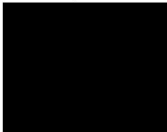




Our ref: 70014753-003

December 18, 2018

Fitzroy Park Residents Association



Subject: 55 Fitzroy Park PA 2018/3672/P - Construction Management Plan Technical Review

WSP has been appointed by The Fitzroy Park Residents Association (FPRA) to review and advise them on the suitability and acceptability of the Construction Management Plan, prepared by Montway Ltd and submitted as part of planning application 2018/3672/P, for a new residential development at 55 Fitzroy Park, Highgate.

At the present time, based on the information contained within the aforementioned CMP, there appears to be inadequate or missing information which as a result could underestimate the potential requirements or impacts of the construction activities. Subsequently the true mitigation required to address to maintain the safe and efficient operation of Fitzroy Park and the surrounding public highways for all users may also be underestimated.

The key findings which have led us to this conclusion are summarised as follows:

1. Site Access from Merton Lane and reversing on Fitzroy Park;
2. Site Entry and Loading areas;
3. Potential Pavement Impact & Damage;
4. On-Site Parking Spaces; and
5. Fitzroy Park & Merton Lane Junction - Swept Path Analysis;

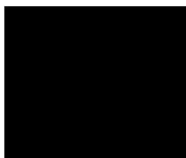
Further explanation and details on each are set out in subsequent sections of this letter.

We would recommend the FPRA via the London Borough of Camden seek an address from the applicant to the points set out below before the application is determined as the issues may not all be appropriate to condition for post consent address prior to works commencing on site.

Site Access from Merton Lane & Reversing on Fitzroy Park

In Revision C of the CMP the applicant has added notes in Sections 20 and 20c which suggests there would only be a single reversing movement required to deliver an excavator to the site. After which a turning circle will be created on site, allowing vehicles to enter and exit the site in a forward gear.

In our opinion we believe this statement is not reflective of what will actually be required for a number of reasons. In particular, the building would have to be demolished before this area could be used for creating a turning circle. There is also a level difference of approximately 2 metres between Fitzroy Park and the lower building





level that does not seem to have been considered in how a turning circle would be constructed. Until the building is demolished and suitable earthworks undertaken there would be insufficient space within the site to turn around a lorry, which are required for the removal of the spoil generated through demolition and earthworks. Based on the above we are of the opinion there will be more reversing movements than the single occurrence currently claimed by the applicant.

Without any layout plans or swept path analysis demonstrating how the building would be demolished, the required earthworks constructed, and a turning circle provided, we assume the extent of reversing on Fitzroy park is likely to continue for most of the demolition phase, i.e. up to 12 weeks.

Each reversing movement requires vehicles to turn left on to Millfield Lane and reverse over 120m down Fitzroy Park to manoeuvre into site. Assuming a maximum speed of 5 km/hr where reversing, the time taken to carry out each manoeuvre would be a minimum of 90 seconds, however this may vary depending upon site conditions. As stated by the applicant, all traffic will be halted by traffic marshals on Fitzroy Park whilst each manoeuvre is completed which would appear unreasonable to Fitzroy Park road users and residents.

The FPRA undertook baseline traffic surveys for Fitzroy Park in June 2018 which found that the current usage of Fitzroy Park is approximately 360 daily movements between 7am to 7pm, equivalent to a movement every 2 minutes, therefore there is a high likelihood that each reversing manoeuvre will adversely affect other Fitzroy Park road users.

In accordance with standard industry practice and FPRA's expectations, the proposed CMP should demonstrate that HGVs can arrive and leave site in forward gear without causing an unreasonable impact on the amenity of neighbours. Our concern is the applicant is underestimating the potential disruption to pedestrian and vehicular users of Fitzroy Park caused by the proposed reversing movements.

We note that the CMP is based on all construction vehicles arriving and departing from the site via the Merton Lane end of Fitzroy Park. This accords with the standard practices and policy of the FPRA so, for the avoidance of doubt, we would recommend the applicant confirm that 'The Grove' will not be used or relied upon for any site access or egress as a condition of using Fitzroy Park for construction access.

Turning on The Spot or 'Dry Steering'

The previous revision of the CMP (Rev B) presented swept path analysis on Royal HaskoningDHV drawings TR14, TR15c, TR16 and TR17 which used 'Turning on the Spot' also known as 'Dry Steering'. We have reservations about over reliance on the aforementioned practice.

However, we note in CMP Rev C that dry steering has now been omitted from the construction vehicle movements shown on the latest revisions of Royal HaskoningDHV drawings TR14, TR15c, TR16 and TR17 which is positive.

Loading Area Phase 1

The loading area does not appear to adequately take full account of the site conditions and constraints. Therefore we are of the opinion the submitted analysis may not be representative of the actual operations on site.

To elaborate, referencing Appendix L of the CMP, the applicant proposes to use the existing 55 Fitzroy Park driveway for the Phase 1 vehicle loading area. The CMP states that a site cabin will be provided at the northern end of the driveway which takes up approximately one third of the loading area. As presented, the CMP does not allow for scaffolding that we anticipate would be required for dismantling the existing structure, as the CMP outlines that all demolition would be undertaken by hand tools.



The CMP states that in the demolition process hard-core arisings will be crushed and re-used on site. It also states that timber will be stored and re-used on site. We note storage areas of these materials and crusher plant have not been identified, which may compromise and reduce the size of the loading area presented in the CMP. Based on the information provided it is not clear in the CMP if there is sufficient space for the storage of this material, scaffolding, the site cabin and plant equipment, while also providing sufficient space for construction vehicles to park and unload/load within the site extents.

In conclusion, we would recommend that the applicant's contractor gives more thorough consideration to the area and operation of the Phase 1 loading area to inform the CMP so the impacts on Fitzroy Park can then be fully understood, as we are conscious the CMP as proposed appears to underestimate the true requirements. Any parking or encroachment into Fitzroy Park due to insufficient space on site would be unacceptable to the FPRA.

Loading Area Phase 2 & Phase 3

The swept path analysis presented on RoyalHaskoningDHV drawing TR15c P5 has been undertaken with a 3-axle concrete mixer, whereas the applicant has stated in Section 23 that a 4-axle concrete mixer will be used. This may be underestimating the potential number of deliveries or footprint of the vehicle movements.

Review of the swept path analysis in Rev C of the CMP on RoyalHaskoningDHV drawing TR15c P5 identifies that the 10m wide northern entrance has been moved further north to allow the movement to be undertaken without the use of 'dry steering'. The swept path analysis in the previous CMP, drawing TR15c P4, had a different northern kerb with note 'the northern kerb line associated with the secondary access has been placed in order to maximise the root protection zone around the neighbouring tree located within the neighbouring property.' The previous kerb line seems to generally accord with the tree protection fencing as per the applicant's submitted drawing, BoskyTrees drawing 'TPP-1'. However, we note that this tree protection fencing / root protection zone has been removed from the latest iteration of the swept path analysis. Assuming the tree protection fencing shown on Bosky Trees drawing is still required, it would appear there is a greater risk of the compression of the roots and damage to the tree if omitted. If the effects cannot be mitigated by an arboriculturalist we recommend the kerb line is amended to provide sufficient clearance from the root protection zone.

For the purposes of the CMP review, WSP has undertaken an independent swept path analysis of a 4-axle, 8m³ concrete mixer, entering and exiting the site, based on the constraints and site arrangement for Phase 2. The WSP swept path analysis includes a clear buffer of 0.5 metres to allow for such things as vehicle wing mirrors which extend outside the vehicle profile and provide a suitable margin for error or data inaccuracy from any physical constraints. The analysis was completed with no use of 'turning on the spot' and used a driving speed of 1 km/hr in both directions. For our review we have shown the tree protection fencing zone as per BoskyTrees plan 'TPP-1'.

The swept path analysis (refer to enclosed 7453-003-ATR-001) confirmed that the ingress movement would overrun the root protection zone of tree T570 located within the neighbouring 53 Fitzroy Park.

The combination of a larger vehicle and avoidance of the tree protection fencing / zone lead us to the fair and reasonable predication a greater number of movements than shown within the existing CMP will need to be undertaken for the concrete mixer to unload, turn around and depart from site.

The greater number of movements will in turn lead to an increase in the duration Fitzroy Park is obstructed. The manoeuvres are predicted to occur on a regular basis throughout Phase 2 and 3 for up to 63 weeks as stated in the CMP. Therefore, an incorrect assessment could have a significant impact to Fitzroy Park.

Our review of the applicant's CMP also identifies that piling is proposed within the vicinity of the site frontage on Fitzroy Park. We would recommend further detail is provided on the proposed construction methodology as



it is not immediately clear from the information provided what impact, if any, this may have on the operation of Fitzroy Park. Further information should include how abnormal or large plant and machinery, such as piling rigs, will be delivered to site.

We would recommend any necessary or proposed piling work should be wholly undertaken within the applicant's site / land boundary and it should not rely on the closure of Fitzroy Park.

Construction Vehicle Movements

Comparison of the vehicle movements in Section 21 and Section 23 of the CMP indicates discrepancies in the anticipated vehicle movements for the development. Review of Phase 1 Excavation in Section 21 states that there will be a total of 122 movements, whereas Section 23 states that Excavation would require 250 movements. This inconsistency is reflected in all items and proposed construction phases.

The total movements in Section 23 also does not reflect the individual totals of each item of muck away, concrete, general deliveries and enabling works. The total of each of these items would be 777 vehicles or 1554 movements, not 732 vehicles (1464 movements) as stated. In addition to the proposed movements, there appears to be no partially full vehicles or wastage, which we expect the contractor to make a reasonable allowance for. Other vehicles typically required for construction such as piling rigs, asphalt pavers, skip lorries or contractor and LGVs are not listed or allowed for in the applicant's report which is not in accordance with Camden's CMP guidance that states typical sizes of all vehicles and the approximate frequencies are to be provided.

The discrepancies would lead us to believe that the applicant has not fully considered the traffic volumes generated by the development construction and this should be reviewed and corrected to determine the true impacts and any reasonable mitigation.

The FPRA undertook baseline traffic surveys for Fitzroy Park in June 2018 which found that the current usage of Fitzroy Park is limited to 1 to 2 weekly OGV1 (2 or 3 axle lorry) movements and 2 to 3 OGV2 (4 axle or more lorry) movements.

The volume of HGV traffic proposed by the applicant is therefore a significant increase on the current baseline and assessment of the impacts of this additional traffic should be considered and mitigation measures proposed.

Pavement Condition & Impact

Fitzroy Park is a private road, managed and maintained on behalf of residents by the FPRA. The road is also of a historic nature and the specification and makeup of the existing pavement construction would be considered a lesser standard.

A review of the CMP has identified that the applicant has not assessed or considered the necessity for any measures to mitigate the risk of pavement damage from the traffic through the construction period.

An independent site investigation was provided by FPRA, the results of which indicated that the pavement was comprised of approximately 150mm of asphalt, underlain by approximately 300mm of granular material, on a clay subgrade. In addition, it recorded subgrade CBR's in the order of 3% on Fitzroy Park.

The current design standard DMRB IAN 73/06, recommends a sub-base of 420mm thickness of well graded granular material (Type 1) for a pavement constructed on subgrade of 3% CBR. The sub-base depth on Fitzroy Park is less, although we would acknowledge this standard is more often applied to highways which may experience a greater intensity or level of imposed loading than may be experienced by Fitzroy Park over the duration of the construction phase.



We would also note there can be a wide variation in the performance of granular material depending on the aggregate strength, size, grading and angularity of material.

If not properly assessed and suitability established at the outset, over time, the use of Fitzroy Park by construction vehicles may lead to the compression or consolidation of the underlying pavement layers. We note that Steve Cardno of LBC echoed this concern with his statement 'The proposed works are also likely to lead to the Fitzroy Park sustaining damage in the vicinity of the site' in correspondence provided by the applicant.

We would recommend that the applicant includes mitigation measures in the CMP in the form of the following:

1. Baseline pre-commencement condition survey undertaken by suitably qualified and independent individual(s) appointed by the developer;
2. We expect a structural assessment of the road to be undertaken to review the suitability of the road for the proposed construction loadings and identify any strengthening works that may be required prior to construction.
3. A commitment or undertaking to provide a reasonable bond, exact figure to be agreed, so that any damage caused by construction vehicles can be rectified and not financially burden or penalise the FPRA;
4. In addition to such a bond, FPRA also requests the Council to include an obligation on the developer to insure third parties and their property;
5. The developer provides assurance that they will be responsible for rectifying any damage to Fitzroy Park from construction activity in an acceptable and prompt manner; and
6. Post completion condition survey undertaken by suitably qualified and independent individual(s).

Development On-Site Parking Spaces

The following section considers a review of the on-site parking spaces from the planning application which we note is not construction management related. The planning application allows for 1 parking space per dwelling, giving a total of 5 spaces for the development. It is noted that the Camden Local Plan 2017 generally requires all residential development in the borough to be car-free. However, it is acknowledged by Camden that a car-free development with no car parking spaces within the site would result in residents parking on Fitzroy Park. Consultation with Camden contained within the Transport Statement confirms that an allowance of 1 parking space per dwelling would be appropriate.

The two applicants currently have access to a total of 10 on-site parking spaces within their existing curtilages and it is understood these are all used regularly. Given there is provision for only 5 parking spaces in the new development scheme, one for each household, a total of two together for these applicants, it is therefore unclear where additional residential or guest vehicles will park. It is assumed any such vehicle would be displaced off-site and need to park on the Fitzroy Park carriageway.

Based on the topographical survey the width of Fitzroy Park along the development frontage varies from approximately 4.1 to 4.6 metres. This is wide enough for vehicles to park in some locations along the edge of carriageway without impeding other vehicles wishing to pass however we note the width is narrow. As a consequence there is a risk that with the increase in the number of dwellings and limited parking spaces, that any extra vehicles will park along the development frontage between the entrances to Plots 1, 2 and 3. There are three driveways located on the opposite side of Fitzroy Park which could have their access impeded if vehicles are parked on Fitzroy Park. There is no information currently in the applicant's documentation to outline mitigation measures to address such eventualities therefore we recommend this is addressed and details of how this issue would be avoided or managed clearly set out.



Swept path analysis is presented by the applicant within the Transport Statement (reference T&PPB6538R001D0.1), for the on-site parking spaces as shown in Royal HaskoningDHV drawings TR24, TR25, TR26 and TR27. For the purposes of this review, WSP has undertaken an independent swept path analysis of a large car, entering and exiting the proposed parking spaces from the Merton Lane end of Fitzroy Park for plots 1 to 5, based on the proposed development layout on LUC drawing 7122_010_Z.

The analysis was completed with no use of 'turning on the spot' and used a driving speed of 1 km/hr in both directions.

The swept path analysis (refer to enclosed drawings 7453-003-ATR-002 to 004) confirmed the following:

- The analysis shows without the use of dry steering vehicles will require multiple movements to position a large car into each parking space and to exit onto Fitzroy Park.
- This is particularly emphasised for Plots 2 and 3, where for Plot 3 the analysis shows that up to 12 movements would be required for a large car to exit onto Fitzroy Park;
- Plots 4 and 5 are not able to turn around within the site and would exit via reversing onto Fitzroy Park. This was also reflected on Royal HaskoningDHV drawings TR25 and TR27. Under the Highway Code reversing in and driving out of a driveway is recommended and where possible it should be designed out.

Based on the swept path analysis undertaken by WSP we suggest that the analysis presented by the applicant may not be reflective of the actual usage of the spaces and may need to be revisited.

Fitzroy Park / Merton Lane Junction - Swept Path Analysis

We wish to highlight the swept path analysis of an 9.1m rigid HGV vehicle negotiating the junction of Merton Lane and Millfield Lane presented in Appendix N. The Fitzroy Park and Merton Lane junction's swept path analysis has been undertaken and based on Ordnance Survey mapping data. Our concern is Ordnance Survey (OS) mapping data has an inherently limited level of accuracy.

At its smallest (most detailed) scale of 1:1250 OS data's accuracy is reported, by the Ordnance Survey, to be $\pm 0.5\text{m}$. As a consequence, there is a greater risk of disparity between the OS data and the roads topography.

We note that in Revision C of the CMP site measurements have now been undertaken to more accurately determine the dimensions of the traffic islands and kerblines which is a positive step towards validating the OS data as a basis for the re-analysis. In the revised swept path analysis, the movement is still tight and therefore recommend that these site measurements are confirmed by topographical survey.

We would also recommend the allowance for a reasonable offset in the swept path analysis to provide a suitable margin for error or data inaccuracy, a clearance of 0.5 metres would be appropriate based on industry best practice.



Conclusion

WSP has undertaken a review of the Montway Ltd Construction Management Plan, on behalf of the Fitzroy Park Residents' Association to review and provide them with independent advice on the suitability and acceptability of the management plans proposals.

We would recommend the CMP is revisited by the applicant, addressing the points on the discrepancies, inadequacies or missing information we have raised before any decisions are taken on the suitability of the proposed CMP, the development and the impact on the surrounding area.

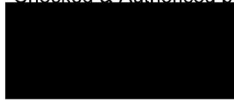
Prepared by:



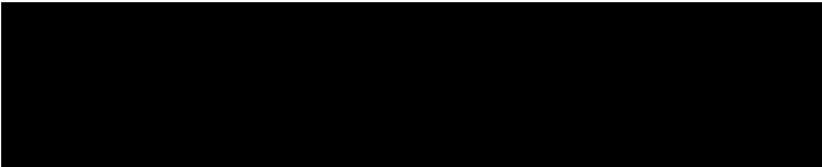
Mark Shellshear BEng (Hons) CPEng MIEAust
Principal Engineer



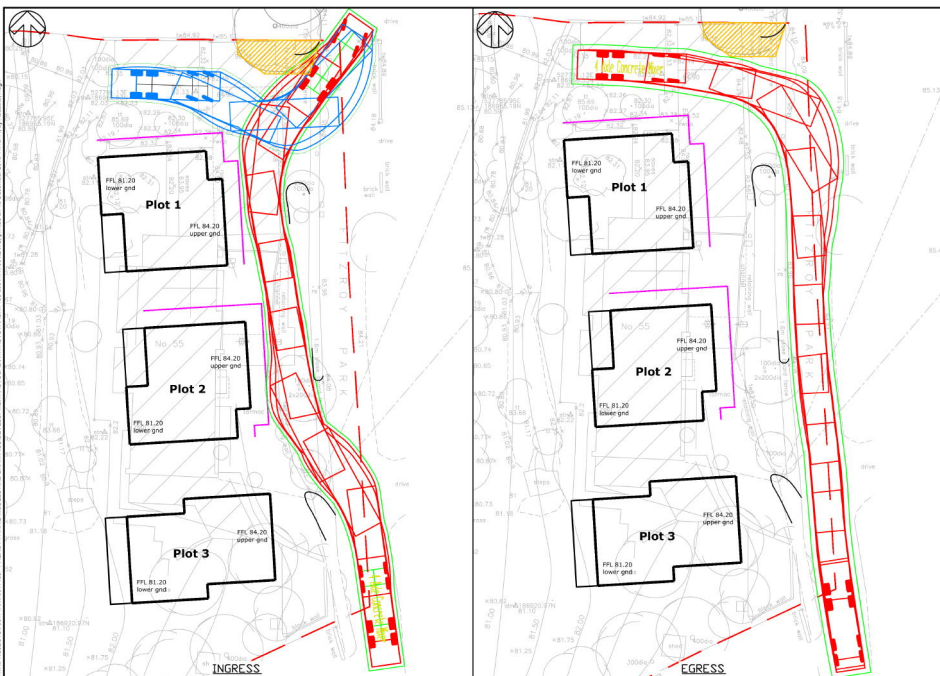
Checked & Authorised by:



James O'Connor BEng (Hons) MScEng MCIHT
Associate Director



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DO NOT SCALE

NOTES:

- SWEEP PATH ANALYSIS BASED ON TOPOGRAPHICAL SURVEY DATA PROVIDED BY FFR.
- TOLERANCE ZONE AROUND VEHICLE PROVIDED AS BEST PRACTICE AND TO ALLOW FOR SAFE CLEARANCE TO PHYSICAL CONSTRAINTS.
- PROPOSED BUILDING POSITIONS TRANSPOSED FROM LUC DRAWING 7122_010_2.
- PROPOSED CONSTRUCTION ACCESS KERB LINES TRANSPOSED FROM ROYAL HASKONINGDHV DRAWING PB6538 TR15C. VEHICLE SPECIFICATION TAKEN FROM MONTWAY C/MP SECTION 23.
- NO DRY STEERING HAS BEEN USED FOR THE SWEEP PATH ANALYSIS.

KEY:

- 450mm CLEARANCE/TOLERANCE ZONE
- TEMPORARY CONSTRUCTION ACCESS KERB LINE
- 1.5m BUILDING CLEARANCE/SCAFFOLDING ZONE
- TREE PROTECTION ZONE AS PER BOSKY TREE PROTECTION PLAN TPP-1

4 Axle Concrete Mixer
 Overall length 9.400m
 Overall width 2.500m
 Overall body height 4.022m
 Win body ground clearance 0.313m
 Max track width 3.005m
 Lock to lock time 5.00s
 Kerb to kerb turning radius 9.000m

REV	DATE	BY	DESCRIPTION	CHK	APP
A	10/10/2018	JK	GENERAL AMENDMENTS	JK	JK
B	04/10/2018	MA	FIRST ISSUE	MA	MA

ISSUING STATUS: S2 - FOR INFORMATION



CLIENT: FFR

PROJECT: 55 FITZROY PARK

ARCHITECT: [Redacted]

TITLE: SITE ACCESS CONCRETE MIXER SWEEP PATH ANALYSIS

SCALE: 1:250

PROJECT NO: 7453

DRAWING NO: 7453-003-ATR-001

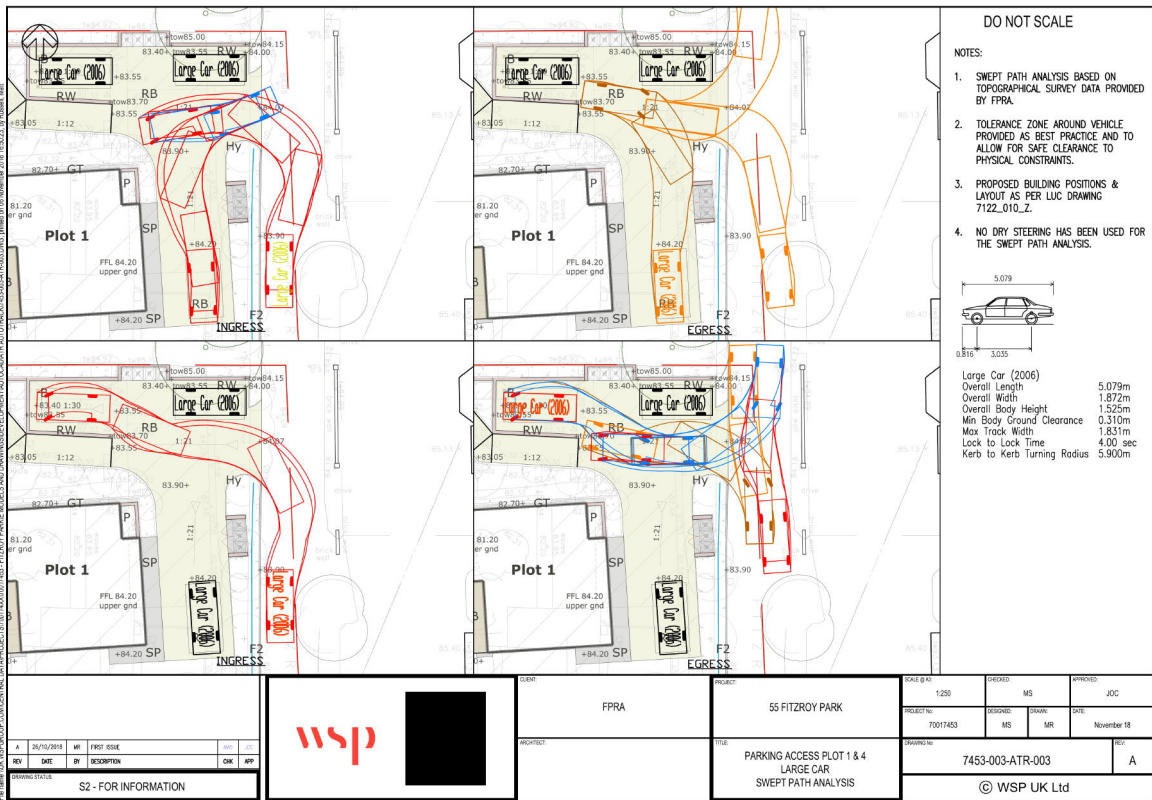
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DESIGNED	DRAWN	CHECKED	DATE
MS	MC	MC	December 18

APPROVED: JOC

REV: B





REV

NO	DATE	BY	DESCRIPTION	CHK	APP
A	26/10/2019	MR	FIRST ISSUE		

ISSUING STATUS: S2 - FOR INFORMATION

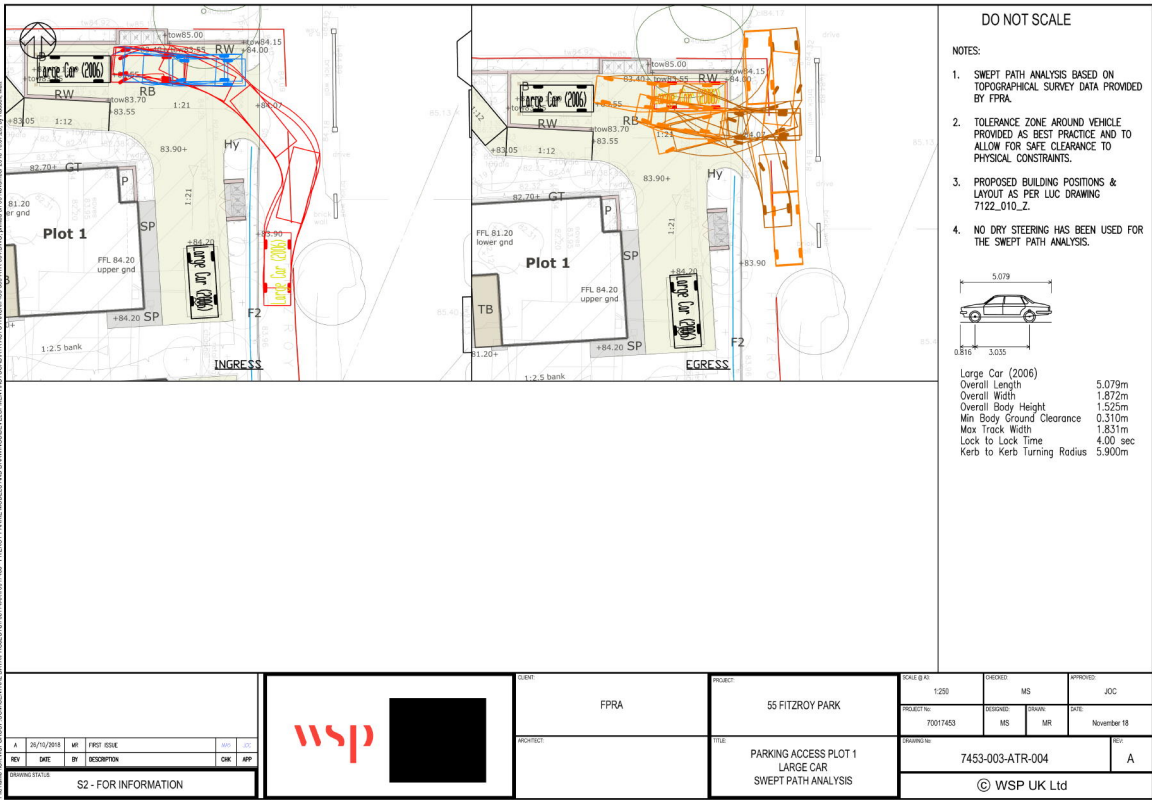


CLIENT: FPRA

PROJECT: 55 FITZROY PARK

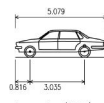
TITLE: PARKING ACCESS PLOT 1 & 4
LARGE CAR
SWEEP PATH ANALYSIS

SCALE @:	1:250	CHECKED:	MS	APPROVED:	JOC
PROJECT NO:	70017453	DESIGNED:	MS	DRAWN:	MR
				DRAWING NO:	7453-003-ATR-003
				DATE:	November 18
				REV:	A



DO NOT SCALE

- NOTES:
1. SWEEP PATH ANALYSIS BASED ON TOPOGRAPHICAL SURVEY DATA PROVIDED BY FPRA.
 2. TOLERANCE ZONE AROUND VEHICLE PROVIDED AS BEST PRACTICE AND TO ALLOW FOR SAFE CLEARANCE TO PHYSICAL CONSTRAINTS.
 3. PROPOSED BUILDING POSITIONS & LAYOUT AS PER LUC DRAWING 7122_010_Z.
 4. NO DRY STEERING HAS BEEN USED FOR THE SWEEP PATH ANALYSIS.



Large Car (2006)
 Overall Length 5.079m
 Overall Width 1.872m
 Overall Body Height 1.525m
 Min Body Ground Clearance 0.310m
 Max Track Width 1.831m
 Lock to Lock Time 4.00 sec
 Kerb to Kerb Turning Radius 5.900m

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REV	DATE	BY	DESCRIPTION	CHK	APP																			
A	26/10/2019	MR	FIRST ISSUE																					
DRAWING STATUS: S2 - FOR INFORMATION		PROJECT:		TITLE:	PARKING ACCESS PLOT 1 LARGE CAR SWEEP PATH ANALYSIS	DRAWING NO:	7453-003-ATR-004	DESIGNED:	MS	DRAWN:	MR	DATE:	November 18											
												REF:	A											
												© WSP UK Ltd												