

**Ennor Farm, Old Town, St Mary's,
Isles of Scilly**

Outline Earthworks Specification

For



**Council of the
ISLES OF SCILLY**

Project Number: 13847

July 2022

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Contents

1.0	Introduction	1
1.1.	General	1
1.2.	The Site.....	1
1.3.	Site History	2
1.4.	Ground Conditions.....	2
2.0	Development Proposals	4
2.1.	Proposed Layout	4
2.2.	Proposed Topography	4
2.3.	Proposed Development.....	4
2.4.	Foundation Options	4
3.0	Outline Earthworks Requirements	6
3.1.	Site Preparation	6
3.2.	Site Won Soils.....	6
3.3.	Excavations	6
3.4.	Fill Type and Approval	7
4.0	Method of Compaction	8
4.1.	General	8
4.2.	Compaction Trials	11
4.3.	Compaction Methodology.....	12
4.4.	Compaction Criteria	13
	REFERENCES	14

APPENDIX A: Drawings

APPENDIX B: Tables From SHW Series 600

1.0 INTRODUCTION

1.1. General

- 1.1.1. This outline specification has been produced by Campbell Reith Hill LLP (CampbellReith) on behalf of the Council of the Isles of Scilly (the Client) to allow the Contractor to design the required earthworks necessary to achieve the performance criteria for land raising and development at the site.
- 1.1.2. This specification covers the performance requirements for:
 - i. The excavation and filling and land raising of the site to achieve the desired reprofiled site;
 - ii. the engineering behaviour of the land raising materials so as to provide a development platform for the site;
- 1.1.3. The Contractor is to be responsible for the earthworks covered by the Specification and is permitted to self-certify the works, in accordance with the requirements of the design.
- 1.1.4. This specification should be read in conjunction with the supporting information and other Specifications and drawings contained within the tender pack.

1.2. The Site

- 1.2.1. A site location is presented in Appendix A. The site is located just north of Ennor Farm, Old Town, St Marys, Isles of Scilly with an approximate post code of TR21 0NL. The site is centred at approximate National Grid Reference 91440E and 10460N.
- 1.2.2. Land to the west and north are of agricultural use. Old Town Inn, a public house with garden, is located on the southern boundary of the site. Old Town Lane (A3112) lies immediately adjacent and runs along the eastern boundary of the site. Two residential dwellings lie approximately 25m to the east and southeast of the site. A significant area of natural wetland was observed c.30m NW of the site during a walkover in December 2019. A pumping station and potential well (Castle Rocks Well) are located c.25m WSW of the site.
- 1.2.3. The site is broadly trapezoidal in shape with an area of approximately 0.5ha and comprises a grassed field that is used for grazing livestock. An access to the field from Old Town Lane is currently located in the south-eastern corner of the site and the access track continues along the southern boundary of the site to provide access to the adjacent residential property in a converted barn (Ennor Castle Barn). Low stone hedges (drystone) mark the boundaries of the site. The northern and western boundaries have semi-mature trees growing on them.
- 1.2.4. The site is at an elevation of between c.3.3m to c.8.5m OD and slope from the east, south east and south towards the north western corner. The north-western corner is low lying (c.3.3m OD) and was observed with some localised standing water / flooding during a walkover visit undertaken in December 2019. The site is at a slightly higher level than the field and land to the north (c.2.9m OD). No permanent surface water features were observed on the site during the site walkover.
- 1.2.5. An overhead power cable follows the southern part of the western boundary and then at the halfway point along the western boundary passes diagonally across the field to the middle part of the northern boundary.

- 1.2.6. A small pile of stones and a manhole are located in the south-eastern corner of the site and are reportedly part of a drainage feature (manhole to soakaway or septic tank) for the dwellings to the east of the site.

1.3. Site History

- 1.3.1. Map records show the site has been used for agricultural grazing since 1890 with open land to the north, west and east and the village of Old Town to the south. Current and historic agricultural uses include a potential soakaway / cess pit in the SE corner of the site. Offsite features include small fuel tanks (c. 100m SW) a quarry (c.70m NE) and modifications to the Lower Moors wetland's drainage, which may include unrecorded infilled ground (c.50m NW).

1.4. Ground Conditions

- 1.4.1. Intrusive site investigations were carried out by Wheal Jane Consultancy in January 2020 and the data was interpreted by CampbellReith [1].
- 1.4.2. The ground conditions encountered during the investigation generally consisted of Topsoil over Superficial Head deposits, with Granite bedrock interpreted to underlie the superficial soils.
- 1.4.3. The Head deposits comprised varying mixtures of clay, silt, sand and gravel, with the gravel component comprising granite. SPT N60 values ranged from 2.5-21. Modified plasticity index results indicated negligible volume change potential as per NHBC Guidance.
- 1.4.4. A greater thickness of Head was encountered on the north and west sides of the site, and the soil horizons at the base of this unit generally contained a higher gravel component than the overlying horizons. The higher proportion of gravel is considered to be due to the incorporation of weathered material from the underlying granite bedrock.
- 1.4.5. Although not directly sampled or recovered from any of the boreholes, Granite was interpreted to be present below the Head in all exploratory hole locations. This was based on very high SPT N60 values of between 61 and 101, which prevented further progress of the exploratory holes.
- 1.4.6. The general distribution of each stratum is shown in Table 1.1.

TABLE 1.1: Soil Profile

Stratum	From		To		Typical Thickness (m)
	(m bgl)	(m OD)	(m bgl)	(m OD)	
Topsoil	GL	6.80	1.10	2.80	0.70
Superficial - Head	0.50	6.12	3.75	0.25	3.00
Bedrock - Granite	2.05	3.84	Not proven		Not proven

- 1.4.7. Groundwater was encountered in all exploratory holes apart from WS05, ranging from 0.70-3.20m bgl, and was generally encountered at a level of 3.00m OD.
- 1.4.8. The following geotechnical hazards were identified from the investigation:
- Shallow groundwater level;
 - Soft or loose ground to depths up to 2.0m;

- Running sands;
- Sloping ground.

2.0 DEVELOPMENT PROPOSALS

2.1. Proposed Layout

- 2.1.1. The current proposed development plan [2] is presented in Appendix A.

2.2. Proposed Topography

- 2.2.1. Site levels are proposed to be raised due to the sloping nature of the site and to allow for proposed roads to tie into the existing road to the east. The maximum raise in levels is anticipated to be c1.0-1.5m. Limited to no cut works are anticipated during the earthworks, with the exception of a topsoil strip.
- 2.2.2. A plan showing the proposed levels and contours for the site [3] is presented in Appendix A and reference is made to a Technical Note on Preliminary Cut and Fill Analysis (assumed on the basis of shallow foundations being used) [4].

2.3. Proposed Development

- 2.3.1. The Proposed Development comprises an outline planning application for 12 detached and semi-detached self-build homes with appearance as a reserved matter (Major Development). The type of foundation to be used was unknown at the time of writing.
- 2.3.2. The Client received Outline Planning Permission (ref: P/21/002/OUT) for the Proposed Development on the 13th April 2021.
- 2.3.3. It is assumed that the self-build homes will comprise low-rise detached and semi-detached housing of traditional construction. Plot Passport drawings show the approved development Build Zones.
- 2.3.4. Retaining walls of up to 1.0m in height are proposed to accommodate level changes [3]. No information has been provided regarding the form or design of these retaining walls, which will be a contractor designed element as well.

2.4. Foundation Options

- 2.4.1. An assessment of possible foundation solutions was included in the LQS [1] produced by CampbellReith in January 2021. Based on the available preliminary ground investigation data, an allowable bearing capacity of 40kN/m² was recommended for shallow foundations (pads, strips or rafts) between 0.60m and 1.50m wide, placed at a minimum depth of 1.50m bgl.
- 2.4.2. The proposed development will comprise low-rise residential dwellings for which a nominal bearing capacity of 100kPa is assumed to be required to support them. On this basis, the natural shallow ground will not provide a suitable bearing capacity for shallow foundations to be used. Two potential foundation options considered suitable for the site are:
- Ground improvement in conjunction with a shallow foundation solution. This is discussed further in Section 4.0 below.
 - Piled foundation. Bored piles, with piles socketing into the Granite bedrock, are considered appropriate, however further investigation of the Granite bedrock would be required to confirm the available bearing capacity. Driven piles may also be suitable for

the site. The advice of reputable piling specialists, experienced in the ground conditions considered here, should be sought. They should be responsible for the selection of appropriate piling equipment and the final design of the piles.

3.0 OUTLINE EARTHWORKS REQUIREMENTS

3.1. Site Preparation

- 3.1.1. Topsoil shall be stripped and, where required for further on-site use, stockpiled in a designated area.
- 3.1.2. Stockpiles of topsoil shall be formed in accordance with guidance provided by DEFRA 'Construction code of Practice for the Sustainable Use of Soils on Construction Sites (2009)' and research carried out by non-statutory bodies, which suggests that optimum stockpiles of topsoil shall not exceed 1.3m in height and that topsoil shall not be stockpiled for more than 1 year.
- 3.1.3. On completion of a stockpile the slopes shall be trimmed to falls to shed rainwater and the surface sealed via compaction to limit infiltration. Temporary drainage shall be provided at the base of the stockpile to collect runoff from the stockpile and to carry any surface water away from the base of the stockpile.
- 3.1.4. Following the topsoil removal, the formation level should be inspected to ensure organic material such as tree roots, and other unacceptable material as defined by the SHW, have been removed.

3.2. Site Won Soils

- 3.2.1. As mentioned previously, limited to no cut in natural soils is anticipated. However, if such is undertaken locally, the material excavated from these areas may be suitable for re-use as engineered fill to raise levels elsewhere on site.
- 3.2.2. Excavated soil is likely to comprise Head deposits formed of mixtures of clay, silt, sand and gravel, and is considered suitable for re-use as engineered fill subject to appropriate classification testing.

3.3. Excavations

- 3.3.1. Excavations may be readily completed using conventional excavation plant. Shallow excavations are not likely to remain stable unsupported during construction, due to the presence of loose sandy Head deposits and the local presence of groundwater near the ground surface. Any open excavations will deteriorate rapidly in the presence of water, therefore all excavations should be protected from rain and surface run-off.
- 3.3.2. As the stability of excavation faces in Head deposits cannot be relied on, an allowance should be made for battering faces back to a safe angle of repose, or the provision of shuttering. Support or battering of the excavation faces to a safe angle of repose will also be required for all excavations where man entry is necessary, the nature and extent of which will need to be evaluated under CDM Regulations.
- 3.3.3. Pumping of groundwater for any shallow excavations should be allowed for during construction especially towards the northernmost areas of the site. The loss of fines should be prevented as this may lead to running sand conditions.
- 3.3.4. Notwithstanding the above, based on the proposed levels and contours plan [3] it is expected that, overall, material will need to be imported to site in order to achieve the proposed site levels.

3.4. Fill Type and Approval

- 3.4.1. The earthworks to raise site levels should be undertaken in accordance with Series 600 of the Highways England Specification for Highways Work (SHW) [5].
- 3.4.2. The following types of fill are therefore considered suitable for raising site levels:
- Class 1 General Granular Fill.
 - Class 2 General Cohesive Fill.
- 3.4.3. Soils imported to site for use as an engineered fill shall be subject to Source Approval testing to characterise the fill and confirm its suitability for use.
- 3.4.4. It is understood that crushed concrete has already been imported to the site for use in the earthworks. This material will also require confirmatory testing to check its class and compaction requirements.
- 3.4.5. The Contractor shall provide the following test results for each Fill source to be used at the site:
- 1) Water content (BS1377: Part2: 1990: Section 3);
 - 2) Liquid and plastic limits for cohesive soils (BS1377: Part 2:1990: Sections 4 and 5);
 - 3) Compaction tests to determine maximum dry density and optimum moisture content at the appropriate compaction effort (2.5 and 4.5kg rammer - BS1377: Part 4:1990: Section 3);
 - 4) Particle density (specific gravity) to assist in evaluating the compaction test (BS1377: Part 2:1990: Section 8); and,
 - 5) Particle size distribution (PSD) by the wet sieving method to give the distribution of particle sizes down to fine sand and the percentage of fines (BS1377: Part 2:1990: Section 9.2).
- 3.4.6. The CL:AIRE Register of Materials could be considered as a way of locating fill to import to site, with such sourcing of fill potentially being a more sustainable route when compared to going to a supplier e.g. sourced more locally, promoting re-use of surplus material offsite that would have been otherwise landfilled etc.

4.0 METHOD OF COMPACTION

4.1. General

- 4.1.1. The engineered fill shall be placed in layers and compacted in accordance with Tables 6/1 to 6/4 of Series 600 of the Specification for Highways Works (SHW). These tables are presented in Appendix B for reference.
- 4.1.2. The fill should be placed in accordance with an End Product Specification, to achieve the appropriate characteristics to support the development.
- 4.1.3. Geotechnical and chemical testing requirements and frequencies are presented in Table 4.1 and 4.2 below.

Table 4.1 Geotechnical Testing Requirements and Frequency Summary

Description	Test Type	Frequency / Number	Comments
1. Source Approval For all site-won and imported material, including the concrete crush already imported to site.	Water content	5 per source	Adding lime, cement etc. to improve workability renders the material a new source and source approval testing is needed for each admixture.
	Liquid limit & plastic limit	5 per source	
	Particle Density	5 per source	
	Compaction test using 2.5kg rammer to determine maximum dry density and optimum moisture content	3 per source	
	Compaction test using 4.5kg rammer to determine maximum dry density and optimum moisture content	3 per source	
	Particle size distribution by wet sieve method.	5 per source	
	Chemical testing as Table 4.2	5 per source	
2. Site Trials A separate trial is required for each material source. Tests to be carried out after each set of 6, 8 and 10 passes of selected compaction plant.	Water content	5 per source	
	Liquid limit & plastic limit	5 per source	
	Particle Density	5 per source	
	Compaction test using 2.5kg rammer to determine maximum dry density and optimum moisture content	3 per source	
	Compaction test using 4.5kg rammer to determine maximum dry density and optimum moisture content	3 per source	
	Particle size distribution by wet sieve method.	5 per set of passes, per source	
	Bulk Density (sand replacement)	3 per set of passes, per source	
	Water content (laboratory test)	3 per set of passes, per source	
	Bulk Density (nuclear density gauge)	3 per set of passes, per source	
	Water content (nuclear density gauge)	3 per set of passes, per source	
3. Control testing of Earthworks	Liquid limit & plastic limit	1 per 500m ³	
	Particle size distribution by wet sieve method.	1 per 500m ³	
	In situ bulk density (nuclear density gauge)	Minimum 1 per 500m ³ of placed fill (extra testing if required in visually doubtful areas or previously failed areas).	
	In situ water content (nuclear density gauge)	As above	
	In situ bulk density (sand replacement test)	1 per 100m ³	
	Water content	1 per 100m ³	
	Compaction test using 2.5kg rammer to determine maximum dry density and optimum moisture content	1 per 500m ³	
	Compaction test using 4.5kg rammer to determine maximum dry density and optimum moisture content	1 per 500m ³	
	Particle Density	1 per 500m ³	
	pH (U), Total SO ₄ (U), W/S SO ₄ (U), and Total S (U)	1 per 500m ³	
	Chemical testing as Table 4.2	1 per 250m ³	
	Bearing capacity	3 per Plot Build Zone	
4. Road Pavement Formation	Plate tests	1 per 25m length of road formation	

Table 4.2 Chemical Testing Soil Limiting Values (Residential End Use with Private Gardens)

Substance		Max Soil Concentration (mg/kg)
Metals and cyanide		
Arsenic		37 ^A
Beryllium		1.7 ^A
Cadmium		22 ^B
Chromium (Total)		910 ^A
Copper		200 ^D
Inorganic Mercury (Total)		42 ^A
Selenium		270 ^A
Nickel		110 ^D
Lead		200 ^B
Vanadium		480 ^A
Zinc		300 ^D
Cyanide (Total)		24 ^C
Asbestos		
Asbestos		<0.001%
Asbestos containing material		not present
BTEX		
Benzene		0.20 ^A
Toluene		160 ^A
Ethylbenzene		50 ^A
Xylene (total)		59 ^A
Phenolics		
Phenol (total)		130 ^A
Polycyclic Aromatic Hydrocarbons		
Naphthalene		2.3 ^A
Acenaphthylene		190 ^A
Acenaphthene		230 ^A
Fluorene		180 ^A
Phenanthrene		100 ^A
Anthracene		2,600 ^A
Fluoranthene		310 ^A
Pyrene		670 ^A
Chrysene		16 ^A
Benzo(a)anthracene		7.4 ^A
Benzo(b)fluoranthene		2.6 ^A
Benzo(k)fluoranthene		78 ^A
Benzo(a)pyrene		5.0 ^A
Indeno(123-cd)pyrene		28 ^A
Benzo(ghi)perylene		320 ^A
Dibenzo(ah)anthracene		0.2 ^A
Total Petroleum Hydrocarbons		
TPH	EC>5-10	27 ^E
	EC>10-12	81 ^E
	EC>12-16	160 ^E

Substance	Max Soil Concentration (mg/kg)	
	EC>16-21	290 ^E
	EC>21-40	1,100 ^E

Notes: All values above assume 1% Soil Organic Matter (SOM). ^AS4UL for Residential end use with p/u. ^BC4SL for Residential end use with p/u. ^CSoBRA Acute Risk GAC. ^DBS3882:2015 Topsoil Requirements (assuming pH>7.0). ^ES4UL for Residential end use using lowest value for aliphatic/aromatic hydrocarbon fraction. Other requirements: all soils must be free from metal, plastic, wood, glass, bitumen macadam, paper, odours and organic matter (except within topsoil) and shall be sorted into an appropriate size fraction and comply with the requirements of the landscaping specification. Maintain the following records: a description of the source, type and quantity of material, documentation to demonstrate legality and a non-waste status of materials, analytical testing records that show suitability of the material. Sample storage and handling – All samples should be placed in prepared, analysis specific sample jars/bottles and labelled with sample record details, sample ID, time and date of collection. Each sample shall comprise a plastic tub, amber vial and volatile jar or methanol preservative vial, supplied by the laboratory. Ensure that all samples are stored and transported in a suitable manner for sample preservation. The analysis laboratory shall have UKAS accreditation for each of the test types required. The test data sheets shall show Limits of Detection, Laboratory accreditation to BS EN ISO/IEC17025:2000 and other supporting information if requested. All samples shall be retained by the specialist under suitable/refrigerated conditions for a period of one month after receipt of the final report by the Engineer. Asbestos analysis must be to HSG 248.

- 4.1.4. As described above, chemical testing of site won or imported soils for reuse on site should be a minimum of 5 tests per source or 1 test per 250m³.

4.2. Compaction Trials

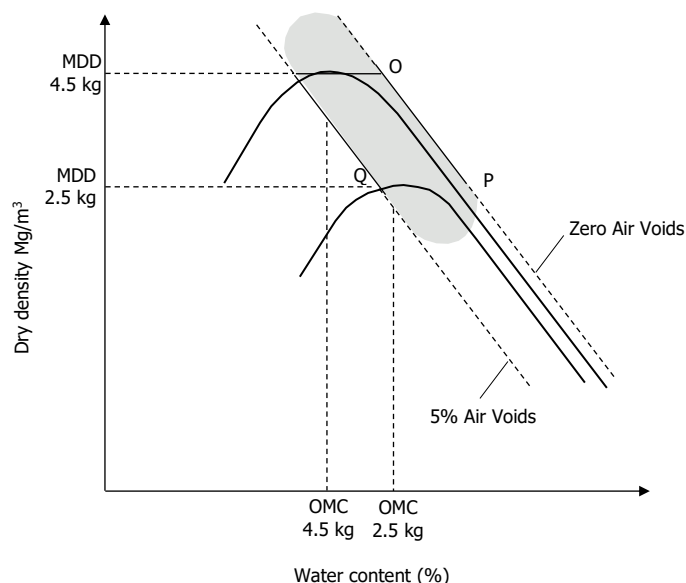
- 4.2.1. Since a method of compaction is to be established for each Fill type, site trials shall be carried out to confirm the method(s). A separate compaction trial shall be carried out for each type of Fill to be used on the site.
- 4.2.2. A sufficient quantity of each type of material shall be used to lay a 10m × 4m × approximately 0.3m thick trial layer on a previously rolled horizontal area of the site. Any soft spots in the subgrade below the trial layer shall be removed and replaced with compacted granular material. A guide to the thickness of layer that may be suitable for compaction end product requirements based on the material classification and proposed compaction plant can be obtained from Table 6/2 and 6/4 in Appendix 2 of this Specification (they are extracts from DoT Specification for Highway Works Series 600 Earthworks - Tables 6/2 and 6/4 and are included for guidance only – actual thicknesses and number of passes shall be obtained from the trials).
- 4.2.3. The trial shall be conducted using the same compaction plant as proposed for the main compaction works.
- 4.2.4. Bulk density determinations shall be carried out at 3 locations to give density and moisture content determinations after 6, 8 and 10 passes of the roller using;
- Sand replacement test (BS 1377: Part 9: Section 2)
 - Nuclear density gauge (BS 1377: Part 9: Section 2)
- 4.2.5. Water content shall be determined at the same locations by;
- Laboratory testing (BS 1377: Part 2: Section 3)
 - Nuclear density gauge BS (BS 1377: Part 9: Section 2)
- 4.2.6. Calibration shall be undertaken in accordance with BS 1377: Part 9: Section 2.
- 4.2.7. Tests shall be performed as soon as is practical after placement so as to prevent changes in moisture content that could affect results.

- 4.2.8. Three laboratory determinations of particle density, grading and Atterberg Limits (if applicable), shall be carried out for each type of material (as specified in Table 4.1).
- 4.2.9. Graphs of dry density against number of passes shall be drawn from:
- Sand replacement and laboratory water content results.
 - Nuclear density meter results.
- 4.2.10. The number of passes required to achieve more than 95% (4.5 kg rammer) or 98% (2.5 kg rammer) of the maximum dry density in the field trial and less than 5% air voids at the in-situ moisture content shall be determined.
- 4.2.11. As a guide, the number of passes derived in Section 4.2.9 above should be equal to or greater than the number derived from Tables 6/2 and 6/4 of Series 600 of the SHW in Appendix 2 based on the selected compaction plant and material classification. The number of passes derived from the site trial shall form the method of compaction for that type of material and the specific plant used in the trial at the in-situ water content.
- 4.2.12. If it is shown that 5% or less air voids cannot be achieved during the site trial, then the site trial shall be repeated with different conditions, i.e. heavier or different type of roller and/or increased/decreased moisture content and/or thinner layer.
- 4.2.13. If the source for the Fill material alters, and a new material is therefore proposed for use, a site trial shall be performed on the new material to demonstrate that it can be compacted satisfactorily before this material is used in the works.

4.3. Compaction Methodology

- 4.3.1. Data from the laboratory testing described in points 1) to 5) from 3.4.45 above, shall be used to create a graph as illustrated in Figure 4.1 below.

Figure 4.1: Basis for End Product. Compaction curves for 2.5kg and 4.5kg rammer methods. Water contents and dry densities, when plotted are to fall within the shaded area



- 4.3.2. The graph will show: dry density plotted against moisture content for the 2.5kg and 4.5kg rammer method compaction tests; the corresponding optimum moisture contents and maximum dry densities; and the 0%, 5% and 10% air voids lines.
- 4.3.3. By reference to the shaded area illustrated on Figure 4.1, the required level of compaction will be indicated by selecting appropriate moisture content and dry density values to achieve the level of compaction described below, since these shall form the basis of the End Product Compaction Specification.
- 4.3.4. Where fill is to be constructed on ground with a slope exceeding 1:8, benching of the existing slope shall be formed as per the SHW. Bench heights are to be a multiple of the relevant compaction layer thickness with the maximum vertical height of each bench not exceeding 500mm.
- 4.3.5. Additional considerations relating to ground contamination or environmental matters may need to be taken into account by the earthworks contractor. This should be taken into consideration with any remedial work that is undertaken prior to raising site levels, to address land quality and contamination.

4.4. Compaction Criteria

- 4.4.1. Following compaction, the engineered fill should achieve a minimum relative compaction of 95% of the maximum dry density, as determined from **4.5kg** Proctor Hammer testing, with a maximum air voids content of 5%. No single dry density shall be <93% MDD and no more than 25% shall be between 93 and 95% MDD. No single air void content shall be >10% and no more than 25% shall be between 5 and 10%.
- 4.4.2. In addition to the above, the engineered fill should achieve a minimum relative compaction of 98% of the maximum dry density, as determined from **2.5kg** Proctor Hammer testing, with a maximum air voids content of 5%. No single dry density shall be <95% MDD and no more than 25% shall be between 95% and 98% MDD. No single air void content shall be >10% and no more than 25% shall be between 5 and 10%.
- 4.4.3. Confirmation of the available bearing capacity at the top of the completed engineered fill platform will be required, with a minimum of 3 locations tested within each of the Plots' Build Zone.
- 4.4.4. Plate bearing tests at road pavement formation level must be undertaken along all road pavements, at no greater than 25m spacing, to confirm a minimum CBR value of 5% has been achieved.
- 4.4.5. Compaction, available bearing capacity and road formation CBR is to be demonstrated through in situ validation testing and reported in a verification report.
- 4.4.6. In-situ validation testing will also be required in line with the design/specification of specific components of the development
- 4.4.7. Fill to retaining structures is to be constructed as per retaining wall designs. Similarly, road sub-base build up is to be constructed in accordance with the civil engineer's design.

REFERENCES

Reference No	Reference Details
1	Land Quality Statement by CampbellReith, ref. 13394-CRH-XX-XX-RP-LQ-LQS-0001_P02, rev P02, dated January 2021
2	Drawing ref. SC-KT-XX-XX-DR-A-2002-S0-SK100, rev P8, dated 10/05/2022 Site Plan As Proposed
3	Drawing by CampbellReith, ref. 13847-CRH-XX-XX-DR-C-5000, rev P3, dated 11/03/2022 Proposed Levels and Contours Plan
4	Technical Note – Preliminary Cut & Fill Analysis by CampbellReith, ref. 13847-CRH-XX-XX-RP-C-0004, rev P1, dated 28/02/2022
5	Highways England (2016), The Manual of Contract Documents for Highway Works, Volume 1, Specification for Highway Works, Series 600, Earthworks

Appendix A: Drawings



Ennor Farm, St Mary's
Client: Council of Isle of Scilly

Figure 1:
Site Location Plan

Scale: 1:10000@A4
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Contains Ordnance Survey data © Crown copyright and database right 2021.
Job Number: 13394
Drawn by - Checked by: RP/RLF - AD/TT
Drg No - Status/Revision: 13394-CRH-XX-XX-FG-G-7000 - P2
File location: \\red-data1\gis-data\13250 - 13499\13394 B - Ennor Farm St Mary's\Project_Workspaces\DTs (pdf in Outputs)
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PLOT	ILLUSTRATIVE HOUSETYPE	NUMBER OF BEDS	*SEMI/ DETACHED
01	TYPE A/B	2B4P	DETACHED
02	TYPE A/B	2B4P	DETACHED
03	TYPE E	2B4P	DETACHED
04	TYPE A/B	2B4P	DETACHED
05	TYPE E	2B4P	DETACHED
06	TYPE E	2B4P	DETACHED
07	TYPE A/B	2B4P	DETACHED
08	TYPE E	2B4P	DETACHED
09	TYPE A/B	2B4P	DETACHED
10	TYPE E	2B4P	DETACHED
11	TYPE D	2B4P	SEMI DETACHED
12	TYPE D	2B4P	SEMI DETACHED

*SEMI/ DETACHED - Plots are to be detached or semi detached in accordance with the site plan and plot table above.

Scale, materiality and form are to be informed the the Design Code.



Contractors to check all dimensions on drawings.
Any discrepancies must be reported to KTA or the contract administrator before proceeding.
Do not scale from planning drawings, work to figured dimensions.
This drawing must be read in conjunction with all relevant consultants drawings.
This drawing is © KTA.

Revision Schedule			
Revision Number	Revision Date	Revision Description	Issued/ Authorised by
P8	MAY 2022	Added-plot levels,ret walls,moved AC pumping station, adjusted allot. beds, main parking area adjusted	MC/AC
P7	MAR 2021	PLANNING-Reduced to 12 Plots to ease HENG. issue	MC/AC
P6	FEB 2021	Post Planning 12 Plots	MC/AC
P5	JAN 2021	PLANNING ISSUE	MC/AC
P4	JAN 2021	DRAFT PLANNING ISSUE - HOME ZONE	MC/AC
P3	JAN 2021	DRAFT PLANNING ISSUE	MC/AC
P2	NOV 2020	DRAFT ISSUE - Foul pumping station added	MC/AC
P1	JULY 2020	DRAFT ISSUE	MC/AC

Existing tree/ grouping
Refer to Arboricultural
Impact Assessment for
further detail

Tree/ grouping
removed
Refer to Arboricultural
Impact Assessment for
further detail

Proposed tree

Proposed landscaped
stone hedge bank

Proposed communal
space/ landscaping

Proposed front garden

Proposed back garden

Proposed home zone/
parking

Proposed landscaped
path

Plot levels derived from Campbell Reith (CR) Engineers. Refer to CR drawing for all levels and externals within plots and site wide.

PLANNING
ISSUE

KTA

Architects | Urban Designers

Kensington Court, Woodwater Park, Pynes Hill,
Exeter, EX2 5TY

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Web: www.kta.uk.com

Project
Ennor Farm

Title
SITE PLAN AS
PROPOSED
DRAFT ISSUE Author AC/MC Checked by AC

Date 10/05/2022 13:18:15 Scale As indicated @ A1

Project 2002 Status Pre Construction

Drawing number
SC-KT-XX-XX-DR-A-2002-S0-SK100 -P8

1. Do not scale from this drawing on print or electronically. Work from figured dimensions only.
2. No deviation from the details on this drawing is allowed without CampbellReith's prior permission in writing.
3. Read this drawing with all Architect's, Service Engineer's and CampbellReith's relevant details, specifications and drawings.
4. All work is to be done in accordance with the relevant specifications issued by CampbellReith, British Standard Codes of Practice, Statutory Requirements and the Contract Documents.

5. Drawing revision:
- | | |
|-----------------------|---|
| P: Preliminary | Evolving drawings for approvals, tenders, billings etc. |
| C: Contractual | Drawings authorized and approved for stage completion
i.e. Stage-Tender or Stage 5-Construction. |

Work in progress

S0 - Initial status

Shared (Non-contractual)

S1 - Suitable for coordination, **S2** - Suitable for information, **S3** - Suitable for review and comment, **S4** - Suitable for stage approval.

Published (For contractors purposes)

A1, Aa etc - Authorised and accepted ('n' relates to work stages)

B1, Bn etc - Partial sign-off (with comments)

CR - As constructed record document (Final Construction ONLY. Any deviations to that which is on site is not the liability of CampbellReith)

2 - Concept, 3 - Definition, 4 - Design, 5 - Build & commission, 6 - Handover

8. Only drawings with **revision Cn** and **status A5** to be used for Construction.

9. Existing survey Survey DOC1701A by Nationwide Surveys received on 01/10/2020

10. Site layout based on 2002-SK100 P7. CampbellReith layout changes subject to approval

11. Specification and details of tanking, underbuild and DPC is subject to design by the plot developer's architect.

CampbellReith
consulting engineers

Job Title

Ennor Farm

Client

The Council of the Isles of Scilly

Drawn by	Date made	Scale @ A1	Checked by	Suitability	CR Project
JA	11/03/22	1:200	FN	S2	13847

Appendix B: Tables from Series 600

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
GENERAL GRANULAR FILL	1	A	–	Well graded granular material	General Fill	Any material, or combination of materials, other than material designated as Class 3 in the Contract. (Properties (i), (ii) and (iv) in next column, shall not apply to chalk). Recycled aggregate. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates); A (construction and demolition recycling industries); B1 (municipal incinerator bottom ash (MIBA)); D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) E (non ferrous steel industry – except E2 molybdenum slag) G (mining and quarry industry)	(i) grading	BS 1377: Part 2 or BS EN 13242	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	1	A	–
							(ii) uniformity coefficient	See Note 5	10	–				
							(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iv) MCV	Clause 632	App 6/1	App 6/1				
							(v) IDD of chalk	Clause 634	–	App 6/1				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
G E N E R A L	1	B	–	Uniformly graded granular material	General Fill	Any material, or combination of materials, other than chalk. Recycled aggregate Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except chalk); A (construction and demolition recycling industries); B1 (municipal incinerator bottom ash (MIBA)); C1 (coal fly ash) C4 (coal bottom ash) D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) E (non ferrous steel industry – except E2 molybdenum slag) F (foundry industry) G (mining and quarry industry) H1 (dredge spoil sand)	(i) grading	BS 1377: Part 2 or BS EN 13242	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	1	B	–
	(ii) uniformity coefficient	See Note 5	–	10										
	(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1										
	(iv) MCV	Clause 632	App 6/1	App 6/1										
R F I L L	1	C	–	Coarse granular material	General Fill	Any material, or combination of materials, other than material designated as Class 3 in the Contract. (Properties (i) and (ii) in next column, shall not apply to chalk). Recycled aggregate Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) G (mining and quarry industry)	(i) grading	BS 1377: Part 2 or BS EN 13242	Tab 6/2	Tab 6/2	Tab 6/4 Method 5	1	C	–
	(ii) uniformity coefficient	See Note 5	5	–										
	(iii) Los Angeles coefficient	Clause 635	–	50										

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
G E N E R A L	2	A	–	Wet cohesive material	General Fill	Any material, or combination of materials, other than chalk.	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 1 except for materials with liquid limit greater than 50, determined by BS 1377: Part 2, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used.	2	A	–
	(ii) plastic limit (PL)	BS 1377: Part 2	–	–										
	(iii) mc	BS 1377: Part 2 See Note 4	PL -4%	App 6/1										
	(iv) MCV	Clause 632	App 6/1	App 6/1										
	(v) Undrained shear strength of remoulded material	Clause 633	App 6/1	App 6/1										
C O H E S I V E	2	B	–	Dry cohesive material	General Fill	Any material, or combination of materials, other than chalk	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	2	B	–
	(ii) plastic limit (PL)	BS 1377: Part 2	–	–										
	(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	PL -4%										
	(iv) MCV	Clause 632	App 6/1	App 6/1										
	(v) undrained shear strength of remoulded material	Clause 633	App 6/1	App 6/1										
F I L L	2	C	–	Stony cohesive material	General Fill	Any material, or combination of materials, other than chalk	(i) grading	BS 1377: part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	2	C	–
	(ii) plastic limit (PL)	BS 1377: part 2	–	–										
	(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1										
	(iv) MCV	Clause 632	App 6/1	–										
	(v) Undrained shear strength of remoulded material	Clause 633	App 6/1	–										

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
GENERAL	2	D	–	Silty cohesive material	General Fill	Any material, or combination of materials, other than chalk	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	2	D	–
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
							(iv) undrained shear strength of remoulded material	Clause 633	App 6/1	App 6/1				
COHESIVE FILL	2	E	–	Reclaimed pulverised fuel ash cohesive material	General Fill	Reclaimed material from lagoon or stockpile containing not more than 20% furnace bottom ash	(i) mc	BS 1377: Part 2 See Note 4	To enable compaction to Clause 612		End product 95% of maximum dry density of BS 1377 : Part 4 (2.5 kg rammer method)	2	E	–
							(ii) bulk density	BS 1377: Part 9	App 6/1	App 6/1				
GENERAL CHALK FILL	3	–	–	Chalk	General Fill	Chalk and associated materials all designated as Class 3 in the Contract	(i) mc	BS 1377: Part 2 See Note 4	–	App 6/1	Tab 6/4 Method 4, or Method 1 if required in App 6/1. All types of vibratory rollers of Categories over 1800 kg shall not be used	3	–	–
							(ii) IDD	Clause 634	App 6/1	App 6/1				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
LANDSCAPE FILL	4	–	–	Various	Fill to landscape areas	See App 6/1	(i) grading	BS 1377: Part 2	App 6/1	App 6/1	See Clause 620 and App 6/1	4	–	–
	(ii) mc	BS 1377: Part 2 See Note 4	–				App 6/1							
	(iii) MCV	Clause 632	App 6/1				App 6/1							
TOPSOIL	5	A	–	Topsoil, or turf, existing on site	Topsoiling	Topsoil or turf designated as Class 5A in the Contract	(i) grading	Clause 618	–	Clause 618	–	5	A	–
	5	B	–	Imported topsoil	Topsoiling	General purpose grade complying with BS 3882	–	–	–	–	–	5	B	–

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
		Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:				Acceptable Limits Within:							
							Lower	Upper						
S E L E C T E D	6	A	–	Selected well graded granular material	Below water	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil or any combination thereof. (Properties (i) and (ii) in next column, shall not apply to chalk.) Recycled aggregate Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); G1 (red coal shale) G3 (pre-selected all-in from quarrying/mining)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	No compaction	6	A	–
						BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5						
					(ii) uniformity	See Note 5	10	–						
					(iii) SMC of chalk index	Clause 634	–	20%						
					(iv) plasticity index	BS 1377: Part 2	Non-plastic							
G R A N U L A R F I L L	6	B	–	Selected coarse granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, chalk, well burnt colliery spoil, slag or any combination thereof. (Properties (ii) and (iii) in next column, shall not apply to chalk.) Recycled aggregate Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G1 (red coal shale) G3 (pre-selected all-in from quarrying/mining)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 5	6	B	–
						BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5						
					(ii) plasticity index	BS 1377: Part 2	Non-plastic							
					(iii) Los Angeles coefficient	Clause 635	–	50						
					(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1						

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D G R A N U L A R F I L L	6	C	–	Selected uniformly graded granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil, slag or any combination thereof. (Property (iii) in next column, shall not apply to chalk.) Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G1 (red coal shale) G3 (pre-selected all-in from quarrying/mining)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	6	C	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	–	10				
							(iii) plasticity index	BS 1377: Part 2	Non-plastic					
							(iv) Los Angeles coefficient	Clause 635	–	50				
							(v) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	D	–	Selected uniformly graded granular material	Starter layer below pulverised fuel ash	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil, slag or any combination thereof. Recycled aggregate Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 4	6	D	–
								BS EN 933-2 Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	–	10				
							(iii) plasticity index	BS 1377: Part 2	Non-plastic					
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(v) MCV	Clause 632	App 6/1	App 6/1				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D G R A N U L A R	6	E	–	Selected granular material (Class 9A)	For stabilisation with cement to form capping	Any material, or combination of materials, other than unburnt colliery spoil and argillaceous rock. (Properties (i), (ii) and (iii) in next column, shall not apply to chalk.) Recycled aggregate Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) G (mining and quarry industry – except G2 (black coal shale))	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Not applicable	6	E	–
							BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5					
						(ii) mc	BS 1377: Part 2 See Note 4	–	App 6/1					
						(iii) liquid limit	BS 1377: Part 2	–	45					
						(iv) plasticity index	BS 1377: Part 2	–	20					
						(v) organic matter	BS 1377: Part 3	–	App 6/1					
						(vi) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	3000 mg/l as SO ₄					
						(vii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.6% as SO ₄					
						(viii) SMC of chalk	Clause 634	–	20%					
U L A R F I L L	6	F	1	Selected granular material (fine grading)	Capping	Any material, or combination of materials – including recycled aggregates with not more than 50% by mass of recycled bituminous planings and granulated asphalt, but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil, argillaceous rock and chalk. Property (vi) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less. Where material in this Class is imported onto site it shall be classified as Class 6F4 and comply with the requirements for that material.	(i) grading	BS 1377: Part 2 (On site materials only)	Tab 6/2	Tab 6/2	Tab 6/4 Method 6	6	F	1
						(ii) optimum mc	BS 1377: Part 4 (vibrating hammer method)	–	–					
						(iii) mc	BS 1377: Part 2 See Note 4	Optimum mc - 2%	Optimum mc					
						(iv) Los Angeles coefficient	Clause 635	–	60					
						(v) Class Ra (asphalt) content	Clause 710	–	50%					
						(vi) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	2.0%					

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class					
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:								
									Lower	Upper							
S E L E C T E D G R A N U L A R F I L L	6	F	2	Selected granular material (coarse grading)	Capping	Any material, or combination of materials - including recycled aggregates with not more than 50% by mass of recycled bituminous planings and granulated asphalt, but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil and argillaceous rock. Property (i) in the next column shall not apply to chalk. Property (vi) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less. Where material in this Class is imported onto site it shall be classified as Class 6F5 and comply with the requirements for that material.	(i) grading	BS 1377: Part 2 (On site materials only)	Tab 6/2	Tab 6/2	Tab 6/4 Method 6	6	F	2			
						(ii) optimum mc	BS 1377: Part 4 (vibrating hammer method)	–									
						(iii) mc	BS 1377: Part 2 See Note 4	Optimum mc - 2%	Optimum mc								
						(iv) Los Angeles coefficient	Clause 635	–	50								
						(v) Class Ra (asphalt) content	Clause 710	–	50%								
						(vi) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	2.0%								
A N N U L A R F I L L	6	F	3	Selected granular material	Capping	Any material, or combination of materials with not less than 50% by mass of recycled bituminous planings and granulated asphalt, but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil and argillaceous rock. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from the following source codes, see Notes 8, 9 and 10: A1 (reclaimed asphalt) A4 (mixed recycled aggregate) Aggregates from source code A4 shall contain at least 50% of constituents in Class Ra (bituminous materials).	(i) grading	BS 1377: Part 2 (On-site) BS EN 933-2 (Imported onto site)	Tab 6/2 Tab 6/5	Tab 6/2 Tab 6/5	Tab 6/4 Method 6 Maximum Compacted layer thickness shall be 200 mm	6	F	3			
						(ii) optimum mc	Clause 613	–	–								
						(iii) mc	Clause 613 See Note 4	Optimum mc -2%	Optimum mc								
						(iv) Class Ra (asphalt) content	Clause 710	50%	–								
						(v) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	10%								

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612		Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:						
									Lower	Upper					
S E L E C T E D G R A N U L A R F I L L	6	F	4	Selected granular material (fine grading) – imported on to the Site	Capping	Unbound mixture complying with BS EN 13285 containing aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10:	(i) Size designation and overall grading category	BS EN 13285 – 0/31.5 and G_E	Tab 6/5	Tab 6/5	Tab 6/4 Method 6	6	F	4	
						P (natural aggregates – except chalk, shale, siltstone or slate, see Note 7)	(ii) Maximum fines and oversize categories	BS EN 13285 – UF_{15} and OC_{75}	Tab 6/5	Tab 6/5					
						A2 (crushed concrete)	(iii) Los Angeles coefficient	BS EN 13242 – LA_{60}	–	60					
						A3 (crushed bricks, masonry)	(iv) Volume stability of blast furnace slag	BS EN 13242 – free from dicalcium silicate and iron disintegration	–	–					
						A4 (mixed recycled aggregate)	(v) Volume stability of steel (BOF) and EAF) slag	BS EN 13242 – V_5	–	–					
						B1 (municipal incinerator bottom ash (MIBA))	(vi) Other aggregate requirements	BS EN 13242 – Category _{NR} (no requirement)	–	–					
						D2 (air cooled blast furnace slag)	(vii) Laboratory dry density and optimum water content	BS EN 13285, Clause 5.3 – declared values	–	–					
						D3 (basic oxygen furnace slag)	(viii) Water content	BS EN 1097-5	Optimum wc – -2%	Optimum wc					
						D4 (electric arc furnace slag (EAF C))	(ix) Class Ra (asphalt) content	Clause 710	–	50%					
						G (mining and quarry industry – except G2 (black coal shale))	(x) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	2.0%					
						Aggregates from source code A4 shall contain not more than 50% of constituents in Class Ra (bituminous materials).									
						Property (x) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less.									

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D G R A N U L A R F I L L	6	F	5	Selected granular material (coarse grading) – imported on to the Site	Capping	Unbound mixture complying with BS EN 13285 containing aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except chalk, shale, siltstone or slate, see Note 7) A2 (crushed concrete) A3 (crushed bricks, masonry) A4 (mixed recycled aggregate) B1 (municipal incinerator bottom ash (MIBA)) D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G (mining and quarry industry – except G2 (black coal shale)) Aggregates from source code A4 shall contain not more than 50% of constituents in Class Ra (bituminous materials). Property (x) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less.	(i) Size designation and overall grading category	BS EN 13285 – 0/80 and G_E	Tab 6/5	Tab 6/5	Tab 6/4 Method 6	6	F	5
	(ii) Maximum fines and oversize categories	BS EN 13285 – UF_{12} and OC_{75}	Tab 6/5				Tab 6/5							
	(iii) Los Angeles coefficient	BS EN 13242 – LA_{50}	–				50							
	(iv) Volume stability of blast furnace slag	BS EN 13242 – free from dicalcium silicate and iron disintegration	–				–							
	(v) Volume stability of steel (BOF) and EAF slag	BS EN 13242 – V_5	–				–							
	(vi) Other aggregate requirements	BS EN 13242 – Category NR (no requirement)	–				–							
	(vii) Laboratory dry density and optimum water content	BS EN 13285, Clause 5.3 – declared values	–				–							
	(viii) Water content	BS EN 1097-5	Optimum wc – -2%				Optimum wc							
	(ix) Class Ra (asphalt) content	Clause 710	–				50%							
	(x) bitumen content	BS EN 12697-1 or BS EN 12697-39	–				2.0%							
	6	G	–	Selected granular material	Gabion filling	Natural gravel, crushed rock, crushed concrete or any combination thereof. None of these constituents shall include any argillaceous rock. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	None	6	G	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) Los Angeles coefficient	Clause 635	–	50				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D G R A N U L A R F I L L	6	H	–	Selected granular material	Drainage layer to reinforced soil and anchored earth structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, chalk, well burnt colliery spoil or any structures combination thereof. None of these constituents shall include any argillaceous rock. (Properties (vi), (vii), (viii), (ix), (x), (xi) and (xii) in next column only apply when metallic reinforcing or anchor elements, facing units or fastenings are used.) (Properties (ii) and (v) in next column shall not apply to chalk.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	6	H	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) plasticity index	BS 1377: Part 2	Non-plastic					
							(iii) Los Angeles coefficient	Clause 635	–	50				
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(v) MCV	Clause 632	App 6/1	App 6/1				
							(vi) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(vii) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(viii) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(ix) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(x) resistivity	Clause 637	Tab 6/3	–				
							(xi) redox potential	Clause 638	Tab 6/3	–				
							(xii) organic content	BS 1377: Part 3	–	Tab 6/3				
							(xiii) microbial activity index	Table 6/3	–	Tab 6/3				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
		Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:				Acceptable Limits Within:							
							Lower	Upper						
S E L E C T E D G R A N U L A R F I L L	6	I	–	Selected well graded granular material	Fill to reinforced soil and anchored earth structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, chalk, well burnt colliery spoil or any combination thereof except that chalk shall not be combined with any other constituent. None of these constituents shall include any argillaceous rock. (Properties (i), (ii) and (v) in next column shall not apply to chalk.) (Properties (viii), (ix), (x), (xi), (xii), (xiii) and (xiv) only apply when metallic reinforcing or anchor elements, facing units or fastenings are used.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	6	I	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	10	–				
							(iii) SMC of chalk	Clause 634	–	20%				
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(v) MCV	Clause 632	App 6/1	App 6/1				
							(vi) effective angle of friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(vii) coefficient of friction and adhesion (fill/elements)	Clause 639	App 6/1	–				
							(viii) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(ix) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(x) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(xi) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(xii) resistivity	Clause 637	Tab 6/3	–				
							(xiii) redox potential	Clause 638	Tab 6/3	–				
							(xiv) organic content	BS 1377: Part 3	–	Tab 6/3				
							(xv) microbial activity index	Table 6/3	–	Tab 6/3				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
		Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:				Acceptable Limits Within:							
							Lower	Upper						
S E L E C T E D G R A N U L A R F I L L	6	J	–	Selected uniformly graded granular material	Fill to reinforced soil and anchored earth	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, chalk, well burnt colliery spoil or any combination thereof, except that chalk shall not be combined with any other constituent. None of these constituents shall include any argillaceous rock. (Properties (viii), (ix), (x), (xi), (xii), (xiii) and (xiv) in next column only apply when metallic reinforcing or anchor elements, facing units or fastenings are used.) (Properties (i), (ii) and (v) in next column shall not apply to chalk.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	6	J	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	5	10				
							(iii) SMC of chalk	Clause 634	–	20%				
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(v) MCV	Clause 632	App 6/1	App 6/1				
							(vi) effective angle of friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(vii) coefficient of friction and adhesion (fill/elements)	Clause 639	App 6/1	–				
							(viii) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(ix) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(x) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(xi) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(xii) resistivity	Clause 637	Tab 6/3	–				
							(xiii) redox potential	Clause 638	Tab 6/3	–				
							(xiv) organic content	BS 1377: Part 3	–	Tab 6/3				
							(xv) microbial activity index	Table 6/3	–	Tab 6/3				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D G R A N U L A R F I L L	6	K	–	Selected granular material	Lower bedding for corrugated steel buried structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto which is not ‘as dug’ site it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes,)see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	End product 90% of maximum dry density of BS 1377: Part 4 (Vibrating hammer method)	6	K	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	5	–				
							(iii) plasticity index	BS 1377: Part 2	–	6				
							(iv) optimum mc	BS 1377: Part 4 (vibrating hammer method)	–	–				
							(v) mc	BS 1377: Part 2 See Note 4	Optimum mc -2%	Optimum mc +1%				
							(vi) MCV	Clause 632	App 6/1	App 6/1				
							(vii) Los Angeles coefficient	Clause 635	–	40				
							(viii) resistivity	Clause 637	2000 ohm cm	–				
							(ix) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/ l as SO ₄				
							(x) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO ₄				
							(xi) chloride ion content	BS EN 1744-1	–	0.025%				
							(xii) pH value	BS 1377: Part 3	6	9				
							(xiii) sulfide and hydrogen sulfide	Standard textbook of qualitative inorganic analysis	–	Rapid blackening of lead acetate paper				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	L	–	Selected uniformly graded granular material	Upper bedding for corrugated steel buried structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2		6	L	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) resistivity	Clause 637	2000 ohm cm	–				
							(iii) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/ l as SO ₄				
							(iv) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO ₄				
							(v) chloride ion content	BS EN 1744-1	–	0.025%				
							(vi) pH value	BS 1377: Part 3	6	9				
							(vii) sulfide and hydrogen sulfide	Standard textbook of qualitative inorganic analysis	–	Rapid blackening of lead acetate paper				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D G R A N U L A R F I L L	6	M	–	Selected granular material	Surround to corrugated steel buried structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) G1 (red coal shale).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	End product 90% of maximum dry density of BS 1377: Part 4 (Vibrating hammer method) unless otherwise stated in App 6/1	6	M	
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	5	–				
							(iii) plasticity index	BS 1377: Part 2	–	6				
							(iv) optimum mc	BS 1377: Part 4 (vibrating hammer method)	–	–				
							(v) mc	BS 1377: Part 2 See Note 4	Optimum mc -2%	Optimum mc +1%				
							(vi) MCV	Clause 632	App 6/1	App 6/1				
							(vii) Los Angeles coefficient	Clause 635	–	40				
							(viii) resistivity	Clause 637	2000 ohm cm	–				
							(ix) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/ l as SO ₄				
							(x) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO ₄				
							(xi) chloride ion content	BS EN 1744-1	–	0.025%				
							(xii) pH value	BS 1377: Part 3	6	9				
							(xiii) sulfide and hydrogen sulfide	Standard textbook of qualitative inorganic analysis	–	Rapid blackening of lead acetate paper				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	N	–	Selected well graded granular material	Fill to structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	End product 95% of maximum dry density of BS 1377: Part 4 (vibrating hammer method)	6	N	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	10	–				
							(iii) Los Angeles coefficient	Clause 635	–	40				
							(iv) undrained shear parameters (c and ϕ)	Clause 633	App 6/1	–				
							(v) effective angle of internal friction (ϕ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(vi) permeability	Clause 640	App 6/1	–				
							(vii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(viii) MCV	Clause 632	App 6/1	App 6/1				
							(ix) slope stability test (where required in App 6/6)	Clause 610	App 6/6					

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D G R A N U L A R F I L L	6	P	–	Selected granular material	Fill to structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, chalk, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. (Properties (i), (ii) and (ix) in next column shall not apply to chalk.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	End product 95% of maximum dry density of BS 1377: Part 4 (vibrating hammer method)	6	P	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	5	–				
							(iii) IDD of chalk	Clause 634	–	App 6/1				
							(iv) Los Angeles coefficient	Clause 635	–	60				
							(v) undrained shear parameters (c and ϕ)	Clause 633	App 6/1	–				
							(vi) effective angle of internal friction (ϕ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(vii) permeability	Clause 640	App 6/1	–				
							(viii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(ix) MCV	Clause 632	App 6/1	App 6/1				
	(x) slope stability test (where required in App 6/6)	Clause 610	App 6/6											

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
Property (See Exceptions in Previous Column)		Defined and Tested in Accordance with:	Acceptable Limits Within:											
			Lower				Upper							
S E L E C T E D G R A N U L A R F I L L	6	Q	–	Selected granular material	Fill to structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, chalk, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. (Properties (i), (ii) and (ix) in next column shall not apply to chalk.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale).	As for Class 1A, 1B or 1C with the addition of the following:				End product 95% of maximum dry density of BS 1377: Part 4 (vibrating hammer method)	6	Q	–
							(i) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/ l as SO ₄				
							(ii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO ₄				
							(iii) chloride ion content	BS EN 1744-1	–	0.025%				
							(iv) pH value	BS 1377: Part 3	6	9				
							(v) sulfide and hydrogen sulfide	Standard textbook of qualitative inorganic analysis	–	Rapid blackening of lead acetate paper				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
		Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:				Acceptable Limits Within:							
							Lower	Upper						
SELECTED GRANULAR	6	R	–	Selected granular material	For stabilisation with lime and cement to form capping (Class 9F)	Any material, or combination of materials, other than unburnt colliery spoil and argillaceous rock. (Properties (i), (ii) and (iii) in next column, shall not apply to chalk.)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2		6	R	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	–				
							(iii) liquid limit	BS 1377: Part 2	–	45				
							(iv) plasticity index	BS 1377: Part 2	–	20				
							(v) organic matter	BS 1377: Part 3	–	App 6/1				
							(vi) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	3000 mg/ l as SO ₄				
							(vii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.6% as SO ₄				
							(viii) IDD of chalk	Clause 634	–	App 6/1				
FILL	6	S	–	Selected well graded granular material	Filter layer below subbase	Crushed rock or sand. Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except chalk, shale, siltstone or slate, see Note 7).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	–	6	S	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) plasticity index	BS 1377: Part 2	–	Non-plastic				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D C O H E S I V E F I L L	7	A	–	Selected cohesive material	Fill to structures	Any material or combination of materials, other than argillaceous rock and materials designated as Class 3 in the Contract. If chalk is used it shall form 100% of constituents. (Properties (i) and (iii) shall not apply to chalk.) (Properties (vii) and (viii) may be increased to 54% and 31% respectively for Lias Clay only and subject to the requirements of contract specific Appendix 6/6)	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	End product: 100% of maximum dry density of BS 1377 : Part 4 (2.5 kg rammer method) or a dry density corresponding to 5% air voids at field mc whichever is lower	7	A	–
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
							(iv) undrained shear parameters (c and ϕ)	Clause 633	App 6/1	App 6/1				
							(v) effective angle of internal friction (ϕ') and effective cohesion (c')	Clause 636	App 6/1	App 6/1				
							(vi) IDD of chalk	Clause 634	App 6/1	App 6/1				
							(vii) liquid limit	BS 1377: Part 2	–	45				
							(viii) plasticity index	BS 1377: Part 2	–	25				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D C O H E S I V E F I L L	7	B	–	Selected conditioned pulverised fuel ash cohesive material	Fill to structures and to reinforced soil	Conditioned material direct from power station dust collection system and to which a controlled quantity of water has been added	(i) mc	BS 1377: Part 2 See Note 4	To enable compaction to Clause 612		End product: 95% of maximum dry density of BS 1377 : Part 4 (2.5 kg rammer method)	7	B	–
							(ii) bulk density	BS 1377: Part 9	App 6/1	App 6/1				
							(iii) undrained shear parameters (c and φ)	Clause 633	App 6/1	–				
							(iv) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(v) coefficient of friction and adhesion (fill/elements)	Clause 639	App 6/1	–				
							(vi) permeability	Clause 640	App 6/1	–				
							(vii) slope stability test (where required in App 6/6)	Clause 610	App 6/6					

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
		Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:				Acceptable Limits Within:							
							Lower	Upper						
S E L E C T E D C O H E S I V E F I L L	7	C	–	Selected wet cohesive material	Fill to reinforced soil	Any material, or combination of materials, other than unburnt colliery spoil, argillaceous rock and chalk. (Properties (viii), (ix), (x), (xi) and (xii) in next column only apply when metallic reinforcing elements, facing units or fastenings are used)	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 1	7	C	–
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
							(iv) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(v) coefficient of friction and adhesion (fill/elements)	Clause 639	App 6/1	–				
							(vi) liquid limit	BS 1377: Part 2	–	45				
							(vii) plasticity index	BS 1377: Part 2	–	25				
							(viii) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(ix) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(x) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(xi) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(xii) resistivity	Clause 637	Tab 6/3	–				
							(xiii) redox potential	Clause 638	Tab 6/3	–				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
		Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:				Acceptable Limits Within:							
							Lower	Upper						
S E L E C T E D C O H E S I V E F I L L	7	D	–	Selected stony cohesive material	Fill to reinforced soil	Any material, or combination of materials, other than unburnt colliery spoil, argillaceous rock and chalk. (Properties (vi), (vii), (viii), (ix), (x), (xi) and (xii) in next column only apply when metallic reinforcing elements, facing units or fastenings are used)	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	7	D	–
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
							(iv) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(v) coefficient of friction and adhesion (fill/elements)	Clause 639	App 6/1	–				
							(vi) liquid limit	BS 1377: Part 2	–	45				
							(vii) plasticity index	BS 1377: Part 2	–	25				
							(viii) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(ix) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(x) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(xi) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(xii) resistivity	Clause 637	Tab 6/3	–				
							(xiii) redox potential	Clause 638	Tab 6/3	–				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D	7	E	–	Selected cohesive material	For stabilisation with lime to form capping (Class 9D)	Any material, or combination of materials, other than unburnt colliery spoil	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Not applicable	7	E	–
	(ii) mc	BS 1377: Part 2 See Note 4	–	App 6/1										
	(iii) MCV	Clause 632	App 6/1	–										
	(iv) plasticity index	BS 1377: Part 2	10	–										
	(v) organic matter	BS 1377: Part 3	–	App 6/1										
	(vi) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	App 6/1										
	(vii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	App 6/1										
	(viii) total potential sulfate (TS) content	BS EN 1744-1 clause 11	–	App 6/1										
C O H E S I V E F I L L	7	F	–	Selected silty cohesive material	For stabilisation with cement to form capping (Class 9B)	Any material, or combination of materials, other than chalk, unburnt colliery spoil and argillaceous rock	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Not applicable	7	F	–
	(ii) uniformity coefficient	See Note 5	5	–										
	(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1										
	(iv) MCV	Clause 632	App 6/1	App 6/1										
	(v) liquid limit	BS 1377: Part 2	–	45										
	(vi) plasticity index	BS 1377: Part 2	–	20										
	(vii) organic matter	BS 1377: Part 3	–	App 6/1										
	(viii) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	App 6/1										
	(ix) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	App 6/1										
	(x) total potential sulfate (TS) content	BS EN 1744-1 clause 11	–	App 6/1										

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S E L E C T E D C O H E S I V E F I L L	7	G	–	Selected conditioned pulverised fuel ash cohesive material	For stabilisation with cement to form capping (Class 9C)	Conditioned material direct from power station dust collection system and to which a controlled quantity of water has been added	(i) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1		7	G	–
	(ii) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	3000 mg/l as SO ₄										
	(iii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.6% as SO ₄										
	(iv) total potential sulfate (TS) content	BS EN 1744-1 clause 11	–	1.2% as SO ₄										
	7	H	–	Wet, dry, stony or silty cohesive material and chalk	Overlying fill for corrugated steel buried structures	As Class 2A, 2B, 2C, 2D general cohesive fill material or Class 3 chalk fill material, except that argillaceous rock, slag, PFA or any combination thereof shall not be used	As for Class 2A, 2B, 2C, 2D or 3 with the addition of the following					7	H	–
	(i) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/l as SO ₄										
	(ii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO ₄										
	(iii) chloride ion content	BS EN 1744-1	–	0.025%										
							(iv) pH value	BS 1377: Part 3	6	9				
	7	I	–	Selected cohesive material	For stabilisation with lime and cement to form capping (Class 9E)	Any material, or combination of materials, other than unburnt colliery spoil	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Not applicable	7	I	–
	(ii) mc	BS 1377: Part 2 See Note 4	–	App 6/1										
	(iii) MCV	Clause 632	App 6/1	–										
	(iv) plasticity index	BS 1377: Part 2	10	–										
	(v) organic matter	BS 1377: Part 3	–	App 6/1										
	(vi) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	App 6/1										
	(vii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	App 6/1										
							(viii) total potential sulfate (TS) content	BS EN 1744-1 clause 11	–	App 6/1				

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
MISC FILL	8	–	–	Class 1, Class 2 or Class 3 material	Lower trench fill	Any material; except no stones or lumps of clay shall be retained on the 40mm test sieve. Recycled aggregate Where material is imported onto site which is not ‘as dug’ it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates); A (construction and demolition recycling industries) B1 (municipal incinerator bottom ash (MIBA)) D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G (mining and quarry industry).	(i) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1	Tab 6/4	8	–	–
							(ii) MCV	Clause 632	App 6/1	App 6/1				
STABILISED	9	A	–	Cement stabilised well graded granular material	Capping	Class 6E with addition of cement according to Clause 614	(i) pulverisation	BS EN 13286-48	60%	–	Tab 6/4 Method 6	9	A	–
							(ii) bearing ratio	BS EN 13286-47	App 6/1	–				
							(iii) mc	BS EN 13286-2	App 6/1	App 6/1				
	9	B	–	Cement stabilised silty cohesive material	Capping	Class 7F with addition of cement according to Clause 614	(i) pulverisation	BS EN 13286-48	App 6/1	–	Tab 6/4 Method 7	9	B	–
							(ii) MCV immediately before compaction	Clause 632	App 6/1	12				
							(iii) bearing ratio	BS EN 13286-47	App 6/1	–				
(iv) mc							BS EN 13286-2	App 6/1	App 6/1					
MATERIALS	9	C	–	Cement stabilised conditioned pulverised fuel ash cohesive material	Capping	Class 7G with addition of cement according to Clause 614	(i) pulverisation	BS EN 13286-48	60%	–	End product 95% of maximum dry density BS EN 13286-47 (2.5 kg rammer method)	9	C	–
							(ii) bearing ratio	BS EN 13286-47	App 6/1	–				
							(iii) mc	BS EN 13286-2	To enable compaction to Clause 612					

TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
S T A B I L I S E D M A T E R I A L S	9	D	–	Lime stabilised cohesive material	Capping	Class 7E with addition of lime according to Clause 615	(i) pulverisation	BS EN 13286-48	30%	–	Tab 6/4 Method 7	9	D	–
							(ii) MCV immediately before compaction	Clause 632	App 6/1	App 6/1				
							(iii) bearing ratio	BS EN 13286-47	App 6/1	–				
							(iv) mc	BS EN 13286-2	App 6/1	App 6/1				
	9	E	–	Lime and cement stabilised cohesive material	Capping	Class 7I with addition of lime and cement according to Clause 643	(i) pulverisation	BS EN 13286-48	30%	–	Tab 6/4 Method 7	9	E	–
							(ii) MCV immediately before completion	Clause 632	App 6/1	App 6/1				
							(iii) bearing ratio	BS EN 13286-47	App 6/1	–				
							(iv) mc	BS EN 13286-2	App 6/1	App 6/1				
	9	F	–	Lime and cement stabilised well graded granular material	Capping	Class 6R with addition of lime and cement according to Clause 643	(i) pulverisation	BS EN 13286-48	60%	–	Tab 6/4 Method 6	9	F	–
							(ii) bearing ratio	BS EN 13286-47	App 6/1	–				
							(iii) mc	BS EN 13286-2 See Note 4	App 6/1	App 6/1				

Footnotes to Table 6/1

1	(02/16) App = contract specific Appendix
2	(02/16) Tab = Table
3	(02/16) Where in the Acceptable Limits column reference is made to App 6/1, only those properties having limits ascribed to them in contract specific Appendix 6/1 shall apply. Where contract specific Appendix 6/1 gives limits for other properties not listed in this Table such limits shall also apply.
4	(02/16) Where BS 1377: Part 2 is specified for mc, this shall mean BS 1377: Part 2 where the material is a soil or BS EN 1097-5 where the material is required to conform to a harmonised European Standard.
5	(02/16) Uniformity coefficient is defined as the ratio of the particle diameters D_{60} to D_{10} on the particle-size distribution curve, where: D_{60} = particle diameter at which 60% of the soil by weight is finer D_{10} = particle diameter at which 10% of the soil by weight is finer
6.	(02/16) The limiting values for Class U1B material are given in contract specific Appendix 6/14 and contract specific Appendix 6/15.
7	(02/16) For works in Wales see sub-Clause 601.21W.
8	(02/16) Where material source codes are referenced these are as listed in Table 6/7.
9	(02/16) Where materials are required to be aggregates conforming to BS EN 13242 materials certificated as being compliant with BS EN 13285 are acceptable for use provided that they meet all the specification requirements and the Declaration of Performance for constituent parts to BS EN 13242 are provided to the Overseeing Organisation.
10	(02/16) Materials shall comply with the current Environmental Regulations at the time of use. Reference shall be made to Annex ZA (informative) of BS EN 13242.

TABLE 6/2: (02/16) Grading Requirements for Acceptable Earthworks Materials Other Than Classes 6F4, 6F5 and 6S

Percentage by Mass Passing the Size Shown																					
Class	Size (mm)		Size (mm) BS Series													Size (microns) BS Series				Size (micr- ons)	Class
	500	300	125	90	75	37.5	28	20	14	10	6.3	5	3.35	2	1.18	600	300	150	63	2	
1A		100	95-																<15		1A
1B			100																<15		1B
1C	100		10-95													0-25			15		1C
2A & 2B			100											80-100					15-100		2A & 2B
2C			100											15-80					15-80		2C
2D			100																80-100	0-20	2D
6A	100									0-100		0-85				0-45			0-5		6A
6B	100		0-10																		6B
6C			100			0-100					0-100		0-35	0-10		0-2					6C
6D										100		89-100		60-100	30-100	15-80	5-48	0-15 except 0-20 for crushed rock			6D
6E & 6R			100	85-100						25-100						10-100				<15	6E & 6R
6F1					100	75-100				40-95		30-85				10-50			<15		6F1
6F2			100	80-100	65-100	45-100				15-60		10-45				0-25			0-12		6F2
6F3			100	80-100	65-100	45-100				15-60		10-45				0-25			0-12		6F3
6H								100				60-100			15-45	0-25		0-5			6H
6I & 6J			100		85-100				25-100					15-100		9-100			<15		6I & 6J
6K								100											0-10		6K
6L										100		89-100		60-100	30-100	15-100	5-70	0-15 except 0-20 for crushed rock			6L

TABLE 6/2: (02/16) Grading Requirements for Acceptable Earthworks Materials (continued)

Percentage by Mass Passing the Size Shown																					
Class	Size (mm)		Size (mm) BS Series													Size (microns) BS Series				Size (microns)	Class
			500	300	125	90	75	37.5	28	20	14	10	6.3	5	3.35	2	1.18	600	300		
	500	300	125	90	75	37.5	28	20	14	10	6.3	5	3.35	2	1.18	600	300	150	63	2	
6M					100														0-10		6M
6N & 6P					100														<15		6N & 6P
6S					100									60-100		30-90		4-45	0-16		6S
7A					100														15-100		7A
7C			100		85-100				83-100					80-100		60-100			15-45	0-20	7C
7D			100		85-100				40-90					15-79		15-75			15-45	0-20	7D
7E					100		95-100												15-100		7E
7F			100																15-100		7F
7I					100		95-100												15-100		7I

TABLE 6/3: (02/16) Limits of Material Properties of Fill for Use With Metal Components in Reinforced Soil and Anchored Earth Structures for Class 6H, 6I, 6J, 7C and 7D Materials

Reinforcing Element Material	Properties of Fill								
	pH Value		Max Chloride Ion Content %	Max Organic Content %	Max Water Soluble (WS) Sulfate Content mg/l as SO ₄	Maximum Oxidisable Sulfides (OS) Content % as SO ₄	Minimum Restivity Ohm.cm	Minimum Redox Potential volts	Microbial Activity Index
	Min	Max							
Galvanised Steel	5	10	0.02	0.2	300	0.06	5000	0.40)
Stainless Steel	5	10	0.025	0.2	600	0.12	3000	0.35) Less than 5
)
)

NOTES:

- 1** (02/16) A method of calculating the Microbial Activity Index may be obtained by reference to TRRL Contractor Report 54 'Soil Corrosivity Assessment'.
- 2** (02/16) The corrosion potential of frictional fill shall be assessed from resistivity, pH, chloride, water soluble sulfate and oxidisable sulfides tests. For cohesive soil it will be necessary to test additionally for organic content. Should either organic content or sulfate be in excess of the specified levels, then tests shall also be included for Redox Potential and Microbial Activity Index.
- 3** (02/16) The water soluble sulfate content and oxidisable sulfides content shall be determined in accordance with the methods described in BS EN 1744-1 clause 10, 11 and 13.
- 4** (02/16) Methods of test (except for Microbial Activity Index, water soluble sulfate content and oxidisable sulfides content) are given in BS 1377: Part 3.

TABLE 6/4: (02/16) Method Compaction for Earthworks Materials: Plant and Methods (Method 1 to Method 6)
(This Table is to be read in conjunction with sub-Clause 612.10)

Type of Compaction Plant	Ref No.	Category	Method 1		Method 2		Method 3		Method 4		Method 5		Method 6		
			D	N#	D	N#	D	N#	D	N	D	N	N for D = 110 mm	N for D = 150 mm	N for D = 250 mm
Smoothed wheeled roller (or vibratory roller operating without vibration)	1	Mass per metre width of roll: over 2100 kg up to 2700 kg	125	8	125	10	125	10*	175	4	unsuitable		unsuitable	unsuitable	unsuitable
	2	over 2700 kg up to 5400 kg	125	6	125	8	125	8*	200	4	unsuitable		16	unsuitable	unsuitable
	3	over 5400 kg	150	4	150	8	unsuitable		300	4	unsuitable		8	16	unsuitable
Grid roller	1	Mass per metre width of roll: over 2700 kg up to 5400 kg	150	10	unsuitable		150	10	250	4	unsuitable		unsuitable	unsuitable	unsuitable
	2	over 5400 kg up to 8000 kg	150	8	125	12	unsuitable		325	4	unsuitable		20	unsuitable	unsuitable
	3	over 8000 kg	150	4	150	12	unsuitable		400	4	unsuitable		12	20	unsuitable
Deadweight tamping roller	1	Mass per metre width of roll: over 4000 kg up to 6000 kg	225	4	150	12	250	4	350	4	unsuitable		12	20	unsuitable
	2	over 6000 kg	300	5	200	12	300	3	400	4	unsuitable		8	12	20
Pneumatic-tyred roller	1	Mass per wheel: over 1000 kg up to 1500 kg	125	6	unsuitable		150	10*	240	4	unsuitable		unsuitable	unsuitable	unsuitable
	2	over 1500 kg up to 2000 kg	150	5	unsuitable		unsuitable		300	4	unsuitable		unsuitable	unsuitable	unsuitable
	3	over 2000 kg up to 2500 kg	175	4	125	12	unsuitable		350	4	unsuitable		unsuitable	unsuitable	unsuitable
	4	over 2500 kg up to 4000 kg	225	4	125	10	unsuitable		400	4	unsuitable		unsuitable	unsuitable	unsuitable
	5	over 4000 kg up to 6000 kg	300	4	125	10	unsuitable		unsuitable		unsuitable		12	unsuitable	unsuitable
	6	over 6000 kg up to 8000 kg	350	4	150	8	unsuitable		unsuitable		unsuitable		12	unsuitable	unsuitable
	7	over 8000 kg up to 12000 kg	400	4	150	8	unsuitable		unsuitable		unsuitable		10	16	unsuitable
	8	over 12000 kg	450	4	175	6	unsuitable		unsuitable		unsuitable		8	12	unsuitable
Vibratory tamping roller		Mass per metre width of a vibrating roll:													
	1	over 700 kg up to 1300 kg	100	12	100	12	150	12	100	10	unsuitable		unsuitable	unsuitable	unsuitable
	2	over 1300 kg up to 1800 kg	125	12	125	12	175	12*	175	8	unsuitable		12	unsuitable	unsuitable
	3	over 1800 kg up to 2300 kg	150	12	150	12	200	12*	unsuitable		unsuitable		8	12	unsuitable
	4	over 2300 kg up to 2900 kg	150	9	150	9	250	12*	unsuitable	400	5		6	10	unsuitable
	5	over 2900 kg up to 3600 kg	200	9	200	9	275	12*	unsuitable	500	6		6	10	unsuitable
	6	over 3600 kg up to 4300 kg	225	9	225	9	300	12*	unsuitable	600	6		4	8	unsuitable
	7	over 4300 kg up to 5000 kg	250	9	250	9	300	9*	unsuitable	700	6		3	7	12
	8	over 5000 kg	275	9	275	9	300	7*	unsuitable	800	6		3	6	10

TABLE 6/4: (02/16) Method Compaction for Earthworks Materials: Plant and Methods (Method 1 to Method 6)
(This Table is to be read in conjunction with sub-Clause 612.10) (Continued)

Type of Compaction Plant	Ref No.	Category	Method 1		Method 2		Method 3		Method 4		Method 5		Method 6		
			D	N#	D	N#	D	N#	Δ	N	D	N	N for D = 110 mm	N for D = 150 mm	N for D = 250 mm
Vibratory roller		Mass per metre width of vibratory roll:													
	1	over 270 kg up to 450 kg	unsuitable		75	16	150	16	unsuitable		unsuitable		unsuitable	unsuitable	unsuitable
	2	over 450 kg up to 700 kg	unsuitable		75	12	150	12	unsuitable		unsuitable		unsuitable	unsuitable	unsuitable
	3	over 700 kg up to 1300 kg	100	12	125	10	150	6	125	10	unsuitable		16	unsuitable	unsuitable
	4	over 1300 kg up to 1800 kg	125	8	150	8	200	10*	175	4	unsuitable		6	16	unsuitable
	5	over 1800 kg up to 2300 kg	150	4	150	4	225	12*	unsuitable		unsuitable		4	6	12
	6	over 2300 kg up to 2900 kg	175	4	175	4	250	10*	unsuitable		400	5	3	5	11
	7	over 2900 kg up to 3600 kg	200	4	200	4	275	8*	unsuitable		500	5	3	5	10
	8	over 3600 kg up to 4300 kg	225	4	225	4	300	8*	unsuitable		600	5	2	4	8
	9	over 4300 kg up to 5000 kg	250	4	250	4	300	6*	unsuitable		700	5	2	4	7
	10	over 5000 kg	275	4	275	4	300	4*	unsuitable		800	5	2	3	6
Vibrating plate compactor		Mass per m ² of base plate:													
	1	over 880 kg up to 1100 kg	unsuitable		unsuitable		75	6	unsuitable		unsuitable		unsuitable	unsuitable	unsuitable
	2	over 1100 kg up to 1200 kg	unsuitable		75	10	100	6	75	10	unsuitable		unsuitable	unsuitable	unsuitable
	3	over 1200 kg up to 1400 kg	unsuitable		75	6	150	6	150	8	unsuitable		unsuitable	unsuitable	unsuitable
	4	over 1400 kg up to 1800 kg	100	6	125	6	150	4	unsuitable		unsuitable		8	unsuitable	unsuitable
	5	over 1800 kg up to 2100 kg	150	6	150	5	200	4	unsuitable		unsuitable		5	8	unsuitable
	6	over 2100 kg	200	6	200	5	250	4	unsuitable		unsuitable		3	6	12
Vibro-tamper		Mass:													
	1	over 50 kg up to 65 kg	100	3	100	3	150	3	125	3	unsuitable		4	8	unsuitable
	2	over 65 kg up to 75 kg	125	3	125	3	200	3	150	3	unsuitable		3	6	12
	3	over 75 kg up to 100 kg	150	3	150	3	225	3	175	3	unsuitable		2	4	10
	4	over 100 kg	225	3	200	3	225	3	250	3	unsuitable		2	4	10
Power rammer		Mass:													
	1	100 kg up to 500 kg	150	4	150	6	unsuitable		200	4	unsuitable		5	8	unsuitable
	2	over 500 kg	275	8	275	12	unsuitable		400	4	unsuitable		5	8	14
Dropping-weight compactor		Mass of rammer over 500 kg weight drop:													
	1	over 1 m up to 2 m	600	4	600	8	450	8	unsuitable		unsuitable		unsuitable	unsuitable	unsuitable
	2	over 2 m	600	2	600	8	unsuitable		unsuitable		unsuitable		unsuitable	unsuitable	unsuitable

TABLE 6/4: (02/16) Method Compaction for Earthworks Materials: Plant and Methods (Method 7) (This Table is to be read in conjunction with sub-Clause 612.10) (Continued)

Type of Compaction Plant	Ref~ No.	Category	Method 7	
			N for D = 150 mm	N for D = 250mm
Smooth wheeled roller (or vibratory roller operating without vibration)	1	Mass per metre width of roll: over 2100 kg up to 2700 kg	unsuitable	unsuitable
	2	over 2700 kg up to 5400 kg	unsuitable	unsuitable
	3	over 5400 kg	12	unsuitable
Grid roller	1	Mass per metre width of roll: over 2700 kg up to 5400 kg	unsuitable	unsuitable
	2	over 5400 kg up to 8000 kg	16	unsuitable
	3	over 8000 kg	8	unsuitable
Deadweight tamping roller	1	Mass per metre width of roll: over 4000 kg up to 6000 kg	4	8
	2	over 6000 kg	3	6
Pneumatic-tyred roller	1	Mass per wheel: over 1000 kg up to 1500 kg	unsuitable	unsuitable
	2	over 1500 kg up to 2000 kg	12	unsuitable
	3	over 2000 kg up to 2500 kg	6	unsuitable
	4	over 2500 kg up to 4000 kg	5	unsuitable
	5	over 4000 kg up to 6000 kg	4	16
	6	over 6000 kg up to 8000 kg	unsuitable	8
	7	over 8000 kg up to 12000 kg	unsuitable	4
	8	over 12000 kg	unsuitable	4
Vibratory tamping roller	1	Mass per metre width of vibrating roll: over 700 kg up to 1300 kg	unsuitable	unsuitable
	2	over 1300 kg up to 1800 kg	unsuitable	unsuitable
	3	over 1800 kg up to 2300 kg	16	unsuitable
	4	over 2300 kg up to 2900 kg	12	unsuitable
	5	over 2900 kg up to 3600 kg	10	unsuitable
	6	over 3600 kg up to 4300 kg	8	16
	7	over 4300 kg up to 5000 kg	7	14
	8	over 5000 kg	6	12
Vibratory roller	1	Mass per metre width of vibrating roll: over 270 kg up to 450 kg	unsuitable	unsuitable
	2	over 450 kg up to 700 kg	unsuitable	unsuitable
	3	over 700 kg up to 1300 kg	unsuitable	unsuitable
	4	over 1300 kg up to 1800 kg	unsuitable	unsuitable
	5	over 1800 kg up to 2300 kg	12	unsuitable
	6	over 2300 kg up to 2900 kg	10	unsuitable
	7	over 2900 kg up to 3600 kg	10	unsuitable
	8	over 3600 kg up to 4300 kg	8	unsuitable
	9	over 4300 kg up to 5000 kg	8	unsuitable
	10	over 5000 kg	6	12
Vibratory plate compactor	1	Mass per m ² of base plate: over 880 kg up to 1100 kg	unsuitable	unsuitable
	2	over 1100 kg up to 1200 kg	unsuitable	unsuitable
	3	over 1200 kg up to 1400 kg	unsuitable	unsuitable
	4	over 1400 kg up to 1800 kg	10	unsuitable
	5	over 1800 kg up to 2100 kg	8	unsuitable
	6	over 2100 kg	6	unsuitable
Vibro-tamper	1	Mass: over 50 kg up to 65 kg	unsuitable	unsuitable
	2	over 65 kg up to 75 kg	unsuitable	unsuitable
	3	over 75 kg up to 100 kg	unsuitable	unsuitable
	4	over 100 kg	8	unsuitable
Power rammer	1	Mass: 100 kg up to 500 kg	8	unsuitable
	2	over 500 kg	6	10
Dropping weight compactor	1	Mass of rammer over 500 kg height drop: over 1 m up to 2 m	unsuitable	unsuitable
	2	over 2 m	unsuitable	unsuitable

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