



Umow Lai

# ***The Sikh Grammar School, Australia***

## Infrastructure Management Plan



## REPORT AUTHORISATION

**PROJECT: THE SIKH GRAMMAR SCHOOL, AUSTRALIA  
INFRASTRUCTURE MANAGEMENT PLAN**

**REPORT NO: SSGS0101-R001-RC**

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## EXECUTIVE SUMMARY

Sikh Grammar School Sydney wish to build a new school to comprise of primary and secondary educations streams. There will also be an Early Learning Centre on the site. As part of the unique pedagogy of the Sikh community it is also proposed to construct a community centre Gurdwara (a place of worship) and Langar (community dinning space). Student and staff accommodation will also be built on the site.

Situated on a greenfield site in Rouse Hill, NSW, the site forms part of the Greater Western Sydney growth corridor within the Blacktown City Council. The site was formerly used for agricultural purposes but will now become part of a new urban centre which includes a new train station, housing, retail and other community infrastructure.

Part of the site will be used as a place of worship and will, at times, be open to the broader community as part of an all-inclusive vegetarian feast that the Sikh community provide to people of all denominations.

The Masterplan provides an overall framework for development over the next 10 to 25 years, building on existing opportunities whilst looking to the future and forecasting change. The process has included an extensive physical investigation of the site.

The purpose of this report is to make recommendations regarding available infrastructure and required upgrade works.

This report describes the existing and proposed site infrastructure and utility connections required for the project, including:

- Potable Water Supply
- Fire Fighting Water Supply
- Sanitary Drainage
- Natural Gas Supply
- Electricity Supply
- Telecommunications Services

The proposed development has been assessed against all relevant standards/guidelines, including the following:

- Plumbing Code of Australia
- Relevant Australian Standards
- Sydney Water Regulations
- Jemena Natural Gas Regulations
- City of Sydney Stormwater Management Policy
- Endeavour Energy Regulations



- NBN Co Standards and Regulations
- SEARS Application Number SSD 9472, relevant clauses;

13. Utilities

*Prepare an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation and easement requirements of the development for the provision of utilities including staging of infrastructure.*

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## **1.0 INTRODUCTION**

### **1.1 PREAMBLE**

The Sikh Grammar School Australia is planning to build a new primary and secondary school in the Western Sydney suburb of Rouse Hill, in the vicinity of the Sikh community hubs of Parklea, Kellyville, Blacktown, Quakers Hill and The Ponds.

The school will be constructed on a greenfield site bordered by Tallawong and Guntawong Roads in the Blacktown City Council Local Government Area.

The project is located close to the new Cudgegong Road Metro Station, which forms part of the new Sydney Metro Northwest project, and the existing Riverstone and Schofields Train Stations located on the T1 Richmond line.

The project is intended to be staged over a number of years. A staging plan is included in the Architectural design package.

The project has been deemed to be a “State Significant Development” (SSD) and therefore must be submitted to the NSW Government Department of Planning and Environment through a process known as an SSDA.

Umow Lai Consulting Engineers and PMDL Architects have been commissioned by The Sikh Grammar School Australia to provide a Concept Design which will be form part of the SSDA.

### **1.2 SCOPE**

This report describes the existing and proposed site infrastructure and utility connections required for the project, including:

- Potable Water Supply
- Fire Fighting Water Supply
- Sanitary Drainage
- Natural Gas Supply
- Electricity Supply
- Telecommunications Services

### **1.3 SOURCES OF INFORMATION**

The design loads have been estimated from the building areas indicated on the DA Submission drawings prepared by PMDL Architects and issued to Umow Lai on 19<sup>th</sup> March 2019.

### **1.4 LIMITATIONS**

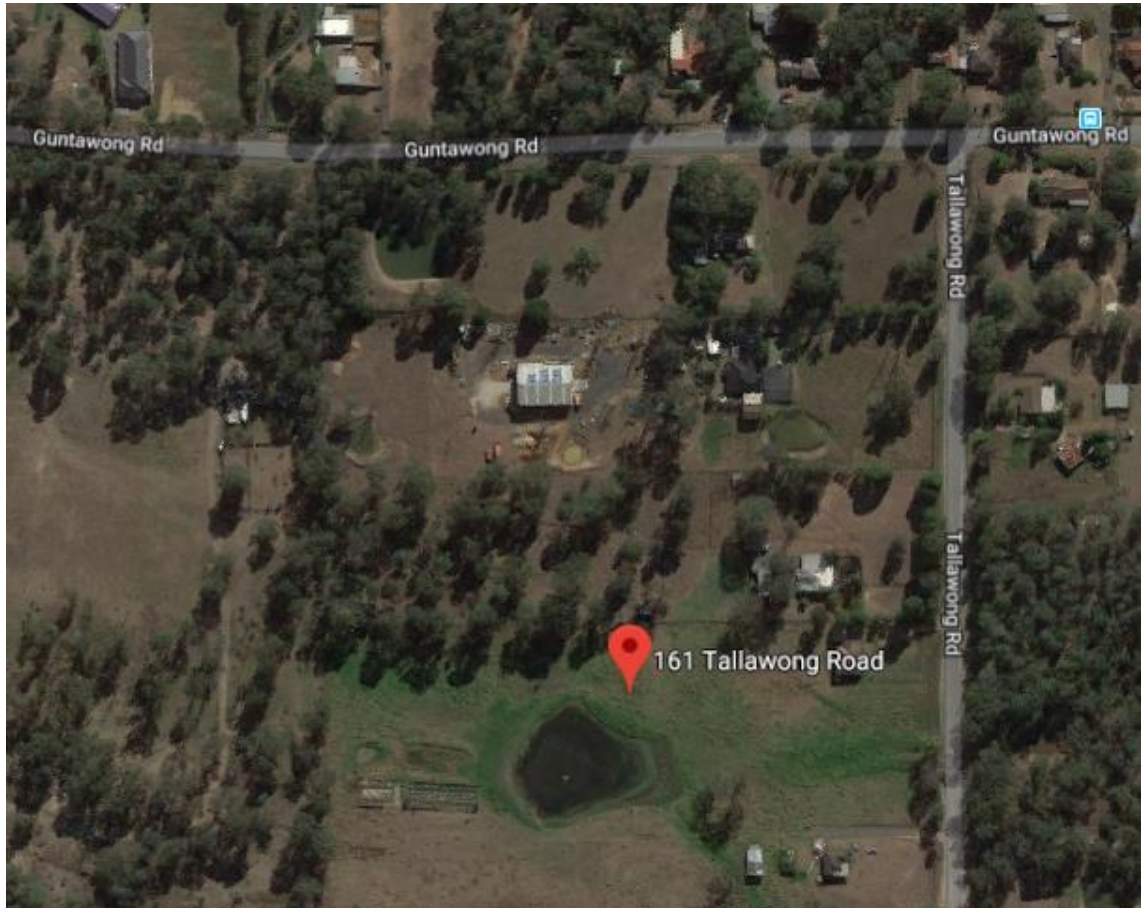
The reliability of the incoming electrical supply to the facility and the utility (Endeavour Energy) power network serving the region has not been reported in any statistical form.



## 2.0 SITE OVERVIEW

### 2.1 SITE LOCATION

The new Sikh Grammar School will be constructed on approximately 4 ha (40,000m<sup>2</sup>) of grassy land located at 151-161 Tallawong Road, Rouse Hill.



*Figure 1 Satellite Image of Project Site*

### 2.2 PROJECT DESCRIPTION

The greenfield project site forms part of the Greater Western Sydney growth corridor within the Blacktown City Council. The site was formerly used for agricultural purposes but will now become part of a new urban centre which includes a new train station, housing, retail and other community infrastructure.

Part of the site will be used as a place of worship and will, at times, be open to the broader community as part of an all-inclusive vegetarian feast that the Sikh community provide to people of all denominations.

The Masterplan provides an overall framework for development over the next 10 to 25 years, building on existing opportunities whilst looking to the future and forecasting change. The process has included an extensive physical investigation of the site.



## 2.3 POPULATION

The population numbers for staff and students are as follows:

**Table 1** *Population numbers*

<i>Building</i>	<i>Population Details</i>
Gurdwara & Langar	800 person
Staff Accommodation	3 off 2 bedroom apartments 3 off 1 bedroom apartments
Student Boarding House	108 students
Early Learning House	86 place 18 Staff
Primary School	588 Students 30 Staff
Secondary School	672 Student 47 Staff
Administration & Staff	25 staff

## 2.4 BUILDING SERVICES DESIGN BRIEF

The building services will be designed to address the health, amenity, life safety and energy performance criterion of the National Construction Code (NCC).

While the Sikh Grammar School is a private institution, all school buildings will provide an equivalent level of comfort and an equivalent range of services defined in the Educational Facilities Standards and Guidelines (EFSG) published by Schools Infrastructure NSW (SINSW) and the NSW Department of Education.



## 3.0 POTABLE WATER SUPPLY

### 3.1 EXISTING AUTHORITY INFRASTRUCTURE

The nearest Sydney Water Main to the proposed site is a DN200mm oPVC Water Main, located in Tallawong Rd to the south eastern side of the development to serve 136 Tallawong Road site development and terminates at the boundary between 136 & 144 Tallawong Road.

The water main service has been extended from this termination point and run past 151-161 Tallawong Road, Sikh School, to the frontage of 144-154 Tallawong Road development which is currently under construction. There is no available information yet in regard to the extended service exact location or pipe size.

As design progresses, an application to Sydney Water will be lodged to extend their water main to Sikh School site, if required, and to make new connection to supply the school.



**Figure 2** *Sydney Water – Water Mains Infrastructure*

### 3.2 ANTICIPATED DESIGN LOADS

The total water demand is summarised as below:

**Table 2** *Proposed Total Water Demands*

Application	Demand
L/Day	48,800
PSD (l/s)	0.56



### 3.3 PROPOSED SITE INFRASTRUCTURE

The Proposed Potable Water Supply to Sikh School Site is via new connection to the Sydney Water main on Tallawong Road.

Potable Water Supply to feature a new authority meter and backflow assembly adjacent Tallawong Road.

From new authority meter, extend potable water main to new cold water booster pumps south west of permanent car park. Extend new inground potable water line downstream of water pumps to feed the school buildings.



**Figure 3** *Proposed Potable Water Supply from Tallawong Road*



## 4.0 FIRE FIGHTING WATER SUPPLY

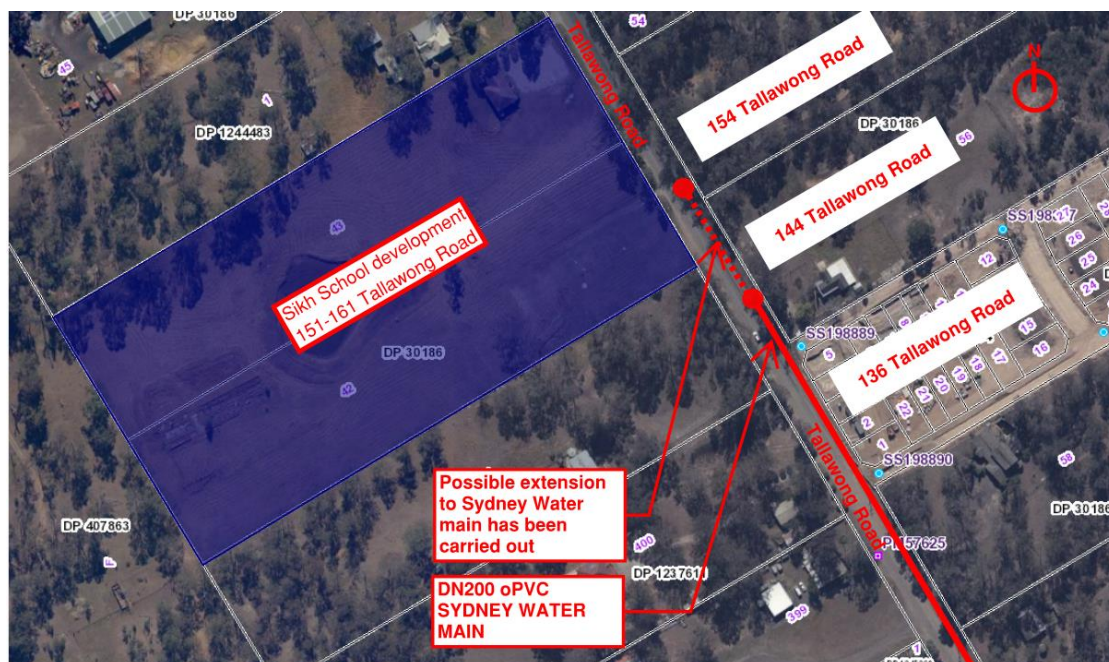
### 4.1 EXISTING AUTHORITY INFRASTRUCTURE

Capacity of existing water mains flow and pressure have been provided by Sydney Water for a 250mm water main located on the corner of Tallawong and Macquarie road.

Refer to Appendix A – Sydney Water Flow and Pressure Enquiry. This is yet to be confirmed.

As described under Section 3, The nearest Sydney Water Main to the proposed site is a DN200mm oPVC Water Main, located in Tallawong Rd to the south eastern side of the development to serve 136 Tallawong Road site development and terminates at the boundary between 136 & 144 Tallawong Road.

The water main service has possibly been extended from this termination point and past 151-161 Tallawong Road, Sikh School, to the frontage of 144-154 Tallawong Road development which is currently under construction. This is yet to be confirmed.



**Figure 4** *Sydney Water – Water Mains Infrastructure for fire water connection*

### 4.2 ANTICIPATED DESIGN LOADS

The anticipated Sikh School Fire Water demands are summarised in the following table:

**Table 3** *Proposed Fire Water Demands*

Fire System	Demand (L/s)
Fire Hydrant System	20
Fire Sprinkler System	20

The above loads are subject to further design development and any possible requirement for wall wetting sprinklers to be incorporated into the design.



### 4.3 PROPOSED SITE INFRASTRUCTURE

The following fire systems are proposed for the site:

- An internal Sprinkler system is proposed, as detailed in the BCA report and Fire Safety Engineering Report which will include the following:
  - New Sprinkler Booster at the main entrance facing Tallawong Road
  - New Fire Sprinkler connection from the proposed Tallawong Road St 200 mm dia water main
  - New backflow assembly to the new water connection
  - New pipe reticulation to service the individual fire sprinkler systems within the buildings along with sprinkler control valve assemblies
  - 1 x fire sprinkler diesel pump set
- A new hydrant system will be installed compliant with AS2419.1. This will include:
  - New Hydrant Booster at the main entrance along Tallawong Road
  - New Fire Water connection from the proposed Tallawong Road St 200 mm dia water main
  - New backflow assembly to the new water connection
  - New pipe reticulation to service the internal and external fire hydrants around the site.
  - 1 x fire hydrant diesel pump set



**Figure 5** *Proposed Fire Water Supply Connections to Sikh School Site*



## 5.0 SANITARY DRAINAGE

### 5.1 EXISTING AUTHORITY INFRASTRUCTURE

The nearest Sydney Water Sewer main to the proposed site is a 150mm dia uPVC Sewer existing line, located at the southern boundary and running from the eastern border, Tallawong Road, to the western border, approximately 240m along the future road at the southern boundary.

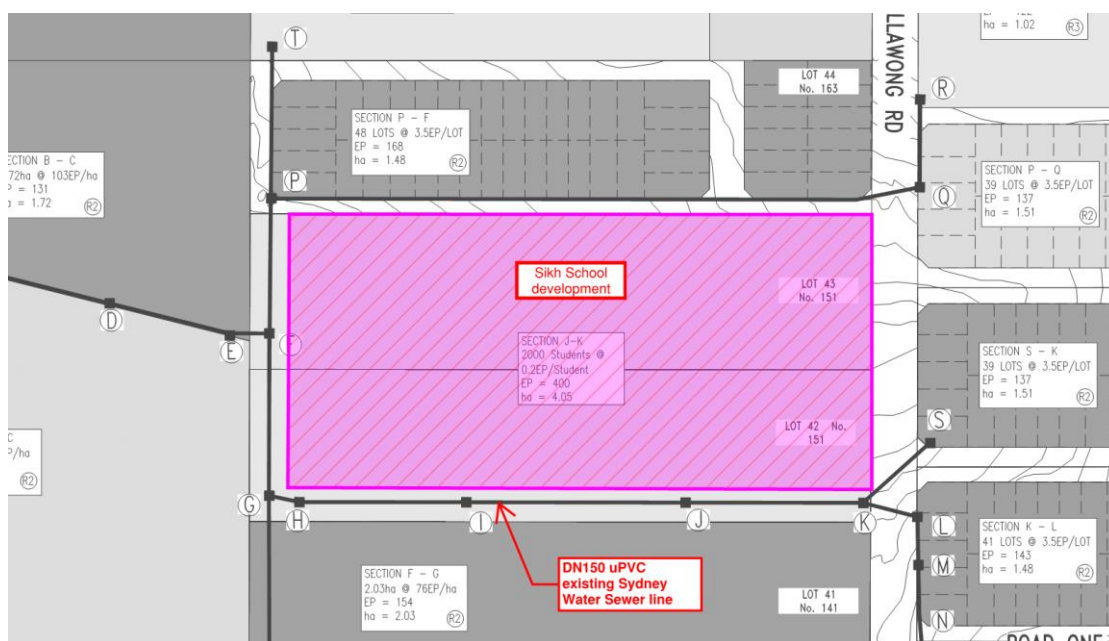


Figure 6 Sydney Water – Sewer Drainage Infrastructure

### 5.2 ANTICIPATED DESIGN LOADS

The projected Sikh School sewer flow demands are summarised in the table below:

Table 4 Projected Sewer Infrastructure Load

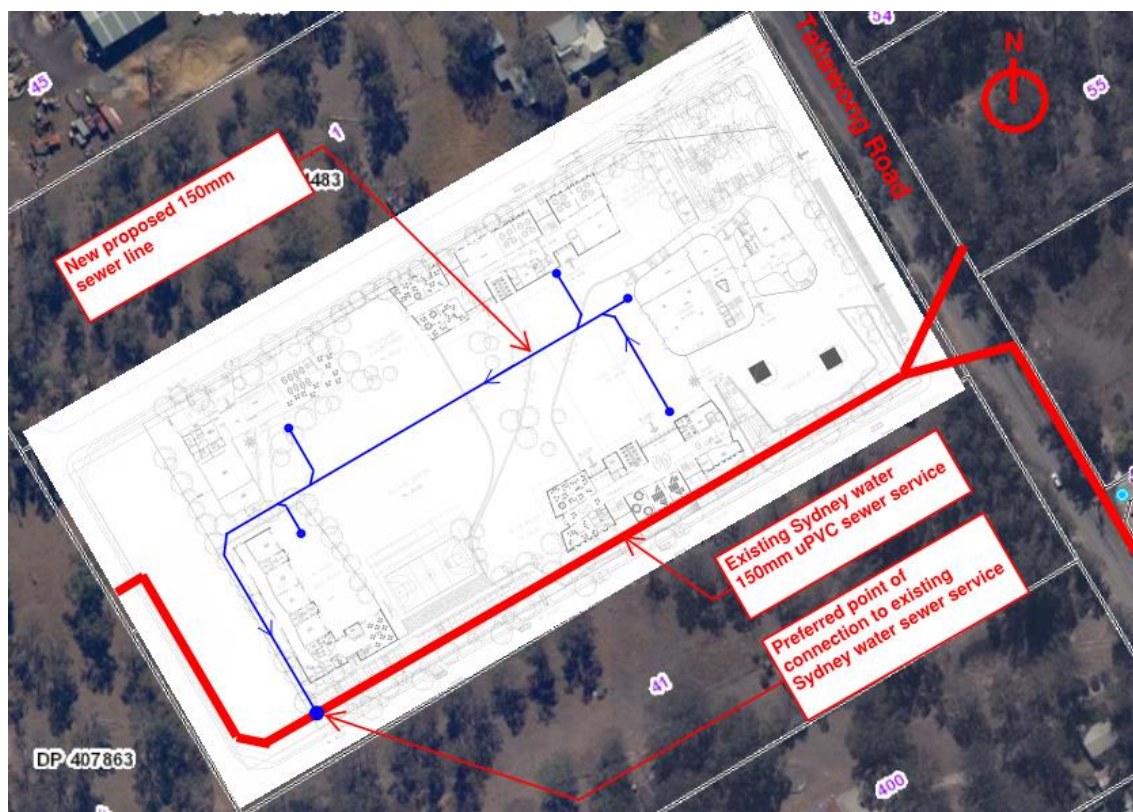
Application	Quantity
EP	387
Average Dry Weather Flow (ADWF)	0.95 L/s



### 5.3 PROPOSED SITE INFRASTRUCTURE

The proposed sewer infrastructure for the Sikh School site features a new 150mm main sewer line collecting school buildings' waste water and gravitates south to connect and discharge to existing Sydney water sewer line.

The diagram below shows the preferred point of connection of the new sewer line to the existing service at the southern site boundary.



**Figure 7** *Proposed Sikh School Site Discharge*





### 6.3 PROPOSED SITE INFRASTRUCTURE

The proposed NG supply to Sikh School is via a new connection to the Jemena NG main adjacent to the site on Tallawong Road.

As design progresses, an application to Jemena will be lodged to extend their Gas main to Sikh School site.

From the new connection, extend gas main to new boundary regulator and authority gas main assemblies.

A secondary regulator is to be provided at each building for internal gas reticulation.



**Figure 9** Proposed Natural Gas Supply to Sikh School Site



## 7.0 ELECTRICAL SUPPLY

### 7.1 EXISTING AUTHORITY INFRASTRUCTURE

The Local Network Supply Authority is Endeavour Energy.

Over-head high voltage and low voltage power lines are installed along Tallawong Road which form part of Endeavour Energy's power distribution network. The utility poles and wires are serving several customers and would need to be retained.

However, the low voltage power connection serving the residential premises at 161 Tallawong Road would need to be decommissioned.

### 7.2 ANTICIPATED DESIGN LOADS

The preliminary Maximum Demand for the site is **1,495kVA**. The breakdown of electrical demand loads is outlined in the table below.

**Table 6** *Breakdown of Electrical Loads*

<b>Building / Load</b>	<b>No. Floors</b>	<b>Floor Area (m<sup>2</sup>)</b>	<b>Max. Demand (kVA)</b>
Multipurpose Hall	2.5	4,700	305
Secondary + Library	3	6,798	448
Primary School	3	6,396	424
ELC Play	1.5	1,520	108
Boarding House	3	3,117	209
<b>SUB-TOTAL</b>		<b>22,531</b>	<b>1,495</b>

### 7.3 PROPOSED SITE INFRASTRUCTURE

#### 7.3.1 Kiosk Substations

The anticipated maximum demand figures suggests that the site will require two (2) Nos. 1000kVA kiosk substations.

The substations must be located inside the plot boundary and will require an easement of approximately 5.5m x 5.5m.

In order to maximise equipment access and minimise the extent of high voltage cable easements crossing the site, it is recommended to locate these substations on the perimeter of the plot.

The substations and incoming high voltage cables will form part of Endeavour Energy's distribution network and therefore must be designed by a Level 3 Accredited Service Provider.

#### 7.3.2 High Voltage Cables

The substations will be supplied via the existing overhead high voltage wires located in the public roadways bordering the Plot.

The high voltage connection point (existing utility pole) will be determined by the Level 3 ASP in the next stage of the project.



The high voltage cabling from the utility pole to the substations will be reticulated underground. These cables will generally be buried direct or installed within concrete-encased ducts at driveway and roadway crossings.

### **7.3.3 Customer Main Switchroom**

A Main Electrical Switchroom will be established in the Services Building near Tallawong Road, which will house a dedicated 1600A (3-phase) Main Switchboard for each Kiosk Substation.

Low Voltage Consumer Mains Cables will be reticulated underground within the plot boundary from the Substation to the Main Switchroom.

The Consumer Mains conduits will generally be installed above the underground drainage culverts, to be designed by the project Civil Engineer.



## 8.0 TELECOMMUNICATIONS SERVICES

### 8.1 EXISTING AUTHORITY INFRASTRUCTURE

Telecommunications infrastructure is managed by NBN Co, the Australian government-owned corporation tasked to design, build and operate Australia's National Broadband Network as a monopoly wholesale broadband provider.

NBN Co. have advised that the existing property at 161 Tallawong Road Rouse Hill already contains an active NBN connection and have instructed the project team to:

*"Please provide further details to submit an enquiry for NBN to recover the NBN™ supplied equipment. NBN will need to recover the equipment at the existing premises before you can complete this new development application".*

The NBN service appears to utilize over-head cables installed along Tallawong Road, as indicated in the following image.



**Figure 10** Overhead Telecom Cables in Tallawong Road

It is likely that these cables were originally part of the Optus Pay-TV network and were incorporated into the NBN's Multi Technology Mix (MTM).



## **8.2 PROPOSED SITE INFRASTRUCTURE**

### **8.2.1 Incoming Pits and Ducts**

The Sikh Grammar School will require a new fibre optic telecom service to provide connectivity to the Internet and Public Telephone Network.

An application will need to be lodged to NBN for the supply and installation of a new fibre optic service including new underground pits and ducts along Tallawong Road.

The Client will be responsible for providing an underground telecom cable pathway from Tallawong Road up to the School's Main Communications Room.

### **8.2.2 Main Communications Room**

A Main Communications Room (Campus Distributor) will be established in the Services Building near Tallawong Road, which will house the NBN's Network Termination Devices (NTDs) and the School's centralized network equipment.

The Communications Room will be air conditioned and shall not be directly accessible from an external location.





## **APPENDIX A    SYDNEY WATER FLOW AND PRESSURE ENQUIRY & SEWER SERVICE DIAGRAMS**

