Appendix E

Landscape Character and Visual Impact Assessment
LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT

Overhead Power Line - Grange Avenue, Schofields to South Marsden Park
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Background

1.1 Introduction

JMD Design were commissioned by Endeavour Energy to prepare a Landscape Character and Visual Analysis Report along Grange Ave, Marsden Park between Richmond Rd and Eastern Creek (the Subject Land) Refer Figure 1.2.

Endeavour Energy plan to construct a new overhead transmission line along the northern side of Grange Avenue. JMD have assessed the visual impact of the proposed power line on the existing landscape character and visual amenity of the subject site.

The Subject Land is 2.3km in length and straddles the suburbs of Schofields and Marsden Park in Blacktown City Council LGA. Refer Figure 1.1

![Location Plan Legend](image)

Figure 1.1: Location plan
(Source: Parramatta City Council, 2012)

1.2 Project objectives

Endeavour Energy’s objectives for this project is to provide electricity to the rapidly developing Marsden Park Industrial Precinct through the installation of a new electricity line. This new line will form part of the line connecting Schofields Zone Substation and the future Marsden Park South Zone Substation.

1.3 Purpose of the Report

The purpose of this report is to map existing landscape, visual and scenic qualities of the site and surrounding areas and provide a site analysis and recommendations that will inform the design and implementation of the new power line along Grange Avenue.
Figure 1.2: Subject site
(Source: Nearmaps, 2014)
1.4 Methodology

The methodology employed to undertake this landscape and visual assessment involved the following tasks:

- **Landscape Survey and Analysis**
  - Desk Study:
    - review of available Blacktown City Council documents relevant to the Subject Land;
    - review of topographic maps and aerial photography and
    - undertake services and utilities search.
  - Prepare site analysis diagrams for site geology and soils, topography, hydrology and drainage, vegetation, heritage, land capability, site character, landscape features, and contamination, services, land zonings.
  - Site survey and photography from various viewpoints.

- **Concept Design**
  - Review of current concept design for the Subject Land.

- **Landscape Character Assessment**
  - Describe the existing landscape character based on desk study and site survey.
  - Discuss the impact the project will have on the landscape character of the subject land.

- **Visual Impact Assessment**
  - Detail visual site survey and photography of Subject Land from various viewpoints surrounding the Subject Land to establish a visual catchment.
  - Review existing site photography and satellite images to plot visibility of the site from viewpoints.
  - Review the impact the project will have on views from surrounding areas, both public and private, to determine the visual impact on landscape elements.

- **Mitigation Strategies**
  - Re-review current concept design for the Subject Land based on information derived from Landscape character and visual impact assessment.
  - Provide recommendations and guidelines for future development to ensure the landscape and visual integrity of the site.
Existing Landscape Survey and Analysis

2.1 Natural Factors:

2.1.1 Context

The Subject land is a road corridor along Grange Avenue. It is a narrow slither of land running in an east-westerly direction (Refer Figure 1.2).

Grange Avenue is located in the suburbs of Schofields and Marsden Park which form part of the Blacktown City Council Local Government Area (LGA) (Refer Figure 1.1). It is on the rural outskirts of Sydney, 9km north-west of Blacktown, within the rapidly developing North West Growth Area. It is part of the Cumberland Lowlands that are characterised by rolling hills and some extensive areas of relatively flat land.

Grange Avenue runs from the Northern Western Rail Line in the east to Richmond Road in the west through rural residential properties.

2.1.2 Climate

Landscape changes with the seasons, both in physical appearance and how it is perceived so it is important to consider the different seasons and how this can affect the Landscape character and views.

The climate in the area of Schofields and Marsden Park consists of warm summers with a mean maximum of 30 degrees Celsius in January and mean minimum of 17.7 degrees Celsius in December. Winters are mild with a mean maximum of 17.5 degrees Celsius and mean minimum of 5.0 degrees Celsius in July.

The annual mean rainfall is approximately 860mm with the driest months being July and August with monthly rainfall of about 40mm and the highest rainfall occurring in February of over 127mm per month. (Ref: Meat and Livestock Australia, 2014)

This climate is favourable to the small market gardens and livestock farms that currently occur throughout the area.

2.1.3 Landform and Drainage

Landform is one of the main influences on landscape character and visibility, especially in hilly areas. The topography along Grange Avenue is gently undulating. At the Richmond Road end the road level is approximately 37m AHD. From here heading east the road falls to Bells Creek where the road level is approximately 18.4m AHD. The road then rises to a crest at approximately 31m AHD before dipping back down towards Eastern Creek. At the Eastern Creek crossing the road level is approximately 15m AHD (refer Figure 2.1). The subject land slopes to the north however this cross fall is not evident across Grange Avenue as the road is crowned.

Grange Avenue lies within the South Creek Catchment. Grange Avenue crosses two of the main creeks within this catchment: Bells Creek (towards Richmond Road) and Eastern Creek (down the eastern end of Grange Avenue).

Downstream Bells Creek joins Eastern Creek which then flows north into South Creek and into the Hawkesbury River. There are two bridges across these creeks, both of which are subject to flooding. Blacktown City Council’s flooding information on ‘Maps Online’ rates these two bridge crossings as ‘High Flood Risk’ areas. The rest of Grange Avenue, except for the high area near Richmond Road and the crest between the two creeks is rated as a low flood risk (see figure 2.2).

2.1.4 Soils and Geology

The soils along Grange Avenue are mainly Blacktown Group (bt) residual soils with South Creek (sc) fluvial soils occurring along both the creek lines (see figure 2.2).

Soils of the Blacktown Group result in gently undulating hills with slopes of usually less than 5%. Soils are shallow to moderately deep less than 1.0m deep and are hard setting, moderately reactive highly plastic subsoil with low soil fertility and poor soil drainage. The underlying geology of these soils is the Wianamatta Group shales which contains some shale and weak sandstone beds.

Soils of the South Creek Group occur along drainage depressions. This is often a deep layered sediment over bedrock that is prone to erosion and frequent flooding. These soils are derived from Wianamatta Group shales and Hawkesbury Sandstone.
Figure 2.1: Topography
(Source: Nearmaps, 2014 and NSW Government, 1983)
Figure 2.2: Drainage
(Source: Nearmaps, 2014 and Blacktown City Council, 2014)
Figure 2.3: Soils
2.1.5 Vegetation

Although most of the vegetation along Grange Avenue has been cleared for residential and agricultural pursuits, remnant pockets of the Cumberland Plain Woodland, Sydney Coastal River-flat Forest and Shale Transitional Forest still exist (refer Figure 2.4). The Cumberland Plain Woodland is located on the higher ground. This vegetation is ‘sparsely wooded’ with less than 10% canopy cover. The Tree canopy is generally located along property boundaries with some pockets of vegetation extending into private properties. The vegetation is concentrated at the two Creek crossings where the Sydney Coastal River-flat Forest community can be found. The vegetation here has greater than 10% canopy cover. At the very western end of Grange Avenue along Richmond Road a pocket of Shale Transitional Forest with a sparse canopy can be found. Generally canopy vegetation is dominated by Australian native evergreen trees so visual change from season to season is minimal. Vegetation at ground level along the verge of Grange Avenue is dominated by weedy growth.

2.1.6 Bushfire prone land

A portion of Grange Avenue within the Subject Land is identified as bushfire buffer zone (refer figure 2.5). The existing poles lie within this zone but the new power line will terminate before this zone. Along the Eastern bank of Eastern Creek (outside the subject land) there is a strip of land along the creek identified as a Category 1 Bushfire Zone.

2.2 Cultural/Social Factors:

2.2.1 Land use and zoning

Rural residential lots line Grange Avenue on both the north and south side of the road. These lots are generally 1ha with 60m wide road frontage. West of Bells Creek these lots are zoned as R2 (Low Density Residential) and R3 (Medium Density Residential) on the current zoning plan (refer Figure 2.6). The rural residential properties between Bells creek and Eastern Creek are subject to the State Environmental Plan. Blacktown City Council’s ‘Draft Land Use Zones’ plan on ‘Maps Online’ identify this area to be RU4: Rural small holdings. A few of these rural small holdings also have small businesses running from them including ‘Sultana’s Produce and Pet Food’ and ‘iBake Australia’.

Grange Avenue Reserve, an open space of approximately 15.2ha, is located on the southern side of Grange Avenue approximately halfway along the Subject land. This is a public reserve maintained by Blacktown Council. It is currently under construction, scheduled for completion in December 2014. It is zoned as RE1 Public recreation.

The areas of open space along the creek line are zoned E2 and E3 for Environmental Conservation and Management. The objective of these zones is to protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.

At the very end of Grange Avenue along Richmond Road are the remains of a church that burnt down in December 2013, shortly after being converted into a café. It is zoned as B4 Business - Mixed use Zone.

Throughout the Cumberland Lowlands land is becoming increasingly developed and the land use is being changed from small-holdings or market gardens to suburban estates. Whilst the rural residential land along Grange Avenue has potential for development, is unlikely to be developed in the near future.

2.2.2 Heritage : Aboriginal & European Heritage

Blacktown Council’s ‘Maps Online’ identifies one ‘Known Archaeological Site’ opposite Grange Avenue Reserve (refer Figure 2.7). It also highlights two areas, one along Eastern Creek and another south of South Street, as potential archaeological significant areas.
Figure 2.4: Vegetation
Figure 2.5: Bushfire risk
(Source: Nearmaps, 2014 and Blacktown City Council, 2014)
Figure 2.6: Current and draft Landzones
(Source: Nearmaps, 2014 and Blacktown City Council, 2014)
Figure 2.7: Heritage
(Source: Nearmaps, 2014 and Blacktown City Council, 2014)
2.2.3 Current infrastructure Environment

There is existing infrastructure within, and surrounding, the Subject land that may have potential to affect the new transmission line works (refer Figure 2.7). This infrastructure includes:

- Transgrid 330kV transmission line

This 330kV transmission line crosses Grange Avenue just east of Eastern Creek. The power line and its 60m wide easement are outside the Subject land but it has a strong presence from the Subject Land and affects the landscape character. The steel towers of this 330kV single circuit line can be seen from quite a distance when driving along Grange Avenue.

- Existing street power lines

The current power line runs along the north side of Grange Avenue. The timber poles are generally 10.5m high at approximately 60m centres.

- The Sydney Newcastle Oil & Gas Pipeline

These pipelines run across Grange Avenue just west of Eastern Creek at the very edge of the Subject Land. Jemena has a 24.385m wide easement along these pipelines.

To maintain the integrity and safe operation of the pipeline it is necessary for Jemena to control a number of activities within this easement, including:

a) Carrying out any excavation, blasting or earthworks within the affectation pipeline area.
b) Altering or disturbing existing levels, gradients or contours of the land within the pipeline affectation area.
c) Constructing any improvements or installations on the affectation area.
d) Using the pipeline affectation area for transport or parking of any heavy vehicles of equipment (e.g. vehicles with axle loading in excess of 8 tonnes per axle), and
e) Planting or cultivating trees of any kind upon the pipeline affectation area within 5m of the pipeline.

- Potable water mains

Heading east from Richmond Road a 150mm cast iron cement lined water main runs along the northern side of Grange Avenue. Just before Eastern Creek, where Grange Avenue intersects with Carnarvon Road, additional water mains join with those along Grange Avenue. From this point east there is a water main on both the north and south side of Grange Avenue - a 250mm cast iron cement lined water main on the northern side and a 150mm cast iron cement lined water main on the south side.

These services must be considered in more detail during the detailed design phase of the project.

2.2.4 Vehicle, Cyclist and Pedestrian use

The traffic along Grange Avenue is increasing as it is currently the main connector Road from Richmond Road to Schofields and the east side of the train line. However the future extension of Schofields Road across Eastern Creek through to South Street will direct traffic away from Grange Avenue.

Pedestrian and cyclists movement along Grange Avenue is very low, based on observations, surrounding land use and discussions with residents familiar with the Subject Lands. There is no footpath west of Eastern Creek and a narrow, mostly gravel, road shoulder that is not suitable for road cyclists.
Figure 2.7: Infrastructure
(Source: Nearmaps, 2014 and Dial Before You Dig, 2014)
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3 Concept Design and Review

3.1 Current concept design review

The objective of the proposed works on the Subject land is to provide a new electricity line on the northern side of Grange Avenue. This line will form part of a new 132kV electricity line between Schofields Zone Substation and the future Marsden Park South Zone Substation to provide electricity to the rapidly developing Marsden Park Industrial Precinct. This work will include:

- Removal of the existing power line and 27 timber poles.
- Installation of 35 new poles. These poles are generally 24m tall at approximately 60-70m centres. Two poles will be 26m tall where they span across existing pole substations (poles 10 & 11). Poles are all timber except for two concrete poles at either end of the new line (poles 1 & 35).
- The existing four low voltage wires will be replaced with an aerial bundled conductor (ABC) - a single, thicker insulated wire.
- Additional new wires will be installed.
- The works will require the removal of roadside vegetation as well as some vegetation within private properties. This will include pruning of tree canopies where required. If a high proportion of canopy removal is required it may be appropriate to remove the entire tree.

The following plans in Figures 3.1- 3.3 reflect the above mentioned works. They show the alignment of the new overhead powerline, the location of new power poles and the existing poles to be retained or removed. The areas in yellow indicate potential zones of tree canopy reduction.

The following photomontages in Figures 3.4 - 3.7 represent what the new powerline will look like. Each figure show an existing view and then two future views - one with concrete poles and one with timber poles. These montages help show how the new power line will affect the landscape character.
Figure 3.1: Concept Plan 1 and 2 (Source: Nearmaps and Endeavour Energy, 2014)
Figure 3.2: Concept Plan 3 and 4 (Source: Nearmaps and Endeavour Energy, 2014)
Figure 3.3: Concept Plan 5 (Source: Nearmaps and Endeavour Energy, 2014)
Figure 3.4: Photomontages - Grange Ave West to Richmond Road

Existing view

Future view with concrete poles

Future view with timber poles
Figure 3.5: Photomontages - Grange Avenue west to Bells Creek

Existing view

Future view with concrete poles

Future view with timber poles
Figure 3.6: Photomontages - Grange Ave east from Bells Creek

Existing view

Future view with concrete poles

Future view with timber poles
Figure 3.7: Photomontages - Grange Ave east from Grange Avenue Reserve

Existing view

Future view with concrete poles

Future view with timber poles
4 Landscape Character Assessment

Developing an understanding of Grange Avenue’s landscape character will help to ensure that development is well situated, sensitive to its location, and the potential impacts associated with the proposed development are mitigated where possible.

To understand the landscape character of Grange Avenue it is important to note a wider character assessment of the surrounding area. Grange Avenue straddles the Suburbs of Schofields and Marsden Park. These suburbs sit in the low lands of the Sydney basin, an area that is experiencing a major change of landscape character due to a demand for residential housing. It is rapidly being developed from rural residential to new medium and high density residential estates. Although this development has not yet reached Grange Avenue, the effects of it are visible through projects such as this power line upgrade.

4.1 Description of the Existing Landscape Character

The existing environment along Grange Avenue needs to be understood to determine the potential level of impact the new power line would have.

The current landscape character of Grange Avenue is typical of a rural-residential area in Western Sydney. The major elements in this landscape include the rural open road with overhead power lines, undulating topography, modest housing with generous curtilage, and sporadic canopy vegetation.

**Housing:**
Grange Avenue is lined with 60m wide rural residential lots. Houses are generally set back within the lot providing a generous curtilage. The majority of the property fences are rural looking post and wire fences, with a few, more typically suburban, timber picket and brick fences dotted along the road.

**Undulating Road:**
The gently rolling hills and open road gives Grange Avenue a strong rural feel. The absence of kerb and a gravel road shoulder enforces this character and existing overhead power lines are typical in rural residential areas of the Sydney Basin.

**Vegetation:**
Tree canopy is generally along the property boundaries (some on the road verge and some in private property) with views through to irregular and generally sparsely vegetated lots. The vegetation is concentrated at the two Creek crossings and Grange Avenue Reserve. It then becomes more sporadic at residential areas.

The rural residential character is relatively consistent along the length of Grange Avenue for the Subject Land. However, at Grange Avenue Reserve the character changes slightly as increased vegetation makes the road feel more enclosed. There is a similar experience at the two creek crossings, where an increase in the density of the vegetation and bridge vehicle barriers momentarily interrupt the rural residential character of Grange Avenue.

It is worth noting that east of Eastern Creek, Grange Avenue has a more typical residential feel, with smaller lot sizes and footpaths. However this is outside the extent of the Subject Land.
4.2 Assessment of proposed works on landscape character

4.2.1 Method:

The assessment of Landscape character impact has been undertaken in accordance with the ‘Landscape character and visual impact grading Matrix’ in the EIA Guidelines for Landscape Character and Visual Impact Assessment. The sensitivity of the landscape character and magnitude of the project is assessed to determine the impact on landscape character.

4.2.2 Assessment of landscape character impact

The magnitude of the project on the Subject land is moderate to low for the following reasons:

• the existing four wires will be replaced with a aerial bundled conductor (ABC) - a single, thicker insulated wire. This will reduce the overall number of wires. However, this thicker wire will be more visible thereby slightly increasing the magnitude of the project;

• the upgrade would require larger 24-26m high poles. This larger infrastructure is more typical of contemporary urban infrastructure compared to the traditional rural power poles that currently stand at approximately 10.5m high. This is a moderate effect on magnitude as the poles will be more dominant in the landscape;

• when initially installed the new material of the power pole will stand out. This material is mostly timber, with only 2 of the 35 new poles being concrete. The timber poles are in keeping with the current pole material while the concrete poles will highlight the urban nature of this infrastructure. These new materials will have a moderate effect on magnitude as the poles will read as stronger vertical elements which may emphasise the undulating nature of Grange Avenue as they will be seen undulating from a greater distance. This ‘undulating nature’ is a strong element of the rural road character;

• there would be a few additional power poles however where existing poles are located in the centre of the lot frontage they will generally be re-located to the edge of the lot in front of the common property boundary. This will have a minimal impact on the landscape character along Grange Avenue for road users. However it may be a noticeable improvement to residents as power poles will be located outside the direct view of their properties;

• the removal of tree canopies has a moderate effect on magnitude as these irregular and sporadic tree canopies are an important feature of the rural-residential character.

The sensitivity of the Subject land is low as:

• vegetation at a ground level along the verge of Grange Avenue is dominated by weedy growth and

• there are a few pockets of remnant vegetation communities along the road but they are fragmented and highly disturbed, therefore of lesser value.

Thus the impact to landscape character is moderate-low based on the magnitude and the sensitivity of the construction of the new power line on the subject site.

![Figure 4.1: Landscape Character and visual impact grading matrix](image)
Visual Impact Assessment

This section of the report concentrates on the visual survey of the Subject land and an analysis of the visibility of the site from existing surrounding public and private lands.

5.1 Survey Method

Public Land
Photograph viewpoints were selected from surrounding public lands based on elevation and proximity to the subject land. A total of 12 viewpoints were studied around the Subject land.

Viewpoints 1 and 2 are on Grange Avenue within the subject site and reflect the changing views for road users.
Viewpoints 3, 5-7 are where views through to Grange Avenue can be seen from adjacent streets.
Viewpoint 4 is from Grange Avenue Reserve – a highpoint immediately adjacent to the Subject Land.
Viewpoints 8-12 are all greater than 500m away and are from local highpoints within Schofields and Marsden Park.

Viewpoints assessed include:
1. On Grange Avenue from Grange Avenue Reserve, looking east
2. On Grange Avenue from Bells Creek, looking west
3. On Grange Avenue, looking east from the western side of Richmond Road
4. View from the top of Grange Avenue Reserve, looking north
5. View from the east end of South Street, looking north
6. View from the west end of South Street, looking north
7. View from the west end of Vine Street, looking south
8. Westminster Street Bridge, Schofields, looking west
9. Pedestrian Bridge across the railway line opposite Station Street, Schofields, looking south-west
10. High Point from Hollinsworth Road, Marsden Park, looking north-east
11. Crest of Westminster Street, Schofields, looking west
12. High point from Ridgeline Drive, The Ponds, looking west

Photos were taken looking from the viewpoint towards the Subject land on a clear day. Each viewpoint photo was analysed and visible areas of the site and surrounds were noted on a topographic map.

Private Land
Views from adjacent private residences i.e. those along Grange Avenue, South Street and Vine Street East and West have also been considered and analysed based on aerial photography and site visits.
Figure 5.1: Public viewpoint locations (Source: Nearmaps and NSW Government, 1983)
Figure 5.2: Public viewpoint visibility (Source: Nearmaps and NSW Government, 1983)
Figure 5.3: Viewpoint 1 - On Grange Avenue from Grange Avenue Reserve, looking east

Figure 5.4: Viewpoint 2 - On Grange Avenue from Bells Creek, looking west

Figure 5.5: Viewpoint 3 - On Grange Avenue, looking east from the western side of Richmond Road
Figure 5.6: Viewpoint 4 - View from the top of Grange Avenue Reserve, looking north

Figure 5.7: Viewpoint 5 - View from the east end of South Street, looking north

Figure 5.8: Viewpoint 6 - View from the west end of South Street, looking north
Figure 5.9: Viewpoint 7 - View from the west end of Vine Street, looking south

Figure 5.10: Viewpoint 8 - Westminster Street bridge, Schofields, looking west

Figure 5.11: Viewpoint 9 - Pedestrian Bridge across the railway line opposite Station Street Schofields, looking south-west
Figure 5.12: Viewpoint 10 - High Point from Hollinsworth Road, Marsden Park, looking north-east

Figure 5.13: Viewpoint 11 - Crest of Westminster Street, Schofields, looking west

Figure 5.14: Viewpoint 12 - High point from Ridgeline Drive, The Ponds, looking west
5.2 Analysis of Views

Public Land
The assessment of visual impact has been undertaken in accordance with the ‘Landscape character and visual impact grading Matrix’ in the EIA Guidelines for Landscape Character and Visual Impact Assessment. The key public viewpoints were assessed in terms of sensitivity of the views and magnitude of the project and were then given an overall rating.

In the case of the visual analysis sensitivity refers to the type and number of viewers and the magnitude refers to the scale of the project and how far the Subject land is from the viewer.

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Description</th>
<th>Sensitivity of view</th>
<th>Magnitude of project</th>
<th>Rating of visual impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>View on Grange Avenue at Grange Avenue Reserve, looking east</td>
<td>Low: Few pedestrians. Vehicles would only have a temporary view as they travel past at 60km/h</td>
<td>Moderate: Due to increase in the size of the pole, change of material, re-location of poles and clearing of vegetation</td>
<td>Moderate-Low</td>
</tr>
<tr>
<td>2</td>
<td>View on Grange Avenue, looking west to Bells Creek, Marsden Park</td>
<td>Low: Few pedestrians. Vehicles would only have a temporary view as they travel past at 60km/h</td>
<td>Moderate: Due to increase in the size of the pole, change of material, re-location of poles and clearing of vegetation</td>
<td>Moderate-Low</td>
</tr>
<tr>
<td>3</td>
<td>View on Grange Avenue, looking east from the western side of Richmond Road</td>
<td>Low: This section of Grange Avenue is very quiet. People will have a good view of the new power lines when leaving the nursery</td>
<td>Moderate: Due to increase in the size of the pole, change of material, re-location of poles and clearing of vegetation</td>
<td>Moderate-Low</td>
</tr>
<tr>
<td>4</td>
<td>View from the top of Grange Avenue Reserve, looking north</td>
<td>Moderate: Pedestrians have a 360° view from the top of Grange Avenue Reserve</td>
<td>Moderate: A large section of the new powerline will be visible through a scattered tree canopy on the south side of Grange Avenue</td>
<td>Moderate</td>
</tr>
<tr>
<td>5</td>
<td>View from the east end of South Street, looking north</td>
<td>Low: South Street is currently a quiet residential street with infrequent use</td>
<td>Low: Powerlines and tops of power poles are visible across lots through gaps in vegetation and houses</td>
<td>Low</td>
</tr>
<tr>
<td>6</td>
<td>View from the west end of South Street, looking north</td>
<td>Low: South Street is currently a quiet residential street with infrequent use</td>
<td>Low: Small portions of powerlines and are visible across lots through gaps in vegetation and houses</td>
<td>Low</td>
</tr>
<tr>
<td>7</td>
<td>View from the west end of Vine Street, looking south</td>
<td>Low: Vine Street is currently a quiet residential street with infrequent use</td>
<td>Low: Power poles and powerlines are visible across lots through gaps in vegetation and houses</td>
<td>Low</td>
</tr>
<tr>
<td>8</td>
<td>Westminster Street bridge, Schofields, looking west</td>
<td>Low: Few pedestrians across this bridge. Vehicles would only get a glimpse in the direction of Grange Avenue</td>
<td>Negligible: Views of power lines on Grange Avenue completely blocked by vegetation</td>
<td>Negligible</td>
</tr>
<tr>
<td>9</td>
<td>Pedestrian Bridge across the railway line opposite Station Street, Schofields, looking south-west</td>
<td>Low: Pedestrian views are blocked by bridge enclosure frame and vegetation</td>
<td>Negligible: Views of power lines on Grange Avenue completely blocked by vegetation</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Table 5.1: Assessment of Visual Impact
<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Description</th>
<th>Sensitivity of view</th>
<th>Magnitude of project</th>
<th>Rating of visual impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>High Point from Hollinsworth Road, Marsden Park, looking north-east</td>
<td>Low: Pedestrian views are blocked by new housing and vegetation</td>
<td>Negligible: Views of power lines on Grange Avenue completely blocked by vegetation</td>
<td>Negligible</td>
</tr>
<tr>
<td>11</td>
<td>Crest of Westminster Street, Schofields, looking west</td>
<td>Low: Few pedestrians across this bridge. Vehicles would only get a glimpse in the direction of Grange Avenue</td>
<td>Negligible: Views of power lines on Grange Avenue completely blocked by vegetation</td>
<td>Negligible</td>
</tr>
<tr>
<td>12</td>
<td>High point from Ridgeline Drive, The Ponds, looking west</td>
<td>Low: Pedestrian views are blocked by new housing and vegetation</td>
<td>Negligible: Views of power lines on Grange Avenue completely blocked by new housing and vegetation</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Table 5.1: Assessment of Visual Impact continued

**Private Land**

The visibility of the new transmission line from private residences along Grange Avenue, South Street and Vine Street East and West has been considered and analysed based on the following conditions:

- there is generally a minor increase in visibility due to the increase in size of the power poles and the increase in number of wires and thickness of the ABC wire;
- visibility is reduced if there is a tree canopy behind or in front of the transmission line as the lines tend to blend into the tree canopy;
- there is a moderate increase in visibility if there is no screening of the power line;
- visibility increases if tree canopy removal is required;
- visibility decreases if power poles are relocated to the side of the residential lot;
- visibility decreases if power poles are timber instead of concrete as timber is more in keeping with the existing landscape character.

Views from private residences are given a rating of minor, moderate or high increase in visibility based on the above factors. Refer to figure 5.15: Visibility rating from private residence.
Figure 5.15: Visibility rating from private residence
5.2.1 Overall Visual Impact of proposed works

Following a review of each of the public viewpoints it is apparent that the Subject Lands have low- moderate visibility from the surrounding areas, greater than 500m away. This is because of the following:

- the undulating topography of the road means that at its low points the Subject Land is hidden from view;
- strong bands of vegetation along both creek lines block views of Grange Avenue when viewing the site from a distance.

The private and public views from within a 500m radius are moderately affected. This due to the following:

- the vegetation along the road verge and property lines helps disguise and conceal power lines. However where residential lots are quite open and flat views through to Grange Avenue open up and the existing power lines can be seen from some private residences on South Street and Vine Street East and West;
- views of power lines may increase due to the increase in height of the poles, new pole material, the increase in number of wires and thickness of the ABC wire;
- the use of mostly timber poles (rather then concrete) will help to minimise the visual impact as they are more in keeping with the existing landscape character;
- re-location of poles from the centre of the lot to the property boundary may change where poles are visible, reducing views from private residences.

Thus the visual impact of the project is considered to be moderate-low based on the above analysis.

<table>
<thead>
<tr>
<th>SENSITIVITY</th>
<th>MAGNITUDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Moderate</td>
<td>High-Moderate</td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Figure 5.16: Landscape Character and visual impact grading matrix
Mitigation Strategies

6.1 Review of Concept Design after Landscape Character and Visual Impact Assessment

The existing concept design for the new overhead transmission line along Grange Avenue will have a moderate-low impact on both the Landscape Character and Visual Impact from surrounding areas.

**Landscape Character:**

The new power line will affect the existing landscape character as it will result in infrastructure that is more typical of contemporary urban areas compared to the traditional rural power poles that currently stand. This includes:

- additional powerlines will be more visible;
- the new power line would require larger power poles.
- the new timber and concrete power poles will stand out when initially installed;
- removal of tree canopies.

One improvement to the landscape character is the re-location of power poles to the edges of the rural residential lots. This will de-clutter the frontages of the residential properties and open up views for residents across Grange Avenue.

**Visual Impact:**

The new transmission line has a moderate-low visual impact on the subject land. From viewpoints further than 500m away the existing transmission line is not visible and it is unlikely the new line will be visible as it will be blocked by strong bands of vegetation and future development. However closer views will be affected as the new larger transmission line is more visible due to its increase in height and size of the poles.

6.2 Recommendations to address the visual amenity of the proposal

It is important to ensure the proposed power line upgrade is sympathetic to the landscape character of Grange Avenue and limits visual impact the project will have from surrounding areas. To achieve a result with the least visual impact the following should be considered:

- Conserve and enhance the health of the natural systems e.g: along creeklines where tree canopies help block views from surrounding areas.

- Limit the removal of any existing vegetation, especially at canopy level, as any vegetation removal has potential to open up views of the power lines.

- Where vegetation is highly disturbed and requires replacing select local plant species that have minimal water and maintenance requirements.

- Timber poles will have a lower visual impact than the concrete poles. Timber poles are in keeping with the current pole material while the concrete poles would highlight the urban nature of this new infrastructure.
7. References

- Endeavour Energy, 2014, 132KV Feeder 21J, Schofields to South Marsden Park Overhead line, Revision A