Earthworks Specification – Sports Hub

Appendix 6/1: Requirements for Acceptability and Testing etc. of Earthworks Materials

General

1. The Sports Hub area consists of an access road, parking area, pavilion building, 2 no. grass pitches, 1 no. artificial grass pitch, 4 no. MUGAs, skate park and bike track. The access road crosses an existing watercourse, Channells Brook, which will be culverted. The Sports Hub area will generally be raised above existing ground levels, with embankments formed to the perimeter to tie into existing boundary levels.

2. The earthworks embankments are considered to fall into Geotechnical Category 2 which relates to projects which include conventional geotechnical structures, earthworks and associated activities, and where there are no exceptional geotechnical risks, unusual or difficult ground conditions or loading scenarios. In addition to the Specification, the Contractor shall refer to the levels and earthworks designs as shown on drawing Refs. Mowbray-GLA-SH-D-C-1170/1171/1172 (Earthworks Analysis and Sections) and the Ground Appraisal Report (Ref. GE20724-GAR-SEPT-22) as prepared by Geo-Environmental Services Limited (GESL).

3. All details pertaining to soil parameters and soil conditions both in-situ and proposed as contained within Appendix 6 have been provided by GESL. Any discrepancies shall be reported to the Client or Client's representative immediately so that clarification can be sought prior to the commencement of any works.

4. The classification and compaction requirements of acceptable earthworks materials is as defined in Tables 6/1 and 6/4 respectively of Volume 1 of the Specification for Highways Works (Series 600 – Earthworks). The grading requirements are as defined in Table 6/2 of Volume 1 of the Specification for Highways Works (Series 600 – Earthworks). The Acceptability Criteria for each class of material is defined in Table 6/1.1 of this Appendix and Appendices 6/14 and 6/15 of the Specification.

5. The Contractor shall be responsible for organising and undertaking all necessary acceptability and compliancy testing of materials in such a timely manner to not affect the progression of the earthworks. The Contractor shall provide copies of all results to the Client / Client's representative for verification of material acceptability in accordance with the Specification.

6. There are a number of existing stockpiles of site-won material on the Sports Hub area which are to be reused in accordance with this specification to raise ground levels within the Sports Hub area. The location of the stockpiles are shown on the plan included in Appendix A.

Appendix 6/1: (cont'd)

7. The Contractor is responsible for ensuring all statutory and regulatory requirements for the receipt and use of all materials either excavated from the site or imported onto the site are observed. The Contractor is responsible for ensuring a record of each load delivered and accepted is retained giving:

   i. Date
   ii. nature and quality
   iii. place of origin
   iv. quantity by weight/volume
   v. carrier
   vi. supplier

   The Contractor is responsible for ensuring a visual and olfactory assessment is carried out on every load, on initial receipt and after deposition, to ensure compliance with the Acceptance Criteria; the findings of the assessment shall be recorded with the record sheet for the load.

Unacceptable Material and Contamination

8. The fill areas, embankment and side slopes will be constructed within an area having had a greenfield use prior to construction. Chemical testing in these areas, as part of the site investigation did not reveal any evidence of contamination.

9. Class U1A material is defined as material that does not meet the requirements of Table 6/1 and material composed of peat, materials from swamps, marshes and bogs; logs, stumps and perishable material; materials in a frozen condition; clay having a liquid limit determined in accordance with BS 1377: Part 2, exceeding 90 or plasticity index determined in accordance with BS 1377: Part 2, exceeding 65; or material susceptible to spontaneous combustion except unburnt colliery spoil complying with sub-Clause 15 of this Clause

10. Class U1B materials are defined as contaminated materials, including controlled wastes (as defined in the Environmental Protection Act 1990 Part IIA) whose level of contamination is above that given either in contract specific Appendix 6/14 or in contract specific Appendix 6/15, but excluding all hazardous wastes (as defined in the Hazardous Waste (England and Wales) Regulations 2005) and radioactive wastes (as defined in the Radioactive Substances Act 1993).

11. Class U2 material is defined as hazardous waste (as defined in the Hazardous Waste (England and Wales) Regulations 2005) and radioactive waste (as defined in the Radioactive Substances Act 1993) Notwithstanding the results of any testing, bituminous bound materials, including tarmac, asphalt and the like shall be U2 and shall not be incorporated into the site backfill.

12. Unacceptable material (other than Class U2) can be processed by mechanical, chemical or other means to render the material acceptable for use in the permanent works in accordance with the requirements of Table 6/1 and contract specific Appendix 6/1. Any such treatment would be subject to further verification testing to confirm acceptability and will require prior consultation with and agreement from the Engineer. The testing rate in such circumstances may be varied by the Engineer to provide greater confidence in the material's acceptability. Alternatively, Class U1A materials may be used as Class 4 fill to landscape areas, subject to agreement by the Engineer.

Appendix 6/1: (cont'd)

13. Generic Acceptance Criteria for potential contaminants are given in Appendix 6/14 of this Specification. Acceptability Criteria for the potential contaminant suite to be analysed are given in Appendix 6/15 of this Specification.

Classification of Earthworks Materials

14. The classification and confirmation of acceptability of earthworks materials shall be carried out by the Contractor from samples obtained from stockpiles and / or from imported materials delivered to the site. Given the classification of site won fill material, soil water content will be crucial to successful compaction. Using samples as extracted from stockpiles and / or imported materials soil water content shall be measured at arrival and at the time of placement in its permanent location to confirm acceptability. Where appropriate, sources of material are to be covered by an appropriate Materials Management Plan. The testing required is listed in Appendix 1/5. Occasionally locally sourced materials might include a proportion of mudstone fragments that should breakdown on compaction but at time of excavation and stockpiling the percentage and size of mudstone fragments could potentially indicate in grading analysis that the material is not acceptable as Class 2. Where this is suspected suitability testing should be undertaken on samples of the placed and compacted material to assess grading of the compacted material and suitability as Class 2 fill.

15. Where, prior to placement, the soil water content is lower than the acceptable range specified in Table 6/1.1, treatment could take the form of spraying exposed stockpiles to increase the soil water content. Where the soil water content exceeds the acceptable limit defined in Table 6/1.1, the Contractor will take such measures as are required to render the soil suitable. This could be in the form of setting the overly wet soil aside to dry out, the addition of lime or cement to reduce the soil water content, mixing with granular material or similar measures. Stockpiles should be protected from excessive water ingress and earthworks placement should be restricted or postponed during inclement weather. The Contractor shall demonstrate through materials testing that the soils meet acceptability criteria (Table 6/1) prior to use in any earthworks structure.

Imported Materials

16. Earthworks materials for use in the construction of the Sports Hub, including the embankment and side slopes to the perimeter shall be obtained from one of the following sources:-

    i. Site won from existing development site (Class 2A, 2B or 2C as defined in the Geotechnical Ground Appraisal Report) for use in embankments and to build up site levels. Site won material will generally be sourced from existing stockpiles on the Sports Hub area.
    ii. Site won from existing development site (Class 4) for use in landscaped fill areas (not under embankments).
    iii. Imported material (Class 1/6F4/6F5) for use as part of pavement foundation. Refer to design proposals.

17. The Contractor is responsible for ensuring that all fill to be imported for use in the earthworks meets the requirements of the Specification.

Appendix 6/1: (cont'd)

Material Stockpiles

18. The required earthworks may produce the following types of material stockpiles:

- Material awaiting off-site disposal as Class U2.
- Other Class U1 material stockpiled awaiting processing and/or treatment at locations to be agreed with the Engineer in accordance with the site constraints.
- Earthworks material excavated and awaiting use as earthworks fill on the scheme.

19. The Contractor shall take all reasonable measures to ensure that stockpiled soils remain free from pernicious weeds. Where any such measures include the spraying or otherwise application of herbicides, the Contractor shall, prior to commencement, demonstrate to the Engineer that any such herbicides are suitable for use and will not harm the wider environment. Where any licences are required for the application of herbicides, the Contractor shall provide evidence of their current and valid licence for the proposed works.

20. The Contractor shall take reasonable precautionary measures to prevent the release of sediment into controlled waters.

Groundwater

21. The Contractor shall take all necessary measures to prevent any surface runoff from the construction works flowing directly into any watercourses, either existing or proposed, on the site. Where pumping is undertaken and discharge is into an existing watercourse, a method statement of the intended operation (which should include the Contractor's methodology to limit silt, debris and other contamination entering the watercourse) shall be presented for approval.

Appendix 6/1: (cont'd)

Table 6/1.1: Acceptable Earthwork Materials: Classification and Compaction Requirements

Class	General Material Description	Typical Use	Permitted Constituents (all subject to Requirements of Clause 601 and 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
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:		
						Lower	Upper	
1	General Granular Fill excluding any material with gradings that would be Class 1C	General Fill.		i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	End Product Compaction to 95% maximum dry density as determined by 2.5kg rammer.
				(ii) mc	BS 1377: Part 2	OMC -2%	OMC +2%	
				(iii) pH	BS 1377: Part 3	4	8	
				(iv) CBR	BS 1377: Part 9	3.5 - 4.5%	-	
2A	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	End Product Compaction to 95% maximum dry density as determined by 2.5kg rammer and maximum 7% air voids

Class	General Material Description	Typical Use	Permitted Constituents (all subject to Requirements of Clause 601 and 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
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:		
						Lower	Upper	
2A				(iii) mc	BS 1377 Part 2 See Note 4	OMC -2%	OMC +2%	
				(v) Undrained shear strength of remoulded material by hand vane	BS 1377: Part 9 Clause 4.4	50kPa	150kPa	
				(vi) Insitu CBR	BS 1377: Part 9	3.5 - 4.5%	-	
2B	Dry Cohesive material	General Fill.	Any materials or combination of materials, other than chalk	i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	End Product Compaction to 95% maximum dry density as determined by 2.5kg rammer and maximum 7% air voids.
				(iii) mc	BS 1377 Part 2 See Note 4	OMC -2%	PL -4%	

Class	General Material Description	Typical Use	Permitted Constituents (all subject to Requirements of Clause 601 and 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
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:		
						Lower	Upper	
2B				(v) Undrained shear strength of remoulded material by hand vane	BS 1377: Part 9 Clause 4.4	50kPa	150kPa	
				(viii) Insitu CBR	BS 1377: Part 9	3.5 - 4.5%	-	
2C	Stony cohesive material	General Fill	Any materials or combination of materials, other than chalk	i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	End Product Compaction to 95% maximum dry density as determined by 2.5kg rammer and maximum 7% air voids
				ii) Plastic Limit PL	BS 1377: Part 2	-	-	
				(iii) mc	BS 1377: Part 2 See Note 4	OMC -2%	OMC +2%	

Class	General Material Description	Typical Use	Permitted Constituents (all subject to Requirements of Clause 601 and 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
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:		
						Lower	Upper	
2C				(v) Undrained shear strength of remoulded material by hand vane	BS 1377: Part 9 Clause 4.4	50kPa	150kPa	
				(vii) Insitu CBR	BS 1377: Part 9	3.5 – 4.5%		
4	Various	Fill to landscape areas	Any material or combination of materials, other than chalk.	(i) grading	BS 1377: Part 2	-	Tab 6/2 (equivalent to Class 2C)	End Product Compaction to 95% maximum dry density as determined by 2.5kg rammer and maximum 7% air voids
				(i) mc	BS 1377: Part 2 See Note 4	-	OMC +3%	
5A	Topsoil, or turf existing on site	Topsoiling	Topsoil or turf designated Class 5A in the Contract	i) grading	Clause 618	-	Clause 618	-
5B	Imported topsoil	Topsoiling	General purpose grade complying with BS 5882		-	-	-	-

Class	General Material Description	Typical Use	Permitted Constituents (all subject to Requirements of Clause 601 and 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
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:		
						Lower	Upper0 '#	
6F4	Selected granular material (fine grading) - imported onto the site	Capping	Unbound mixtures 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))	(i) Size designation and overall grading category	BS EN 13285 – *0/31.5 and GE*	Tab 6/5	Tab 6/5	Tab 6/4 Method 6
				(ii) Maximum fines and oversize categories	BS EN 13285 – *UF15* and *OC75*	Tab 6/5	Tab 6/5	
				(iii) Los Angeles coefficient	BS EN 13242 – *LA60*	-	60	
				(iv) Stability of blast furnace slag	BS EN 13242 – free from dicalcium silicate and iron disintegration	-	-	
				(v) Volume stability of steel (BOF/EAF) slag	BS EN 13242 – *V5*	-	-	
				(vi) Other aggregate requirements	BS EN 13242 – Category*NR* (no requirement)	-	-	

Class	General Material Description	Typical Use	Permitted Constituents (all subject to Requirements of Clause 601 and 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
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:		
						Lower	Upper	
6F4			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) Aggregate from source code A4 shall contain not more than 50% 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.	(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%	

Class	General Material Description	Typical Use	Permitted Constituents (all subject to Requirements of Clause 601 and 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
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:		
						Lower	Upper	
6F5	Selected granular material (coarse grading) Imported onto the site	Capping	Unbound mixtures complying with BS EN 13285 containing aggregate conforming to BS EN 13242 from one 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)	(i) Size designation and overall grading category	BS EN 13285 – 0/80 and GE	Tab 6/5	Tab 6/5	Tab 6/4 Method 6
				(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 – CategoryNR (no requirement)	-	-	

Class	General Material Description	Typical Use	Permitted Constituents (all subject to Requirements of Clause 601 and 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
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:		
						Lower	Upper	
6F5			D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G (mining and quarry industry – except G2 (black coal shale) Aggregate from source code A4 shall contain not more than 50% 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.	(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%	

Note

1 App = contract specific Appendix

2 Tab = Table

3 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 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 Uniformity coefficient is defined as the ratio of the particle diameters D60 to D10 on the particle-size distribution curve,
where:

D60 = particle diameter at which 60% of the soil by weight is finer
D10 = particle diameter at which 10% of the soil by weight is finer

6 The limiting values for Class U1B material are given in contract specific Appendix 6/14 and contract specific Appendix 6/15.

7 For works in Wales see sub-Clause 601.21W.

8 Where material source codes are referenced, these are as listed in Table 6/7.

9 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 Engineer.

10 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

Appendix 6/2: Requirements for Dealing with Class U1B and Class U2 Unacceptable Materials

General

1. The Sports Hub will be constructed within an area having had a greenfield use prior to construction. Chemical testing in these areas, as part of the site investigation did not reveal any evidence of contamination. However, the Contractor shall note the following clauses and act accordingly, where applicable.

2. Where Class U1B material is identified, the Contractor shall undertake Waste Acceptance Criteria (WAC) Tests to determine the waste type and whether the waste will comprise U2 material, i.e. Hazardous Waste.

3. The Contractor shall make all necessary enquiries and arrangements for the disposal off-site of all U1B and U2 materials and shall liaise with the relevant regulatory bodies prior to initiating removal of any material from site.

4. The Contractor shall inform the Engineer immediately of the discovery of U1B or U2 materials, asbestos or other gross contamination. The Contractor shall define in their Method Statement the procedures for handling asbestos, U1B or U2 materials or other waste.

5. No groundwater or surface water shall be discharged to foul or storm sewer, nor to watercourses without the prior written approval by the relevant authorities.

6. The Contractor shall ensure that waste is stored, handled, recorded and disposed of in accordance with all relevant regulations and best practice.

7. The Contractor shall take appropriate measures to avoid and prevent cross contamination of plant and personnel and also to ensure that all plant and personnel are free from contaminants and mud upon exiting the site.

Appendix 6/3: Requirements for Excavation, Deposition, Compaction (Other than Dynamic Compaction)

Drawings

1. Earthworks details are shown on the drawing Refs. Mowbray-GLA-SH-D-C-1106/1107/1108/1109/1110/1111 (Technical Layout Sheets 1-6) Mowbray-GLA--SH-PH2-D-C-1138 (Engineering Details Sheet 1), Mowbray-GLA--SH-PH2-D-C-1170 (Earthworks Plan) and Mowbray-GLA-SH-PH2-D-C-1171/1172 (Earthworks Long-Sections), latest revisions thereof.

2. Construction plant shall use site haul roads to move around the site to avoid damage to future development land.

Blasting for Excavation

3. No blasting is permitted.

Undercutting Requirements

4. Undercutting Restrictions - undercuttings at the toe of embankment slopes (existing or new) shall be, as far as practical, avoided. In the event that undercutting is unavoidable, adequate support to prevent failure of the slope shall be provided. Undercuttings shall be kept free of standing water, with dewatering, if required, and controlled in a manner so as not to disturb the fines in adjacent soils.

5. Clearing loose material - isolated patches of soft, loose, fragmented or insecure material shall be excavated and either:

   a filled by the ramming in of a Class of fill with similar characteristics to the surrounding intact material, or;
   b excavated to a depth of at least 200mm and replaced as soon as practicable with ST2 concrete to Clause 2602 well rammed into the cleaned-out void.

   The creation of "hard spots" must be avoided and the selected method shall be agreed with the Engineer.

6. Drainage trenches and trenches for other services the toe of embankments shall be offset and excavated in lengths to be agreed with the Engineer so that no long lengths of trench shall be open in a continuous run.

7. Seepage may occur in excavations and this is to be monitored by visual observation until it dissipates. Permanent drainage on the embankment faces is not anticipated but an assessment shall be made on site ahead of topsoiling to determine whether this is required.

Watercourses Including Ditches

8. Redundant ditches are to be cleaned out (removal of all soft material and water) and infilled with compacted acceptable fill.

9. Where temporary ditches are utilised, ditches are to be maintained until permanent drainage measures are constructed. Permanent filter drains shall be constructed after completion of earthworks unless otherwise indicated on the drawings.

Appendix 6/3: (cont'd)

Compaction

10. Compaction to comply with Clause 612 unless otherwise specified in Table 6/1.1 of the Specification.

11. Where end product compaction is required a nuclear surface density gauge is permitted for measuring field dry density as an aid to the Contractors material compaction control, subject to calibration in accordance with Clause 612.15 and correlation with direct measurements of field density. Compliance testing must be undertaken using sand replacement testing or core cutters.

12. Compaction of fills shall be in uniform layers, compacted as works proceed and with particular reference to the plant used and Table 6/4 (Series 600 – Earthworks). Cohesive and granular fills shall not be interlayered.

13. Compaction shall be completed as soon as possible after the material has been spread and in accordance with requirements for the material.

14. The surface of any layer of material shall on completion of compaction and immediately before overlaying, be free from movement under compaction plant and be free from ridges, cracks, loose materials, potholes, ruts and other defects. All loose segregated or otherwise defective areas shall be removed to the full thickness of the layer and new material should be laid and compacted.

15. The Contractor shall confirm the method of compaction including layer thickness, type of plant, number of passes and material type with the Engineer prior to starting compaction and will keep contemporaneous records during the earthworks. Refer to Table 6/4 (Series 600 – Earthworks).

16. Acceptability testing of the as-placed material will be required to confirm that the material has been placed in accordance with the Specification and to ensure the long-term performance of the fill material. The acceptability testing required and frequency is given in Appendix 1/5.

17. All acceptability testing is to be carried out by the Contractor under the direction of the Engineer. The Engineer reserves the right to vary the type of testing carried out and the frequency. The location and depth of the tests shall be instructed by the Engineer unless otherwise indicated in Appendix 1/5 .

18. Class 4 materials in landscape areas require sufficient compaction to remove large voids and produce a coherent mass. Over compaction is to be avoided.

Excavation

19. Soils shall be excavated using conventional pneumatic tyred or tracked excavation plant using buckets to suit to ground conditions present on the site.

Appendix 6/3: (cont'd)

20. Where possible, excavation shall proceed in a benched manner, with plant operating on higher ground to the rear of the bench step/face with excavated soil loaded onto site transport situated to the rear of the excavator. This is to minimise damage to the exposed formation. The benches shall be no more than 0.5 m high and at least 0.5 m wide.

21. Hard ground, such as rock bands should where necessary be broken out using hydraulic hammers, mounted on the excavation plant, to facilitate excavation.

22. Where topsoil has not already been stripped, and prior to excavation, the topsoil shall be stripped for the footprint of the Sports Hub area. Topsoil shall be stockpiled for re-use where acceptable.

23. The Contractor shall note and record any groundwater inflows, existing land drainage or cases of instability and provide records to the Engineer within 24 hours.

Topsoil Stockpile

24. Topsoil shall be stockpiled in accordance with BS3882 at locations to be agreed with the Engineer.

25. Temporary topsoil stockpiles shall be constructed no higher than 3m above ground level.

26. Topsoil shall be transported to the stockpiles in pneumatic tyre dumpers, or similar vehicles and placed by end tipping to form the stockpile.

27. Compaction shall be limited to 'nominal compaction' from tracked plant operating on the stockpile to move materials to form the stockpile and remove large voids.

28. Stockpile side slopes shall be formed no steeper than 1v:2.5h and in the event of any slope movement or instability, the Contractor shall re-form the slope, where necessary to a shallower batter.

29. In the event that the topsoil stockpiles remain uncovered or unseeded, a bund 0.5m high with side slopes no steeper than 1v:1.5h shall be formed around the perimeter of the topsoil stockpiles to intercept any rainfall run-off and prevent the loss of materials from the stockpile if stockpiles of topsoil are to be left for longer than 6 months they shall be seeded in accordance with BS3882.

30. The Contractor shall allow for the removal of water run-off from within the bunded area.

31. The Contractor shall minimise vehicular movements over topsoiled areas once it has been placed.

Earthworks Fill Stockpiles

32. The Contractor is to ensure that all fill to be used in the earthworks meets the requirements of the Specification.

33. The Contractor shall form cut-off trenches around material stockpiles to intercept any run-off from the stockpile. The trench shall be 0.5m deep and 0.5m width (minimum), with side slopes no steeper than 1v:2.5h.

Appendix 6/3: (cont'd)

34. The trench shall be maintained throughout the course of the stockpiling operation to avoid it becoming silted up.

35. In order to prevent any pollution of surface water bodies, e.g. fine soil being washed into watercourses, the Contractor shall allow for the removal of standing water from the cut-off trench, whenever the trench is more than 75% full.

36. Stockpiles shall be constructed no higher than 4m above ground level.

37. Soil to be used as earthworks fill shall be transported to the stockpiles in pneumatic tyre dumpers, or similar vehicles and placed by end tipping to form the stockpile.

38. Compaction to minimise over-stressing soils in the stockpile and mitigate the risk of large voids shall be limited to 'nominal compaction' from tracked plant operating on the stockpile.

39. The Contractor shall take all reasonably practicable measures to ensure that the soil within the stockpiles is not over-trafficked or over-compacted as this could render the soil unsuitable for its intended use.

40. The Contractor shall be responsible for maintaining stable side slopes and in the event of any slope movement, the Contractor shall re-form the slope, where necessary to a shallower batter and stockpiles are to be shaped to shed rainwater.

41. Where stockpiles are situated over any ditches or ephemeral watercourses, the ditch/watercourse shall be piped beneath the footprint of the stockpile.

Dust Control

42. The Contractor shall throughout the contract employ measures to control dust to the satisfaction of the Engineer.

Appendix 6/5: Geotextiles Used to Separate Earthworks Materials

Geotextiles used in Pavement Construction, Ditch Linings and Perforated Pipe Surrounds

1. A geotextile layer shall be installed beneath the pavement foundation for all new carriageway pavement constructions. The layer shall be Terram 1000 or similar approved. Carriageway construction details including locations of geotextiles are shown on the drawing Refs. Mowbray-GLA-SH-D-C-1101/1102/1103/1104/1105 (Surface Finishes Layout Sheets 1-5) and Mowbray-GLA-SH-PH2-D-C-1138/1139/1140 (Engineering Details Sheets 1-3), latest revisions thereof.

2. A geotextile layer shall line all drainage ditches / toe drains. The layer shall be Terram 1000 or similar approved. Toe drain construction details including locations of geotextiles are shown on the drawing as shown on drawing Refs. Mowbray-GLA-SH-D-C-1170/1171/1172 (Earthworks Analysis and Sections) and Mowbray-GLA-Mowbray-GLA-SH-PH2-D-C-1138 (Engineering Details Sheet 1), latest revisions thereof.

3. The minimum life expectancy of a geotextile shall be no less than 25 years.

4. Distribution and numbers of samples for subsequent testing shall be in accordance with Appendix 1/5 Clause 609 and 621.

5. Laying and lapping shall be in accordance with Clause 609.5.

6. Contractors shall retain samples of geotextile until end of Maintenance Period.

Appendix 6/6: Fill to Structures and Fill Above Structural Foundations

1. The fill material used in new embankments and to build up levels across the Sports Hub area shall be site won Class 2A engineered fill material or Class 2B or 2C fill. The material used as part of the pavement foundation (as capping) shall be imported 6F4 or 6F5. Subbase material shall be Type 1. All fill materials regardless of origin shall comply with the requirements of Table 6/1.1 of this Specification.

Appendix 6/7: Sub-Formation and Capping and Preparation and Surface Treatment of Formation

Capping and Sub-Formation

1. Preparation and surface treatment of formation in soil shall be to levels in accordance with Clause 616.

2. Where required, capping material is to be provided in accordance with the drawings and Appendix 7/1.

3. Permitted classes of Capping are specified in Table 6/1.1 of Appendix 6/1.

4. CBR values should be tested and recorded at the appropriate time. Test results, along with date and weather conditions shall be submitted to the Engineer. In-situ testing should be undertaken at frequencies to suit the anticipated ground but the spacing of tests should not be greater than 30 metres.

5. The pavement foundation design is based on an assumed Design CBR of 3.5% - 4.5% based on the Plasticity Index results as recorded in the GAR, equivalent to a subgrade surface modulus (E) of 39MPa - 46MPa.

6. In accordance with CD225 (which supersedes IAN73/06), where E is less than 27MPa (~CBR 2.0%) the subgrade shall be permanently improved. The thickness of material removed will be at least 0.5m below the road formation level.

7. A geotextile separation fabric shall be installed between the subgrade and capping. Refer to Appendix 6/5.

Appendix 6/8: Topsoiling

1. Topsoil specification is included in David Jarvis Associates Sports Hub Landscape Specification Ref. 2898-5-4-SP-2001-S4.

Appendix 6/9: Earthwork Environmental Bunds, Landscaping Areas, Strengthened Embankments

1. For details on landscaped areas refer to David Jarvis Associates proposals Ref. 2898-5-2-10-DR-2102/2103/2104. Landscape areas may be constructed simultaneously with adjoining embankments, where approved by the Engineer.

2. Class 4 materials in landscape areas require sufficient compaction to remove large voids and produce a coherent mass. Over compaction is to be avoided.

3. Landscape areas to be topsoiled in accordance with Appendix 6/8 and Clause 618.

4. Strengthened earthworks are not envisaged for any part of the embankment works.

Appendix 6/12: Instrumentation and Monitoring

General – Instrumentation

1. No geotechnical instrumentation is anticipated as part of the construction works. However, in the event that instrumentation is required, the Contractor shall be responsible for and shall follow the manufacturers' instructions and the requirements of this Specification in the installation, calibration and testing of all measuring instruments and equipment, which shall be carried out in the presence of the Engineer. The Contractor shall inform the Engineer at least 2 working days prior to undertaking installation of the equipment. The Contractor shall make allowances in his construction programme for delays which may arise on account of the installation of the instruments and of their maintenance.

2. The Contractor shall provide suitably qualified and competent staff to take readings of instruments during construction and provide measurements/data at the time the instruments are read.

3. The Contractor shall take all necessary and reasonable steps to protect equipment and datums during the construction phase. Any damage shall be reported to the Engineer.

Survey Equipment

4. All surveying equipment used in conjunction with the monitoring of instrumentation, including measuring tapes, levels and EDMs shall be maintained and calibrated as required by the manufacturer's and good surveying practice.

Monitoring

5. The Contractor shall be responsible for all elements of the earthworks including (but not limited to) acceptability and compliancy testing as set out in the Specification and MCHW (Series 600 – Earthworks), supervision and inspections both during the construction. The Contractor shall also be responsible for determining the sequence of the construction, verification of ground conditions, monitoring groundwater and the safety of the workforce.

Appendix 6/14: Limiting Values for Pollution of Controlled Waters

1. The limiting concentrations for the protection of controlled waters are presented in Schedule A of this Appendix. Given the site's proximity to open watercourses, the limiting values are based on Environmental Quality Standards (EQS) for the protection of surface waters.

2. The Contractor shall undertake leachability tests on the determinand list as set out in Schedule A and the limits of detection shall, as a minimum, be no greater than the respective EQS concentration. Testing rates are set out in Appendix 1/5.

3. No material exceeding these limits shall be incorporated into the works.

4. The Contractor shall advise the Engineer in the Contractor's sampling and testing method statement on the methods for sampling, containment, storage, transit, scheduling, testing and reporting. All testing shall be undertaken in accordance with UKAS accreditation.

Table 6/14.1 - Schedule A: Acceptability Criteria for the Water Environment

Contaminant	EQS value (µg/l)
Arsenic	50
Boron	2000
Cadmium	5
Chromium (Total)	5
Copper	1
Lead	4
Mercury	1
Nickel	50
Zinc	8
TPH	10
Naphthalene	10
PAH [1]	0.1
Benzo(a)pyrene	0.01
Phenol	1
Ammoniacal Nitrogen	1000
Biological Oxygen Demand	3000
Chemical Oxygen Demand [2]	-
Sulphate [2]	-
Chloride [2]	-
pH [2]	-
Hardness [2]	-

NOTES:

1. PAH is the sum concentration of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(1,2,3-cd)pyrene.

2. Water quality indicators for which no specific acceptability criteria are set.

Appendix 6/15: Limiting Values for Harm to Human Health and the Environment

General

1. The limiting concentrations for the protection of human health and the environment are presented in Schedules A, B and C of this Appendix.

2. All material from the existing made ground present on site and to be together with all imported fill materials shall be tested to ensure the concentrations of potential contaminants are below the guideline values for residential use (POSresi). This is considered to be conservative approach as there is no specific designation for Sports Pitches. These values are given by:

   i. EA (2009) Soil Guideline Value Reports. CLEA website. http://www.environment-agency.gov.uk/research/planning/33714.aspx Environment Agency, Bristol.

   ii. CIEH (2009) The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition). The Chartered Institute of Environmental Health, Nottingham.

3. The Contractor shall undertake tests on the determinand list as set out in Schedules A, B and C and the limits of detection shall, as a minimum, be no greater than the respective threshold concentration.

4. The Contractor shall advise the Engineer in the Contractor's sampling and testing method statement on the methods for sampling, containment, storage, transit, scheduling, testing and reporting. All testing shall be undertaken in accordance with UKAS and MCERTS accreditation.

Table 6/15.1 - Acceptability Criteria for Human Health (Total Petroleum Hydrocarbons)

Contaminant	Public Open Space (Resi)
	Soil Concentration (mg/kg)
	SOM 1.0%
TPH Aliphatic C5-6	682000
TPH Aliphatic C6-8	753000
TPH Aliphatic C8-10	18000
TPH Aliphatic C10-12	18500
TPH Aliphatic C12-16	18600
TPH Aliphatic C16-35	445000
TPH Aromatic C5-7	140
TPH Aromatic C7-8	55300
TPH Aromatic C8-10	7300
TPH Aromatic C10-12	7420
TPH Aromatic C12-16	7470
TPH Aromatic C16-21	3770
TPH Aromatic C21-35	3770

Appendix 6/15: (cont'd)

Table 6/15.2 - Acceptability Criteria for Human Health (Metals and Metalloids)

Contaminant	Public Open Space (Resi)
	Soil Concentration (mg/kg)
	SOM 1.0%
Antimony	749
Arsenic (C4SL)	79.1
Asbestos screening	Should Asbestos be identified the Project Manager should be informed immediately
Barium	2680
Beryllium	2.19
Cadmium (C4SL)	219
Chromium III	30600
Chromium VI (C4SL)	26.1
Chromium VI (MRL)	4.62
Copper	16400
Lead (C4SL)	625
Mercury (elemental)	1020
Mercury (inorganic)	474
Mercury (methyl)	53.1
Molybdenum	1360
Nickel	347
Selenium	1370
Vanadium	818
Zinc	93700

Table 6/15.3 - Acceptability Criteria for Human Health (Polycyclic Aromatic Hydrocarbons)

Contaminant	Public Open Space (Resi)
	Soil Concentration (mg/kg)
	SOM 1.0%
Acenaphthene	14700
Anthracene	74100
Fluoroanthene	9870
Fluorene	9870
Napthalene	3490
Pyrene	7400
Benzo(a)pyrene (C4SL)	10.3
Benzo(a)pyrene (MRL)	4.04

Appendix 6/15: (cont'd)

Table 6/15.4: Acceptability Criteria for Human Health (BTEX)

Contaminant	Public Open Space (Resi)
	Soil Concentration (mg/kg)
	SOM 1.0%
Benzene (C4SL)	140
Toluene	55300
Ethylbenzene	24300
Xylene, o-	37800
Xylene, o-	37500
Xylene, o-	37400
Methyl tert-butyl ether	73600

Table 6/15.5: Acceptability Criteria for Human Health (Pesticides)

Contaminant	Public Open Space (Resi)
	Soil Concentration (mg/kg)
	SOM 1.0%
Dinoseb	38.3
Prochloraz	1480
DDD	111

Table 6/15.6: Acceptability Criteria for Human Health (PCBs)

Contaminant	Public Open Space (Resi)
	Soil Concentration (mg/kg)
	SOM 1.0%
Total PCDDs, PCDFs and Dixon-like PCBs	0.023

Table 6/15.7: Acceptability Criteria for Human Health (Other Contaminants)

Contaminant	Public Open Space (Resi)
	Soil Concentration (mg/kg)
	SOM 1.0%
Nicotine	120
Tributyl tin oxide	30.1
Free Cyanide	34

Table 6/15.8: Acceptability Criteria for Human Health (VOCs)

Contaminant	Public Open Space (Resi)
	Soil Concentration (mg/kg)
	SOM 1.0%
Chlorobenzene (mono)	15500
Chloroform	1700
1,1,2-Trichloroethane	967
1,1-Dichloroethane	42200
1,1-Dichloroethene	9190
1,2-Dichloropropane	1190
2,4-Dimethylphenol	5010
2,4-Dinitrotoluene	501
2,6-Dinitrotoluene	251
2-Chloronaphthalene	6050
2-Methylphenol	25100
4-Methylphenol	25100
3-Methylphenol	25100
Bromobenzene	4700
Bromoform	3870
Butyl benzyl phthalate	125000
Chloroethane	518000
Chloromethane	465
Cis 1,2 Dichloroethene	1240
Dichloromethane	755
Bromodichloromethane	69.7
Diethyl Phthalate	49300
Di-n-butyl phthalate	1300
Di-n-octyl phthalate	10600
Hexachloroethane	122
Trans 1,2 Dichloroethene	3550
Bis (2-ethylhexyl) phthalate	9680
Trichloroethene	33.1
Vinyl chloride	3.45
1,1,1,2-Tetrachloroethane	4800
1,1,2,2-Tetrachloroethanes	4870
Tetrachloroethene	3360
1,1,1-trichloroethane	304000
1,2-dichloroethane	85.2
Carbon tetrachloride	981
Carbon disulphide	9950
Trichloromethylbenzene	0.18
Formaldehyde	1700
2,6-bis(1,1-dimethyl)-4-(1-methylpropyl)-phenol	311
Iso-propylbenzene	23900
Propylbenzene	24700
Styrene	3010
Biphenyl	9440
1,2,4-Trimethylbenzene	244
2,4-Dichloro-o-cresol	8030
Dibromochloromethane	227

Appendix A

Earthworks Plan and Long-Sections

INSET A

FOR CONTINUATION SEE BELOW

FOR CONTINUATION SEE INSET A

GOAL RECESS

ARTIFICIAL GRASS PITCH
100 x 64m PPA
106 x 70m TOTAL

3G ARTIFICIAL GRASS PITCH

RUNOFF

SPECTATOR AREA

MUGA 1
21.5m x 37m
including run-off

MUGA 2
21.5m x 37m
including run-off

MUGA 3
21.5m x 37m
including run-off

MUGA 4
21.5m x 37m
including run-off

FF 54.300

COACH

STADIA FTP
100 x 64m PPA
106 x 70m O/A

6 Pitch Cricket Wicket
20.12m x 18.3m

Outfield 46m plus 3m run-off
measured from outer mid stump to
boundary
45.72m min. to 82.26m max)

STADIA FTP
100 x 64m PPA
106 x 70m O/A

Channells Brook

10.0 0.0 10.0 20.0 30.0 40.0 50.0

Scale = 1:500 @ A1

N

KEY

- 54.60 Existing level
- 25 Chainage marker
- Existing topsoil spoil heaps
- Existing area stripped to a depth of 300mm (29393m² x 300mm = 8818m³)
- Existing topsoil to be stripped to a depth of 300mm (28389m² x 300mm = 8571m³)

NOTES

1. This drawing is to be read in conjunction with all relevant documents and specifications.
2. Dimensions are not to be scaled.
3. All works shall be in accordance with Volume 1 of Manual of Contract Documents for Highways Works - Specification for Highway Works (MCHW).
4. Contours are shown at 50mm intervals.
5. Embankments and levels to be built-up to construction formation level / underside of topsoil level using site-won Class 2 A engineered fill material or any Class 2B or 2C fill material. Layer thickness, material compaction/number of passes shall be in accordance with the Earthworks Specification.
6. For topsoil specification refer to Glanville Sports Hub Earthworks Specification and David Jarvis Associates Sports Hub Landscape Specification Ref. 2898-5-4-SP-2001-S4.
7. Refer to Earthworks Specification for further details of earthworks and topsoiling.
8. Refer to Cut and Fill drawing (Ref. Mowbray-GLA-SH-Ph2-D-C-1180) for details of cut and fill volumes.

Rev.	Description	Date	Chkd
C1	Notes revised. Layout updated to suit site changes. Issued for construction.	08/09/2023 DS	CS
P1	First issue.	19/07/2023 DS	CS

Glanville
Cornerstone House
62 Foxhall Road, Didcot
Oxon, OX11 7AD
Tel: (01235) 515550 Fax: (01235) 817799
postbox@glanvillegroup.com www.glanvillegroup.com

Client :
Legal & General
(Strategic Land North Horsham) Limited

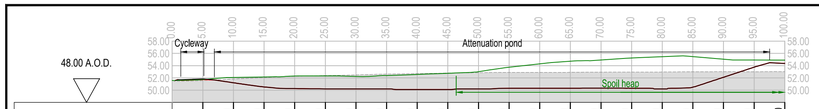
Project :
Sports Hub at Mowbray
North Horsham

Title :
Earthworks
Plan

Project Engineer :	C Salt	Scale :	As Shown @ A1
Project Director :	J Birch	Date :	June 2023
Status :	CONSTRUCTION		

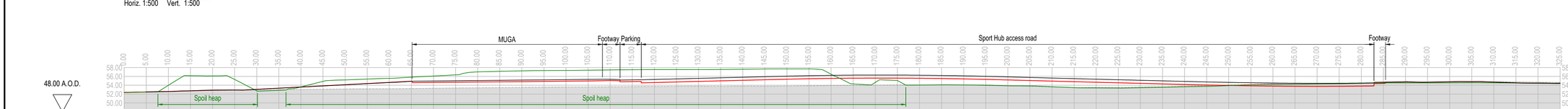
Glanville Job Number: 8220585

Drawing No. Mowbray-GLA-SH-Ph2-D-C_1170 Rev C1

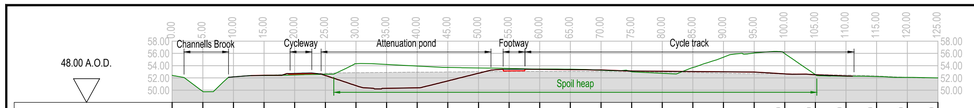


	Chainage	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
	Existing Level	51.583	51.746	52.081	52.167	52.311	52.320	52.248	52.390	52.669	52.757	53.025	53.741	54.306	54.727	54.930	55.251	55.468	55.486	55.058	54.936	54.903
	Finished Level	51.594	51.843	51.209	50.531	50.264	50.200	50.200	50.202	50.100	50.100	50.210	50.312	50.319	50.324	50.329	50.324	50.200	50.495	52.109	53.760	54.369
	Formation Level	51.594	51.723	51.209	50.531	50.264	50.200	50.200	50.202	50.100	50.100	50.210	50.312	50.319	50.324	50.329	50.324	50.200	50.495	52.109	53.760	54.370
	Pre-Spoil Heaps Level	51.445	51.573	51.827	52.060	52.269	52.389	52.504	52.634	52.714	52.794	52.860	52.906	52.905	52.909	52.947	52.966	52.972	53.011	53.015	53.004	53.025

EARTHWORKS SECTION A-A
Horiz. 1:500 Vert. 1:500

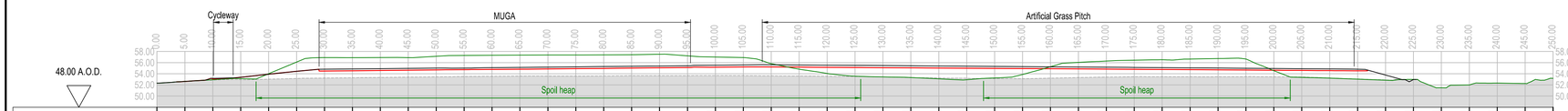


| | Chainage | 0.00 | 5.00 | 10.00 | 15.00 | 20.00 | 25.00 | 30.00 | 35.00 | 40.00 | 45.00 | 50.00 | 55.00 | 60.00 | 65.00 | 70.00 | 75.00 | 80.00 | 85.00 | 90.00 | 95.00 | 100.00 | 105.00 | 110.00 | 115.00 | 120.00 | 125.00 | 130.00 | 135.00 | 140.00 | 145.00 | 150.00 | 155.00 | 160.00 | 165.00 | 170.00 | 175.00 | 180.00 | 185.00 | 190.00 | 195.00 | 200.00 | 205.00 | 210.00 | 215.00 | 220.00 | 225.00 | 230.00 | 235.00 | 240.00 | 245.00 | 250.00 | 255.00 | 260.00 | 265.00 | 270.00 | 275.00 | 280.00 | 285.00 | 290.00 | 295.00 | 300.00 | 305.00 | 310.00 | 315.00 | 320.00 | 325.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---



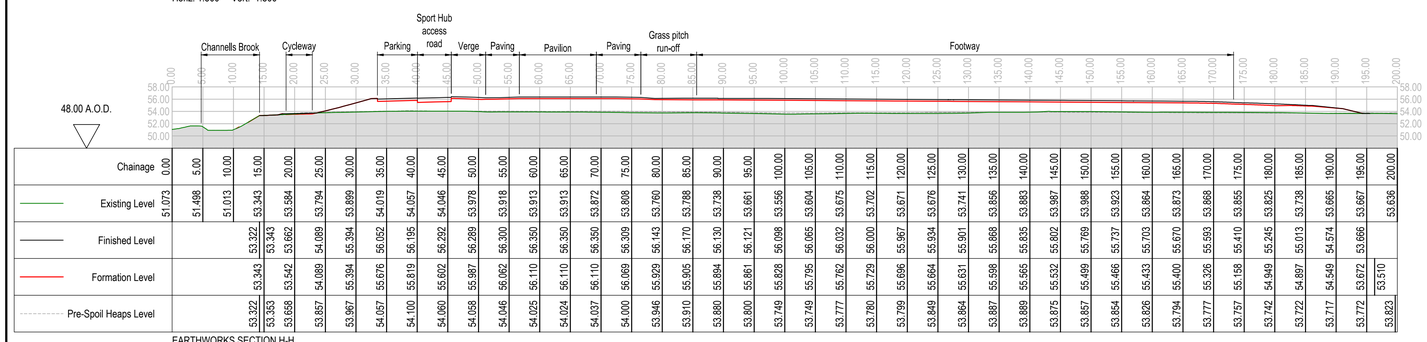
	Chainage	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00	105.00	110.00	115.00	120.00	125.00
	Existing Level	52.439	49.798	52.169	52.412	52.494	52.595	54.324	54.208	53.942	53.712	53.632	53.548	53.442	53.431	53.258	53.011	52.763	53.703	55.981	56.071	55.968	52.533	52.285	52.225	52.096	52.011
	Finished Level		52.107	52.169	52.416	52.750	52.401	50.748	50.312	50.392	51.513	52.763	53.411	53.414	53.366	53.291	53.137	53.093	53.051	53.010	52.966	52.668	52.519	52.323	52.283			
	Formation Level			52.393	52.416	52.630	52.401	50.748	50.312	50.392	51.513	52.763	53.141	53.414	53.366	53.291	53.137	53.093	53.051	53.010	52.966	52.668	52.519	52.323	52.283			
	Pre-Spoil Heaps Level			52.393	52.457	52.609	52.765	52.854	52.901	52.938	52.974	53.022	53.055	53.064	53.066	53.043	52.999	52.949	52.876	52.779	52.696	52.666	52.577	52.485	52.322	52.082	51.997

EARTHWORKS SECTION F-F
Horiz. 1:500 Vert. 1:500



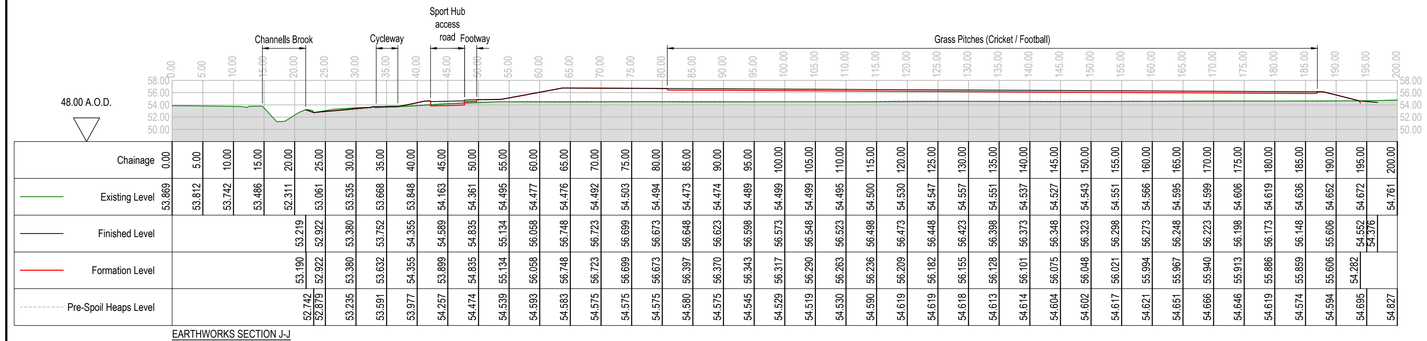
	Chainage	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00	105.00	110.00	115.00	120.00	125.00	130.00	135.00	140.00	145.00	150.00	155.00	160.00	165.00	170.00	175.00	180.00	185.00	190.00	195.00	200.00	205.00	210.00	215.00	220.00	225.00	230.00	235.00	240.00	245.00	250.00
	Existing Level	52.304	52.629	52.941	53.118	54.012	56.092	56.903	56.885	56.913	56.902	57.137	57.284	57.316	57.347	57.379	57.370	57.390	57.420	57.496	57.208	56.991	56.899	55.816	54.829	54.062	53.569	53.430	53.321	53.090	52.936	53.242	53.866	55.258	56.048	56.287	56.438	56.513	56.647	56.735	56.631	54.547	53.343	53.214	53.032	52.850	52.978	51.483	51.995	52.332	52.239	53.178
	Finished Level	52.308	52.628	53.181	53.373	53.919	54.440	54.817	54.867	56.895	57.017	57.017	55.017	55.092	55.142	55.192	55.242	55.292	55.342	55.392	55.442	55.532	56.588	56.622	56.585	55.547	55.509	55.471	55.434	55.396	55.358	55.320	55.283	55.245	55.207	55.169	55.132	55.094	56.056	56.018	56.981	54.943	54.905	54.868	54.819	53.776	52.957	52.974				
	Formation Level		52.628	53.094	53.373	53.919	54.440	54.492	54.542	54.592	54.642	54.692	54.747	54.782	54.827	54.867	54.917	54.967	55.017	55.067	55.117	55.179	55.228	55.218	55.193	55.161	55.128	55.098	55.067	55.034	55.002	54.970	54.937	54.905	54.873	54.841	54.808	54.774	54.741	54.708	54.671	54.639	54.605	54.567	54.528	54.538							
	Pre-Spoil Heaps Level		52.610	52.858	52.952	53.031	53.161	53.233	53.283	53.342	53.402	53.454	53.504	53.543	53.583	53.589	53.579	53.617	53.667	53.672	53.672	53.677	53.677	53.639	53.599	53.554	53.509	53.422	53.312	53.245	53.190	53.145	53.120	53.215	53.325	53.407	53.462	53.479	53.469	53.467	53.487	53.459	53.419	53.245	53.069	52.894	52.979	52.965					

EARTHWORKS SECTION G-G
Horiz. 1:500 Vert. 1:500



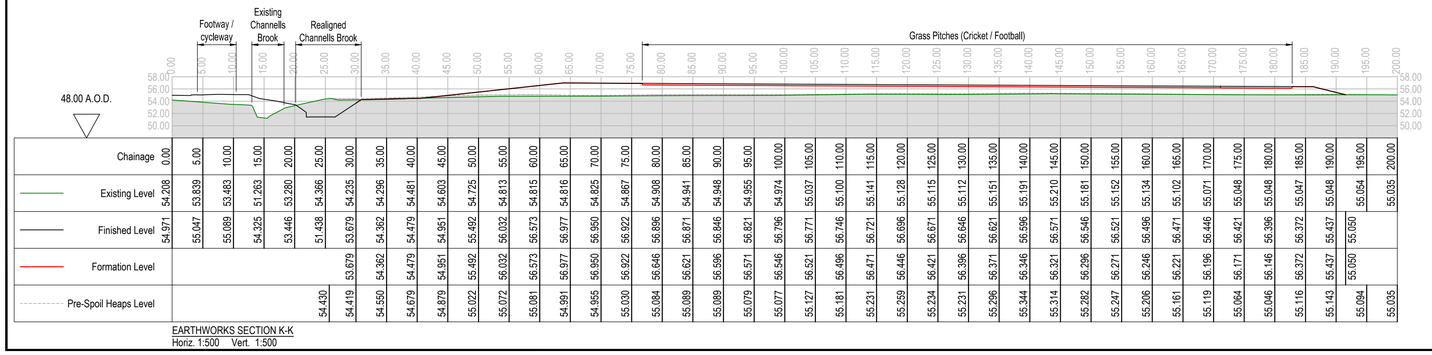
	Chainage	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00	105.00	110.00	115.00	120.00	125.00	130.00	135.00	140.00	145.00	150.00	155.00	160.00	165.00	170.00	175.00	180.00	185.00	190.00	195.00	200.00
	Existing Level	51.073	51.498	51.013	53.343	53.584	53.794	53.899	54.019	54.057	54.046	53.978	53.918	53.913	53.913	53.872	53.808	53.760	53.788	53.738	53.661	53.556	53.604	53.675	53.702	53.671	53.676	53.741	53.856	53.883	53.987	53.988	53.923	53.864	53.873	53.868	53.855	53.825	53.738	53.665	53.667	53.636
	Finished Level				53.322	53.662	54.089	55.394	56.052	56.195	56.292	56.289	56.300	56.350	56.350	56.350	56.309	56.143	56.170	56.130	56.121	56.098	56.065	56.032	56.000	55.967	55.934	55.901	55.868	55.835	55.802	55.769	55.737	55.703	55.670	55.637	55.593	55.410	55.245	55.013	54.574	53.666	
	Formation Level				53.343	53.542	54.089	55.394	56.052	55.819	55.602	55.987	56.062	56.110	56.110	56.110	56.069	55.929	55.905	55.894	55.861	55.828	55.795	55.762	55.729	55.696	55.664	55.631	55.598	55.565	55.532	55.499	55.466	55.433	55.400	55.326	55.158	54.949	54.897	54.549	53.672	53.510	
	Pre-Spoil Heaps Level				53.322	53.353	53.658	53.857	53.967	54.057	54.100	54.060	54.058	54.046	54.025	54.024	54.037	54.000	53.946	53.910	53.880	53.800	53.749	53.749	53.777	53.780	53.799	53.849	53.864	53.887	53.889	53.875	53.857	53.854	53.826	53.794	53.777	53.757	53.742	53.722	53.717	53.772	53.823

EARTHWORKS SECTION H-H
Horiz. 1:500 Vert. 1:500



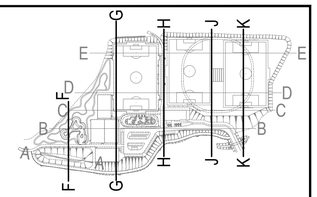
	Chainage	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00	105.00	110.00	115.00	120.00	125.00	130.00	135.00	140.00	145.00	150.00	155.00	160.00	165.00	170.00	175.00	180.00	185.00	190.00	195.00	200.00
	Existing Level	53.869	53.812	53.742	53.486	52.311	53.061	53.535	53.668	53.848	54.163	54.361	54.495	54.477	54.476	54.492	54.503	54.494	54.473	54.474	54.489	54.499	54.499	54.495	54.500	54.530	54.547	54.557	54.551	54.537	54.527	54.543	54.551	54.566	54.595	54.599	54.606	54.619	54.636	54.652	54.672	54.761
	Finished Level					53.219	52.922	53.380	53.752	54.355	54.589	54.835	55.134	56.058	56.748	56.723	56.699	56.673	56.648	56.623	56.598	56.573	56.548	56.523	56.498	56.473	56.448	56.423	56.398	56.373	56.348	56.323	56.298	56.273	56.248	56.223	56.198	56.173	56.148	55.606	54.552	54.316		
	Formation Level					53.190	52.922	53.380	53.632	54.355	53.899	54.835	55.134	56.058	56.748	56.723	56.699	56.673	56.397	56.370	56.343	56.317	56.290	56.263	56.236	56.209	56.182	56.155	56.128	56.101	56.075	56.048	56.021	55.994	55.967	55.940	55.913	55.886	55.859	55.606	54.282			
	Pre-Spoil Heaps Level					52.742	52.879	53.235	53.591	53.977	54.257	54.474	54.539	54.593	54.583	54.575	54.575	54.575	54.580	54.575	54.545	54.529	54.519	54.530	54.590	54.619	54.619	54.618	54.613	54.614	54.604	54.602	54.617	54.621	54.651	54.666	54.646	54.619	54.574	54.594	54.695		54.827	

EARTHWORKS SECTION J-J
Horiz. 1:500 Vert. 1:500



	Chainage	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00	105.00	110.00	115.00	120.00	125.00	130.00	135.00	140.00	145.00	150.00	155.00	160.00	165.00	170.00	175.00	180.00	185.00	190.00	195.00	200.00
	Existing Level	54.208	53.839	53.483	51.263	53.280	54.366	54.235	54.296	54.481	54.603	54.725	54.813	54.815	54.816	54.925	54.867	54.908	54.941	54.948	54.955	54.974	55.037	55.100	55.141	55.128	55.115	55.112	55.151	55.191	55.210	55.181	55.152	55.134	55.102	55.071	55.048	55.048	55.047	55.048	55.054	55.035
	Finished Level	54.971	55.047	55.089	54.325	53.446	51.438	53.679	54.362	54.479	54.951	55.492	56.032	56.573	56.977	56.950	56.922	56.895	56.871	56.846	56.821	56.796	56.771	56.746	56.721	56.696	56.671	56.646	56.621	56.596	56.571	56.546	56.521	56.496	56.471	56.446	56.421	56.396	56.372	56.437	55.050	
	Formation Level							53.679	54.362	54.479	54.951	55.492	56.032	56.573	56.977	56.950	56.922	56.646	56.621	56.596	56.571	56.546	56.521	56.496	56.471	56.446	56.421	56.396	56.371	56.346	56.321	56.296	56.271	56.246	56.221	56.196	56.171	56.146	56.372	55.437	55.050	
	Pre-Spoil Heaps Level						54.430	54.419	54.560	54.679	54.879	55.022	55.072	55.081	54.991	54.955	55.030	55.084	55.089	55.089	55.079	55.077	55.127	55.181	55.231	55.259	55.234	55.231	55.296	55.344	55.314	55.282	55.247	55.206	55.161	55.119	55.084	55.046	55.116	55.143	55.094	55.035	

EARTHWORKS SECTION K-K
Horiz. 1:500 Vert. 1:500



NOTES

1. This drawing is to be read in conjunction with all relevant documents and specifications.
2. Dimensions are not to be scaled.
3. All works shall be in accordance with Volume 1 of Manual of Contract Documents for Highways Works - Specification for Highway Works (MCHW).
4. Embankments and levels to be built-up to construction formation level / underside of topsoil level using site-won Class 2 A engineered fill material or any Class 2B or 2C fill material. Layer thickness, material compaction/number of passes shall be in accordance with the Earthworks Specification.
5. For topsoil specification refer to Glanville Sports Hub Earthworks Specification and David Jarvis Associates Sports Hub Landscape Specification Ref. 2898-5-4-SP-2001-S4.
6. Refer to Earthworks Specification for further details of earthworks and topsoiling.
7. Refer to Cut and Fill drawing (Ref. Mowbray-GLA-SH-Ph2-D-C-1180) for details of cut and fill volumes.

Glanville Job Number: 8220585

Rev.	Description	Date	Chkd
C1	Notes revised. Issued for construction.	08/09/2023 DS	CS
P1	First issue.	19/06/23 DS	CS

Glanville
Cornerstone House
62 Foxhall Road, Didcot
Oxon, OX11 7AD
Tel: (01235) 515550 Fax: (01235) 817799
posttbox@glanvillegroup.com www.glanvillegroup.com

Client :
Legal & General
(Strategic Land North Horsham) Limited

Project :
Sports Hub at Mowbray
North Horsham

Title :
Earthworks
Long Sections
Sheet 2

Project Engineer :	C Salt	Scale :	As Shown @ A1
Project Director :	J Birch	Date :	June 2023
Status :	CONSTRUCTION		

Drawing No. Mowbray-GLA-SH-Ph2-D-C_1172 Rev C1