# Countess Road, Killarney

## Proposed Residential Development

# Private Dwelling Light Spill Analysis Report

Countess Road,
Dromhale (townlands),
Killarney,
Co. Kerry

Client
Dipharma Unlimited Company

DKP document no
5045

Document issue / status
2 / P

Issue date
2026-06-03

Project file no
P3500-DKP-50450-WD-XX-XX ¦ 2P

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# Document control

DKP project no: P35(00)
DKP document no: 50450
Project file no: P3500-DKP-50450-DC-XX-XX

| Circular | Issue > | 1# | 2P | 3P |
|---|---|---|---|---|
| Client | Dipharma Unlimited Company | | | |
| Architect | Meitheal Architects | ☑ | ☑ | |
| Planning consultant | HW Planning | ☑ | ☑ | |

| | | | |
|---|---|---|---|
| Issue | 1# | 2026-04-23 | Draft Planning issue |
| Issue | 2P | 2026-06-03 | Planning issue |

Document issue status ID

# Sketch/draft
P Planning
C Concept
D Design
G General information
T Tender
W Works/construction
Z As-build/constructed

| Issue | Prepared | Checked | Approved |
|---|---|---|---|
| 1# | 212 | 201 | 201 |
| 2P | 212 | 201 | 201 |
| 3P | | | |
| | | | |

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| Appendix A | Drawing 2121 – DKP - 1:150 Private lighting – Illumination contours external wall light | Separate |
| Appendix B | Drawing 2122 – DKP - 1:150 Private lighting – Illumination contours internal pendant | Separate |

# 1 Introduction

## 1.1 Report purpose

This report gives information on the possible external light spill of private dwellings external wall mounted lights and internal pendant lights in connection with the new prosed project.

## 1.2 Instruction

DKPartnership (DKP) have been commissioned by Dipharma Unlimited Company to carry out the analysis and report for the proposed development at Countess Road, Dromhale (townlands), Killarney, Co. Kerry.

## 1.3 Development detail

Dipharma Unlimited Company intend to apply for a 10-Year Planning Permission for a Large-Scale Residential Development (LRD) at Countess Road, Dromhale (townland), Killarney, Co. Kerry. The development will consist of: The construction of a residential development of 259 no. residential units with ancillary single storey creche, landscaping and all associated site development works.

The proposed development includes the demolition of 2 no. existing two-storey semi-detached dwelling houses and an existing ruinous structure on the site and construction of 103 no. two storey houses (3-bed units), comprising of 27 no. terraced units, 62 no. end of terrace units, and 14 no. side entry units, 82 no. courtyard apartment units over 2 no. storeys (42 no. 1-bed units, 40 no. 2-bed units), and 74 no. apartment units (34 no. 1-bed units, 40 no. 2-bed units) in 2 no. part 3 storey and part 4 storey blocks.
Vehicular access to the proposed development will be via one entrance from Countess Road (L3904) to the north, with the entrance design including improvement works on the public road inclusive of a raised crossing point. The design includes pedestrian/cycle infrastructure to/from Countess Road and internally within the development site and to adjoining areas.

Ancillary site works include car parking, provision of bicycle parking and bin storage facilities serving the proposed apartment/courtyard apartment buildings and creche, 2 no. ESB substations, landscaping, water services and drainage infrastructure (including foul and storm network upgrades in Countess Grove), and all associated site development works. The proposed development also provides for the demolition of existing site boundary walls along Countess Road. A Natura Impact Statement (NIS) has been prepared and will be submitted to the Planning Authority with the application.

## 1.4 Policy and building regulation requirements

The project is subject to the following statutory and policy illumination target requirements:
a) 1 EN13201 European Standard for Road lighting
b) Kerry County Council Public Lighting Manual and Product Specification.

# 2 Summary

## 2.1 Analysis conducted

This report analyses the illumination calculation results of the selected external wall mounted downlighters and internal standard pendants in respect to their relative external light spill.

## 2.2 External private dwelling light spill design targets.

There are no particular private dwelling light spill standards although some local authorities mandate that new private lighting should not cause any significant spill or sky glow without going into how to achieve this nor do they refer to any maximum / minimum illumination levels or other technical details. There are however guidance notes with regards to light spill issued by the Institute of Lighting Professionals (ILP) in the form of "ILP Guidance notes for the Reduction of Obtrusive light (GN01:2021)". For the record EN 1332201 which is applied for public lighting is a lighting standard document mainly covering road and area (flood) lighting.

## 2.3 ILP Guidance notes for the Reduction of Obtrusive light (GN01:2021)environmental zones.

The Institute of Lighting Professionals have published these guidelines with regards to achieving acceptable light spill (obtrusive lighting) from private dwellings or other lighting installations. The ILP guide refers to specific targets in particular environments as an urban location would have different requirement than a rural location. The table below details the environmental lighting class zones

| Zone | Surrounding classification | Lighting environment | Examples |
|---|---|---|---|
| E0 | Protected | Dark | UNESCO reserve |
| E1 | Natural | Intrinsically dark | National parks |
| E2 | Rural | Low district brightness | Village, outer urban area |
| E3 | Suburban | Medium district brightness | Small town centre, suburban area |
| E4 | Urban | High district brightness | Town / city centre |

Table 2.1 IPL Environmental lighting zone classification.

The Countess road housing development is not located in a UNESCO reserve or in a national Park and it is within the Killarney Town boundaries and therefore its environmental class would be E3 or a sub-urban location.

## 2.4 ILP Guidance notes for the Reduction of Obtrusive light (GN01:2021) environmental zone illumination data.

The table below details the illumination thresholds of the relevant environmental zone although it does not cover dwelling light spill on the horizontal surface. From section 2.3 we note that we are to target the E3 zone data.

| Zone | Sky Glow (Max %) | Light intrusion into windows (lx) | | Luminaire intensity (Cd) | |
|---|---|---|---|---|---|
| | | Dusk to 23.00Hrs | 23/00Hrs to 7.00Hrs | Dusk to 23.00Hrs | 23/00Hrs to 7.00Hrs |
| E0 | 0 | 0 | 0 | 0 | 0 |
| E1 | 0 | 2 | 1 | 2500 | 0 |
| E2 | 2.5 | 5 | 1 | 7500 | 500 |
| E3 | 5.0 | 10 | 2 | 10000 | 1000 |

Table 2.2 IPL Obtrusive light (spill) limitations for exterior lighting installations.

We note that reducing the light spill will also be beneficial to any fauna and in particular to any bat roosting areas and or feeding areas / corridors.

## 2.5 Approach.

The private dwelling lighting spill is assessed using 2 different scenarios;
1) The light spill from externally wall mounted light fittings and
2) The light spill from internal lighting fittings without and curtains or blinds drawn.

## 2.6 Light source.

The private dwelling lighting spill is assessed using 2 different scenarios;

1) The light spill from externally wall mounted light fittings.
The illustration below details the light fitting type (wall mounted down lighter) illumination contour pattern with a 1.0lx light spread measuring 8.5m x 2.5m to light the footpath without any major forward light spill and minimal upward spill at 1.03% with the fitting mounted at a height of ca 2.5m.

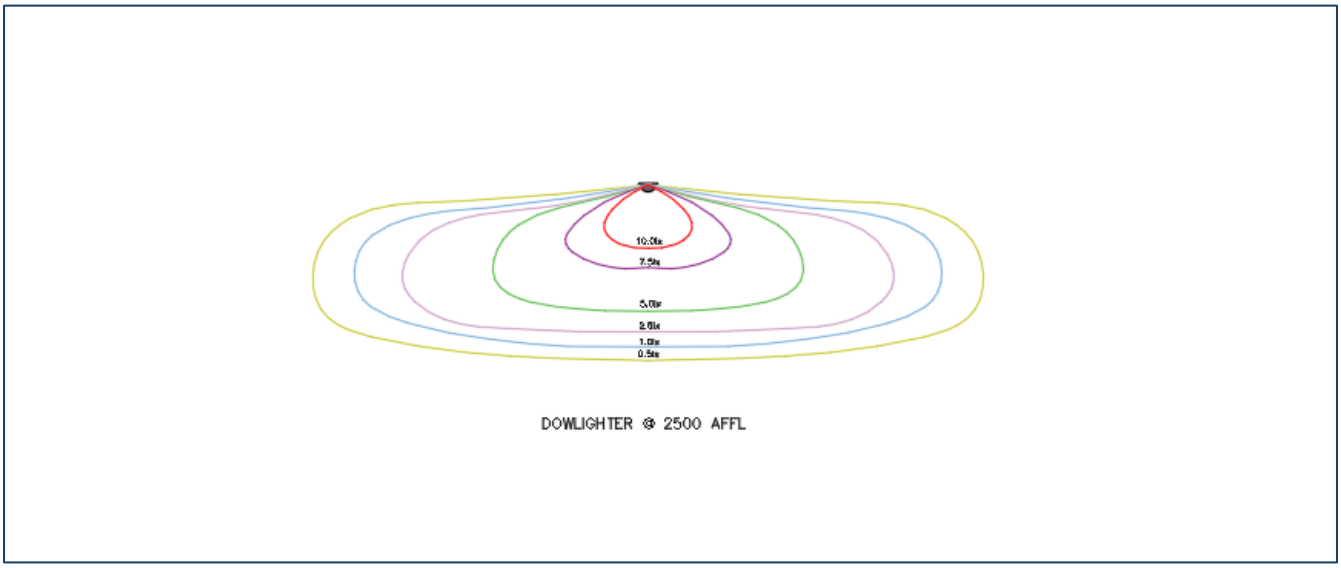



Illustration 2.1 Illumination contour patterns an light intensity of the wall mounted down lighter.

The wall mounted downlight fitting represents a 10W LED wall mounted downlighter with a light intensity of 1.47lm and light luminous intensity of 16cd.



Illustration 2.2 Example of external wall mounted LED downlighter.

2) The light spill from internal lighting fittings without and curtains or blinds drawn.
The illustration below details the light fitting type (pendant) illumination contour pattern through the window and sliding doors with a 1.0lx light spread measuring 4.3m x 3.3m for the sliding door and 3.25m x 3.25m for the window with minimal upward spill at 0.86% with the fitting mounted at a height of ca 2.1m.

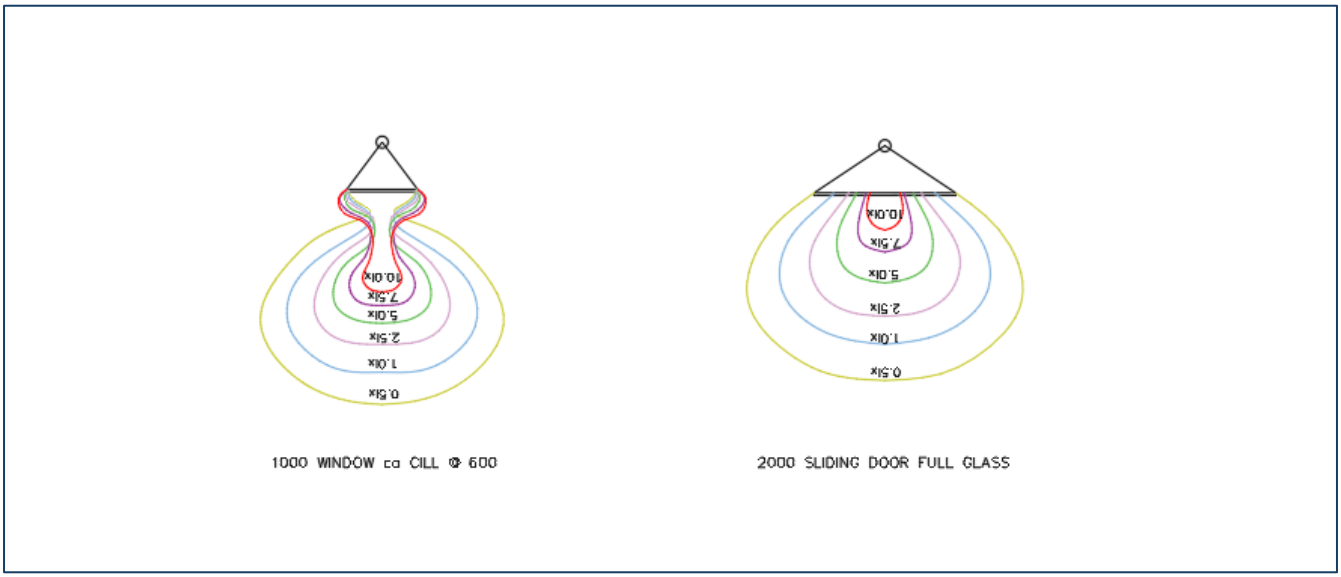



Illustration 2.3 Illumination contour patterns an light intensity of atypical internal pendant type light fitting.

The pendant light fitting represents a 8W LED with a light intensity of 1.12lm and light luminous intensity of 13.5cd.

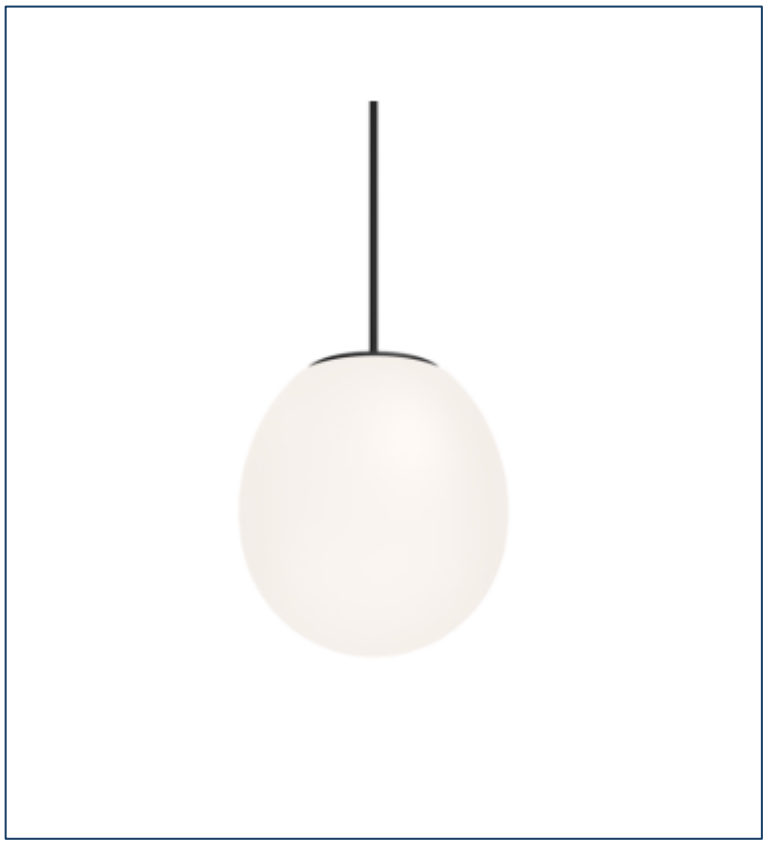


Illustration 2.4 Example of internal LED pendant fitting.

## 2.7 Calculation data results

The following tables represent the light spill data of the typical light fittings applied in this report. Table 2.3 details the collation data from the 2 no light fitting scenario's and compares the data with the environmental lighting class zone (E3) and table 2.4 represents the illumination data from the examples light fittings.

| Zone | Sky Glow (Max %) | Light intrusion into windows (lx) | | Luminaire intensity (Cd) | |
|---|---|---|---|---|---|
| | | Dusk to 23.00Hrs | 23/00Hrs to 7.00Hrs | Dusk to 23.00Hrs | 23/00Hrs to 7.00Hrs |
| E3 | 5.0 | 10 | 2 | 10000 | 1000 |
| External wall mounted down lighter | 1.05 | n/a | n/a | 16 | 16 |
| Internal pendant | 0.86 | n/a | n/a | 13.5 | 13.5 |

Table 2.3 Luminaire intensity and sky-glow calculation data to compare to environmental zone E3.

We note that both light sources are comfortable within the guidelines of the IPL's Reduction of Obtrusive light (GN01:2021) however they both have a mainly downward (to ground) light beam direction and therefore sky-glow would be relative to the reflection of the surface being lit hence the less reflective we can make the surface area the smaller the sky-glow fraction becomes.

| Item | E avg (lx) | E min (lx) | Item |
|---|---|---|---|
| Wall mounted LED downlighter | 2.94 | 0.22 | 12.3 |
| Internal ceiling mounted pendant | 2.10 | 0.21 | 10.1 |

Table 2.4 Illumination calculation data.

We note that both light sources have very low minimum illumination levels and the illumination intensity drops of significantly when the distance to the source increase.

## 2.8 Conclusion

From the 1:150 DKP illumination contour drawings 2121 and 2122 and the above noted illumination calculation results we note that the external light spillage and sky-glow is significantly below the environmental light class zone E3 representing the sub-urban environmental lighting category and that the illumination spillage levels at 1.0lx have been minimised to the extent that they cover the general foot path areas but with minimal spill outside the intended areas. The 1.0lx zone would also be favourable to any bat activity zones or corridors and we, DKP, therefore deem the lighting design to be in compliance with the applied standards and recommendations.

## 2.9 Mitigation measures / actions.

Private lighting design, unlike, public lighting, is more difficult to enforce and whereas at construction stage the light fitting design can be specified and installed these fittings can be adjusted or replaced after handover or at any time thereafter to any of the properties effecting the desired light spill. At this point and up to handover of any properties we can ensure the following;

1: Limit the private house external wall mounted light fittings to downlighters only.
2: Considerer less reflective surfaces for the areas (footpath) to be lit by the external lights
3: Encourage the use of blinds or curtains.

# 3 Geographical overview

## 3.1 Project overview

Image 3.1, the (google maps) site map below shows the approximate location of the site with proposed development approximately outlined in red.




Image 3.1 Proposed development with approximate site boundary in red.

The illustrations below (North & South) represent the overall site layout with the housing block used in the private dwelling light spill analysis red lined..

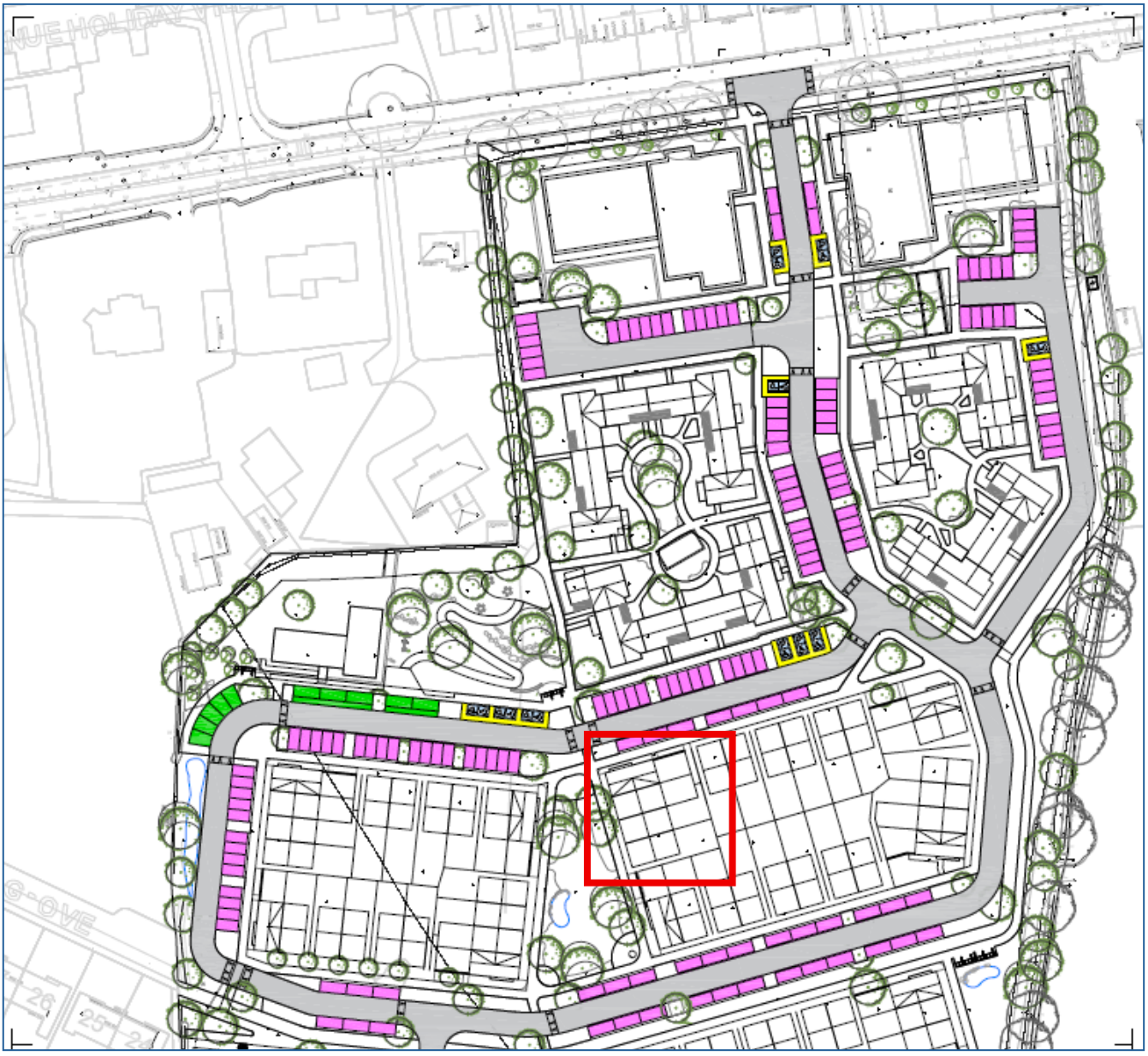


Image 4.1 Architects layout. Northern half

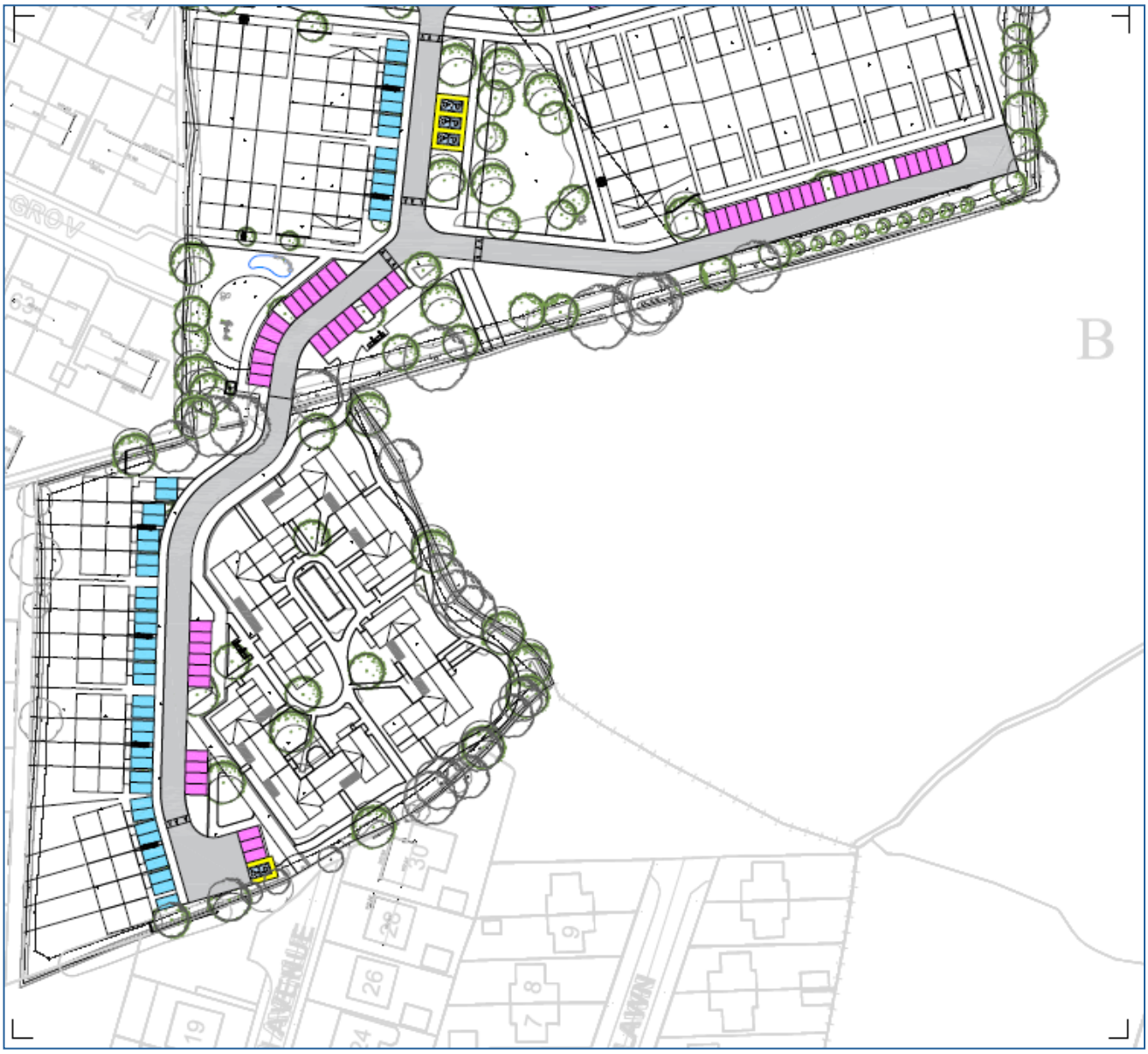



Image 4.1 Architects layout. Southern half.