TOMASY PLANNING

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PCU072645

11 October 2017

Director, Transport Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Director

RE: APPLICATION NUMBER SSI 17-8285
PARRAMATTA LIGHT RAIL – WESTMEAD TO CARLINGFORD
PREMISES 151 HAWKESBURY ROAD, WESTMEAD

We wish to advise that Tomasy Planning has been engaged by PRP Diagnostic Imaging (Australia) Pty Ltd who currently operate a radiology practice from premises known as 151 Hawkesbury Road, Westmead.

We have been instructed to lodge a submission by way of an objection to the current location and alignment of the proposed Parramatta Light Rail Corridor extending from Westmead to Carlingford via Parramatta CBD and Camellia.

In preparing this submission we have taken into consideration supporting documentation which is currently on public exhibition and includes the Environmental Impact Statement and various expert consulting reports. It is our understanding that key features of the project include:

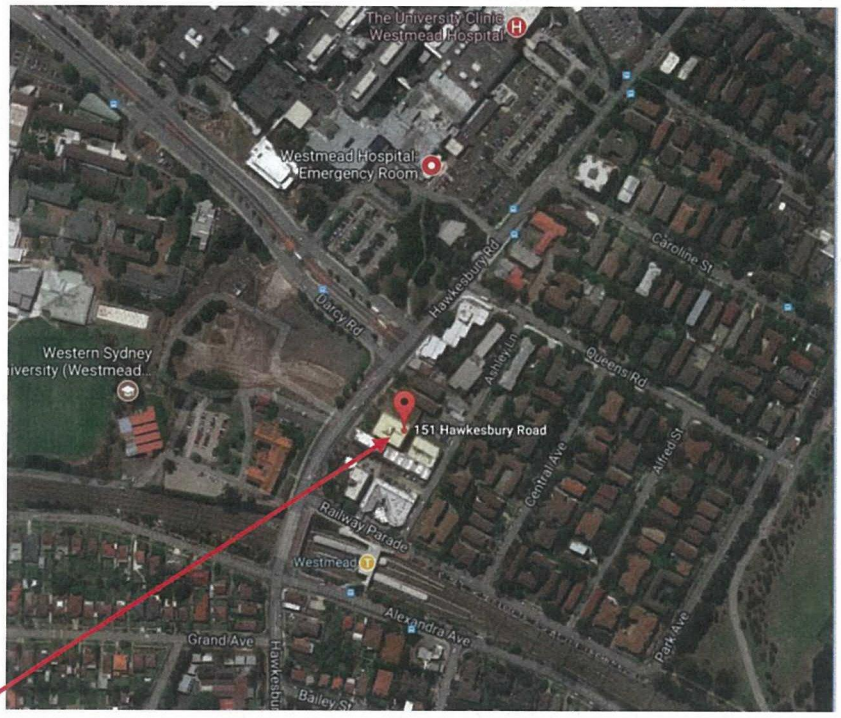
- A light rail network extending approximately 12kms in length with 16 stops;
- The conversion of part of the existing T6 Carlingford Line heavy rail corridor and the Sandown Line for use as dedicated light rail corridors;
- Interchanges with existing rai and/or bus facilities at Westmead, Parramatta, CBD and Carlingford.

In 2013, our clients purchased an already established radiology practice on the site, being 151 Hawkesbury Road, Westmead, which comprised other supporting medical and health facilities. The PRP doctors have for many years, in fact decades, worked in conjunction with the previous practice which had a MRI operating from the premises. PRP are in the course of planning the installation of an MRI Machine in the location which is shown on documentation which forms part of this submission. The MRI considered a critical component of their business and a $3M investment. Based on a review of the documentation that has been submitted in the EIS for the proposed light rail transport

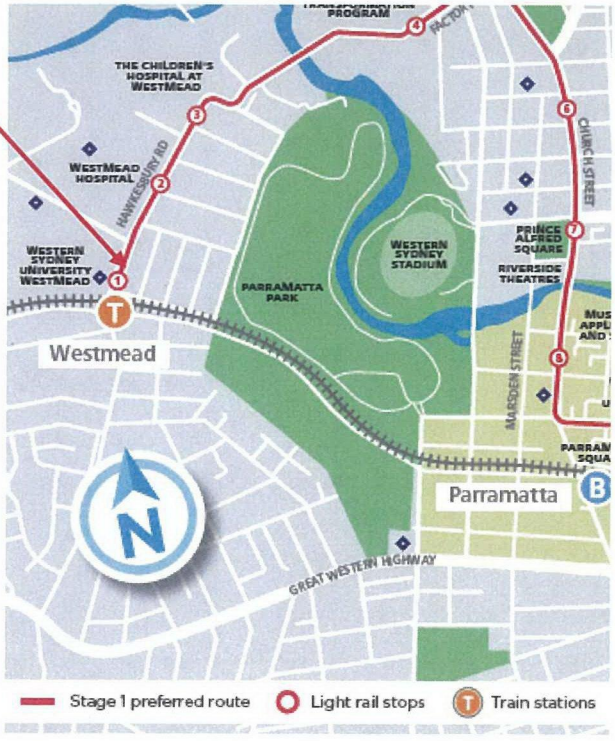
facility, the location of the light rail line would prevent the installation of an MRI machine as it would cause magnetic field disturbance.

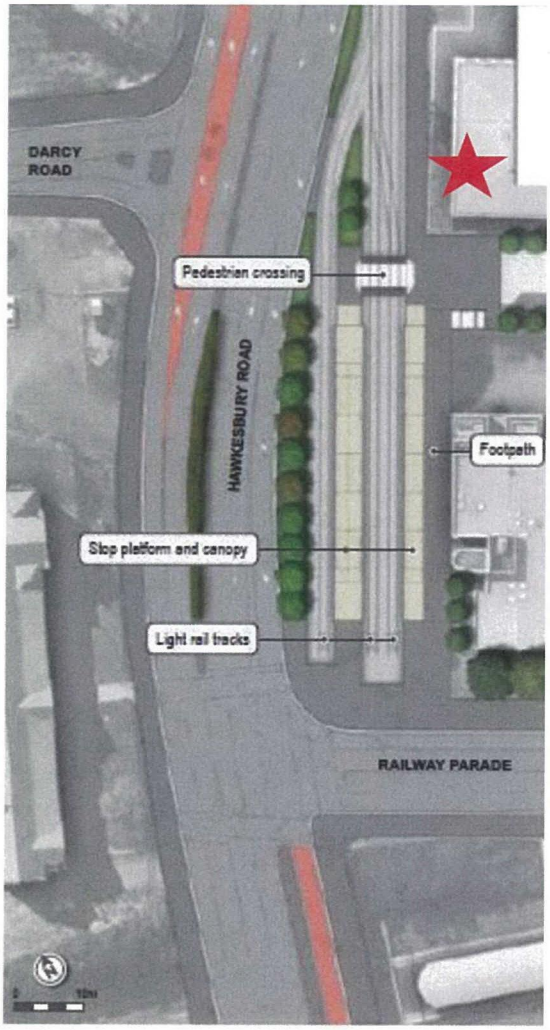
If the MRI is not installed the business would be denied the opportunity to provide a comprehensive medical imaging service and which would result in a large ongong financial impact.

To support the grounds of objection, the following information is submitted which clearly demonstrates the concerns currently being expressed by our clients:



Subject Site





Note this plan does not represent an accurate interpretation of the buildings in relation to the proposed light rail infrastructure.

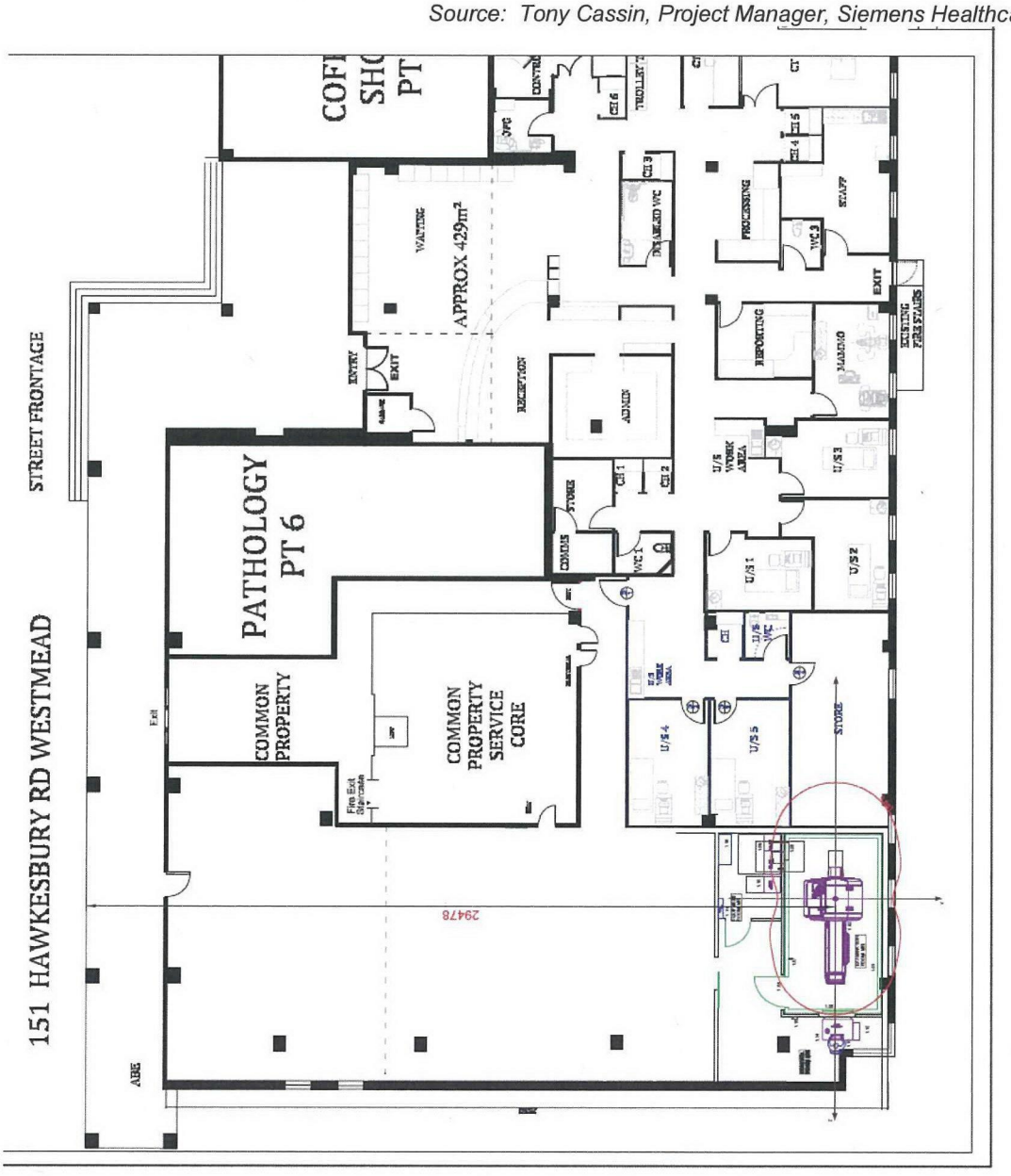
Our Client's building is shown with the red star.

Comment: The alignment of the light rail and associated infrastructure traverses past and includes part of the existing property at 151 Hawkesbury Road, Westmead.

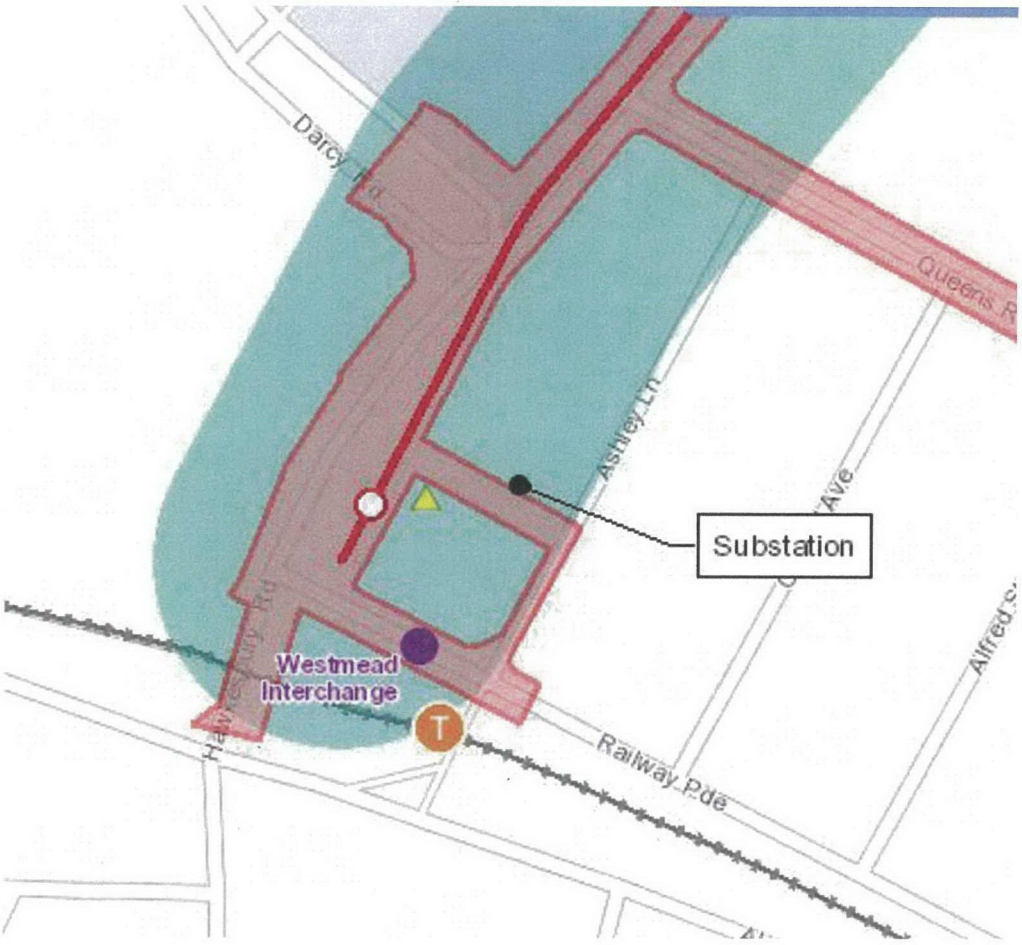
The drawing below has been prepared by Siemens Healthineers to demonstrate the proposed location of the MRI Machine and the distance between the centre of the machine and the alignment of Hawkesbury Road. Siemens have provided the following information:

- The maximum distance we can get from the isocentre of the MRI to the front of the building is 29.4m, to prevent image artefacts our planning guides require this to distance to be 40.0m from the nearest point of a train or tram.
- Looking at the first picture below and comparing with Google maps, it appears the proposed tram line will run across the front of your building with acquisition of the trees in the forecourt and the CommBank Building, we would need more detailed plans of this area to confirm that there is an additional 10.0 metres from the front of your building to the tram lines.
- The second issue is the EIS shows a substation proposed fairly close to your MRI, this requires further investigation as the mains and the substation need to be more than 15.0m away from the MRI

Source: Tony Cassin, Project Manager, Siemens Healthcare Pty Ltd



The project manager from Siemens also makes reference to the proposal to set up a sub-station.



The location of a MRI facility within the existing radiology practice is limited due to the location of a common property core and the design and configuration of the actual building plate on which PRP operate. It is physically impossible to locate the MRI any further than what is shown on the drawing prepared by Siemens Healthineers. A distance of 29.47m from the alignment of the new road frontage to the machine is totally inadequate and would result in the MRI not being installed which therefore means that the community would suffer due to the lack of an MRI machine being readily accessible to the existing radiology facilities. As pointed out previously, an MRI machine is now a critical component of all major radiology practices and strongly supported by State and Federal Government Health Services.

It is acknowledged that there is merit in the proposed light rail facility from the Westmead health precinct through to the Parramatta main CBD however it is only reasonable due consideration be given to the location of the existing health facilities in this immediate precinct, and, the provision of an MRI machine which will have significant benefits to the community and to other support medical facilities that are in this immediate vicinity. It is requested that the NSW Department of Planning and Environment, through the Director of Transport Assessments, re-assess the current planned alignment for the light rail adjacent to 151 Hawkesbury Road, Westmead, and relocate the main line so that there is a clear distance of 40m between the centre of the proposed MRI and the associated rail infrastructure.

Please find attached a completed survey for the electromagnetic interferene and noise/vibration for the Parramatta Light Rail. It is noted that the documentation submitted on the attached form is based upon the criteria that would apply if the MRI is installed at the subject premises.

Happy to discuss any matter with you. Please ensure that our submission is acknowledged.

Denis Smith

DENIS SMITH
Planning and Property Consultant

Parramatta Light Rail – electromagnetic interference and noise/ vibration survey

Address	PRP IMAGING - 151-155 HAWKESBURY RD WESTMEAD
Contact Details **Name, email or phone.**	DANNY ROOKE danny.rooke@prpimaging.com.au Ph: 99814500 Mob: 0412507611

Do you have any equipment or other items which could be sensitive to electromagnetic interference (EMI) or Noise and Vibration from Parramatta Light Rail?

(circle appropriate answer) (YES) NO

Do you have any equipment or other items that emit high levels of EMI that could affect the Light Rail?

(circle appropriate answer) YES (NO)

If you have answered "YES" to any of the questions above please complete the following table for each item and provide a sketch of the site plan of where this equipment is located on your site.

Please provide any manufacturers information that you have available that describes the sensitivities.

					Sensitive to	
Item	**Description**	**Manufacturer**	**Model**	**Hours of Use**	**EMI (Y/N)**	**N&V (Level)**
1	MRI unit	Siemens	Skyra 3-T	8-5	Y	Refer page 4
2	CT Scanner	Toshiba	Aq 64	8-5	Y	Refer page 10
3						
4						
5						

Provide site plan sketch below with locations of equipment:

Weights

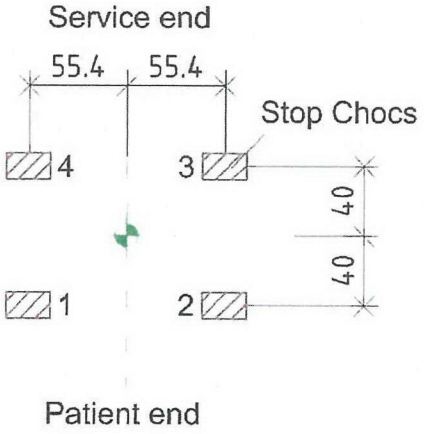
Magnet:	7100 kg
Patient-table:	240 kg
GPA/EPC und SEP:	1818 kg

You have to consider the additional weights of the RF-cabin and the possibly iron shielding for the static calculation.

The weight of the RF-cabin depends on the cabin size and the kind of the RF-cabin (e.g. modular, copper). The weight of an eventually necessary magnetic shielding depends on the material used and on the shielding requirements.

Support feet and floor load

Measurements in cm,
not to scale



Weight of the magnet: 7190kg
4 support feet each 150 x 250 mm (375 cm²)

Pos. 1 = 1820 kg
Pos. 2 = 1620 kg
Pos. 3 = 1640 kg
Pos. 4 = 2110 kg

The system has to be installed on a solid underground with sufficient carrying capacity, such as, e.g. concrete. The load bearing capacity has to be checked by a stress analyst

The floor in the vicinity of the magnet and patient table (2.6 x 5.6 m) must be levelled to within max. ± 2 mm.

External vibration or shocks affecting the magnet may degrade image quality. In the 3 spatial orientations the **building vibration** must not exceed the following specification:

Building vibration specification:
a_{max} = - 80 dB(g) in the frequency range from 0 to 100Hz.

RF Shielding

An RF shielding (Faraday cage) is required for the MR examination room. This shielding protects the environment from RF interference and conversely protects the MR system from external interference.
Required attenuation: >90 (Co-siting 100) dB over the frequency range 15 to 128 MHz.
These values must be verified by measurement before the MR system is installed.
RF shielding components (doors, windows, interfaces) and complete modular RF cabins can be supplied on request by SIEMENS.

A **quench pipe** (thermally insulated tube) made of non-magnetic metal must be fitted from the super-conducting magnet to the outside of the building in order to vent the vaporising helium gas.

Site Requirements

The siting of the magnet must be such that during operation neither external influences affect the homogeneity of the magnetic field nor the safety of persons and/or the functioning of sensitive equipment can be affected by the stray magnetic field.

State of the art ferromagnetic metal detectors might be able to reduce the likelihood of projectile accidents.
Siemens recommends the use of such detectors, because magnet forces accidents still are a significant source of danger. It is the local project management together with the customer to decide about the purchase and installation of such detector systems.
In order to optimize the deployment and set-up, it is necessary to consider the installation in an early phase in site preparation.
Ferromagnetic detector systems recommended by Siemens Healthcare can be found in the SIEMENS accessories catalogue.

Magnetic field level warning signs in the control zone ≥ 0.5 mT:

If the magnetic flux density in a given area exceeds 0.5 mT, it is necessary to display warning signs and restrict access in accordance with local regulations.

Magnetic room shielding

A magnetic room shielding must be taken in account and calculated by the planning department, if the site is critical concerning the magnet fringe field *(see table 1* or the required minimum distances are not kept *(see table 3)*.

Noise emission

If required, noise reduction should be realized based on the noise emission values as specified.

	Examination room	Control room	Equipment room
Average values across 8 hours	88.3 dB(A)	≤ 55 dB(A)	≤ 65 dB(A)

Table 1 Guidelines for max. permissible flux density (mT):

Magnet field specification depends on manufacturer

Servo-Ventilator (Siemens)	40
Defibrillator	20
RF-filter plate	10
MR electronics cabinets (Siemens) GPA/EPC, SEP	5
Small motors, watches, photographic equipment	3
Computers, oscilloscopes	1
X-ray tubes, pacemakers and insulin pumps (safety limit for unrestricted open access)	0.5
Colour monitors (CRT)	0.15
Linear accelerators (Siemens)	0.1
Image intensifiers, gamma cameras linear accelerators (non-Siemens)	0.05

The magnetic stray field is present in all three dimensions around the magnet and can be reduced by a magnetic shielding. Typical lines of constant magnetic flux density are shown in the drawing. This represents the ideal field distribution in air, which can be distorted by the presence of steel in the building.

Table 2 **Minimum distance between magnet – magnet (Siemens)**

	0.2T	0.35T	1.0T	1.5T	3.0T
0.2T	10.0	10.0	5.0	6.0	10.0
0.35T	10.0	10.0	5.0	6.0	10.0
1.0T	5.0	5.0	4.5	5.0	6.0
1.5T	6.0	6.0	5.0	5.0	6.0
3.0T	10.0	10.0	6.0	6.0	6.0
7.0T	10.0				

For more information see 'Co-Siting' in the PG
No ramping during the other magnet measures! Shim is only optimised with both magnets ramped up.

Disturbances caused by the magnetic stray field:

All devices and systems with functions, which can be influenced by an external magnetic field must be taken into consideration. The maximum permissible magnetic flux density depends on the sensitivity of each system component and must be cross-checked with the equipment manufacturer, if necessary.

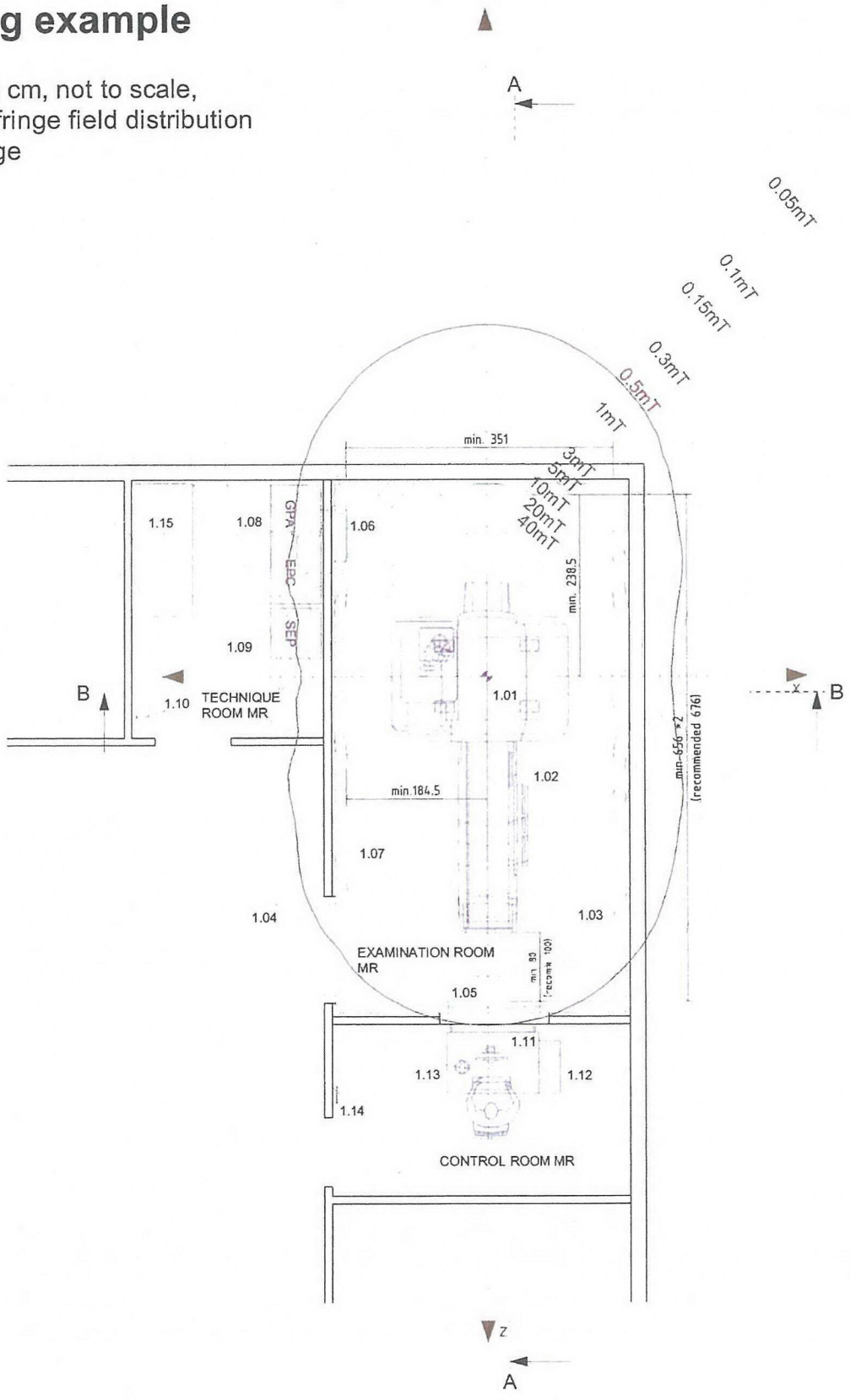
Disturbing influences on the magnetic field, causes and remedies:

Static:
E.g. iron girders, reinforcements, especially beneath the magnet.
Partially correctable by shimming of the magnet and/or compliance with minimum clearances/maximum weights.

Dynamic:
E.g. moving ferromagnetic objects, electrical wiring, transformers. Avoidable if minimum distances are kept. Minimum distances depend on moving direction and magnet orientation. If distances are not kept, please contact the planning department.

Planning example

Measures in cm, not to scale,
legend and fringe field distribution
see next page

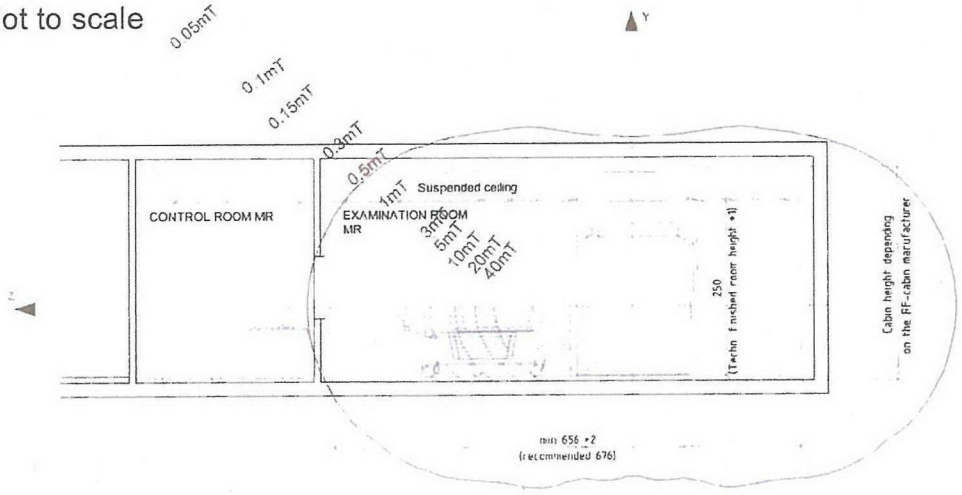


MAGNETOM Skyra - Equipment Legend				
		Weight (kg), Heat dissipation to the air (W)		
Pos.	Description	kg	W	Remark
1.01	Magnet	7100	3000	#1/#2
1.02	Mobile Table	240		
1.03	RF-Cabin			
1.04	RF-Door			
1.05	RF-Window			
1.06	RF-Filter	130	250	
1.07	Magnet Stop			
1.08	Electronics cabinet GPA/EPC	1500		#1/#3
1.09	SEP cabinet	318		#2/#3
1.10	Power distributor	52		by customer
1.11	Control unit MRC Table	20 44	200	 optional
1.12	Host PC MRC	22	700	
1.13	Intercom System	1		
1.14	Alarm box	1		by customer
1.15	Air conditioning cabinet			by customer
	#1 Heat dissipation depending on measuring #2 Additional water cooling system necessary #3 Typical heat dissipation of both components to the environment in the Technik-Area ≤ 1 kW			

Fringe field distribution MAGNETOM Skyra			
Fringe field	Distance in m from the magnetic center in direction of		
	X axis	Y axis	Z axis
40mT	1.5	1.5	2.0
20mT	1.6	1.6	2.2
10mT	1.8	1.8	2.5
5mT	1.9	1.9	2.9
3mT	2.1	2.1	3.2
1mT	2.3	2.3	4.0
0.5mT	2.6	2.6	4.6
0.3mT	2.8	2.8	5.2
0.15mT	3.4	3.4	6.1
0.1mT	3.8	3.8	6.8
0.05mT	4.9	4.9	8.2

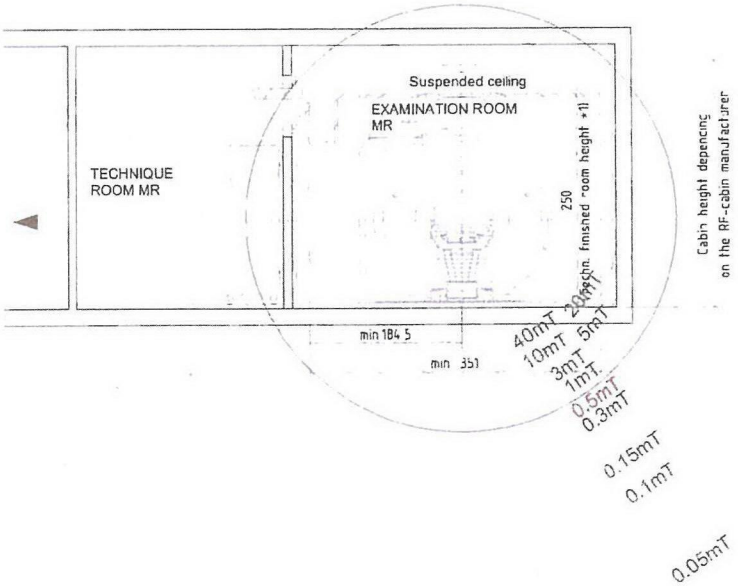
Section A-A

Not to scale



Section B-B

Not to scale



(7) Site environment

(a) Ambient temperature, humidity, and calorific value

Heat generation by units and environmental conditions

Names of rooms and units	Maximum heat generation*1		Normal heat generation*2		Environmental conditions	
	[kW]	[kJ/h]*3	[kW]	[kJ/h]	Temperature*4 (°C)	Relative humidity (%)
Scanning room	(20.2)	(72,753)	(14.0)	(50,433)	18°C to 28°C where median value is 20°C to 26°C. Fluctuation around the median not to exceed ±2°C.	30% to 90% (No condensation)
• Gantry	10.0	36,000	4.0	14,400		
• Patient couch	0.5	1,800	0.3	1,080		
• REC BOX	8.9	32,070	8.9	32,070		
• Power distributor	0.8	2,883	0.8	2,883		
Control room	(1.5)	(5,405)	(1.5)	(5,405)	16°C to 28°C	30% to 90% (No condensation)
• Console	1.5	5,405	1.5	5,405		

*1 Maximum heat generation is the heat that is generated when continuous scanning is performed at the maximum output rating of the unit.

*2 Normal heat generation is the heat that is generated when scanning is not performed.

*3 1 kW = 860 kcal/h, 1 cal = 4.19 J

*4 A temperature from 0°C to 40°C is permissible if the units are not operated.

(b) Maximum vibration from the floor surface that the units can withstand

0.98 m/s^2 (0.1 G) over all frequencies

(c) Floor construction

Refer to subsection 7.4 "Floor Structure of the Scanning Room".

(d) Floor vibration during gantry rotation

Install the gantry so that the following conditions are satisfied during gantry rotation.

- Vibrational acceleration is 0.98 m/s^2 (0.1 G) or less at all frequencies.
- The maximum amplitude is 0.1 mm or less in all directions.

(e) Explosion-proof structure

This system is not explosion-proof. Therefore, do not use flammable or explosive gases near the system.

(f) Other

Check for evidence of excessive dust or dirt.