Parramatta City Council

Alexis Cella

From: Chris Milne [Chris.Milne@capitalinsight.com.au]
Sent: Tuesday, 17 August 2010 3:41 PM
To: Alexis Cella
Cc: Amanda Harvey
Subject: FW: Street Trees

Alexis,

Record of conversation between council & Scape as our landscaping designers.

Regards

Chris Milne Capital Insight Pty Ltd
ABN 76 056 297 100 Telephone 61 2 9959 2636
77 Berry Street Facsimile 61 2 9955 5574
North Sydney NSW 2060 Mobile 0438 243068

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From: Lisa Heathers [mailto:lisah@scapestrategy.com.au]
Sent: Tuesday, 17 August 2010 3:33 PM
To: Jonathan Jacka
Cc: Chris Milne
Subject: RE: Street Trees

Jon
Further to my previous email, I have received the following information from Council as discussed in our meeting yesterday:

Street trees
Parramatta City Council (Michael, Street Tree Management) have a draft street tree master plan. Street trees are not recommended on Hawkesbury Road due to the narrow verge in this location. This master plan is not yet endorsed by Council but we can refer to it as a general guide and record of conversation. I agree that the verge is quite narrow and the tree may struggle in this situation, and if Council isn't willing to maintain it then it may not be a good outcome. Given the south facing side of the building, provision of shade is less important than say a north or west facing frontage.

Bike parking
Parramatta City Council (Melanie, Development) have no standards for bike parking for this area, therefore we can pick an item which suits our needs.

Paving
No requirements at this stage - we can detail this later if required.

Regards

Lisa Heathers
Associate | RLA # 1591 | BLarch Hons

From: Jonathan Jacka [mailto:Jonathan_Jacka@bvn.com.au]
Sent: Tuesday, 17 August 2010 2:48 PM
To: Lisa Heathers
Cc: Chris Milne
Subject: Street Trees

Hi Lisa

Do you know what species of tree we're using to replace the existing trees on the Hawkesbury Road frontage of the building. We're currently working up the photomontages and anything you have currently would be useful to put into the model.

Thanks

--
Jonathan Jacka
BVN Architecture

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MINUTES

Date: 26th August 2010, 10am

Venue: Parramatta City Council

Attendees:

David Gray – Senior Project Officer Transport Planning, Parramatta City Council
Paul Kennedy - Land Use Planning Officer, Parramatta City Council
Steve Ellis - Place Manager, Parramatta City Council
Rosemarie Barretto - A/Manager Traffic & Transport, Parramatta City Council
Bryony Cooper, SCAPE

Westmead Millennium Institute Ref: 20100030

Bryony Cooper presented a summary of the transport report supporting the WMI EA. This covered key points including:

- Development background
- Approach to future transport provision (i.e. demand management approach)
- Mode share targets
- Total parking additional to Westmead parking stock
- Traffic impacts

Bryony also pointed out references to work undertaken by Council and focused on Westmead. This included traffic modelling and intersection performance.

Bryony Cooper confirmed that the EA has not yet been submitted and the purpose of the meeting is consultation pre-EA submission.

Steve Ellis noted that a key concern is additional parking in residential streets exacerbating existing problems. This will be a key concern for Councillors.

It was agreed that while a demand management approach is desirable, the WMI travel demand management plan needs to be comprehensive and very strong to ensure modal share targets are met.

David Gray noted the need to ensure some detail is included on the use and allocation of WMI parking, particularly in supporting the travel demand management plan. He also noted the need to be able to expand cycle parking in the future.

David Gray also noted that, given the zero card driver mode share target for students at WMI, students would need to be a particular focus of the travel demand management plan.

On the topic of traffic generation, there was agreement that WMI is a relatively small development and confirmation that based on recent modelling, the Hawkesbury Road / Darcy Road intersection should not be detrimentally impacted even with future growth.

Helicopter Consultation

Alexis Cella

From: Daniel E Tyler [dan@tylerdigital.com]
Sent: Sunday, 20 June 2010 3:57 PM
To: Chris Milne
Subject: Re: Millennium Institute

Hi Chris,

Here is my take on the overall impact of the proposal.

Firstly, I am less concerned by the height of the structure reducing the scope for backward, Cat-A vertical-style take-off's than I am by the effect of lee-side mechanical turbulence on the NETS helipad. As long as there is no tail-wind component in the take-off, the fact that the climb/backup procedure is not exactly into wind is not a show-stopper, in my opinion.

But I believe there is a significant impact by placing a large structure immediately adjacent to the helipad. It's hard to express it in definitive, legalistic terms because of the inadequacy of HLS standards in Australia at the moment.

Accepting that we can probably meet the strict letter of the NSW Health Policy Document 2005_128, the development will still have an impact. HPD 2005_128 (as was CAAP 92-2 - upon which it is based) were developed at a time when both single-engine and twin-engine helicopters were used in air medical operations in NSW.

Single-engine helicopters normally have about the same climb performance as twin-engine helicopters do with both engines operating. The 7 1/2 degree obstacle-clear flight paths prescribed by CAAP 92-2 and HPD 2005_128 was designed to provide for adequate clearance for single-engine helicopters and twin-engine helicopters (so long as both engines continue to run).

If the only engine in a helicopter quits, then the helicopter must autorotate to the ground. If there is not clear space to land immediately in front, then there will be a crash following from the engine failure.

If one of the engines in a twin-engine helicopter quits, the helicopter may be able to maintain height or climb slowly -- depending on how much power is in each of the engines. Ultra-modern twin-engine helicopters have been designed with engines that can develop relatively high power settings for a very short period of time. This means they can survive an engine failure during take-off, climb and accelerate using the short power burst -- and then maintain height at a lower power setting and fly to a safe landing site where they can make a "run-on" landing. The three helicopters currently operated by Child Flight are not from this latest generation of twin-engine helicopters. Although they are modern and certified to Cat-A standards, they still require quite a bit of space and a clear flight path to continue a take-off following an engine failure.

Because the performance standards set by the NSW Ambulance Service mandate the use of Cat-A-certified, multi-engine helicopters, which have the possibility of surviving an engine failure on take off -- provided the facilities from which they operate have flight paths with shallow, obstacle-free take-off climb surfaces. One standard is the ICAO 4.5% climb surface (less than 3 degrees) which is recommended by the Victorians and Queenslanders for their hospital helipads.

Even though engine failures on take-off are rare -- it is pointless for the Ambulance Service to require this helicopter performance capability as a pre-requisite to being approved for air medical flights -- and then have the hospitals fail to provide (and protect) adequate flight paths to allow that extra performance to be utilized. The lack of facilities frustrates the purpose of the enhanced helicopter performance. If the helicopter is going to crash following an engine failure on take-off anyway -- it may as well be a single-engine helicopter.

For that reason, I agree with Andrew Berry that the NSW Health Policy Directive 2005_128 is overdue for revision

In summary, the combined effects of the development on the NETS helipad will be:- 1) Producing lee-side turbulence when winds are from the north east (second most common wind direction at the site); 2) narrowing the available flight paths into fewer and narrower corridors; and 3) placing obstacles immediately below the 7 1/2 degree flight paths that may not be cleared if an engine fails during take-off -- even in a twin-engine helicopter.

Having said all of that, if Child Flight truly does have serious aspirations of acquiring a BA609 civil tiltrotor aircraft in the near- to mid-term future, then I do not think it is viable to operate that aircraft from their existing site. I believe they would welcome the prospect of someone sharing the cost of relocating to a bigger and better site -- if it came up.

Those are my thoughts.

Best regards,
Dan Tyler
Heli-Consultants Pty Limited
0419-49 3634

----- Original Message -----
From: Chris Milne
To: Andrew Berry ; Andrew Berry
Sent: Friday, June 18, 2010 11:48 AM
Subject: Millennium Institute

Andrew,

Thank you for your time yesterday to discuss the impact of NETS and WMI on each other.

As we discussed would you please confirm the formal/documented issues and also the non formal/documented issues which need to be considered in the planning for the proposed WMI building.

I will be meeting with Health Infrastructure and SWAHS (Col Erickson) on Tuesday to discuss, so it would be of great assistance to have this information for the meeting.

Regards

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Alexis Cella

From: Andrew Berry [Andrew.Berry@nets.health.nsw.gov.au]
Sent: Friday, 18 June 2010 3:55 PM
To: Chris Milne
Cc: jdufty@nets.org.au; Greg Duncombe
Subject: RE: Millennium Institute

Thanks Chris.
As you know, NETS is the state-wide service for neonatal and paediatric retrieval; covering NSW and the ACT. It is responsible for inter-hospital critical care networking and patient transport. Unlike traditional ambulance and air rescue services, it requires close functional relationships with key tertiary centres such as Children's Hospital at Westmead and Westmead Hospital. In the near future, it will be joined by the Pregnancy and newborns Services Network which has a strategic role in addressing issues around high-level perinatal care. It is likely the role of NETS will extend to fill a gap in emergency inter-hospital clinical networking for high-risk obstetric cases; including the transport of those patients.
NETS acts as a gateway for clinical discussion about patients needing the services of hospitals distant from the patient's own hospital. Multi-party conference calls link clinicians together to make optimal decisions about immediate management and transport options. A collegiate relationship between clinicians in different institutions and levels of care is nutured by NETS working close to two of the main destination hospitals for patients moved by NETS, viz. CHW and WH.
Road and helicopter transport is used to take teams from the NETS Base at Westmead to hospitals across the state; sometimes with the added vehicle of a fixed wing plane at an airport. Direct functional links are essential; from the NETS ambulance garage to the road system of Sydney and beyond and from the heliport which, being outside / under the controlled airspace boundary at Rosehill permits rapid deployment of teams.
The heliport is also used for the arrival of children being transported from the scene of an accident by an Ambulance rescue helicopter to CHW.

1. Approach path from the south is rotated anticlockwise to avoid 181 Hawkesbury Road and following experience with prevailing winds when in summer (NE prevailing), departures are made to the NE. This traverses the proposed construction site more that previously anticipated. However, width of approach/departure path now agreed as narrower (60m).
2. The safety of an approach which is 'off centre' to the wind direction (cross wind) or any curved approach manoeuvre, reduces the available power for emergency purposes.
3. Using Category A procedures, a departure to the West require a reversing climb profile to 100 ft above the helideck which brings the helicopter over the proposed building at low level (some 210 ft) whilst at maximum thrust. This manoeuvre is designed to mitigate the risk while close to the ground of an engine failure leaving the aircraft dependent on the other remaining engine. Helicopters normally used for medical purposes don't have the power to operate at slow speed (< 40k) and out of ground effect and still ascend on one engine. The manoeuvre is designed to protect the helicopter its occupants and those below the aircraft in the event that one engine fails before a height can be reached which permits a diving 'fly-away' to achieve 40k

and single-engine performance or alternatively make a controlled emergency descent onto the FATO. There is significant down-draft, noise, fumes & vibration associated with this manoeuvre. Pilots can't see behind a helicopter and the proposed building therefore seriously confines the helicopter's operations for westerly/south-westerly departures (requiring the back-up to the NE/E). The existing relatively obstacle-free sectors to the north through west, south through north-east cannot be reduced without serious impact on the flight operations of the NETS Heliport.
    a. There is no available documentation on the radius of the 'reversing space' required.
    b. On hot days, the Category A reversing climb is slowed by high density altitude affecting aircraft performance and may, especially at max payload, be unachievable.
4. The current aircraft fleet includes new model types with higher gross weight, increased down-wash and noise but increased high payload performance and safety margin. These aircraft already operate into the NETS Heliport and are likely to replace types currently used by Child Flight.
5. Low cloud and other adverse weather sometimes closes the NETS Heliport. An existing non-precision approach permits helicopter operation when the cloud is above 800ft. Plans to reduce this minimum by the introduction of new technology will significantly reduce the times an aircraft is grounded or can't reach the heliport. There is potential with new precision instrument approaches to permit safe operations in conditions where the cloud base is significantly lower (250-300ft).
6. New aircraft types are available soon which offer significant operational advantages for NETS. The BA609 'Tiltrotor' offers reductions of 2 to 3 fold in response times to rural NSW through. Example, NETS to in front of a patient in Wagga in 60 minutes versus the current 4 hours 18 minutes by fixed wing or 2 hours 45 mins by helicopter). While operating requirements are still in development, a larger FATO (not all load-bearing) is expected and approach / departure profiles are still to be established.
7. Technical documentation from CASA, Victorian Capital Works and ICAO specify different obstacle-free gradients for approach and departure but are silent on many of the necessary issues in relation to Category A procedures etc.; delegating risk management to operators and building / heliport owners. CASA CAAP (92) – 7.5%, Victoria - 8% approach/ 4.5% for departure; starting from a point 250m from the FATO. ICAO Annexure 14 also uses 4.5% but is currently being reviewed and updated.
8. There is no precinct planning overlay which defines the airspace needing to be quarantined to ensure safe operations. The development of structures on the health campus and in surround commercial / residential areas is occurring without considerations. 181 Hawkesbury Road and CMRI extensions are examples. All development proposals need to consider existing use.
9. Any proposal to introduce MRI and similar facilities in the new structure would need to be assessed to avoid interference with aircraft magnetic compasses.

Andrew Berry AM FRACP

NETS

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From: Chris Milne [mailto:Chris.Milne@capitalinsight.com.au]
Sent: Friday, June 18, 2010 11:48 AM
To: Andrew Berry; Andrew Berry
Subject: Millennium Institute

Andrew,

Thank you for your time yesterday to discuss the impact of NETS and WMI on each other.

As we discussed would you please confirm the formal/documented issues and also the non formal/documented issues which need to be considered in the planning for the proposed WMI building.

I will be meeting with Health Infrastructure and SWAHS (Col Erickson) on Tuesday to discuss, so it would be of great assistance to have this information for the meeting.

Regards

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To Heath Infrastructure

Attention Bruno Zinghini

From Chris Milne

Date 17 June 2010

Subject NETS Base Impact on Millennium Institute.

Bruno,

As we advised we net with NETS today to finalise any imposts that may exist on the proposed Millennium Institute Site due to the location of the NETS base and in particular the Helicopter landing.

The attendees were:

- Dr Andrew, Berry State Director NETS
- John Dusty, Operations Director NETS
- Greg Duncan, Chief Pilot NETS
- Dan Tyler, Heliconsultants
- Col Erickson, SWAHS
- Chris Milne, CI
- Jonathan Jacka, BVN Architects

The meeting was held at the NETS base at 08:30 on 17 June 2010, concluding at 11:30. The reason for the meeting was to further the discussion regarding the size and location of the FATO and also identify all matters which have potential to influence the utilisation of the proposed Millennium Institute Building and site.

The record of the meeting follows:

#	Issue	Action
1	The location of the centre of the FATO Circle was discussed. The theoretical position is the middle of the Landing and Lift off Area. (LLA). This has been assumed as being the centre of the + within the NETS logo.	Note.
2	The group reviewed the drawing previously prepared by BVN to identify any issues which need discussion, resolution.	Note
3	The FATO identified on drawing SK_BVN_100618_01 was agreed as being appropriate, however it was noted that their normal flight path was further to the North East. (i.e. closer to the CMRI building.) It has been indicated that pilots do not generally fly over the CMRI building so that they do not disrupt the researches.	Note
4	The maximum width of the FATO is identified at 60m which equates to the dimension of 4 x rotor widths. This is confirmed by Dr Andrew	Note

	Berry.	
5	The arrival and departure path should be straight in the final approach, ie any curves etc should take place some distance away from the final approach. This is say 500m out from the HLS.	DT
6	The pilots who fly for NETS are from a small crew who know the facility well, however there are often pilots who use the HLS who may have not used the location previously. This is due to other parties using the HLS to deliver patients to WCH. This introduces an issue when taking off and landing at night in bad weather, with pilots who are not accustom to the local conditions.	Note
7	The take off procedure as described in (BHT-412-FMS-62.3 & 62.4) indicates the emergency landing/takeoff profile has been considered. The building elevation and plan location does not conflict with these requirements, however the indications given by the NETS pilots is that they would not back up towards a known structure. The actual heights etc are ultimately up to the pilot of the machine. The pilot or crew are not able to see behind the Helicopter when undertaking this procedure. **NETS to confirm the acceptable profiles.** See attached Emergency Landing/Takeoff Profile. BVN Sketches SK-BVN-100617-01 and 02	**NETS to confirm**
8	The prevailing winds in the Westmead area are from the west, the north east and the north west. The takeoff direction is parallel with and in the direction of the wind to the hover position and then departure into the Wind.	
9	NSW Health Policy Directive, Medical Helipads – Guidelines Doc # PD2005_128 indicate that the approach and departure paths are to have an obstacle free gradient of 7.5deg. NETS have indicated that they need a free gradient of 3 deg. This still needs to be clarified but only impacts on Stage 2.	NETS
10	Any MRI machines or items which generate radio waves must be carefully planned because they impact the helicopter navigation equipment.	Note
11	The operation of the helicopter will potentially have an impact on the construction process. This would be the down draft blowing materials around the site, also the potential of the helicopter ingesting dust, etc from the building site. The crane operation during construction is also a consideration.	
12	Sound and vibration issues were raised. They will be planned for as appropriately. It should be noted that the cost of these abatement measures may be substantial and could be reinvested into the building or relocating the helicopter. This will address structure and also facades.	
13	There is an average of 3.6 helicopter movements per day, with possibly up to 10 movements in a day.	
14	Overall campus planning is required to establish the best place for the helipad (HLS) with consideration of future development opportunities.	
15	Planning for new tilt rotor aircraft would need to be considered in	

	any option which develops a new HLS. (Google BA 609)	
16	Dr Andrew Berry was asked to document the know and documented constraints and also the non documented constraints which impact on the NETS operation.	
17	Turbulence is also a consideration in the location and planning of the new building. It is very difficult to determine exactly the impact of the wind and turbulence. Tests can be done in wind tunnels, but may not be definitive.	
	Other issues outside the WMI Project.	
18	Andrew raised the issue of the need for NSW Health / Health Infrastructure to implement a policy that all planning applications within close proximity of a hospital with a HLS should be referred to the chief pilot of that facility. This would capture planning constraints imposed due to the location of HLS. A planning overlay should be considered. For Westmead this would be Parramatta Council and Dept of Planning.	HI

Conclusion:

- The selected site is able to house stage 1 of the Millennium Institute project;
- The FATO as drawn on the BVN sketch attached indicates a 37m FATO growing to a 60m wide approach and departure path which has been agreed is satisfactory. (The NSW Health Policy Guideline indicates a width of 74m in very small font which is not regarded as appropriate);
- 181 Hawkesbury Rd does impact on the flight path;
- The WMI building will impact on the flight paths now available. This has the affect of further limiting the available options for free space;
- The Cat-A vertical style takeoff can be achieved, however it is not the optimum situation. The pilots will have to back up against a known obstacle;
- The Cat-A vertical style takeoff path can be achieved in theory without crossing the building footprint, however this may not be the situation in high density operations;
- The turbulence introduced by the new building will impact the safety of the operations. This can be tested and design introduced to limit the impact, however this is not a precise process;
- The longer term viability of the NETS base will require it to be relocated, due to the limiting impact on the redevelopment opportunities of the site and the vision to use a tilt-rotor aircraft, which is unlikely to be able to operate from the existing facility.

Recommendations:

Reference Data:

- NSW Health Policy Directive, Medical Helipads – Guidelines Doc # PD2005_128
- CAAP 92-2 (1) Guidelines for the establishment and use of helicopter landing sites. (HLS) *Civil Aviation Safety Authority Australia*.
- Email 18/06/2010 from Dr Andrew Berry, State Director NETS.
- Feed back from Dan Tyler from Heli Consultants.

Alexis Cella

From: Jonathan Jacka [Jonathan_Jacka@bvn.com.au]
Sent: Wednesday, 9 June 2010 11:12 AM
To: Chris Milne
Cc: Julian Ashton/Sydney/BVN; Ali Bounds
Subject: Re: Helicopter

Hi Chris,

To answer Andrew's query regarding where the 7.5 degree incline begins: The drawings (both plans and sections) show the 7.5 degree incline originating from the edge of the FATO (not the centre of the FATO). This is in accordance with both CAAP 92-2 (1) ("Guidelines for the establishment and use of helicopter landing sites (HLS)") and NSW Health Policy Directive PD2005-128 ("Medical Helipads - Guidelines"). And answers Andrew's question on the viability of the flight path in regard to these guidelines (ie. the flight path at a 7.5 degree incline from the edge of the FATO clears the building at 181 Hawkesbury Road).

At a 7.5 degree incline, the removal of the parapet at the corner of the hangar would be beneficial for the clearances of the helicopter between the hangar and the Stage 1 building envelope. However, this is not relevant with a flight path of 3 degree incline (as suggested by Andrew previously), which would conflict with this part of the hangar at a lower point.

In regard to the additional operational margins of the NETS heliport that Andrew raises in regard to departure engine failure. I'd suggest we need:
- information on the ICAO guidelines (as referred to in Andrew's email);
- the confirmation of the Area Health Service as to their judgement (as Andrew suggests); and
- a clear direction on the ramifications for development of the site and Stage 1 of our project in relation to (i) the flight path incline and (ii) the acceptable orientation of the flight path (particularly concerning the suggestion of the flight path being swung around to the southeast over the Stage 1 proposal).

We also need to understand the maximum rotor dimensions of helicopters using the helipad in order to confirm at what dimension the path straightens.

Hope this helps,

Jonathan Jacka
BVN Architecture

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From: Chris Milne <Chris.Milne@capitalinsight.com.au>
To: Julian Ashton/Sydney/BVN <Julian_Ashton@bvn.com.au>, Jonathan Jacka <Jonathan_Jacka@bvn.com.au>
Date: 09/06/2010 07:54 AM
Subject: Helicopter

Gents,

Further information re the helicopter. I will set up a meeting with Andrew ASAP to resolve the issue.

Regards
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----- Message from Daniel E Tyler <dan@tylerdigital.com> on Tue, 8 Jun 2010 12:24:30 +1000 -----

To: Chris Milne <Chris.Milne@capitalinsight.com.au>

Subject: Further on profile view of flight path versus 181 Hawkesbury Road

Chris,

This is a disjointed series of communiques on my part -- hope you can sort out my comments.

In my previous e-mail I queried whether the 7.5 degree obstacle-free gradient along the south east flight path really cleared the high-rise building at 181 Hawkesbury Road.

The reason I query that is because I'm not sure whether the origin of the 7.5 degree incline is the centre of the helipad or the edge of the FATO -- being about 18.5 metres from the centre of the helipad.

If the 7.5 degree flight path incline originates at the edge of the FATO, then that answers my question about the viability of that flight path. It would also follow that removal of the parapet at the corner of the hangar might allow the flight path to be rotated further south -- thus reducing the impact on your client's proposed development site.

From an operational point of view, the scenario of having an engine failure in a twin-engine helicopter on departure along that flight path is this:- the pilot will have a residential building directly in front of him and will not have the performance capability to climb over it. That is why ICAO requires a shallower flight path for departures than it requires for arrivals.

There's no way anyone can say that building the new structure won't have some impact on the helicopter operations. We can say with some confidence that in-flight engine failures are extremely rare nowadays. But we can't say they will never happen -- and we are closing off the options for the pilots if they do happen.

It really should be for the Area Health Service to make a value judgement on whether they are prepared to sacrifice the operational margins of the NETS heliport in order to obtain maximum development potential from the adjoining real estate.

Sorry again for the disjointed nature of my commentary. I should have read through and answered your e-mails in chronological order -- rather than starting at the top of my inbox and working down.

Regards,
Dan Tyler
Heli-Consultants Pty Limited
0419-49 3634

----- Message from Daniel E Tyler <dan@tylerdigital.com> on Tue, 8 Jun 2010 12:05:46 +1000 -----

To: Chris Milne <Chris.Milne@capitalinsight.com.au>

Subject: Corrections

Chris,

I'm sorry -- but I didn't notice that the drawing you sent had multiple pages and I was only focussing on the first page.

It's hard to tell from the photograph whether it is viable to shift the flight path around to the south further if the part of

the parapet that is shaded in red is removed. But at least I see what you are talking about now. It doesn't look like it would gain you more than a few degrees of flight path rotation, though.

I now realize that the building shown as 181 Hawkesbury Road is the high-rise building that we were talking about. I don't know whether it's below the 7.5 degree flight path or not -- but I recall that it is quite tall.

If you remove the parapet and rotate the flight paths to the south -- doesn't that make the high-rise building a more significant obstacle?

I would have thought it would be necessary to have that flight path clear the high-rise building by rotating it anti-clockwise, when viewed from above.

Sorry for the confusion -- I just didn't notice the PDF file had multiple pages.

Dan

Heli-Consultants Pty Limited

----- Message from Daniel E Tyler <dan@tylerdigital.com> on Tue, 8 Jun 2010 11:56:19 +1000 -----

To: Chris Milne <Chris.Milne@capitalinsight.com.au>

Subject: Re: WMI_Helipad_181 Hawkesbury Road

Chris,

I don't know exactly what structure we are talking about but if it allows them to use a better approach/departure path then it can be looked at. What about the flight path projected further away from the helipad? Is the adjusted flight path after the parapet has been removed still viable further away from the helipad -- or do we need to curve the flight paths around obstacles?

Some degree of flight path curvature is okay from a performance perspective -- but it negates the use of an approach path indicating system. Light travels in a straight line.

----- Original Message -----
From: Chris Milne
To: Daniel E Tyler
Cc: Jonathan Jacka
Sent: Monday, June 07, 2010 8:25 AM
Subject: RE: WMI_Helipad_181 Hawkesbury Road

Thanks Dan,
What are your thoughts about removing the small parapet on the NETS hanger? Is this a sensible thing to look at removing?

With the proposed flight path in mind does NETS need to adjust their fly in light system or any other flight details?

I will let you know any comments from Andrew.

Regards
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77 Berry Street Facsimile 61 2 9955 5574
North Sydney NSW 2060 Mobile 0438 243068

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information is virus free or free of any other defect or error.

From: Daniel E Tyler [mailto:dan@tylerdigital.com]
Sent: Sunday, 6 June 2010 8:36 PM
To: Chris Milne
Subject: Re: WMI_Helipad_181 Hawkesbury Road

Chris,

The FATO portion and initial 10 degree splay at the origin of the flight paths looks correct.

The final width of the flight path needs to be 4 x largest rotor diameter -- which is just under 15 metres.

Thus the final width of the flight path corridor only needs to be about 60 metres -- not 74 metres.

Dan Tyler
Heli-Consultants Pty Limited

----- Original Message -----
From: Chris Milne
To: dan@tylerdigital.com
Cc: Jonathan Jacka
Sent: Friday, June 04, 2010 8:44 AM
Subject: FW: WMI_Helipad_181 Hawkesbury Road

Hi Dan,

Your comments and confirmation of our understanding would be greatly appreciated.

Regards
Chris Milne Capital Insight Pty Ltd
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77 Berry Street Facsimile 61 2 9955 5574
North Sydney NSW 2060 Mobile 0438 243068

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From: Chris Milne
Sent: Friday, 4 June 2010 8:43 AM
To: 'Andrew Berry'; Andrew Berry
Cc: 'bruno.zinghini@hinfra.health.nsw.gov.au'; 'dan@tylerdigital.com'; 'Jonathan Jacka'
Subject: FW: WMI_Helipad_181 Hawkesbury Road

Good morning Andrew,

Please see the attached document which indicates the FATO impact from your HLS on the neighbouring site. Would you please review it and indicate if the assumptions we have made are correct and therefore the impact of the Helicopter is correctly determined.
If you require any further information please let me know and we will forward it to you. If all is satisfactory please confirm in writing and we will progress the design on that basis.

Your earliest attention to this would be greatly appreciated.

Regarding the VMS you will get an invitation this morning and we hope you can attend. We also understand that you may not be able to attend for the full day.

Regards
Chris Milne Capital Insight Pty Ltd
ABN 76 056 297 100 Telephone 61 2 9959 2636
77 Berry Street Facsimile 61 2 9955 5574
North Sydney NSW 2060 Mobile 0438 243068

www.capitalinsight.com.au

From: Jonathan Jacka [mailto:Jonathan_Jacka@bvn.com.au]
Sent: Thursday, 3 June 2010 8:52 AM
To: Chris Milne
Cc: Scott Lawlor; Julian Ashton; Ali Bounds
Subject: WMI_Helipad_181 Hawkesbury Road

Hi Chris

Pls find attached helicopter flight path studies in relation to 181 Hawkesbury Road.

Pages 1 & 2 (plan and sections) relate to a flight path avoiding all buildings & structures. The sections show that at survey locations '4' & '6' at the top of the building at 181 Hawkesbury Road the flight path clears the building. The clearances above the building are 6.35m and 5m for locations '4' & '6', respectively.

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As discussed, the method and locations drawn for the setout of the flight path and the conclusions from this study need to be reviewed and approved by NETS, HI, WH, Dan Tyler and any other relevant bodies.

Regards

--
Jonathan Jacka
BVN Architecture

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part of its contents, is prohibited. If you receive this Email in error please notify us by return Email or telephone. We will reimburse you for any reasonable expenses incurred in meeting this request.

----- Message from Daniel E Tyler <dan@tylerdigital.com> on Tue, 8 Jun 2010 11:37:23 +1000 -----

To: Chris Milne <Chris.Milne@capitalinsight.com.au>

Subject: Re: WMI_Helipad_181 Hawkesbury Road

Chris,

Firstly, it sounds like the flight path as depicted conflicts with a high-rise apartment building on the east side of Hawkesbury Road. I would need to see a plan view with the flight path plotted that extended to cover that area out to about 500 metres to know for sure how the flight path interacts with the building. But I know the building they are talking about and it is quite a tall building.

Secondly, I don't think there are any design standards that require a 3 degree "approach" path. The descent profiles for the two instrument approaches that serve Westmead Hospital are both 3 degree profiles (also expressed as 5.2 per cent or about 320 feet per nautical mile). But those two instrument approach procedures approach from the north west (127 degrees inbound) and the south west (052 degrees inbound). As I understand it, the flight path to the south east does not have an associated instrument approach procedure either currently or planned. Therefore, that flight path would only be used by helicopters departing or by helicopters circling to land after reaching the minimum descent altitude (MDA) on the instrument approach. So I don't think it is correct to say that particular flight path needs to have a 3 degree obstacle-free approach gradient.

The note about the HAPI I believe refers to the vertical band for which there is glide path guidance. As far as I know, the HAPI installations are adjustable to depict any approach slope from 3 degrees up to about 12 degrees. I'm not sure exactly which model they have there -- but the idea of the "helicopter approach path indicator" (HAPI) is that it can be customized to suit the particular installation. For the HAPI's serving the north west and south west flight paths, it would make sense to have the HAPI's set to 3 degrees so that a stabilized descent profile can be maintained all the way to the helipad from either of those instrument approach procedures.

But for a "circling approach" using the south eastern flight path, I don't believe there is any reason why a steeper approach cannot be used. CAAP 92-2 and Health Policy Document 2005_128 specify a 7.5 degree minimum obstacle-free gradient which would comfortably accommodate a 9 degree approach path. The US Federal Aviation Administration (FAA) Heliport Design Advisory Circular and the International Civil Aviation Organization (ICAO) Technical Annex 14, Volume 2 (Heliports) both specify a minimum obstacle-free approach gradient of 1:8 (which is about 7.13 degrees -- only slightly shallower than the 7.5 degrees recommended by CAAP 92-2 & HPD 2005_128) for the APPROACH path. The FAA also recommends 1:8 for the DEPARTURE path. In contrast, ICAO recommends a shallower DEPARTURE path. CAAP 92-2 and HPD 2005-128 don't differentiate between the minimum obstacle-free gradients required for APPROACH and DEPARTURE.

As I mentioned to you earlier, there is a school of thought supporting the use of ICAO standards in Australia. Both the Victorian and the Queensland state governments have approved hospital heliport design guidelines based on the ICAO model rather than the CAAP 92-2 or FAA model. Because the same flight paths are usually used for both APPROACH and DEPARTURE, it would follow that following the ICAO model would require ALL flight paths to have a shallower obstacle-free gradient. So far, the NSW Health Department has not embraced the ICAO model.

Hope this information is what you are seeking.

Best regards,
Dan Tyler
Heli-Consultants Pty Limited
0419-49 3634

----- Original Message -----
From: Chris Milne
To: Daniel E Tyler
Sent: Monday, June 07, 2010 1:31 PM
Subject: FW: WMI_Helipad_181 Hawkesbury Road

Dan,
Would you please review Andrew's comments and let me know your thoughts. Possibly biggest impact is the 3 deg path.

Please advise ASAP.

Regards
Chris Milne Capital Insight Pty Ltd
ABN 76 056 297 100 Telephone 61 2 9959 2636
77 Berry Street Facsimile 61 2 9955 5574
North Sydney NSW 2060 Mobile 0438 243068

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From: Chris Milne
Sent: Monday, 7 June 2010 1:30 PM
To: 'bruno.zinghini@hinfra.health.nsw.gov.au'
Cc: 'Stuart.Bosel@hinfra.health.nsw.gov.au'
Subject: FW: WMI_Helipad_181 Hawkesbury Road

Bruno,

This is further information from Andrew Berry of NETS.

The impact of the information as I understand it is that we need to move the envelope further East and avoid the residential building at 181 Hawkesbury Rd and also the lower 3deg incline will have a bigger impact. I am not aware at this stage where the 3 deg is written but it is required for instrument landing. We will address the impact and advise ASAP.

Andrew mentioned the letter from Richard Mathews but was uncertain of the content.

Regards
Chris Milne Capital Insight Pty Ltd
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North Sydney NSW 2060 Mobile 0438 243068

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From: Andrew Berry [mailto:Andrew.Berry@nets.health.nsw.gov.au]
Sent: Monday, 7 June 2010 12:22 PM
To: Chris Milne; Andrew Berry
Cc: bruno.zinghini@hinfra.health.nsw.gov.au; dan@tylerdigital.com; Jonathan Jacka; jdufty@nets.org.au; Greg Duncombe; col.erickson@wsahs.nsw.gov.au

Subject: RE: WMI_Helipad_181 Hawkesbury Road

Hi Chris.
Thanks for the diagrams. Several points:
1. Vertical plane: The 7.5 degrees should be 3.0 degrees. There is a vertical splay which defines the lower boundary as 3 degrees with a path through the air which is at a higher angle (as per HAPI).
2. Horizontal plane: Advice from the TCF chief pilot is that prevailing winds are such that the pilots in practice actually depart and approach more in a 130-135 degree direction than 170-180. This is now also safer since the high rise block was constructed in Hawkesbury Rd.
3. It occurs to me that the proposed building might be less limited by the flight paths if the flight path were swung around to about 130 degrees (perpendicular to the long axis of the heliport). This way the higher parts of the construction might be to the south-west end of the plot and the lower parts (below the 3 degrees) to the north-east end. Just a thought…
See you tomorrow.

Andrew Berry AM FRACP

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+61 2 9633 8782
+61 4 1823 9847

NETS

From: Chris Milne [mailto:Chris.Milne@capitalinsight.com.au]
Sent: Friday, June 04, 2010 8:43 AM
To: Andrew Berry; Andrew Berry
Cc: bruno.zinghini@hinfra.health.nsw.gov.au; dan@tylerdigital.com; Jonathan Jacka
Subject: FW: WMI_Helipad_181 Hawkesbury Road

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From: Jonathan Jacka [mailto:Jonathan_Jacka@bvn.com.au]
Sent: Thursday, 3 June 2010 8:52 AM
To: Chris Milne
Cc: Scott Lawlor; Julian Ashton; Ali Bounds
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Jonathan Jacka
BVN Architecture

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Alexis Cella

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Sent: Monday, 7 June 2010 12:22 PM
To: Chris Milne; Andrew Berry
Cc: bruno.zinghini@hinfra.health.nsw.gov.au; dan@tylerdigital.com; Jonathan Jacka; jdufty@nets.org.au; Greg Duncombe; col.erickson@wsahs.nsw.gov.au
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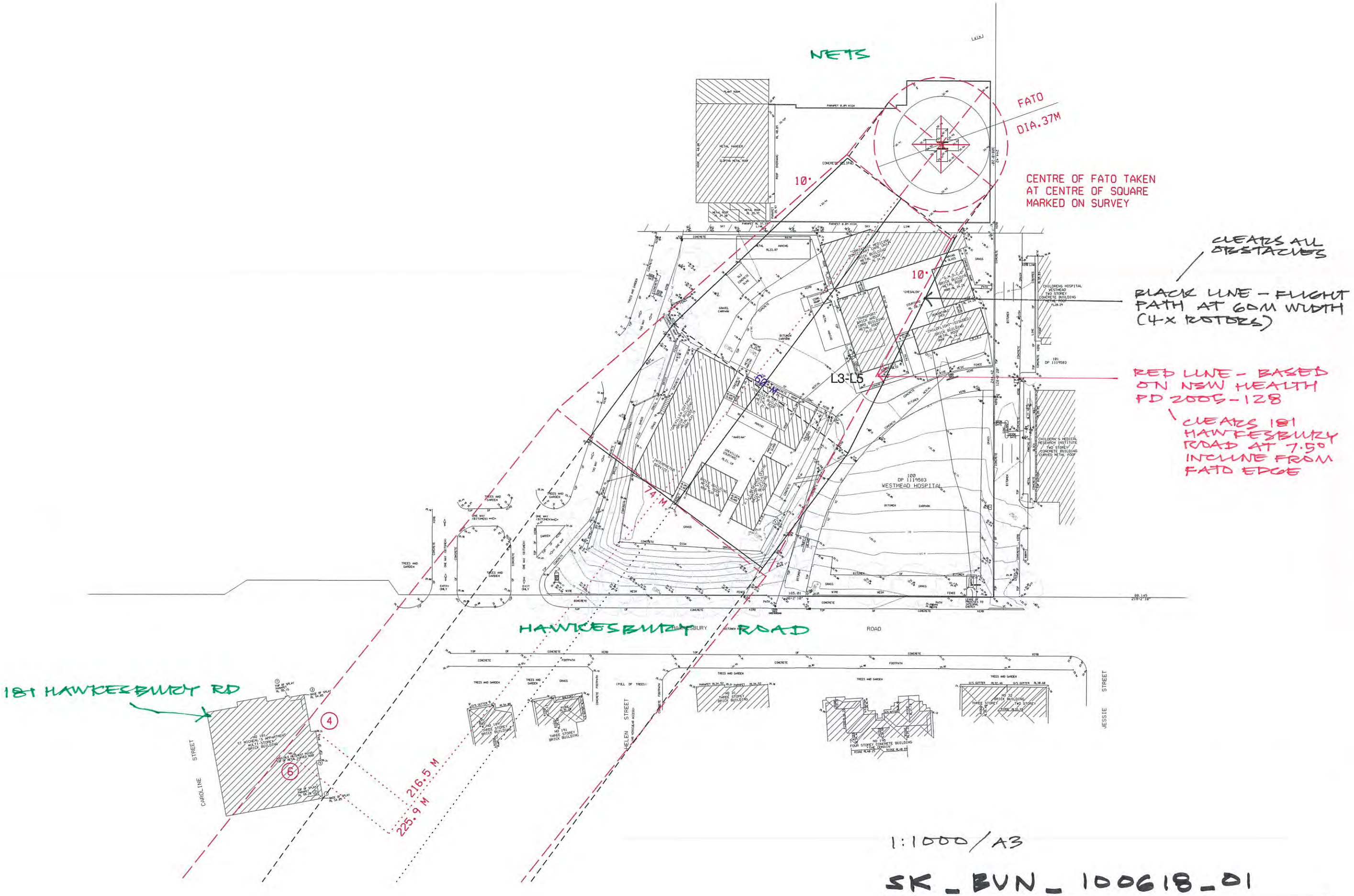
NTS



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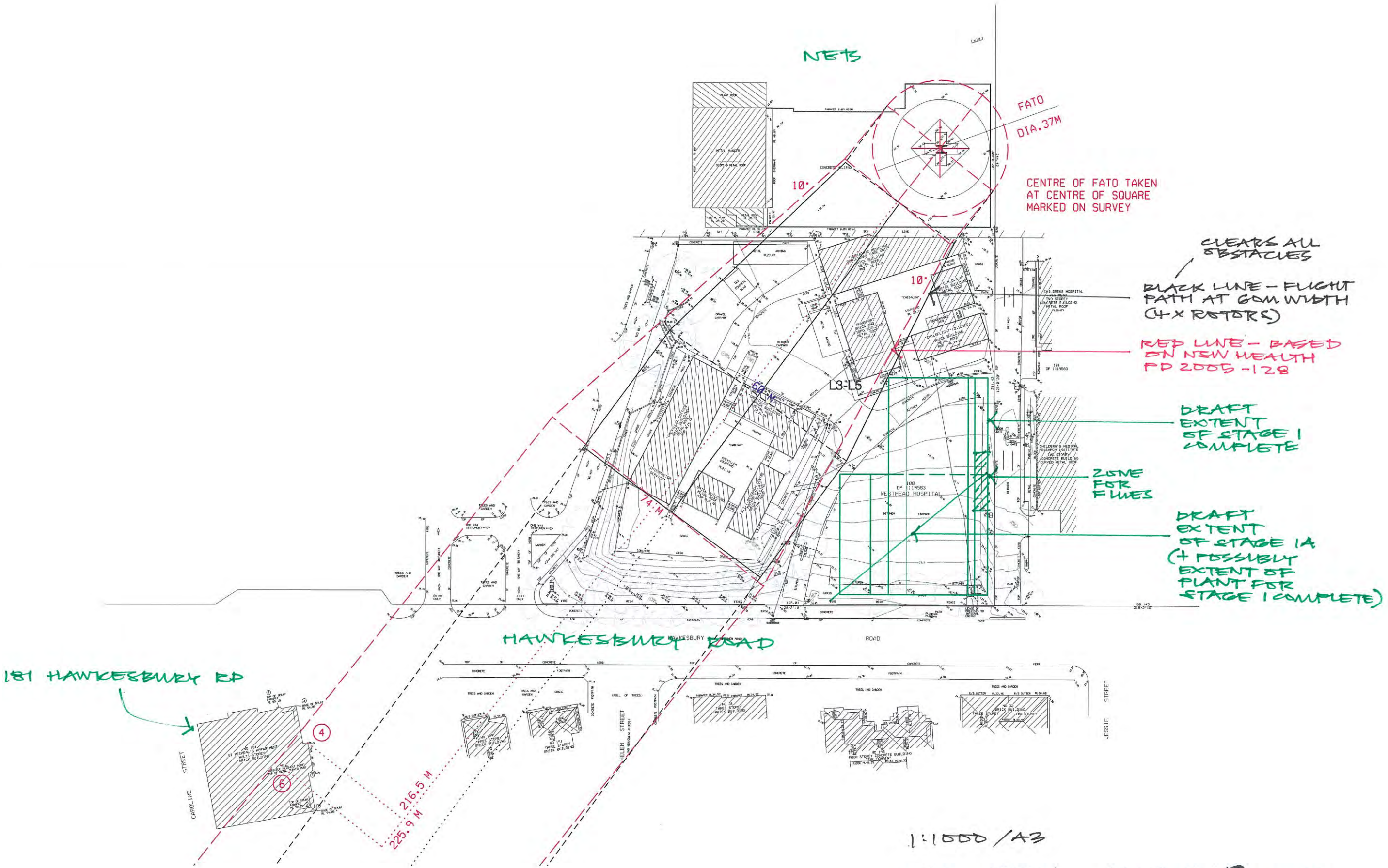
FLIGHT PATHS



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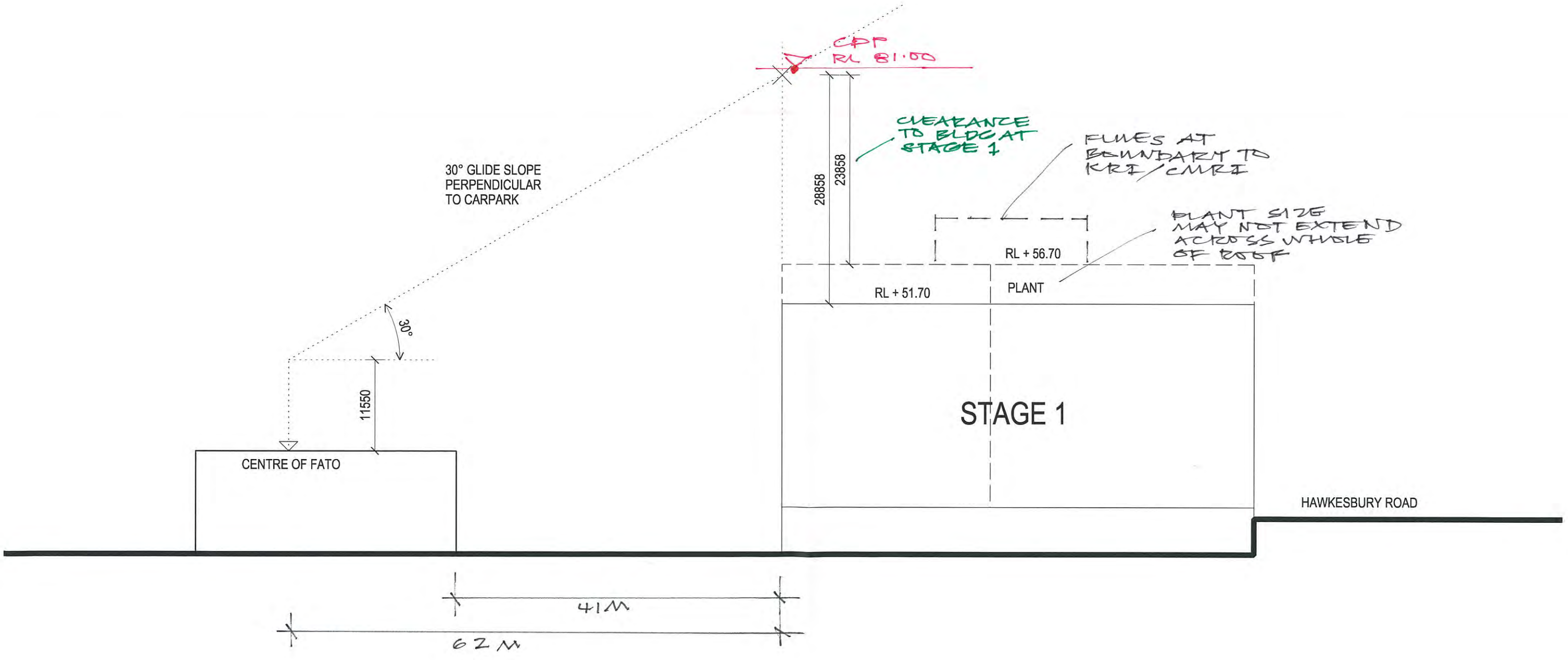
FLIGHT PATHS WITH PRELIMINARY BUILDING FOOTPRINTS



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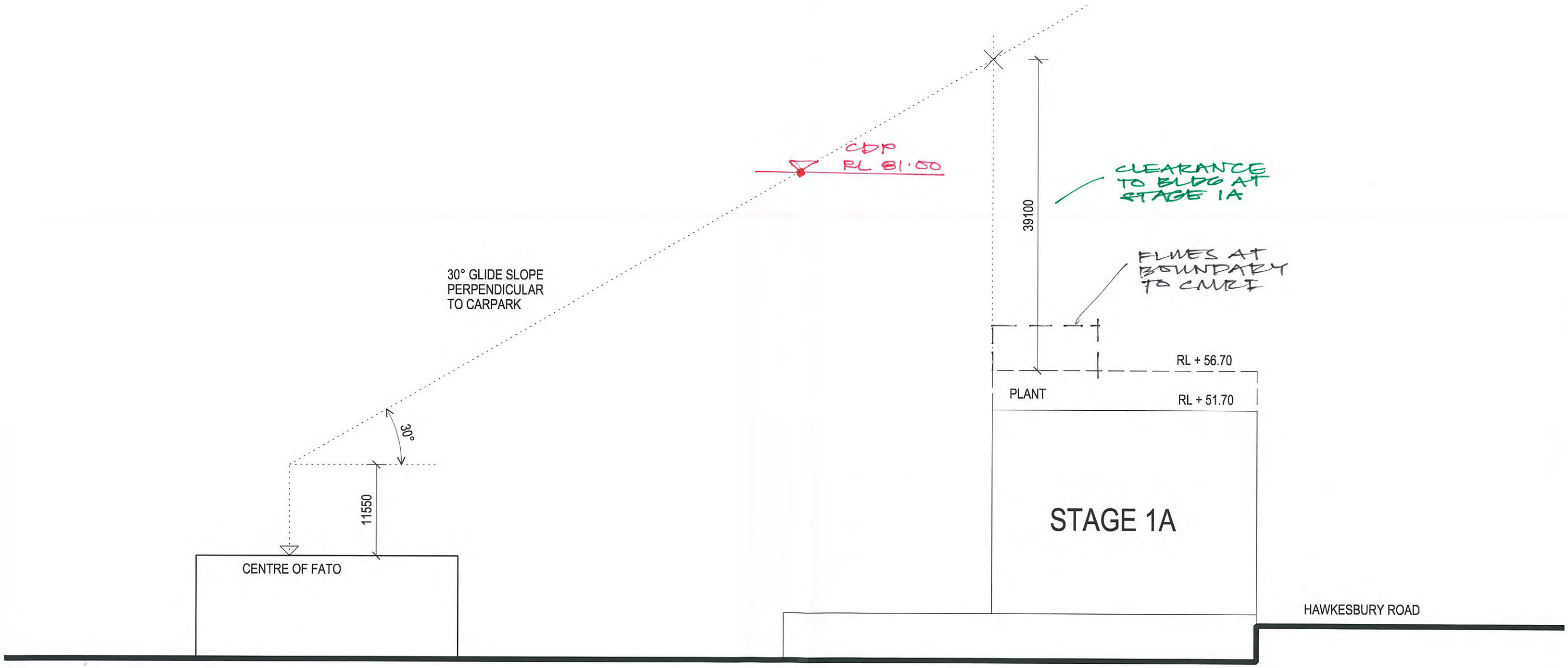
STAGE 1 SECTION DEPARTURE PROFILE



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SK_BVN_100617_02

STAGE 1A SECTION
DEPARTURE PROFILE

Policy Directive

Department of Health, NSW
73 Miller Street North Sydney NSW 2060
Locked Mail Bag 961 North Sydney NSW 2059
Telephone (02) 9391 9000 Fax (02) 9391 9101
http://www.health.nsw.gov.au/policies/

Medical Helipads - Guidelines

Document Number	PD2005_128
Publication date	25-Jan-2005
Functional Sub group	Corporate Administration - Asset Management
Summary	States requirements for location, size and security of medical helipads.
Author Branch	Statewide Services Development
Branch contact	9391 9146
Applies to	Area Health Services/Chief Executive Governed Statutory Health Corporation, Board Governed Statutory Health Corporations, Affiliated Health Organisations - Non Declared, Affiliated Health Organisations - Declared, Divisions of General Practice, NSW Ambulance Service, Public Health Units
Distributed to	Public Health System, Divisions of General Practice, Health Professional Associations and Related Organisations, NSW Ambulance Service, Public Health Units
Review date	25-Jan-2011
Policy Manual	Not applicable
File No.	A32603/1
Previous reference	98/61
Issue date	13-Jul-1998
Status	Active

Director-General

This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is **mandatory** for NSW Health and is a condition of subsidy for public health organisations.

NSW HEALTH DEPARTMENT

CIRCULAR

File No	A32603/1
Circular No	98/61
Issued	13 July 1998
Contact	G Lavender (02) 9391 9146

GUIDELINES FOR MEDICAL HELIPADS

In 1993 the Department of Health implemented a policy circular (93/107) specifying the requirements of Guidelines for Medical Helipads.

Following concerns expressed by Helicopter pilots in NSW, the Guidelines detailed in Circular 93/107 have been updated to reflect the current requirements of helipads and the increase in helicopter sizes.

These Guidelines have been revised by the NSW Medical Retrieval Committee (MRC) and have received endorsement of the Civil Aviation Safety Authority. The recommendations of the Civil Aviation Safety Authority have been included in the new Guidelines.

The Civil Aviation Safety Authority has also advised that the new Medical Helipads Guidelines comply fully with the recommendation contained in the Civil Aviation Advisory Publications (CAAP) 92-2(i) Guidelines for the establishment and use of Helicopter Landing sites, dated January 1996.

IMPACT OF CHANGES

The impact of these new Guidelines has particular emphasis on the location and security of the helicopter, size of the landing and lift-off area of the helipad, safety distances, reduced noise and changes in lighting and helipad markings.

Location and Security

Whenever possible helipads are to be located on an elevated surface such as roof tops or high rise car parks. This provides better security for the aircraft, unrestricted approaches for landing and take-off and decreases the noise impact on nearby residences.

Safety Factors

The revised Guidelines emphasis better safety precautions by stipulating actual minimum safety distances people should be when the helicopter is taking off and landing. These distances should be sufficient to protect them from the effects of rotorwash or possible mishaps.

Increase in Size of the Helipad

The 1993 Guidelines erroneously indicated a minimum touch down level area of $9m_2$. The revised Guidelines corrects this error and provides for a Landing and Lift Off Area (LLA) with the dimensions of 9m X 9m ($81M_2$).

Landing and Take-off Area

Special mention is made to the Final Approach and Take-off Area (FATO) especially in situations where the hospital helipad is located in higher elevations (above 2,500' above sea level) or in areas of high

ambient temperatures(35 C and hotter)
Other minimal requirements in relation to Ground Effect Area (GEA) and the Landing Lift-off Area (LLA) have been revised.

Lighting

Additional lighting requirements have been included to better define the Landing and Lift -off and approach area. In general the edge of the FATO should be defined with omni directional YELLOW lights. Any flood lighting is to be positioned in such a way as to not cause glare to the pilots during manoeuvring. A BLUE high density strobe light is to be positioned on top of the wind indicator to assist the pilot to identify the helipad at night.

Planning Stages

Any decisions to include a helipad in new or existing hospitals are to be made in consultation with the Medical Retrieval Committee at the earliest stages of planning.

Development Application Approval

Where a landing site or major renovation to an existing landing site is proposed, a Development Application is to be lodged with the Local Council. That Council may also insist on an Environmental Impact Statement being prepared to accompany the Development Application.

Michael Reid
Director-General

GUIDELINES FOR MEDICAL HELIPADS

Guidelines for medical helipads have received endorsement from the Perinatal Emergency Transport Co-ordinating Committee to the NSW Perinatal Services Network and the Medical Retrieval Committee of the NSW Ambulance Service. The guidelines are intended for the use of those hospitals whose role warrants the provision of medical helipad facilities.

It is now considered essential that any new public hospital intended to provide critical care services have helicopter access; and that any major refurbishment of existing hospitals which offer critical care services should be preceded by a feasibility study on retrofitting a hospital landing area. While tertiary facilities (as referral centres) have the greatest need for helipads, any new secondary facilities which would be likely "exporters" of patients should also have helicopter access.

Decisions to include helipads in specific new hospitals or refurbishment projects are to be made in consultation with the Medical Retrieval Committee at the earliest stages of planning. Such consultations have now been successfully utilised by a number of hospitals in NSW to improve their facilities.

Medical helipads - two types defined

The Civil Aviation Safety Authority (CASA) now only provides guidelines for the establishment and use of helicopter landing sites and/or upgrading of helicopter landing sites throughout Australia. It is the responsibility of the pilot in command and the aircraft operating company to ensure that landing area is adequate for safe operations.

For all hospitals making use of medical helicopters, a medical helipad is required. This should preferably be a "hospital helipad", defined as *"a helicopter landing area within easy trolley access to and from the hospital's critical care areas"*. All tertiary hospital facilities should be equipped with a "hospital helipad".

At some locations, a "hospital helipad" may not be practical because, for instance, of existing construction or lack of space. In these cases, an "off site helipad" may be the only alternative. An "off-site helipad" is *'a helicopter landing area designated for medical helicopter use which requires the use of a vehicle to convey a patient between the landing area and hospital'*.

Hospital helipads - operational and clinical advantages to patients

Time saving:

Time saved by ready access between the hospital helipad and Emergency Unit, ICU or Paediatric Unit has been calculated to average 15-20 minutes over using a road ambulance between a nearby landing site and hospital.

Multiple handling:

Hospitals with helipads within trolley access generally are able to make a trolley available for the purpose. This minimises unnecessary handling. Every additional patient lift increases the risk of accidental disconnection or disruption of a vital monitor or line.

Patient tolerance:

Medical retrievals which involve multiple transfers between vehicles, increase movement and discomfort for patients, who may be particularly susceptible because of the severity or potential instability of their condition.

Travelling conditions:

Well planned hospital helipads are served by level or near-level smooth pathways leading from the helipad to the hospital building. Where a vehicle is used, the ambulance trolley will often traverse unprepared surfaces from the ambulance to the helicopter. Such surfaces are often uneven, boggy, poorly lit or sloping. Ambulance vehicles, even when very carefully driven over gutters or ridges in off-site locations such as sports ovals, can suffer gross movement of their stretchers. Deteriorations in patient condition have been observed in these situations.

Interruption of appropriate patient care:

The importance of maintaining appropriate clinical care and supervision throughout all phases of transport should be considered in hospital helipad planning. Having a helipad accessible by trolley not only saves time, it also reduces manpower requirements and avoids splitting the retrieval team where multiple patients are being transported.

Cost:

A well-planned hospital helipad can achieve long-term manpower savings which can be off-set against short-term development costs. A secure helipad (ie. an elevated helipad or one securely fenced) may require as little as one attendant to meet or despatch a helicopter -- the same person fulfilling the requirements for site security, fire guard, and porter.

Security:

On-site hospital helipads can be made more secure from the general public than can landing areas in a nearby park or sports ground. Control of the public for medical helicopter activities can often involve not only ambulance but police, council officers or local fire brigade. These are unnecessary for a well planned hospital helipad. Elevated or roof-top helipads are easily secured and have the added advantage of decreasing the noise impact of helicopter movements.

Definitions and other expressions

“Approach and departure path” means the track of a helicopter as it approaches or takes off and departs from the FATO of a HLS.

“Final approach and take off area” (FATO) in relation to a HLS, means an area over which the final phase of the approach to a hover or landing is completed and from which the take off manoeuvre is commenced.

“Final approach” means the reduction of height and airspeed to arrive over a predetermined point above the FATO of a HLS.

“Ground effect area” (GEA) in relation to a HLS, means an area that provides ground effect for a helicopter rotor system.

“Helicopter landing site” (HLS) means a place that may be used as an aerodrome for the purposes of landing or taking off of helicopters.

“Length” (L) in relation to a helicopter, means the total length of the helicopter, including its rotor(s) when they are turning.

“Landing and lift off area” (LLA) in relation to a HLS, means an area within the HLS on which helicopters land and lift off.

“Movement” means a landing or a lift off of a helicopter.

Roof-top or Elevated Helipads

Hospital helipads located on a rooftop or on an elevated structure eg., top level of a multi-storey carpark offer distinct advantages when compared with surface level sites:

- unobstructed approach/departure gradients are easier to achieve,
- elevated siting requires less ground in the vicinity of the HLS be quarantined from development in order to avoid future introduction of obstructions infringing the approach/departure flight paths,
- securing of an elevated site is more easily achieved with less personnel (a long term cost advantage),
- reduced noise impact at ground level as the approach/departure flight paths are raised by a height equal to the height of the elevated HLS.

Security considerations

Hospital helipads require (a) designated attendant(s) to meet or despatch a helicopter -- such attendant(s)

to be responsible for site security, ensuring non-participants are kept clear for their own safety, ensuring the site and the approach paths are free of obstacles, activating lights, standing “fireguard” (ie. ready to raise the alarm in the event of a mishap), and assisting with patient handling.

- the HLS must be kept clear of all:
  - persons, other than persons essential to the helicopter operation; and
  - objects and animals likely to be a hazard to manoeuvring the helicopter, other than objects essential to the helicopter operation; and
- no person outside the helicopter, other than a person essential to the operation is within 30 metres of the helicopter (45 metres of the centre of the HLS).

NOTE:

The 30 metre “buffer” from non-participants is an absolute minimum based upon design advice applicable to a cross-section of helicopters in use. Air Medical services tend to use larger, twin-engine helicopters which create much greater “rotor-wash” compared to smaller, single-engine utility helicopters.

In general, the “safety buffer” is considered to apply on the plane of the landing and lift-off area, ie. it is a horizontal buffer. The safety buffers’ primary purpose is protecting non-participants from fire or debris in the event of a landing mishap. A secondary purpose is protection of non-participants from the effects of rotorwash.

In some cases up, to 70 metres horizontal “buffer” may be required to ensure no injury or damage from rotorwash. Examples of strategies which may mitigate the effects of rotorwash include use of elevated helidecks, erection of physical barriers (subject to maintenance of the requisite obstacle-fee imaginary surfaces), or the delineation of areas which must be vacated during helicopter operations.

Hospital helipads - minimum requirements

General: Since a hospital HLS is intended to be used both day and night under prevailing wind conditions, it should satisfy the following guidelines:

- **The FATO**, at minimum, should have a circular area with a diameter of 37 metres, which is free of obstacles likely to interfere with the manoeuvring of the helicopter. High Density Altitude Operations - For hospital helipads located at higher elevations (above 2500' above sea level) or in areas of high ambient temperatures (35EC and hotter) consideration should be given to use of an elongated FATO to allow acceleration/deceleration in ground effect.

- **The GEA**, at minimum, should have a circular area with a diameter of 18.5 metres. Further, the GEA should be within the FATO with the overall slope not be exceed 7.5 degrees (1:8 vertical to horizontal).

- **The LLA**, should be a hardstand surface, with minimum dimensions of 9 metres X 9 metres, preferably concrete capable of bearing a minimum 14,600kg. Non concreted areas within 50m of touchdown area should be well grassed to avoid

dust. If the LLA is not within the FATO, an air taxying route 37 metres in width should be provided between the LLA and the FATO. If on a building, the entire GEA should also be capable of accepting the static and dynamic loads involved. Overall slope of the LLA, in any direction, should not exceed 5E.

C **The approach and departure path(s)** should extend outwards from the edge of the FATO as indicated Fig 1 and have an obstacle free gradient of 7.5 degrees (1:8 vertical to horizontal) measured from the edge of the FATO to a height of 500 feet above the LLA level. This path may be curved left or right to avoid obstacles or take advantage of a more advantageous approach or departure path. Two directions of approach/departure, preferably not less than 150 degrees apart are necessary to allow operations in different wind conditions. Where curved paths are proposed, specialist advice should be sought concerning the degree of curvature and the orientation of the final approach path. Environmental considerations are also a factor in selecting approach/departure

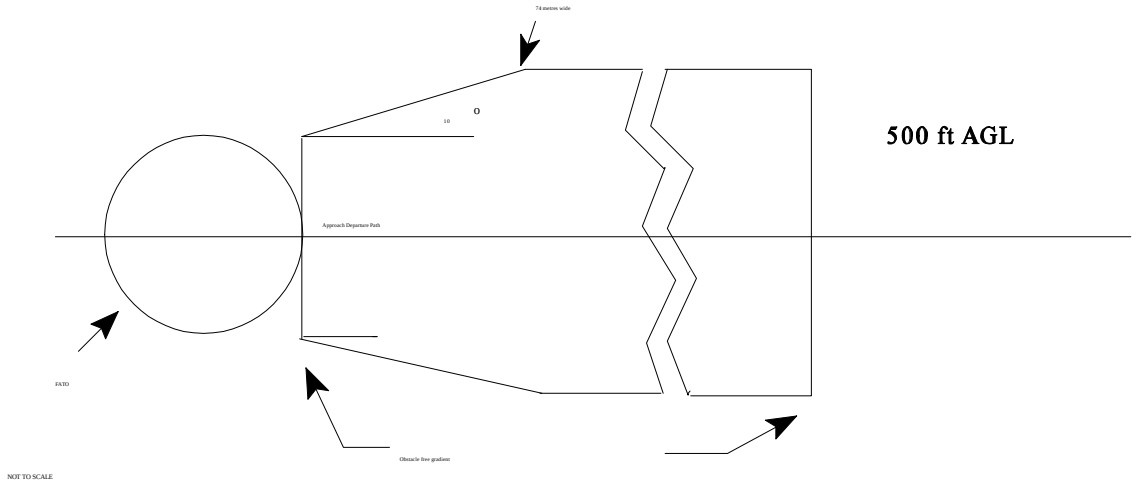


Figure 1

flight paths and this may require input from an acoustic consultant.

Night operations: For night operations, the following additional requirements apply:

C **Lighting** The edge of the FATO should be defined by omni directional Yellow lights which project no more than 25 centimetres above the level of the HLS and are spaced no more than eight metres apart. Where ground level lighting is not practicable, such as “off-site helipad”, then a combination of markings and floodlighting may be used.

Any floodlighting must be positioned so that it does not cause glare to pilots during manoeuvring. Purpose-built surface-floodlighting is available which provides surface texture without glare. Such fixtures must be positioned at the edge of the FATO so that they do not impinge the obstacle-free manoeuvring areas.

Alternative lighting solutions may involve electro-luminescent strips in lieu of perimeter lighting. Specialist advice should be sought in developing a lighting

solution suitable for a particular site.

- **Strobe** A blue high intensity strobe should be mounted on top of the wind indicator to assist the pilot to identify the HLS at night.

- **Wind velocity information** An accurate means of assessing the HLS wind direction and speed should be provided. This may be accomplished either by an illuminated wind director indicator (windsock) located in an unobstructed area visible to approaching/departing helicopter pilots (not to obstruct the approach departure paths), or by any other suitable means such as radio communication with a responsible person located on or in proximity to the HLS.

- **Approach guidance** When it is considered essential that an accurate approach path be achieved due to obstacles, the direction of approach should be indicated by at least two omni directional green lights, or by one white lead-in light positioned as indicated in Fig 2.

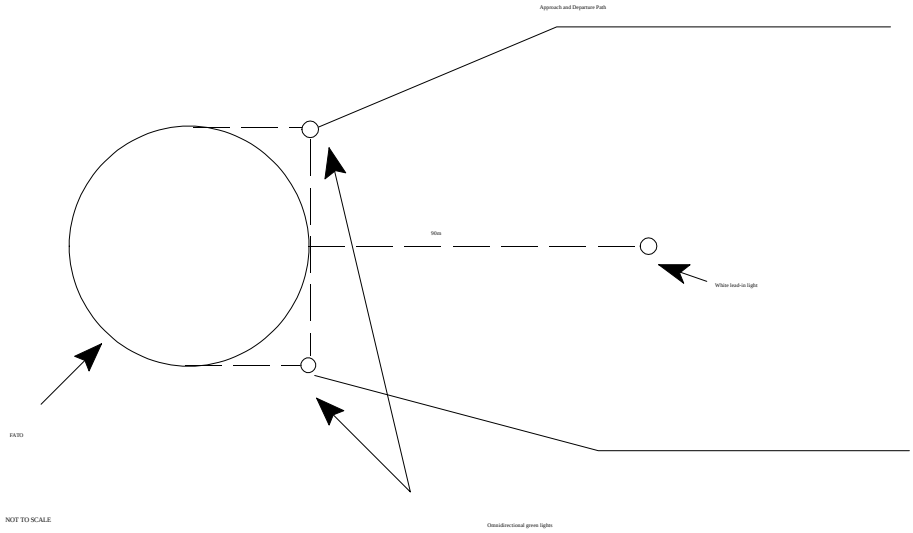


Figure 2

The use of two green lights should only apply where there is only one approach path or where the approach paths are, say, between 90E and 160E apart. In the ideal situation, 2 approach paths would be at or near 180E apart. Use of green approach lights would then mean that 4 green lights would be located at approx 90E spacing around the FATO. From the air, it would be impossible to tell from this configuration which 2 of 4 possible approach directions were the correct flight paths.

- Any **air taxying route**, as recommended for day operations, should, depending on the operational demands, be marked by either blue edge or green centre line lights spaced at 15 metre intervals, or be floodlit.

- **Obstruction lighting** may be necessary on the top of any obstacles which are close to the obstacle free plane of the approach and departure paths.

All lights except any air taxying route lights, should be visible from at least 5 km in clear conditions. Professional advice is required to ensure the adequacy of lighting requirements.

Building For a **hospital HLS** that is located on a building, the following additional guidelines are suggested:

- **Markings** The aiming point of the HLS should be the international hospital heliport logo ... ie. red cross on a white background. The size of this marking should be equal to that of the LLA and thereby indicate the undercarriage ground contact limit points on which the helicopter may be positioned without compromising clearance requirements. The clearance requirement is that the extremity of an operating helicopter is no closer than half a rotor diameter to a fixed obstacle.

- The **edge** of the FATO should be indicated by a 40 centimetre wide stripe painted on the HLS.

- A whole number (termed the **indicator number**) should be painted on the HLS with the helicopter's weight, expressed in Kg, calculated by multiplying the indicator number by 1000. The numbers should appear 1.5m high painted with 20cm wide strokes.

- **Drainage facilities** should be provided to prevent the collection, the spreading, or the falling of liquids onto other parts of the building.

  Note: Specialist design advice should be sought in respect of the design of elevated helidecks to facilitate drainage, the routing of drainage from helidecks and the use of fuel-water separators (if required). Proponents should also be aware of the availability of pre-fabricated helideck designs (eg. Triple-S Aluminium Helidecks) which incorporate passive fire-extinguishing capabilities.

- **Safety net** As a means of avoiding risk of death or injury to passengers, crew and other personnel, the outer edge of the HLS should be protected by a safety net, or similar device, that is at least 1.5 metres wide and does not project more than 25 centimetres above the HLS at its outer edge.

- **Access** The HLS should be sited with separate primary and emergency personnel access routes with both routes located as far apart as practicable. Safety rails/handrails, etc must not impinge the obstacle-free manoeuvring

planes.

- **Fire extinguishers** The HLS should be equipped with at least two carbon dioxide fire extinguishers each with a minimum capacity of 4.5kg; one extinguisher should be positioned at each of the primary and emergency personnel access routes.

- **A wind direction indicator** should be positioned on the HLS in an unobstructed area so that it is readily visible to helicopter pilots when approaching/departing the HLS.

Hospital helipads - other considerations

- **Planning requirements** Various legislative requirements relating to helicopter landing sites in NSW are complex and no single advice about hospital or medical helipads can be given. Proponents should note, however, that emergency service landing sites are excluded from the definition of 'designated development' in the Environmental Planning and Assessment Regulation (which otherwise includes most helicopter landing sites). Generally, hospital helipads are considered 'ancillary-uses' to hospital purposes and are thus not separate 'development'. The same cannot necessarily be said about off-site medical helipads. Helicopter landing sites are 'scheduled premises' under the Noise Control Act and thus may require a 'noise licence' and 'pollution control approval'. Specialist advice should be sought about the statutory requirements for any particular facility.

- The **planning and design** of a hospital helipad is a complex task and it is advisable to engage the services of a specialist consultant to ensure that the facility which results is safe after balancing the many requirements which are often conflicting.

- **Pathway to touchdown area**

Construction:	concrete or asphalt
Minimum width:	1.2m
Minimum slope:	1:10
Maximum camber:	nil

  No steps

- **Single control point for lighting** (flood, strobe, wind indicator and edge lighting). Area flood-lighting to assist with patient loading/unloading should be on a separate switch. The desirability of flood-lighting is very subjective -- some pilots definitely want it on and others definitely want if off during take off and landing. This subjectivity cannot be accommodated if it is on the same switch as the other lights.

- Designated **flight paths** to and from the helipad should be developed in consultation with the medical helicopter operator(s) using the facility.

- A **noise abatement** procedure should be developed for the helipad.

- A **weather-proof sign** should be displayed so that it can be read by the pilot of a helicopter parked on the touchdown area. Details of the approach and departure paths (using bearings or geographical landmark references) and the noise abatement procedure should be given.

- **Turbulence** Helicopter landing sites should preferably be sited in areas free of turbulence. Turbulence can affect both ground level and elevated helipads.

  Surface level helipads sited immediately adjacent to large structures are susceptible to lee-side turbulence. Rooftop helidecks may be subject to "cliff-edge" turbulence. Expert advice on the effects of turbulence and how best to mitigate it should be sought in either case.

  Furthermore, elevated helidecks and their associated approach paths should be sited well clear of any air outlets or intake vents. Also, any flues venting hot gases should not be overflown at low level by helicopters on approach or departure.

- **GPS** The recent development of satellite-based navigation systems and of instrument flight capability which is not dependant upon ground-based radio-navigation aids has the potential to greatly reduce the impact of adverse weather on air medical operations. Siting of any hospital HLS should be done in consideration of the use of such instrument approach systems in future. This requires consideration of the approach/departure path obstacles and their impact on future instrument approach minimum altitudes and also the reservation of space to install instrument approach lighting arrays which may be required for precision instrument approach procedures.

Hospital helipads - preferred additional features

Pathway Covered from hospital to within 20m of helipad and lit with edge lighting.

Perimeter fencing 1 metre high fencing (child-safe) at least 8 metres out from edge of FATO if the ground is level to avoid infringing the obstacle free gradient of the approach and departure paths. The fence may be positioned closer to the edge of the FATO if the ground rises toward the GEA so that the fence is not infringing the approach/departure paths. It should be noted that this fencing is an aid to security of the helicopter when not operating, and does not define the public exclusion zone around the operating helicopter (see "Security Requirements").

Noise abatement Windows of occupied hospital buildings within 50m to be double glazed.

Pathway Pathway to tochdown area should have gradients as shallow as possible.

Access Any lifts between helipad and hospital entrance to be fitted with key control.

Lighting One floodlight to provide area lighting for the loading/unloading of the patient and which is switched on only after the helicopter has landed to avoid blinding the pilot during manoeuvering.

Access
- 24 hour availability.
- Shortest practical route to hospital.
- Not dependent on using a vehicle.
- Pathway should extend from touchdown area to hospital entrance.

MRI (magnetic resonance imaging) Particular care needs to be given to siting Hospital Helipads at facilities where MRI is installed as the strong magnetic fields (which exist whether the MRI is in use or not) may affect helicopter navigation systems. Specialist advice should be sought in these circumstances.

Re-fuelling facilities Hospital helipads intended to be used as a base of operations will require hangarage, re-fuelling and crew accommodation. The particular requirements of the air medical service provider must be carefully ascertained prior to commencing the design process. To minimise double-movements, it is desirable to locate the re-fuelling and hangar facilities immediately adjacent to the helipad which is used to pick-up or discharge patients. However, space must be available for parking which leaves the main helipad open for use by other, itinerant air medical helicopters.

Hospital HLS in country areas should have provision for the secure storage of fuel in drum stock near the HLS, unless arrangements can be made for mobile re-fuelling at the HLS by other means. Dangerous Goods Legislation governs the storage of more than 1000 litres of fuel at any site.

Off-site helipads - requirements

The closest site as determined by medical helicopter operators to meet operational, aviation safety, access and medical requirements, in consultation with local authorities. This may be a nearby sports ground, park, golf course, open area or airport.

Off-site helipads - other matters of consideration

Ground surface	-	should be flat, grassed and well drained
Security & safety	-	may require police attendance
Transport	-	will require ambulance vehicle transport
Lighting	-	may require portable lighting

Vehicle access - preferably a smooth surface, minimum slope

In the case of sporting areas, potential for disruption of sporting events. Wherever possible, upgrading to a “hospital helipad” should be the goal.

Helipad Lighting Equipment

Airport Lighting Specialists
Ph. 03 9432 0511 Fax. 03 9423 1952

DNT Europhane Pty Ltd
Ph. 03 9720 3233 Fax. 03 9720 8233

CMRI

CHILDREN'S
MEDICAL
RESEARCH
INSTITUTE

Children's Medical
Research Institute
ABN 47 002 684 737
Street: 214 Hawkesbury Rd
Westmead NSW 2145 Australia
Postal: Locked Bag 23
Wentworthville NSW 2145 Australia
Tel 02 9687 2800
Fax 02 9687 2120
Freecall 1800 436 437
Email rreddel@cmri.usyd.edu.au
www.cmri.com.au

Roger Reddel MBBS, PhD, FRACP
Lorimer Dods Professor and Director

30 August 2010

Mr Chris Milne
Capital Insight Pty Ltd
77 Berry Street
North Sydney NSW 2060

Dear Chris,

I am writing to confirm that Children's Medical Research Institute (CMRI) is aware that the plans for the future Westmead Millennium Institute (WMI)/Westmead Research Hub (WRH) building include construction of link ways to the adjacent buildings of WMI's Hub partners (the CMRI building, and the Kerry Packer building of The Children's Hospital Westmead), and that CMRI approves the link bridges connecting the WMI/WRH and CMRI buildings being included in the Part 3A application.

CMRI's building plans, which have already been approved by NSW Department of Planning, include connections to link ways from the WMI/WRH building at three levels within Stage 4 of the new CMRI building, and connections to a tunnel link way at basement level. If construction of the new CMRI building is delayed, connection to a temporary link way can be accommodated at the side of laboratory 12 at the rear of the current building.

Yours sincerely,

Roger Reddel
Lorimer Dods Professor and Director
Children's Medical Research Institute

Project Governence

1.1 GOVERNANCE AND PROJECT MANAGEMENT

The project is being planned under the direction of Health Infrastructure, NSW Health's agency responsible for all major projects in the health sector. It is envisaged that the current project governance structure will continue with the Executive Steering Committee and Project Control Groups maintaining control and oversight until a successful completion. There will be, however, some changes as the project moves from a planning and design phase to an implementation phase.

1.1.1 Project Governance Structure

Figure 1 outlines the project governance structure developed for the planning stage of the WMI/WRH project. It features an Executive Steering Committee leading the project and directing the Project Control Group, which has representation from the key stakeholders. This reflects the current governance structure, which would continue through the documentation and tender preparation phase.

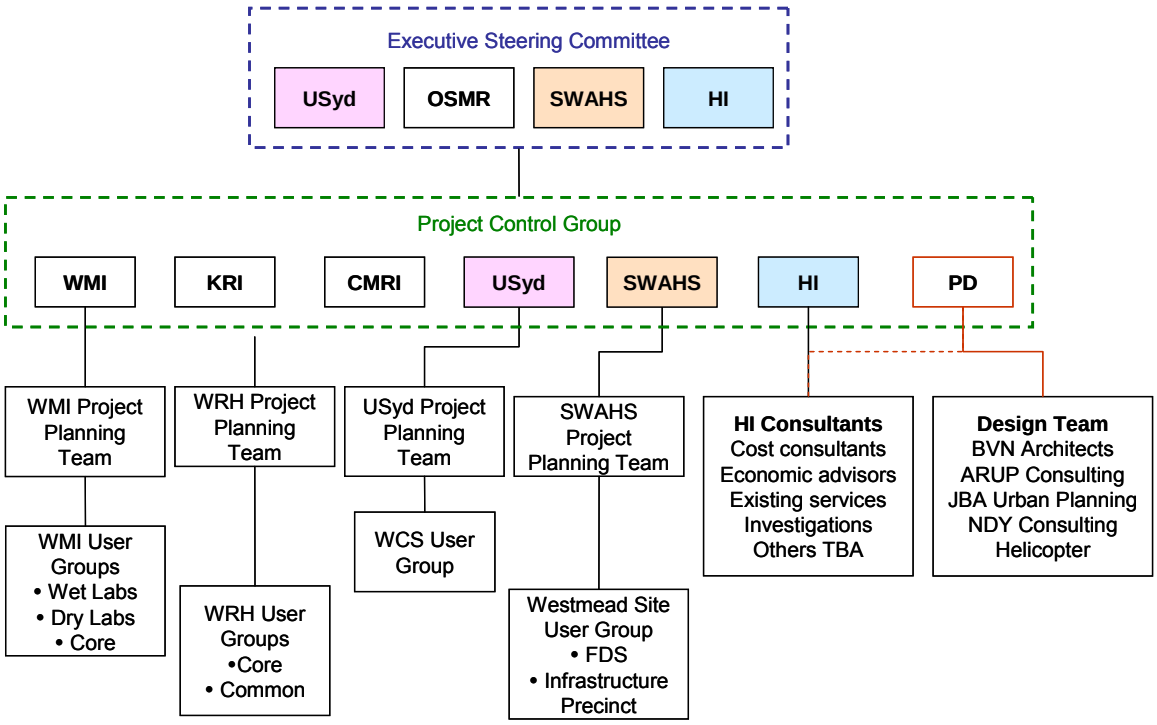


Figure 1 - Planning phase governance structure

As the project moves into implementation, the University of Sydney project planning team will not be included but will still be included during this phase as a key stakeholder. The proposed structure of the governance will then change to include key sub-groups to control planning and design activities and manage the interfaces with the contractor and the users, as indicated in Figure 2. These groups would report to then Project Director/Manager, who ultimately would have responsibility for delivering the project within the target budget and timeframe.

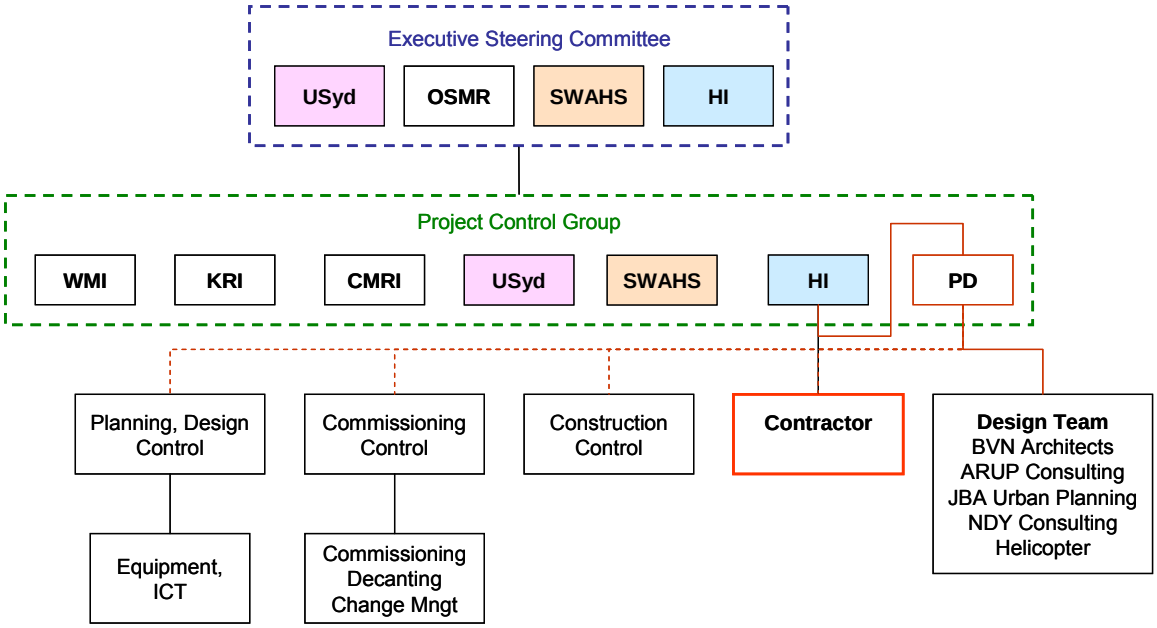


Figure 2 – Implementation phase governance structure

1.1.2 Governance and reporting process

The main governance groups and roles are summarised below.

Executive Steering Committee

The Executive Steering Committee provides focus, oversight, and strategic guidance and direction to the project. This committee is responsible for guiding the overall planning, implementation and strategy. The committee reviews and approves critical strategy, business, and design decisions made by the PCG and other governance bodies.

The committee comprises the following membership:

- Office of Science and Medical Research: (Chair and Project Sponsor);
- Health Infrastructure;
- Sydney West Area Health Service (SWAHS); and
- University of Sydney.

Project Control Group

The PCG is the key decision making body for the WMI/WRH/USWCS implementation phase. This committee has been responsible for overseeing the development of the Service Procurement Plan and Project Definition Plan phase of the project and has ensured that the interests of WMI, WRH Partners, University of Sydney and other key stakeholders including SWAHS are represented at an executive level. The PCG will have an ongoing responsibility for ensuring planning decisions and investments in physical infrastructure and assets are optimised to achieve the required service delivery outcomes.

The membership of the PCG comprises representatives from the following groups:

- Project Director Procurement (Chair);

- Health Infrastructure;
- SWAHS;
- University of Sydney;
- WMI;
- CMRI; and
- SCHNW.

Jemena Gas

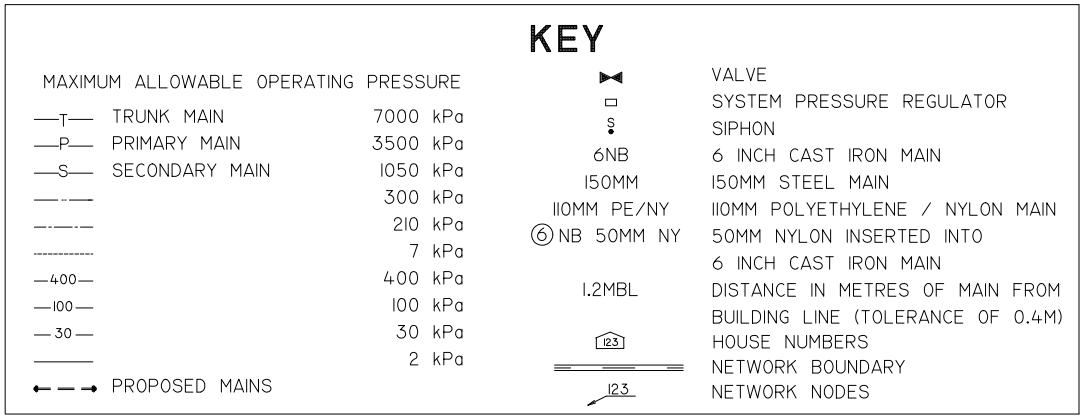
Network Protection

In reply to your enquiry, there are gas mains at the location of your intended work as per the attached map. For an explanation of the map, please see the key below. The following excavation guidelines apply:

Excavation Guidelines:

If you are going to excavate/bore within 0.4m of the gas main location as indicated on the map you must excavate carefully by hand. If you can't locate the gas main, contact the local depot.

Sydney North (02) 9397 9290



Warning: The enclosed plans show the position of Jemena Gas Networks (NSW) Ltd's underground gas mains and installations in public gazetted roads only. **Individual customers' services and services belonging to other third parties are not included** on these plans. These plans have been prepared solely for the use of Jemena Gas Networks (NSW) Ltd and Jemena Asset Management Pty Ltd (together "**Jemena**") and any reliance placed on these plans by you is entirely at your own risk. The plans may show the position of underground mains and installations relative to fences, buildings etc., as they existed at the time the mains etc were installed. The plans may not have been updated to take account of any subsequent change in the location or style of those features since the time at which the plans were initially prepared. Jemena makes no warranty as to the accuracy or completeness of the enclosed plans and does not assume any duty of care to you nor any responsibility for the accuracy, adequacy, suitability or completeness of the plans or for any error, omission, lack of detail, transmission failure or corruption in the information provided. Jemena does not accept any responsibility for any loss that you or anyone else may suffer in connection with the provision of these plans, however that loss may arise (including whether or not arising from the negligence of Jemena, its employees, agents, officers or contractors). The recipient of these plans must use their own care and diligence in carrying out their works and must carry out further surveys to locate services at their work site. Persons excavating or carrying out other earthworks will be held responsible for any damage caused to Jemena's underground mains and equipment.

In case of Emergency Phone 131 909 (24 hours)

Ros
9397 9101

Jemena Asset Management Pty Ltd ABN 53 086 013 461
for and on behalf of Jemena Gas Networks (NSW) Ltd ABN 87 003 004 322


HAINSWORTH
WESTMEAD
HOSPITAL
DARCY
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HAWKESBURY
JESSIE
HELEN
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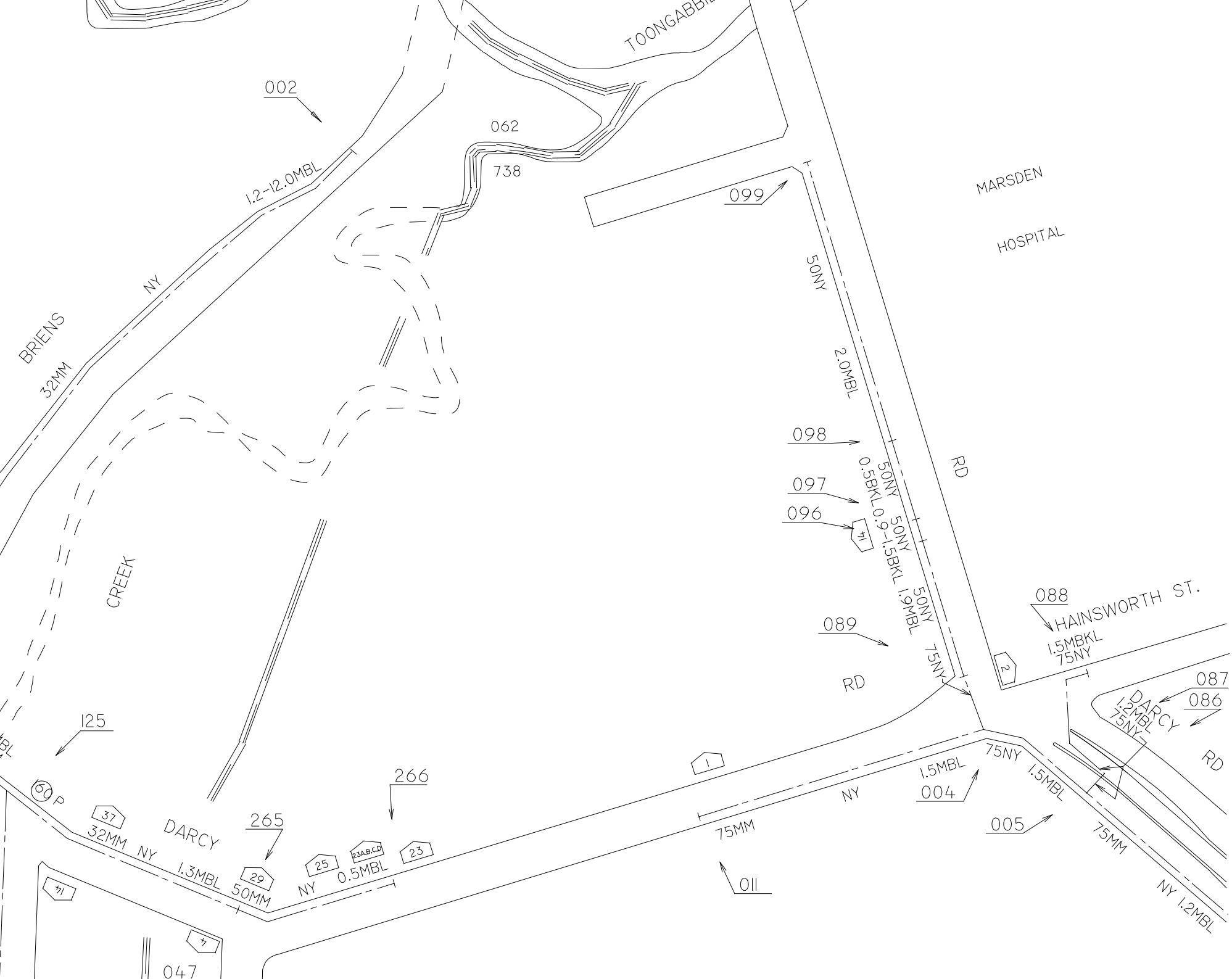
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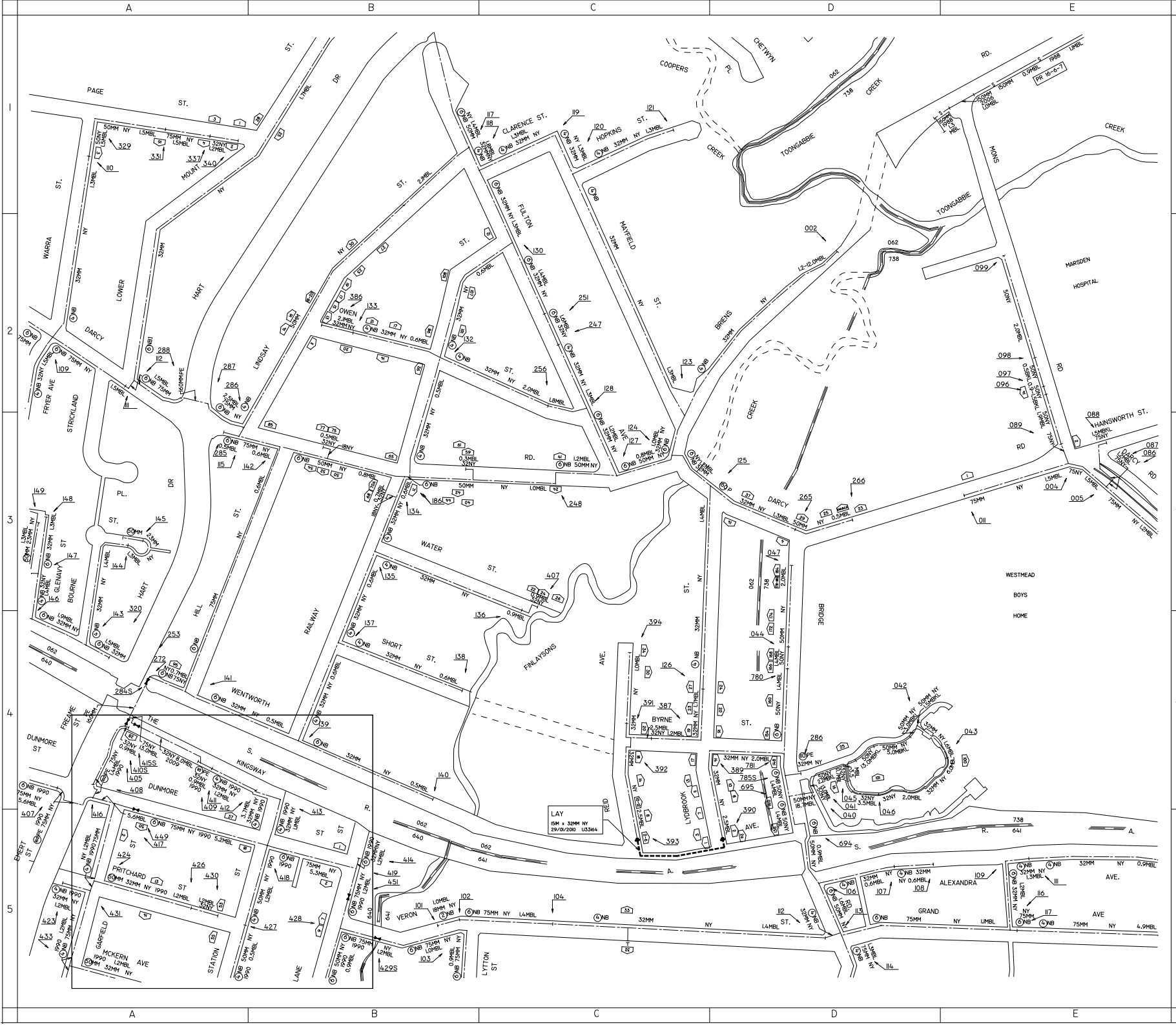
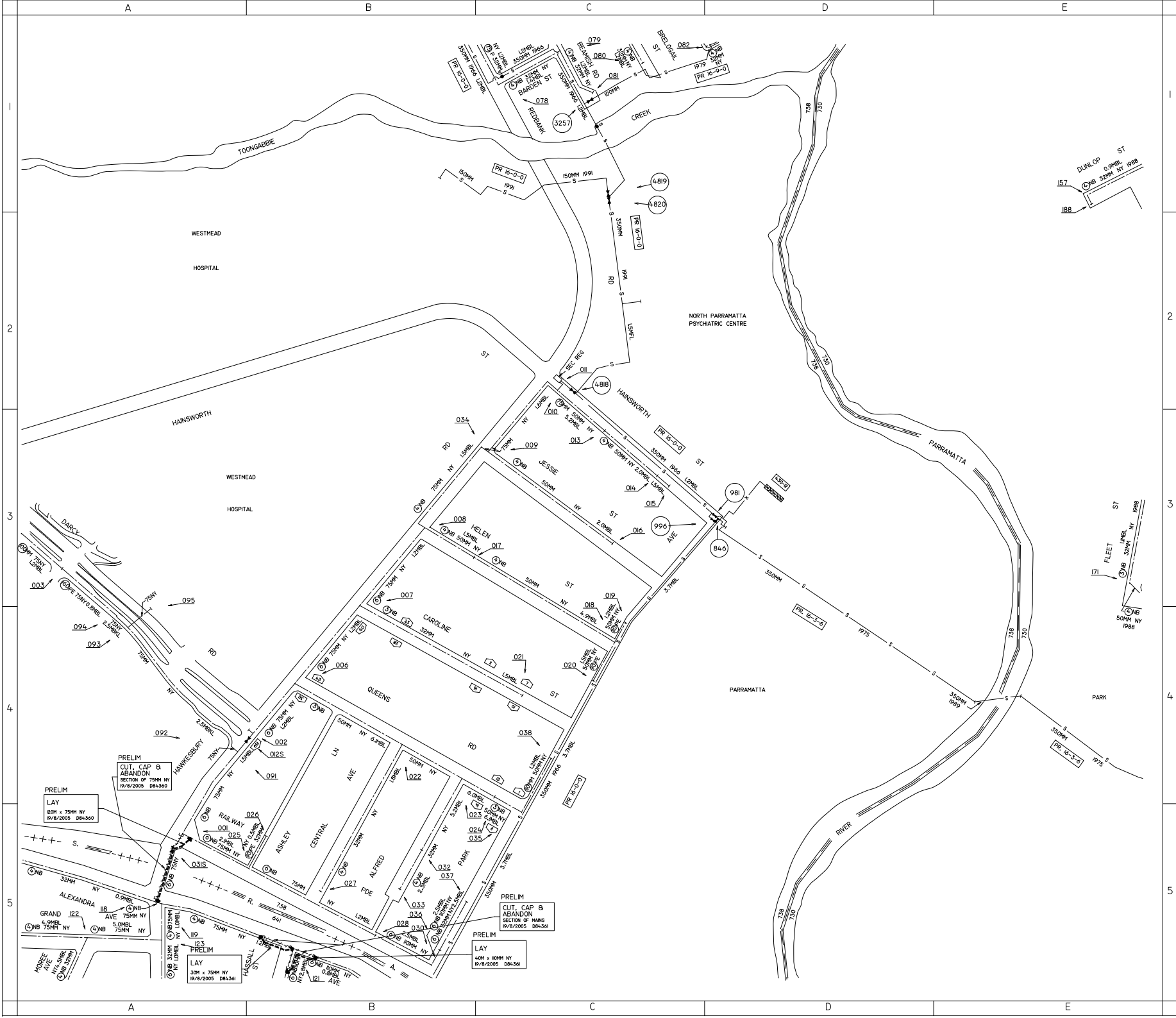


MERRYLANDS 3C



MERRYLANDS 3D

SCALE 1:2000

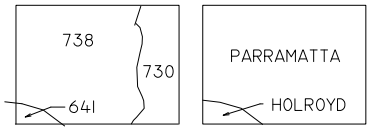
50 0 50 100 150 200

THIS MAP UPDATED ON 14/9/06
THIS PLAN IS DIAGRAMATIC ONLY. DISTANCES SCALED FROM THIS PLAN MAY NOT BE ACCURATE.

DATE ALTERED:..... BY:.....

M3A	M3B	P1A
M3C	M3D	P1C
M6A	M6B	P4A

ADJOINING MAPS



NETWORK AREA MUNICIPALITY AREA

AGL

KEY

MAX ALLOWABLE OPERATING PRESSURE

T	TRUNK MAIN	7000 kPa
P	PRIMARY MAIN	3500 kPa
S	SECONDARY MAIN	1050 kPa
		300 kPa
		210 kPa
		7 kPa
400		400 kPa
100		100 kPa
		2 kPa
	PROPOSED MAINS	
PR 11-2 3	STEEL MAIN PROJECT NUMBER	
P	PRESSURE MONITORING STATION	
	VALVE	
	SYSTEM PRESSURE REGULATOR	
S	SIPHON	
123	NETWORK NODES	
123S	ITEM DETAIL SKETCH AVAILABLE	
696	VALVE NUMBER (OLD NUMBERING)	
6NB	6 INCH CAST IRON MAIN	
150MM	150MM STEEL MAIN	
110MM PE/NY	110MM POLYETHYLENE/NYLON MAIN	
6NB 50MM NY	50MM NYLON INSERTED INTO 6NB MAIN CAST IRON MAIN	
1.2MBL	DISTANCE IN METRES OF MAIN FROM BUILDING LINE (TOLERANCE OF 0.4M)	
1957	YEAR LAID	
	MUNICIPALITY BOUNDARY	
	NETWORK BOUNDARY	
123	HOUSE NUMBER	

MERRYLANDS 3D

Integral Energy

Head Office: 51 Huntingwood Drive, Huntingwood NSW 2148
HOURS: 8am TO 4:30pm MONDAY TO FRIDAY
CONTACT: 9853 4161

FAX Report

INTEGRAL ENERGY

DBYD Underground Search Report and Facsimile

Enquiry Number: 17385962

Company:	Arup
Attention:	Mr, Samuel Gobraiel
Sent By:	Integral Energy - Underground Enquiry Service
Fax Number:	Not Supplied
Date Faxed/Emailed:	18 December 2009
Number of Pages:	1
Enquiry Location:	Hawkesbury Rd, Westmead, NSW, 2145

Our Search has shown that:

UNDERGROUND CABLES ARE PRESENT on our plans within the nominated search area, PLEASE CALL the nearest office 3 DAYS PRIOR TO EXCAVATION to arrange a time to collect plans showing the position of our underground assets. (see note below)

Note:
For the safety of our customers, plans are provided as a free service and Integral Energy Staff will explain the plan contents. It is essential that the plans are signed for, on pick up from either the Huntingwood or Coniston Office. These requirements are in accordance with IE Company Policy.

Integral Energy's Assets are generally located in the Road Reserve. If your search is within your own property and there are no Electricity Easements affecting your property, then you need not attend this office. If your work is within your own property and is close to a Property Boundary then it is advisable to attend this office to receive plans as survey information maybe misleading.

Thank you for your enquiry relating to underground services

Important Information
Read Before Excavating.

BACKGROUND

Integral Energy is able to make available plans of its underground assets to persons who intend to undertake excavation works in Integral Energy's distribution area.

We have set out below important information regarding the recommended procedures that should be followed when using this service and also the extent of our responsibility in respect of any plans provided.

Any plans provided to you are made available subject to the provisions set out below.

It is very important that you read and understand all the information and disclaimers provided below before making a request for plans.

INFORMATION PROVIDED BY INTEGRAL ENERGY

- Any plans provided to pursuant to this service are intended to show the approximate location of underground cables relative to fixtures when the cables were laid.
- Such plans have been prepared solely for use by Integral Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register, which must also be signed by the person making the enquiry.

DISCLAIMER

Whilst Integral Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

CUSTOMER REQUEST AND RESPONSIBILITIES:

- If you intend to undertake any excavation work in Integral Energy's distribution area, it is your responsibility to contact **1100 – Dial Before You Dig or www.dialbeforeyoudig.com.au** and request plans, at least 3 working days prior to the proposed excavation date.
- Integral Energy expects to be able to provide relevant plans within 48 hours after a request is made.
- **Copies of plans must be collected from Integral Energy.** Plans are frequently updated to record changes to underground assets. Excavation should take place as soon as possible after the plans have been collected. All plans provided by Integral Energy are subject to the warning set out below.
- All copies of plans must be signed by the customer at the time of collection to acknowledge the disclaimer mentioned above.
- All searches carried out by non-Integral Energy staff are the sole responsibility of those persons.
- Integral Energy retains copyright in all plans and details provided in conjunction with customer's request.

- Persons excavating are expected to exercise all due care in the vicinity where cables are indicated and will be held responsible for any damage to any underground assets (including any Integral Energy property) or any other loss caused (including consequential losses) as a result of such excavations. All underground assets should be visually located by hand digging (pot holing).
- Any damage to Integral Energy's assets must be reported to it on **131003** immediately.

FURTHER INFORMATION:

- Individual customer services are not shown on Integral's plans.
- For further clarification on cable locations or the correct interpretation of the drawing is required contact **98534161** between 8.00am – 4.30pm, Monday to Friday.
- For information concerning proposed works affecting your property contact Integral's Contestable Works Administrators nearest Service Centre.

WARNING:

Integral Energy's plans show only the presence of cables and their position relative to road boundaries, property fences and other structures at the time of installation. Integral Energy does not warrant or hold that such plans are accurate.

DO NOT ASSUME DEPTH OR ALIGNMENT of cables as these vary significantly as a result of changes to road widths, road levels, fences or buildings subsequent to installation.

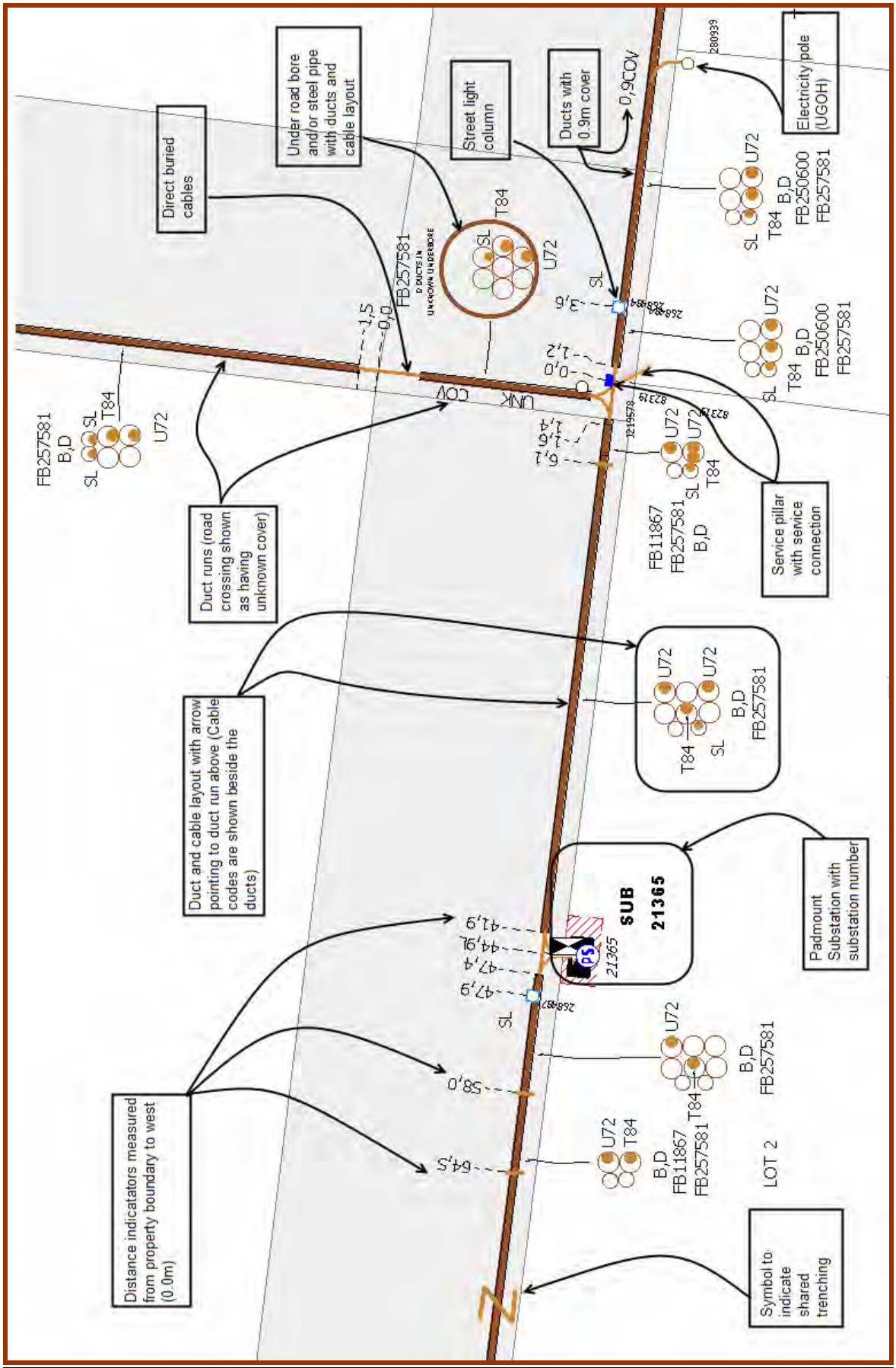
Persons excavating have a DUTY OF CARE when excavating near Integral Energy cables. Before using machine excavators Integral Energy's cables MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG (potholing) to identify its location.

Those excavating near Integral Energy's cables should be aware that asbestos or asbestos-containing material may be present in Integral Energy's underground assets and that Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.

ALL ELECTRICAL APPARATUS SHALL BE REGARDED AS LIVE UNTIL PROVED DE-ENERGISED. Contact with live electrical apparatus will cause severe injury or death.

In all cases of electric shock or suspected electric shock the victim shall immediately be transported to hospital or medical centre for treatment.

EXAMPLE OF HOW TO READ INTEGRAL ENERGY PLANS:

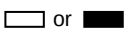


STANDARD UNDERGROUND SYMBOLS / LABELS

NOTE: If symbology has not been provided on the plan use symbols as shown below.

or Street light column


Padmount substation


Overground pillar (O.G.Box)


Underground pit

Duct run

Cable run


Typical duct section


Typical underbore section


Blocked duct


Cable section

STJ, PBJ

STJ Straight through joint

PBJ Parallel branch joint


Underground to overhead pole

SL Streetlight conductor

SC Service cable

SE Cable sealed end

SF Service Feeder

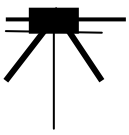
OS Out of Service

O.A.M. Over awning main

U.A.M. Under awning main

N.I.S. Not in service

Shared trenching


Service point of attachment

DUCT CODE LABLES

B = 50 mm PVC

D = 125mm PVC

DEPTH & LOCATION LABELS

0.5- 0.7 COV = 500mm – 700mm Standard Depth (Not Shown on Plans)

0.9 COV = 900mm Depth

UNK COV = Depth Unknown

LOC UNK = Location Unknown

0.6 PL = Standard Location 600mm from Property Line (Not Shown on Plans)

0.9 PL = Located 900mm from Property Line

Sydney Water

PIPELINE LOCATION INFORMATION

Accuracy of plans not to be assumed – see Clause 4.
Plans not for conveyancing purposes.

www.dialbeforeyoudig.com.au DIAL 1100 BEFORE YOU DIG

ATTENTION

The accompanying plan(s) in relation to Sydney Water's pipelines are forwarded in response to your recent Dial Before You Dig inquiry. Please note the following important information and bases upon which the plan(s) are issued:

1. The accompanying plans have been generated by an automated system. The plans should cover the area highlighted in the "Locality Indication Only" window on your Caller Confirmation. It is that defined area which is used to automatically generate the plans and not UBD or address information or any free text information provided to Dial Before You Dig. It is important, therefore, that you be accurate in defining your dig site when you lodge your enquiry with Dial Before You Dig. It is the enquirer's responsibility to resubmit the enquiry to Dial Before You Dig if the information supplied does not match the proposed dig site.
2. Plans indicate the general position of Sydney Water's pipelines and associated structures and fittings ("pipelines") **at the time of their construction**. Sydney Water does NOT guarantee that all its existing pipelines are shown on the plans (Particular care should be exercised in newer developments as pipeline details may not yet have been supplied to Sydney Water). Plans have NOT necessarily been adjusted to reflect any subsequent changes to surface levels, road alignments, fences, buildings and the like. Pipeline locations are approximate and, accordingly, the plans are NOT suitable for scaling purposes.
3. Plans do NOT show locations of property services (often called house service lines) belonging to and/or serving individual customers, and which are usually connected to Sydney Water's pipelines.
4. The plans have been prepared and are only intended for Sydney Water's own use. Sydney Water does not supply the plans on a commercial basis because it cannot and will not warrant the iraccuracy or completeness. It supplies them free of charge only with a view to reducing the very real risk of inadvertent damage being caused to its pipelines. Accordingly, Sydney Water accepts no liability for any inaccuracies in the information or lack of information on the plans.
5. To determine their precise location, Sydney Water's pipelines MUST first be exposed by pot-holing using hand-held tools or vacuum techniques i.e. **before** any mechanical means of excavation are employed.
6. Asbestos cement pipelines may form part of Sydney Water's water and sewerage reticulation systems and, if damaged, can pose a risk to health.
7. Persons excavating in the vicinity of Sydney Water's pipelines MUST exercise care and suitably protect Sydney Water's pipelines. Protection may include timbering, sheet piling, support and/or bracing or tomming to prevent movement.
8. Any movement in a pipeline could result in joint failure, flooding and death or injury to persons (in addition to damaged assets). The protection of Sydney Water's pipelines benefits the safety of workers.
9. Constructors are legally responsible for any damage and financial loss resulting from their interfering with Sydney Water's pipelines. **In an emergency, call 13 20 90 (24 hours, 7 days).**
10. Minimum clearances MUST be maintained between Sydney Water's pipelines and underground services belonging to other parties.
11. Plans MUST be approved by Sydney Water (usually signified by stamping) prior to landscaping and/or building over or adjacent to any Sydney Water asset.
12. Backfilling of excavation work in the immediate vicinity of Sydney Water's pipelines MUST comply with Sydney Water's standards.

Further information and guidance is available on Sydney Water's website at **www.sydneywater.com.au** / *Building and Development* where the following documents can be found under *Dial Before You Dig*:

- Avoid Damaging Water and Sewer Pipelines
- Water Main Symbols
- Sewer Symbols
- Depths of Mains
- Guidelines for Building Over/Adjacent to Sydney Water Assets
- Clearances Between Underground Services

or call 13 20 92 for Customer Enquiries.

NOTE:

If you lodged your enquiry via telephone or facsimile, be aware that on-line enquiries 24 hours per day 7 days per week to **www.dialbeforeyoudig.com.au** will enable you to receive colour plans in .pdf format 24/7 via email.

If you have any questions concerning DBYD requests, call (02) 8849 3800 Monday to Friday, between 8 am and 4 pm.

Hydra Legend

Sewer

Sewer Main (with flow arrow & size type annotation) — 225 PVC
Disused Main
Pressure Main (Rising Main)
Maintenance Hole with upstream depth to invert — 1.7
Terminal Maintenance Shaft — TMS
Maintenance Shaft — MS
Maintenance Hole with Overflow Weir — 7.1
Rodding Point — RP
Ventshaft INDUCT — VSI
Ventshaft EDUCT — VSE
Vertical — VERT
Lamphole
Property Connection Point (with chainage to downstream MH)
Concrete Encased Section — 10.6 — Conc. Enc
Sewer Rehabilitation
Pumping Station — SP0882
Sewer Mining — SM

Sewer - Low Pressure Sewer

Low Pressure Sewer Main
Pump Unit (Alarm, Electrical Cable, Pump Unit) — A
Property Valve Boundary Assembly
Stop Valve
Reducer / Taper
Flushing Point — FP

Sewer - Vacuum

Vacuum Sewer Main
Divisional Valve
Vacuum Chamber
Clean Out Point

Stormwater

Stormwater Pipe
Stormwater Channel
Stormwater Gully
Stormwater Maintenance Hole

Property Details

Boundary Line
Lot Number — SMITH — 25 — 6
House Number — 999999
Development Application Reference — ROAD

Location of SWC Heritage item - Please call **13 20 92** during office hours and ask for the **Heritage Unit**.

Water

Water Main - Potable (with size type annotation) — 200 PVC
Disconnected Main - Potable
Proposed Main - Potable
Water Main - Recycled
Special Supply Conditions - Potable
Special Supply Conditions - Recycled
Restrained Joints - Potable
Restrained Joints - Recycled
Hydrant
Maintenance Hole
Stop Valve
Stop Valve with By-pass
Stop Valve with Tapers
Closed Stop Valve
Air Valve
Valve
Scour
Reducer / Taper
Vertical Bends
Reservoir

Symbols for Recycled Water as per Potable above. Main and Symbol colour as indicated.

Private Mains

Potable Water Main
Recycled Water Main
Sewer Main

Symbols for Private Mains shown grey. Main colour as indicated.

PIPELINE MATERIAL ABBREVIATIONS

ABBREVIATION	INTERPRETATION
ABS	acrylonitrile butadiene styrene
AC	asbestos cement
BRICK	brick
CI	cast iron
CICL	cast iron cement lined
CONC	concrete
COPPER	copper
DI	ductile iron
DICL	ductile iron cement (mortar) lined
EPDM	ethylene propylene diene monomer
EW	earthenware
FIBG	fibreglass
FL BAR	forged locking bar
GI	galvanised iron
GRP	glass reinforced polyester
HDPE	high density polyethylene
MS	mild steel
MSCL	mild steel cement lined
PE	polyethylene
PP	polypropylene
PVC	polyvinylchloride
PVC-M	polyvinylchloride modified
PVC-O	polyvinylchloride oriented
PVC PW	polyvinylchloride profile wall
PVC SW	polyvinylchloride smooth wall
PVC-U	polyvinylchloride unplasticised
RC	reinforced concrete
S	steel
SCL	steel cement (mortar) lined
SGW	salt glazed ware
SS	stainless steel
STONE	stone
VC	vitrified clay
WI	wrought iron
WS	woodstave

DBYD Address:
Hawkesbury Rd
Westmead NSW 2145

DBYD Job No: 1836366

DBYD Sequence No: 1.1785965

SYDNEY WATER CORPORATION
No warranty is given that the information shown is complete or accurate.

Copyright Reserved Sydney Water 2009

Scale: 1:2000

Date of Production: 18/12/2009 12:39:09

Sydney WATER

Plan 1 of 1

A0

Telecoms

Network Operations Centre - Asset Analysis
1 Lyonpark Road,
Macquarie Park, NSW 2113
Ph: 1800 505 777
Fax: 1300 307 035

18/12/2009

To: Mr Samuel Gobraiel

Company: Arup

Address: 201 Kent St

Sydney, Nsw 2000

Fax: Not Supplied

Asset Location Reply

Dear Mr Samuel Gobraiel,

With reference to your enquiry of

- **Location:** Hawkesbury Rd Westmead, NSW 2145
- **Sequence No:** 17385969
- **Dial Before You Dig Job No:** 3722294
- **Dial Before You Dig Customer No:** 874036

After referring to the Optus and/or Uecomm asset database, OPTUS find that within the vicinity of your proposed works there are:

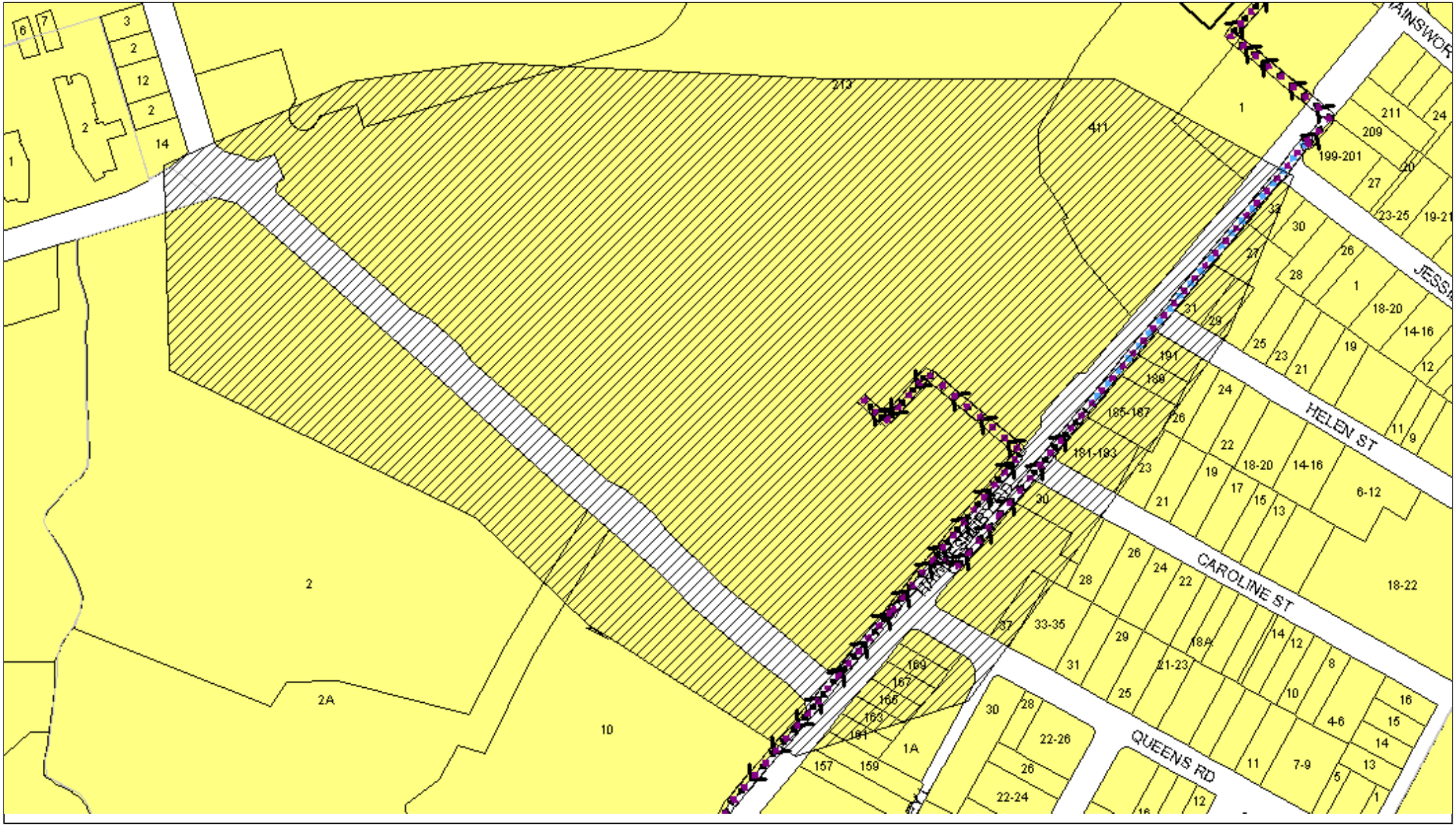
EXISTING Optus UNDERGROUND ASSETS
Please refer to the attached map for further details as you are responsible for any damage you may cause to Optus and/or Uecomm assets due to negligence on your part.

Note: You must not commence work without first obtaining an on-site location of the Optus underground plant and approval of your works plans. Only Optus staff (or Optus approved location contractors) are to provide onsite location services for Optus plant. You can arrange Optus and/or Uecomm onsite locations by calling Optus on 1800 505 777 and Optus or its approved representatives will attend your site to identify the exact location of Optus assets (the "Optus and/or Uecomm Asset Alignment").

Optus requires 2 clear business days notice to conduct an on-site location.
The initial on site location visit will not normally incur a charge, but at the discretion of Optus, subsequent site visits may incur a charge to be applied at an hourly rate.

We thank you for your enquiry and appreciate your continued use of the Dial Before You Dig Service and/or Optus Asset Analysis Service. If you require further information please contact Optus on **1800 505 777**

This reply relates only to the location indicated above and is valid for 14 days from the sent date. Where additional works are planned that have not been specified with this reply, Optus require that an additional enquiry be submitted. In the case of no additional location request being submitted, Optus will hold the relevant party responsible for any damage to Optus and/or Uecomm plant and all expenses incurred by Optus as a result of asset damage.



Optus
Cable Optus Undergroud OVERVIEW MAP
Scale: 1 : 3500 **Printed On:** 18/12/2009

Sequence Number: 17385969
Location: Hawkesbury Rd

Job Location
Line
Point
Area

Undergound Asset
Optus
Optus In Other Utility's Duct

Alexis Cella

From: Dial Before You Dig [dbyd@soulaustralia.com.au]
Sent: Tuesday, 22 December 2009 9:16 AM
To: Samuel Gobraiel
Subject: Dial Before You Dig Ref #17385966
Attachments: 17385966.gif

Please see attached Map for details.

Dial before you dig location details

To:	**Mr Samuel Gobraiel**	From:	Soul Converged Communications
Company:	**Arup**	DBYD Sequence #:	17385966
Address:	**201 Kent St**	Date:	22/12/2009
	Sydney	District:	Westmead
	Nsw 2000		
Phone:	0293209472	Fax #:	Not Supplied
Email:	samuel.gobraiel@arup.com	Mobile #:	Not Supplied

The following PLAN (s) is/are provided from SOUL Converged Communications (SOUL) records in response to your request to show the approximate location of SOUL's fibre within the vicinity of:---

Commencement Date:	18/12/2009		
Location:	Hawkesbury Rd	Side of Street	Not Supplied
	Westmead	Intersection:	Not Supplied
	NSW		
	2145		

IMPORTANT:

- Please read and understand all the information and disclaimers provided below.
- PLAN (s) provided by SOUL are circuit diagrams only and indicate the presence of fibre in the general vicinity of the geographical area shown; exact ground cover and alignments cannot be given with any certainty and cover may alter over time. Fibre seldom follows straight lines and careful on site investigation is essential to uncover and reveal its exact position.

DUTY OF CARE

When working in the vicinity of SOUL fibre there is a legal "Duty of Care" that must be observed.

It is SOUL's responsibility to:

- To provide free PLAN (s) showing the presence of its fibre at the requested location

It is the owner's (or constructor's) responsibility to:

- Request plans of SOUL fibre for a particular location at a reasonable time before construction begins.
- Visually locate SOUL fibre by hand digging (pot-holing) where construction activities may damage or interfere with SOUL fibre

DAMAGE:

ANY DAMAGE TO SOUL'S FIBRE MUST BE REPORTED TO SOUL OPERATIONS 0249273519 IMMEDIATELY.

- The owner is responsible for all fibre damage when works commence prior to obtaining SOUL plans, or failure to follow agreed instructions.

  SOUL reserves all rights to recover compensation for loss or damage to its cable network or other property including consequential losses.

ESSENTIAL PRECAUTIONS and APPROACH DISTANCES:

NOTE: If the following clearances cannot be maintained, please contact SOUL OPERATIONS 0249273519 for advice on how best to resolve this situation.

- On receipt of plans and sketches and before commencing excavation work or similar activities near SOUL's fibre, **carefully locate THE FIBRE FIRST** to avoid damage.
- Where SOUL's fibre is in an area where road and footpaths are well defined by kerbs or other features a minimum clear distance of 600mm must be maintained from where it could be reasonably presumed that fibre would reside.
- In non established or unformed reserves and terrain, this approach distance must be at least 1.5 metres.

- In country/rural areas which may have wider variations in reasonably presumed fibre presence, the following minimum approach distances apply:
    - Parallel to SOUL fibre: 10 metres

Note: Even manual pot-holing needs to be undertaken with extreme care, commonsense and employing techniques least likely to damage cables. For example, orientate shovel blades and trowels parallel to the cable rather than digging across the cable.
If construction work is parallel to SOUL fibre, then careful hand digging (pot-holing) at least every 5m is required to establish the location of all fibre, hence confirming nominal locations before work can commence.

- Maintain the following minimum clearance between construction activity and **actual location** of SOUL Fibre.

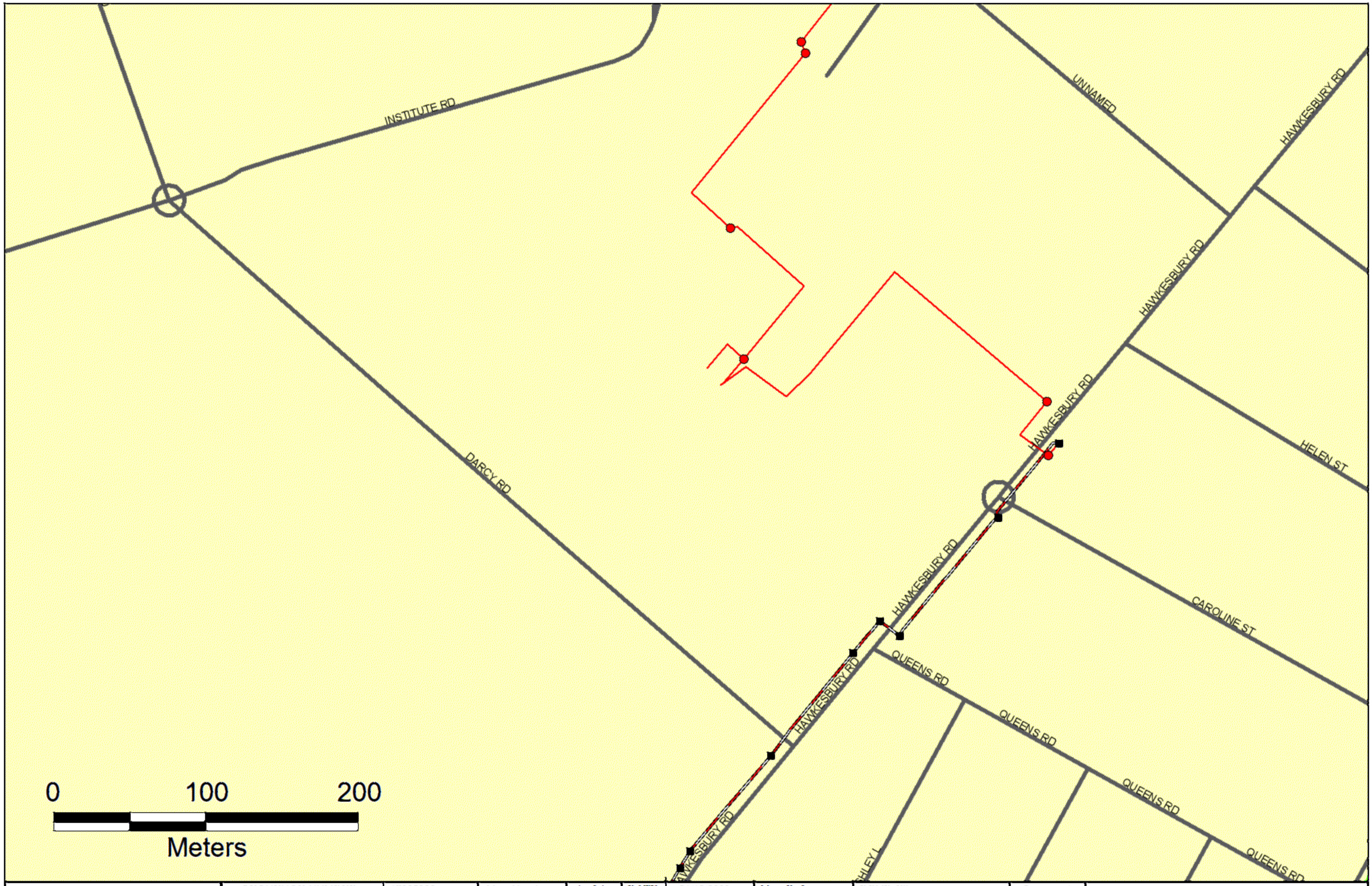
Jackhammers/Pneumatic Breakers	Not within 1.0m of **actual location**
Vibrating Plate or Wacker Packer Compactor	Not within 0.5m of SOUL ducts. 300mm compact clearance covers before compactor can be used across SOUL ducts
Boring Equipment (in-line, horizontal and vertical)	Not within 2.0m of actual location. Constructor to hand dig (pot-hole) and expose fibre
Heavy Vehicle Traffic (over 3 tonnes)	Not to be driven across SOUL ducts (or fibre) with less than 600mm cover. Constructor to check depth via hand digging.
Mechanical Excavators, Boring and Tree Removal	Not within 1.0m of actual location. Constructor to hand dig (pot-hole) and expose fibre

.
All SOUL pits and manholes should be a minimum of 1.2m in from the back of kerb after the completion of your work.
All SOUL conduits should have the following minimum depth of cover after the completion of your work:

- **Footway 450mm**
- **Roadway 450mm at drain invert and 600mm at road centre crown**

CONCERNING SOUL PLAN (S)

- SOUL plans and information are valid for 60days from the date of issue. If this timeframe has elapsed please re-apply via Dial before you dig
- SOUL retains copyright in all plans and details provided in conjunction with this request.
- SOUL plans or other details are provided for the use of the applicant and shall not be used for any unauthorised purpose
- Please contact **SOUL OPERATIONS 0249273559** immediately should you locate SOUL assets not indicated on the plan
- SOUL shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant
- Please ensure SOUL plans and information provided remains on-site at all times throughout your construction phase



SEQUENCE NUMBER	17385966	Map Number	1 of 1	DATE	21/12/2009	Map Reference	DBYD Fibre	Comment	

WARNING - MAJOR OPTIC FIBRE IN THE AREA.

TO:Mr Samuel Gobraiel
Arup
201 Kent St
Sydney, Nsw, 2000

Uecomm Pty Limited
ABN 56 079 083 195

Building 8, 658 Church St,
Richmond, VIC 3121
Ph: (03) 9221 4100
Fax: (03) 9221 4193
Ah: 1800 707 447

LOCATION OF UNDERGROUND FIBRE OPTIC CABLE INFORMATION SHEET

IMPORTANT: PLEASE READ ALL INFORMATION AND CONDITIONS BELOW AND THE NOTICE ON THE REVERSE SIDE OF THE PLAN/S.

"Dial Before You Dig" Sequence No 17385969 **Customer ID 874036**	**Issue Date: 18/12/2009** **Issue By: Bruce**

Location: **Hawkesbury Rd, Westmead, NSW 2145**
Map Ref: **190K14, 190L14, 190M14, 190N14, 190K15, 190L15, 190M15, 190N15, 190M16**
Uecomm Asset Location No. **17385969**
Dial Before You Dig Job No. **3722294**

In relation to your enquiry at the above address, Uecomm advises as follows:

The records of Uecomm Limited disclose that there ARE underground FIBRE OPTIC / TELECOMMUNICATIONS cables in the vicinity of the above enquiry as per attached plan/s.

- The underground cables referred to in this advice are defined as the underground communications cables owned or controlled by Uecomm Pty Limited.
- The person/company responsible for submitting the inquiry should take care to ensure all plans listed above have been received. For any plan listed above but not received please contact **1800 707 447**
- Any information provided is valid only for **14 days** from the date of issue set out above.
- If the work operations extends beyond this period, or if the designs are altered in any way, you are requested to re-submit your proposal for re-assessment.
- Further assistance may be obtained if necessary by telephoning **1800 707 447**

PLEASE READ ALL INFORMATION AND DISCLAIMERS BELOW:

1. Due to the nature of underground cables and the age of some cables and records, it is impossible to conclusively ascertain the location of all cables. The accuracy and/or completeness of the information cannot be guaranteed and, accordingly, they are intended to be indicative only and as a result Uecomm does not accept any responsibility for any inaccuracies of its plans. They should not be solely relied upon when undertaking underground works. It is also inaccurate to assume that fibre optic cables follow straight lines and careful onsite investigations are essential to locate its exact position.

2. The following minimum clearances must be maintained:
   - 300mm - when laying asset's inline, horizontal or vertical.
   - 500mm - when operating vibrating equipment. Eg: Jackhammers or vibrating plates.
   - 1000mm - when operating mechanical excavators.

3. Due to the inherent dangers associated with excavation in the vicinity of underground cables, precautions should be taken in the undertaking of any underground works, including (but not limited to) the following:
   - All excavation sites should be examined for underground cables by careful hand excavation. Cable cover slabs if present must not be disturbed. Hand excavation needs to be undertaken with extreme care to minimise the likely hood of damage to the cable. EG: Blades of hand equipment should be orientated parallel to the line of the cable rather than digging across the cable.
   - If any undisclosed underground cables are located, Uecomm Limited should be notified immediately.
   - All personnel must be properly briefed, particularly those associated with the use of earth-moving equipment, trenching, boring and pneumatic equipment.
   - All excavations must be undertaken in accordance with the relevant legislation and regulations.

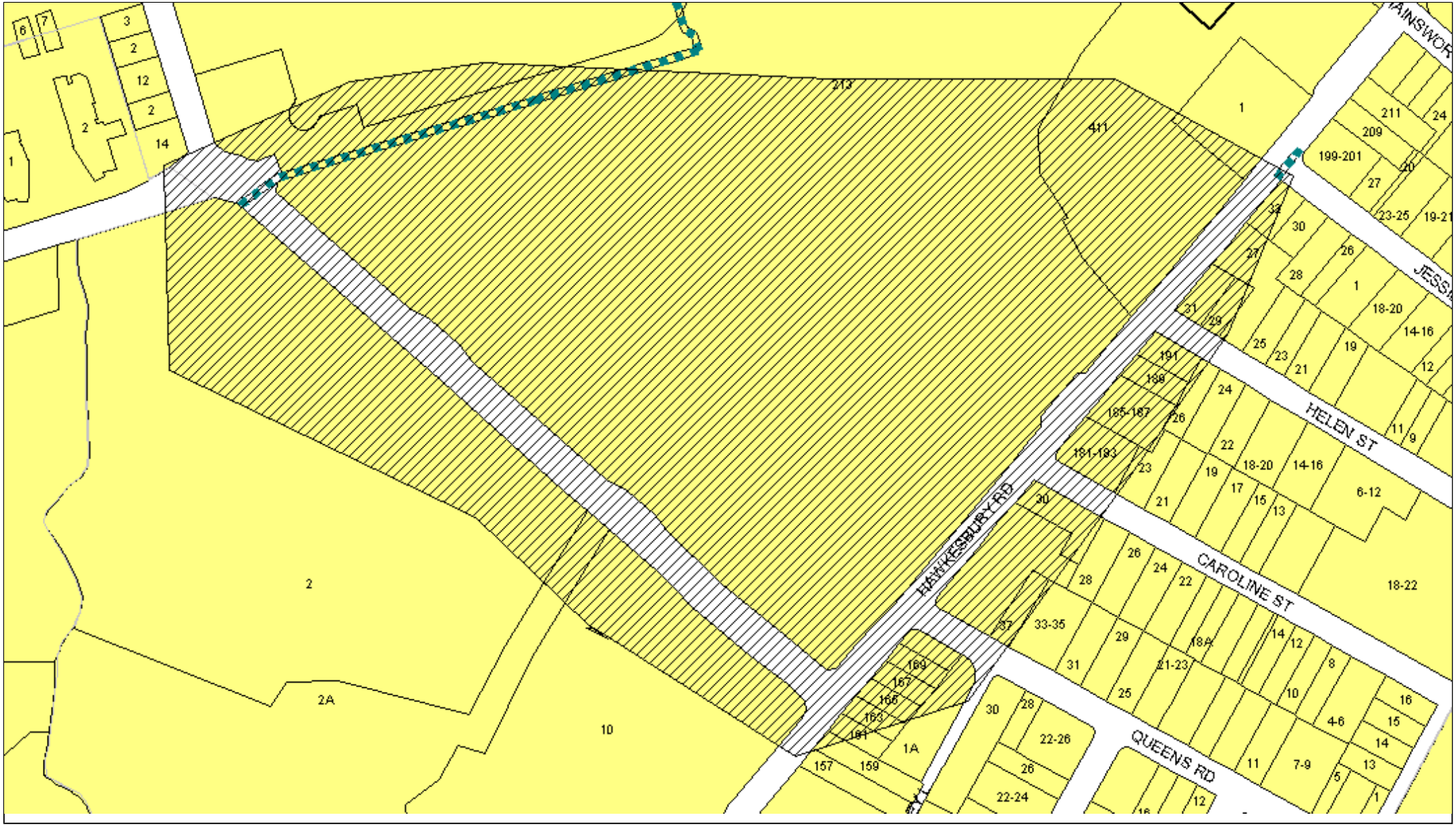
4. **DAMAGE. ANY DAMAGE TO UECOMM'S NETWORK MUST BE REPORTED IMMEDIATELY TO 1800 707 447**

5. Uecomm recommends using Uecomm approved location contractors to provide onsite location services for Uecomm plant. You can arrange Uecomm onsite visits by calling Uecomm on 1800 707 447 and Uecomm or its approved representative will attend your site to provide guidance to the location of the Uecomm assets (the *"Uecomm Asset Alignment"*). **Uecomm requires 3 clear business days notice to conduct an onsite location.** The initial on site visit by Uecomm will not normally incur a charge, but at the discretion of Uecomm, subsequent site visits may incur a charge to be applied at an hourly rate.

6. Uecomm will hold the relevant party responsible for any damage to Uecomm plant and all expenses incurred by Uecomm as a result of asset damage.

7. Except to the extent that liability may not be capable of lawful exclusion, Uecomm Pty Limited and its servants and agents and the related bodies corporate of Uecomm Pty Limited and their servants and agents shall be under no liability whatsoever to any person for any loss or damage (including indirect or consequential loss or damage) however caused (including, without limitation, breach of contract negligence and/or breach of statute) which may be suffered or incurred from or in connection with this information sheet or any Plans attached hereto. Except as expressly provided to the contrary in this information sheet or the attached Plans, all terms, conditions, warranties, undertakings or representations (whether expressed or implied) are excluded to the fullest extent permitted by law.

We thank you for your enquiry and appreciate your continued use of the Dial Before You Dig Service and/or Uecomm Asset Analysis Service. If you require further information please contact Uecomm on **1800 707 447.**



Uecomm
Cable Uecomm Underground OVERVIEW MAP
Scale: 1 : 3500 **Printed On:** 18/12/2009

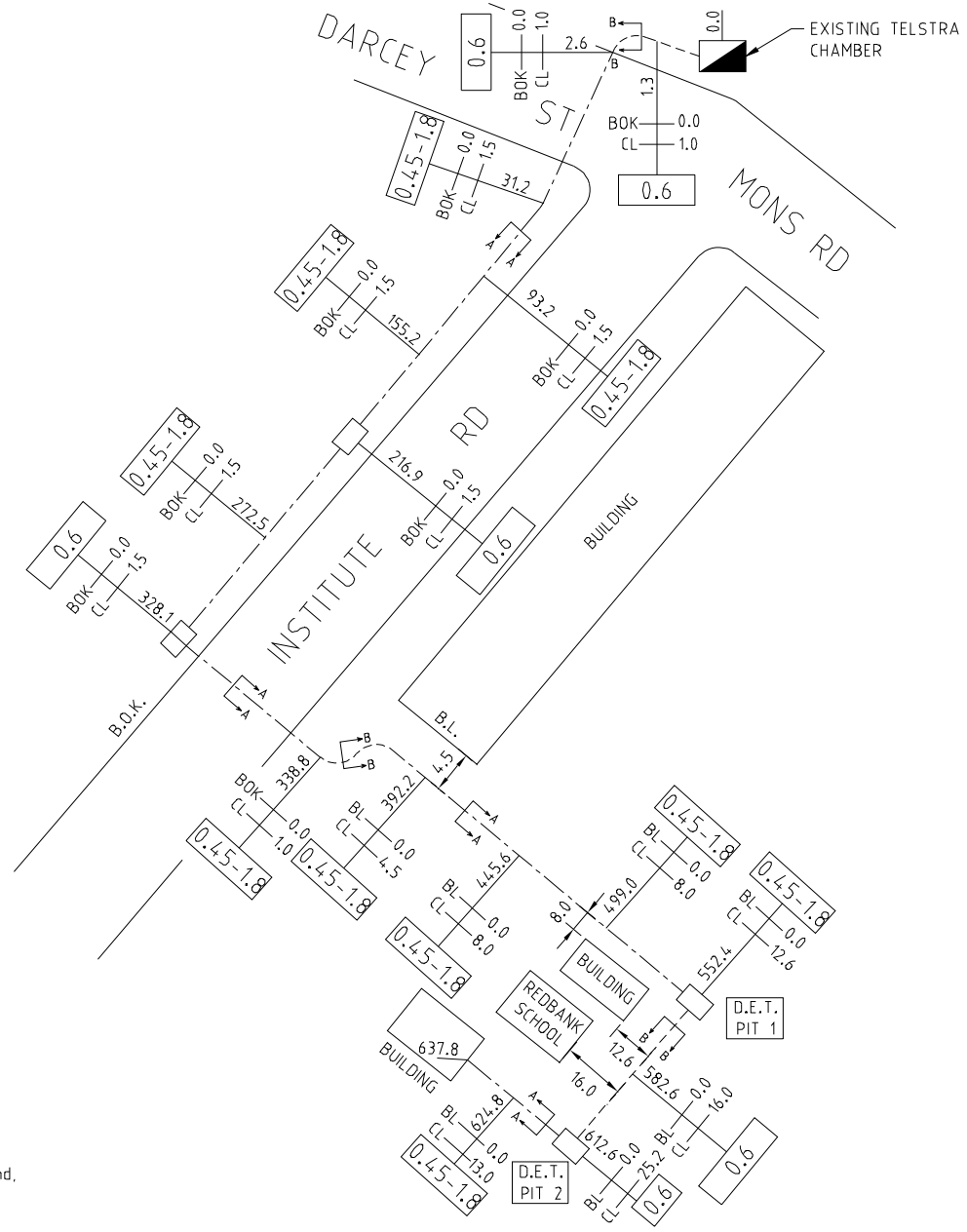
Sequence Number: 17385969
Location: Hawkesbury Rd

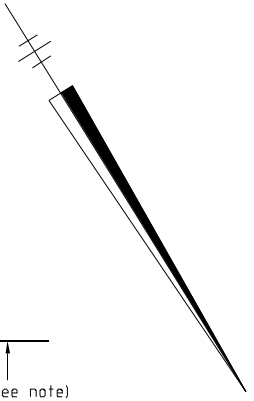
Job Location
Line
Point
Area

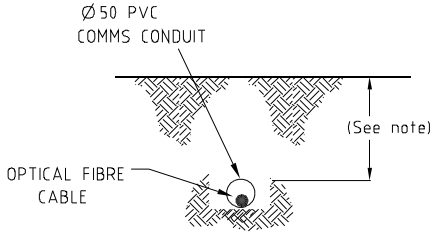
Undergound Asset
Uecomm

LEGEND

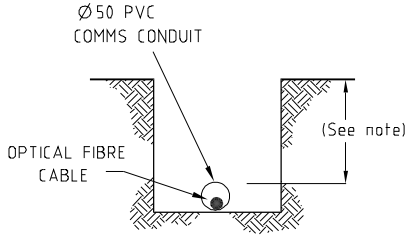
- ELECTRICITY POLE
- FIBRE OPTIC CABLE
- CABLE CONDUIT (TRENCHING)
- CABLE CONDUIT (BORE TUNNELLING)
- UE P2 PIT
- UE P5 PIT
- UE P6 PIT
- UE P8 PIT
- UE P9 PIT
- BL - BUILDING LINE
- BOK - BACK OF KERB
- CL - CENTRELINE OF CONDUIT
- TP - TURNING POINT OF CONDUIT
- FENCE LINE, FL
- TELSTRA MANHOLE
- TELSTRA PIT
- OPTICAL FIBRE JOINT
- JOINT LOOP (m) - POLE / UNDERGROUND
- CABLE HEAD POLE
- 0.6m - CABLE DEPTH







SECTION A-A
BORE



SECTION B-B
TRENCH

ABB Australia Pty Ltd.
109 Bannister Rd
Canning vale WA 6155
QUALITY ENDORSED COMPANY
ISO9001 REGISTRATION No.049
STANDARDS AUSTRALIA

Note:
1. Conduit depths quoted are approximate only and may change due to unforseen circumstances.
2. In all instances it is recommended that the position of conduits & cables should be proved on site by hand, prior to commencement of works.
3. Loop in all pits unless otherwise stated.

DRAWING NOT TO SCALE

REVISION	DATE	REV.	REVISION DESCRIPTION	CHECKED	APP'D.
	31.07.03	0	AS BUILT	MW	DC

CONTACT OFFICER	TREVOR SMITH PH: (02) 8226 3244
PROJECT NUMBER	UEC-DE&TS-532
PLAN No.	-
UBD REF	190-M13

Uecomm MAKING THE CONNECTION ACN 079 083 195

UECOMM MEL/SYD/QLD

DRAWN JMCK 31.07.03
DESIGN CHECKED M.W. 31.07.03
APPROVED 31.07.03 DC

DRG No. OFN5-SYD-2403

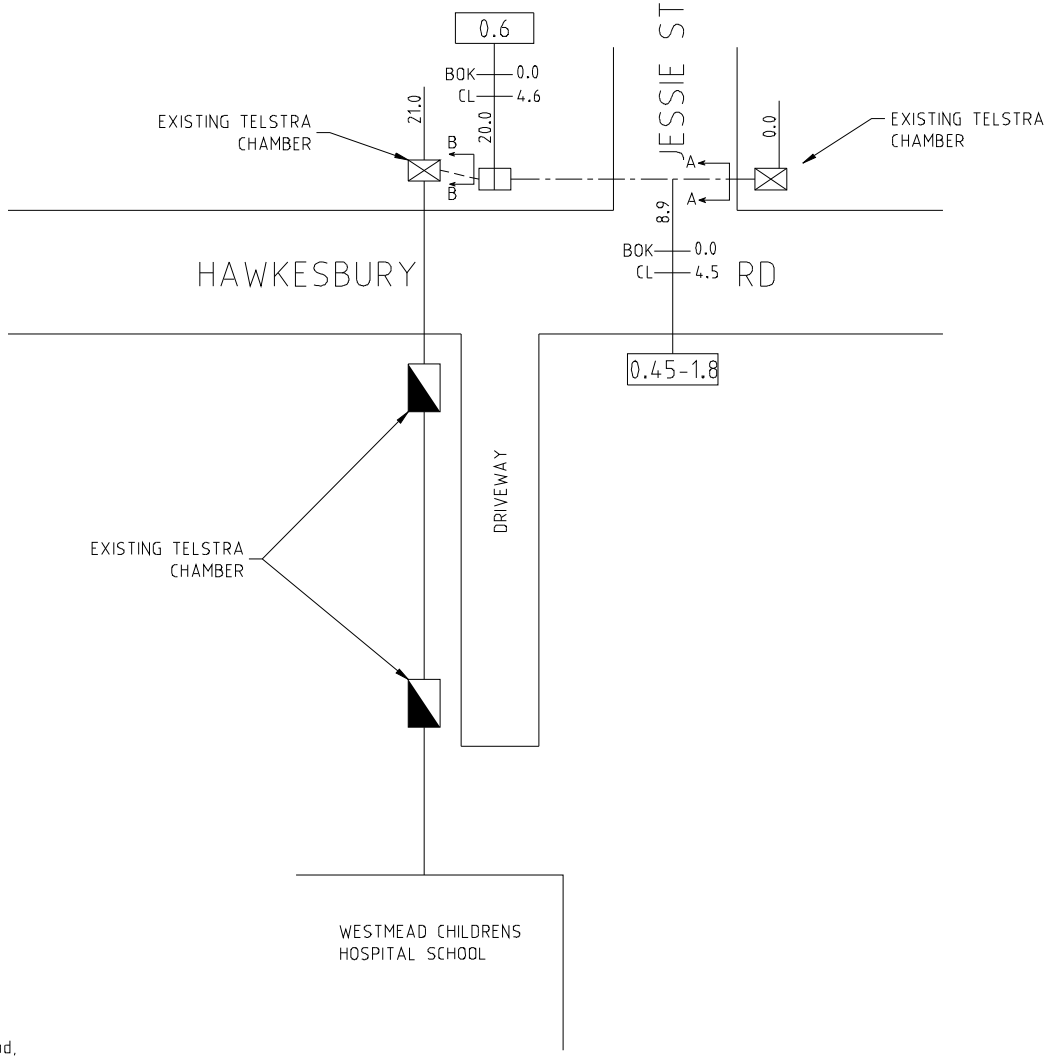
EXTERNAL ROUTE (1 of 1)
REDBANK SCHOOL (5559)
INSTITUTE ROAD,
WESTMEAD 2145

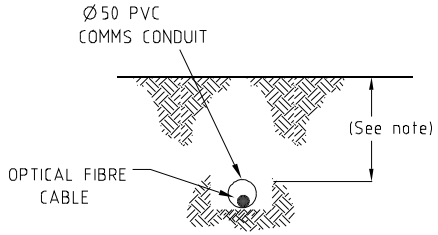
A3

DRAWING NOT TO SCALE

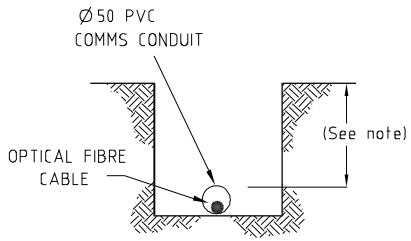
LEGEND

- ELECTRICITY POLE
- FIBRE OPTIC CABLE
- CABLE CONDUIT (TRENCHING)
- CABLE CONDUIT (BORE TUNNELLING)
- UE P2 PIT
- UE P5 PIT
- UE P6 PIT
- UE P8 PIT
- UE P9 PIT
- BL - BUILDING LINE
- BOK - BACK OF KERB
- CL - CENTRELINE OF CONDUIT
- TP - TURNING POINT OF CONDUIT
- FENCE LINE, FL
- TELSTRA MANHOLE
- TELSTRA PIT
- OPTICAL FIBRE JOINT
- JOINT LOOP (m) - POLE / UNDERGROUND
- CABLE HEAD POLE
- 0.6m - CABLE DEPTH





SECTION A-A
BORE



SECTION B-B
TRENCH

ABB Australia Pty Ltd.
109 Bannister Rd
Canning vale WA 6155
QUALITY ENDORSED COMPANY
ISO9001 REGISTRATION No.049
STANDARDS AUSTRALIA

Note:
1. Conduit depths quoted are approximate only and may change due to unforseen circumstances.
2. In all instances it is recommended that the position of conduits & cables should be proved on site by hand, prior to commencement of works.
3. Loop in all pits unless otherwise stated.

REVISION	DATE	REV.	REVISION DESCRIPTION	CHECKED	APP'D.
	08.08.03	0	AS BUILT	MW	DC

CONTACT OFFICER	TREVOR SMITH PH: (02) 8226 3244
PROJECT NUMBER	UEC-DE&TS-472
PLAN No.	-
UBD REF	190-P14

Uecomm™ MAKING THE CONNECTION
ACN 079 083 195

UECOMM
MEL/SYD/QLD

DRAWN JMCK 08.08.03
DESIGN CHECKED M.W. 08.08.03
APPROVED 08.08.03 DC

DRG No. OFN5-SYD-2404

EXTERNAL ROUTE (1 of 1)
THE WESTMEAD CHILDRENS HOSPITAL SCHOOL (5751), HAWKESBURY RD. WESTMEAD 2145

A3

Alexis Cella

From: Telstra_Smartplan@domino.in.telstra.com.au
Sent: Friday, 18 December 2009 1:34 PM
To: Samuel Gobraiel
Subject: DBYD JOB: 3722294 SEQ:17385964-Hawkesbury RdWestmeadNSW 2145
Attachments: Telstra Duty of Care.pdf; HS_AccreditedPlantLocators.pdf; 17385964.dwf

Attention: Samuel Gobraiel

Site Location: Hawkesbury Rd, Westmead, NSW 2145

The attached files contain Telstra information relating to your recent Dial-Before-You-Dig request. Please ensure you read the Telstra Duty of Care document as it contains important information.
If you are unable to launch any one of the files for viewing and printing, you may need to download and install one or more of the free viewing and printing products such as Adobe Acrobat Reader (for PDF files) or Autodesk Design Review 2009 (for DWF files) available off the internet.

Tips for VIEWING Telstra DWF files -
Telstra DWF files come with all layers turned on. You will need to turn individual layers on or off for viewing and printing clarity e.g. print individual layers CC (main cable/conduit), DA (distribution area network) and sometimes a combined layer - CAC.
Layer details can be viewed by either picking off the side menu or by selecting 'window' then 'layers'
off the top menu bar. Use 'layers' to turn individual layers off or on.
(double click or right click on layer icon.)

Tips for PRINTING Telstra DWF files -
Some DWF coverage areas are large and are not suited to printing legibly on a single A4 sheet - you may need several prints or an A3 or larger printer.
To print - zoom in or out to make the text legible on your screen and then by changing the 'print range' settings you can print what is displayed on your screen to suit your paper size. For this the 'view' setting when printing should be changed from 'full page' to 'current view'. The 'current sheet' setting should also be selected.

For all Telstra DBYD map enquiries:

Email:
Telstra.Plans@team.telstra.com
Fax: 02 4961 3714
Optic Fibre Enquiries 1800 653 935 (7.30 am to 5 pm, 5 days per week)

(For urgent onsite enquiries only - 1800 653 935. Business Hours)

For all Telstra asset relocation enquiries:

Phone: 1800 810 443

Please DO NOT SEND A REPLY to this email as it has been automatically generated and replies are not monitored.

|---|
| WARNING - MAJOR CABLES and/or OPTIC FIBRE IN THE AREA. |
| Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant |

| from Telstra’s plans. The preciseness and/or completeness of the information |
| supplied can not be guaranteed as property boundaries, depths and other natural |
| landscape features may change over time, and accordingly the plans are |
| indicactive only. Telstra does not warrant or hold out that its plans are |
| accurate and accepts no responsibility for any inaccuracy shown on the plans. |
| It is your responsibilty to locate Telstra’s underground plant by careful hand |
| pot-holing prior to any excavation in the vicinity and to exercise due care |
| during that excavation. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE |
| TO ITS PLANT. Please read and understand the information supplied in the duty |
| of care statement attached with the Telstra Plans. |
| |
| Phone 1800 653 935 for further assistance. |
| |
| Caution: Some Telstra fibre routes may be marked as "Amcom", as Telstra has |
| purchased much of this infrastructure. If in doubt please contact us on the Netw |
| ork Integrity Help Desk number. |
| Telstra plans and information are valid for 60 days from the date of issue. If |
| this timeframe has elapsed, please reapply for plans. |

(See attached file: Telstra Duty of Care.pdf)

(See attached file: HS_AccreditedPlantLocators.pdf)

(See attached file: 17385964.dwf)

DUTY OF CARE

Telstra Corporation Limited

IMPORTANT:

- Please read and understand all the information and disclaimers provided below.
- Sketches and Plans provided by Telstra are circuit diagrams only and indicate the presence of telecommunications plant in the general vicinity of the geographical area shown; exact ground cover and alignments cannot be given with any certainty and cover may alter over time. Telecommunications plant seldom follow straight lines and careful on site investigation is essential to uncover and reveal its exact position.
- Due to the nature of Telstra plant and the age of some cables and records, it is impossible to ascertain the location of all Telstra plant. The accuracy and/or completeness of the information can not be guaranteed and, accordingly Telstra plans are intended to be indicative only.

"DUTY OF CARE"

When working in the vicinity of telecommunications plant you have a legal "Duty of Care" that must be observed. The following points must be considered:-

1. It is the responsibility of the owner and any consultant engaged by the owner, including an architect, consulting engineer, developer, and head contractor to design for minimal impact and protection of Telstra plant. Telstra will provide plans and sketches showing the presence of its network to assist at this design stage.
2. It is the owner's (or constructor's) responsibility to:-

a) Request plans of Telstra plant for a particular location at a reasonable time before construction begins.

b) Visually locate Telstra plant by hand digging (pot-holing) where construction activities may damage or interfere with Telstra plant (see "Essential Precautions and Approach Distances" section for more information).

c) Contact Telstra's **Network Integrity Group** (see below for details) if Telstra plant is wholly or partly located near planned construction activities.

DAMAGE:

ANY DAMAGE TO TELSTRA'S NETWORK MUST BE REPORTED TO 132203 IMMEDIATELY.

- The owner is responsible for all plant damage when works commence prior to obtaining Telstra plans, or failure to follow agreed instructions.
- Telstra reserves all rights to recover compensation for loss or damage to its cable network or other property including consequential losses.

CONCERNING TELSTRA PLANS:

- **Phone 1100 - Dial Before You Dig** for plans of Telstra plant locations. Please give at least 2 business days notice.
- Telstra plans and information provided are **valid for 60 days** from the date of issue.
- Telstra owns and retains the copyright in all plans and details provided in conjunction with the applicant's request. The applicant is authorised to use the plans and details only for the purpose indicated in the applicant's request. The applicant must not use the plans or details for any other purpose. The plans and details should be disposed of by shredding or any other secure disposal method after use.
- Telstra plans or other details are provided only for the use of the applicant, its servants, or agents. **The applicant may not give the plans or details to other parties, and may not generate profit from commercialising the plans or details.**
- Please contact the **Network Integrity Help Desk** (see below for details) immediately should you locate Telstra assets not indicated on these plans.
- Telstra, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Telstra against any claim or demand for any such loss or damage.
- Please ensure Telstra plans and information provided remains on-site at all times throughout your construction phase.

ESSENTIAL PRECAUTIONS and APPROACH DISTANCES:

NOTE: If the following clearances cannot be maintained, please contact the Network Integrity Help Desk (see below for details)

for advice on how best to resolve this situation.

1. On receipt of plans and sketches and before commencing excavation work or similar activities near Telstra's plant, **carefully locate this plant first** to avoid damage. Undertake prior manual exposure such as potholing when intending to excavate or work **closer** to Telstra plant than the following approach distances.

- Where Telstra's plant is in an area where road and footpaths are well defined by kerbs or other features a minimum clear distance of 600mm must be maintained from where it could be reasonably presumed that plant would reside.
- In non established or unformed reserves and terrain, this approach distance must be at least 1.5 metres.
- In country/rural areas which may have wider variations in reasonably presumed plant presence, the following minimum approach distances apply:

a) Parallel to major plant: 10 metres (for IEN, optic fibre and copper cable over 300 pairs)
b) Parallel to other plant: 5 metres

- Note: Even manual pot-holing needs to be undertaken with extreme care, commonsense and employing techniques least likely to damage cables. For example, orientate shovel blades and trowels parallel to the cable rather than digging across the cable.
- If construction work is parallel to Telstra plant, then careful hand digging (pot-holing) at least every 5m is required to establish the location of all plant, hence confirming nominal locations before work can commence.

2. Maintain the following minimum clearance between construction activity and **actual location** of Telstra Plant.

Jackhammers/Pneumatic Breakers	*Not within 1.0m of **actual location.***
Vibrating Plate or Wacker Packer Compactor	*Not within 0.5m of Telstra ducts.* *300mm compact clearance cover before compactor can be used across Telstra ducts.*
Boring Equipment **(in-line, horizontal and vertical)**	*Not within 2.0m of **actual location**.* *Constructor to hand dig (pot-hole) and expose plant.*
Heavy Vehicle Traffic (over 3 tonnes)	*Not to be driven across Telstra ducts (or plant)* *with less than 600mm cover.* *Constructor to check depth via hand digging.*
Mechanical Excavators, Boring and Tree Removal	*Not within 1.0m of **actual location.*** *Constructor to hand dig (pot-hole) and expose plant.*

- All Telstra pits and manholes should be a minimum of 1.2m in from the back of kerb after the completion of your work.
- All Telstra conduit should have the following minimum depth of cover after the completion of your work:-
- **Footway 450mm**
- **Roadway 450mm at drain invert and 600mm at road centre crown**
- For clearance distances relating to Telstra pillars, cabinets and RIMs/RCMs please contact the Network Integrity Help Desk (see below for details).

FURTHER ASSISTANCE:

Over-the-phone assistance can be obtained by calling the **Network Integrity Help Desk**.

Where on-site location is provided, the owner is responsible for all hand digging (pot-holing) to visually locate and expose Telstra plant.

If plant location plans or visual location of Telstra plant by digging reveals that the location of Telstra plan is situated wholly or partly where the owner plans to work, then **Telstra's Network Integrity Group** must be contacted through the **Network Integrity Help Desk** to discuss possible engineering solutions.

NOTE:

If Telstra relocation or protection works are part of the agreed solution, then payment to Telstra for the cost of this work shall be the responsibility of the principal developer or constructor. The principal developer or constructor will be required to provide Telstra with the details of their proposed work showing how Telstra's plant is to be accommodated and these details must be approved by the Regional Network Integrity Manager prior to the commencement of site works.

RURAL LANDOWNERS - IMPORTANT INFORMATION

Where Telstra owned cable crosses agricultural land, Telstra will provide a one off free on-site electronic cable location. Please note that the exact location of cables can only be verified by visual proving by pot holing, which is not covered by this service. The Network Integrity Helpdesk Officer will provide assistance in determining whether a free on-site location is required. Please ring the Network Integrity Helpdesk Officer as listed above.

PRIVACY NOTE

A GUIDE TO READING Telstra PLANS

Telstra Corporation Limited
ABN 33 051 775 556

Exchange
(major cable present)

Footway access chamber
(can vary from 1-lid to 12-lid)

Roadway access chamber

Pillar/cabinet
(above the ground / free standing)

Above ground complex equipment housing (eg RIM)
Please Note: This equipment is powered by 240V electricity.

PT Public telephone
Please Note: This equipment is powered by 240V electricity.

Direct buried cable

Cable jointing pit
(number indicating pit type)

Buried cable jointing pit
(number indicating pit type)

Elevated cable joint
(above ground joint on buried cable)

Cable loop (direct buried)

Telstra Plant in shared utility trench

Aerial Cable
(above ground)

Aerial cable
(attached to joint use pole e.g. power)

SMOF **Optical fibre cable direct buried**

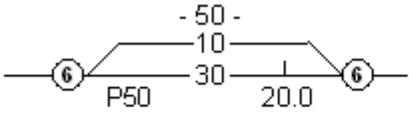
Single to multiple round conduit
Configurations 1, 2, 4, 9 respectively
(Attached text denotes conduit type and size)
P100

Multiple square conduit
Configurations 2, 4, 6 respectively
(Attached text denotes conduit type and size)
E85

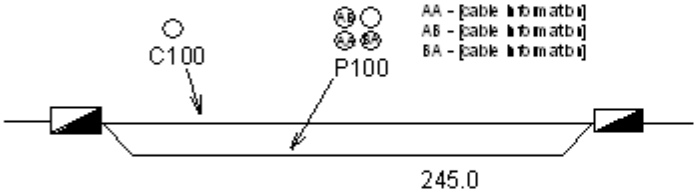
Some examples of conduit type and size:
A - Asbestos cement, P - PVC / plastic, C - Concrete, GI - Galvanised iron, E - Earthenware.
Conduit sizes *nominally* range from 20mm to 100mm.

P50	50mm PVC conduit
P100	100mm PVC conduit
A100	100mm asbestos cement conduit
E 85	85mm square earthenware conduit

Some examples of how to read Telstra plans:



One 50mm PVC conduit (P50) containing a 50-pair and a 10-pair cable between two 6-pits, 20.0m apart, with a direct buried 30-pair cable along the same route.



Two separate conduit runs between two footway access chambers (manholes) 245m apart. A nest of four 100mm PVC conduits (P100) containing assorted cables in three ducts (one being empty) and one empty 100mm concrete duct (C100) along the same route.

WARNING: Telstra's plans show only the presence of cables and plant. They only show their position relative to road boundaries, property fences etc. at the time of installation and Telstra does not warrant or hold out that such plans are accurate thereafter due to changes that may occur over time.
DO NOT ASSUME DEPTH OR ALIGNMENT of cables or plant as these vary significantly.
The customer has a DUTY OF CARE when excavating near Telstra cables and plant. Before using machine excavators TELSTRA PLANT MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG (potholing) to identify its location.
Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

ACCREDITED PLANT LOCATERS (For your area)

On-site assistance should be sought from an **Accredited Plant Locater** if the telecommunications plant cannot be located within

2.5 metres of the locations indicated on the drawings provided.

On-site advice should be obtained from a suitably qualified contractor highly skilled in locating Telstra plant if there is any doubt whatsoever about the actual location of the telecommunications plant, the best method for locating the telecommunications plant or the correct interpretation of the drawings provided. In the case where Telstra plant is outside a recognised road reserve Telstra recommends that the **Network Integrity Help Desk** is contacted for assistance prior to engaging an Accredited Plant Locater.

For the assistance of customers Telstra has established strict criteria to assess the skill of contractors that may be engaged by owners requiring Telstra plan locating services to perform any of the following activities if requested to do so by the owner:

- review Telstra's plans to assess the approximate location of Telstra plant;
- advise owners of the approximate location of Telstra plant according to the plans;
- advise owners of the best method for locating Telstra plant;
- advise owners of the hazards of unqualified persons attempting to find the exact location of Telstra plant and working in the vicinity of Telstra plant without first locating its exact position.
- perform trial hole explorations by hand digging (pot-holing) to expose Telstra plant with a high degree of skill, competence and efficiency and utilising all necessary safety equipment.

Telstra has provided a number of contractors with certification as an Accredited Plant Locater.

A list of Accredited Plant Locaters operating in your area is attached. Accredited Plant Locaters are certified by Telstra to perform the tasks listed above. Owners may engage Accredited Plant Locaters to perform these services, however Telstra does not give any warranty in relation to these services that Accredited Plant Locaters are competent or experienced to perform any other services.

The attached list provides the names and contact details for Accredited Plant Locaters who service your area and can provide you with assistance in locating Telstra plant on site. These organisations have been able to satisfy Telstra that they have a sound knowledge of telecommunications plant and its sensitivity to disturbance; appropriate equipment for locating telecommunications plant and competent personnel who are able to interpret telecommunications plans and sketches and understand safety issues relevant to working around telecommunications plant. They are also able to advise you on the actions which should be taken if the work you propose will/could result in a relocation of the telecommunications plant and/or its means of support.

We recommend that you engage the assistance of one of these Accredited Plant Locaters as a step towards discharging your Duty of Care obligations when seeking the location of Telstra's telecommunications plant.

Please Note:

1. The details of any contract, agreement or retainer for site assistance to locate telecommunications plant shall be for you to decide and agree with the organisation engaged. Telstra is not a party to any contract entered into between an owner and an Accredited Plant Locater. The Accredited Plant Locaters are able to provide guidance concerning the extent of site investigations required.
2. Payment for the site assistance will be your responsibility and payment details should be agreed before the engagement is confirmed.
3. Telstra does not accept any liability or responsibility for the performance of or advice given by an Accredited Plant Locater. Accreditation is an initiative taken by Telstra towards the establishment and maintenance of competency standards. However, performance and the advice given will always depend on the nature of the individual engagement.
4. Each Accredited Plant Locater has been issued with a certificate which confirms the Accreditation. Each year Telstra will reassess the accreditation and where appropriate will issue a letter confirming the accreditation for the next calendar year. You have the right to request the organisation you engage to show evidence of this certificate and its currency.
5. The Accredited Plant Locater is required to service each engagement with the personal attendance of at least one accredited employee who has satisfactorily completed a Telstra approved employee accreditation training course. These people will carry a certification card issued by Telstra.
6. Neither the Accredited Plant Locater nor any of its employees are an employee or agent for Telstra and Telstra is not liable for any damage or loss caused by the Accredited Plant Locater or its employees.
7. The attached list contains the current names and contact details of Accredited Plant Locators who service your area, however, these details are subject to change.

Accredited Plant Locaters:

Name and Address	Phone Number	Ask for:
Abitek Pty Ltd - Rouse Hill	Ph:02 88147899 Fax:02 88147855 Mob:0413 327 243	Braden Tynan
Action Locating	02 9671 5600 0415 228 466	Matthew Tynan
Australian Locating Services	02 9751 1859 0412 227 434	Scott Hogan
Barry Bros Specialised Servcies	Mob: 0433 500 405 Ph: 02 8723 8777 Fax 02 9773 0777	Chris Gaven
Bradmac Locating Services - Springwood	Ph: 02 47543626 Fax: 02 47543735 Mob: 0434 157 409	Brad McCorkindale
Civilscan Pty Ltd	Mob: 0416 068 060	Doug Dean
Daley Boring Pty Ltd	Mob: 0409 244 670 Fax: 02 4655 4647	Michael Daley
D & K Vacuum Excavation	02 47292428 0422 764 271	Dwayne Miller
Dig Smart - Vacuum Potholing Services	0433 213 045	(James) Scott Harris
Down Under Consulting	Ph: 02 948 492 73 Fax: 02 998 023 95 Mob: 040 815 0345	Ashleigh Ferris
Duds	0418 267 964	Philip Pegler
Durkin Construction Pty Ltd- Sydney	Ph: 02 97120308 Fax: 02 97120206 Mob: 0413158255	Sean & Jane Durkin
Excavac Potholing	Mob: 0414 521 808 Fax: 02 4631 1450	Peter Lawrence
Hunter Smith Management PtyLtd	Ph:/Fax: 02 9634 8684 Mob: 0422 224 761	Doug Smith
JFTA Pty Ltd	02 82138677	Trevor Ormond
Line-tel Pty Ltd	02 9601 8472 0418 677 809	Dominic Cannon Sam Nicoletti
Locaters	0418 262 025	Paul Forbes
Locating Tracing Services	0417 147 945 02 8824 6654 (A.H)	Darryl Critcher
On Line Pipe & Cable Locating	02 98312750	Barry Maloney
Optical Technologies Pty Ltd	02 9501 4922 0402 354 322	Bruce Whittaker
Point Locations	02 4284 1532 02 4268 4812 0417 683 939	Troy Stanning
Power Serve Pty Ltd - Newcastle	0402 696 535	Murray Oldham
Protech Plumbing	02 9542 8820 0418 971 587	Glenn East
Sydwide Concrete Saw & Pipe Locators	02 9822 8228 0407 433 580	Tony Stojanovski
Topcrew P/L T/AS Excavac Potholing	Fax: 02 46311450 Mob: 0414521808	Peter Lawrence