



Technical Note - 6008/02

Project Title:	Parcel KMF and KMG, Hawkswood, Kingsmere, Bicester				
Client:	Linden Homes				
Project No.:	6008	Date:	February 2021	Issue No.:	1
Title:	Drainage Design Statement				
Written By:	N. Parajuli MEng	Checked By:	R. Bowley BSc CEng MCIWEM	Authorised By:	R. Bowley BSc CEng MCIWEM

1.0 Background

- 1.1 This *Drainage Design Statement* has been prepared in relation to the discharge of drainage conditions associated with two parcels, KMG and KMF, located within the wider Kingsmere development in Bicester.
- 1.2 As per WSP Design Code (Page 46) and drainage strategy of the wider site as shown in WSP Plan No. 1903-D-006-Y [*Surface Water Strategy and Catchment Layout*] enclosed, each parcel is required to attenuate at least the 1 in 10 year event, with flow limited to the equivalent 1 in 10 year greenfield rate. Whilst on-plot attenuation (or infiltration if ground permits) will be required to manage up to the 10 year event, runoff in events exceeding the 1 in 10 year will overflow to the strategic surface water networks and be attenuated within the strategic basins located at the outfalls. Total discharge from the wider site will not exceed the equivalent greenfield rates in the respective 2, 10, 30 and 100 year + 30% events. Refer to Notes 1 and 2 in the enclosed plan.
- 1.3 Accordingly, Parcels KMG and KMF provide on-plot storage within cellular tanks and/or oversized pipes for up to the 1 in 10 year event, with flow restricted to the equivalent 10yr greenfield rate with the use of a Hydrobrake flow control. Flows exceeding the 10yr event will overflow downstream via an overflow weir system provided within the flow control manhole, and will be attenuated within the strategic basins located at the outfalls. Site investigation works carried out by Merebrook Ltd in March 2018 confirmed that infiltration is not feasible in these site areas as the area is underlain by Kellaway Clays. Refer to SI report extract enclosed.
- 1.4 Refer to CEC Plan 6008 - 02 (Parcel KMG) and Plans 6008 - 110 Sheet 01 to 04 (Parcel KMF) and calculations enclosed for drainage design details relating to these two parcels prepared in accordance

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with the design code above. The table 1.1 below presents the drainage design summary for these parcels.

- 1.5 The drainage design has shown have been approved for adoption by Thames Water once built. Refer to S104 approvals enclosed.

Table 1.1: Drainage Design Summary

Schedule	Hard Area (ha)	1:10yr Storage (m ³)	10yr Discharge Rate (l/s)	Comments
Parcel KMG	0.536	100	5.2	Runoff in excess of 10yr event will overflow into the strategic sewers and basins
Parcel KMF	1.852	406	25.6	
KMF Network 1	0.527	101 (67m ³ in cellular tanks+34m ³ in 750mm pipes)	12.7	
KMF Network 2	0.721	151 (114m ³ in cellular tanks+37m ³ in 750mm pipes)	8.3	
KMF Network 3	0.519	124 (23m ³ in cellular tank+70m ³ in permeable paving+36m ³ in 750mm pipes)	3.7	
KMF Network 4	0.085	30m ³ (in cellular tank)	0.9	

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February 2021

Enclosures:

- WSP Plan No. 1903-D-006-Y Surface Water Strategy and Catchment Layout
- CEC Plan 6008 - 02AC Engineering Layout
- CEC Plan 6008 - 110 -01M Engineering Layout
- CEC Plan 6008 - 110 -02O Engineering Layout
- CEC Plan 6008 - 110 -03R Engineering Layout
- CEC Plan 6008 - 110 -04J Engineering Layout
- Surface Water Network Design Calculations
- Site Investigation Report Extract by Merebrook Limited Dated March 2018
- S104 Approvals

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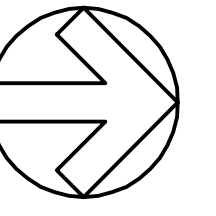
Technical Note - 6008/02

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PETROL INTERCEPTOR FOR
NEW ROUNDABOUT

EXISTING HIGHWAY DITCH

PETROL INTERCEPTOR FOR
NEW ROUNDABOUT

DITCH DIVERTED FOR
ROUNDABOUT

CUT OFF DITCH

WHITELANDS FARM

WHITELANDS FARM

EXISTING HIGHWAY DITCH SYSTEM TO BE RETAINED

EXISTING HIGHWAY DITCH SYSTEM TO BE RETAINED

PETROL INTERCEPTORS FOR
NEW ROUNDABOUT

PROPOSED DITCH WITHIN
FENCED BUFFER ZONE
OUTSIDE SCHOOL SITE

GARDEN CENTRE

EXISTING HIGHWAY
DITCH SYSTEM TO BE
RETAINED

A41 ROADSIDE DITCH

CONNECTION TO BRANCH
SPUR

PINGLE BROOK

EXISTING HIGHWAY
DITCH SYSTEM TO BE
RETAINED

PINGLE BROOK

SW ATTENUATION
REQUIRED ON PLOT

Centre

DB

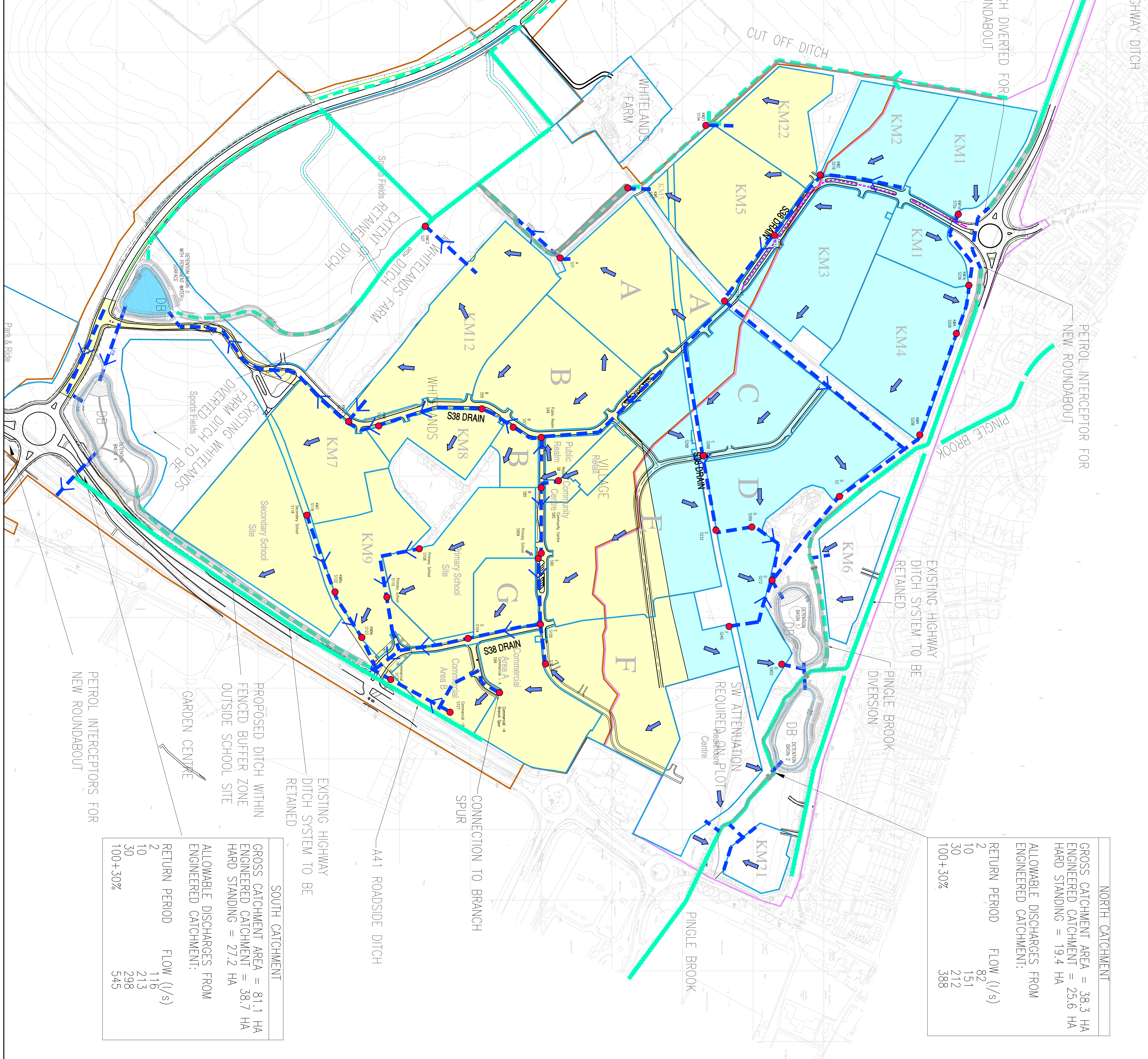
NORTH CATCHMENT		
GROSS CATCHMENT AREA = 38.3 HA		
ENGINEERED CATCHMENT = 25.6 HA		
HARD STANDING = 19.4 HA		
ALLOWABLE DISCHARGES FROM ENGINEERED CATCHMENT:		
RETURN PERIOD	FLOW (l/s)	
2	82	
10	151	
30	212	
100+30%	388	

SOUTH CATCHMENT		
GROSS CATCHMENT AREA = 81.1 HA		
ENGINEERED CATCHMENT = 38.7 HA		
HARD STANDING = 27.2 HA		
ALLOWABLE DISCHARGES FROM ENGINEERED CATCHMENT:		
RETURN PERIOD	FLOW (l/s)	
2	116	
10	213	
30	298	
100+30%	545	

Figure 1												
Ground Area (ha)	Imp Factor	Imp Area (ha)	Storage Vol (m³)	Matt. Conc. (kg/m³)	Mt. (kg)	Downstream Pipe Size (mm)	Downstream Pipe Size (mm)	Pre-development Matt. Conc. (kg/m³)	Pre-development Mt. (kg)	Site Wide Limits Q2 ls	Q10 ls	Q20 ls
0.869	0.750	0.652	86.9	51.26	74.185	18.000	450	5.0	10.0	15.2	27.6	38.8
1.762	0.750	1.321	176.2	51.16	73.647	23.000	450	2.8	5.1	7.1	13.05	18.76
2.829	0.750	2.121	282.9	51.19	71.741	23.000	450	9.0	16.0	22.2	42.80	61.48
3.009	0.750	2.317	300.9	51.00	73.424	18.000	450	9.9	18.1	25.3	46.38	68.59
2.837	0.750	2.137	283.7	51.06	71.910	18.000	450	8.4	15.5	21.6	39.89	58.28
3.545	0.750	2.659	354.5	53	70.086	18.000	450	12.6	23.1	32.4	59.27	87.59
2.344	0.750	1.758	234.4	51.00	71.189	11.000	450	7.5	13.8	19.2	35.20	50.20
0.671	0.750	0.503	67.1	51.00	69.715	16.000	375	2.1	3.9	5.5	10.08	14.34
0.768	1.000	0.768	76.8	15.777	17.171	172.8	315.8	67.4	132.4	172.8	315.8	454.9

Figure 2												
Ground Area (ha)	Imp Factor	Imp Area (ha)	Storage Vol (m³)	Matt. Conc. (kg/m³)	Mt. (kg)	Downstream Pipe Size (mm)	Downstream Pipe Size (mm)	Pre-development Matt. Conc. (kg/m³)	Pre-development Mt. (kg)	Site Wide Limits Q2 ls	Q10 ls	Q20 ls
1.259	0.750	0.944	125.9	51.26	74.185	18.000	450	5.0	10.0	15.2	27.6	38.8
2.518	0.750	1.888	251.8	51.16	73.647	23.000	450	2.8	5.1	7.1	13.05	18.76
3.777	0.750	2.828	377.7	51.19	71.741	23.000	450	9.0	16.0	22.2	42.80	61.48
3.957	0.750	2.968	395.7	51.00	73.424	18.000	450	9.9	18.1	25.3	46.38	68.59
3.785	0.750	2.844	378.5	51.06	71.910	18.000	450	8.4	15.5	21.6	39.89	58.28
4.493	0.750	3.370	449.3	53	70.086	18.000	450	12.6	23.1	32.4	59.27	87.59
2.851	0.750	2.137	285.1	51.00	71.189	11.000	450	7.5	13.8	19.2	35.20	50.20
0.851	0.750	0.638	85.1	51.00	69.715	16.000	375	2.1	3.9	5.5	10.08	14.34
0.948	1.000	0.948	94.8	15.777	17.171	172.8	315.8	67.4	132.4	172.8	315.8	454.9

Figure 1												
Ground Area (ha)	Imp Factor	Imp Area (ha)	Storage Vol (m³)	Matt. Conc. (kg/m³)	Mt. (kg)	Downstream Pipe Size (mm)	Downstream Pipe Size (mm)	Pre-development Matt. Conc. (kg/m³)	Pre-development Mt. (kg)	Site Wide Limits Q2 ls	Q10 ls	Q20 ls
2.578	0.750	1.934	257.8	51.7	72.234	1.015	625	8.2	15.1	21.2	39	55
1.969	0.750	1.477	196.9	51.18	69.983	26.000	450	6.3	11.6	16.2	30	43
1.553	0.750	1.165	155.3	51.21	67.524	26.000	450	4.8	8.8	12.3	23	33
0.669	0.750	0.502	66.9	51.23	65.268	26.000	450	2.1	3.9	5.5	10	14
3.147	0.750	2.360	314.7	52.1	74.982	4.000	450	10.0	18.5	26.8	47	67
3.493	0.750	2.620	349.3	52.0	73.590	15.000	450	0.0	0.0	0.0	0	0
3.347	0.750	2.510	334.7	52.5	68.550	7.011	600	10.7	19.8	27.5	50	72
3.129	0.750	2.347	312.9	53.0	70.223	15.000	450	10.0	18.4	26.7	47	68
3.765	0.750	2.844	376.5	53.0	67.445	15.000	450	12.0	22.3	31.0	53	76
0.888	0.750	0.666	88.8	51.04	67.760	15.000	600	2.8	5.2	7.3	13	19
1.905	0.750	1.429	190.5	51.54	73.884	1.011	626	5.4	9.9	13.9	25	36
2.470	0.750	1.853	247.0	51.08	68.395	23.000	450	4.4	8.1	11.3	21	30
3.160	0.750	2.370	316.0	51.19	69.915	26.000	450	4.4	8.1	11.3	21	30
1.133	0.750	0.842	113.3	51.00	66.502	26.000	450	5.8	10.6	14.6	26	37
0.427	0.750	0.320	42.7	51.00	66.502	26.000	450	1.4	2.5	3.5	6	9
0.146	0.750	0.109	14.6	51.00	66.502	26.000	450	0.5	0.9	1.3	2	3
0.272	0.750	0.204	27.2	51.11	66.502	26.000	450	0.8	1.4	2.0	3	4

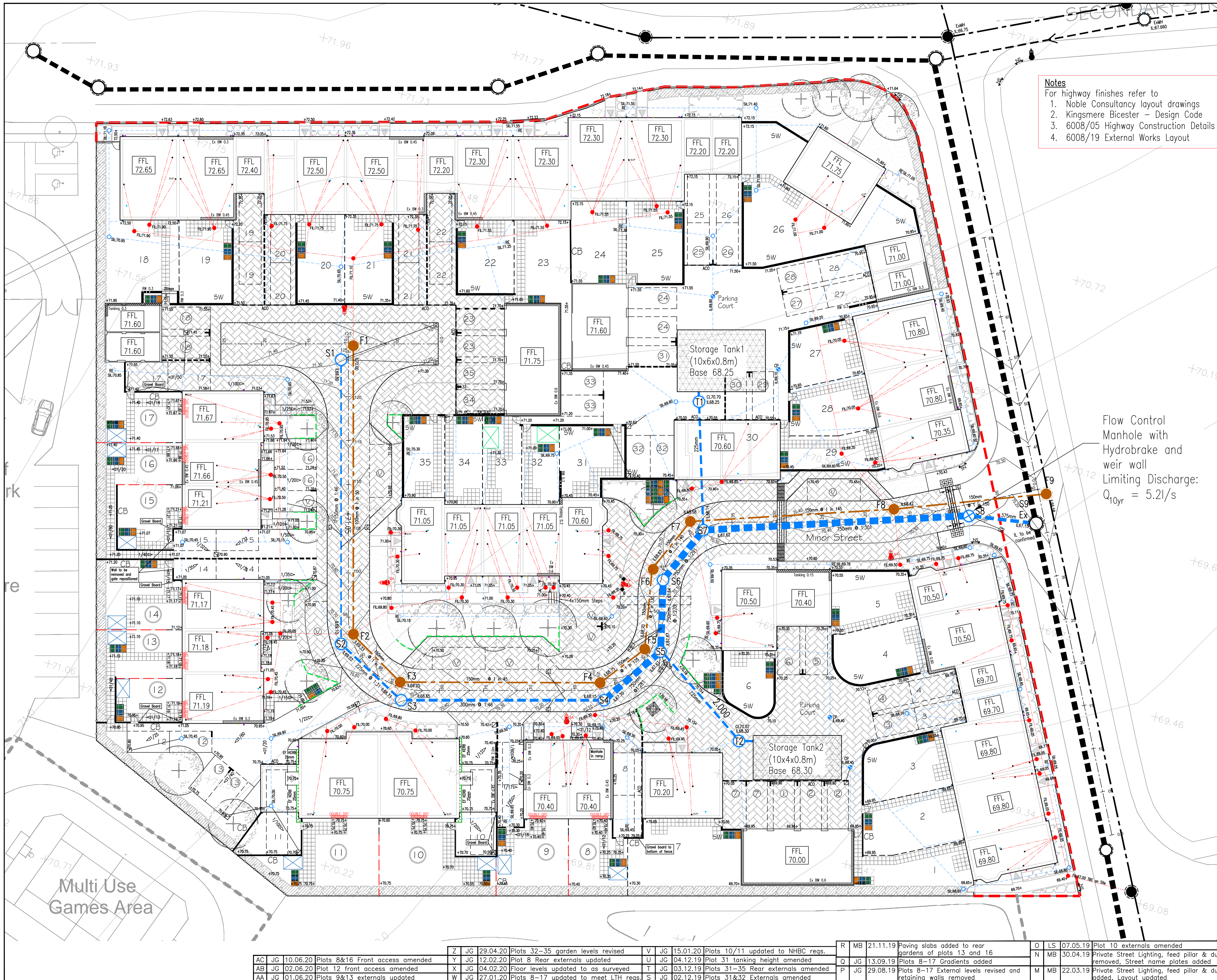


DO NOT SCALE	
	SURFACE WATER FLOW DIRECTION
	RETAINED EXISTING DITCHES
	NEW OR RELOCATED DITCHES
	INDICATE SURFACE WATER DRAIN ROUTES
	NORTHEN ENGINEERED CATCHMENT AREA DRAWING TO BASINS
	SOUTHERN ENGINEERED CATCHMENT AREA DRAWING TO BASINS
	DEFLECTION BASINS
	PETROL CONNECTION MANHOLE
	DB
	3000
	PARCEL BOUNDARY

NOTES:
 NOTE 1: THE INTERCEPTOR ON PLOT 29808 IS LOCATED APPROXIMATELY 10M FROM THE CENTER OF THE ROUNDABOUT. THIS STORAGE IS DESIGNED TO ATTENUATE THE 1 IN 10 YEAR EVENT (MAYFLOW) FLOW. THE STORAGE CAN INCLUDE SPILLS AND WHEEL WASHES.
 NOTE 2: INTERCEPTOR AND STORAGE FOR EACH PLOT SHALL BE DESIGNED TO ATTENUATE THE 1 IN 10 YEAR EVENT (MAYFLOW) IN EXCESS OF THE 1 IN 10 YEAR FLOW (MAYFLOW) TO THE STREET. EVENTS IN EXCESS OF THE 1 IN 10 YEAR FLOW WILL BE ATTENUATED WITHIN THE BASINS LOCATED AT THE OUTFALLS AND BE ATTENUATED WITHIN THE BASINS.
 NOTE 3: WHERE THE DESIGN DISCHARGE IS LESS THAN 5 L/S, THE DESIGN FLOW WILL BE 5 L/S AS THIS IS CONSIDERED TO BE THE MINIMUM FLOW A CONTROL DEVICE CAN ACHIEVE WITHOUT HIGH BACKLOG RISK.
 CHANGES SINCE THE PREPARED LAYOUTS AND SIZES HAVE CHANGED. THE ENGINEERED CATCHMENT AREAS AND THEREFORE THE ALLOWABLE DISCHARGE RATES FOR THE CATCHMENTS.

FOR TECHNICAL APPROVAL:

Client: **WSP**
 Address: **WSP Group plc**
 11011903 | 19031006



Notes
 For highway finishes refer to
 1. Noble Consultancy layout drawings
 2. Kingsmere Bicester - Design Code
 3. 6008/05 Highway Construction Details
 4. 6008/19 External Works Layout

KEY:

FFL 70.45	FINISHED FLOOR LEVELS
+108.65	PROPOSED SPOT LEVELS
Ex BW 0.3	EXPOSED BRICKWORK & HEIGHT
RE	TANKING & HEIGHT
RE	RETAINING WALL & HEIGHT
Type CLAY 225mm	STORM WATER SEWER, MANHOLE & PIPE DETAILS
Type CLAY 150mm	FOUL WATER SEWER, MANHOLE & PIPE DETAILS
1 in 60	HIGHWAY GULLY & CONNECTION
SL 72.20	PRIVATE SW DRAIN, INSPECTION CHAMBER & INVERT LEVEL
RE	PRIVATE SW RODDING EYE
CP	PRIVATE SW CATCHPIT
FL 72.10	PRIVATE FW DRAIN INSPECTION CHAMBER & INVERT LEVEL
ACD	PRIVATE YARD GULLY & CONNECTION
ACD	PRIVATE ACO DRAIN
SL	STREET LIGHTING COLUMN
SL	SERVICE DUCT CROSSING
TR	TREE ROOT PROTECTION BARRIER
DK	DROPPED KERB CROSSING
TP	TACTILE PAVING
CP	COROUROY PAVING
B	BOLLARD
SL	EXISTING STREET LAMP COLUMN
SL	PRIVATE STREET LIGHTING
1.8M	1.8M CLOSE BOARD WITH 300MM GRAVEL
1.8M	1.8M POST AND PANEL FENCE
BD	BRICK DEMARCATION
SN	STREET NAME PLATES
DB	DOUBLE DPC

Revision Note G:
 Service duct crossings added. Service/maintenance margins updated to visitor parking bays. Tactile paving & drop kerbs added to entrance junction. Tree root protection barrier added

Revision Note H:
 Hard standing to visitor parking added. Driveway alignment & gully to plots 11-13 amended. ACO channel drain added to plot 11 drive-through. Service duct crossing outside plot 14 extended into amended margin. Footpath extended by plot 29 to meet private access. Bollards added to lamp column 5A. Corouroy paving added at end of footpath by plot 6. Tactile paved crossing added to entrance.

No.	By	Date	Revision Details
L	MB	12.03.19	Plot 26 RWP and connection added
K	LS	25.02.19	Levels by plots 11/12 amended
J	LS	10.01.19	SVPs added to head of foul runs
I	LS	10.12.18	Notes added for surfacing requirements
H	MR	12.11.18	See revision note H
G	MB	23.10.18	See revision note G
F	MR	02.10.18	Drawing status updated. References added to storage tank manholes
E	MR	07.09.18	Block Paving reinstated as requested
D	MR	03.09.18	Updated to latest layout. 2m service margin shown. Turning head adjusted
C	MB	16.07.18	Plot paths and patios added
B	RB	05.07.18	Plot 4&5 garage FFL amended to 69.70 Rear garden levels to plot 5 amended
A	RB	25.05.18	Plot 31 FFL amended to 70.60

Flow Control Manhole with Hydrobrake and weir wall
 Limiting Discharge:
 $Q_{10yr} = 5.2l/s$

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Client: Linden Homes

Job Title: Proposed Residential Development
 Parcel KMG
 Kingsmere
 Bicester

Drawing Title: Engineering Layout

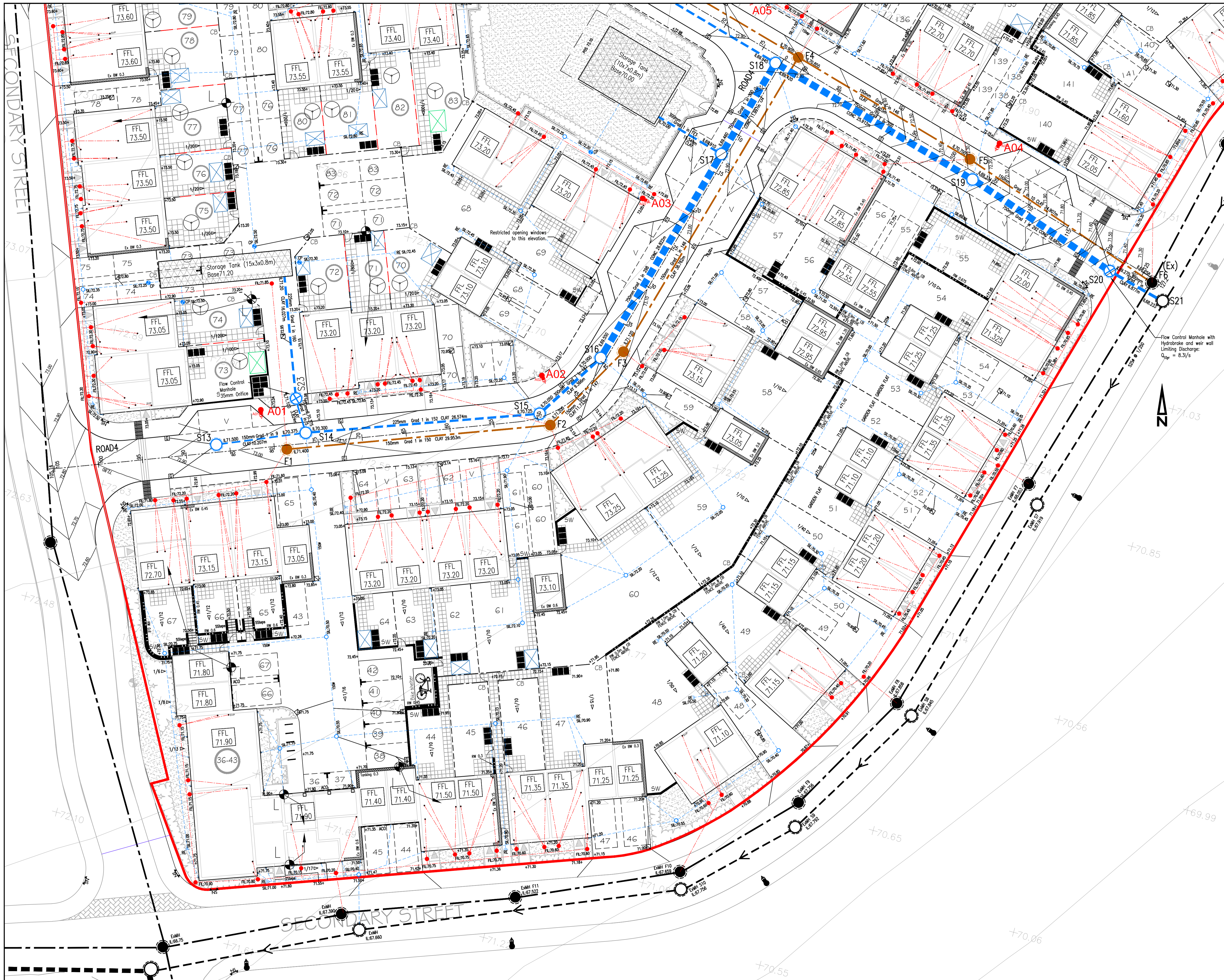
FOR COMMENT	FOR PLANNING	FOR TENDER	FOR APPROVAL	FOR CONSTRUCTION	AS BUILT

Designed by: RB
 Drawn by: RT
 Checked by: RB

Date: May 2018
 Scale: 1:200 @ A1

AC	JG	10.06.20	Plots 8&16 Front access amended	Z	JG	29.04.20	Plots 32-35 garden levels revised	V	JG	15.01.20	Plots 10/11 updated to NHBC reqs.	R	MB	21.11.19	Paving slabs added to rear gardens of plots 13 and 16	O	LS	07.05.19	Plot 10 externals amended
AB	JG	02.06.20	Plot 12 front access amended	X	JG	04.02.20	Floor levels updated to as surveyed	U	JG	04.12.19	Plot 31 tanking height amended	Q	JG	13.09.19	Plots 8-17 Gradients added	N	MB	30.04.19	Private Street Lighting, feed pillar & duct removed, Street name plates added
AA	JG	01.06.20	Plots 9&13 externals updated	W	JG	27.01.20	Plots 8-17 updated to meet LTH reqs.	T	JG	03.12.19	Plots 31-35 Rear externals amended	P	JG	29.08.19	Plots 8-17 External levels revised and retaining walls removed	M	MB	22.03.19	Private Street Lighting, feed pillar & duct added, Layout updated

Dwg No: 6008/02
 Rev: AC



KEY:

FFL 70.45	FINISHED FLOOR LEVELS
+108.05	PROPOSED SPOT LEVELS
Ex BW 0.15	EXPOSED BRICKWORK & HEIGHT
1 in 120	TANKING & HEIGHT
1 in 120	RETAINING WALL & HEIGHT
1 in 120	STORM WATER SEWER, MANHOLE & PIPE DETAILS
1 in 120	FOUL WATER SEWER, MANHOLE & PIPE DETAILS
1 in 120	HIGHWAY GULLY & CONNECTION
1 in 120	PRIVATE SW DRAIN, INSPECTION CHAMBER & INVERT LEVEL
1 in 120	PRIVATE SW RODDING EYE
1 in 120	PRIVATE SW CATCHPIT
1 in 120	PRIVATE FW DRAIN INSPECTION CHAMBER & INVERT LEVEL
1 in 120	PRIVATE YARD GULLY & CONNECTION
1 in 120	PRIVATE ACO DRAIN
1 in 120	STREET LIGHTING COLUMN
1 in 120	TACTILE PAVING
1 in 120	CORDOURY PAVING
1 in 120	STREET NAME PLATES
1 in 120	PIR LIGHTING FITTED TO GARAGE OR ADJACENT PLOT
1 in 120	SCREEN WALL & CONNECTED TO 1.2M HIGH POST & PANEL FENCE
1 in 120	1.8M HIGH POST & PANEL FENCE
1 in 120	1.8M CLOSE BOARD
1 in 120	1.8M SCREEN WALL

SEE DRAWING 6008/110/04 SHEET 4 FOR ENGINEERING NOTES

M	JG	20.01.20	Plots 57&73 visitor parking adjusted
L	JG	14.10.19	Plots 72 - 79 checked for Lifetime Home compatibility
K	MR	19.08.19	Siding sash windows noted on drawing.
J	MR	18.07.19	Retaining wall added to rear gardens of plots 48-55
I	RB	17.07.19	Screenwalls and CB fenestration rationalised
H	MB	15.07.19	Screenwalls updated to client comment fences updated on layout and key
G	MB	29.05.19	PIR Street Lighting added to layout
F	MB	01.05.19	Street Name Plates added to layout
E	RT	15.04.19	Design revised following OCC comments
D	LS	10.01.19	SVPs added to head of foul runs
C	MR	21.11.18	Design updated.
B	MR	07.11.18	Highways updated to reflect as built information. Plot 36-67 design not shown
A	MR	23.10.18	Design to Plots 140-144 added

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Client: Linden Homes

Job Title: Proposed Residential Development
Parcel KMF
Kingsmere
Bicester

Drawing Title: Engineering Layout 1-200
Sheet 1 of 4

FOR COMMENT	FOR PLANNING	FOR TENDER	FOR APPROVAL	FOR CONSTRUCTION	AS BUILT

CONSTRUCTION AT CLIENT / CONTRACTOR RISK

Designed by: RB	Checked by: MR	Checked by: RB
Date: September 2018	Scale: 1:200 @ A1	

Dwg No: 6008/110/01	Rev: M
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