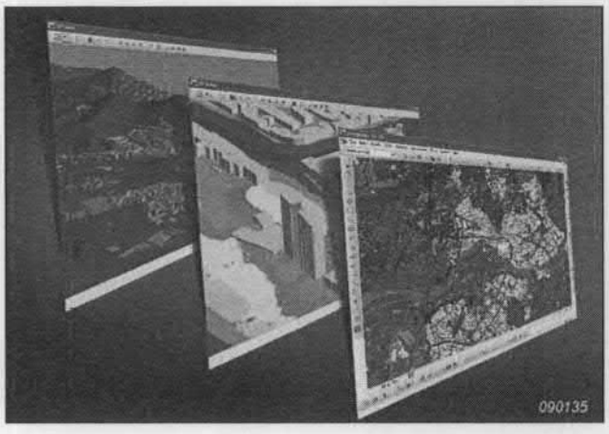
Appendix A
Predictor Software Product Details

PRODUCT DATA

Predictor Version 7 — The Intuitive Solution (Types 7810-A/B/C/D/E/F/G)



Predictor™ is the most intuitive environmental noise calculation software package available. It allows you to calculate and analyse noise from various noise sources such as industry or traffic.

The software has a fast learning curve, enabling you to work efficiently, even for infrequent use. Model comparison is easy with its intuitive and unique multi-model view – particularly important for infrequent use, it's easier to remember what to do. You can model real-life quickly, easily and accurately, even in complex situations, e.g., flyovers, bridges with barriers, indoor-outdoor noise.

Predictor gets imperfect data into shape quickly and automatically with advanced geometrical post-processing and macros while, with the unique unlimited undo/redo functionality, modelling is faster as you avoid tricky repairs of mistakes. Once modeled, get results quickly with Predictor's fast calculations, without the need to purchase large numbers of licenses or computers. Powerful result analysis enables you to check the model and identify the main sources. Avoid tedious bookkeeping with automated data and result management using model versioning. In addition, real-life measured data from a noise monitoring system or a sound level meter, for example, Type 2250, can be used as input for source emission and for checking results. Predictor matches modern IT-hardware with dual core support as default and is cost-efficient as one license allows modelling on several linked PCs.

Different configurations are optimised for different applications, enabling Predictor to be used for all applications ranging from small-scale impact assessments to mapping of large agglomerations.

Uses and Features

Uses

- Environmental noise mapping, management, action planning and impact assessment
- Educational purposes

Features

- Compliance with a range of national and international calculation standards
- Fulfilment of European Commission directives such as Environmental Noise Directive (2002/49/EC) in accordance with Guidelines on Revised Interim Computation Methods (2003/613/EC) and the European Commission's Assessment of Exposure to Noise Working Group's Good Practice Guide
- Fulfilment of the IPPC Directive (96/61/EEC)
- Intuitive, powerful and modern
- Fast learning curve, even for infrequent use
- Easy model comparisons with unique multi-model view
- Accurate and intuitive modelling, also for complex situations, for example, fly-overs, bridges with barriers, indoor/outdoor noise
- Advanced and extendable geometrical post-processing using macros
- Quick repair of mistakes with unlimited undo functionality
- Fast calculations, among the fastest on the market
- Time saving integrated bookkeeping for model data and results
- Powerful result analysis and what if scenarios
- Cost-efficient – one license allows modelling on several linked PCs

Brüel & Kjær

Fast Learning Curve

Predictor has the most intuitive interface available. More than any other noise calculation software, Predictor has been designed according to the Windows® software design guide, helping you to be familiar with it from the very start – as installing and using Predictor is like any other Windows® software. Predictor software developers are skilled in implementing the handling of complex functionality in an intuitive manner and within the Predictor software developer group, there exists both software knowledge and knowledge of noise consultancy. The well organised data structure and integrated bookkeeping of a Predictor project is therefore based on many years of practical experience and good practice. This makes it easy to learn from the start, and it is extremely powerful for more experienced users. Predictor takes the weight off your shoulders by managing your data, and is quick to pick up if you only use the software infrequently. Environmental noise calculation is much easier with Predictor!

Clear and Intuitive Import and Export Options

Predictor has powerful options to import digital GIS data, enabling even large models with items such as roads, railways, buildings, terrain models, water surfaces and/or specific land usage areas to be setup quickly. After import all data can be modified, if needed, individually as well as simultaneously. Predictor offers edit, display and check options like 2D or 3D map views, cross-sections, sorted lists and complex geometrical editing using automated macros, unique to the Brüel & Kjær portfolio of calculation software. All data can be exported for use in other geographical applications like ArcGIS™, MapInfo™ and Google Earth™.

For General Planning and Detailed Studies

With Predictor, studies can be performed in a straightforward and intuitive manner. You can determine the level of detail. Starting with a global scenario, the possible alternatives can be determined and compared quickly within the same project structure, using the unique Model Manager. Then, the chosen scenario can be refined and studied in full detail.

For Visualisation of Possible Choices

Predictor is more than advanced calculation software. With Predictor, the results of the calculations can be viewed directly on top of digital geographical maps. Existing digital maps can be used as backgrounds to the model items and the transparent noise contours. In addition, the results can be analysed further with the Predictor Analyst module, producing conflict maps and noise exposure maps based on demographic information, such as the number of people annoyed by noise.

Fast and Accurate

The standardised calculation methods demand complex 3-dimensional calculations of all possible propagation paths from source to receiver. For this, Predictor uses smart search algorithms and optimisations that allow models to be calculated within minutes, or even seconds! At the same time, the calculation algorithms in the software have been optimised for speed, giving you results without undue waiting time. By using Predictor calculation clients and multi-core PCs, even very large models like complete cities can be calculated within one day.

Used Worldwide

Predictor is used worldwide by a large number of industries, consultants and authorities. In cooperation with feedback from our users, the software is continuously being developed and adapted to the latest needs, calculation methods and Windows® and IT platforms.

Functional Specifications

CALCULATION METHOD
Depending on which option is chosen, the algorithm for calculating the propagation of sound from source to receiver in a model is based upon:

- ISO 9613.1 and 9613.2 Industry (International method for general purpose. Octaves and 1/3-octaves)
- ISO 9613.1 and 9613.2 Road (International method for general purpose, including the Dutch road source emission model. Octaves)
- DAL 32 (Nordic industry method. Octaves)
- ENM-link (Industrial noise, links with external ENM calculation core)
- RMR/SRM2 (Dutch rail method. Octaves)
- CRTN (L_{10}) (UK road method)
- CRTN (TRL) (UK road method with L_{10} to L_{eq} conversion according to TRL PR/SE/451/02)
- CRTN (NZ) (L_{10}) (New Zealand road method)
- XPS 31-133 (French road and rail methods based on NMPB. Octaves)
- Harmonoise (European method for general purpose short-term L_{aeq}, including meteorological effects. 1/3-octaves)

MODEL PROPERTIES
Meta Information: Description (45 characters), full length memo, management information (user name and date of creation, date last used, final declaration, project origin), boundaries and calculation method. The boundaries are expressed in metres to 2 decimal places. Maximum coordinates in x and y directions is 10000 km × 10000 km
Specific Information: Items (sources, objects and receivers), groups, calculation parameters, periods (4 basic periods and 1 compound period), results, control values

MODEL ITEMS
(depending on selected method)
Sources: Road, Railway, Area source, Line source, Point source, Moving point source, Emitting façade, Emitting roof
Objects: Barrier (including cantilever option), Bridge, Building, Foliage region, Ground region, Height line, Height point, Housing region, Industrial site, Miscellaneous general purpose items (DIV-area, DIV-line and DIV-point)
Receivers: Receiver point, Horizontal grid, Vertical grid, Contour point

GEOMETRICAL PROCESSING
Actions: Join, connect, split, parallel item, insert/delete node, simplify geometry
Macro Functions: concatenate, attribute calculator, advanced simplify, rectangulate
Functions can be extended by the user

MAXIMUM MODEL SIZE
Grids: 1000000 grid points per grid
Other Items: No preset limits. In practice, depending on available memory and system performance

MAXIMUM CALCULATION SIZE
CRTN and XPS Methods: 1000000 nodes (total for all objects), 200000 source nodes. Larger models can be handled in Predictor Advanced using the Tiling option
Predictor Standard: 250000 source/receiver combinations
Predictor Plus: 2500000 source/receiver combinations
Predictor Advanced: >1000000000 source/receiver combinations. In practice, depending on available memory and system performance

VIEW PROPERTIES
Zoom: To selection, To fit, In, Out, Window, Pan
Items: Specification of colour, shading, symbol, line style, text labels
Background: Topographical maps in various (geo referenced) pixel and vector formats such as BMP, JPG, TIF, DXF, DWG, SHP and MIF
Cross-section: Elevation view of model including ground height at a defined line
3D View: Interactive perspective view of model and noise contours with zoom, rotate and edit option

RESULTS DISPLAY
On-screen: Annotated maps, colour contour maps or tables (see below)
Periods: 4 user-defined (for example, day, evening, night, siesta) plus 1 compound (for example, L_{DN}, L_{den}, etc.)
Table of Results: Shows calculated results at each specified receiver, either total, per group, octave or 1/3-octave values (depending on calculation method)
Table of Comparisons: Shows the difference in SPL between two specified scenarios of the model – a 'before and after' or 'what if' tool, between the model and control values, and the cumulated result of two specified models
Table of Control: Shows calculated values compared to permitted values with ranking to identify possible solutions to noise reduction

CALCULATION
Features: Start, Test, Selective, Stop, Pause, Resume, Batch
Parameters: (depending on selected method) Meteorological Correction, Ground Factor, Temperature, Pressure, Humidity, Air Absorption
Optimisation: (depending on selected method) Fetching Radius, Order of Reflections (up to 10)
Result Storage: Per source, per group or total results

INPUT TO MODEL
Import GIS: In SHP, MIF/TAB, DXF or TXT format
Import Other: From other Predictor projects, from output of Type 7816 Acoustic Determinator software and from output of SourceDB+ software
Digitizer: For specifying item position coordinates, for example, relative to an existing map.
Actual Measured Data: Automatic creation of receiver points from L_{eq}, L_{10} and L_{90} measured with 2260 Investigator™ with GPS positional data
Import of L_{eq}, L_{10} and L_{90} measured with Hand-held Analyzer Type 2250
Automatic creation of point sources from L_w measured with Type 2260 Investigator (with GPS positional data)
Import of L_{eq} data with location identified by GPS from Environmental Noise Management Software Type 7843

SourceDB+ MODULE
Database of sound power in 1/3-octave
Input: Manual data entry
Fields: Description, source, type, drive type, industry type, quality, sound power, measurement method, measurement date, source height, literature references, notes, picture
Filter Options: By any user-selected field

OUTPUT
On-screen: Results displayed in tabular or graphical form
Clipboard: Tables and screen pictures can be copied for inclusion in other Windows®-based programs
Export: To other Predictor projects and GIS systems (ASCII, SHP, MIF/TAB, POI and KML formats)
Printing: Graphical display with extra annotation printable to all standard Windows®-based output devices
Print Model: Print preview available as well as option of selectively removing components, such as GPS reference points and ground regions, from the model as desired. Storage and re-use of multiple print templates possible

ACOUSTIC DETERMINATOR MODULE (Predictor Plus and Advanced Configurations)
See Product Data for Type 7816 (BP 2003)

PREDICTOR ANALYST (Predictor Advanced Configuration)
See Product Data for Type 7813 (BP 2239)

PREDICTOR ADVANCED CALCULATION CLIENT
Two additional licenses with calculation capacity equivalent to Predictor Advanced, works only in same network as a full Predictor Advanced Type 7810-B license
Network Protocol: TCP-IP
Settings: Shared folder, communication port

Computer System

RECOMMENDED REQUIREMENTS
Intel® Core™ 2 Duo Processor 2.8 GHz with Microsoft® Windows® XP, 2 GB RAM, CD-ROM drive, SVGA graphics display/adaptor, mouse or other pointing device
At least 200 MB of free disk space, plus the disk space used as a working area
For calculation of large Predictor Advanced models, tiling is recommended in combination with Calculation Client add-ons and/or the multi-core option for multi-processor computers
Operating System: Predictor works with Windows® XP, Windows Vista™ and Windows 7

Ordering Information

Predictor Type 7810 Version 7 is available in several packages:

Type 7810-A	Predictor Plus Calculates models of ≤ 2500000 source/receiver combinations. Covers all specified road, rail and industry methods. Includes Acoustic Determinator Type 7816
Type 7810-B	Predictor Advanced Calculates models of ≥ 1000000000 source/receiver combinations, includes Predictor Analyst module, in addition to all the functionality of Predictor Plus 7810-A
Type 7810-C	Predictor ISO 9613 Calculates models of ≤ 250000 source/receiver combinations in accordance with ISO 9613
Type 7810-D	Predictor NMPB Calculates models of ≤ 250000 source/receiver combinations in accordance with XPS/NMPB method
Type 7810-E	Predictor Harmonoise Calculates models of ≤ 250000 source/receiver combinations in accordance with Harmonoise
Type 7810-F	Predictor DAL32 Calculates models of ≤ 250000 source/receiver combinations in accordance with DAL32
Type 7810-G	Predictor Standard Calculates models of ≤ 250000 source/receiver combinations. Covers all specified road, rail and industry methods

All Type 7810 Predictor Version 7 packages include the following accessories:
- Program on CD-ROM (all modules included in the one license)
- Program protection key
- License files on CD-ROM
- User Manual

Predictor Software Maintenance, Upgrade and Support Agreement for first 12 months after purchase

Optional Software

BZ-5703	License for using Predictor Plus Type 7810-A on two additional cores on same PC
BZ-5704	License for using Predictor Advanced Type 7810-B on two additional cores on same PC

Both license packages above include:
- License files on CD-ROM

BZ-5552	Predictor Advanced Calculation Client License Pack for Predictor Advanced Type 7810-B Calculation licenses for 2 additional workstations within the same network environment as the Predictor Advanced license

Includes:
- Program on CD-ROM
- Program protection keys (2)
- License files on CD-ROM

Appendix B
Noise Modelling Graphic Outputs

Twickenham Station, Twickenham

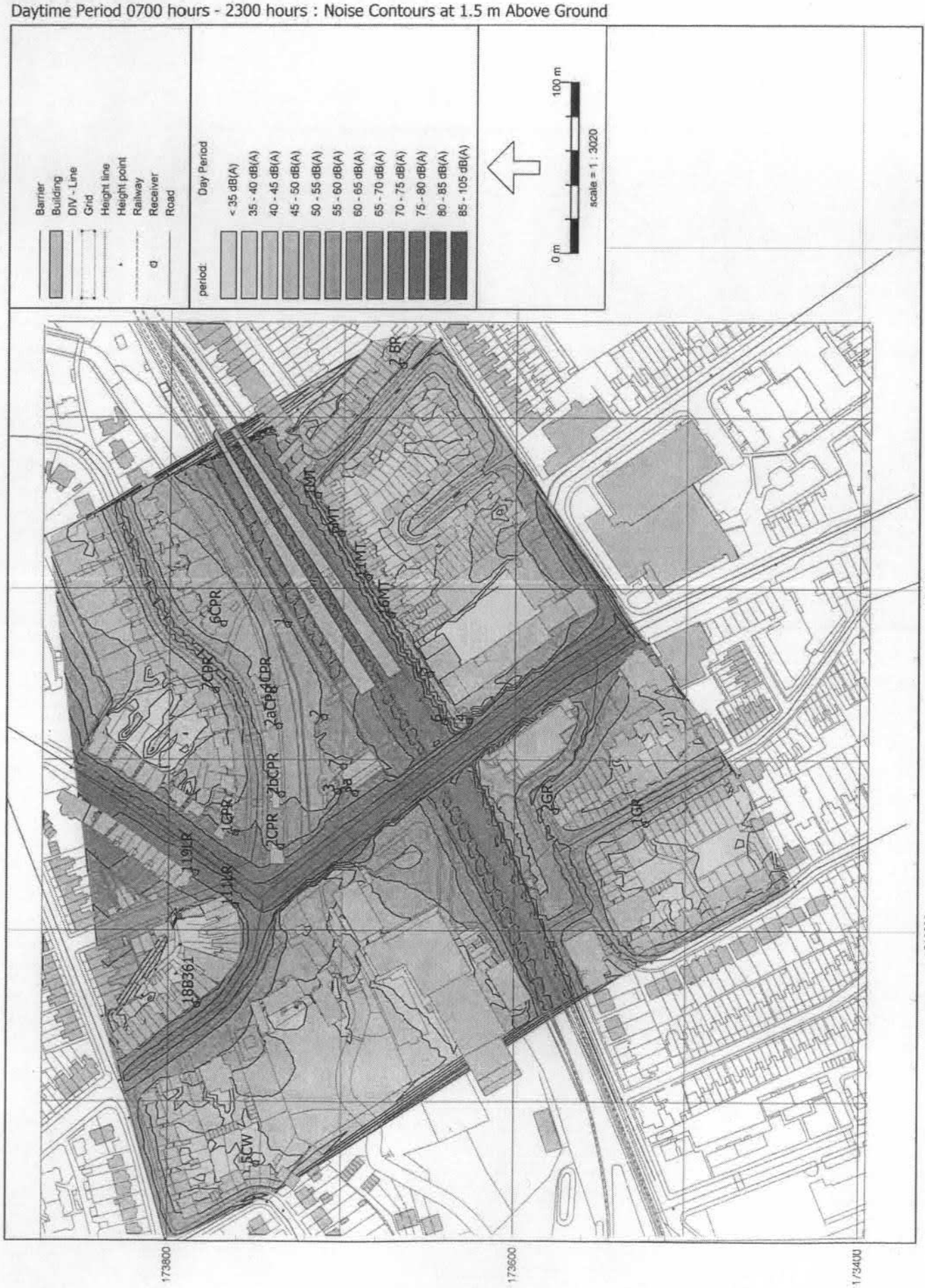
Environmental Assessment Services Ltd

Noise Modelling of Twickenham Station and Vicinity

Pre and Post Redevelopment Scenario Modelling

PRE REDEVELOPMENT SCENARIO

Daytime Period 0700 hours - 2300 hours : Noise Contours at 1.5 m Above Ground



Twickenham Station, Twickenham
Noise Modelling of Twickenham Station and Vicinity
Pre and Post Redevelopment Scenario Modelling
PRE REDEVELOPMENT SCENARIO
Night-time Period 2300 hours - 0700 hours : Noise Contours at 1.5 m Above Ground

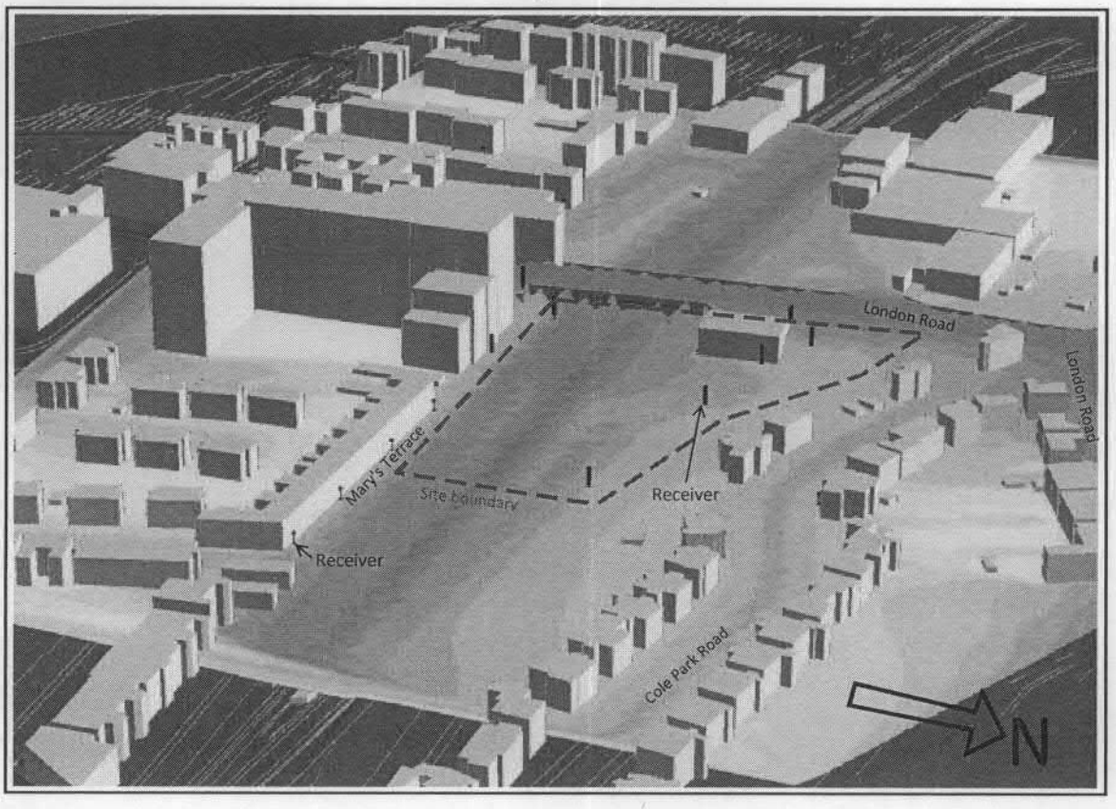
General noise - Harmonoise, [Twickenham Station - Base Model - Scenario 1 - Pre Redevelopment Scenario] , Predictor V8.10

Environmental Assessment Services Ltd

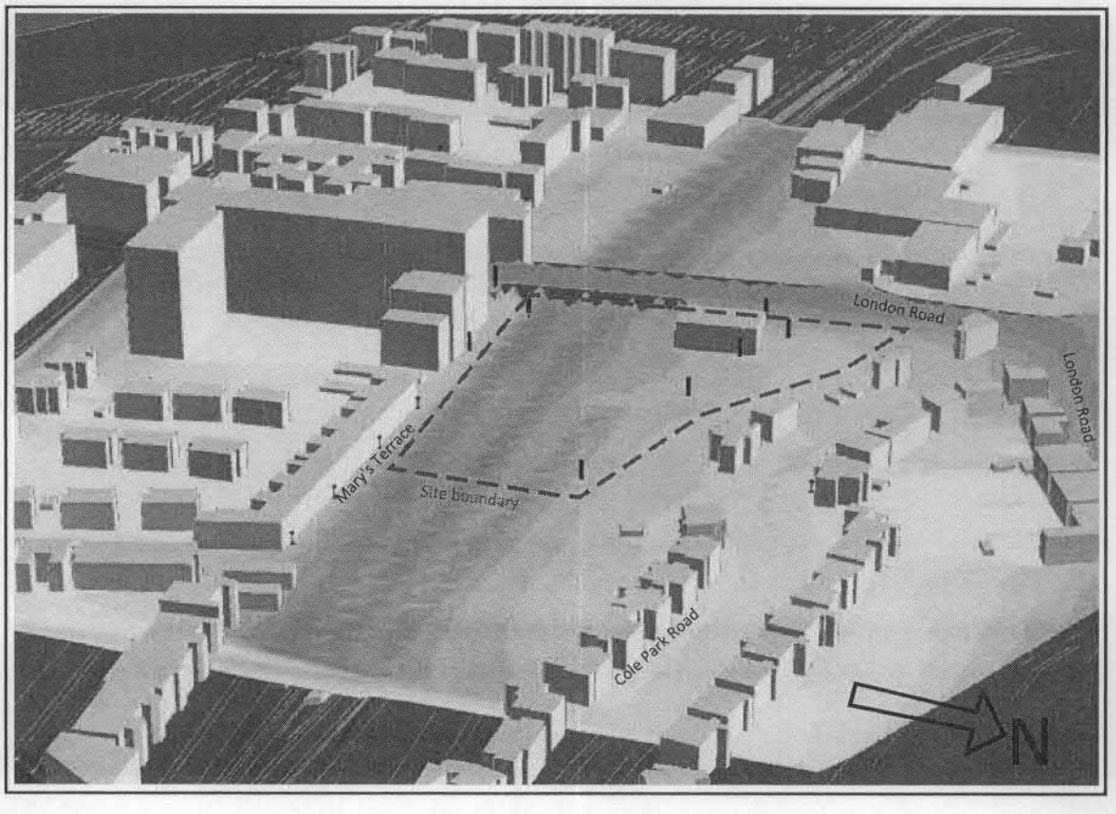
Twickenham Station, Twickenham
Noise Modelling of Twickenham Station and Vicinity
Pre and Post Redevelopment Scenario Modelling
PRE REDEVELOPMENT SCENARIO
Noise Contours at 1.5 m Above Ground

Environmental Assessment Services Ltd

Daytime



Night-time



Contours as shown on plan view

Not to scale

Twickenham Station, Twickenham

Noise Modelling of Twickenham Station and Vicinity

Pre and Post Redevelopment Scenario Modelling

POST REDEVELOPMENT SCENARIO

Daytime Period 0700 hours - 2300 hours : Noise Contours at 1.5 m Above Ground

General noise - Harmonoise, [Twickenham Station - Final Development - Final Development Scenario] , Predictor V8.10

Environmental Assessment Services Ltd

Twickenham Station, Twickenham

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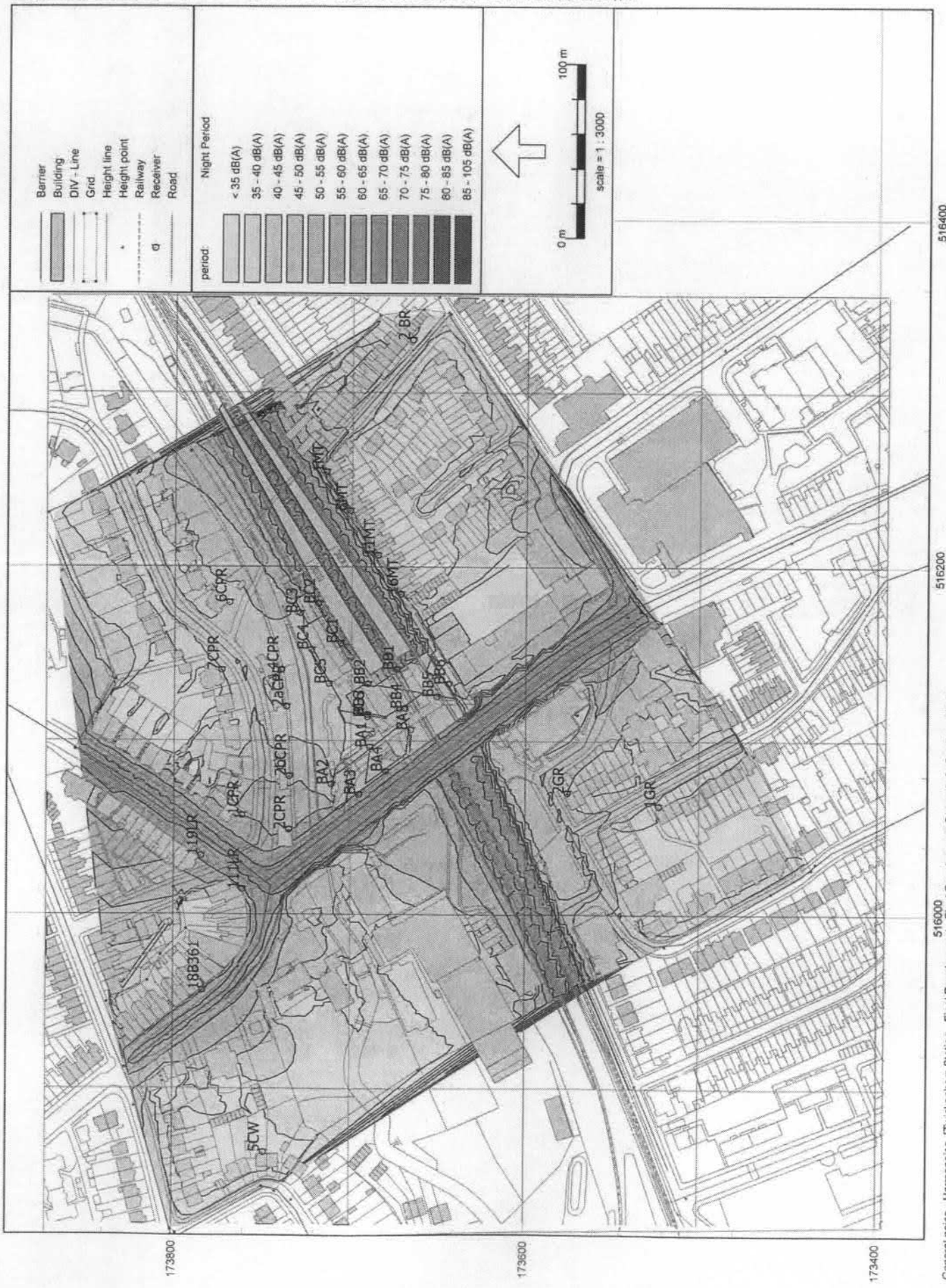
Noise Modelling of Twickenham Station and Vicinity

Pre and Post Redevelopment Scenario Modelling

POST REDEVELOPMENT SCENARIO

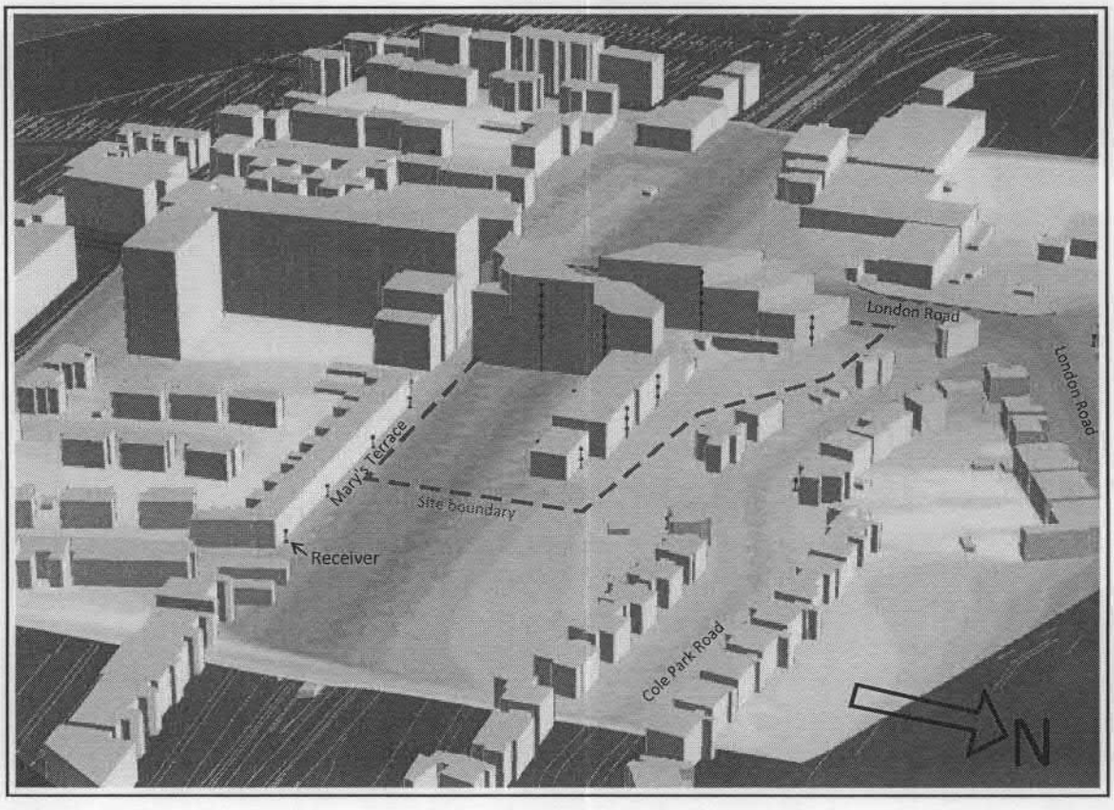
Night-time Period 2300 hours - 0700 hours : Noise Contours at 1.5 m Above Ground



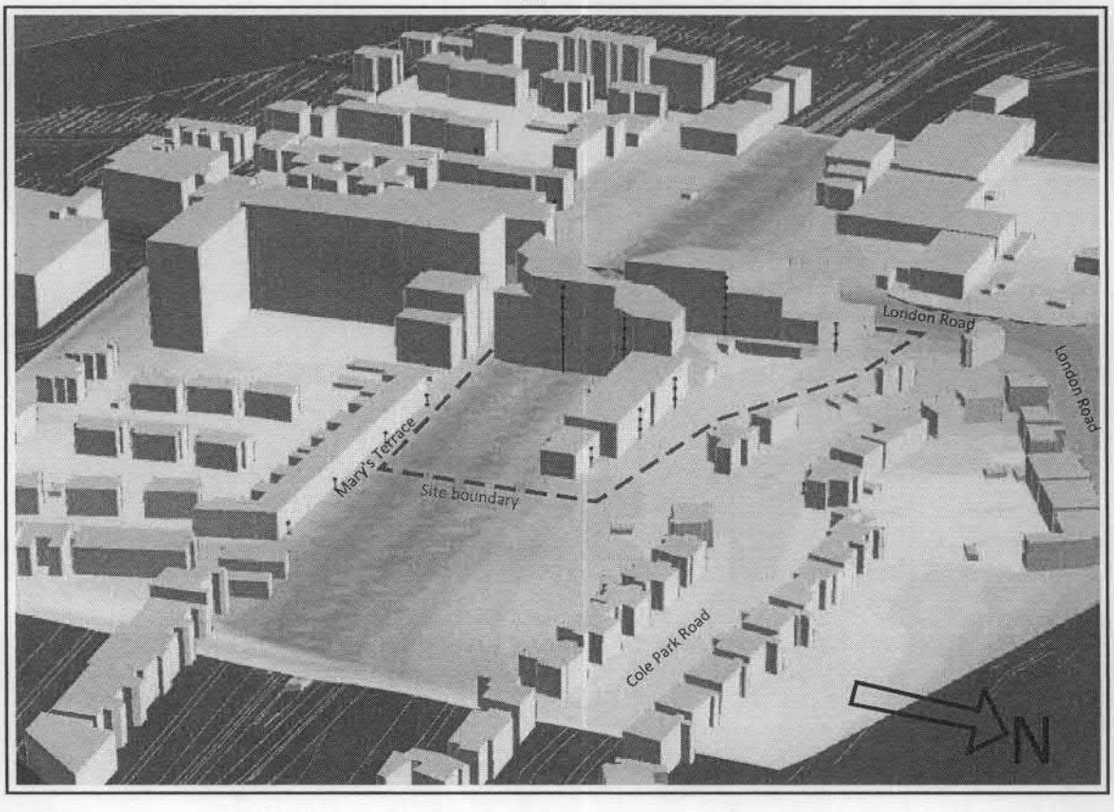
Twickenham Station, Twickenham
Noise Modelling of Twickenham Station and Vicinity
Pre and Post Redevelopment Scenario Modelling
POST REDEVELOPMENT SCENARIO
Noise Contours at 1.5 m Above Ground

Environmental Assessment Services Ltd

Daytime



Night-time



Contours as shown on plan view

Not to scale

Twickenham Station, Twickenham

Noise Modelling of Twickenham Station and Vicinity

Pre and Post Redevelopment Scenario Modeling

POST REDEVELOPMENT SCENARIO

Daytime Period 0700 hours - 2300 hours : Noise Contours at 4.5 m Above Ground

General noise - Harmonoise, [Twickenham Station - Final Development - Final Development Scenario] , Predictor V8.10

Environmental Assessment Services Ltd

Twickenham Station, Twickenham

Environmental Assessment Services Ltd

Noise Modelling of Twickenham Station and Vicinity

Pre and Post Redevelopment Scenario Modelling

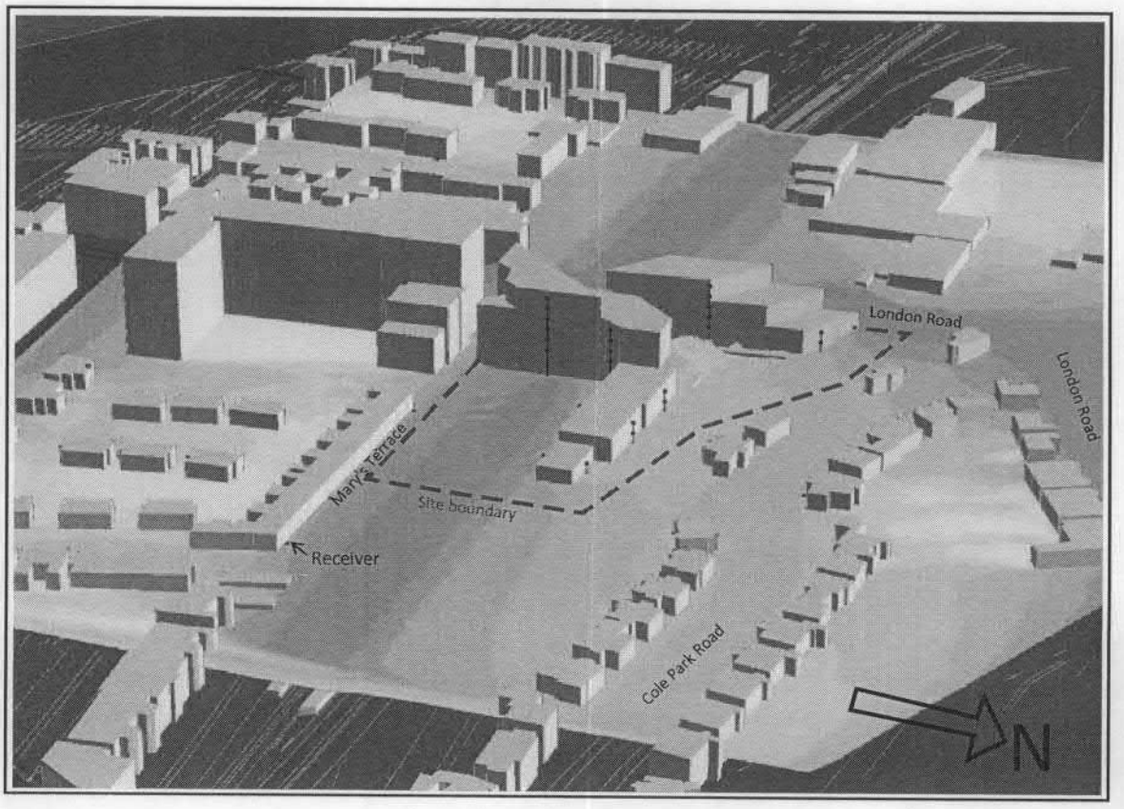
POST REDEVELOPMENT SCENARIO

Night-time Period 2300 hours - 0700 hours : Noise Contours at 4.5 m Above Ground

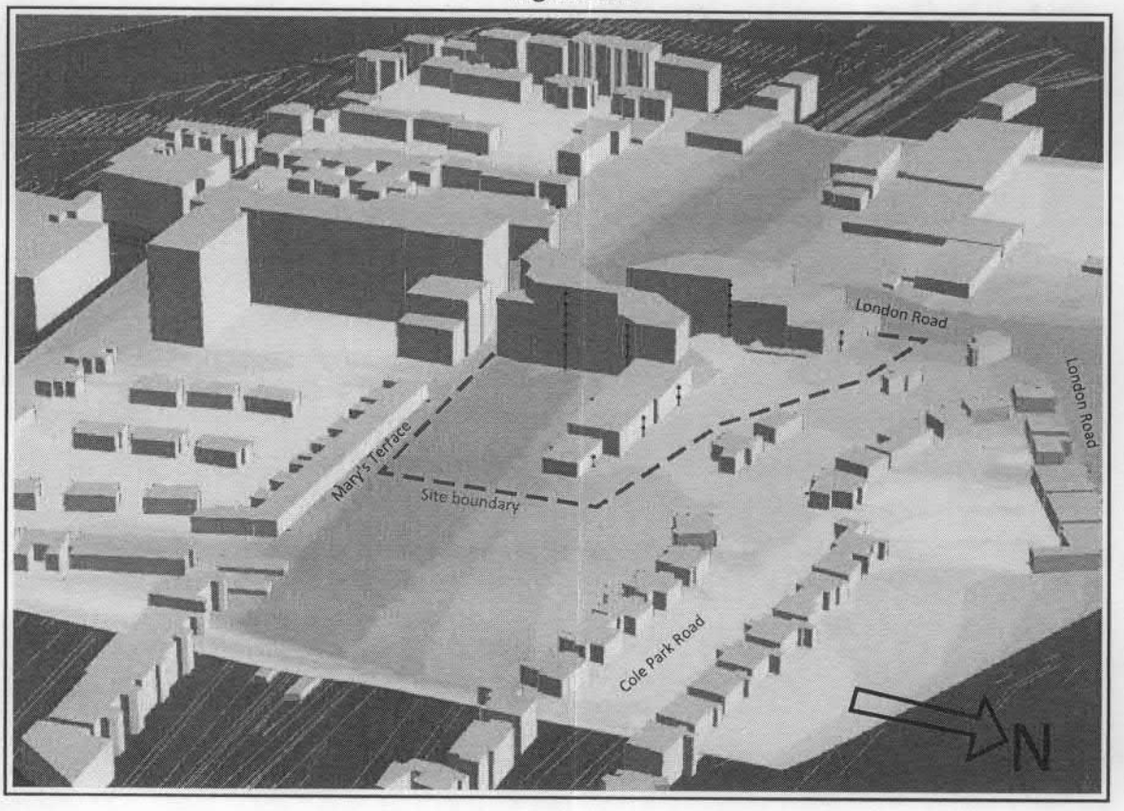
Twickenham Station, Twickenham
Noise Modelling of Twickenham Station and Vicinity
Pre and Post Redevelopment Scenario Modelling
POST REDEVELOPMENT SCENARIO
Noise Contours at 4.5 m Above Ground

Environmental Assessment Services Ltd

Daytime



Night-time



Contours as shown on plan view

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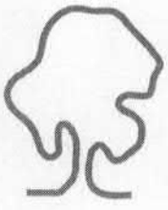

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