biodiversity and accords with policy EN6 of the Neath Port Talbot Local Development Plan.”

- 1.4 Policy EN6 of the Neath Port Talbot Local Development Plan relates to Important Biodiversity and Geodiversity Sites.
- 1.5 The planning condition and relevant policy are primarily concerned with ecology and biodiversity. This SRMS addresses the supporting soil aspects only that provide the platform for the site's biodiversity.

2 Existing Soil Resource

- 2.1 The site was subject to soil survey in November 2021 during which five soil cores and one soil pit were observed. The north-western field parcel was not included in the survey due to the presence of cattle at the time.
- 2.2 The survey found the topsoil to comprise sandy clay loam. The texture was verified by laboratory determination of particle size distribution. The depths ranged from 28cm to 35cm across the main field parcel, but was shallower in the north-eastern parcel at around 17cm. The average depth is 28cm. The colour is very dark greyish brown or dark brown (10YR3/2 or 10YR3/3 in the Munsell soil colour charts¹) and the volume of stone is low at between 2 and 8%. The topsoil has a friable consistency and a fine angular or subangular blocky structure within which many plant roots and worms were observed. In the north-eastern field, the surface layer of soil is notably more organic.
- 2.3 The upper subsoil comprises sandy clay loam which is dark greyish brown or brown (10YR4/2 or 10YR4/3). The stone content increases to 10-25% by volume. The structure is weakly developed, but with fine subangular or angular blocky peds and a friable consistency, the upper subsoil is permeable.
- 2.4 The stone content increases with depth, and additionally the subsoil was particularly dry at the time of survey, resulting in an average total observation depth of 46cm, ranging from 22cm in the north-east to 80cm in the west. The lower subsoil observed in the west comprises medium to coarse sandy loam which is light olive brown (2.5Y5/3).

¹ **Munsell Color (2009).** *Munsell Soil Color Book*. Grand Rapids, MI, USA

3 Scheme Soil Requirements

3.1 The approved strategic landscape plan (2181102-SBC-00-XX-DR-L-001 PL02) is reproduced below as Figure 1 and also attached in Appendix 1.

Figure 1: The approved Strategic Landscape Plan (source: Soltys Brewster Consulting)



3.2 For the purpose of assessing available soil resources, the site has been divided into three categories, as shown in Figure 2, also attached in Appendix 1:

- areas of build development that will generate topsoils for reuse (shown as orange in Figure 2);
- areas of marshy grassland that will be retained and managed (and will not be suitable for accepting additional soil resources) shown as pink in Figure 2; and
- the remainder of the site, comprising open areas and proposed habitats that may be suitable for accepting soil resources generated from the areas of built development (shown as yellow in Figure 2).

Figure 2: Categorisation of land use



- 3.3 The area of built development has been calculated as 48,117m² (4.8ha) of agricultural land for the siting of built aspects; 2,257m² (0.2ha) of wet grassland is to be retained in the north of the site; and 27,013m² (2.7ha) will be used for the new grassland, woodland and hedgerow planting.
- 3.4 The average topsoil depth at the site is 28cm, giving a total volume of available topsoil of approximately 13,473m³ to be removed from the footprint of the built development. The east of the site, where the proposed end-use is grassland, represents the most appropriate location for the siting of temporary soil stockpiles.
- 3.5 A volume of 13,473m³ of topsoil spread over an area of 27,013m² could be spread at an average of approximately 50cm. In parts, such as in the creation of permanent soil bunds, it would be appropriate to deepen this. The western, southern and eastern periphery of the site, encompassing the proposed built development including the car park in the east, extends to approximately 950m. A permanent soil bund of 950m length, 2m height and 4m width could contain approximately 7,600m³ topsoil.
- 3.6 Soil contained within a bund of only 2m height and 4m width would receive adequate airflow to retain aerobic conditions which is vital for the establishment and continued growth of plant

roots. Bunds may be seeded with more than simply grass, for example a clover or wildflower mix.

- 3.7 This would leave 5,873m³ to be respread over 23,213m² at an average depth of 25cm which will support other proposed grassland habitats and tree and hedgerow planting, such that there should be no need to export topsoil from site. It is not anticipated that any subsoil resource will be required for reuse on-site. Whether retained on-site or exported off-site, the same soil management principles apply.

4 Soil Management

- 4.1 There is one soil resource at the site. The topsoil can therefore be managed as one unit, as can the upper subsoil. The soil should be managed in line with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites² which is designed to help general construction industries and their contractors to achieve a good standard soil management when using various combinations of earth-moving machinery for soil stripping, storage and replacement.
- 4.2 The soil structures will be disrupted by handling and trafficking. To minimise any potential impacts, the soil will only be handled under appropriate conditions. Soil in a dry and friable state is least susceptible to damage by compaction and smearing. To avoid damage of soils on site, weather conditions will be continuously monitored, and site works will stop in line with the following criteria:
- if there is very light rain or drizzle, handling can proceed for up to four hours unless the soils are already in too moist a state (determined by field tests);
 - if there is normal rain, handling will cease if the rain has not stopped in 15 minutes;
 - if there is heavy rain (as from intense showers, slow-moving depressions) handling will stop immediately;
 - after rainfall has ceased, field tests will be applied to determine when handling may re-start.
- 4.3 The field tests used to determine the suitability of handling should be applied to soils from at least five locations in each area to be assessed. Records of all tests will be kept.

² DEFRA (2009). *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/716510/pb13298-code-of-practice-090910.pdf

4.4 The soils should be assessed as follows:

Table 1: Assessing suitability of soil for handling

Test	Outcome
If the soil sample is wet, films of water are visible on the surfaces of grains and aggregates and/or when a soil sample is squeezed in the hand and it readily deforms into a cohesive "ball"	NO HANDLING
Peds (structures) break up/crumble readily when squeezed in the hand rather than forming into a ball	HANDLING OK
If the sample is moist, there is a slight dampness when squeezed between the fingers, but it does not significantly change colour (darken) on further wetting	NO HANDLING BY DOZERS BUT MAY BE HANDLED BY TRACKED EXCAVATORS IF CONSISTENCY TEST (TABLE 2) IS PASSED
If the sample is dry and brittle it will look dry and change colour (darken) if water is added	HANDLING OK IF CONSISTENCY TEST (TABLE 2) IS PASSED

4.5 The consistency of the soil should also be assessed by first attempting to roll the soil into a ball by hand and then applying the following criteria:

Table 2: Consistency test

Test	Outcome
Impossible to mould a soil sample into a ball by hand because the soil is too hard (dry)	HANDLING OK
Impossible to mould a soil sample into a ball by hand because the soil is too loose (dry)	HANDLING OK
Impossible to mould a soil sample into a ball by hand because the soil is too loose (wet)	NO HANDLING
Possible to mould a soil sample into a ball by hand	GO TO TABLE 3

Table 3: Additional consistency test when sample can be moulded into a ball

Test	Outcome
Impossible to roll the ball into a thread of 3mm diameter on a flat non-adhesive surface using light pressure from the flat of the hand; the soil crumbles or disintegrates	HANDLING OK
Possible to roll the ball into a thread of 3mm diameter on a flat non-adhesive surface using light pressure from the flat of the hand	NO HANDLING

Soil Stripping

- 4.6 Planning Condition 11 specifies that one week prior to soil stripping, the vegetation shall be cut to a height of 100mm, and that not less than 48 hours later will be cut again to a height of 50mm, in order to facilitate investigations by the ecology contractor.
- 4.7 Following clearance from the ecology contractor, stripping of the topsoil may commence.
- 4.8 Stripping of the topsoil will initially occur along a pre-defined main haul route and the planned access routes to any stockpiles. Topsoil will also be stripped from beneath the proposed footprints of any subsoil stockpiles but is not necessary beneath topsoil stockpiles. During the stripping of the haul roads, the excavator will start closest to the stockpile location to minimise the trafficking on undisturbed soils.
- 4.9 Once the topsoil has been stripped from the haul routes, stripping can begin within the main site area. Excavators will operate along 5m wide strips (or according to the reach of the excavator arm) excavating topsoil. Stripped soils will be loaded into dump trucks and transported along the haul routes to the stockpile area.
- 4.10 Topsoil across the site will be stripped to a depth of 300mm. Every effort should be made to strip the full depth of the topsoil resource whilst taking care to not incorporate notable volumes of upper subsoil.
- 4.11 Any subsoil stripping will then follow using the same method.

Stockpile Formation

- 4.12 As much of the soil resource as is possible should be retained on site. The wet and marshy grassland areas that are to be retained in the final landscape strategy are not suitable for storage due to the requirement for heavy machinery to repeatedly track those areas. The woodland is similarly not suitable. Stockpiles will therefore be restricted to peripheral bunds.
- 4.13 Topsoil and subsoil (if required to be stripped) will be stored in separate stockpiles. During formation of the stockpiles, dump trucks will loose-tip the soil in heaps, starting at the furthest point in the storage area and working back toward the access point. When the entire storage area has been filled with heaps, a dozer (or other tracked machine) will level the heaps and firm the surface for a second layer of heaps to be tipped.
- 4.14 This sequence will be repeated until the topsoil stockpile reaches a height of up to 3m and a maximum side gradient of 1 in 2. Any subsoil stockpiles may be up to 5m in height. To help shed

rainwater and prevent ponding and infiltration the dozer (or other tracked machine) will compact and re-grade the sides and top of the stockpile to form a smooth gradient.

Stockpile Maintenance

- 4.15 Any soils that are to be stockpiled for more than 6 months shall be seeded with a low maintenance grass/clover mix to minimise the impact from soil erosion, dust, weed infestation and the oxidation of organic matter.
- 4.16 The management of grass cover and weeds will be undertaken during the summer months by spraying, mowing or strimming to prevent the weeds from shedding their seeds.
- 4.17 Stockpiles will be monitored for signs of ponding water. If ponding occurs, temporary drainage will be put in place or regrading of the stockpile will be required.

Reinstatement

- 4.18 Topsoils will be taken out of the stockpile using an excavator and loaded into dump trucks to be transported to the end destination, where it will be loose-tipped onto the subsoil or existing topsoil in areas not required to be stripped. Dump trucks shall only run-on designated haul routes. The topsoil will be levelled by a low ground pressure dozer or excavator restoring the topsoil to a pre-determined depth according to specific habitat type before seeding/planting.

Exported Soils

- 4.19 The same principles and care should be taken over the handling of any soils, including subsoils, to be exported off-site as to those retained on-site. The soil represents a valuable resource that could be used productively in a number of different applications, provided adequate soil health and conditions are maintained throughout the construction process.

Appendix 1: Plans



- Proposed Tree
- Proposed Native Woodland Mix
- Proposed Native Hedge Mix
- Proposed Meadow Mix
- Proposed Grass

Trees	Code	Latin Name	Common Name
T1		<i>Acer rubrum</i> 'Armstrong'	Red Maple 'Armstrong'
T2		<i>Alnus glutinosa</i>	Common Alder
T3		<i>Betula utilis</i> var. <i>jacquemontii</i>	Himalayan birch
T4		<i>Castanea sativa</i>	Sweet Chestnut
T5		<i>Quercus sylvatica</i>	Common Beech
T6		<i>Malus</i> 'Evereste'	Crab Apple 'Evereste'
T7		<i>Pinus sylvestris</i>	Scots Pine
T8		<i>Prunus avium</i>	Gean or Wild Cherry
T9		<i>Quercus robur</i>	Common Oak
T10		<i>Liriodendron</i> 'Streetwise'	Small Leaved Lime 'Streetwise'

Native Hedge Mix (HNM)

Note: Plant in a 1m prepared line, 6 plants per 1 linear metre in a double staggered row in the central 300mm zone. Plant in random groups between 3 & 5 of the

%	Latin Name	Common Name
10	<i>Cornus sanguinea</i>	Common Dogwood
20	<i>Corylus avellana</i>	Common Hazel
40	<i>Crataegus monogyna</i>	Common Hawthorn
5	<i>Ilex aquifolium</i>	Common Holly
5	<i>Lonicera periclymenum</i>	Honeysuckle
5	<i>Prunus spinosa</i>	Blackthorn
5	<i>Rosa canina</i>	Dog Rose
10	<i>Sorbus aucuparia</i>	Rowan

Meadow Mix

Code	Name	Specification
MM1	Seasonal flood tolerant meadow mix	Emergent Seeds EC1 Emergent Seeds SAB
MM2	Standard general purpose meadow mix	Emergent Seeds EC1 Emergent Seeds EM2

1	%	Latin Name	Common Name
5	1	<i>Alnus glutinosa</i>	Black Alder
10	1	<i>Betula pendula</i>	Silver Birch
5	3	<i>Cornus sanguinea</i>	Common Dogwood
10	3	<i>Corylus avellana</i>	Common Hazel
10	3	<i>Crataegus monogyna</i>	Common Hawthorn
5	3	<i>Ilex aquifolium</i>	Common Holly
5	3	<i>Malus sylvestris</i>	Crab Apple
5	3	<i>Pinus sylvestris</i>	Scots Pine
5	3	<i>Prunus padus</i>	Bird Cherry
15	3	<i>Quercus robur</i>	Common Oak
5	3	<i>Salix cinerea</i>	Grey Willow
10	3	<i>Sorbus aucuparia</i>	Rowan

Code	Name	Specification	Additional Information
MM1	Seasonal flood tolerant meadow mix	Emorsgate Seeds EC1	Sown at 2g/m ²
		Emorsgate Seeds EM8	Sown at 4g/m ²
MM2	Standard general purpose meadow mix	Emorsgate Seeds EC1	Sown at 2g/m ²
		Emorsgate Seeds EM2	Sown at 4g/m ²

[illegible]



Key

- Scheme boundary
- Proposed development including paved areas (48117m²)
- Existing landscaping to be retained (2257m²)
- Management area (27013m²)



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Title
LAND USE PLAN

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Ref
RAC/9209/3

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Date
03/2023