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TV Reception Survey Report

THIS PRE CONSTRUCTION TELEVISION RECEPTION SURVEY HAS BEEN CARRIED OUT ON BEHALF OF:

Hines UK Ltd & Manchester & Metropolitan Properties Ltd
No 1 Tabley Mews
Off Stamford Street
Altrincham
Cheshire
WA14 1DA

PROPOSED DEVELOPMENT:

Landmark
Oxford Street
Manchester

THIS PRE CONSTRUCTION TV RECEPTION SURVEY WAS CARRIED OUT BY:

Taylor Bros Installations (Bolton) Ltd
Taylor Building
247 Crompton Way
Bolton
BL2 2RY

DATE OF SURVEY: 21st May 2013

Survey Reference Number: 8145/REV1

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OFCOM REPORT	Tall Structures and the impact on Broadcast and other Wireless Services

INTRODUCTION

Theory predicts, and practical evaluation has confirmed, that the introduction of new buildings or structures into an area can cause interference to television reception.

This interference is caused by either “shadowing” when the existing viewers are located in an area where their television aerial beampath (direction) is either through or within close proximity to the building or structure; or “reflection” when a viewer is situated in the surrounding area to the building or structure and their television aerials receive delayed signals, which have been reflected from the building or structure, as well as the direct signals from the television transmitter.

Both shadowing and reflections can result in a reduction in television signal strengths and quality.

To enable us to make an assessment an initial desktop study is conducted, followed by a full comprehensive field study.

The desk top study is carried out using plans of the proposed development along with maps of the surrounding area and television transmitter broadcast information.

The field survey is then carried out at a number of test point locations. Test results are information are recorded at each of the test point locations (please refer to method).

By analysing all of the findings we are then able to draw up conclusions regarding the potential impact that the proposed development could have upon television reception.

METHOD

1. Tests are carried out at a selection of locations in the area surrounding the proposed development.
2. Test results are recorded regarding television reception, e.g. signal strength and quality.
3. An alternative television transmitter is tested for and where receivable, results are recorded.
4. The direction and type of existing viewers' television aerials is noted.
5. A bearing and distance to the proposed development is recorded at each test point location for comparison with the bearing and distance to the television transmitter serving the area.
6. Existing obstructions to television reception are recorded.

EQUIPMENT

The survey is carried out using the following equipment:-

- Specialist Vehicle complete with Telescopic Mast
- 360° Antenna Rotator
- 10 Element Wideband UHF Antennas with Ballums: one vertical and one horizontal polarisation.
- 20m x WF100 Twin Screened Coaxial Cable
- Promax Spectrum Analyser/Field Strength Meter
- Ordnance Survey Maps
- Garmin GPS Receiver
- Compass
- Digital Camera
- Monitor for both Sound and Vision
- Digital Terrestrial Television Decoder

THE PROPOSED DEVELOPMENT

THE PROPOSED DEVELOPMENT: Landmark
Oxford Street
Manchester

DETAILS

Proposed Building Height: 13 storey, approximately 64m

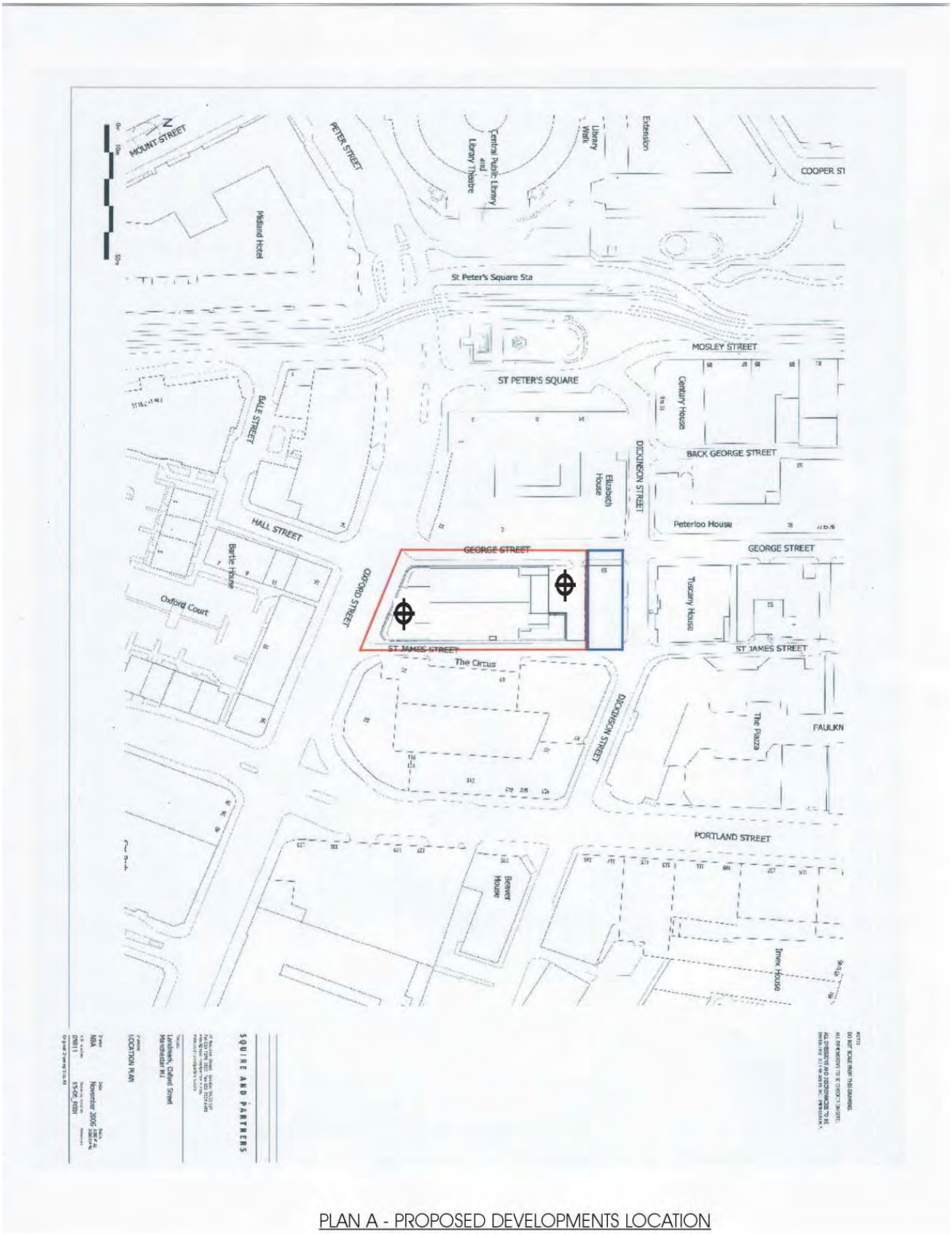
Please refer to Plan A which highlights the proposed development's location and Plan B the proposed development's elevation.

COORDINATES

Prior to commencement of the survey, coordinates at the proposed development's location are entered into a GPS receiver unit, along with the coordinates for the television transmitters serving the area. This enables us to record a bearing and distance from each test point location to the proposed development for comparison with the bearing and distance to the television transmitter.

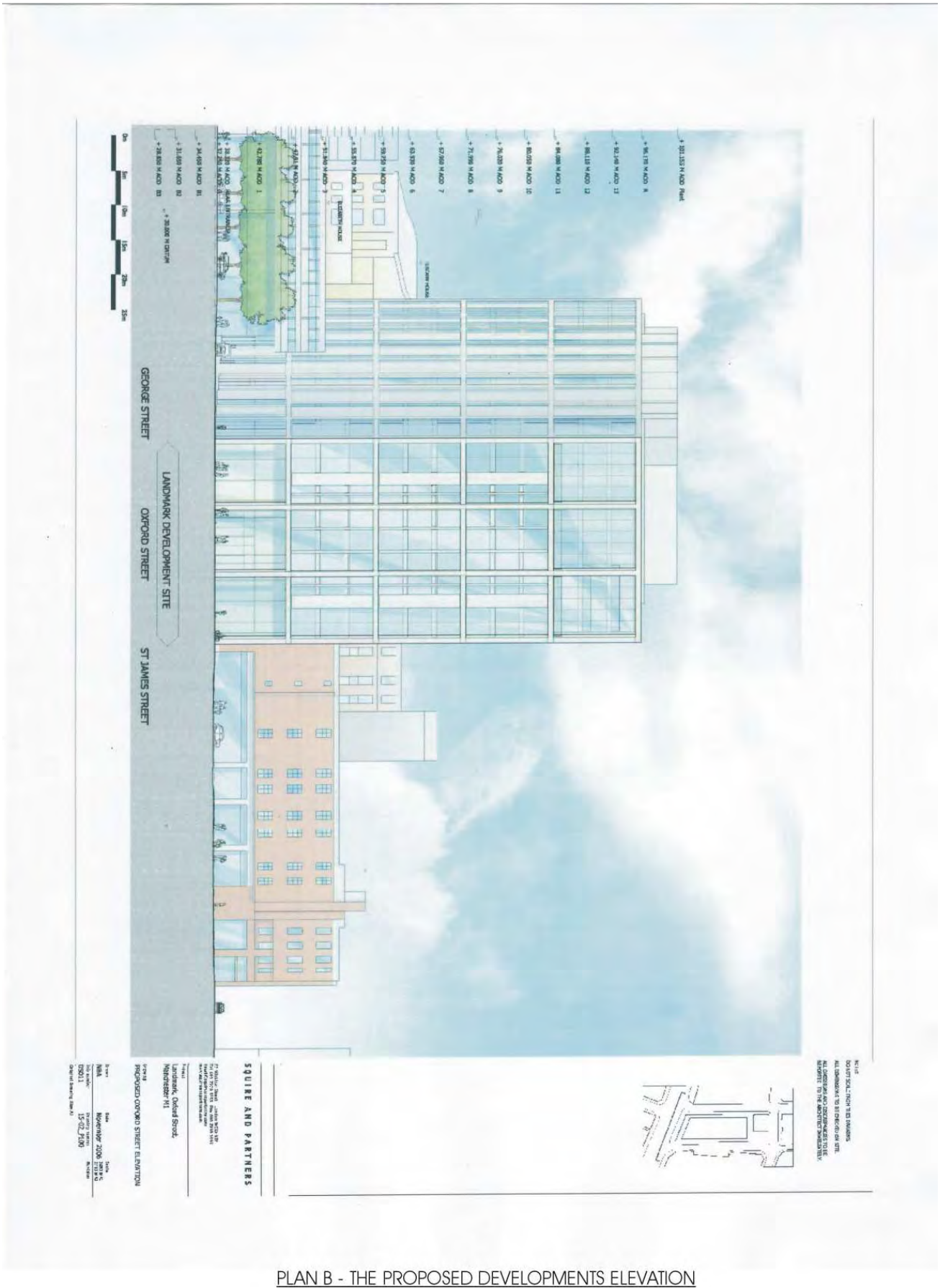
The coordinates used for the development are listed below and shown below.

LOCATION	NGR
L1	SJ 83986 97833
L2	SJ 84022 97875



PLAN A - PROPOSED DEVELOPMENTS LOCATION

COORDINATE POSITIONS



PLAN B - THE PROPOSED DEVELOPMENTS ELEVATION

TELEVISION TRANSMITTERS SERVING THE AREA

WINTER HILL TRANSMITTER

TRANSMITTER NO:	103.00
NGR:-	SD 660144
APPROXIMATE BEARING FROM THE DEVELOPMENT:	313°
APPROXIMATE DISTANCE FROM THE DEVELOPMENT:	23.49 km

Television Broadcasts from the Winter Hill Transmitter:

The Winter Hill Transmitter broadcasts six digital multiplexers for the full range of digital terrestrial television services (DVB, Freeview).

UHFCHANNEL	MULTIPLEXER	FREQUENCY
49	ARQA	698.00
50	BBCA	706.00
54	BBCB(HD)	738.00
55	ARQB	746.00
58	SDN	770.00
59	D3+4	778.00

TEST POINT LOCATIONS & RESULTS

TEST POINT 1

TEST POINT LOCATION 1
Junction of Dickenson Street & James Street

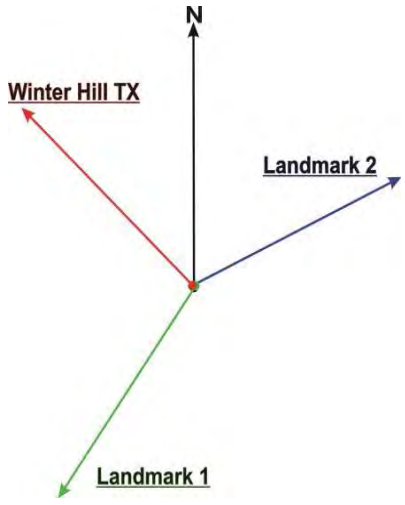
NGR:	SJ 84035 97870
Alt:	40 m
Mast Height:	10 m
Existing Aerial Arrays:	High gain aerials on 2m and 3m masts mounted at rooftop height on 4, 6 and 8 storey buildings, probably feeding communal TV systems, directed towards the Winter Hill transmitter.
Existing Obstructions:	Various multi storey buildings including construction site in the general direction of the Winter Hill transmitter.

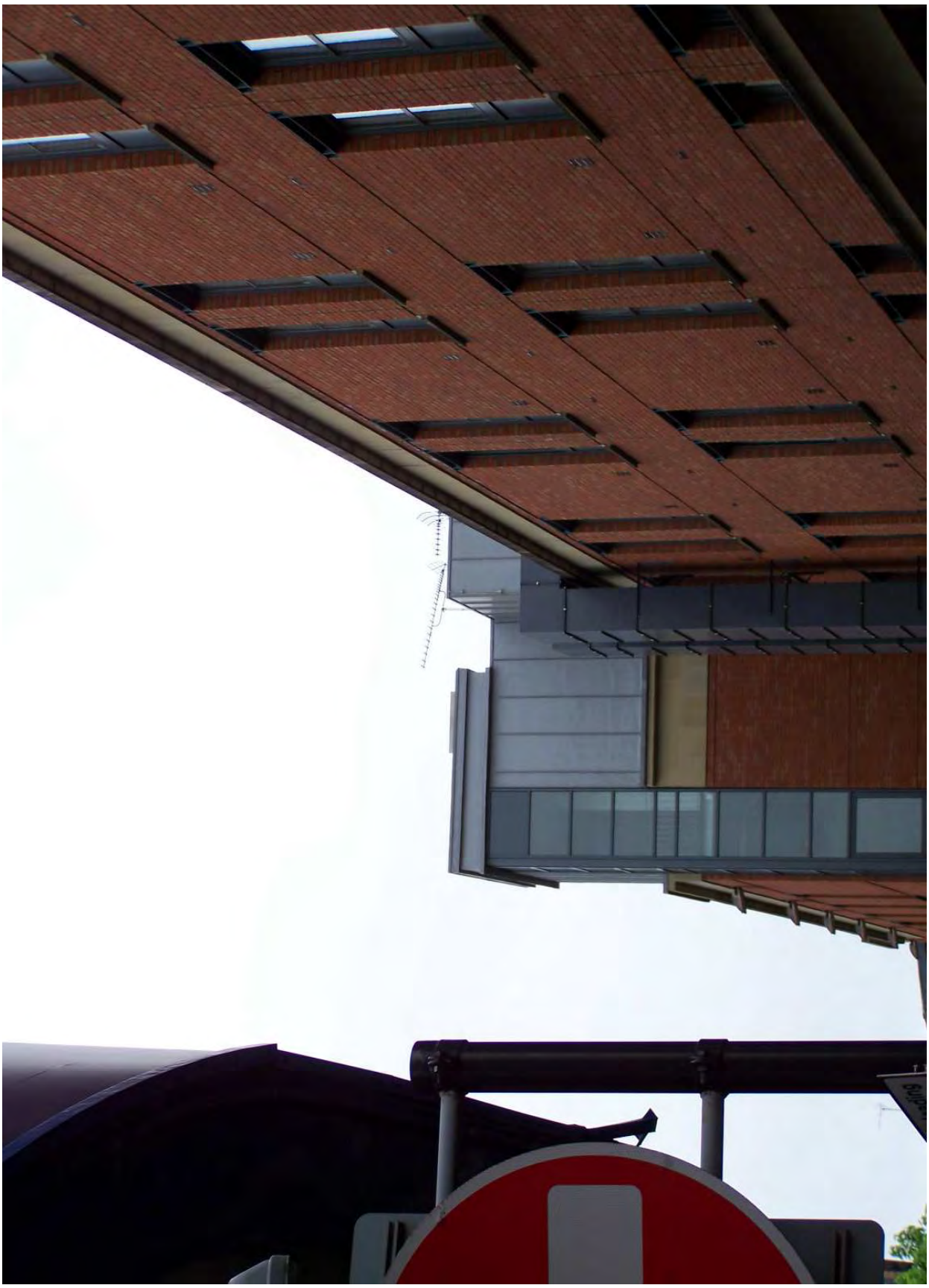
REPORT

- Terrestrial television cannot be received at this location at 10m height, but may be possible at 6 & 8 storey. As the construction site at One St Peters Square progresses, television reception will be blocked from this location for buildings of a lesser height than One St Peters Square.

Channel	Frequency	MUX	Level (dBμv)	BER	CSI	Quality
49	698.00	ARQA	NOT RECEIVEABLE			
50	706.00	BBCA				
54	738.00	BBCB				
55	746.00	ARQB				
58	770.00	SDN				
59	778.00	D3+4				

Location	BRG	Distance
Winter Hill Tx	312°	24.46km
Landmark 1	217°	0.05 km
Landmark 2	66°	0.01 km





PHOTOGRAPH 1: VISIBLE TV AERIALS LOCATED IN THE AREA OF TEST POINT 1

TEST POINT 2

TEST POINT LOCATION 2
Junction of Princess Street & George Street

NGR: SJ 84081 97963

Alt: 40 m

Mast Height: 10 m

Existing Aerial Arrays: 18 element aerials on 4m masts, mounted at rooftop height on 3 storey properties, directed towards the Winter Hill transmitter. Many of the properties in the area are multi storey with no visible TV aerials from the ground, but we would anticipate that these buildings have television aerials sited at roof top height.

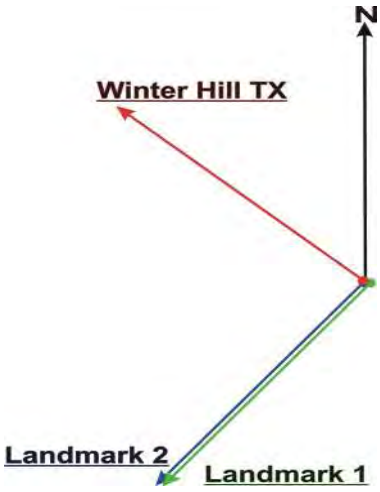
Existing Obstructions: Various multi storey buildings in the direction of the Winter Hill transmitter.

REPORT

- Terrestrial television reception is of an acceptable quality and strength.

Channel	Frequency	MUX	Level (dBμv)	BER	CSI	Quality
49	698.00	ARQA	-7	-7	20%	Pass
50	706.00	BBCA	-8	-7	20%	Pass
54	738.00	BBCB	-9	-	-	-
55	746.00	ARQB	-9	-7	18%	Pass
58	770.00	SDN	-9	-7	18%	Pass
59	778.00	D3+4	-8	-7	18%	Pass

Location	BRG	Distance
Winter Hill Tx	312°	24.45 km
Landmark 1	219°	0.16 km
Landmark 2	219°	0.11 km





PHOTOGRAPH 2: VISIBLE TV AERIALS LOCATED IN THE AREA OF TEST POINT 2

TEST POINT 3

TEST POINT LOCATION 3
Junction of Princess Street and Faulkner Street

NGR: SJ 84117 97930

Alt: 42 m

Mast Height: 10 m

Existing Aerial Arrays: 10 element and high gain aerials on 3m and 4m masts mounted at roof top height on 3 storey properties, directed towards the Winter Hill transmitter. Many of the properties in this area are multi storey with no visible TV aerials from the ground. We would anticipate these buildings have TV aerials sited at roof top height.

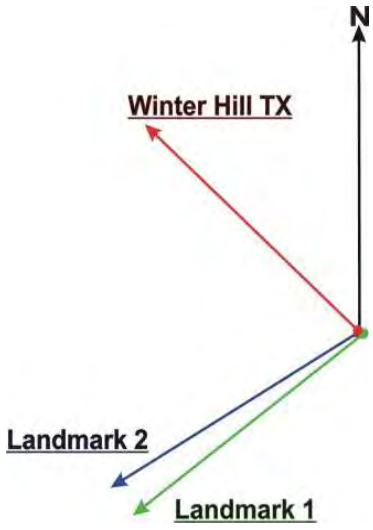
Existing Obstructions: Various multi storey buildings in the direction of the Winter Hill transmitter.

REPORT

- Terrestrial television reception is of an acceptable quality and strength.

Channel	Frequency	MUX	Level (dBμV)	BER	CSI	Quality
49	698.00	ARQA	-2	-7	19%	Pass
50	706.00	BBCA	-2	-7	18%	Pass
54	738.00	BBCB	-3	-	-	-
55	746.00	ARQB	-3	-7	18%	Pass
58	770.00	SDN	-4	-7	18%	Pass
59	778.00	D3+4	-4	-7	18%	Pass

Location	BRG	Distance
Winter Hill Tx	312°	24.50 km
Landmark 1	234°	0.16 km
Landmark 2	240°	0.11 km





PHOTOGRAPH 3: VISIBLE TV AERIALS LOCATED IN THE AREA OF TEST POINT 3

TEST POINT 4

TEST POINT LOCATION 4
Dickenson Street

NGR: SJ 84083 97737

Alt: 41 m

Mast Height: 10 m

Existing Aerial Arrays: High gain aerials on 3m and 4m masts, mounted at rooftop height on 4 storey buildings, directed towards the Winter Hill transmitter. Many of the properties in this area are multi storey with no visible TV aerials from the ground, but we would anticipate that they have aerials located at roof top height.

Existing Obstructions: Various multi storey buildings and construction site (One St Peters Square) in the direction of the Winter Hill transmitter.

REPORT

- Terrestrial television reception has low signal strengths and corruption is being received.

Channel	Frequency	MUX	Level (dBμv)	BER	CSI	Quality
49	698.00	ARQA	-26	-1	56%	Fail
50	706.00	BBCA	-28	-2	50%	Fail
54	738.00	BBCB	-25	-	-	-
55	746.00	ARQB	-24	-1	54%	Fail
58	770.00	SDN	-26	-3	46%	Fail
59	778.00	D3+4	-22	-6	33%	Marginal

Location	BRG	Distance
Winter Hill Tx	313°	24.60 km
Landmark 1	312°	0.13 km
Landmark 2	334°	0.15 km





PHOTOGRAPH 4: VISIBLE TV AERIALS LOCATED IN THE AREA OF TEST POINT 4

TEST POINT 5

TEST POINT LOCATION 5
Oxford Street

NGR: SJ 83986 97784

Alt: 40 m

Mast Height: 10 m

Existing Aerial Arrays: The buildings at this location are multi storey with no visible TV aerials from the ground, but we would anticipate that these buildings have TV aerials sited at roof top height.

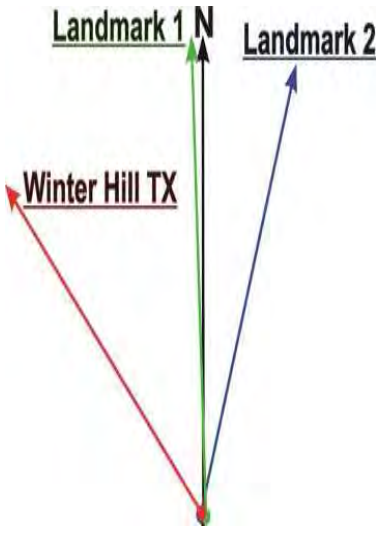
Existing Obstructions: Various multi storey buildings in the direction of the Winter Hill transmitter.

REPORT

- Terrestrial television reception has low signal strengths and corruption is being received.

Channel	Frequency	MUX	Level (dBμV)	BER	CSI	Quality
49	698.00	ARQA	-26	-3	36%	Fail
50	706.00	BBCA	-22	-3	48%	Fail
54	738.00	BBCB	-26	-	-	-
55	746.00	ARQB	-24	-3	41%	Fail
58	770.00	SDN	-25	-2	47%	Fail
59	778.00	D3+4	-27	-2	51%	Fail

Location	BRG	Distance
Winter Hill Tx	313°	24.49 km
Landmark 1	357°	0.04 km
Landmark 2	21°	0.09 km



TEST POINT 6

TEST POINT LOCATION 6
Junction of Princess Street & Hart Street

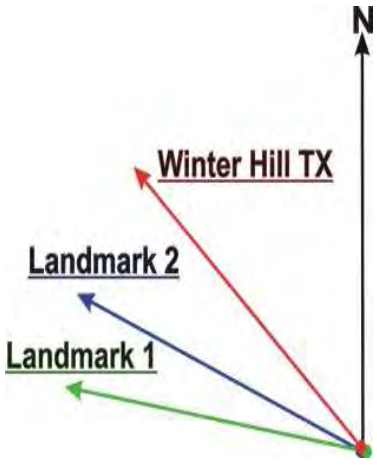
NGR:	SJ 84200 977798
Alt:	40 m
Mast Height:	10 m
Existing Aerial Arrays:	18 element aerial on a 2m mast, mounted at rooftop height on a 5 storey building, directed towards the Winter Hill transmitter. Many of the properties in this area are multi storey with no visible television aerials from the ground, but we would anticipate that these buildings will have aerials sited at roof top height.
Existing Obstructions:	Various multi storey buildings in the direction of the Winter Hill transmitter.

REPORT

- Terrestrial television reception has low signal strengths but the quality is acceptable.

Channel	Frequency	MUX	Level (dBμV)	BER	CSI	Quality
49	698.00	ARQA	-9	-7	27%	Pass
50	706.00	BBCA	-11	-7	20%	Pass
54	738.00	BBCB	-13	-	-	-
55	746.00	ARQB	-10	-7	22%	Pass
58	770.00	SDN	-12	-7	19%	Pass
59	778.00	D3+4	-16	-7	22%	Pass

Location	BRG	Distance
Winter Hill Tx	312°	24.65 km
Landmark 1	279°	0.22 km
Landmark 2	292°	0.20 km





PHOTOGRAPH 5: VISIBLE TV AERIAL LOCATED IN THE AREA OF TEST POINT 6

TEST POINT 7

TEST POINT LOCATION 7
Junction of Bloom Street & Harter Street

NGR:	SJ 84181 97732
Alt:	39 m
Mast Height:	10 m
Existing Aerial Arrays:	18 element and high gain aerials on 2m masts, mounted at rooftop height on 4 and 5 storey apartment buildings, possibly feeding communal TV systems, directed towards the Winter Hill transmitter.
Existing Obstructions:	various multi storey buildings and construction site (One St Peters Square) in the direction of the Winter Hill transmitter.

REPORT

- Due to existing obstructions terrestrial television services cannot be received at this location. However we would anticipate that reception is improved for aerials sited on the 4 and 5 storey buildings.

Channel	Frequency	MUX	Level (dBμv)	BER	CSI	Quality
49	698.00	ARQA	CANNOT BE RECEIVED AT THIS LOCATION.			
50	706.00	BBCA				
54	738.00	BBCB				
55	746.00	ARQB				
58	770.00	SDN				
59	778.00	D3+4				

Location	BRG	Distance
Winter Hill Tx	312°	24.67 km
Landmark 1	295°	0.23 km
Landmark 2	310°	0.21 km





PHOTOGRAPH 6: VISIBLE TV AERIALS LOCATED IN THE AREA OF TEST POINT 7



PHOTOGRAPH 7: VISIBLE TV AERIALS LOCATED IN THE AREA OF TEST POINT 7

TEST POINT 8

TEST POINT LOCATION 8
Oxford Street (Palace Theatre)

NGR:	SJ 84075 97639
Alt:	38 m
Mast Height:	10 m
Existing Aerial Arrays:	High gain aerials on 2m and 4m masts, mounted at rooftop height on 3, 4, 5, 6 and 7 storey buildings, some possibly feeding communal TV systems, directed towards the Winter Hill transmitter.
Existing Obstructions:	Various multi storey buildings in the direction of the Winter Hill transmitter.

REPORT

- Terrestrial television reception has low signal strengths and corruption is being received

Channel	Frequency	MUX	Level (dBμV)	BER	CSI	Quality
49	698.00	ARQA	-22	-5	35%	Marginal
50	706.00	BBCA	-18	-3	43%	Fail
54	738.00	BBCB	-18	-	-	-
55	746.00	ARQB	-18	-6	27%	Pass
58	770.00	SDN	-22	-5	36%	Marginal
59	778.00	D3+4	-23	-5	33%	Marginal

Location	BRG	Distance
Winter Hill Tx	313°	24.66 km
Landmark 1	337°	0.21 km
Landmark 2	349°	0.24 km





PHOTOGRAPH 8: VISIBLE TV AERIALS LOCATED IN THE AREA OF TEST POINT 8

SUMMARY & CONCLUSIONS

SUMMARY

THE PROPOSED DEVELOPMENT

The proposed development, the Landmark is to be located on Oxford Street between George Street and St James Street, Manchester. It will consist of one 13 storey building with an approximate height of 64m.

At the time of surveying the existing building at the proposed development's location was still present. This building was the Odeon Cinema with an approximate height of 20m

A series of photographs have been taken to highlight the proposed development's location, existing building and existing buildings in the surrounding area to the proposed development.

Photograph A & B:	The existing building at the proposed development's location.
Photograph C:	Construction site of One St Peters Square, (the site of the previous Elizabeth House) directly to the north and adjacent to the proposed development's location.
Photographs D & E:	Existing buildings directly to the south of the proposed development

TELEVISION RECEPTION

Viewers in the surrounding area to the proposed development are receiving their television signals from the Winter Hill transmitter located to the northwest.

The Winter Hill transmitter broadcasts six digital multiplexers providing the full range of Freeview services (digital terrestrial television).

During the survey tests were carried out to receive an alternative transmitter which broadcasts the same quantity of services and regional programming as the Winter Hill transmitter. The result of these tests was that no alternative transmitter could be received at an acceptable quality or strength.



PHOTOGRAPH A: THE EXISTING BUILDING AT THE PROPOSED DEVELOPMENT'S LOCATION



PHOTOGRAPH B: EXISTING BUILDING AT THE PROPOSED DEVELOPMENT'S LOCATION



PHOTOGRAPH C: CONSTRUCTION SITE OF ONE ST PETERS SQUARE, DIRECTLY TO THE NORTH OF THE PROPOSED DEVELOPMENT



PHOTOGRAPH D: EXISTING BUILDING DIRECTLY TO THE SOUTH OF THE PROPOSED DEVELOPMENT



PHOTOGRAPH E: EXISTING BUILDINGS LOCATED TO THE SOUTH OF THE PROPOSED DEVELOPMENT

CONCLUSIONS

The proposed Landmarlk development is to be located on Oxford Street, Manchester and is to consist of 1no, 13 storey building with an approximate height of 64m.

The existing building at the proposed development's location is approximately 20m in height. This means that the Landmark building will be approximately 44m greater in height. Subsequently the introduction of the Landmark development will change the existing skyline, which can result in an impact to television reception.

By taking into account the proposed development's location and elevation, the existing viewers' television aerial beampath (direction) to the television transmitter, and the results and information recorded during the survey, we are able to ascertain where, or if, the proposed development will impact upon television reception.

However in the case of the Landmark development certain factors have to be taken into account.

The field study highlighted that viewers in the surrounding area to the proposed development are receiving their terrestrial television services from the Winter Hill transmitter located to the northwest.

Due to the proposed development's height we would anticipate that the proposed development will shadow an area to the southeast, from the Winter Hill transmitter, resulting in a loss of terrestrial television reception for properties close by and a reduction of television signal strength and quality for properties situated further back. Please refer to Map 1 which highlights this potential impact zone.

However directly adjacent to the proposed development's location there is a construction site, One St Peters Square, at the location of the previous Elizabeth House. Please refer to Photograph C.

This development is also to be 13 storey and of a similar height to the Landmark development, and will have the same potential impact zone to television reception as the Landmark development.

One St Peters Square will be completed prior to the Landmark development; subsequently reducing the impact of the Landmark development.

Map 1 highlights two potential impact zones. Zone 1 is the potential impact zone if One St Peters Square was not present, and Zone 2 is with One St Peters Square present.

Because One St Peters Square is under construction the potential impact zone for the Landmark development is focused on Zone 2.

Zone 2 covers the properties located within the Circus at the junction of Oxford Street and Portland Street. Due to its close proximity to the proposed Landmark, any mitigation which may have been undertaken on this building due to One St Peters Square may be affected by the introduction of the Landmark development.



KEY TO MAP 1

1 TEST POINT LOCATION SHOWING LOCAL TELEVISION AERIAL DIRECTION

PROPOSED DEVELOPMENTS LOCATION

POTENTIAL IMPACT ZONE 2

POTENTIAL IMPACT ZONE 1

POSSIBLE REMEDIES

1. REMEDIAL AERIAL WORK

One or all of the following may help reduce impairments being received:-

i) Change of Aerial Type:- Different types of aerials receiver their signals in different ways and selecting an aerial most suited for the interference being received may be required.
ii) Change of Aerial Height:- In some cases increasing or decreasing the aerial height can reduce interference being received.
iii) Relocation of the Aerial:- Moving the aerial to a position on the property where it is less prone to the interference.

2. SATELLITE TELEVISION

When terrestrial television signals cannot be received at an acceptable quality and strength the installation of a satellite dish and set top box utilising one of the Freesat platforms maybe required.

3. REMOTE TELEVISION AERIAL / COMMUNAL TV SYSTEM

When a television aerial is positioned at a location where acceptable signal strengths and quality can be received, which could be a considerable distance away from the affected reception area. The television signals are then distributed to the affected viewers via an amplifier, splitter, tee unit and cable network.



Signed:…… Dated: 04 June 2013

K BODEN

REFERENCE OF TERMS

CH	The UHF Channel allocation from the transmitter.
MUX	The digital multiplexer allocation/operator.
dBμv	Carrier strength reading (decibel microvolt).
BER	Bit Error Rate, a measure of digital demodulation or decoding accuracy.
CSI	Level of carrier signal to interference.
NGR	National Grid Reference.
ALT	Altitude above sea level at the location.
BRG	Bearing from North.
GPS	Global Positioning System.
Tx	Transmitter.

OFCOM REPORT