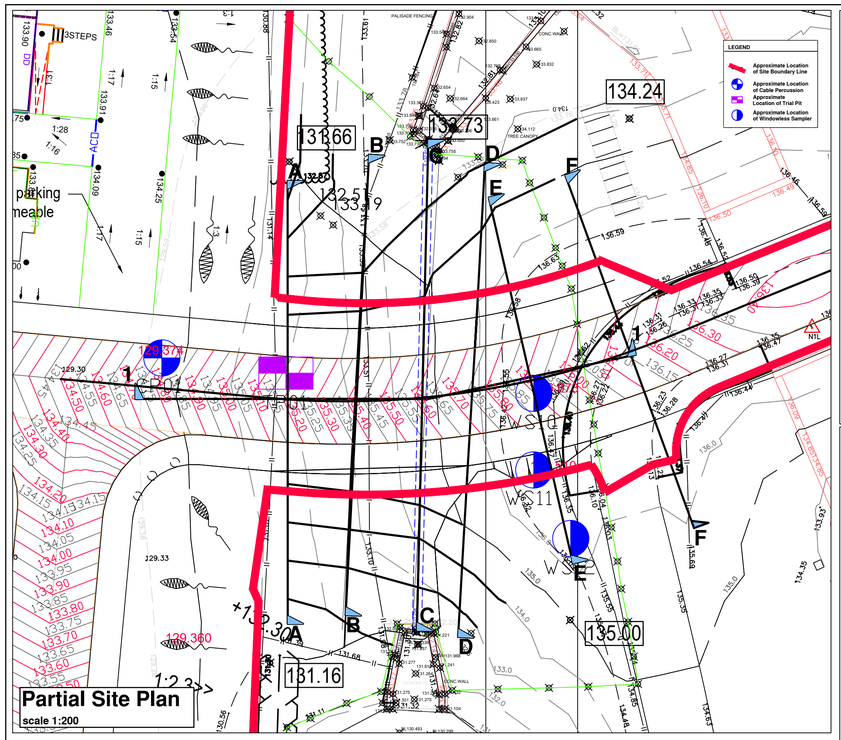
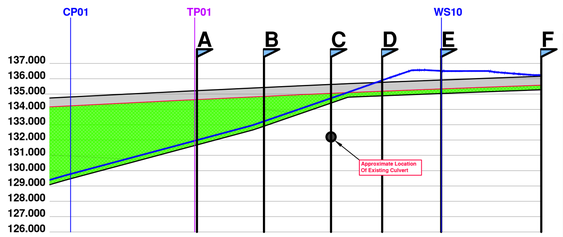
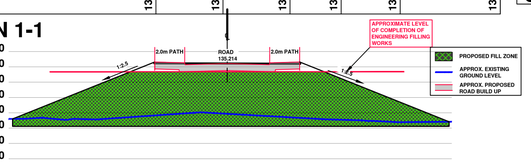




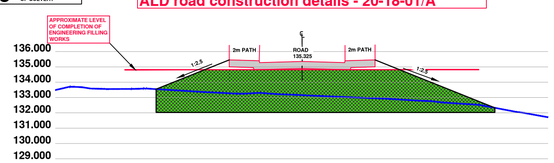
OFFSET	0.000	4.700	9.400	10.000	20.000	24.664	30.000	32.091
GROUND LEVEL	134.980	135.241	135.700				136.085	136.162
OFFSET	8.755	4.377	0.000	3.338	7.190	13.726		
GROUND LEVEL	131.992	133.222	134.731	135.676	136.511	136.242		
FEATURE LEVEL	135.223	135.429	135.629	135.428	135.917	136.162		

SECTION 1-1



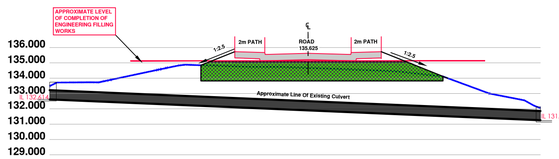
OFFSET	4.730	2.806	2.761	0.000	2.780	2.805	4.730	
GROUND LEVEL	131.601	131.826	131.961	131.963	131.935	131.781	131.777	131.668
FEATURE LEVEL	135.456	135.401	135.276	135.200	131.935	133.034	133.033	135.456

SECTION A-A



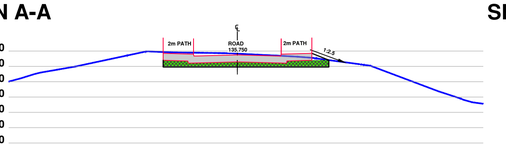
OFFSET	4.761	2.805	2.780	0.000	2.781	2.806	4.761	
GROUND LEVEL	132.486	133.277	133.304	133.303	133.156	133.034	133.033	132.950
FEATURE LEVEL	135.456	135.401	135.276	135.200	135.325	133.034	133.033	135.456

SECTION B-B



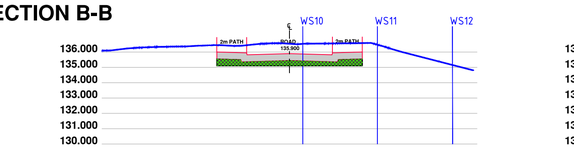
OFFSET	4.872	2.821	2.796	0.000	2.792	2.817	4.782	
GROUND LEVEL	133.484	134.804	134.737	134.737	134.674	134.572	134.571	134.490
FEATURE LEVEL	135.729	135.674	135.549	135.635	135.549	135.674	135.729	132.068

SECTION C-C



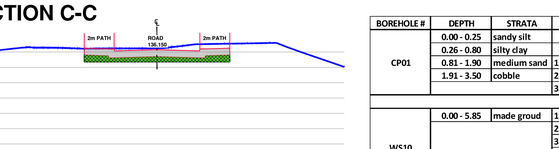
OFFSET	4.847	2.859	2.834	0.000	2.838	2.863	4.863	
GROUND LEVEL	134.011	135.935	135.893	135.893	135.833	135.692	135.691	135.561
FEATURE LEVEL	135.854	135.799	135.674	135.750	135.674	135.692	135.691	135.854

SECTION D-D



OFFSET	4.747	2.797	2.772	0.000	2.778	2.803	4.753	
GROUND LEVEL	136.094	136.454	136.451	136.453	136.543	136.562	136.563	136.587
FEATURE LEVEL	135.949	135.829	135.900	135.824	135.949	136.004	136.587	134.805

SECTION E-E



OFFSET	4.746	2.795	2.770	0.000	2.780	2.805	4.755	
GROUND LEVEL	135.854	136.216	136.198	136.073	136.242	136.073	136.198	136.545
FEATURE LEVEL	136.253	136.198	136.232	136.150	136.073	136.511	136.253	135.031

SECTION F-F

PROPOSED FILL ZONE
APPROX. EXISTING GROUND LEVEL
APPROX. PROPOSED ROAD BUILD UP
APPROX. LOCATION OF CULVERT

To be read in conjunction with:-
REFA SI Report - 18112/FSIR
ALD external works - 20-04-01, 20-04-02, 20-04-03
ALD road construction details - 20-18-01/A

CONSTRUCTION OF FILLS

1. Strip upper made ground, vegetation, and any unsuitable material from the site and remove all arisings from site. Suitable topsoil may be stored separately for re-use. A minimum of 300 mm of existing ground shall be removed. Upon completion of mass stripping to formation level, the exposed ground shall be inspected and proof-rolled using a vibrating roller of mass not less than 2900 kg/m with a minimum of four passes. Any soft spots or unsuitable materials identified shall be excavated and replaced with suitable engineered fill. All over-excavations shall be recorded and reported to the S.O.
2. All imported fill shall consist of approved granular material complying with SHW Series 600, Table 6/1 or 6/2, free from clay lumps, organic matter, and other deleterious materials. Fill shall be placed in horizontal layers not exceeding 300 mm loose thickness (or as otherwise required by Table 6/4, depending on the type of compaction plant used).
3. Each layer shall be evenly spread, levelled, and compacted using appropriate compaction plant in accordance with SHW Table 6/4. The number of passes, layer thickness, and roller type shall correspond to the plant category and method specified. Where multiple plant types are used, the most onerous compaction requirement shall govern.
4. Fill shall be placed such that the angle of any daywork joint does not exceed 25° from the horizontal plane, and each new layer shall lap over underlying joints by a minimum of 1000 mm.
5. All fill material shall be visually inspected and approved by REFA prior to placement. Fill shall be placed at a moisture condition suitable for achieving the specified compaction. If the contractor is in any doubt regarding material suitability or moisture content, they shall contact REFA prior to placement.

EARTHWORK INSITU TESTS

Compaction Testing: Nuclear density gauge tests and moisture content tests shall be carried out at a maximum of 0.50 m thickness of compacted fill and at a minimum rate of 1 test per 500 m² over the total filled area.
Acceptance Criteria: Testing shall demonstrate a minimum of 90% of the maximum dry density as determined by the appropriate compaction test at 0.50 m vertical intervals throughout the fill.

C.D.M. REGULATIONS 2015

In line with the above regulations we are obliged to inform the Client of their responsibilities under section CDM 15/1, and residual risks that may be encountered in the construction of these works.

All design work has been carried out with Health and Safety aspects given full consideration. Wherever possible risks have been eliminated from the design, however due to the very nature of this type of work it is not possible to remove all the risks from the design.

We would also respectfully remind the Client of his obligations to take all reasonable steps in ensuring that only competent Contractors who have a valid safety policy are employed.
They should also provide satisfactory responses at tender stage as to the manner in which they will deal with the elements of risk involved in this type of work and in particular those highlighted by REFA below:-

1. Support / treatment for ALL filling works.
2. Guarding of works outside working hours to prevent unauthorised access.
3. Undermining to adjacent roads or structures.
4. Confined space operations.
5. Dealing with existing services.
6. Traffic management on existing highways.
7. Procedure to be followed in event of accident or emergency.
8. Method of working where contaminated ground is present on site.
9. Confirmation will be required that all operatives are adequately trained, copies of relevant training certificates to be supplied.

The above list is by no means exhaustive but it does highlight operations that present a risk to contractors and the general public. For clarification on any item please contact REFA.

TABLE 6/1: (11/05) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes)

Class			General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Class 601 and Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Class 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	(i) grading	BS 1377 : part 2	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	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				
	1	B	Uniformly graded granular material	General Fill	Any material, or combination of materials, other than chalk. Recycled aggregate	(i) grading	BS 1377 : Part 2	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	App 6/1	App 6/1				
						(iv) MCV	Clause 632	App 6/1	App 6/1				
	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	(i) grading	BS 1377 : Part 2	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: (11/05) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class			General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Class 601 and Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Class 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 COHESIVE FILL	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	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	-				
	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	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				
	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	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				

TABLE 6/1: (11/05) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class			General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Class 601 and Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Class 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	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 t chalk.) Recycled aggregate	(i) grading	BS 1377 : Part 2 (On-site)	Tab 6/2	Tab 6/2	No compaction	6	A	-
							BS EN 933-2 (Off-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					
	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	(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 (Off-site)	Tab 6/5	Tab 6/5				
						(ii) plasticity index	BS 1377 : Part 2	Non-plastic					
						(iii) Los Angeles coefficient	Clause 635	-	50				

Type of Compaction Plant	Ref No.	Category	Method 1 D	Method 1 Nd	Method 2 D	Method 2 Nd	Method 3 D	Method 3 Nd	Method 4 D	Method 4 N	Method 5 D	Method 5 N	Method 6 N for D = 110 mm	Method 6 N for D = 150 mm	Method 6 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	unsuitable
	2	over 2700 kg up to 5400 kg	125	6	125	8	125	8*	200	4	unsuitable	16	unsuitable	unsuitable	unsuitable
	3	over 5400 kg	150	4	150	8	unsuitable		300	4	unsuitable	8	16	unsuitable	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	unsuitable
	2	over 5400 kg up to 8000 kg	150	8	125	12	unsuitable		325	4	unsuitable	20	unsuitable	unsuitable	unsuitable
	3	over 8000 kg	150	4	150	12	unsuitable		400	4	unsuitable	12	20	unsuitable	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	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	unsuitable
	2	over 1500 kg up to 2000 kg	150	5	unsuitable		unsuitable		300	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable
	3	over 2000 kg up to 2500 kg	175	4	125	12	unsuitable		350	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable
	4	over 2500 kg up to 4000 kg	225	4	125	10	unsuitable		400	4	unsuitable	12	unsuitable	unsuitable	unsuitable
	5	over 4000 kg up to 6000 kg	300	4	125	10	unsuitable		unsuitable		unsuitable	12	unsuitable	unsuitable	unsuitable
	6	over 6000 kg up to 8000 kg	350	4	150	8	unsuitable		unsuitable		unsuitable	12	unsuitable	unsuitable	unsuitable
	7	over 8000 kg up to 12000 kg	400	4	150	8	unsuitable		unsuitable		unsuitable	10	16	unsuitable	unsuitable
	8	over 12000 kg	450	4	175	6	unsuitable		unsuitable		unsuitable	8	12	unsuitable	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	unsuitable
	2	over 1300 kg up to 1800 kg	125	12	125	12	175	12*	175	8	unsuitable	12	unsuitable	unsuitable	unsuitable
	3	over 1800 kg up to 2300 kg	150	12	150	12	200	12*	unsuitable		unsuitable	8	12	unsuitable	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

GEOTECHNICAL EARTHWORKS SPECIFICATION - GRANULAR MATERIAL

It is proposed to up-fill and level part of the site to form a working platform to the required working level in accordance with the proposed formation levels drawing to be submitted separately. This work will include, but not necessarily be limited to, the following elements.

The contractor should employ an experienced geotechnical engineer to be present on site during these earthwork operations to ensure granular fill material suitability, placement, compaction and testing is undertaken in accordance with this specification and to ensure that any unforeseen circumstances, such as adverse weather, do not compromise the cut and fill process.

IMPORTED FILL MATERIAL

It is proposed to partially up-fill and level a portion of the site with selected granular material.

CLASSIFICATION OF FILL MATERIAL

This Specification should be read in conjunction with the following:

- The Manual of Contract Documents for Highway Works, Volume 1, Specification for Highway Works, Series 600, Earthworks as amended in November 2005; and,
- Soils for Civil Engineering Purposes, BS1377, 1999

General Classification

The contractor should ensure that all granular fill materials comply with Clause 601 of the Specification for Highway Works and shall fall into one of the other of the following general classifications as defined in Table 6/1 of the Specification for Highway Works.

- General granular fill (Class 1),
- Selected granular fill (Class 6).

Use of Fill Materials

In addition to any grading requirement the maximum particle size of any granular fill material shall be no more than two-thirds of the compacted layer thickness except that cobbles having an equivalent diameter of more than 150mm shall not be deposited within 1.5m of the restored surface level unless directed otherwise by the Engineer. Un-burnt colliery spoil, pulverised fuel ash or furnace bottom ash shall not be used as a granular fill material.

GENERAL REQUIREMENTS

The contractor shall employ only plant and working methods which are suited to the granular fill materials to be handled and traversed. He shall be responsible for maintaining the nature of the acceptable granular fill material so that when it is placed and compacted it remains acceptable in accordance with the Contract.

Acceptability shall be determined in accordance with Table 6/1 of the Highway Specification.

Laboratory testing for the purpose of determining acceptability and compaction requirements will be conducted by the Engineer.

Haulage of granular fill material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction plant is operating at the place of deposition to ensure compliance with Clause 612 of the Highways Specification.

No excavated acceptable granular material or unacceptable granular material required to be processed, other than surplus to the requirements of the contract, shall be removed from the site.

Where the excavation reveals a combination of acceptable and unacceptable granular fill materials the Contractor shall carry out the excavation in such a manner that the acceptable granular fill materials are excavated separately for use in the Permanent Works without contamination by the unacceptable materials. Unless otherwise described in the Contract classes of granular fill material required to be deposited separately shall be excavated separately without contamination by other classes of granular fill material.

The Contractor shall make his own arrangements for stockpiling of acceptable granular fill material, and unacceptable granular fill material to be processed, and for the provision of site for purpose.

The Contractor shall ensure that he does not adversely affect the stability of excavations or fills by his methods of stockpiling granular materials, use of plant or silting of temporary buildings or structures.

Topsoil shall wherever practicable be used immediately after its stripping and if not shall be stored in stockpiles of heights not exceeding 2.0m; topsoil shall not be stockpiled for more than two years. Topsoil shall not be unnecessarily trafficked either before stripping or when in a stockpile. Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum.

Excavations requiring backfilling shall remain open only for the minimum period necessary.

The Contractor shall keep earthworks free of water including:

(i) Arranging the rapid removal of water:
(a) Shed on to the earthworks
(b) Entering the earthworks from any source
(ii) Provide where necessary temporary watercourses, drains, pumping and the like:
(iii) Discharge accumulated water and groundwater into the permanent outfalls of the drainage system where practicable
(iv) Provide adequate means for trapping silt on temporary systems discharging into permanent drainage systems.

The Contractor shall carry out and maintain any groundwater lowering or other treatment required.

Where materials are designated either Class U1B or Class U2 (according to the Highways Specification), the Contractor shall carry out any special requirements for their handling. Where such materials are encountered during the process of the Works, the Contractor shall make all necessary arrangements for their safe handling and disposal after consultation with the appropriate environmental authority.

CONSTRUCTION OF FILLS

All fills shall be constructed:

(i) In the locations as shown in the contract drawings to the lines and levels stated therein;
(ii) Of classes of granular fill material complying with this specification;
(iii) By deposition, as soon as practicable after excavation, in layers to meet the compaction requirements as required for each Class of granular fill material as specified
To the requirements of this clause and any other requirements for fill in this Specification.

Before commencing work on any area of fill the Contractor shall ensure that:

(i) The base is sound and stable by excavation and removing any unsuitable material or soft formation
(ii) Base layers are not exposed until the fill layer is ready for placement
(iii) Un-compacted granular fill material on the side slopes of preciously backfilled zones shall be removed and benches of 0.5m height cut in compacted fill immediately prior to deposition of the new granular fill material to ensure that the new backfill placed against the slope is properly integrated.

Whenever fill is to be placed on surfaces inclined at 1 vertical to 7 horizontal or steeper, the surface shall be benched immediately prior to deposition of the fill in order to achieve horizontal basal surfaces. The benches shall be between 1.0m and 1.5m in height.
Areas of fill shall, unless stated otherwise permitted by the Engineer, be constructed evenly over their fullest possible extent and the Contractor shall carefully control and direct construction plant and other vehicular traffic uniformly over the area of compacted fill. The minimum plan dimensions of any other panel of backfilling shall be properly integrated with areas of previous backfilling. Damage by construction plant and other vehicular traffic shall be made good by the Contractor with material having the same characteristics and strength as the material had before it was damaged.
Temporary slopes within compacted and un-compacted backfill shall be formed at gradients which ensure stability.

COMPACTION OF FILLS

The Contractor shall carry out compaction upon the materials which require to be compacted, as soon as practicable after deposition.

Compaction shall either be method compaction or end product compaction as required for the classes of material being compacted.

The Contractor shall obtain permission from the Overseeing Organisation before carrying out compaction requirements as listed in Table 6/1 for the Class of material being compacted.

Earthmoving plant shall not be accepted as compaction equipment nor shall the use of a lighter category of plant to provide any preliminary compaction to assist the use of heavier plant to be taken into account when assessing the amount of compaction required for any layer.

If more than one class of material is being used in such a way that it is not practicable to define the areas in which each class occurs, the Contractor shall compact with plant operating as if only the material which required the greater compaction effort is being compacted.

If the results of field tests show densities which indicate the state of compaction to be inadequate, then if this is due to failure on the Contractor to comply with requirements of the Contract, the Contract shall carry out such further work as is required to comply with the contract.

Refer to Clause 612/10 of the Highway Specification for definition of plant to be used in accordance with this specified works.

The Contractor will be responsible for assessing the Class of Fill in accordance with Table 6/1 of the Highways Specification. Table 6/4 of the Highways Specification should then be employed to assess the method of compaction to be employed. The test results and method statements shall be submitted to the Consulting Engineers for approval.

EARTHWORKS MATERIALS TESTS

Prior testing of the potential sources of fill shall be undertaken by the Contractor and submitted to the Consulting Engineers for approval. This testing shall include, but not necessarily be limited to, the following:

During the construction of the fill the testing outlined above shall be undertaken at on suitable frequency of fill or when the source of the fill changes. The results of this work shall be submitted to the Consulting Engineer for approval.

EARTHWORK INSITU TESTS

1. Nuclear density gauge tests & moisture content tests are to be carried out at maximum 0.5m thickness of compacted fill and at the rate of 1 test per 500m² over the whole area of filling. Tests shall be carried out upon all material types. Tests to demonstrate minimum compaction rate of 90% optimum dry density @ 0.50m vertical increments.
2. Plate loading tests (PLT) should be undertaken at maximum 500mm vertical increments on completed layers and upon the final surface.
Plate loading tests must utilise a plate of at least 450mm diameter

PLTs should be undertaken at the rate of 1 no. test/500m²on each 0.5m level increment.

PLTs should comprise of the following elements:

a. Accurately survey locations and ground level of each test
b. Minimum 450mm diam steel plate at least 25mm thick
c. Loading in increments to a maximum bearing stress of 150kN/m² (kPa)
d. Record of settlement under each increment once the settlement has reached equilibrium.
e. Results presenting incremental data, location and level for all tests

PLTs should confirm total settlement not exceeding 25mm at a bearing stress of 100kN/m² (kPa). Where results exceed this value further compaction should be completed and the test repeated. Where a second test fails the area should be excavated and refilled in a controlled manner.

Upon completion of each phase the following details should be reported:

a. Details of the area of site treated in each phase with record photographs
b. Total thickness of upfilling placed
c. Types, classification, and source of upfilling material
d. Tests results for imported fill material and service details.
e. Locations of PLT at level at which tests carried out
Test results with calculated equivalent CBR value

5. All tests carried out for slab and ancillary loading must record a maximum settlement of 15mm at ultimate load and any tests failing this criteria will require that the area be completely stripped to the engineers satisfaction, re-compacted and retested. These remedial works will be carried out at the contractor's expense and no claims arising from loss of production etc., as a result of these works will be approved.

DISPOSAL OF MATERIALS

The contractor shall be responsible for the safe disposal of any excess or unsuitable material found on the site.

BOREHOLE #	DEPTH	STRATA	SPT
CP01	0.00 - 0.25	sandy silt	
	0.26 - 0.80	silty clay	
	0.81 - 1.90	medium sand	1.20 - N = 12
	1.91 - 3.50	cobble	2.00 - N = 20
			3.00 - N = 27
WS10	0.00 - 5.85	made groud	1.20 - N = 32
			2.00 - N = 10
			3.00 - N = 20
			4.00 - N = 14
			5.00 - N = 14
	5.86 - 6.45	clay	6.00 - N = 42
WS11	0.00 - 5.00	made ground	1.20 - N = 25
			2.00 - N = 21
			3.00 - N = 10
			4.00 - N = 9
			5.00 - N = 9
	5.01 - 6.45	clay	6.00 - N = 15
WS12	0.00 - 0.50	made ground	

GENERAL REQUIREMENTS - COHESIVE MATERIAL

The contractor shall employ only plant and working methods which are suited to the cohesive fill materials to be handed and traversed. He shall be responsible for maintaining the nature of the acceptable material so that when it is placed and compacted it remains acceptable in accordance with the Contract.

Acceptability shall be determined in accordance with Table 6/1 of the Highway Specification.

Haulage of cohesive materials to embankments or other areas of fill shall proceed only when sufficient spreading and compaction plant is operating at the place of deposition to ensure compliance with Clause 612 of the Highways Specification.

Where the excavation reveals a combination of acceptable and unacceptable material the Contractor shall carry out the excavation in such a manner that the acceptable cohesive material are excavated separately for use in the Permanent Works without contamination by the unacceptable materials. Unless otherwise described in the Contract classes of cohesive fill material required to be deposited separately shall be excavated separately without contamination by other classes of material.

The Contractor shall make his own arrangements for stockpiling of acceptable cohesive material and unacceptable cohesive material to be processed, and for the provision of site for this purpose.

The Contractor shall ensure that he does not adversely affect the stability of excavations or fills by his methods of stockpiling cohesive materials, use of plant or siting of temporary buildings or structures.

Excavations requiring backfilling shall remain open only for the minimum period necessary.

CONSTRUCTION OF FILLS

All fills shall be constructed:

(i) In the locations as shown in the contract drawings to the lines and levels stated therein;
(ii) Of classes of cohesive material complying with this specification;
(iii) By deposition, as soon as practicable after excavation, in layers to meet the compaction requirements as required for each Class of cohesive material as specified and in accordance with Table 6/4 of the Specification for Highway Works.

Before commencing work on any area of fill the Contractor shall ensure that:

(i) The base is sound and stable by excavation and removing any topsoil and any soft or unsuitable cohesive subsoil
(ii) Base layers are not exposed until the fill layer is ready for placement
(ii) Un-compacted cohesive material on the side slopes of previously backfilled zones shall be removed and benches of 0.5m height cut in compacted fill immediately prior to deposition of the new fill to ensure that the new backfill placed against the slope is properly integrated.

Whenever fill is to be placed on surfaces inclined at 1 vertical to 7 horizontal or steeper, the surface shall be benched immediately prior to deposition of the fill in order to achieve horizontal basal surfaces. The benches shall be between 1.0m and 1.5m in height.

Areas of fill shall, unless stated otherwise permitted by the Engineer, be constructed evenly over their fullest possible extent and the Contractor shall carefully control and direct construction plant and other vehicular traffic uniformly across the area of cohesive fill to avoid differential settlement. The minimum plan dimensions of any other panel of backfilling shall be properly integrated with areas of previous backfilling. Damage by construction plant and other vehicular traffic shall be made good by the Contractor with cohesive material having the same characteristics and strength as the material had before it was damaged.

Temporary slopes within compacted and un-compacted backfill shall be formed at gradients which ensure stability.

THIS DRAWING IS BASED ON THE FOLLOWING DRAWINGS PROVIDED BY CLIENT:

PLANNING LAYOUT
DRAWING NUMBER:- **MCI-000-DR-A-500**
REVISION:- **PL06**

EXTERNAL WORKS
DRAWING NUMBER:- **20-04-01/F, 20-04-02/F, 20-04-03/G**

TOPOGRAPHICAL SURVEY
DRAWING NUMBER:- **JLP Surveying - S25-0848**

ROAD DESIGN INFORMATION
DRAWING NUMBER:- **Provided by Client - contours**

CLIENT TO ENSURE THE ABOVE LAYOUT IS CURRENT BEFORE USING THIS DRAWING FOR CONSTRUCTION PURPOSES.

revision suffix	Revision details	Date
A	Revised to clients comments (wmi)	08.10.25

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Drawing Stage / Drawing Status

	Draft	●	Comments		Tender
	Issued		Information		Construction
●	Preliminary		Approval		As Built

This drawing is not authorised unless signed as checked & approved

Client
MCI Developments Ltd

Job title
Trub Farm Rochdale

Drawing title
Proposed Road Fill Details - Preliminary

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Chkd	Appvd	date	scale	drawn
		06.06.18	1:200 @ A1	WMI

DRAWING No **18112/224** rev **A**

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