YORKSHIRE WATER REF NO. H-3-263-835

MH REF.	INVERT LEVELS AT CENTRE OF MANHOLE	COVER LEVELS	DEPTH TO SOFFIT	DEPTH TO INVERT	TYPE	SIZE	COVER TYPE	NOTES	SET-OUT COORDINATES
SW 01	131.844 - 2100Ø	137.943	3.999	6.099	SEE DWG 10/366/DE/500/003	3000Ø CONC.	D400		E434899.140, N400506.268
SW 02	131.762 - 2100Ø	137.689	3.827	5.927	SEE DWG 10/366/DE/500/003	4000Ø CONC.	D400		E434911.609, N400522.540
SW 03	131.862 - 2100Ø 133.812 - 150Ø	137.200	3.238	5.338	SEE DWG 10/366/DE/500/003	3000Ø CONC.	D400		E434933.863, N400511.149
SW 04	131.670 - 2100Ø 133.620 - 150Ø	137.357	3.587	5.867	SEE DWG 10/366/DE/500/003	3000Ø CONC.	D400		E434917.115, N400544.871
SW 05	131.526 - 2100Ø 133.476 - 150Ø	136.934	3.308	5.408	SEE DWG 10/366/DE/500/004	3000Ø CONC.	D400		E434931.798, N400577.741
SW 06	131.388 - 2100Ø 133.338 - 150Ø	136.515	3.027	5.127	SEE DWG 10/366/DE/500/004	3000Ø CONC.	D400		E434951.795, N400605.854
SW 07	131.252 - 2100Ø 133.202 - 150Ø	136.061	2.709	4.809	SEE DWG 10/366/DE/500/004	3000Ø CONC.	D400		E434964.138, N400637.534
SW 08	131.188 - 2100Ø	135.833	2.545	4.645	SEE DWG 10/366/DE/500/004	3000Ø CONC.	D400		E434963.615, N400653.525
SW 09	131.020 - 2100Ø 132.970 - 150Ø	134.993	1.873	3.973	SEE DWG 10/366/DE/500/006	4000Ø CONC.	D400		E434980.165, N400692.127
SW 10	131.058 - 2100Ø 132.903 - 225Ø	134.548	1.390	3.490	SEE DWG 10/366/DE/500/006	3000Ø CONC.	D400		E434984.686, N400710.582
SW 11	130.955 - 2100Ø 130.930 - 225Ø	134.400	1.370	3.470	SEE DWG 10/366/DE/500/005	3000Ø CONC.	D400	Flow control MH, see 10/336/DE/500/005	E434955.864, N400703.895
EXG SW	130.490 - 225Ø	132.530	1.815	2.040				Existing MH	

THE POSITION OF THE INTERNAL FACE OF ANY DRAIN/SEWER OR RISING MAIN SHALL NOT DEVIATE FROM THE DESIGN LINE AND LEVEL BY MORE THAN +/- 20mm, PROVIDED THAT NO DRAIN/SEWER SHALL HAVE A REVERSE GRADIENT.

MH REF.	INVERT LEVELS AT CENTRE OF MANHOLE	COVER LEVELS	DEPTH TO SOFFIT	DEPTH TO INVERT	TYPE	SIZE	COVER TYPE	NOTES	SET-OUT COORDINATES
FW 01	132.600 - 150Ø	135.099	2.349	2.499	B	1200Ø CONC.	D400		E434980.830, N400687.149
FW 02	131.405 - 150Ø	135.804	4.249	4.399	A	1200Ø CONC.	D400		E434966.709, N400654.211
FW 03	130.802 - 150Ø 132.057 - (BD)	136.018	5.066	5.216	A	1200Ø CONC.	D400		E434966.458, N400635.675
FW 04	130.637 - 150Ø	136.017	5.230	5.380	A	1200Ø CONC.	D400		E434951.928, N400631.061
FW 05	135.878 - 150Ø	138.950	2.922	3.072	B	1200Ø CONC.	C250		E434880.061, N400592.729
FW 06	135.486 - 150Ø	136.849	1.213	1.363	B1/E	1200Ø CONC.	D400		E434935.028, N400577.896
FW 07	135.436 - 150Ø	136.918	1.332	1.482	B1/E	1200Ø CONC.	D400		[illegible].769
FW 08	135.212 - 150Ø	137.245	1.883	2.033	B	1200Ø CONC.	D400		[illegible].127
FW 09	135.097 - 150Ø	137.383	2.136	2.286	B	1200Ø CONC.	D400		[illegible].261
FW 10	134.922 - 150Ø	137.568	2.496	2.646	B	1200Ø CONC.	D400		[illegible].336
FW 11	134.818 - 150Ø	137.722	2.754	2.904	B	1200Ø CONC.	D400		E434910.141, N400515.549
FW 12	130.578 - 150Ø	136.300	5.572	5.722		1500Ø CONC.	D400	FW pump inlet chamber, refer to Xylem Water Solutions details*	T.B.C. upon receipt of Xylem design
FW 13	131.561 - 150Ø in 135.100 - 89Ø out	136.300	4.589	4.739		3000Ø CONC.	D400	FW pump wet well, refer to Xylem Water Solutions details*	T.B.C. upon receipt of Xylem design
FW 14	135.100 - 89Ø	136.300	1.111	1.200		1800x2400 CONC.	D400	FW valve chamber, refer to Xylem Water Solutions details*	T.B.C. upon receipt of Xylem design
EXG CW (no-8530)	134.580 - 150Ø	137.880	3.150	3.300				Existing public C.W MH	
EXG CW (no-8532)	ø 135.303(225Ø exg.) approx.	139.128	3.600	3.825				Existing public C.W MH	

THE POSITION OF THE INTERNAL FACE OF ANY [illegible] ATE FROM THE DESIGN LINE AND LEVEL BY MORE THAN +/- 20mm, PROVIDED THAT NO DRAIN/SEWER SHALL HAVE A REVERSE GRA[illegible]

SURFACE WATER MANHOL[illegible]

DRAIN LEVEL KE[illegible]

EXTENT OF SITE (PHASE 2) TO BE BUILT DISCHARGING INTO PHASE 1. SYSTEM HAS BEEN DESIGNED SUCH THAT PHASE 1 DRAINAGE IS NOT FLOODED IN ORDER THAT EXISTING 5l/SEC DISCHARGE RATE IS NOT COMPROMISED

PREVIOUSLY AGREED (& BUILT) DISCHARGE FROM SITE OF 5l/SEC

EXTENT OF SITE ALREADY BUILT BY HARTWOOD DEVELOPMENTS

ADOPTABLE PUMPING STATION

PUMP TO INCLUDE MONITOR, VISUAL ALARM AND TELEMETRY LINK/REMOTE DIALLER.

FW PUMPING STATION
CL= 136.136
IL= (150Ø IN) 130.591
IL= (RISING MAIN OUT) 135.100
IL= (RISING MAIN OUTFALL INTO FW05) 136.475
PUMP RATE = 4.7l/s
STATIC HEAD TBC

FW PUMPING STATION SUPPLIED BY XYLEM WATER SOLUTIONS U.K. LTD.

MODEL FLYGT NP3085 MT 3~ADAPTIVE 462

RISING MAIN
RISING MAIN TO BE 110mm (89.1Ø INTERNAL) HDPE SDR11 AND SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 13244-2. COLOUR TO BE BLACK. POLYETHYLENE FITTINGS, INCLUDING FUSION JOINTS AND ELECTROFUSION FITTINGS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 13244-3.

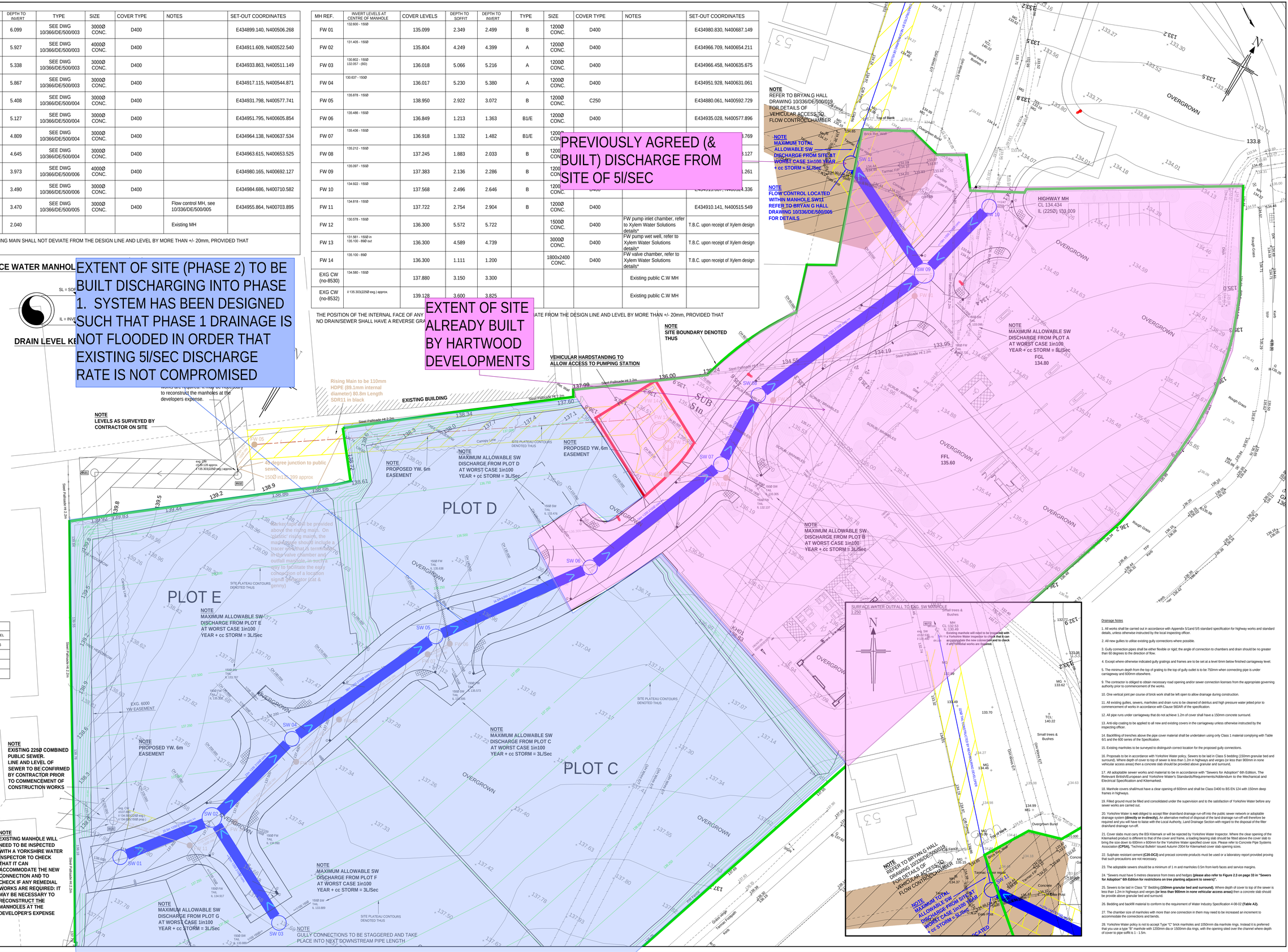
KEY:

- PROPOSED FOUL DRAIN
- PROPOSED SURFACE WATER DRAIN
- PIPE HATCHED THUS ON PLAN TO HAVE 150mm CONCRETE SURROUND
- PROPOSED FOUL WATER RISING MAIN
- FW PROPOSED FOUL MANHOLE
- SW PROPOSED SURFACE WATER MANHOLE
- G PROPOSED ROAD GULLY

DRAINAGE LAYOUT KEY

'HYDROBRAKE' DETAILS				
MANHOLE	RING SIZE	COVER LEVEL	INVERT LEVEL	SUMP LEVEL
SW11	3000	134.400	130.930	130.525
Unit Type	MD-SHE-0081-5000-3400-5000			
Design Head	3.400m			
Design Flow	5.0 L/sec			

NOTE:
1. ALL MANHOLE COVER LEVELS ARE APPROXIMATE AND SHOULD BE ADJUSTED TO SUIT THE FINISHED HIGHWAY LEVEL.



Drainage Notes

1. All works shall be carried out in accordance with Appendix S/1and 5/5 standard specification for highway works and standard details, unless otherwise instructed by the local inspecting officer.

2. All new gullies to utilise existing gully connections where possible.

3. Gully connection pipes shall be either flexible or rigid; the angle of connection to chambers and drain should be no greater than 60 degrees to the direction of flow.

4. Except where otherwise indicated gully gratings and frames are to be set at a level 6mm below finished carriageway level.

5. The minimum depth from the top of grating to the top of gully outlet is to be 750mm when connecting pipe is under carriageway and 600mm elsewhere.

9. The contractor is obliged to obtain necessary road opening and/or sewer connection licenses from the appropriate governing authority prior to commencement of the works.

10. One vertical joint per course of brick work shall be left open to allow drainage during construction.

11. All existing gullies, sewers, manholes and drain runs to be cleaned of detritus and high pressure water jetted prior to commencement of works in accordance with Clause 560AR of the specification.

12. All pipe runs under carriageway that do not achieve 1.2m of cover shall have a 150mm concrete surround.

13. Anti-slip coating to be applied to all new and existing covers in the carriageway unless otherwise instructed by the inspecting officer.

14. Backfilling of trenches above the pipe cover material shall be undertaken using only Class 1 material complying with Table 6/1 and the 600 series of the Specification.

15. Existing manholes to be surveyed to distinguish correct location for the proposed gully connections.

16. Proposals to be in accordance with Yorkshire Water policy, Sewers to be laid in Class S bedding (150mm granular bed and surround). Where depth of cover to top of sewer is less than 1.2m in highways and verges (or less than 900mm in none vehicular access areas) then a concrete slab should be provided above granular and surround.

17. All adoptable sewer works and material to be in accordance with "Sewers for Adoption" 6th Edition, The Relevant British/European and 'Yorkshire Water's Standards/Requirements/Addendum to the Mechanical and Electrical Specification and Kitemarked.

18. Manhole covers shall/must have a clear opening of 600mm and shall be Class D400 to BS EN 124 with 150mm deep frames in highways.

19. Filled ground must be filled and consolidated under the supervision and to the satisfaction of Yorkshire Water before any sewer works are carried out.

20. Yorkshire Water is not obliged to accept filter drain/land drainage run-off into the public sewer network or adoptable drainage system **(directly or in-directly).** An alternative method of disposal of the land drainage run-off will therefore be required and you will have to liaise with the Local Authority, Land Drainage Section with regard to the disposal of the filter drain/land drainage run-off.

21. Cover slabs must carry the BSI Kitemark or will be rejected by Yorkshire Water Inspector. Where the clear opening of the Kitemarked product is different to that of the cover and frame, a loading bearing slab should be fitted above the cover slab to bring the size down to 600mm x 600mm for the Yorkshire Water specified cover size. Please refer to Concrete Pipe Systems Association **(CPSA).** 'Technical Bulletin' issued Autumn 2004 for Kitemarked cover slab opening sizes.

22. Sulphate resistant cement **(C20-DC2)** and precast concrete products must be used or a laboratory report provided proving that such precautions are not necessary.

23. The adoptable sewers should be a minimum of 1 m and manholes 0.5m from kerb faces and service margins.

24. "Sewers must have 5 metres clearance from trees and hedges **(please also refer to Figure 2.3 on page 33 in "Sewers for Adoption" 6th Edition for restrictions on tree planting adjacent to sewers)".**

25. Sewers to be laid in Class "S" Bedding **(150mm granular bed and surround).** Where depth of cover to top of the sewer is less than 1.2m in highways and verges **(or less than 900mm in none vehicular access areas)** then a concrete slab should be provide above granular bed and surround.

26. Bedding and backfill material to conform to the requirement of Water Industry Specification 4-08-02 **(Table A2).**

27. The chamber size of manholes with more than one connection in them may need to be increased an increment to accommodate the connections and bends.

28. Yorkshire Water policy is not to accept Type "C" brick manholes and 1050mm dia manhole rings. Instead it is preferred that you use a type "B" manhole with 1200mm dia or 1500mm dia rings, with the opening sited over the channel where depth of cover to pipe soffit is 1 - 1.5m.

Rev:	Date:	Amendment:	DRN	CHK
Q	13/11/18	Hatching added to show tanker access road highlighted.	JI	RB
P	31/08/18	Hardstanding accessed from new road to allow maintenance of flow control chamber omitted in lieu of allowing access through exg. Rockingham Business Park	RPB	RB
N	02/08/18	Line of rising main updated to reflect as laid on site.	RPB	RB
M	20/07/18	FW5 Location updated and notes amended	JI	RPB
L	05/07/18	FW5 & ECG CW (no-8532) Invert level updated	JI	RPB
K	22/06/18	FW04 & FW12 Invert level updated to suit as built levels	JI	RPB
J	08/06/18	Backdrop added to FW103.	JI	RPB
H	08/05/18	FW dropped from FW01 down to pumping station.	JI	RPB

NOTES:

THIS PLAN 10-336-DE-500-001-N IS THE SAME AS THE TECHNICALLY APPROVED (10-336-DE-500-001-M), BUT THE REFERENCE NUMBER HAS CHANGED TO ALLOW ISSUE TO SITE.

This drawing is copyright and shall not be reproduced nor used for any other purpose without the written permission of the Bryan G Hall ltd. This drawing must be read in conjunction with all other related drawings and documentation.

It is the contractors responsibility to ensure full compliance with the Building Regulations. Do not scale from this drawing, use figured dimensions only. It is the contractors responsibility to check and verify all dimensions on site. Any discrepancies to be reported immediately. IF IN DOUBT ASK.

Materials not in conformity with relevant British or European Standards/Codes of practice or materials known to be deleterious to health & safety must not be used or specified on this project.

Status: FOR APPROVAL

Client: HARTWOOD ESTATES

Project: LAND TO EAST HIGHWAYS DEPOT, BIRDWELL, SOUTH YORKSHIRE

Title: SECTION 104 GENERAL ARRANGEMENT

Scale: 1:250 A0 - 841 x 1185 | Drawn: RPB | Checked: IE | Drawing No: 10/336/DE/500/001 | Revision: Q | Job No: 10-336 | Date: 12/06/17

BRYAN G HALL
CONSULTING CIVIL & TRANSPORTATION PLANNING ENGINEERS
Copyright Reserved Bryan G Hall Ltd.
E highways@bryanghall.co.uk
Suite E15 | Josephs Well Hanover Walk | LEEDS | LS3 1AB
T 0113 246 1555
F 0113 234 2201
W www.bryanghall.co.uk
Lighterman House 26/36 Wharfdale Road LONDON | N1 9RY
T 0203 553 3336