

**TABLE 1/5: TESTING TO BE CARRIED OUT BY THE CONTRACTOR**  
ACCEPTABILITY TESTING OF SOURCE MATERIAL

CLAUDE	WORKS, GOODS OR MATERIAL			TEST	FREQUENCY	COMPLIANCE
	Class	General Description	Permitted Constituents			
Series 600				Defined and test in Accordance with		
<b>Acceptable limits row</b>						
601, 631 to 637, 640	1	General granular fill	Any material, or combination of materials other than Chalk. Recycles aggregate.	MC	BS 1377-2	1 per 1,000m <sup>3</sup>
				Grading & Uniformity Coefficient	BS 1377-2	1 per 1,000m <sup>3</sup>
				OMC/MDD (Vib Hammer)	BS 1377-4	1 per 1,000m <sup>3</sup>
				Sulphate Suite Including WS, OS, TPS, OM	TRL 447	1 per 1,000m <sup>3</sup>
2	General cohesive fill	Any material, or combination of materials other than Chalk. Recycles aggregate.	MC	BS 1377-2	1 per 1,000m <sup>3</sup>	
			PL, LL, PI	BS 1377-2	1 per 1,000m <sup>3</sup>	
			Grading	BS 1377-2	1 per 1,000m <sup>3</sup>	
			OMC/MDD to include HSV at each compaction point & particle Density	BS 1377-4	1 per 1,000m <sup>3</sup>	
4	Fill to Landscape		Grading	BS 1377-2	1 per 2,000m <sup>3</sup>	
			MC / OMC	BS 1377-2	1 per 2,000m <sup>3</sup>	
5	Topsoil, or Turf Existing on site	Topsoil or turf designated as Class 5A in the contract	Grading	BS 1377-2	1 per 2,000m <sup>3</sup>	
			Imported Topsoil	General purpose grade complying with BS 3882	1 per 1,000m <sup>3</sup> min 5 per source	
640	Earthworks material beneath the surface of a road or external area with handstanding, if within 450mm of existing landscaping		Chemical Suite (Imported Materials)	Appendix 6/14	1 per 1,000m <sup>3</sup> min 5 per source	
			Frost Heave		Source Approval	
630	Below slabs and handstanding		Dual Cycle Plate Load Test for equivalent CBR in accordance with Table 1/5-2.		1 per 40m x 40m Grid	
			Dual Cycle Plate Load Test for equivalent CBR in accordance with Table 1/5-2.		1 per 50m x 50m Grid	

**DUAL CYCLE PLATE LOAD TEST: CONFIRMATION OF MODULUS OF SUBGRADE REACTION K762 AND EQUIVALENT CBR**

This test should be undertaken with a minimum 0.60m diameter plate and whilst plates of smaller diameter may be used this should not be less than 0.30m. The method of analysis should follow DM68 IAN 73/06 Rev1 for an equivalent CBR. The modulus of subgrade reaction is an elastic modulus, and can only be proven if the test is done cyclically to ensure repeatable results. Therefore, the testing protocols to be followed are below:

- The initial seating stress is to be based upon the stress required to induce at least 1.5mm.
- The first load cycle is applied incrementally, to achieve cumulative settlement intervals of 0.25, 0.50, 0.75, 1.00, 1.25 and 1.50mm retrospectively. Each incremental stress is maintained until there is less than 0.05mm per minute before the next load is applied.
- Upon achieving the 1.50mm settlement and less than 0.05mm per minute requirement, the plate should be unloaded back to zero and the non-recoverable settlement at a stress of 0kpa is recorded.
- The dial gauges are re-set to zero and the test is repeated to achieve the same number of increments with the corresponding same level of deformation (e.g. stress applied to achieve 0.25mm increments, up to the maximum nominal deformation of 1.50mm).

The results are assessed by:

- Checking that the non-recoverable settlement after the first cycle is less than 50% of the total (e.g. if the total settlement was 1.50mm, then after unloading back to zero the gauges should return to less than 0.75mm). If this is not achieved, additional stress cycles can be undertaken until repeatable values are recorded as this is indicative of poor compaction and required re-engineering.
- Comparison of stiffness (E, EpH) of the final cycle divided by the stiffness of the previous cycle. The target ratio for shall be less than 2.0, an never above 2.2. Where the ratio of greater than 2.2, this indicated the fill has not been fully compacted.
- The modulus of subgrade reaction (ks K762) for the first cycle, shall be equal to or more than the design value for the subgrade and checked against the foundation design requirements. This can be converted to an equivalent CBR if required by the design, using the equation in DM68 IAN 73/06 Rev1.

**TABLE 6/1: COMPACTION REQUIREMENTS IN SHW CLAUSE 612 & ADDITIONAL NOTES**

Earthworks Class of expected materials on site	Typical Use envisaged	Compaction Control and Key Performance Requirements *
Class 1A General Granular Fill (Well Graded)	Site-won Earthworks fill to raise levels and preparation of formation level	SHW Table 6/4 Method 2, modified as required to ensure 95% MDD. *
Class 1B General Granular Fill (Uniformly Graded)	Site-won Earthworks fill to raise levels and preparation of formation level	SHW Table 6/4 Method 3, modified as required to ensure 95% MDD. *
Class 2A General Wet Cohesive Fill	Site-won Earthworks fill to external areas	SHW Table 6/4 Method 1, modified as required to ensure MC achieves between 95-105% MDD and 5% air voids and 95% MDD with min Cu of 50kN/m <sup>2</sup> . *
Class 2B General Dry Cohesive Fill	Site-won Earthworks fill to external areas	SHW Table 6/4 Method 2, modified as required to ensure MC achieves 95% MDD with min Cu of 50kN/m <sup>2</sup> . *
Class 2C General Stoney Cohesive Fill	Earthworks fill to external areas / raise levels and preparation of formation level	SHW Table 6/4 Method 2, modified as required to ensure MC achieves 95% MDD with min Cu of 50kN/m <sup>2</sup> . *
Class 4 Landscape Fill	Fill to Landscaping	SHW Table 6/4 Method 2, modified as required to ensure minimum bulk unit weight of 18kN/m <sup>3</sup> and Cu of 40kN/m <sup>2</sup> .

\* In-situ testing locations to be confirmed by Project Engineer and as agreed with a local authority Highways Representative / Validation of site material to be according to TABLE 1/5, 6/1, AND 6/2 to SHW S600

**TABLE 6/2: Grading Requirements for Acceptable Earthwork Materials**

Class	Size (mm) BS Series											Size (microns) BS Series				Size (microns)							
	500	300	125	90	75	37.5	28	20	14	10	6.3	5	3.35	2	1.18		600	300	150	63	2		
1A		100	95																		<15		
1B			100																			<15	
1C	100		10-95														0-25					15	
2A & 2B			100														80-100					15-100	
2C			100														15-80					15-80	
2D			100																			80-100	0-20

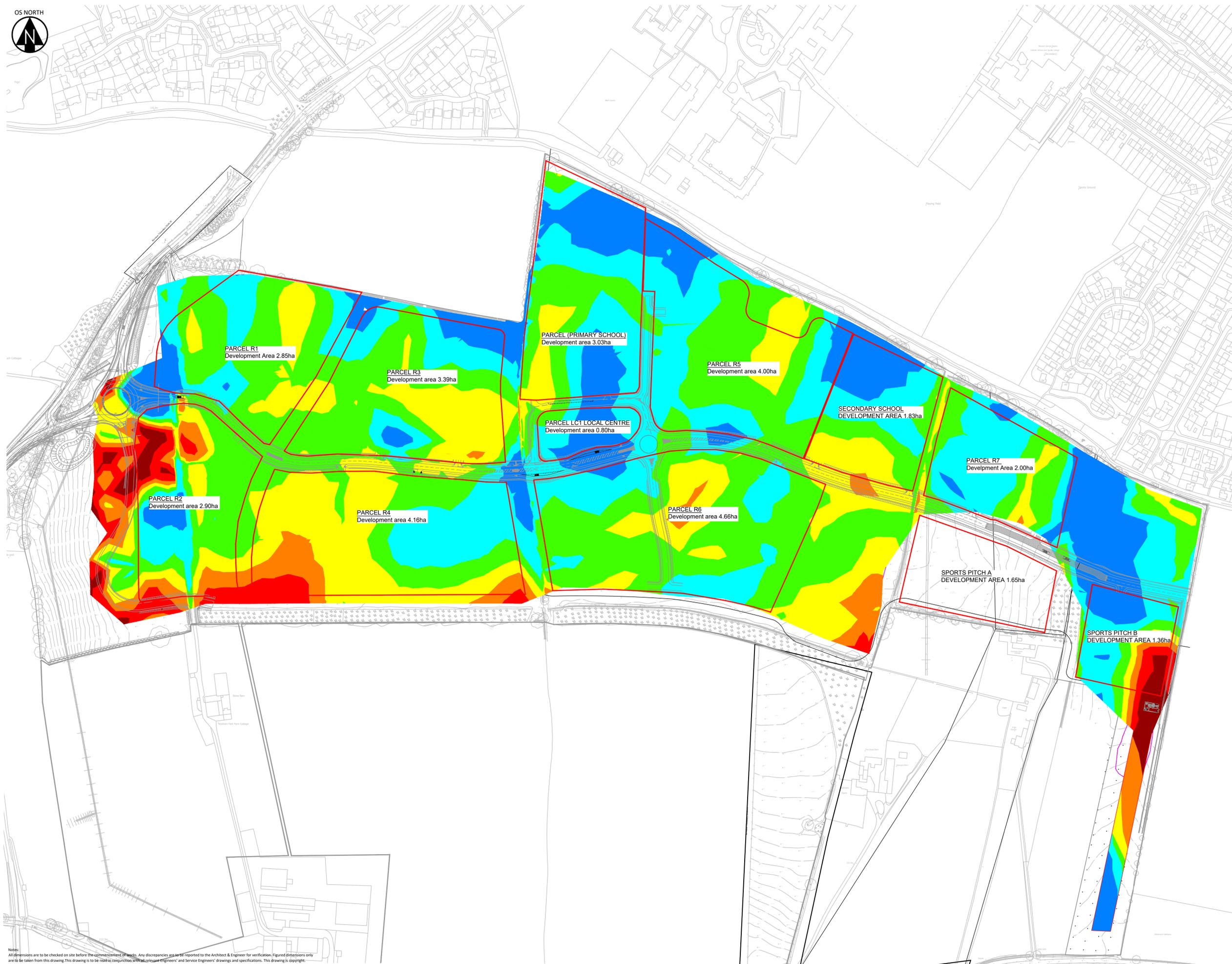
**TABLE 6/4: Method Compaction for Earthworks Materials: Plant and Methods (Method 1 to Method 6)**  
(This Table is to be read in conjunction with sub-Clause 612.10)

Type of Compaction Plant	Ref No.	Category	Method 1		Method 2		Method 3		Method 4		Method 5		Method 6											
			D	N#	D	N#	D	N#	D	N#	D	N#	N for D = 110 mm	N for D = 150 mm	N for D = 250 mm									
Smoothed wheeled roller (or vibratory roller operating without vibration)	1	Mass per metre width of roll:	125	8	125	10	125	10*	175	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	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	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	3	over 5400 kg	150	4	150	8	150	8	300	4	unsuitable	8	16	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
Grid roller	1	Mass per metre width of roll:	150	10	unsuitable	150	10	250	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	2	over 2700 kg up to 5400 kg	150	8	125	12	unsuitable	325	4	unsuitable	20	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	3	over 5400 kg	150	4	150	12	unsuitable	400	4	unsuitable	12	20	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
Deadweight tamping roller	1	Mass per metre width of roll:	225	4	150	12	250	4	350	4	unsuitable	12	20	unsuitable	8	12	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	2	over 6000 kg	300	5	200	12	300	3	400	4	unsuitable	8	12	unsuitable	20	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
Pneumatic-tyred roller	1	Mass per wheel:	125	6	unsuitable	150	10*	240	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	2	over 1000 kg up to 1500 kg	150	5	unsuitable	150	10	300	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	3	over 1500 kg up to 2000 kg	175	4	125	12	unsuitable	350	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	4	over 2000 kg up to 2500 kg	225	4	125	10	unsuitable	400	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	5	over 2500 kg up to 4000 kg	300	4	125	10	unsuitable	400	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	6	over 4000 kg up to 6000 kg	350	4	150	8	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable
	7	over 6000 kg up to 8000 kg	400	4	150	8	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable
	8	over 8000 kg up to 12000 kg	450	4	175	6	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable
Vibratory tamping roller	1	Mass per metre width of a vibrating roll:	100	12	100	12	150	12	100	10	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	2	over 700 kg up to 1300 kg	125	12	125	12	175	12*	175	8	unsuitable	12	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	3	over 1300 kg up to 1800 kg	150	12	150	12	200	12*	200	12*	unsuitable	8	12	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	4	over 1800 kg up to 2300 kg	150	9	150	9	250	12*	400	5	6	6	10	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	5	over 2300 kg up to 2900 kg	200	9	200	9	275	12*	500	6	6	10	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	6	over 2900 kg up to 3600 kg	225	9	225	9	300	12*	600	6	4	8	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	7	over 3600 kg up to 4300 kg	250	9	250	9	300	9*	700	6	3	7	12	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	8	over 4300 kg up to 5000 kg	275	9	275	9	300	7*	800	6	3	6	10	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
Vibratory plate compactor	1	Mass per m <sup>2</sup> of base plate:	unsuitable	unsuitable	75	6	150	6	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	2	over 880 kg up to 1100 kg	unsuitable	unsuitable	75	10	100	6	75	10	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	3	over 1100 kg up to 1200 kg	unsuitable	unsuitable	100	12	125	10	150	6	150	6	150	6	150	6	150	6	150	6	150	6	150	6
	4	over 1200 kg up to 1400 kg	100	6	125	6	150	6	150	6	150	6	150	6	150	6	150	6	150	6	150	6	150	6
	5	over 1400 kg up to 1800 kg	150	6	150	6	150	6	150	6	150	6	150	6	150	6	150	6	150	6	150	6	150	6
	6	over 1800 kg up to 2100 kg	200	6	200	5	250	4	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable
Vibro-tamper	1	Mass:	100	3	100	3	150	3	125	3	unsuitable	4	8	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	2	over 50 kg up to 65 kg	125	3	125	3	200	3	150	3	unsuitable	3	6	12	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	3	over 65 kg up to 75 kg	150	3	150	3	225	3	175	3	unsuitable	2	4	10	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	4	over 75 kg up to 100 kg	225	3	200	3	225	3	250	3	unsuitable	2	4	10	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
Power rammer	1	Mass:	150	4	150	6	unsuitable	200	4	unsuitable	5	8	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	2	over 500 kg	275	8	275	12	unsuitable	400	4	unsuitable	5	8	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
Dropping-weight compactor	1	Mass of rammer over 500 kg weight drop:	600	4	600	8	450	8	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	
	2	over 1 m up to 2 m	600	2	600	8	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	unsuitable	

**Marlstone Rock Formation**

The Marlstone Rock Formation generally comprises of ferruginous limestone, interbedded ferruginous sandstone and subordinate ferruginous mudstone. Elevated concentrations of some metals and metalloids (including arsenic) are known to be present within the Marlstone Rock Formation at concentrations which are considered unacceptable in

OS NORTH



**NOTES:**

It is assumed that any cut material can be reused on site as an engineered fill material. It is likely that material from site will need to be conditioned in terms of their moisture content to ensure they can be adequately compacted within proposed earthworks.

Topsoil strip is as advised by the geotechnical investigation report. (hydrock ref: WPF-HYD-XX-XX-RP-G-1001-P1.4-S2). this suggests topsoil thickness ranging from 0.15m to 0.4m so an average of 0.3m has been assumed.

Depths displayed are taken from existing ground level to top of Marlstone Rock formation

**CUT Depth Bands**

Band 1	-0.00 - -0.25
Band 2	-0.25 - -0.50
Band 3	-0.50 - -0.75
Band 4	-0.75 - -1.00
Band 5	-1.00 - -1.25
Band 6	-1.25 - -1.50
Band 7	-1.50 >

— PARCEL BOUNDARY

P1	25/11/19	First Issue	SM	BS
Rev	Date	Description	By	Ckd

**Hydrock**

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Client: **L & Q ESTATES**

Project: **WYKHAM PARK FARM**

Hydrock Project No: **C-04841**

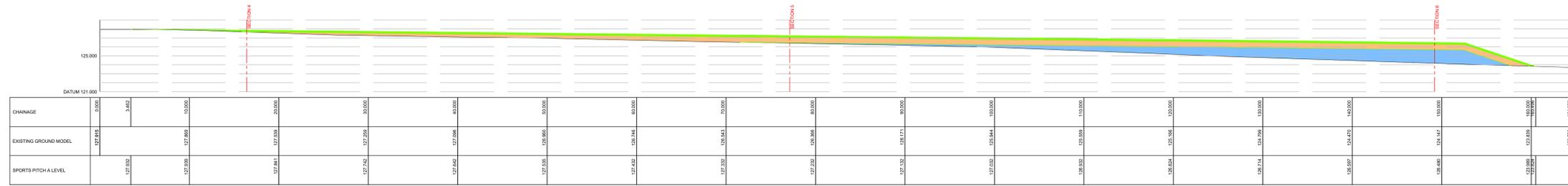
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Status: **SO** Purpose of Issue: **INFORMATION**

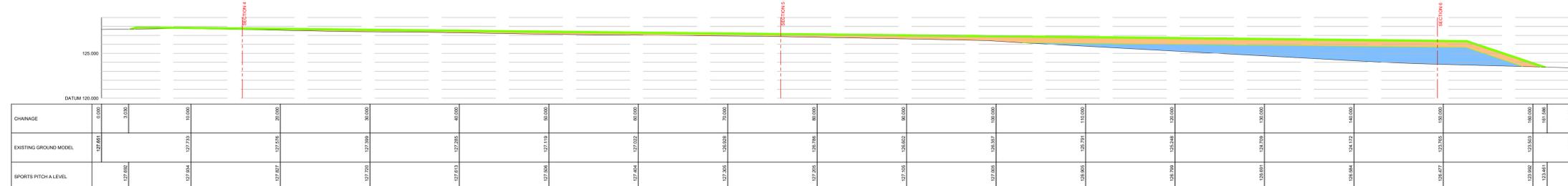
Drawn:	Checked:	Scale @ A1:	Drawn Date:	First Issue:
SM	BS	1:2000	16/08/2017	16/08/2017

Drawing No.	Revision
<b>WPF-HYD-XX-XX-DR-C-2410</b>	<b>P1</b>

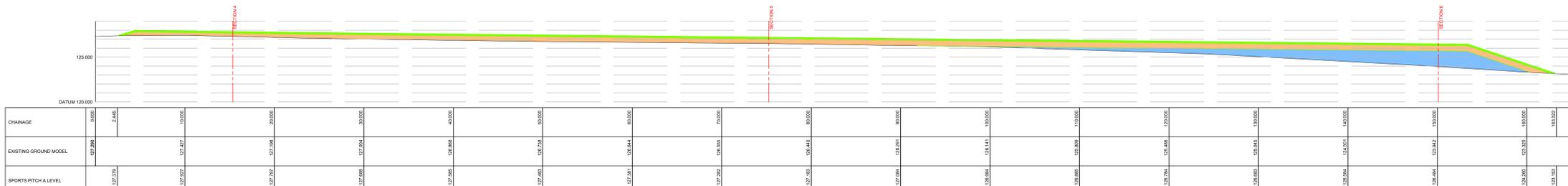
Notes:  
 All dimensions are to be checked on site before the commencement of works. Any discrepancies should be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing. This drawing is to be read in conjunction with all other drawings and specifications. This drawing is copyright.



SPORTS PITCH A CROSS SECTION 1  
SCALE 1:200



SPORTS PITCH A CROSS SECTION 2  
SCALE 1:200



SPORTS PITCH A CROSS SECTION 3  
SCALE 1:200



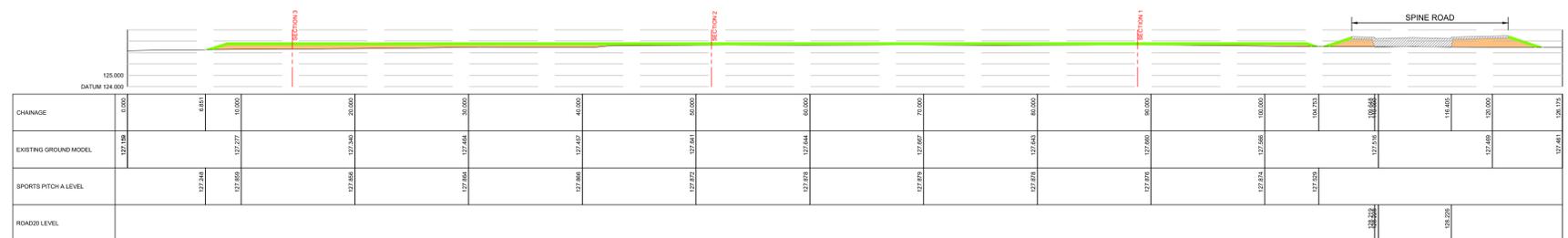
NOTES

**Sports pitch A**  
 Total fill required = 12280m<sup>3</sup>  
 Fill volume consists of - 4125m<sup>3</sup> of Marlstone Rock deposits.  
 2474m<sup>3</sup> Topsoil  
 5681m<sup>3</sup> Sustainable Fill  
 Topsoil reuse volume = 2315m<sup>3</sup> assuming 0.2m thickness  
 No topsoil strip has been assumed beneath the extent of Sports Pitch A  
 For Sports Pitch B sections refer to drawing: WPF-HYD-XX-XX-DR-C-0211  
 For LEAP sections refer to drawing: WPF-HYD-XX-XX-DR-C-0212  
 For site wide Cut & Fill Analysis refer to drawing: WPF-HYD-XX-XX-DR-C-2400

**LEGEND**

TOPSOIL PLACEMENT (200mm thickness where reused)
FILL MATERIAL (Min 600mm cover over marlstone rock volumes)
CUT MATERIAL
MARLSTONE ROCK (Placed in leap & sports pitch A)
EXISTING GROUND
TOPSOIL STRIP

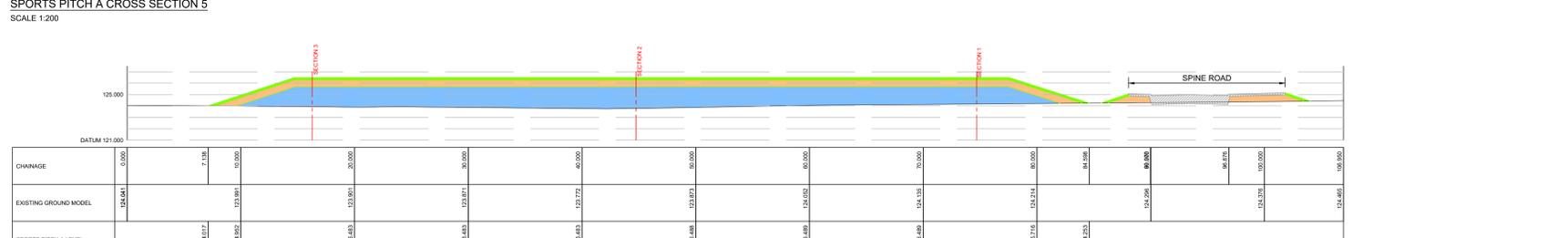
NOTES (CONTINUED)



SPORTS PITCH A CROSS SECTION 4  
SCALE 1:200



SPORTS PITCH A CROSS SECTION 5  
SCALE 1:200



SPORTS PITCH A CROSS SECTION 6  
SCALE 1:200

REVISIONS (CONTINUED)

REVISIONS

Rev	Date	Description	By	Ckd	App
P01	21/10/19	First Issue			

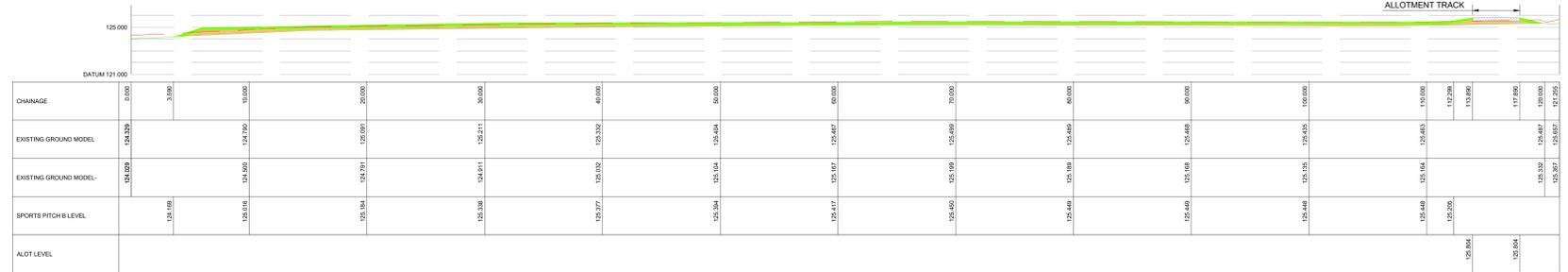
**Hydrock**  
 OVER COURT BARN  
 OVER LANE  
 ALMKROSBURY  
 HERTS  
 T: +44 (0) 1544 616333  
 e: bristol@hydrock.com

CLIENT  
**L & Q ESTATES**

PROJECT  
**WYKHAM PARK FARM**

TITLE  
**CUT AND FILL ANALYSIS -  
 SPORTS PITCH A SECTIONS**

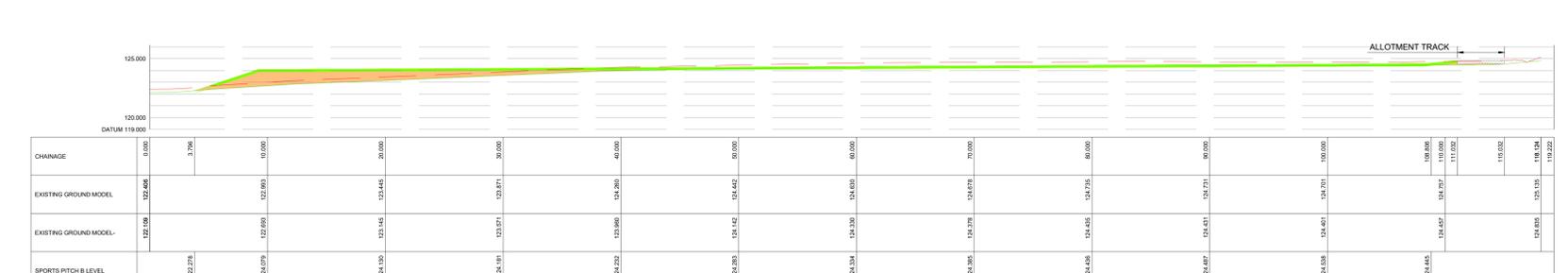
HYDROCK PROJECT NO. C-04841-C	SCALE @ A/D AS SHOWN	STATUS S2
INFORMATION DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE LEVEL-TYPE-ROLE-NUMBER) WPF-HYD-XX-XX-DR-C-0210	REVISION P01	



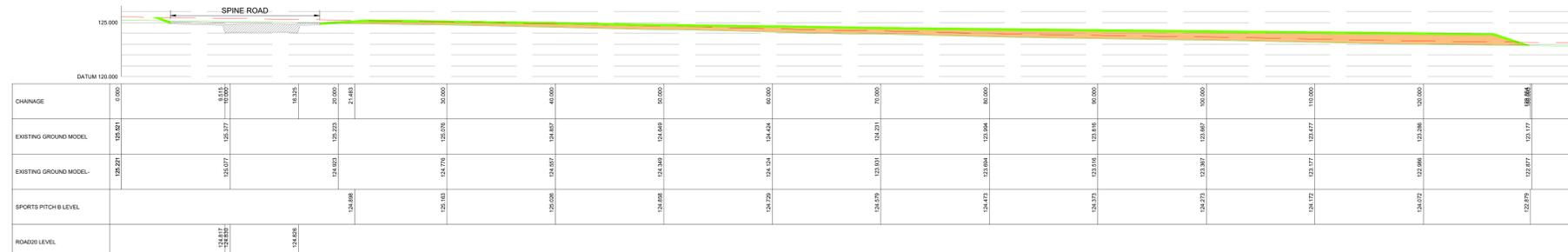
SPORTS PITCH B CROSS SECTION 1  
SCALE 1:200



SPORTS PITCH B CROSS SECTION 2  
SCALE 1:200



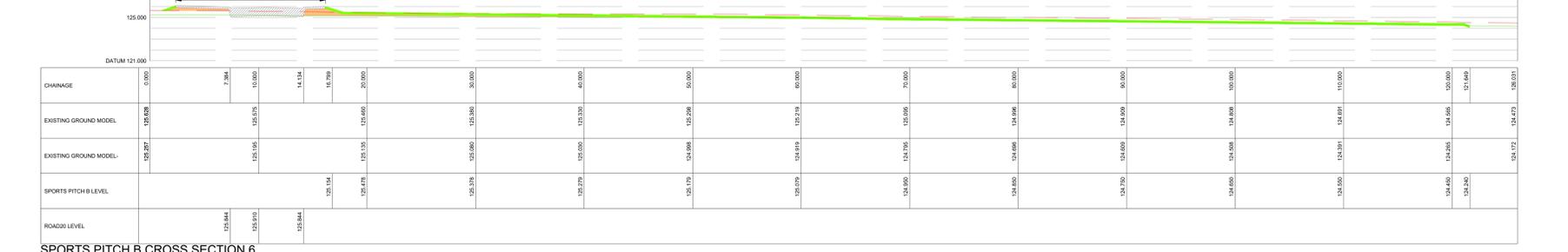
SPORTS PITCH B CROSS SECTION 3  
SCALE 1:200



SPORTS PITCH B CROSS SECTION 4  
SCALE 1:200



SPORTS PITCH B CROSS SECTION 5  
SCALE 1:200



SPORTS PITCH B CROSS SECTION 6  
SCALE 1:200

**LEGEND**

- TOPSOIL PLACEMENT (200mm thickness where reused)
- FILL MATERIAL (Min 600mm cover over marlstone rock volumes)
- CUT MATERIAL
- MARLSTONE ROCK (Placed in leap & sports pitch A)
- EXISTING GROUND
- TOPSOIL STRIP

**NOTES**

Sports pitch B  
Total fill required = 2936m³  
Fill volume consists of -  
2474m³ Topsoil  
5681m³ Suitable Fill  
Topsoil reuse volume = 2315m³ assuming 0.2m thickness  
No topsoil strip has been assumed beneath the extent of Sports Pitch A  
For Sports Pitch B sections refer to drawing: WPF-HYD-XX-XX-DR-C-0211  
For LEAP sections refer to drawing: WPF-HYD-XX-XX-DR-C-0212  
For site wide Cut & Fill Analysis refer to drawing: WPF-HYD-XX-XX-DR-C-2400

**REVISIONS**

Rev	Date	Description	By	Ckd	App
P01	01/10/19	First Issue	MF	MF	SM



CLIENT  
L & Q ESTATES

PROJECT  
WYKHAM PARK FARM

TITLE  
CUT AND FILL ANALYSIS - SPORTS PITCH B SECTIONS

HYDROCK PROJECT NO.	C-04841-C	SCALE @ A0	1:AS SHOWN
STATUS DESCRIPTION	INFORMATION	STATUS	S2
DRAWING NO. (PROJECT CODE ORIGINATOR.ZONE-LEVEL-TYPE-SCALE-NUMBER)	WPF-HYD-XX-XX-DR-C-0211	REVISION	P01