Bonnyrigg Partnerships

# Bonnyrigg Living Communities Project

## Stage 1

## Infrastructure Report

May 2008

| REVISION | STATUS | AUTHOR | CHECKED | APPROVED FOR ISSUE: | ISSUE DATE: |
|---|---|---|---|---|---|
| 4 | For Approval | J. Gilligan | C. Avis | C. Avis | 23.05.08 |

# TABLE OF AMENDMENTS

| Amendment No. | Section Affected | Description of Amendment |
|---|---|---|
| **1** | **6.1 Roads and Traffic** | **6.1.2 Road Widths**<br><br>Additional bullet points in Roads and Traffic section under Road Widths |
| **2** | **6.1 Roads and Traffic** | **6.1.3 Parking Provisions**<br><br>Additional bullet points in Roads and Traffic section under Parking Provisions |
| **3** | **6.1 Roads and Traffic** | **6.1.4 Access Place Commentary**<br><br>Additional bullet points in Roads and Traffic section under Access Place Commentary |
| **4** | **Appendix C – Access and Manoeuvrability** | Addition of turning circles etc |

**Amendments shown in red*

# 1 EXECUTIVE SUMMARY

This report by Hughes Trueman is a summary of the infrastructure works required for Stage 1 of the Bonnyrigg Living Communities Project (BLCP) which has been undertaken for and on behalf of Bonnyrigg Partnerships.

This review of infrastructure requirements identifies the opportunities, constraints, risks and other issues associated with the proposed Stage 1 development layout.

The primary development constraints and issues that are relevant to Stage 1 of the BLCP include:

- Protection or augmentation of existing trunk services to the estate, new infrastructure and temporary connections to service occupied dwellings;
- Removal and replacement of existing roads and services due to realignment of roads/lot layout and regrading of levels in accordance Bonnyrigg Partnerships and Council agreed road design standards and to create safe and desirable stormwater flow paths and detention facilities;
- Isolated areas of uncontrolled or potentially contaminated or unsuitable fill on the site may adversely affect civil/infrastructure works and impact on housing development; and
- Earthworks management during development requires coordination of cut, fill, stockpile and borrow operations for the entire development to avoid unnecessary additional costs.

# 2 INTRODUCTION

As part of the process of implementing the BLCP, a master plan has been prepared. To implement the renewal process the estate will undergo a number of changes including the:

- alteration of the current Radburn layout;
- development of the public and private open space areas; and
- upgrade of utilities and community facilities.

Under the proposed development, residential dwellings will be demolished and the land redeveloped. The development will be staged over eighteen stages and has been structured to respond to the changing property market conditions and design controls throughout this period. Upon completion, 30% of the final yield will be retained as public housing. Stage 1 involves the construction of 119 dwellings on 42 lots.

# 3 EXISTING SITE DESCRIPTION

## 3.1 LOCATION

The BLCP site area is approximately 80 hectares in size and is located 30 km west of the Sydney CBD. It is adjacent to the suburbs of Edensor Park, St Johns Park, Bonnyrigg Heights and Mt Pritchard and lies within the Fairfield municipally. The master plan area is defined by Edensor Road to the north, Elizabeth Drive and Cabramatta Road to the south, Humphries Road to the east and Bonnyrigg Avenue to the west.

The subject site is best categorised by 3 primary catchment divisions; western, central (which also incorporate areas outside the site boundary of the BLCP) and eastern catchments, which occupy a combined area of 90 ha. The two smaller catchments (western and eastern) occupy approximately 4 and 19 hectares respectively while the larger, central catchment contributes to the remaining area.

The Central catchment of the master plan area is defined by the two natural ridgelines that run through the development site. Typically the catchment area grades towards a central reserve which runs south to north through the middle of the existing site. Grades within the catchment vary between 1% and 5%. The central reserve carries both minor and major events via low flow pipes and overload flow paths.

The Eastern catchment falls to the east with grades varying at 2 - 6%, until it reaches Humphries Road (which runs parallel to the ridgeline). Both minor flow pipes and overland flow paths within roadways then direct flow towards Green Valley Creek which runs north east of the development.

The Western catchment grades towards Bonnyrigg Avenue from the western ridgeline (which runs in a north-south orientation) at grades of 3 – 5%. Runoff is collected via the low flow pipe system, and also makes use of the spaces and road corridors that direct flow out of the catchment.

The topography of the existing site typically consists of New South Wales Department of Housing (DOH) dwellings, some medium density housing and open space areas, which are scattered throughout the site. The upgrade of the area into a new community is consequently classified as a “brown field” development.

The existing site also has a number of features that adjoin or are found within the development area. These including a mix of low and high density residential housing, a shopping centre, schools, temples, an electrical substation, a petrol station, a Croatian soccer club, a number of privately owned properties and a large private estate found in the centre of the BLCP site.

In terms of the geology of the site, the area sits on Bringelly Shale comprising of carbonaceous claystone, claystone, laminate, fine to medium grained lithic sandstone, rare coal and tuff. Sub surface strata encountered during intrusive investigations comprised of a variety of clay samples suggesting, given the nature of the materials and the site location, that the sub surface strata is likely to be residual soil that developed over Bringelly Shale. Geotechnical investigations conducted by Parsons Brinckerhoff indicate there was no evidence of contamination within the site and no free groundwater was encountered (Parsons Brinckerhoff 2005).

# 4 PROPOSED SITE DESCRIPTION

A coordinated master planning approach between the Department of Housing (DOH), Bonnyrigg Partnerships and Fairfield City Council (FCC) aims to renew the existing DoH Bonnyrigg estate by replacing much of the public housing stock. Along with this replacement strategy, the renewal of the urban framework of Bonnyrigg also presented a number of opportunities to the region. These included a review of the infrastructure that services the area, an enhancement of the open space and community facilities serving the community and provision of a sustainable housing mix for the area.

## 4.1 STAGE 1 WORKS DESCRIPTION

Stage 1 of the development is approximately nine (9) hectares in size and is bordered by Tarlington Reserve to the west, Edensor Road to the north, Driver Street to the east and public housing to the south. The Stage 1 works also includes regrading and landscaping works to Tarlington Reserve including the creation of a creek line, rain gardens and on-site detention basin. These facilities will be constructed to cater for the fully developed scenario.

The internal works for the Stage 1 redevelopment include the initial site establishment. This role in the project includes the establishment of amenities, fencing, traffic control, survey facilities and site security for entire staging. The environmental controls relating to the soil and water management facilities and the management of environmental issues are required to be established at an early period of the staged development.

With the demolition of dwellings there would also be demolition and removal of the existing infrastructure, being road pavements, pedestrian bridges, pipe systems, underground services and utilities and non-critical vegetation that cannot be retained during the redevelopment process.

# 5 EXISTING SERVICES

The BLCP process must cater for the existing services and residents in the estate. As part of this underlying commitment, the retention of services to all residents is crucial to the development process. The utilisation of temporary services and lead-ins to provide live connections and uninterrupted service to the retained private dwellings or to facilitate the proposed staging, must be maintained as part of the works program.

## 5.1 WATER

A 450mm diameter trunk main runs through the development from Edensor Road to Elizabeth Drive. This main is located within the central reserve and will not be re-located as part of the renewal works. The water main is located within a 5m wide easement and is of regional importance as it supplies water to the surrounding suburbs.

100mm diameter mains and larger are present across the site and will be retained where possible, however some re-locations will be unavoidable. It is intended to retain all of the mains present in the roads bordering the site; these however may require adjustment, particularly where affected by proposed roads.

The list below indicates the location of mains 150mm diameter or larger within the development area or on the side of the external roads fronting the development.

| Street Name | Water Main Size (mm) |
|---|---|
| Edensor Road | 50x2, 150 |
| Bonnyrigg Avenue | 150 |
| Elizabeth Drive | 375 |
| Cabramatta Road | 375, 200 |
| Humphries Road | 200 (northern end only) |
| Bishop Crescent | 200 |
| Bunker Parade | 150, 200 |
| Reeves Crescent | 150, 225 |
| Palisade Crescent | 150 |
| Tarlington Parade | 250 (southern end only) |
| Bradfield Crescent | 450 |
| Monash Place | 450 |

## 5.2 RECYCLED WATER

At present there is no recycled water supply within the Bonnyrigg estate.

## 5.3 SEWER

The main sewer carrier within the development is located within the Central reserve and is 300mm in diameter. The majority of the existing sewer reticulation mains throughout the site are 150mm diameter.

## 5.4 ELECTRICAL

The existing low voltage electrical supply servicing the Bonnyrigg estate is an underground reticulation network. However, a high voltage overhead cable traverses the site from the Integral Energy zone substation in Monash Place, north to Edensor Road on the northern boundary of the development.

## 5.5 TELECOMMUNICATIONS

The existing Bonnyrigg estate telecommunications network consists of a below ground reticulated service. There is currently no exchange, major through route or broadband provisions on site.

## 5.6 GAS

Existing gas mains are located in isolated areas of the Bonnyrigg estate. The majority of the existing gas mains within the estate are retained. The retained services are located in;

- Bonnyrigg Avenue;
- Cabramatta Road;
- Edensor Road;
- Elizabeth Drive;
- Hebblewhite Place;
- Monash Place; and
- Tarlington Parade.

# 6 PROPOSED SERVICES

As part of the proposal, it is intended to provide the following Infrastructure as part of the development.

## 6.1 ROADS AND TRAFFIC

### 6.1.1 Road Works

To achieve the proposed road layout, existing roads will be retained and new roads will require full construction. The road upgrading works will include provisions for the replacement or improvement of pavements, kerbs and gutter, traffic control devices and intersection upgrades (both internal and external). Existing pavements to be retained will have the wearing course re-sheeted. Existing kerbs will be retained where practical.

### 6.1.2 Road Widths

The road, or lane width has a substantial influence on the safety and comfort for users on the roadway. Reductions in lane width reduces the lateral clearance between vehicles and subsequently reduces traffic speed.

A road hierarchy is a division of a road network into classifications depending on their function. The creation of a road hierarchy is essential in controlling vehicle speed in the urban environment and preventing short-cuts and rats-runs through residential areas.

In accordance with standard engineering practice The Bonnyrigg Living Communities Project has been designed with neighbourhood safety and amenity factors being satisfied ahead of traffic efficiency. With pedestrian safety paramount, vehicle speeds have been kept as low as possible.

The proposal has divided the road network into the following three categories:

- Collector Road – collects traffic from access streets and carries high volumes of traffic. A reasonable level of residential amenity is maintained by restricting traffic volumes and speed.
- Access Street – residential environment is dominant, traffic is subservient, speed and volume are low and pedestrian and cycle movements are facilitated.
- Shareway – lowest order of road providing access to sites without any traffic generated by sites in other streets. A shared path of travel for cars accessing garages and carports and pedestrians.

Road and lane widths were determined from the following road design standards:

| Reference | Minimum Road Width (m) | | |
|---|---|---|---|
| | Collector (Bus Route) | Access Street | Shareway |
| AMCORD[1] | 6.0m (plus parking) | 5.5m | 3.0m |
| NSW RTA[2] | 6.0-6.5m | 5.8m | - |
| Fairfield City Council[3] | 8.0m (including parking) | 7.0m | 5.5m |

| Bonnyrigg Living Communities Project | | |
|---|---|---|
| 6.4m (plus parking) | 7.0m | 5.5m |

The selected configuration and widths were subsequently discussed and agreed upon with Councils traffic section.

### 6.1.3 Parking Provisions

The universal Transport Management and Accessibility Plan (TMAP) aim is to achieve a 10% shift to non-car modes relative to the existing mode split base in the Bonnyrigg precinct. Data from the Household Travel Survey indicates that 20% of daily trips and peak period trips for all purposes in the Bonnyrigg Precinct are already undertaken using non-car modes. About 15% of trips are walking with the remaining 5% by public transport.

This has been addressed with the implementation of:

- Upgraded bus network through the site; and
- Fully connected cycleway and pedestrian path network to the local schools, places of worship, shopping facilities and nearby Transitway.

This has reduced private vehicle use and has subsequently reduced private car parking requirements.

Car parking will be provided be in the form of a garage, carport or car space. It is not considered desirable to provide a garage for all dwellings from a design or economic perspective. Detached homes will provide two car spaces per dwelling, with visitor parking on street.

Attached homes will provide car parking at the following rates:

- 1-2 bedrooms – minimum of 1 car space per dwelling.
- 3+ bedrooms - minimum 1.5 car spaces per dwelling.
- Visitor parking will be provided on street.

The apartments will provide car spaces as outlined below:

- 1 bedroom – minimum of 0.6 spaces per apartment.

[1] Australian Model Code for Residential Developments

[2] NSW RTA Road Design Guide – Section 3.2.4.3

[3] FCC Residential Subdivision Guide (1996)

- 2 bedrooms – minimum of 0.9 spaces per apartment.
- 3 bedrooms – minimum of 1.4 spaces per apartment.
- Visitor parking – minimum of 0.2 spaces per apartment.

Notwithstanding the above minimum numbers the Stage 1 DA documentation includes on-street visitor parking in the order of 0.8 – 1.2 spaces per dwelling, depending on the position.

### 6.1.4 Access Place Commentary

The lowest order public road proposed as part of this project is the 8m wide road reserve Access Place. The Access Place's function is that of a shareway, providing access to off-street parking for residents and thoroughfare for pedestrians.

Roadways are signposted as '10 km/h Shared Roadway' (sign code R4-4) which denotes a mix of vehicles and pedestrians using the roadway. The speed of the vehicles driving on the roadway is anticipated to not exceed the sign-posted speed limit due to the combination of the local area traffic management devices and short travel distances to the nearby intersections.

The notification of the 'Shared Zone' to both vehicles and pedestrians upon entrance to the roadway will provide clear notification that a higher than normal rate of interaction is anticipated between pedestrians and vehicles (as is its intention) and therefore prompt a higher than normal awareness of potential hazards. It is anticipated that only local residents shall be the users of the roadways, again reinforcing the assumed actual speed travelled by vehicles (as there are no other vehicles using the shared roadway as a through road). Although situated away from resident front doors and having sufficient visitor parking on collector roads and local streets, further discouragement of on-street parking on Access Places will be achieved with the provision of 'no stopping' signage throughout.

The vehicles exiting out of their garages/carports are shown reversing as it demonstrates the more difficult and likely scenario in terms of identifying potential/oncoming hazards for drivers and pedestrians. Drivers reversing onto the roadway are assumed not to exceed 5km/h.

Determining driver sight lines entering onto a roadway from a side street or access point is calculated using AS 2890.1:2004 Part 1: Off-Street car parking code (Figure 3.2). The data given in Figure 3.2 regarding frontage road speed was extrapolated backwards (As shown in Figure 1 below) to obtain a sight distance (Y) for Domestic Property Access sight requirement (DPA) for a vehicle design speed of 10km/h. The corresponding sight line triangle provides an extent of the driver's view while reversing in relation to the approaching hazards (as shown in Appendix C – Access and Manoeuvrability).

Based on a 1.5-second reaction time and braking distance at 10km/hr, a minimum distance of 3m is required. For the purpose of this analysis, a conservative 5m has been adopted. Appendix C – Access & Manoeuvrability shows how this requirement has been accommodated.

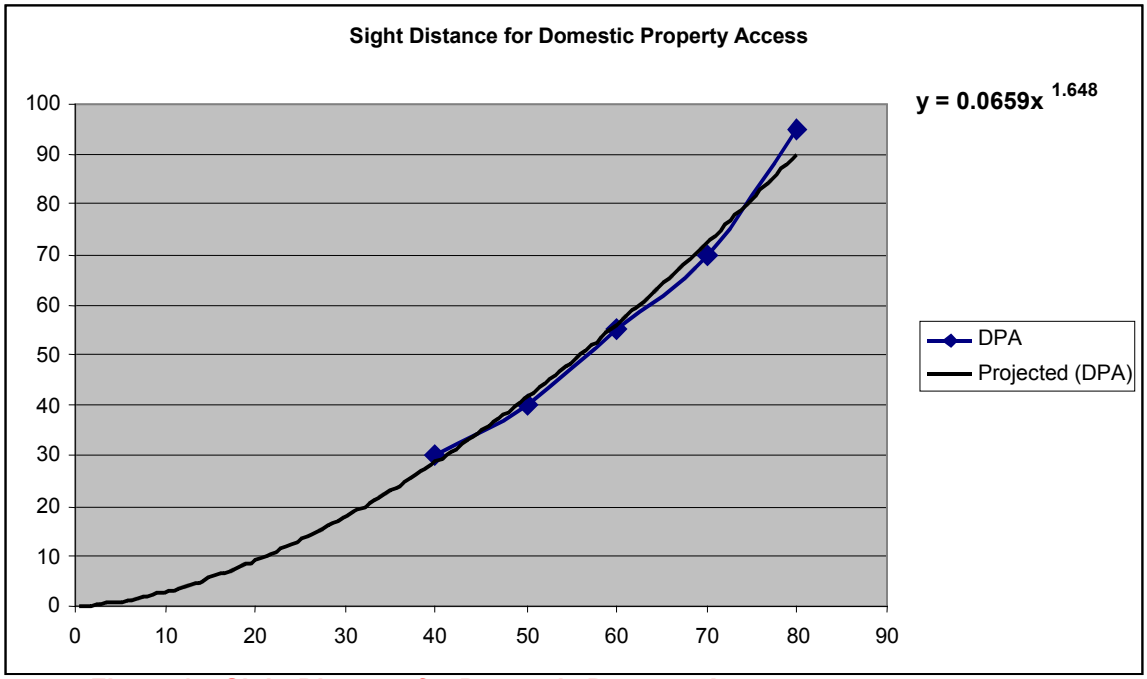



**Figure 1 – Sight Distance for Domestic Property Access**

| Vehicle speed (km/h) | Domestic Property Access (m) |
|---|---|
| 40 | 30 |
| 50 | 40 |
| 60 | 55 |
| 70 | 70 |
| 80 | 95 |
| **10** | **2.93** |

**Table 6.1 – Sight Distance for Domestic Property Access**

## 6.2 EROSION AND SEDIMENT CONTROL

An erosion and sediment control plan has been prepared for this submission (refer to the engineering plans for details). The erosion and sediment control works for Stage 1 include the installation of inlet pit sediment traps, stabilized construction entrances, rock check dams and a sediment basin. The excavation that will form the future raingarden entry statement adjacent Edensor Road will be utilized as the sediment basin for Stage 1 (refer Appendix B – Sediment Basin Calculations).

Due to the nature of the project, each stage will require an updated erosion and sediment control plan with its development application.

## 6.3 STORMWATER

While some of the existing stormwater drainage infrastructure is to be retained, the water cycle management system will include an upgrade of the major and minor systems as follows;

- The construction of a single, stormwater detention facility for Stage 1 in the central reserve will provide approximately 7,900m$^3$ of stormwater detention storage;
- In addition to this stormwater detention, it is also proposed to create a series of water quality control facilities, for treatment of runoff prior to discharge from the site. These facilities shall include wetlands, rain gardens, bio-retention swales and sinks. The area of these facilities is approximately 2,600m$^2$. Refer Water Cycle Management Report for maintenance schedule;
- The construction of new access place stormwater systems will total approximately 500m of pipe and associated pits; and
- Sub-soil drainage provided within the new roads and proposed tree wells will total approximately 1,200m of pipe.

## 6.4 POTABLE WATER

The existing potable water supply within the development area will be extended and upgraded where necessary. The majority of existing pipe will be retained with all new pipe work connecting into the existing system, thus providing approximately 830m of new potable water mains to Stage 1.

Through discussions with Sydney Water it has been ascertained that any net increase in water consumption will have an adverse impact on supply to neighbouring areas. Sydney Water has indicated that that a pumping station and reservoir are not required to service the development (See Appendix D - SWC Feasibility Letter). The precise nature and location of the amplification will need to be determined during the detailed design stage, however it is noted that the use of recycled water may allow this scenario to be avoided.

## 6.5 RECYCLED WATER

As previously mentioned it is intended to supply recycled water to the development. A recycled water main will be laid throughout the entire development, greatly reducing the potable water demand and assisting in satisfying the BASIX requirements for portable water demand reductions. The recycled main will be laid alongside the potable water main where possible in new roads and on opposing sides of the road for existing roads to minimise existing service disruption.

The estimated length of recycled water main in Stage 1 is 1,200m.

## 6.6 SEWER

The existing sewer within the development area will be retained if possible or extended where necessary. In addition to the sewer reticulation works a number of sewer main upgrades both on and off site will be constructed due to the increase in density of the Bonnyrigg renewal.

The Stage 1 sewer reticulation and carrier mains will be connected to the existing Sydney Water system, totalling approximately 1,200m of new sewer main and associated manholes.

Sydney Water has carried out detailed analysis of the system. The result of this analysis is that no augmentation or upgrade of downstream infrastructure is required.

## 6.7 TELECOMMUNICATIONS

While some of the existing telecommunications infrastructure can be retained as part of the renewal process, a significant portion of the site will require new services. These new works shall be undertaken as part of the infrastructure renewal and will be contained within a shared trench arrangement with electrical, broadband and gas reticulation. The additional telecommunications conduit and cabling will total approximately 5,100m.

Existing telecom ducts and cabling will be retained where possible, but will need to be removed where they do not follow proposed road alignments. Telstra have been contacted and the Access Planning division has indicated that Telstra have no future upgrades planned for the area and that no servicing issues are apparent.

In addition to the standard telecommunications cabling it is proposed to reticulate a broadband network throughout the estate for information technology purposes.

It is estimated that the new cabling will total approximately 800m for Stage 1.

## 6.8 GAS

Presently, only the central private properties and public housing to the north west of the site (situated between the playing fields and the shopping centre) have the provision of gas reticulation. The gas service will be installed as part of the shared trenching of services for recycled water and broadband through the remainder of the estate.

Gas supply to the future dwellings will be supplied from the retained mains and extended services as part of the works. The existing mains are of various sizes with the supply feed main being located in Edensor Road.

The gas supplier, Alinta has been contacted and they have indicated that they would supply gas to the entire development area in a shared trench arrangement at no extra cost to Bonnyrigg Partnerships. Alinta indicate that the existing network has the capacity to serve the development.

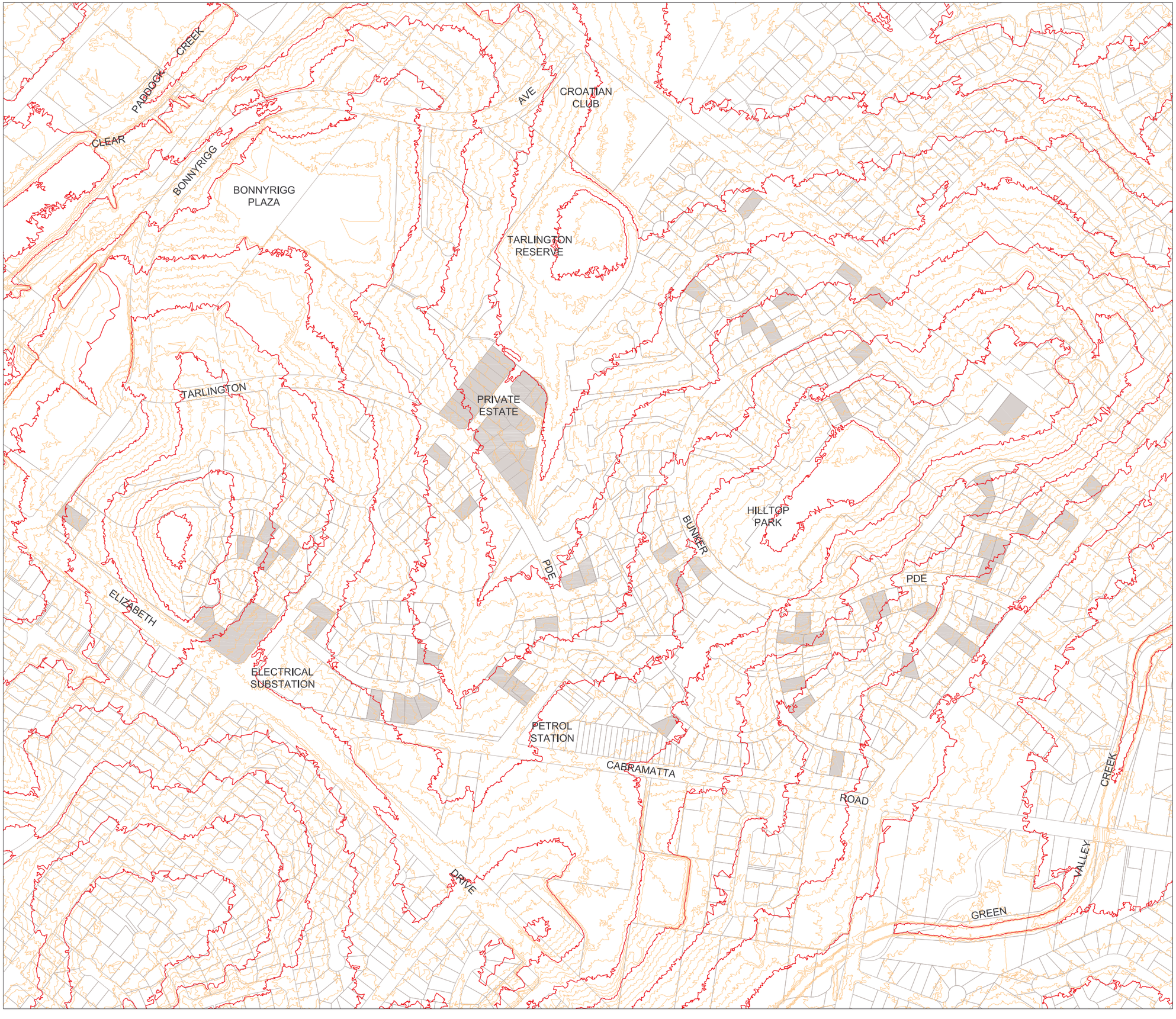
It is anticipated that approximately 1,200m of new gas piping will need to be installed to supply Stage 1.

## 6.9 ELECTRICAL

Similar to the telecommunications services, as much of the existing electrical services as possible will be retained during the renewal process. Any new electrical reticulation will be provided in a shared trenching arrangement within proposed roads and will connect to the existing electrical supply system. The new reticulation will consist of both low and 11 kV high voltage and associated pad-mount substations and switching gear. Due to the Integral Energy's normal augmentation program and the reduction in electrical usage on a per dwelling basis there are no additional off-estate major works required solely servicing the renewal area.

New electrical reticulations will approximate 800m of conduit and cabling and 2 new pad mount substations are to be provided in Stage 1.

# APPENDIX A – STAGE 1 INFRASTRUCTURE PLANS




bonnyrigg
PARTNERSHIPS

## LEGEND

PRIVATE LOTS

SCALE 1:5000 METRES

100 50 0 100
75 25

Bonnyrigg Living Communities Project

DATE
Aug 07

SCALE
1:5000 @ A3

DRAWING TITLE + DESCRIPTION
**Existing Topographical Features**

DRAWING NO.
M01

REVISION
A

*Infrastructure Engineering*

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## LEGEND

- CONSTRUCTION STAGING BOUNDARY
- PRIVATE LOTS
- PARK

CREEK
PADDOCK
CLEAR
BONNYRIGG
AVE
CROATIAN CLUB
EDENSOR ROAD
BONNYRIGG PLAZA
BONNYRIGG PRIMARY SCHOOL
PRIVATE ESTATE
ELIZABETH
ELECTRICAL SUBSTATION
PETROL STATION
CABRAMATTA ROAD
HUMPHRIES ROAD
CREEK
VALLEY
GREEN
DRIVE

SCALE 1:5000 METRES
100 50 0 100
75 25

Bonnyrigg Living Communities Project

DRAWING TITLE + DESCRIPTION
**Proposed Regrading Contour Plan**

DATE
Aug 07

SCALE
1:5000 @ A3

DRAWING NO.
M02

REVISION
A

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## LEGEND

CONSTRUCTION STAGING BOUNDARY

- > 1.0m FILL**
- 0.25 - 1.0m FILL**
- 0.25 CUT - 0.25m FILL**
- 0.25 - 1.0m CUT**
- > 1.0m CUT**

** INDICATIVE EXTENT OF EARTHWORKS REQUIRED FOR LOT RE- GRADING

SCALE 1:5000 METRES
100 50 0 100
75 25

**Bonnyrigg Living Communities Project**

DATE
Aug 07

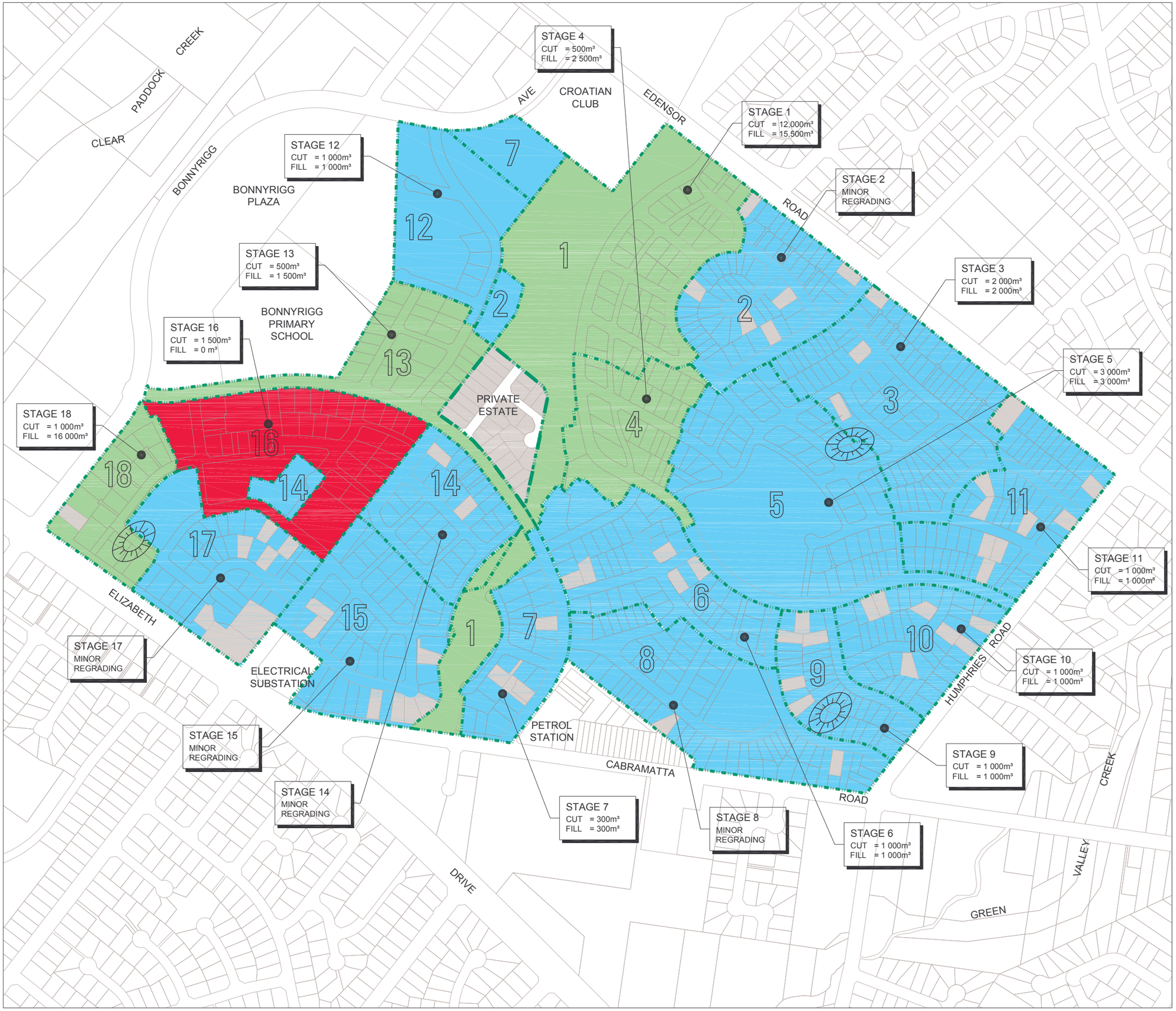
SCALE
1:5000
@ A3

DRAWING TITLE + DESCRIPTION
**Earthworks Cut To Fill Plan**

DRAWING NO.
M03

REVISION
A

*Infrastructure Engineering*

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## LEGEND

- STAGING BOUNDARY
- PRIVATE LOTS
- STAGES WITH AN EXCESS FILL BALANCE
- STAGES WITH AN EXCESS CUT BALANCE
- STAGES WITH CUT TO FILL BALANCE
- POSSIBLE STOCKPILE LOCATION

## NOTES

1. EARTHWORKS MANAGEMENT BASED UPON PRELIMINARY ROAD GRADES AND ASSOCIATED LOT ADJUSTMENTS.
2. REVISED GRADING PLANS AND ADDITIONAL EARTHWORKS BALANCING PROGRAM TO BE PREPARED AS PART OF DETAIL DESIGN FOR EACH CONSTRUCTION PACKAGE.

SCALE 1:5000 METRES

100 50 0 100
75 25

**Bonnyrigg Living Communities Project**

DATE
Aug 07

SCALE
1:5000 @ A3

DRAWING TITLE + DESCRIPTION
**Earthworks Management Plan**

DRAWING NO.
M04

REVISION
A

*Infrastructure Engineering*

CREEK
PADDOCK
CLEAR
BONNYRIGG
AVE
CROATIAN CLUB
EDENSOR ROAD
BONNYRIGG PLAZA
BONNYRIGG PRIMARY SCHOOL
PRIVATE ESTATE
ELECTRICAL SUBSTATION
ELIZABETH
PETROL STATION
CABRAMATTA ROAD
HUMPHRIES ROAD
CREEK
VALLEY
GREEN
DRIVE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

bonnyrigg
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| | | | | |
|---|---|---|---|---|
| COLLECTOR | TYPE | 1 | 2 | 3 |
| | WIDTH (m) | 18 | 18 | 15.5 |
| | STATUS | EXISTING | PROPOSED | PROPOSED |
| | TYPE | 4 | | |
| | WIDTH (m) | 15 | | |
| | STATUS | PROPOSED | | |
| ACCESS STREET | TYPE | 5 | 6 | 7 |
| | WIDTH (m) | 20 | 18 | 15 |
| | STATUS | EXISTING | EXISTING | EXISTING |
| | TYPE | 8 | 9 | 10 |
| | WIDTH (m) | 15 | 15 | 12 |
| | STATUS | PROPOSED | PROPOSED | PROPOSED |
| | TYPE | 11 | | |
| | WIDTH (m) | 10.5 | | |
| | STATUS | PROPOSED | | |
| ACCESS PLACE | TYPE | 12 | | |
| | WIDTH (m) | 15 | | |
| | STATUS | EXISTING | | |
| ACCESS PLACE | TYPE | 13 | | |
| | WIDTH (m) | 8 | | |
| | STATUS | PROPOSED | | |

SCALE 1:5000 METRES
100 50 0 100
75 25

**Bonnyrigg Living Communities Project**

DRAWING TITLE + DESCRIPTION
**Road Heirarchy Plan**

DATE
Aug 07

SCALE
1:5000 @ A3

DRAWING NO.
M05

REVISION
A

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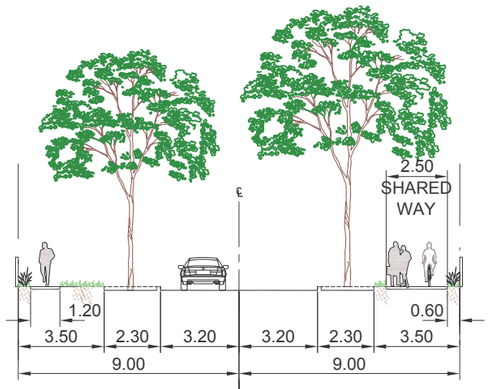
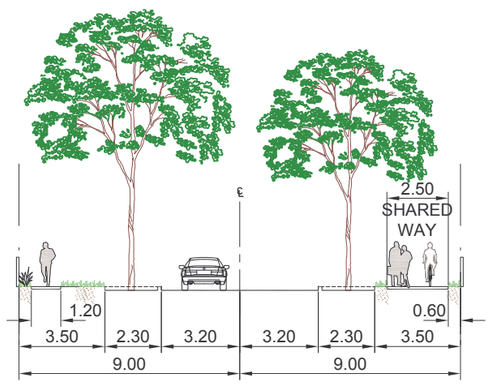
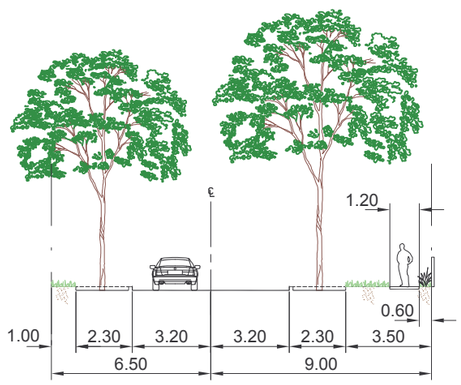


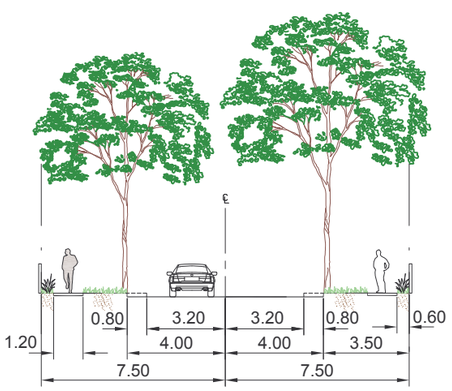

## ROAD TYPE 1
EXISTING 18m COLLECTOR



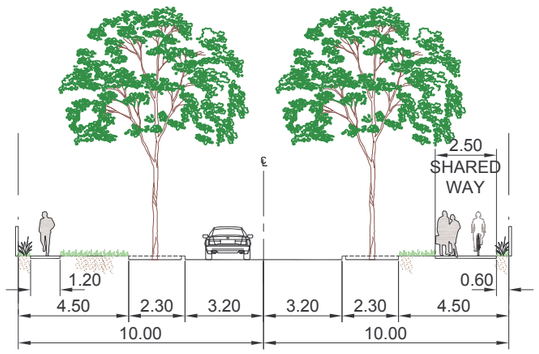

## ROAD TYPE 2
PROPOSED 18m COLLECTOR



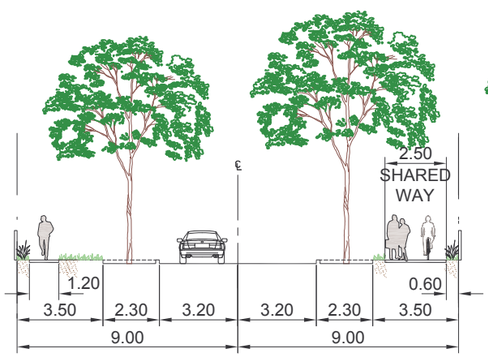

## ROAD TYPE 3
PROPOSED 15.5m COLLECTOR
AT PARK



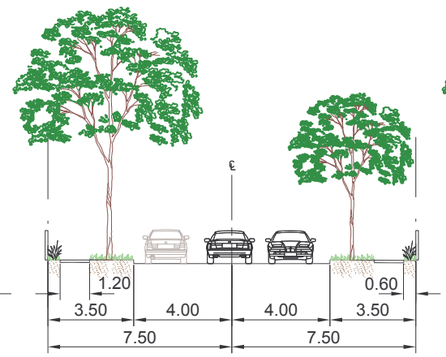

## ROAD TYPE 4
PROPOSED 15m COLLECTOR



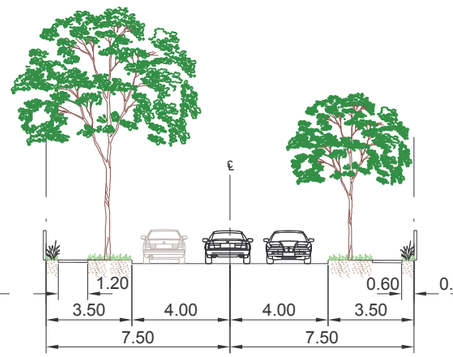

## ROAD TYPE 5
EXISTING 20m ACCESS STREET



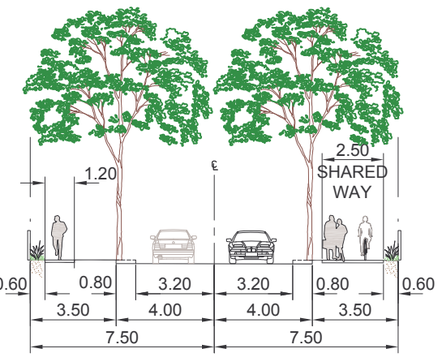

## ROAD TYPE 6
EXISTING 18m ACCESS STREET



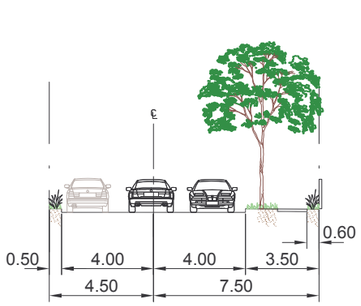

## ROAD TYPE 7
EXISTING 15m ACCESS STREET



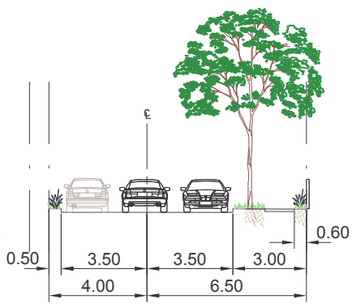

## ROAD TYPE 8
PROPOSED 15m ACCESS STREET



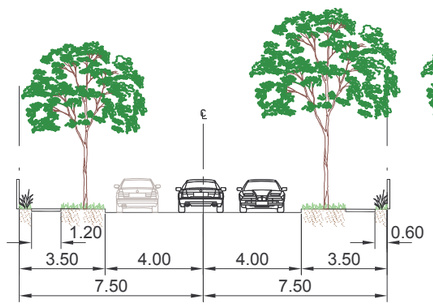

## ROAD TYPE 9
PROPOSED 15m ACCESS STREET



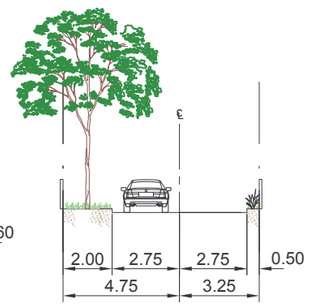

## ROAD TYPE 10
PROPOSED 12m ACCESS
STREET AT PARK




## ROAD TYPE 11
PROPOSED 10.5m ACCESS
STREET AT PARK




## ROAD TYPE 12
EXISTING 15m ACCESS PLACE




## ROAD TYPE 13
PROPOSED 8m ACCESS PLACE

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## NOTES

1. ALL TREES WILL BE INSTALLED WITH ROOT CONTROL BARRIERS.
2. 3200 TRAVEL LANES AND 2300 PARKING ON COLLECTOR TO ALLOW BUS ROUTE PROVISION FOR SHARED WAY.

SCALE 1:250
METRES
4 2 0 5
5 3 1

**Bonnyrigg Living Communities Project**

DRAWING TITLE + DESCRIPTION
**Road Cross Sections**

DATE
Aug 07

SCALE
1:250
@ A3

DRAWING NO.
M06

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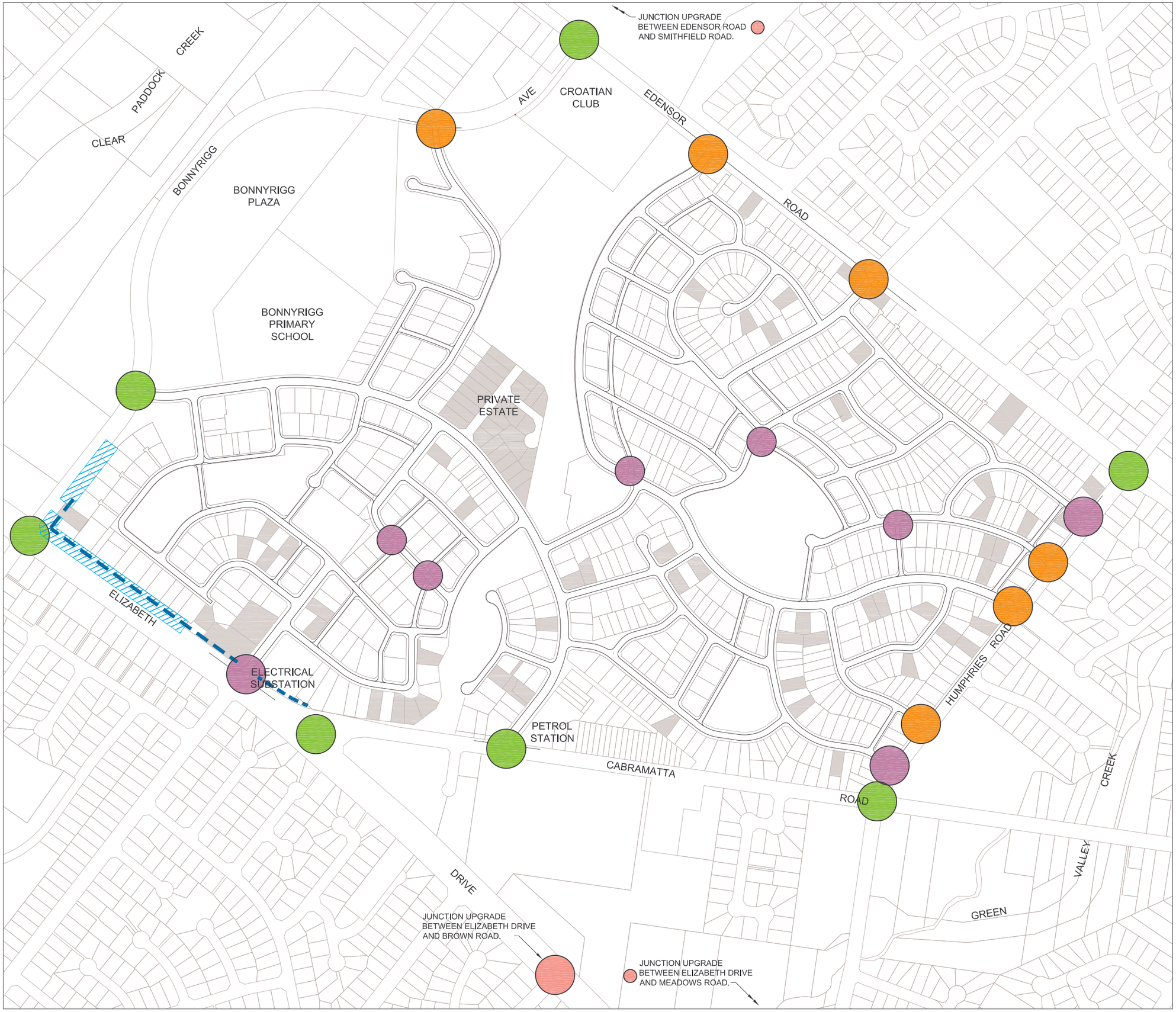


bonnyrigg
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## LEGEND

- SIGNALISED INTERSECTION UPGRADE REQUIRED.
- PROPOSED SIGN CONTROL - ALL TURNS (GIVE WAY)
- PROPOSED SIGN CONTROL - LEFT IN / LEFT OUT
- EXISTING INTERSECTION TREATMENT TO REMAIN
- DENIED ACCESS TO LOT FRONTAGE
- SOUND WALLS

NOTE: INTERNAL INTERSECTION CONTROL (ie. STOP/GIVE WAY NOT SHOWN FOR CLARITY

SCALE 1:5000 METRES
100 50 0 100
75 25

Bonnyrigg Living Communities Project

DATE
Aug 07

SCALE
1:5000 @ A3

DRAWING TITLE + DESCRIPTION
**Traffic / Transportation Infrastructure Plan**

DRAWING NO.
M07

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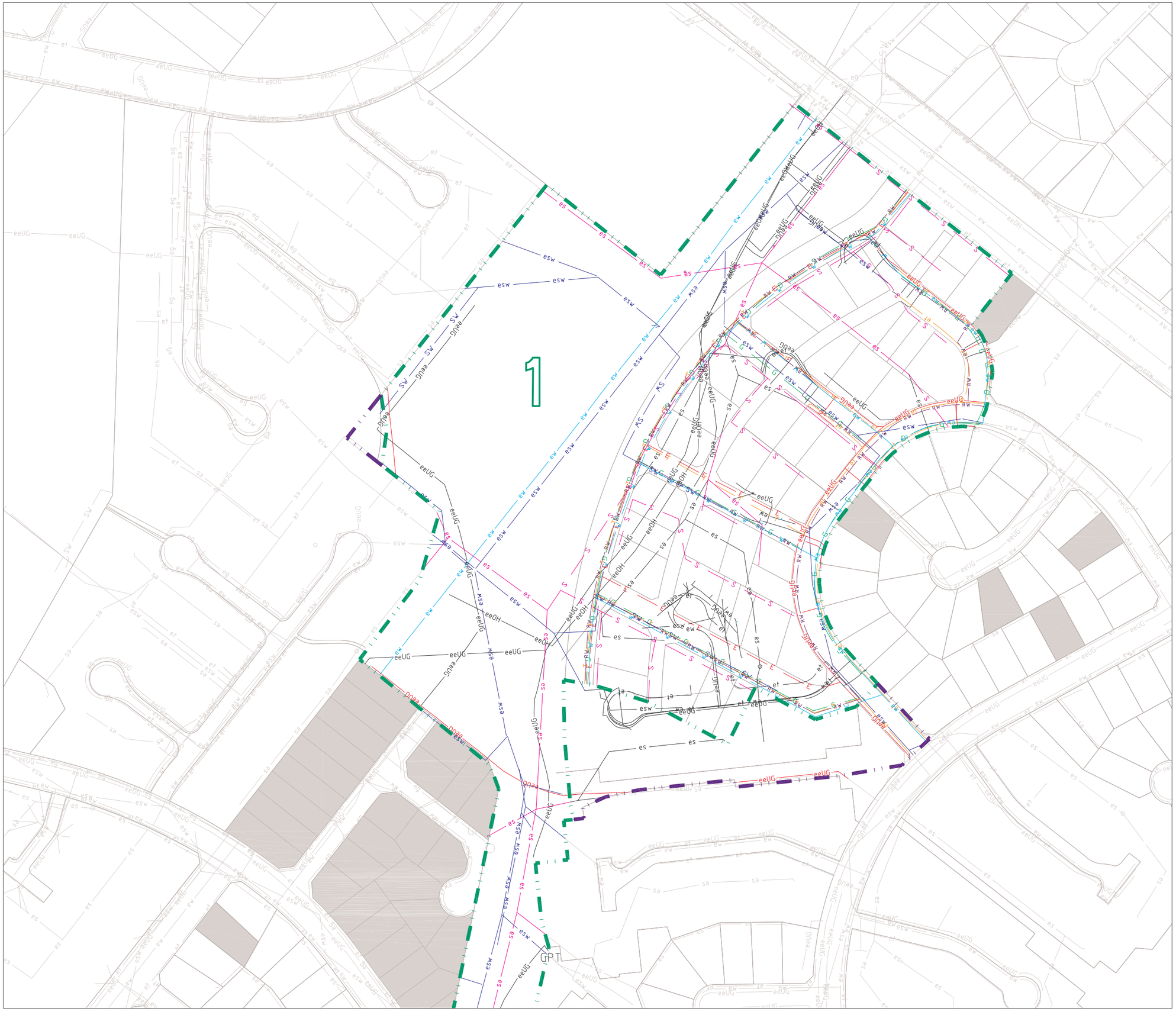


bonnyrigg
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## LEGEND

- CONSTRUCTION STAGING BOUNDARY
- DEMOLITION STAGING BOUNDARY
- PRIVATE LOTS
- esw — EXISTING STORMWATER
- esw — EXISTING STORMWATER TO BE DEMOLISHED
- SW — PROPOSED STORMWATER
- es — EXISTING SEWER
- es — EXISTING SEWER TO BE DEMOLISHED
- S — PROPOSED SEWER
- ew — EXISTING WATER
- ew — EXISTING WATER TO BE DEMOLISHED
- W — PROPOSED WATER
- eg — EXISTING GAS
- eg — EXISTING GAS TO BE DEMOLISHED
- G — PROPOSED GAS
- et — EXISTING TELECOMS
- et — EXISTING TELECOMS TO BE DEMOLISHED
- T — PROPOSED TELECOMS
- eeUG — EXISTING UNDERGROUND ELECTRICITY
- eeUG — EXISTING UNDERGROUND ELECTRICITY TO BE DEMOLISHED
- E — PROPOSED UNDERGROUND ELECTRICITY
- eeOH — EXISTING ABOVE GROUND ELECTRICITY
- eeOH — EXISTING ABOVE GROUND ELECTRICITY TO BE DEMOLISHED
- RW — PROPOSED RECYCLED WATER

SCALE 1:2000 METRES

40 20 0 40
30 10

Bonnyrigg Living Communities Project

DATE
Aug 07

SCALE
1:2000 @ A3

DRAWING TITLE + DESCRIPTION
**Masterplan**
**Staging Plan - Stage 1**
**Sheet 1 of 2**

DRAWING NO.
M08

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# APPENDIX B – SEDIMENT BASIN CALCULATIONS

## SWMP Commentary, Standard Calculation

**Note: These "Standard Calculation" spreadsheets relate only to low erosion hazard lands as identified in figure 4.6 where the designer chooses to not use the RUSLE to size sediment basins. The more "Detailed Calculation" spreadsheets should be used on high erosion hazard lands as identified by figure 4.6 or where the designer chooses to run the RUSLE in calculations.**

# 1. Site Data Sheet

**Site name:** **Bonnyrigg Renewal Scheme - Stage 1**

**Site location:** **Edensor Road**

**Precinct:** **Bonnyrigg**

**Description of site:** **Bonnyrigg Renewal Scheme - Stage 1, including works within Tarlington Reserve**

| Site area | Site | | | | | | Remarks |
|---|---|---|---|---|---|---|---|
| | Stage 1 | | | | | | |
| Total catchment area (ha) | 9.8 | | | | | | Area taken from Master Plan |
| Disturbed catchment area (ha) | 9.8 | | | | | | |

### Soil analysis

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Soil landscape | Blacktown (bt) | | | | | | DIPNR mapping (if relevant) |
| Soil Texture Group | D | | | | | | Sections 6.3.3(c), (d) and (e) |

### Rainfall data

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Design rainfall depth (days) | 5 | | | | | | See Sections 6.3.4 (d) and (e) |
| Design rainfall depth (percentile) | 75th | | | | | | See Sections 6.3.4 (f) and (g) |
| x-day, y-percentile rainfall event | 19.2 | | | | | | See Section 6.3.4 (h) |
| Rainfall intensity: 2-year, 6-hour storm | 10.7 | | | | | | See IFD chart for the site |
| Rainfall erosivity (R-factor) | 2500 | | | | | | Automatic calculation from above data |

**Comments:** Conservatively, the disturbed catchment area has been taken as the Stage 1 site area. It is expected that the land disturbance will be undertaken in phases, depending on the specific methodology applied by the contractor.

# 4. Volume of Sediment Basins, *Type D* and *Type F* Soils

Basin volume = settling zone volume + sediment storage zone volume

## Settling Zone Volume

The settling zone volume for *Type F* and *Type D* soils is calculated to provide capacity to contain all runoff expected from up to the y-percentile rainfall event. The volume of the basin's settling zone (V) can be determined as a function of the basin's surface area and depth to allow for particles to settle and can be determined by the following equation:

$$V = 10 \times C_v \times A \times R_{y\text{-}\%ile,\ x\text{-}day} \ (m^3)$$

where:

10 = a unit conversion factor

$C_v$ = the volumetric runoff coefficient defined as that portion of rainfall that runs off as stormwater over the x-day period

R = is the x-day total rainfall depth (mm) that is not exceeded in y percent of rainfall events. (See Sections 6.3.4(d), (e), (f), (g) and (h)).

A = total catchment area (ha)

## Sediment Storage Zone Volume

In the standard calculation, the sediment storage zone is 50 percent of the setting zone. However, designers can work to capture the 2-month soil loss as calculated by the RUSLE (Section 6.3.4(i)(ii)), in which case the "Detailed Calculation" spreadsheets should be used.

## Total Basin Volume

| Site | $C_v$ | R x-day y-%ile | Total catchment area (ha) | Settling zone volume ($m^3$) | Sediment storage volume ($m^3$) | Total basin volume ($m^3$) |
|---|---|---|---|---|---|---|
| Stage 1 | 0.39 | 19.2 | 9.8 | 733.824 | 367 | 1100.736 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# APPENDIX C – ACCESS AND MANOEUVRABILITY

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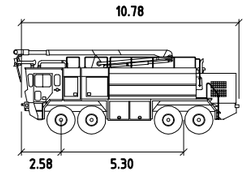
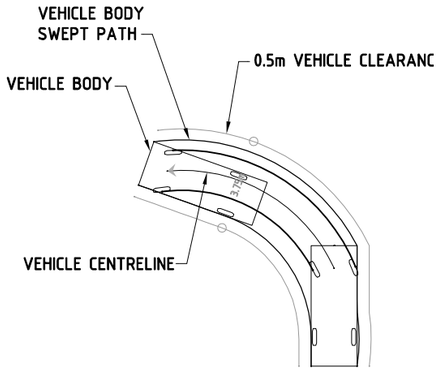



**BRONTO FIRE TRUCK** meters

| | |
|---|---|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.00 |
| Steering Angle | : 36.00 |




SCALE 1:250 METRES

4 2 0 6
3 1

**Bonnyrigg Living Communities Project**

DATE
May 08

SCALE
1:250@A3

DRAWING TITLE + DESCRIPTION
**Emergency Vehicle Turning Manoeuvre**

DRAWING NO
EVM-01

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|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
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200mm A4 SHEET
100mm
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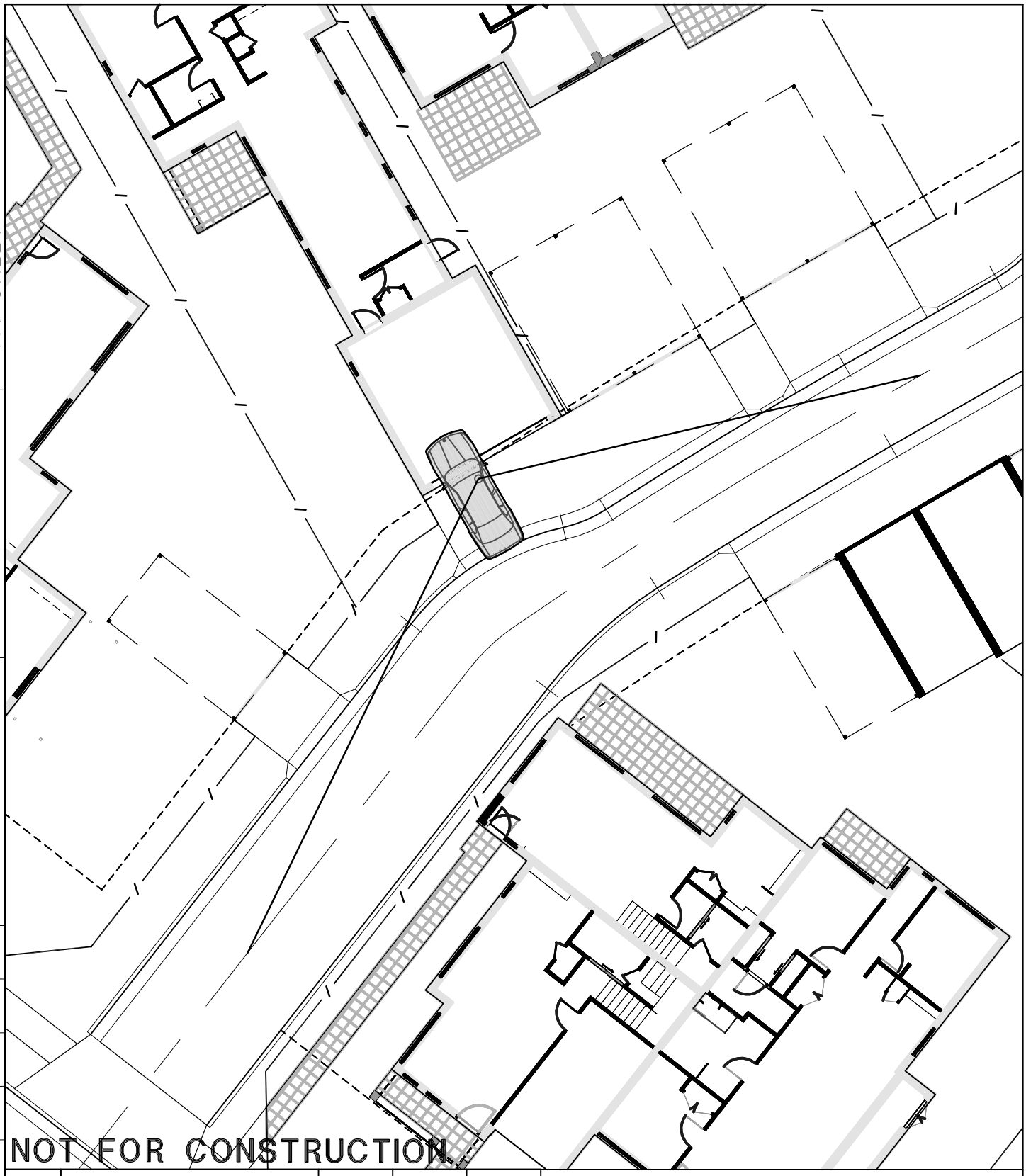

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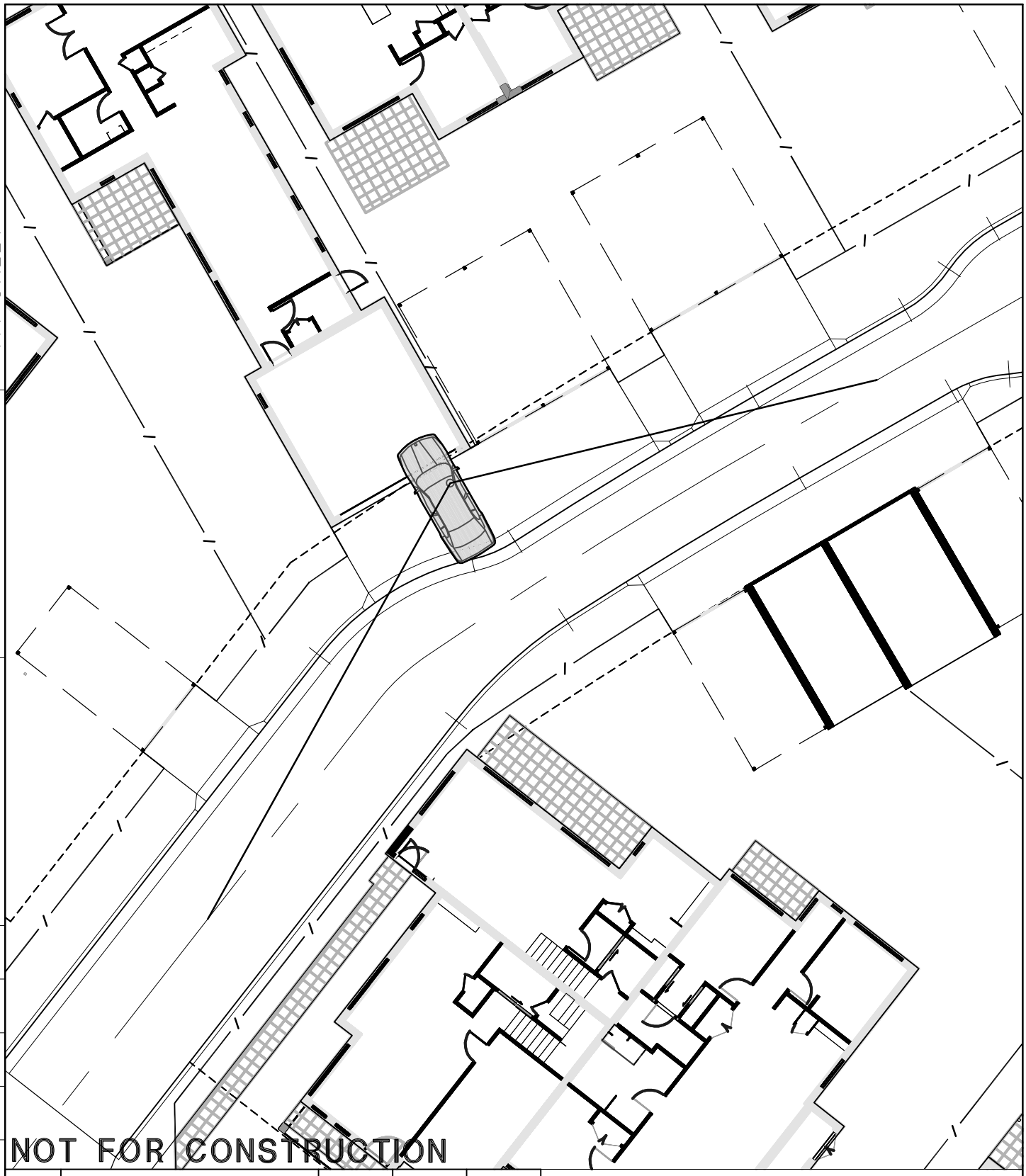

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200mm A4 SHEET
100mm
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A4 SHEET
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100mm
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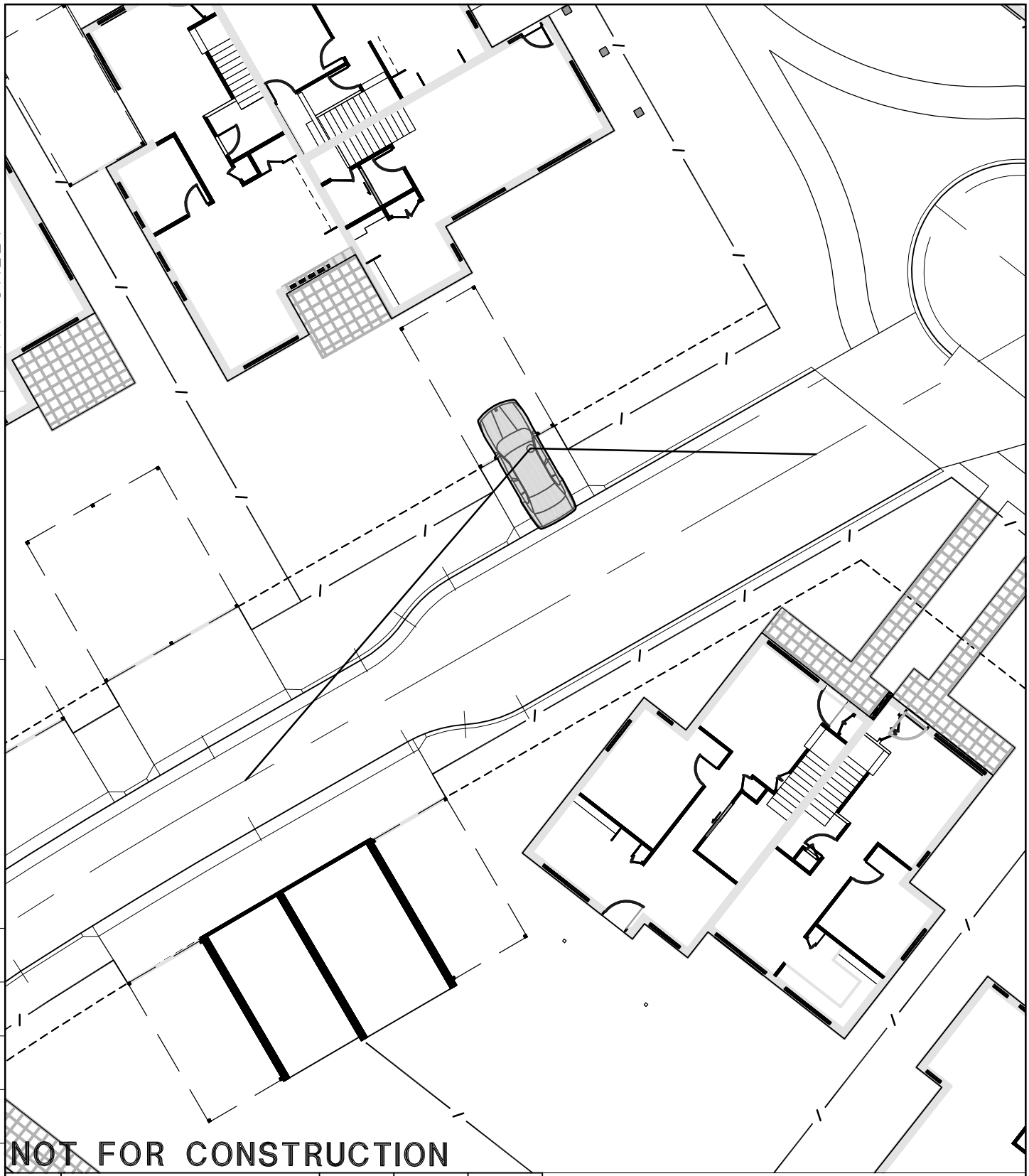

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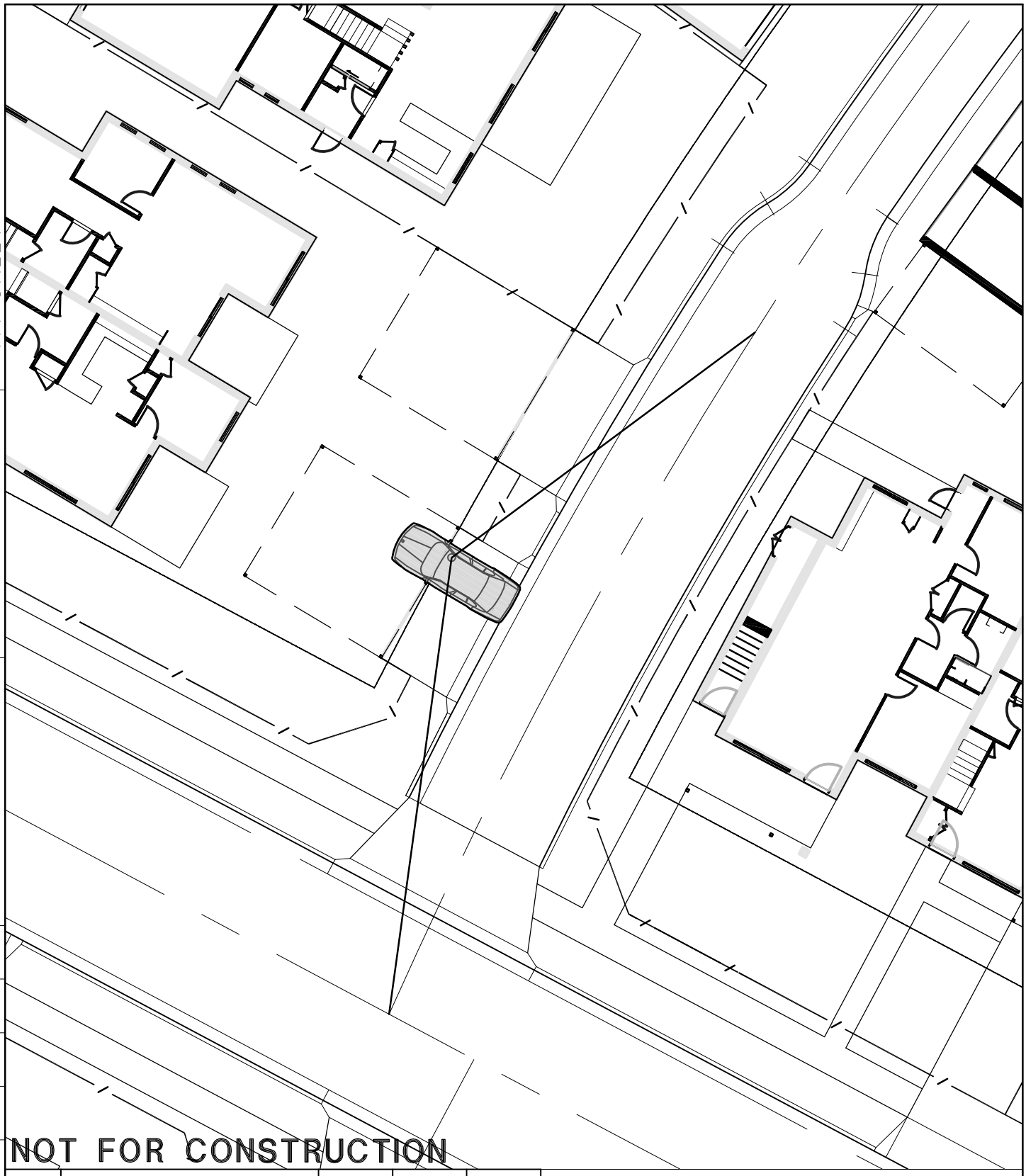

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| Drawing No. – SL202 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0

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|---|---|---|
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| Drawing No. – SL203 | Sheet Of | Revision |



A4 SHEET
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100mm
0

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|---|---|---|
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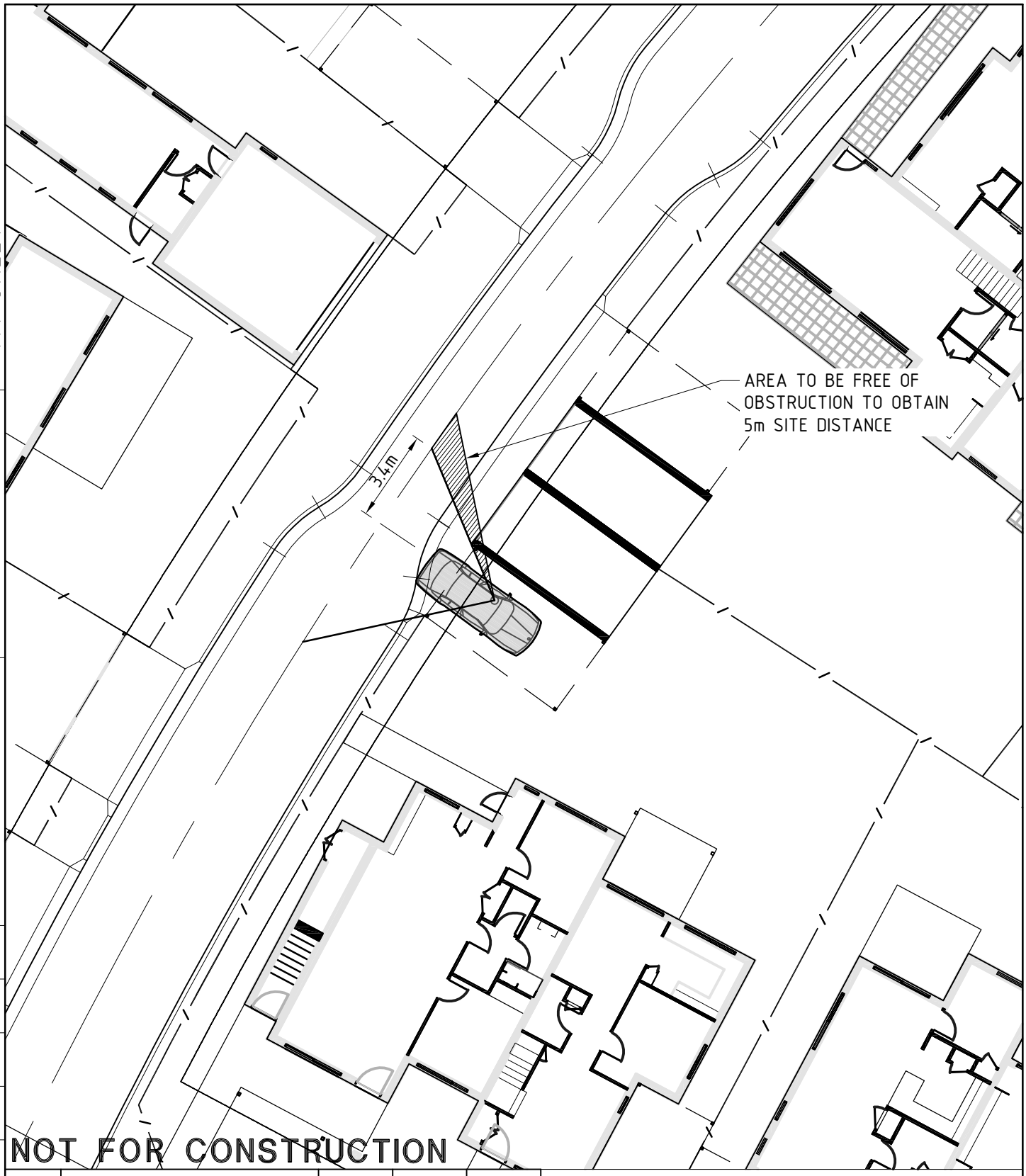


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Project
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL205 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0


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| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
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Project
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL206 | Sheet Of | Revision |

NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |

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Project
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL207 | Sheet Of | Revision |

(*) Unless there is an authorised Hughes Trueman signature at * , this drawing is not authorised for issue.

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| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
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Project
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL208 | Sheet Of | Revision |

(*) Unless there is an authorised Hughes Trueman signature at * , this drawing is not authorised for issue.


200mm A4 SHEET
100mm
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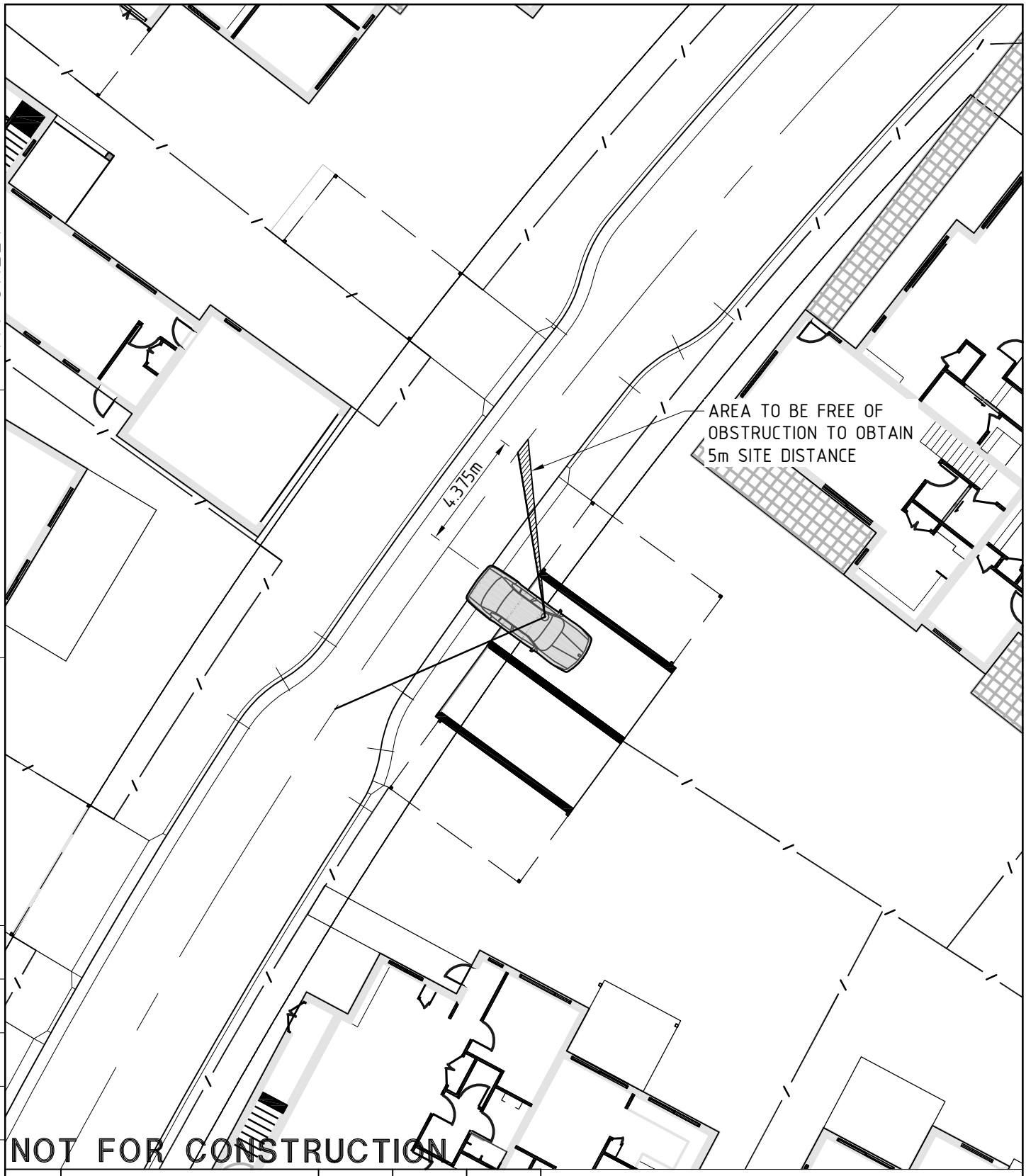


NOT FOR CONSTRUCTION

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|---|---|---|---|---|
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BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL209 | Sheet Of | Revision |



200mm A4 SHEET
100mm
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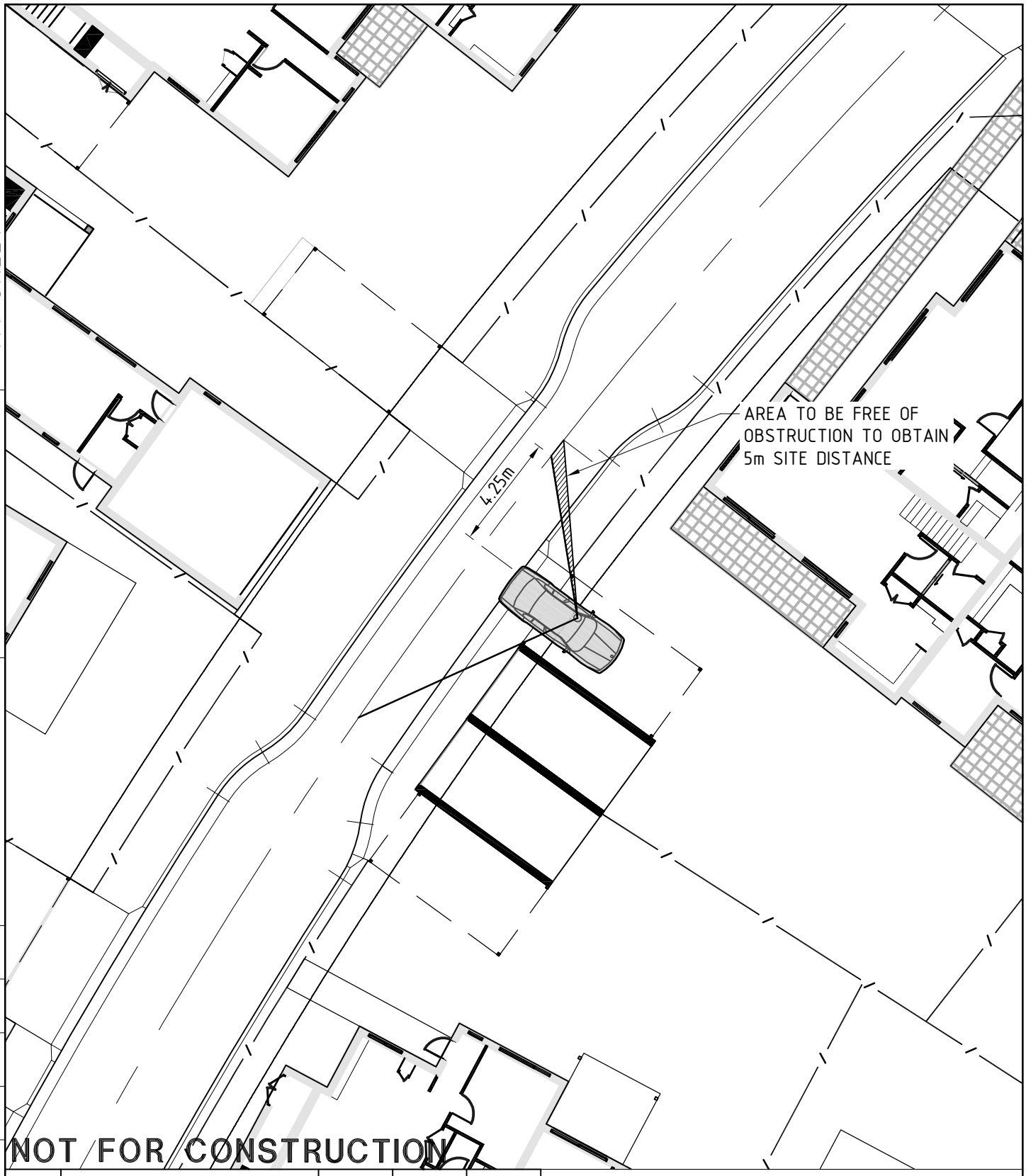


NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |

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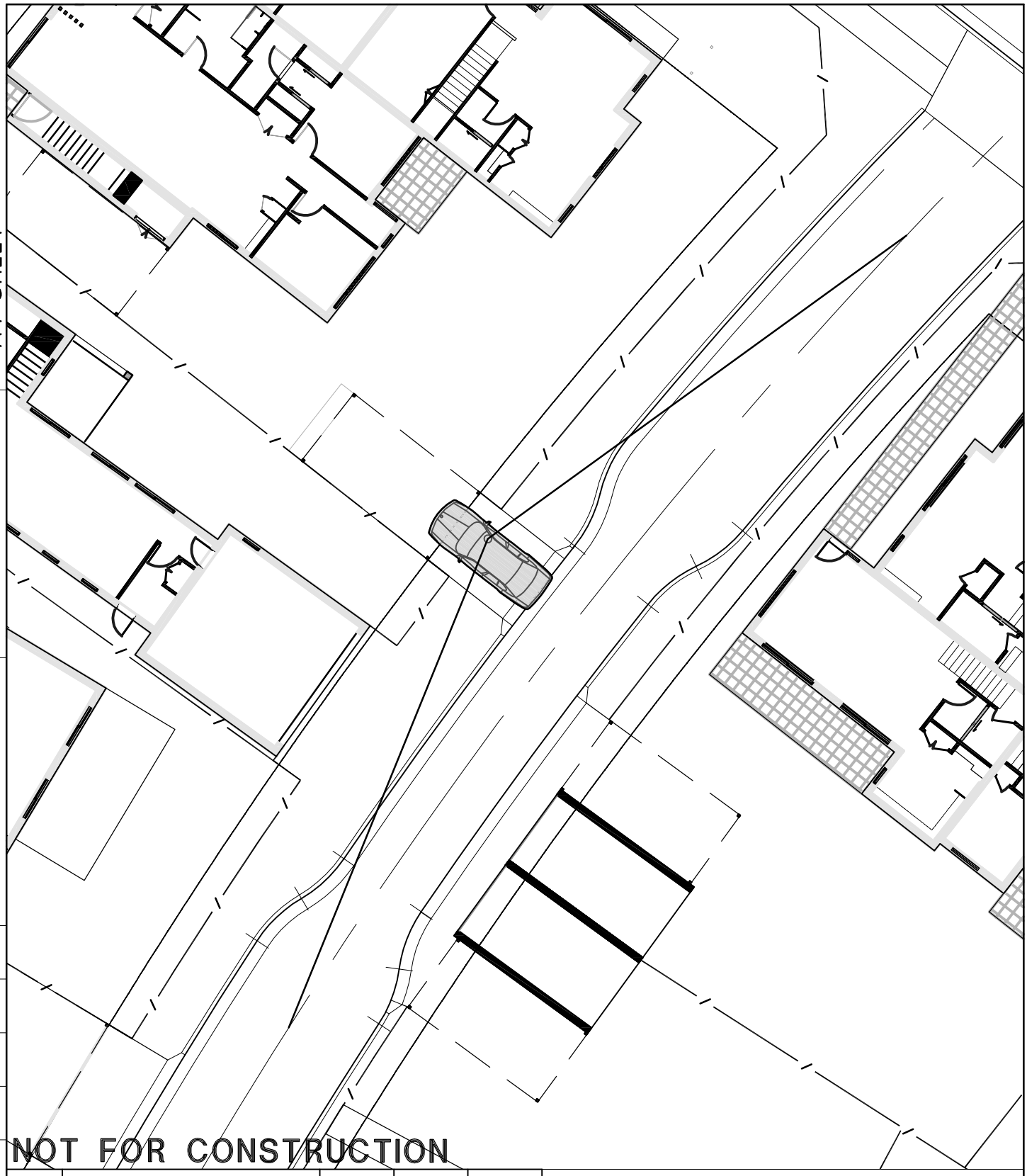
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL210 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0

NOT FOR CONSTRUCTION

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|---|---|---|---|---|
| | | Verified | Authorised (*) | |


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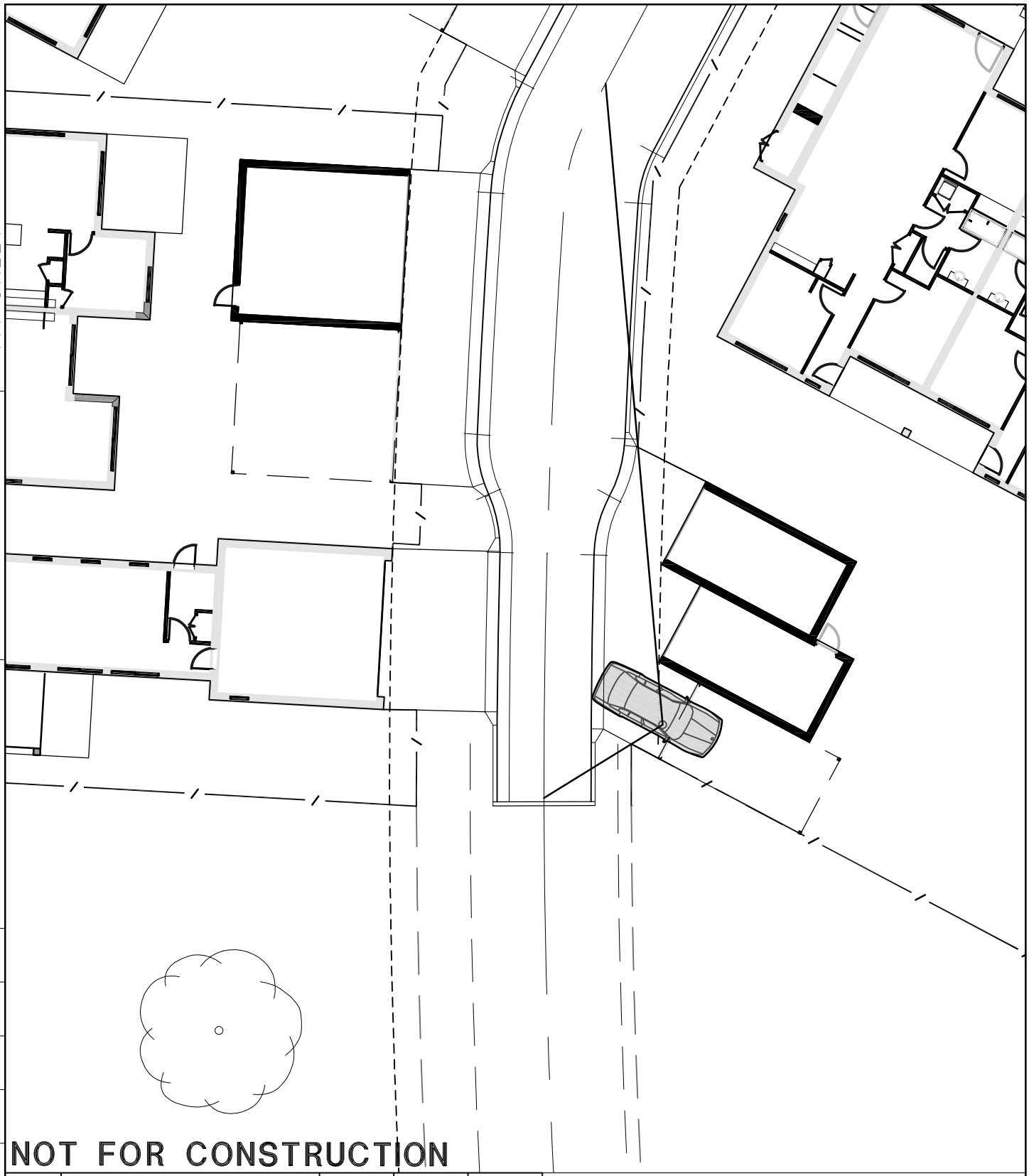
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL211 | Sheet Of | Revision |



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|---|---|---|---|---|
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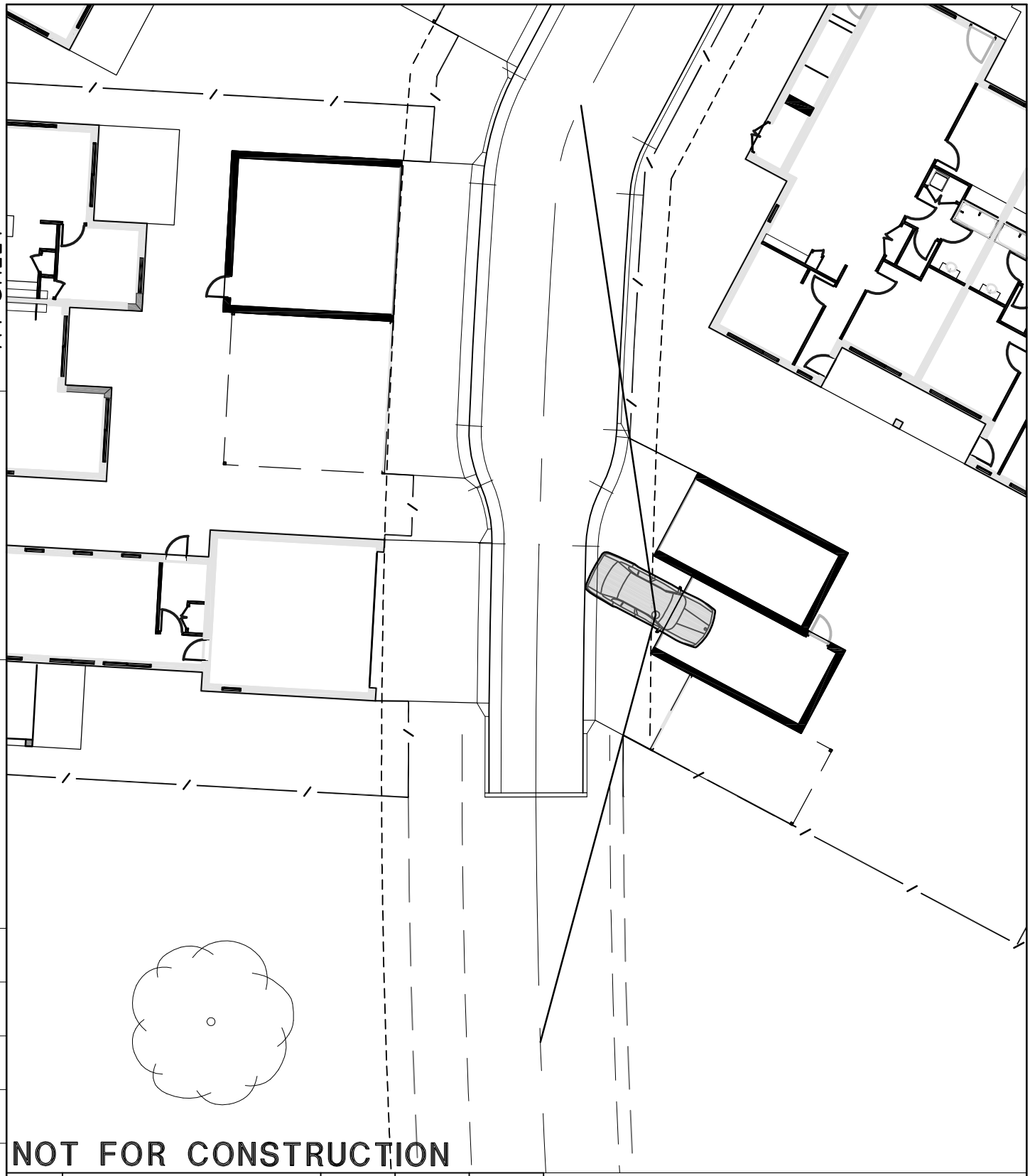
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL301 | Sheet Of | Revision |

(*) Unless there is an authorised Hughes Trueman signature at * , this drawing is not authorised for issue.



A4 SHEET

200mm

100mm

0

NOT FOR CONSTRUCTION

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|---|---|---|---|---|
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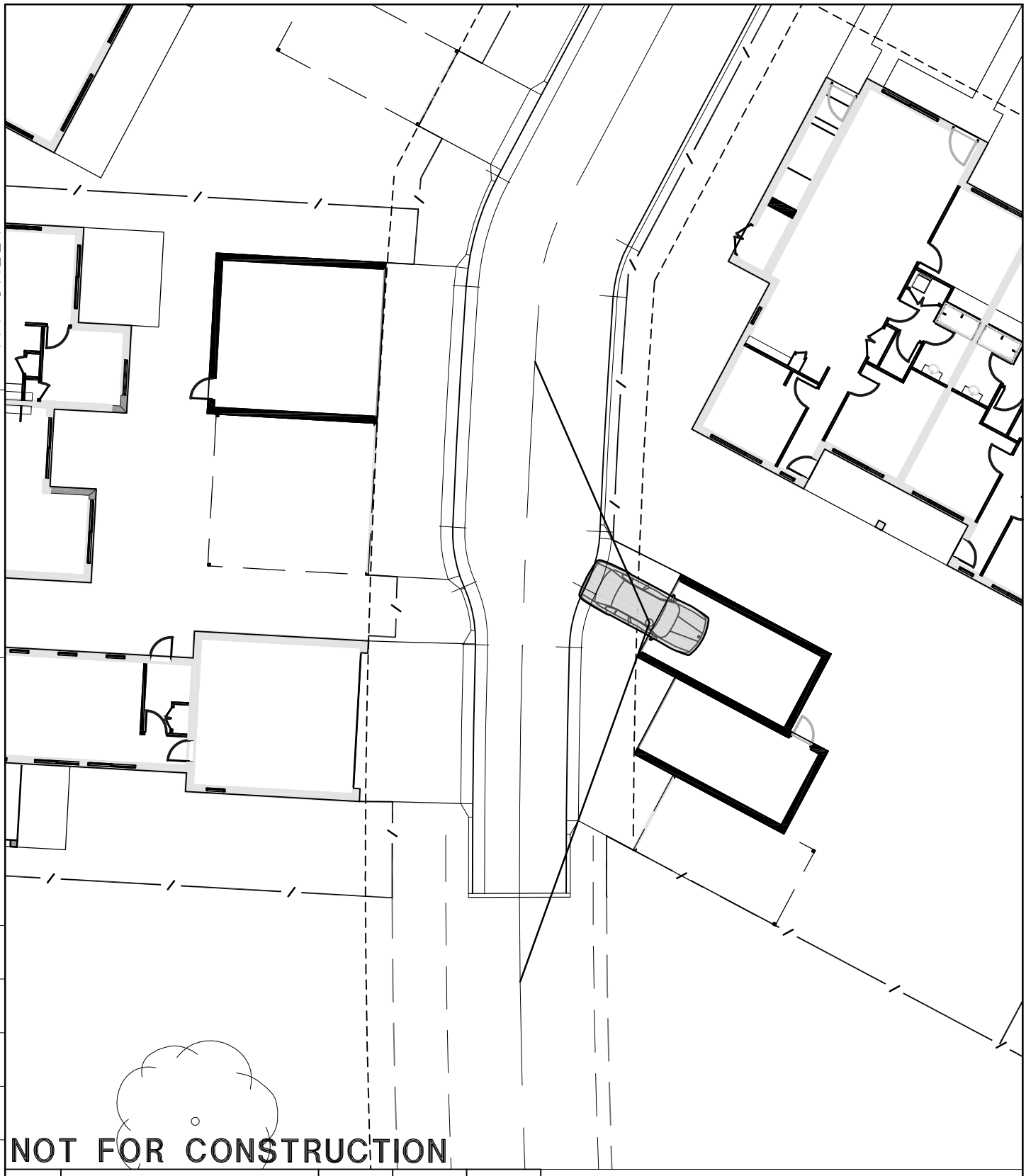
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL302 | Sheet Of | Revision |



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|---|---|---|---|---|
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STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL303 | Sheet Of | Revision |

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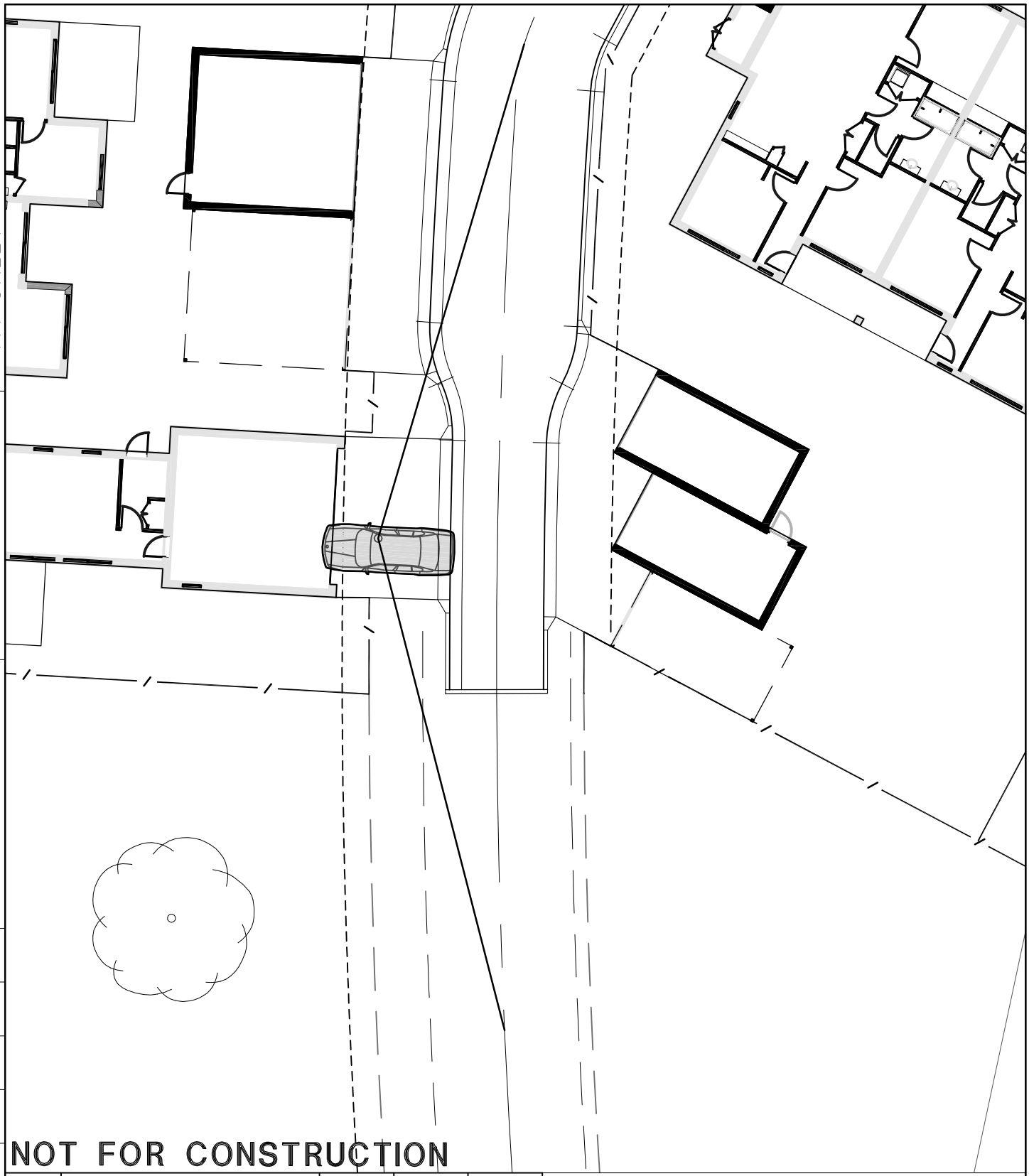
200mm A4 SHEET
100mm
0



A4 SHEET

200mm

100mm

0

NOT FOR CONSTRUCTION

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|---|---|---|---|---|
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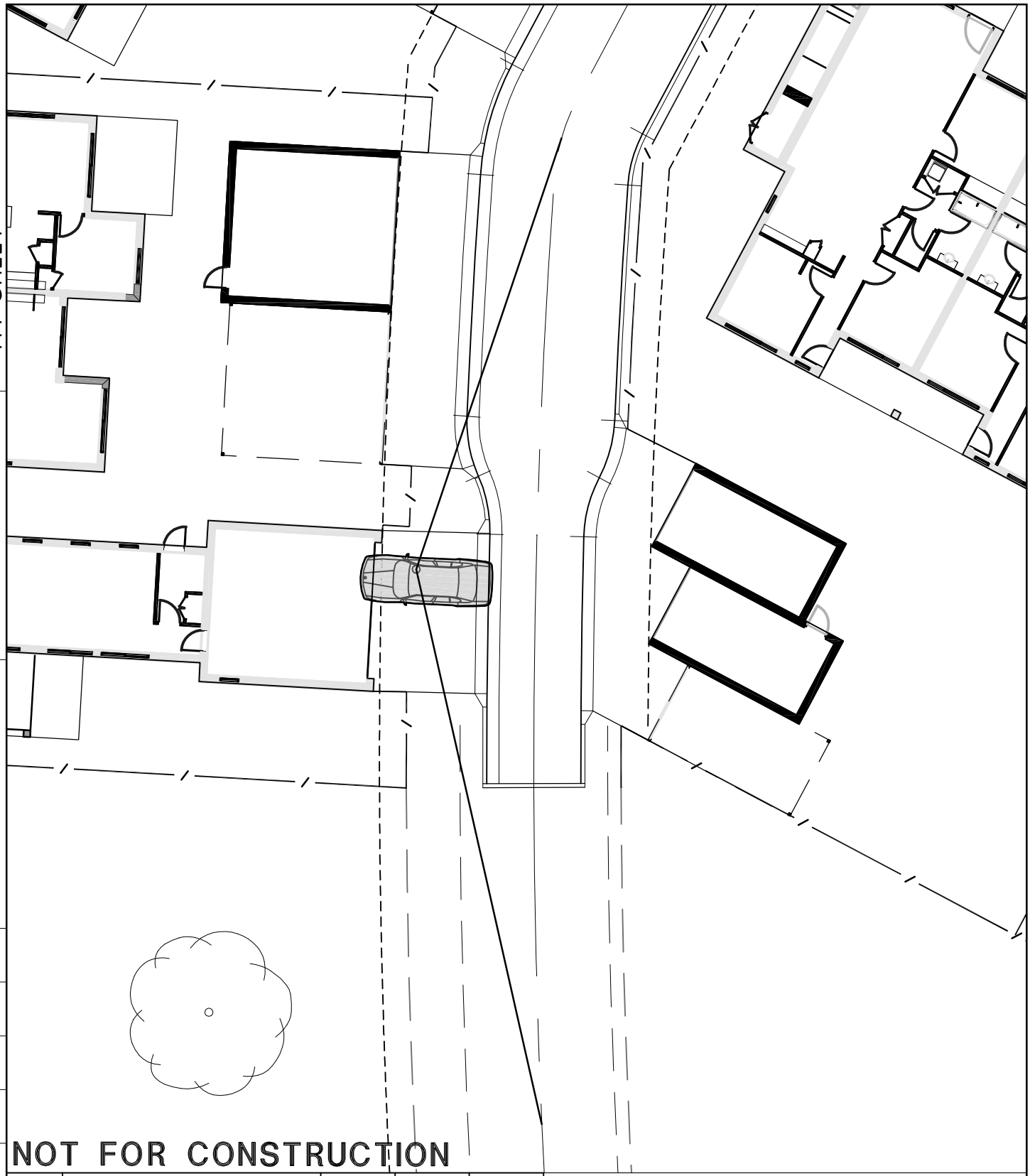
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL304 | Sheet Of | Revision |

(*) Unless there is an authorised Hughes Trueman signature at * , this drawing is not authorised for issue.



A4 SHEET
200mm
100mm
0

NOT FOR CONSTRUCTION

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|---|---|---|---|---|
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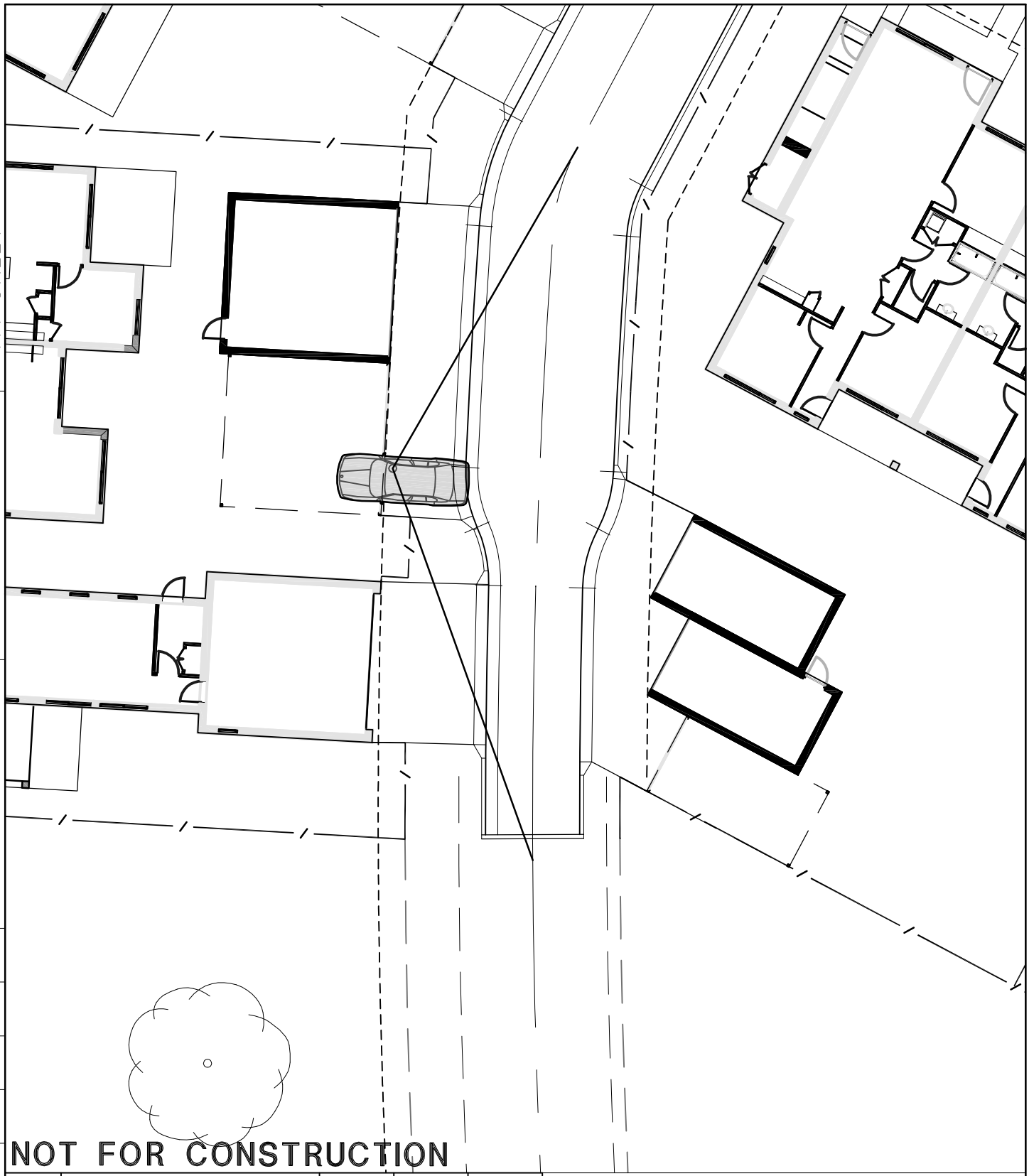
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL305 | Sheet Of | Revision |



NOT FOR CONSTRUCTION

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|---|---|---|---|---|
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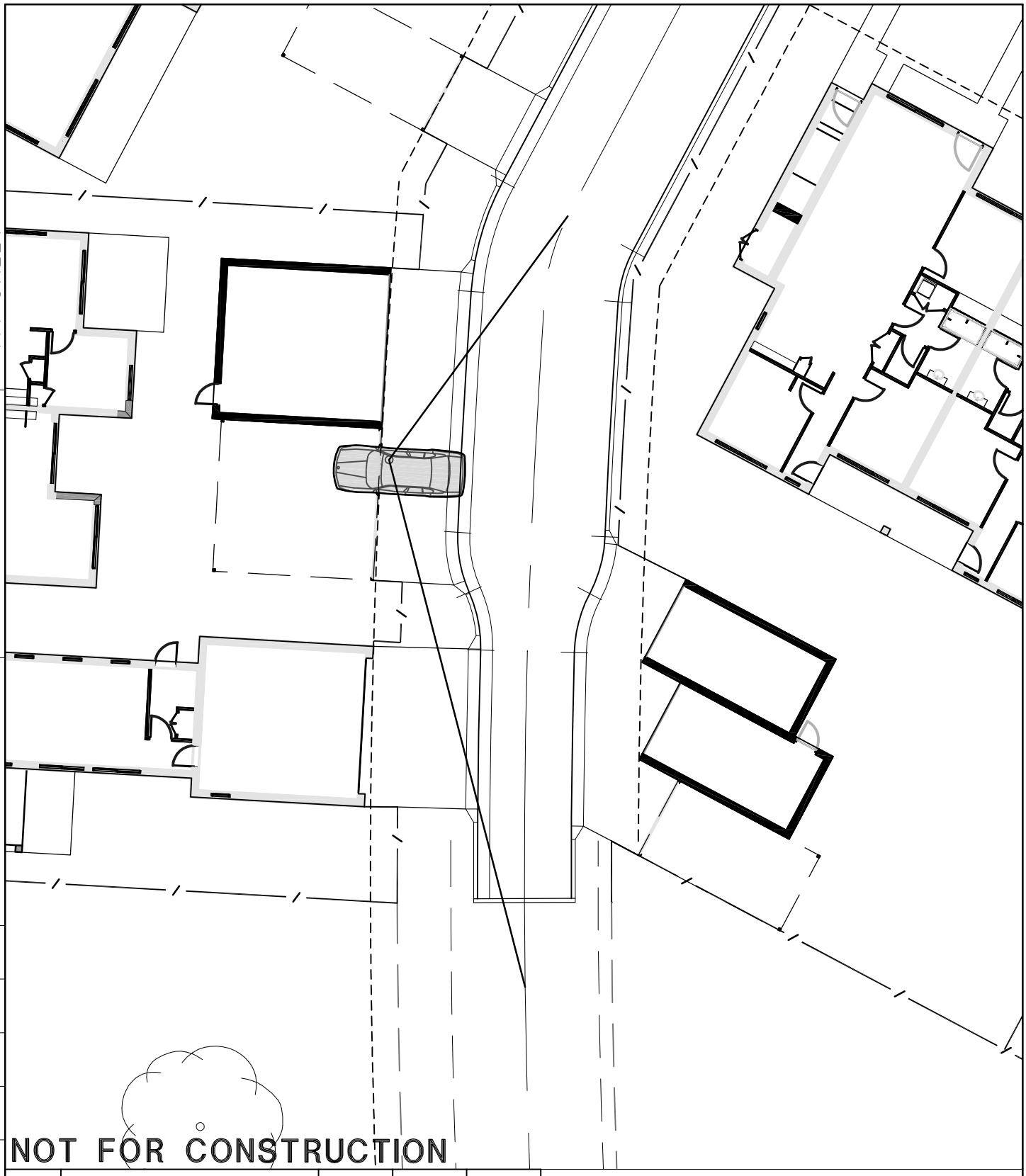
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL306 | Sheet Of | Revision |

(*) Unless there is an authorised Hughes Trueman signature at * , this drawing is not authorised for issue.


A4 SHEET
200mm
100mm
0



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|---|---|---|---|---|
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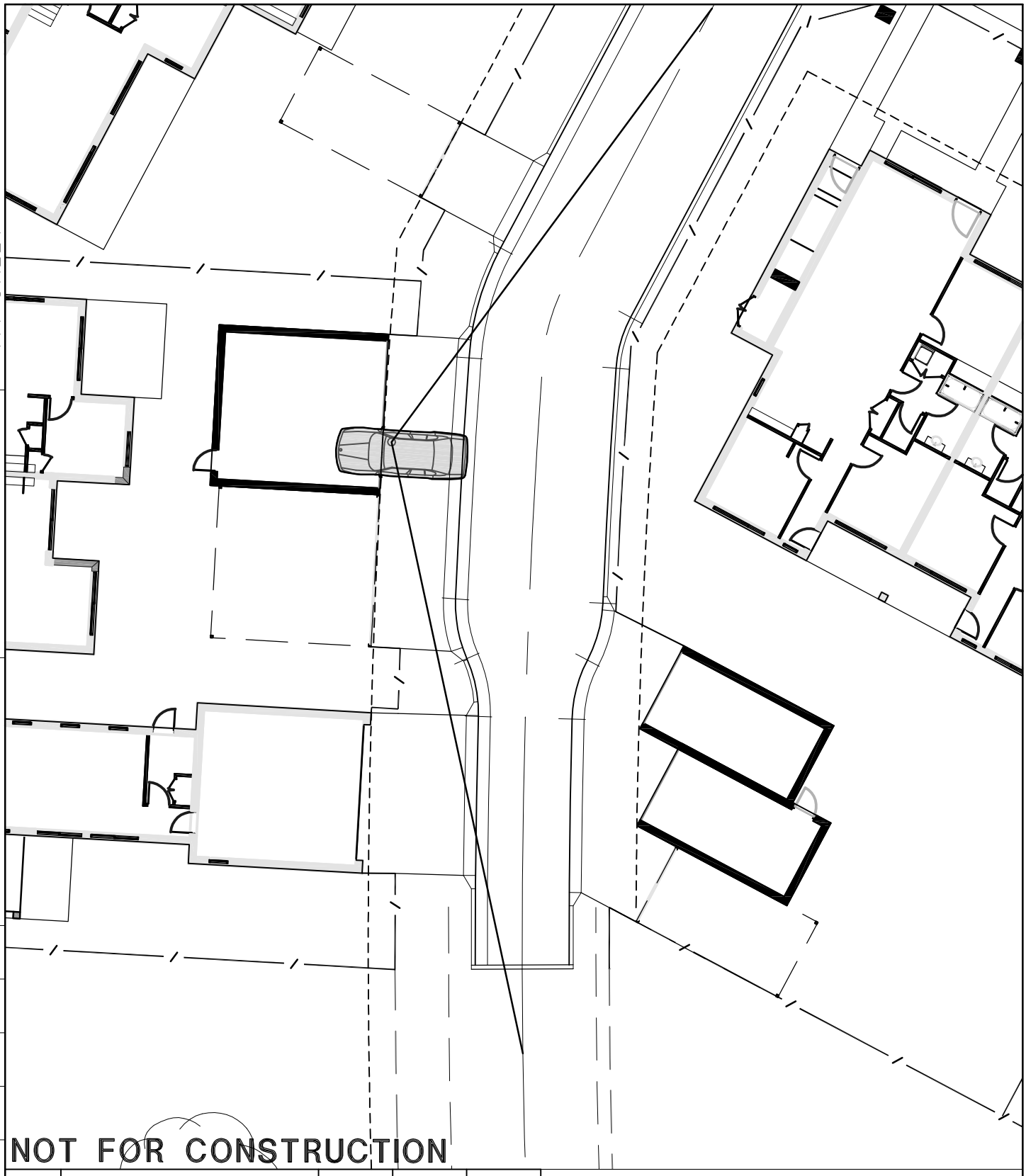
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL307 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0



NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |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BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL308 | Sheet Of | Revision |

NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
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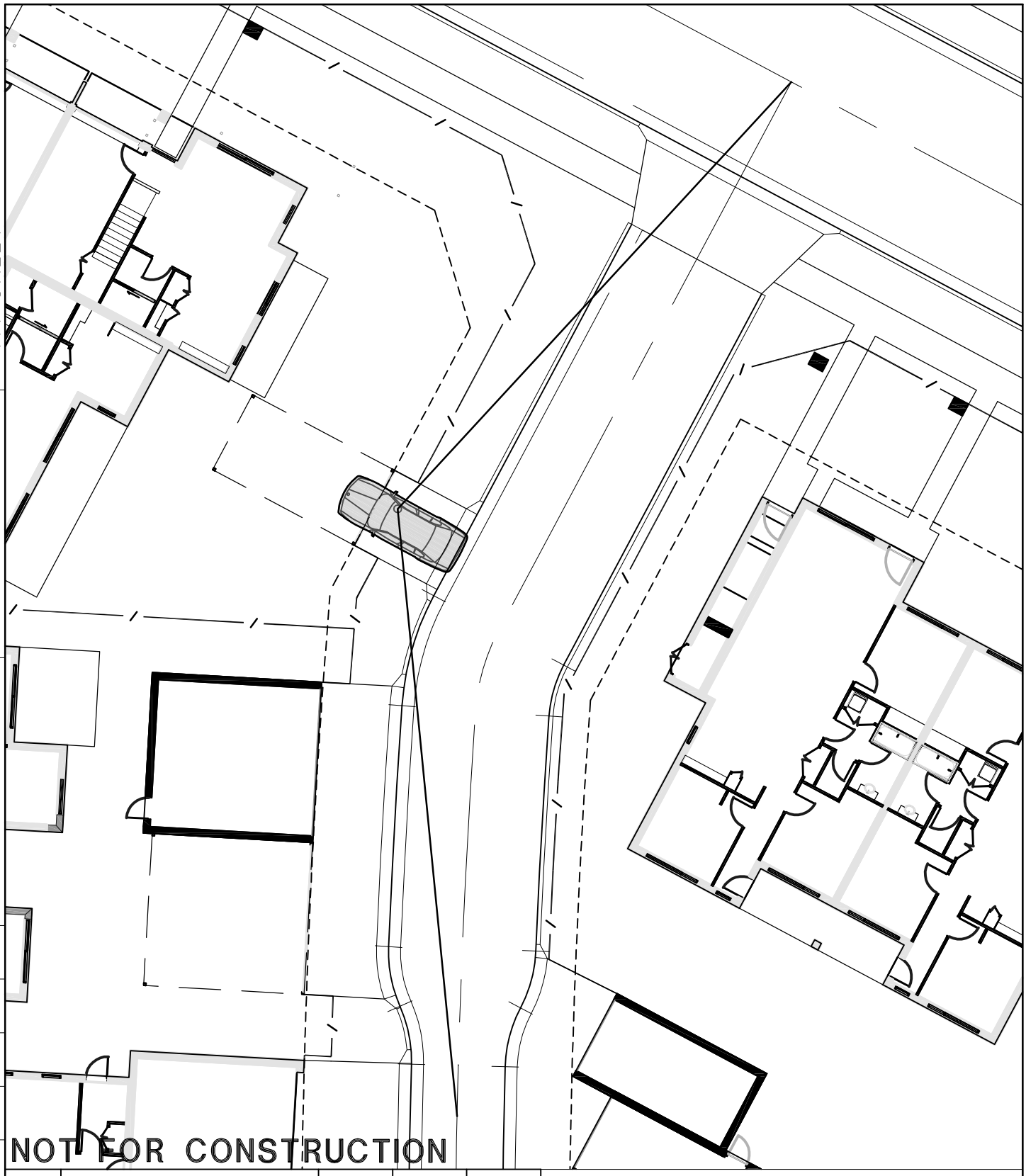
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL309 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0



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|---|---|---|---|---|
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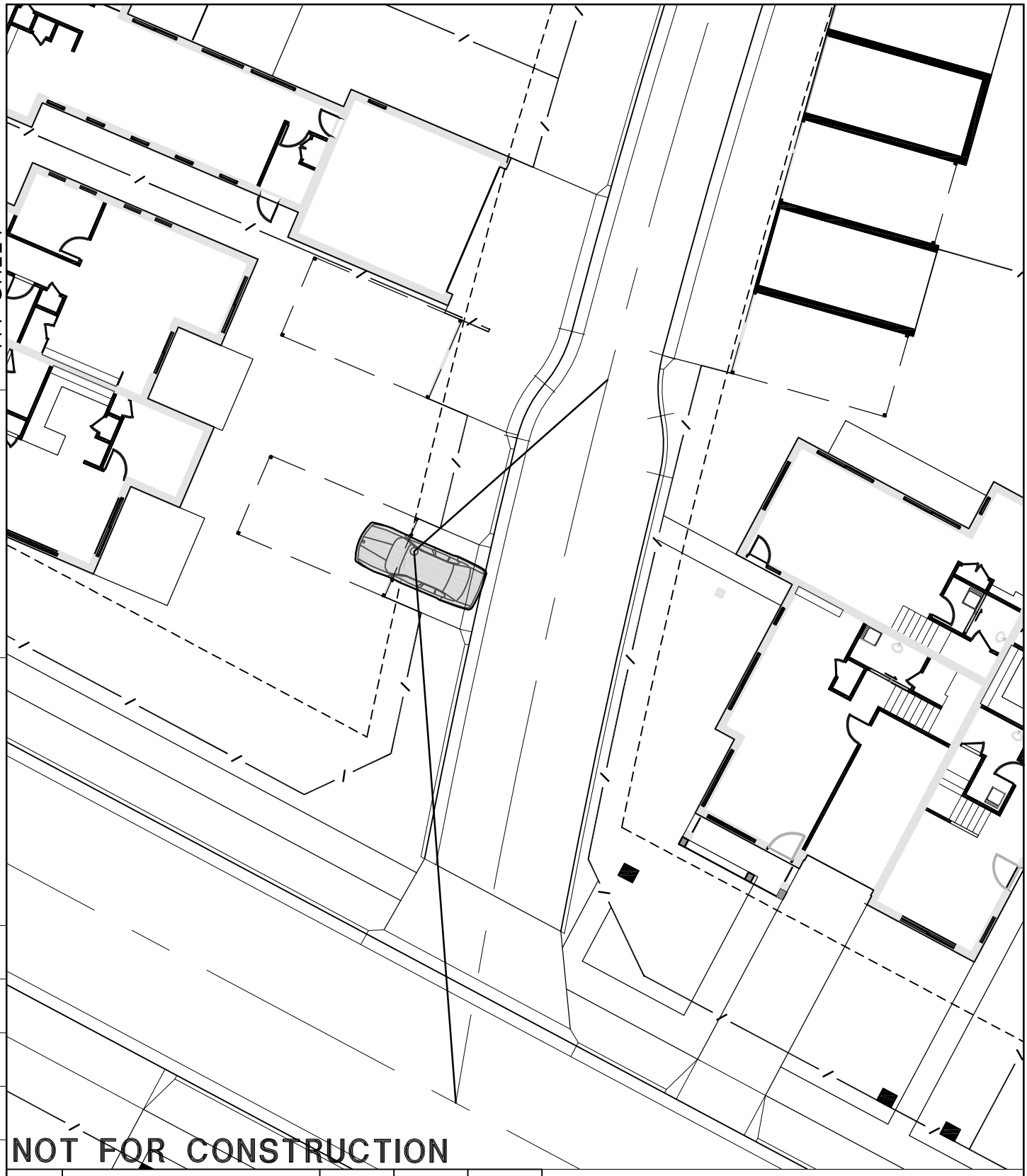
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL310 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0



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|---|---|---|---|---|
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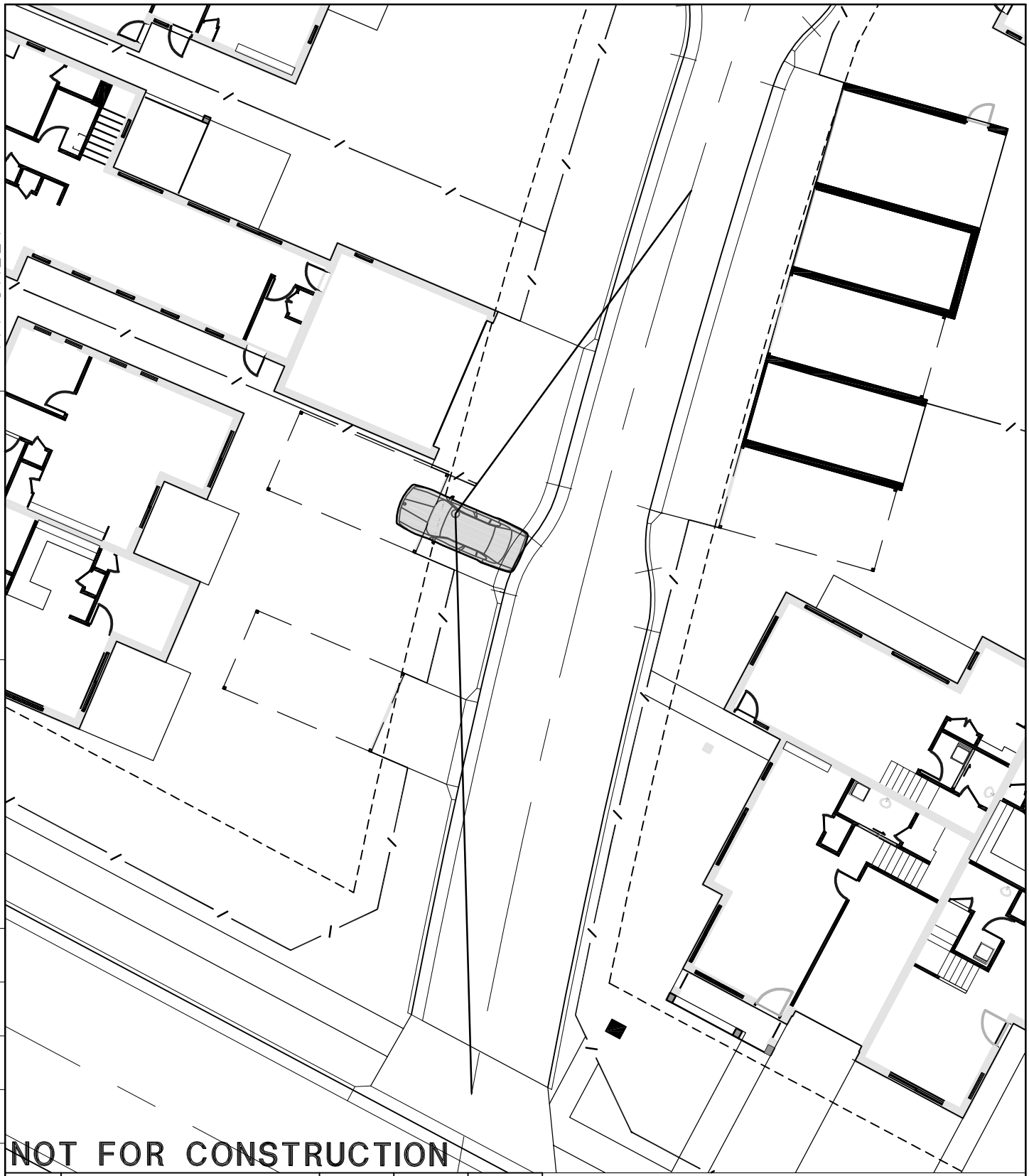
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL311 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0



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|---|---|---|---|---|
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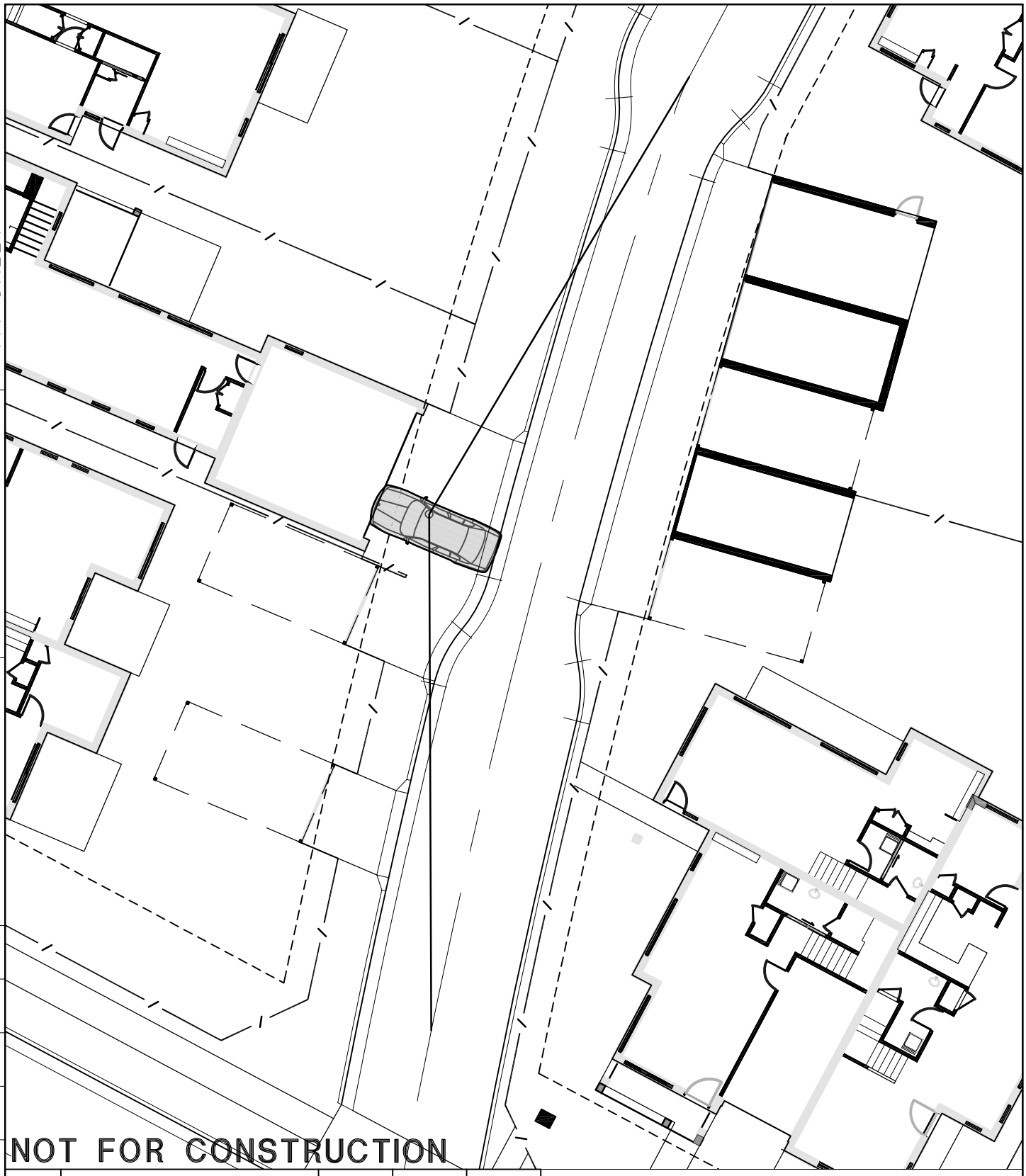
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL312 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0



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| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
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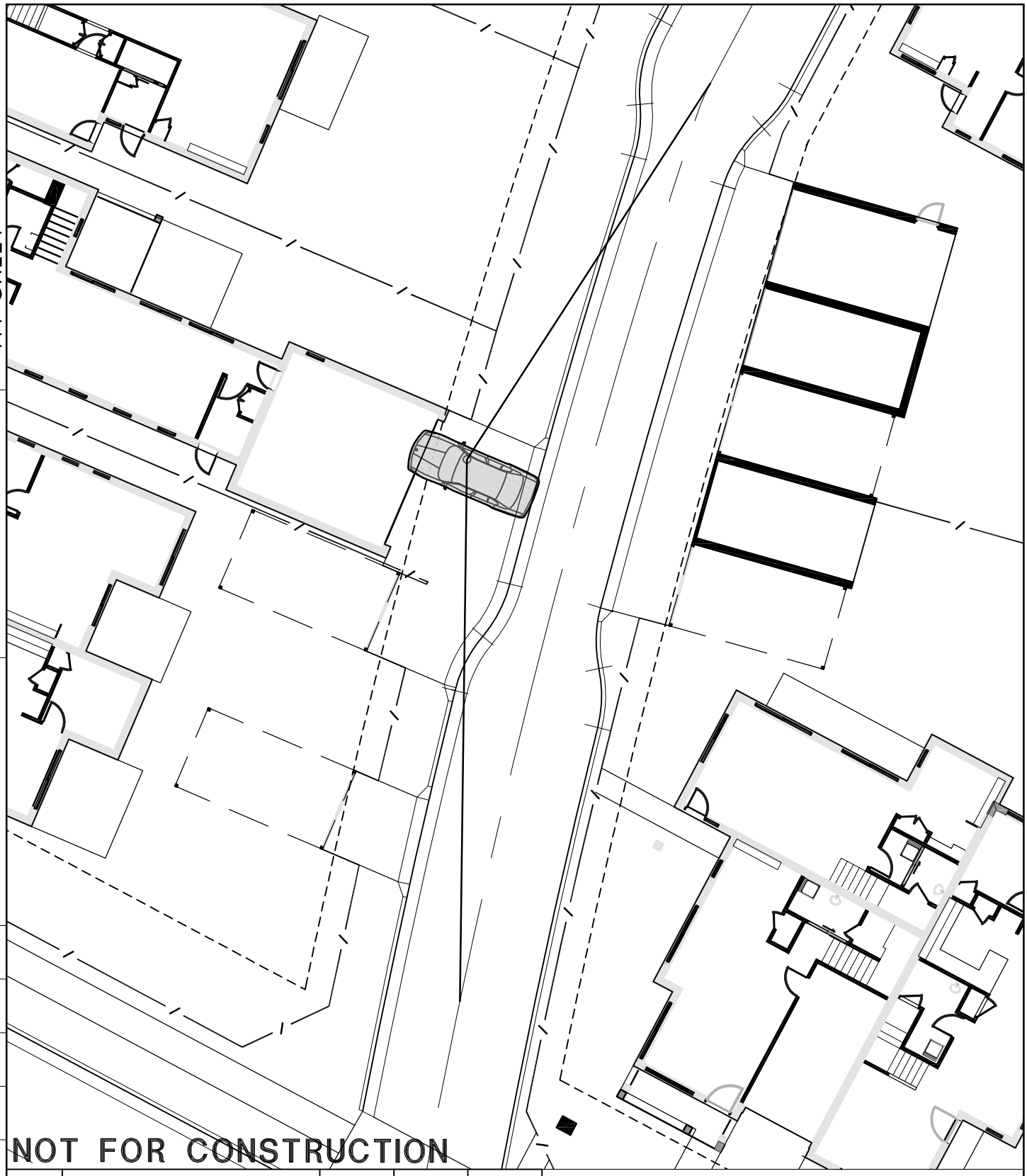
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL313 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0



NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |

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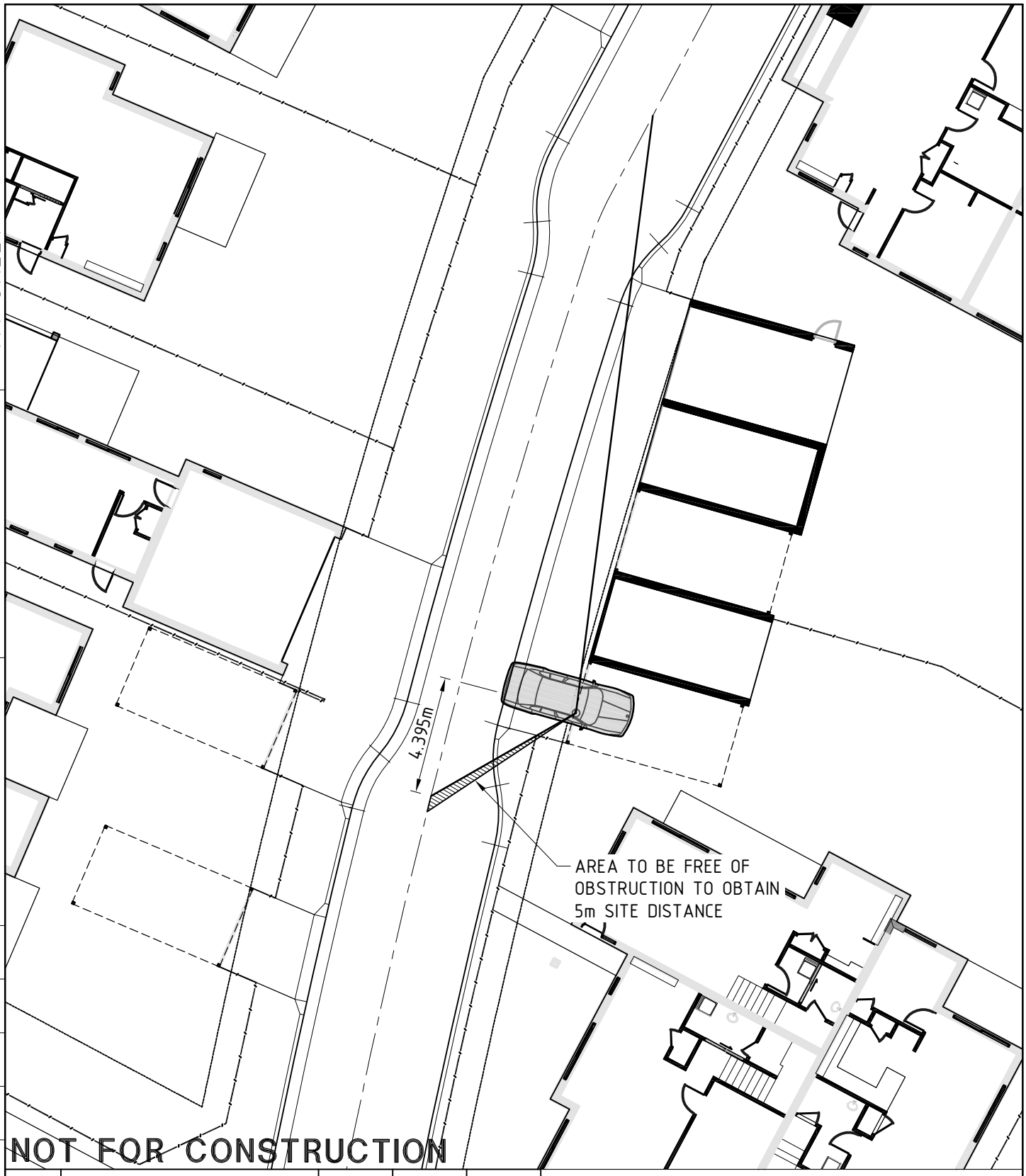
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL314 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0

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|---|---|---|---|---|
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BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL315 | Sheet Of | Revision |

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200mm A4 SHEET
100mm
0

NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |

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STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL316 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0

A4 SHEET

200mm

100mm

0

NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |


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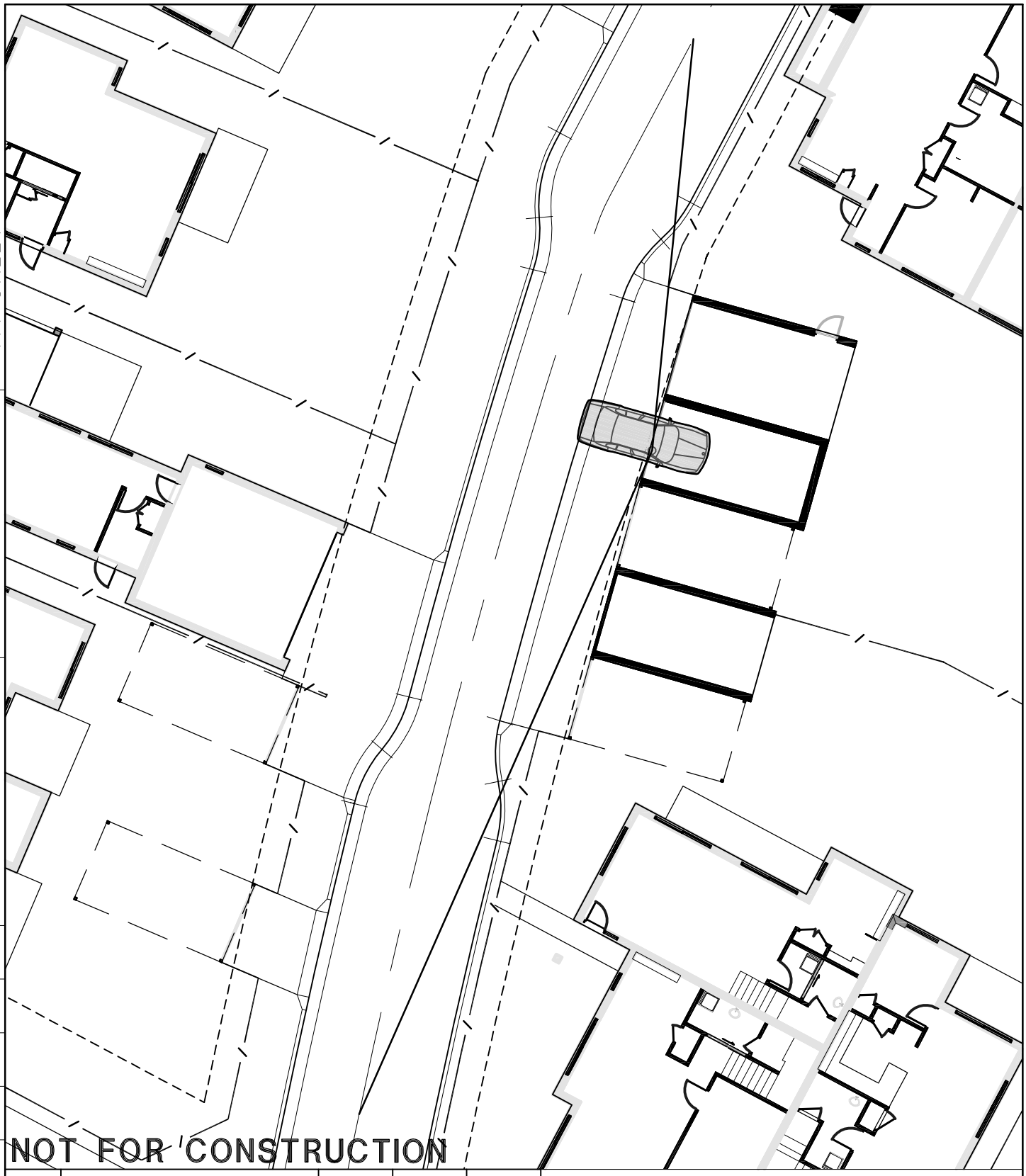
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL317 | Sheet Of | Revision |



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| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |

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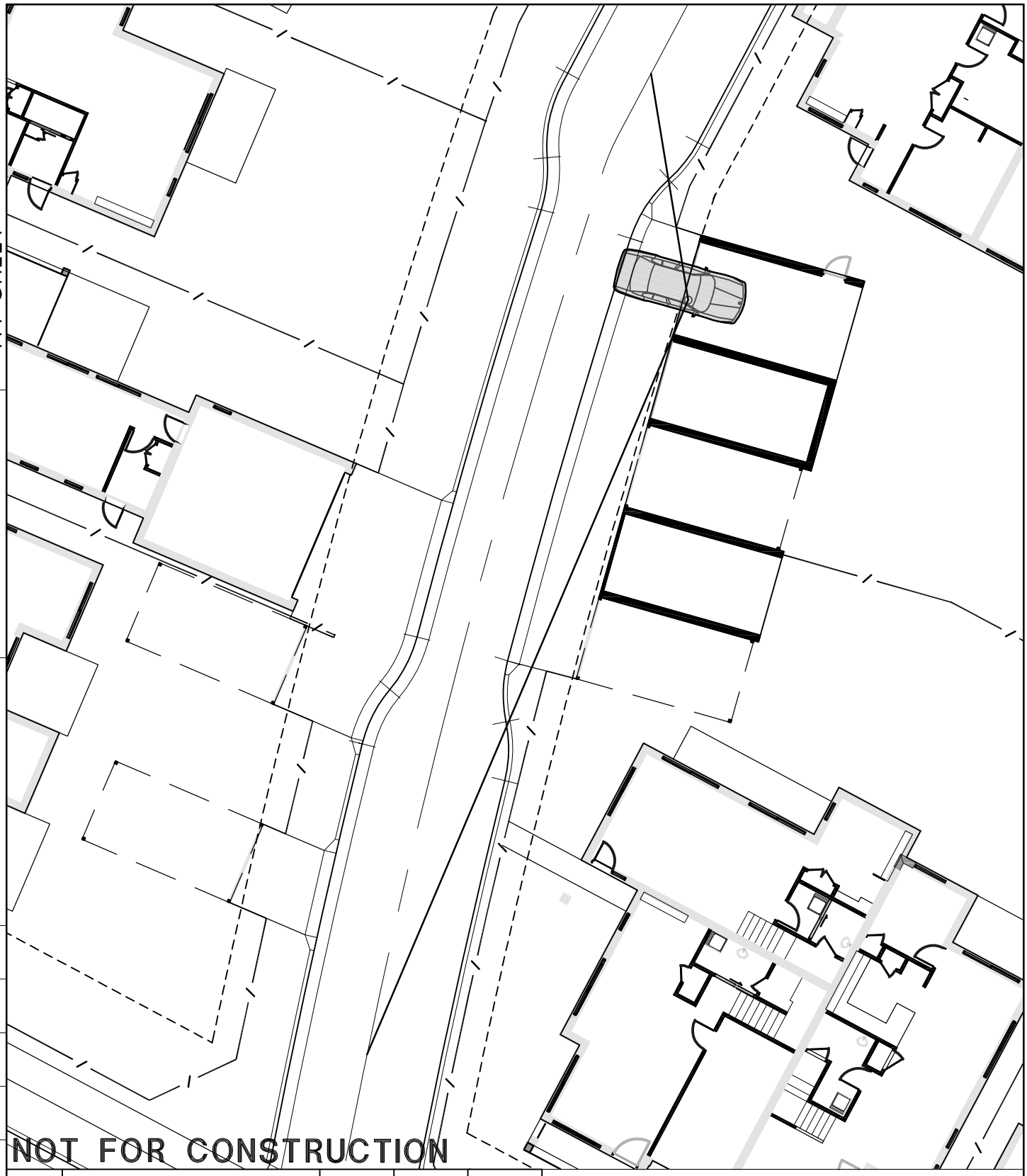
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL318 | Sheet Of | Revision |



NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |

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STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL319 | Sheet Of | Revision |

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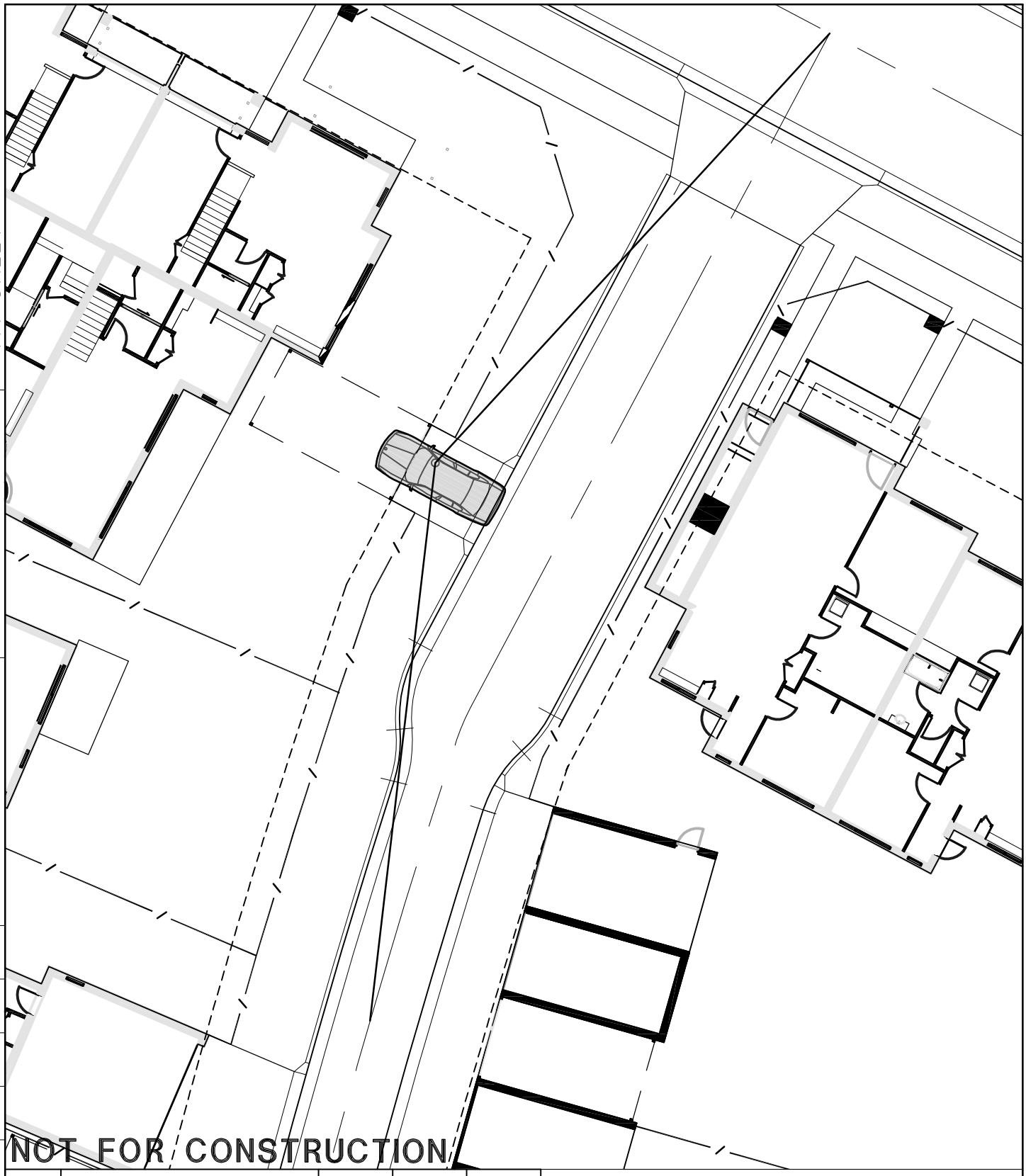
A4 SHEET
200mm
100mm
0



NOT FOR CONSTRUCTION

| Revision | Amendment or Reason For Issue | Date | Drawn | Designed |
|---|---|---|---|---|
| | | Verified | Authorised (*) | |

HughesTrueman
Consulting Engineers Planners & Managers
ABN 53 831 529 091
Level 1, 90 Phillip Street, PARRAMATTA NSW 2150
T 02 9891 5044 F 02 9891 5386 parramatta@hughestrueman.com.au

ACEA

Project
BONNYRIGG LIVING COMMUNITIES
STAGE 1

Client

| Drawing Title | Scales | |
|---|---|---|
| B85 AUTOTURN | 1:200@A4 | |
| Drawing No. – SL320 | Sheet Of | Revision |



A4 SHEET
200mm
100mm
0

# APPENDIX D - SWC FEASIBILITY LETTER

e-Developer

**VIEW REQUIREMENTS**

| CASE INFORMATION | |
|---|---|
| Case Number | **109743** |
| WSC's Reference | **Bonnyrigg** |
| Application Type | **Feasibility** |
| Development Type | **Multi Unit** |
| Development Location | **Edensor Road, Bonnyrigg** |
| WSC Personnel Name | **Christopher Randall** |
| WSC Company Name | **Hughes Trueman Pty Ltd (Prov S2)** |
| Developer's Name | **Bonnyrigg Partnerships** |
| Stage Name | **Masterplan** |
| Stage Number | **1** |
| Define DSR Responsible | **Ann Powell** |

| VIEW REQUIREMENTS | |
|---|---|
| View Notice/Letter | View |

Modifications to the Draft Notice of Requirements:

| NEGOTIATE REQUIREMENTS | |
|---|---|
| Do you agree with the requirements specified in this notice? | (•) Yes ( ) No |

*This advice is provided as a guide only, is current at the date of issue and may be subject to change.*

Sydney WATER

Case Number: 109743

10 January 2008

Bonnyrigg Partnerships
c/- Hughes Trueman P/L (Parramatta)

**FEASIBILITY LETTER**

| | |
|---|---|
| **Developer:** | **Bonnyrigg Partnerships** |
| **Your reference:** | **Bonnyrigg** |
| **Development:** | **Edensor and Bonnyrigg Roads and Elizabeth Drive Bonnyrigg** |
| **Development Description:** | **Urban Re-development of an Existing Brownfield Department of Housing Area (Overall Site)** |
| **Your application date:** | **06 November 2007** |

Dear Applicant

This Feasibility Letter (Letter) is a guide only. It provides general information about what Sydney Water's requirements could be if you applied to us for a Section 73 Certificate (Certificate) for your proposed development. **The information is accurate at today's date only.**

If you obtain development consent for that development from your consent authority (this is usually your local Council) they will require you to apply to us for a Section 73 Certificate. You will need to submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (Coordinator).

Sydney Water will then send you either a:
- Notice of Requirements (Notice) and Works Agreement (Agreement); or
- Certificate.

These documents will be the definitive statement of Sydney Water's requirements.

There may be changes in Sydney Water's requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

**1. Developer Charges**

(a) Adjustment of charges due to the Consumer Price Index (CPI);

(b) Adjustment of charges because of a scheduled review by the Independent Pricing and Review Tribunal (IPART). After that review and registration of the new charges, Sydney Water has to apply those charges; or

(c) If there is rezoning of any land within the development proposal then new charges will apply.

**2. Reticulation Recovery Charges**

These charges recover part of the cost of works that have been paid for by Sydney Water or other developers and that benefit your development. This charge has been made before your points of connection have been determined. If your completed designs show that your development will be connected to other main/s, the charge may be changed and/or you may need to construct other works.

**3. Changing the Proposed Development**

If you change your proposed development, e.g. the development description or the plan/site layout, after today, the requirements in this Letter could change when you submit your new application.

Also, if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

**You have made an application for specific information. Sydney Water's possible requirements are:**

## What You Must Do To Get A Section 73 Certificate

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting www.sydneywater.com.au ➢ Building Developing and Plumbing ➢ Developing Your Land.

**1. Obtain Development Consent from the consent authority for your development proposal.**

As this is to be a staged Subdivision **(18 Stages)** you must make separate applications for Section 73 Certificates for each of the development consents issued.

**2. Engage a Water Servicing Coordinator (Coordinator).**

**You must engage your current or another authorised Coordinator** to manage the design and construction of works that you must provide, at your cost, to service your development. Before you engage another Coordinator you must write and tell Sydney Water.

For a list of authorised Coordinators, either visit www.sydneywater.com.au ➢ Building Developing and Plumbing ➢ Developing Your Land or call **13 20 92.**

The Coordinator will be your point of contact with Sydney Water. They can answer most questions that you might have about the process and developer charges and can give you a quote or information about costs for services/works (including Sydney Water costs).

## 3. Water and Sewer Works

### 3.1 Water

A number of water main extensions must be constructed to provide for all future 18 proposed stages of this development.

Each lot in each stage of your development must have a frontage to a water main that is the right size and can be used for connection.

Sydney Water has no objection to the proposed disuse of water mains as identified on submitted plans in your application.

These works of water reticulation are to be carried out in accordance with the Water Supply Code of Australia (Sydney Water Edition). The developer must submit a detailed design for the construction of the new water mains & provide details of how the new water mains will be constructed while maintaining supply to Sydney Water's customers via the existing water mains.

The existing water system has sufficient capacity to serve the proposed **18 Stages** of this development.

### 3.2 Sewer

A number of sewer main extensions must be constructed in order to provide for 18 proposed stages of this development.

Each lot in each stage of your development must have a sewer main that is the right size and can be used for connection. That sewer must also have a connection point within each lot's boundaries.

Sydney Water has no objection to the proposed disuse of sewer mains as identified on submitted plans in your application provided that the following requirements are met:

a) The existing sewer connections are maintained and connected to the new sewer mains as per Sewer Supply Code of Australia (Sydney Water Edition).

b) Disused sewer mains must be broken out (not sand-filled) and removed from the site.

These sewer reticulation works must also be carried out in accordance with the Sewer Supply Code of Australia (Sydney Water Edition).

The existing sewer system has sufficient capacity to serve the proposed **18 Stages** of this development.

## 4. DSP Charges.

Due to the varying development types and densities associated with the various stages in this development DSP Charges cannot be accurately calculated for each stage until a application for each of the stage of this development has been lodged.

The Water DSP area is Liverpool and the Sewer DSP area is SPS 384.

## 5. Recycled Water

Sydney Water will not comment fully on the proposed use of private recycled water systems in conjunction with this development until full details are submitted for further investigation and it's impact on Sydney Water's existing systems. The comments below have been issued on a general basis:

- Any works associated with the recycled water system for this development should be in accordance with the Water Supply Code of Australia (Sydney Water Edition) and relevant Plumbing Codes.
- The pressure in Sydney Water's potable water system should be greater than the pressure in the proposed private recycled water system to help prevent contamination of the potable water supply should there be a cross connection.
- If Sydney Water ends up owning the potable water and a third party owns the proposed private recycled water system then Sydney Water may require additional checks to our potable water to confirm cross connections between potable water and recycled water do not occur within each property. Please note within the Rouse Hill Development Area where Sydney Water owns both the recycled and potable water systems we carry out additional checks.

Finally as this development proposal is located a substantial distance away from any existing recycled water scheme (i.e. Hoxton Park seems nearest) it is not clear where the developer proposes to source their recycled water from.