A96 Fochabers and Mosstodloch Bypass

Mitigation Strategy for the Bypass between the Gordon Castle Main Estate Driveway and the realigned Gordon Castle Farm Road

Options Assessment Report




November 2007

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1 INTRODUCTION

This Options Assessment Report sets out the initial assessment undertaken in re-examining and evaluating an optimum mitigation strategy.

Transport Scotland has consulted with the following statutory consultees, Moray Council, Scottish Natural Heritage, Historic Scotland and the Scottish Environment Protection Agency, culminating at a workshop on 17 October 2007. This report incorporates the findings and comments from that workshop.

The proposed A96 Fochabers and Mosstodloch Bypass is located to the north of Fochabers. The proposed route passes through the southern part of the Gordon Castle Estate and runs close to properties in Castle Street, including Gordon Chapel, and Duncan Avenue.

During scheme development, the impact of the chosen route on the Gordon Castle Estate was acknowledged and consequently extensive mitigation measures were proposed as part of the Scheme presented at the A96 Fochabers and Mosstodloch Bypass Public Local Inquiry (PLI) in 2003.

The Scottish Ministers issued their decision to proceed with the northern bypass route on 17 March 2005. Their decision included the following requirement at paragraph 8(vi):-

"that the mitigation strategy for the bypass between the realigned farm road and the main estate drive be re-examined and drawn up in consultation with residents of Castle Street and Duncan Avenue, the proprietors of other affected property, and the relevant statutory bodies. This mitigation strategy should ensure the optimum balance between noise reduction, prevention of pedestrian access to the bypass and integration with the designed landscape."

The section of the bypass in question is shown on Figure 1 below.

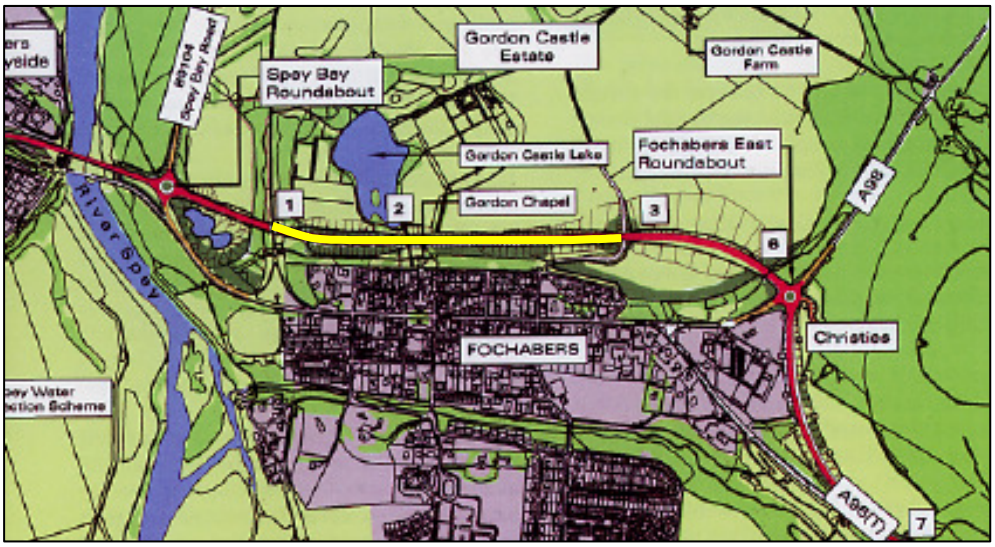


Figure 1: Proposed Fochabers Bypass- Section to be re-examined highlighted in yellow

2 BACKGROUND

The mitigation measures presented at the PLI were included in an Addendum to the Environmental Statement. These were developed in consultation with Historic Scotland and Scottish Natural Heritage.

The principal mitigation proposed at the section under consideration was the provision of false crests with very gentle slopes falling away from the new road. The false crests reduce the impact of road traffic noise and partially hide vehicles using the new road while the gentle slopes reduce the visual impact.

In addition, other mitigation measures proposed included: -

- As deep a cutting as engineering factors would permit along the section
- The use of “estate railings” to mark the “boundary” and fence off the bypass from the Estate
- Use of low noise surfacing
- Provision of “Isothermal” double glazing for Gordon Chapel
- Raising the height of the existing reconstructed wall at Castle Street between the Chapel and East Lodge
- Provision of a wall adjacent to the Estate Lake for noise reduction, visual screening and to act as an amphibian barrier
- Ensuring continued operation of the lake water feed

For the purposes of this report, the mitigation measures described above are referenced as the PLI Scheme.

It should be noted that the base case for any mitigation strategy includes as deep a cutting through the Estate, limited only by the level of the road in relation to the Estate lake, and the use of low noise surfacing. Both these features will be common to all possible alternative measures considered later in this report. A tunnelled option through the estate has been re-considered but has been discounted on the grounds that it is:

a) Technically difficult
b) Prohibitively expensive

In addition, any re-examination of the overall mitigation strategy must include 200m of amphibian-proof barrier over the length through the Estate and any alternative proposal must provide an acceptable solution for this ecological mitigation feature.

Typical cross sections showing the proposed mitigation measures are presented in Appendix A.

3 OPTIONS FOR ASSESSMENT

For this additional study a wide range of possible alternative mitigation measures are considered. Specific interventions at Gordon Chapel, the Lake and the wall adjacent to Castle Street have also been re-examined and are dealt with later in this report. These interventions, in isolation, will not provide sufficient mitigation for the whole section of the bypass under consideration. Any alternative mitigation strategy must consider a range of possible features, either in isolation or as part of a combination of features as appropriate, to cover the whole section of the bypass under consideration.

Therefore, in the first instance, a wide range of features that may assist in achieving an optimum mitigation strategy has been selected for consideration. These are listed below, in no particular order, together with a brief description of each and a short discussion of their possible use:-

LANDSCAPING FEATURES

False Crests: in combination with the road cutting, this feature comprises the provision of false crests between 1.5 and 1.9 metres in height to assist in screening the new road. This feature also assists in reducing the level of traffic noise in adjacent areas. Indeed, false crests will be used to the east of the Gordon Castle Farm access road, as confirmed by the Scottish Ministers' decision letter of 17 March 2005.

WALL FEATURES – the scheme presented at PLI did not utilise any walls, with the exception of a short section of re-claimed brick faced retaining wall on the Estate side of the road adjacent to Gordon Castle Lake. This was provided to improve the noise reduction at the south end of the lake. A re-examination of this proposal has demonstrated that this remains the optimum mitigation at this location.

In addition it was considered that continuous walls either side of the bypass could make a significant contribution to achieving an optimum mitigation strategy and hence a number of alternative wall features have been considered. Different types of wall are available for use, in particular with respect to finishes, and a brief discussion of potential wall features is given below. Each one can potentially be used in isolation or, alternatively, as part of a combination of other measures.

Concrete Noise Barrier/Wall: a concrete wall can potentially be provided in lieu of the false crests provided as part of the PLI Scheme. Alternatively, a specially designed concrete noise barrier could be provided in combination with a false crest feature. A bare concrete wall would be unacceptable in this setting hence any proposal must include a better standard of finish.

Rendered Concrete Wall: For the purposes of this assessment, a more realistic option is a rendered concrete wall that can provide the same functions as the bare concrete wall but is more acceptable in appearance.

Stone Clad Wall: again this is a variant of the concrete wall but with cladding to improve its appearance.

Brick Wall: a brick wall can provide the same functions as the concrete wall.

Willow Acoustic Barrier: this provides a more natural looking noise barrier and is based on live willow woven around a dense earth core. A willow barrier can potentially be provided in lieu of the false crests provided as part of the PLI Scheme. Alternatively, it could be provided in combination with a false crest feature.

'**Hoofmark' Wall**: again this provides a more natural looking noise barrier. It is a reinforced earth turf faced barrier wall and offers the same possibilities as offered by a willow barrier.

Vertical Retaining Wall: a retaining wall would provide an alternative to the PLI Scheme of earth slopes at the back of the road verge. The construction of the wall could incorporate any of the features described above.

BOUNDARY FEATURES – any mitigation strategy should ideally include a feature that provides a suitable road boundary fence. This is especially important in ensuring the prevention of pedestrian access to the bypass. There are a number of potential means to provide this function and a brief discussion of each is given below.

Estate Railings: as proposed in the original scheme Environmental Statement (ES), these comprise black metal "estate" type railings, similar to those found elsewhere around the Estate boundary. These were used in the original scheme to define the estate boundary and help prevent pedestrian access. They do not in themselves contribute to noise reduction. Consequently this feature should only be considered in conjunction with other features.

Chain Link Fence: this is a standard fence type that provides the same function as the estate railings but at a lesser cost. As with the estate railing, it would not contribute to noise reduction and hence should only be considered in conjunction with other features.

Post & Wire Fence: this is a standard fence type that also provides the same function as the estate railings but at a lesser cost. It is also used as a boundary feature elsewhere on the Estate. As with the estate railing, it would not contribute to noise reduction and hence should only be considered in conjunction with other features

Hedge: this provides a more natural solution to defining the estate boundary. Although potentially contributing to noise reduction, the full benefits would not be available until it is sufficiently matured hence it is considered that this feature should only be considered in conjunction with other features. It would also need to be used in conjunction with post and wire fencing.

Close-Boarded Timber Noise Barrier: as well as defining the boundary, a timber noise barrier is effective in providing traffic noise reduction in adjacent areas.

As previously noted, not all the above features can on their own provide the required optimum balance of noise reduction, prevention of pedestrian access and integration with the Designed Landscape. Consequently, before proceeding to full appraisal, an initial sifting of the above features was undertaken to determine what features and combination of features could potentially provide a suitable overall mitigation strategy.

False crests formed an integral part of the PLI Scheme and make a contribution to noise reduction and minimisation of visual impact. They do not on their own however prevent pedestrian access between the Estate and the trunk road. This last requirement can however be achieved by combining false crests with any of the boundary features described above. Similarly, it can also be achieved by combining false crests with any of the wall features. Consequently, the following combinations are taken forward for more detailed appraisal:

- **False crest with estate railing**
- **False crest with chain link fence**
- **False crest with post and wire fence**
- **False crest with hedge**

Whilst the above combinations address all the requirements for an optimum balance of mitigation measures, they are limited to the noise reduction provided by the false crest. As a result, a further set of combinations is considered: false crests in conjunction with a noise barrier or wall, as follows:

- **False crest with timber noise barrier**
- **False crest with wall**
- **False crest with "natural" noise barrier**

In terms of further appraisal, the only real variant here is the type/finish of the barrier/wall used. Therefore, in order to simplify the process at this early stage, two generic categories of ***False crest with wall*** and ***False crest with "natural" noise barrier*** have been used. Within the false crest with wall category two sub-variants should be considered as those likely to be most acceptable and currently in use around the Estate: rendered wall and stone clad wall. For the purposes of option assessment a 3m height of wall/barrier is assumed. It may be however that a 3m high wall is not necessary for prevention of pedestrian access to the bypass, noise reduction or desirable for integration.

In a further variance from the PLI Scheme, it would also be possible to adopt a mitigation strategy that did not use false crests but instead used walls or barriers to screen the road from adjacent areas and provide noise reduction. In terms of further appraisal the same principle applies as adopted for false crest with wall and hence two generic categories of ***wall/barrier*** and ***"natural" noise barrier*** have been adopted. For each of these, a 1:2 slope is assumed at the back of verge with a wall/barrier 3m high at natural ground level.

Lastly, further options that utilise a retaining wall element have also been developed for further appraisal. Two variants were proposed for further assessment:

- ***1:2 slope from back of verge with 3m wall with 1m exposed to carriageway***
- ***3m wall – retaining wall at back of verge***

In summary, ten possible mitigation strategies were taken forward for further appraisal at the Statutory Consultees Stakeholder Workshop:

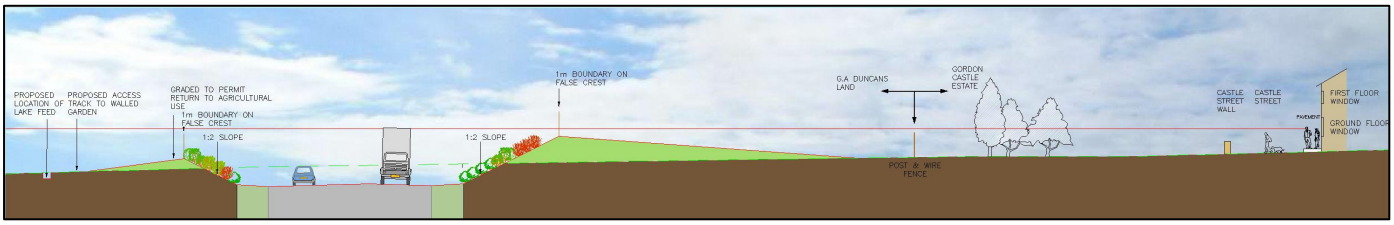
A. False crest with estate railing
B. False crest with chain link fence
C. False crest with post and wire fence
D. False crest with hedge
E. False crest with wall
F. False crest with "natural" noise barrier
G. Wall/barrier
H. "Natural" noise barrier
I. 1:2 slope from back of verge with 3m wall with 1m exposed to carriageway
J. 3m wall – retaining wall at back of verge

During the Workshop, participants identified two further options that were deemed to be worthy of further development and assessment:

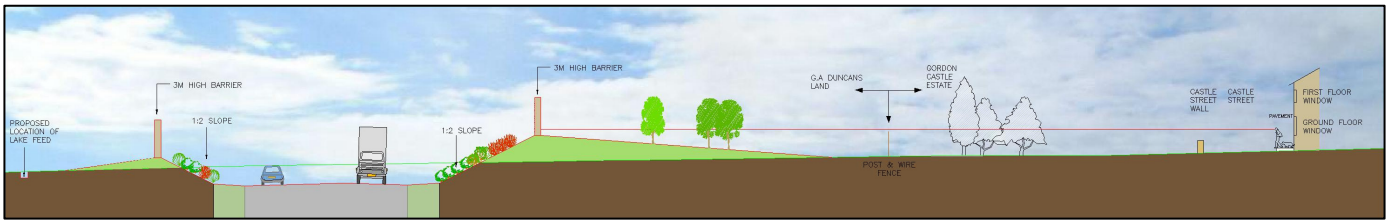
K. Raised false crest with retaining wall and estate railing
L. False crest with 1.9m to 3m noise barrier at back of verge

As previously noted, this report incorporates the findings of the Workshop and records the assessment undertaken of the twelve variants A-L described above.

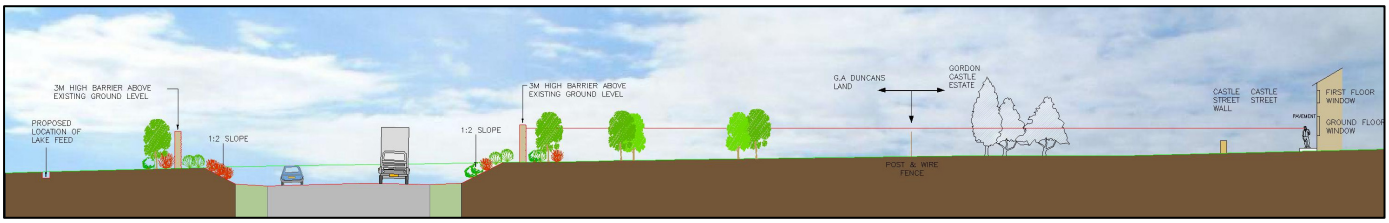
The principle of each of these strategies is shown below diagrammatically.



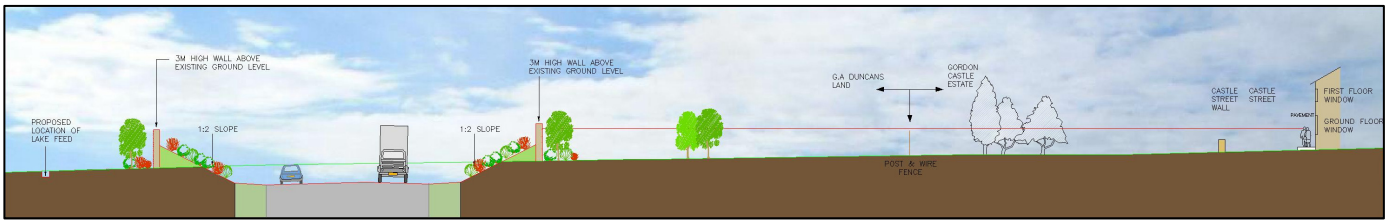
OPTIONS A, B, C & D – FALSE CREST AT APPROX 1.5m to 1.9m HIGH



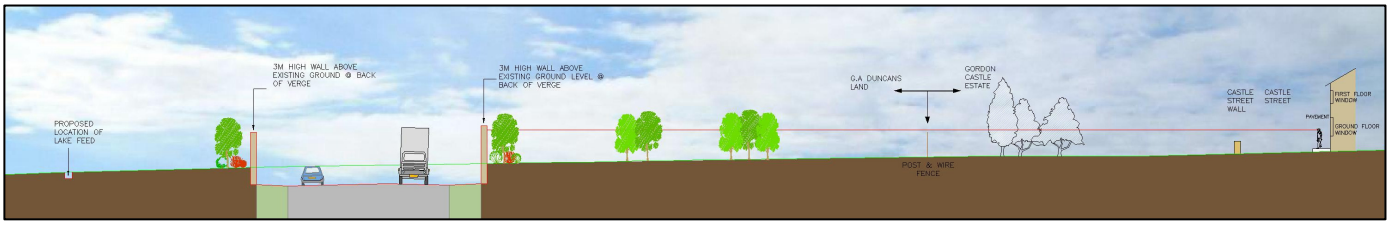
OPTIONS E & F – 3m WALL/BARRIER ON TOP OF FALSE CRESTS



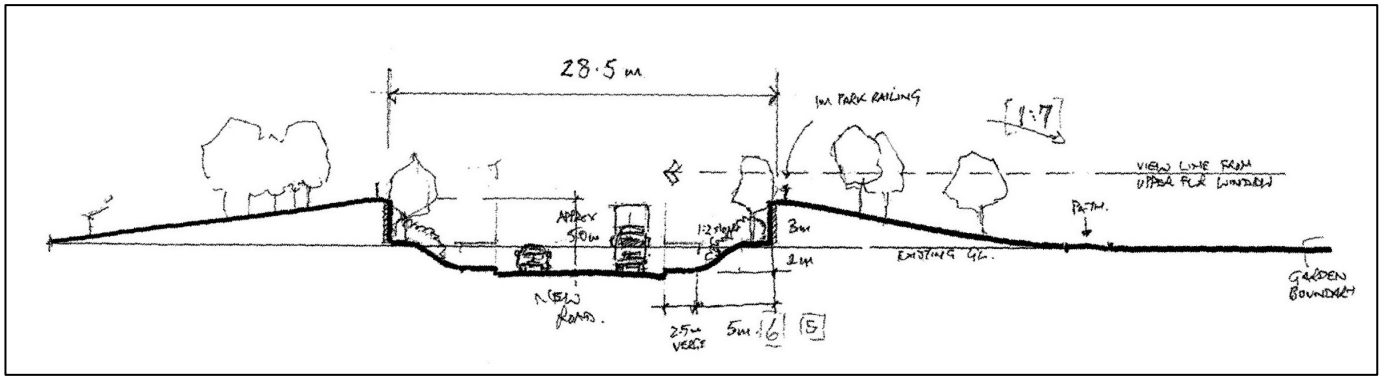
OPTIONS G & H – 3m WALL/BARRIER AT TOP OF CUT SLOPE



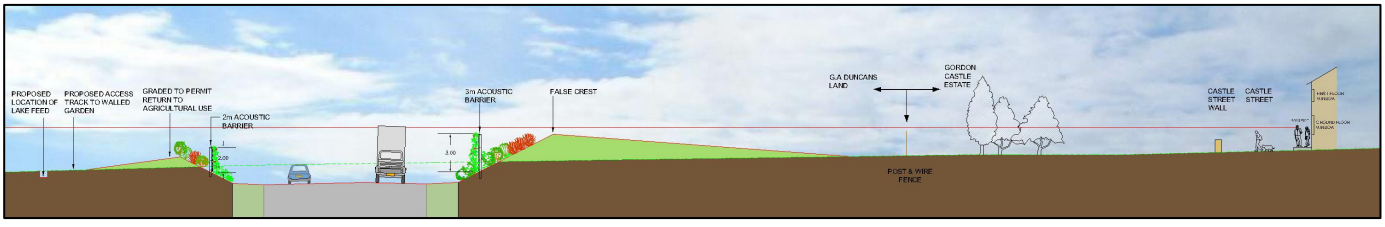
OPTION I – 1:2 SLOPE, 3m WALL, 1m EXPOSED TO CARRIAGEWAY



OPTION J – 3m WALL - RETAINING WALL AT BACK OF VERGE



OPTION K - RAISED FALSE CREST, 3m RETAINING WALL AND RAILING



OPTION L - FALSE CREST WITH 1.9m to 3m NOISE BARRIER AT BACK OF VERGE

4 OPTION ASSESSMENT

4.1 Appraisal Criteria

In order to objectively assess the options, appraisal criteria have been derived based on the five key government high level transport objectives as follows:

- Economy — Promote economic growth through improved journey time reliability
- Integration — Develop a solution that integrates with current and planned land use
- Safety — Improve safety of journeys
- Accessibility — Promote social inclusion
- Environment — Protect the environment

The options have been considered against each of the criteria as set out below. Some of the criteria do not apply and some of the criteria have been further divided into sub-criteria.

The performance against each criterion has been assessed on a seven point scale:

✓✓✓	=	*large beneficial*
✓✓	=	*moderate beneficial*
✓	=	*slight beneficial*
0	=	*neutral*
X	=	*slight adverse*
XX	=	*moderate adverse*
XXX	=	*large adverse*

The specific objective to achieve *"the optimum balance between noise reduction, prevention of pedestrian access to the bypass and integration with the Designed Landscape"* has been addressed by nesting each of these individual performance criteria within the overall transport appraisal criteria. Noise reduction and integration with the Designed Landscape are covered in the noise, cultural heritage, and landscape effects sub-criteria within the Environment criterion and safety is covered by the Safety criterion.

4.2 Economy

Within the terms of an assessment of this nature, the key criterion is the relative construction cost of each option.

Preliminary cost estimates have been prepared for each option, for comparative purposes only. Indicative costs are:

- Option A: £875,000
- Option B: £810,000
- Option C: £780,000
- Option D: £810,000
- Option E: £1,150,000 to £1,875,000 dependent on type of wall
- Option F: £900,000 to £1,050,000 dependent on type of barrier
- Option G: £375,000 to £1,125,000 dependent on type of wall
- Option H: £150,000 to £300,000 dependent on type of barrier
- Option I: £375,000 to £1,125,000 dependent on type of wall
- Option J: £375,000 to £1,125,000 dependent on type of wall
- Option K: £1,250,000 to £2,000,000 dependent on type of wall
- Option L: £940,000 to £1,875,000 dependent on type of barrier

With respect to the appraisal, options A to L are affordable. Therefore, options have not been scored against economy.

Maintenance costs may differ between options, but this does not impact on an assessment of this nature.

4.3 Integration

The alternative mitigation strategies have no real differences in terms of the integration criterion. Consequently this criterion has not been used in the assessment.

4.4 Safety

Under this criterion, each of the options is considered in terms of its impact on the objective to prevent pedestrian access to the bypass. The creation of an effective barrier to prevent pedestrians from crossing the new bypass will enhance their safety and that of other road users. In terms of assessment, those options that offer little pedestrian deterrence are scored as slight adverse; those that do are scored as beneficial with the score varying dependent on the level of deterrence.

OPTION	COMMENT	RATING
A. False crest with estate railing	No real obstacle – boundary marker only.	X
B. False crest with chain link fence	Chain link fence is very difficult to climb without significant aids or assistance.	✓✓
C. False crest with post and wire fence	No real obstacle – boundary marker only.	X
D. False crest with hedge	Little real obstacle until mature as easily breached and gaps can appear over time.	0
E. False crest with wall	3m wall is very difficult to climb without significant aids or assistance.	✓✓✓
F. False crest with "natural" noise barrier	Although difficult to climb natural finish could afford handholds for more determined pedestrians.	✓✓
G. Wall/barrier	3m wall is very difficult to climb without significant aids or assistance	✓✓✓
H. "Natural" noise barrier	Although difficult to climb natural finish could afford handholds for more determined pedestrians.	✓✓
I. 1:2 slope from back of verge with 3m wall with 1m exposed to carriageway	3m wall is very difficult to climb without significant aids or assistance	✓✓✓
J. 3m wall – retaining wall at back of verge	3m wall is very difficult to climb without significant aids or assistance.	✓✓✓
K. Raised false crest with retaining wall and estate railing	No real obstacle and 3m vertical drop introduces a new hazard.	XX
L. False crest with 1.9m to 3m noise barrier at back of verge	2m to 3m barrier provides effective deterrent but slope down to top of barrier may assist more determined pedestrians.	✓✓

4.5 Accessibility

The alternative mitigation strategies have no real differences in terms of the accessibility criterion. Consequently this criterion has not been used in the assessment. The key issue of accessibility to the bypass is addressed under safety.

4.6 Environment

In order to assess the impact on environment, it is normal to assess each option against a range of sub-criteria as recommended in Volume 11 of the Design Manual for Roads and Bridges:

- Air Quality
- Cultural Heritage
- Disruption Due to Construction
- Ecology and Nature Conservation
- Landscape Effects
- Land Use
- Traffic Noise and Vibration
- Pedestrians, Cyclists, Equestrians and Community Effects
- Vehicle Travellers
- Water Quality and Drainage
- Geology and Soils
- Policies and Plans

In accordance with Volume 11 of DMRB, a scoping exercise was carried out which considered which of these sub-criteria would be significant in choosing the optimum mitigation strategy. The focus is on achieving "the optimum balance between noise reduction, prevention of pedestrian access to the bypass and integration with the Designed Landscape". Consequently nine of the above sub-criteria were not considered to be significant in choosing the optimum mitigation strategy. Therefore, the following sub-criteria have not been assessed further:

- Air Quality
- Disruption Due to Construction
- Ecology and Nature Conservation
- Land Use
- Pedestrians, Cyclists, Equestrians and Community Effects
- Vehicle Travellers
- Water Quality and Drainage
- Geology and Soils
- Policies and Plans

The three sub-criteria that were considered to be significant are assessed as follows:

Cultural Heritage and Landscape Effects or "Impact on Designed Landscape"

Cultural Heritage and Landscape Effects both consider the impact on the Designed Landscape therefore they have been combined here as an "Impact on Designed Landscape" criterion. The assessment is considered in relation to compatibility with the surroundings and its integration, or "fit", within the Gordon Castle Designed Landscape and takes account of Historic Landscape Character as set out in the draft guidance document "Assessing the Effect of Road Schemes on Historic Landscape Character" (March 2007). It also considers the ability of the option to screen the intrusion that results from traffic but maintain/sustain views across the Estate from Fochabers. Compatibility with the surroundings and the setting suggest use of natural/traditional features would be less obviously intrusive than a "built" solution particularly if a "modern" finish is used.

The intention is to provide the least adverse effect on the Designed Landscape, which has the status of "Outstanding". However, it must be realised that all options will result in a significant adverse impact on the historic landscape. The optimum solution will be one that screens the intrusion that results from traffic but maintains/sustains views both across the Estate from Fochabers and from within the Designed Landscape and also retains features of the Designed Landscape. At the Workshop, participants stressed the importance of maintaining views across the Estate from Fochabers.

Therefore, in terms of scoring, those options that are incompatible with the Designed Landscape are scored as adverse, whereas those that are more sympathetic are scored positively.

OPTION	COMMENT	RATING
A. False crest with estate railing	Effectively the PLI Scheme, which at the time was considered to be the best compromise as it maintained a degree of visual continuity between Fochabers and the Estate while false crests screen traffic from within the Designed Landscape.	✓✓
B. False crest with chain link fence	Inappropriate in terms of landscape character within the Designed Landscape but would permit degree of visual connectivity between Fochabers and the Estate if fence used on road face of false crest. Will screen traffic from within the Designed Landscape.	✓
C. False crest with post and wire fence	Currently in use within the Designed Landscape and maintains a level of visual continuity between Fochabers and the Estate while screening traffic from within the Designed Landscape. In combination with planting, could provide required screening and integration over time.	✓

D. False crest with hedge	Inappropriate within the Designed Landscape. Hedge would take a considerable time to mature sufficiently and would then be visual barrier between Fochabers and the Estate. False crest will provide immediate screening of traffic from within the Designed Landscape.	XX
E. False crest with wall	If a natural stone wall or stone clad used it would be an attractive landscape feature. Will screen traffic from within the Designed Landscape. Significant visual/physical severance of Designed Landscape and between Fochabers and the Estate.	XXX
F. False crest with "natural" noise barrier	Natural barrier has greatest potential to blend into landscape. Will provide screen from day 1 that will "green up" over time. Positioning of barrier within slope of crest would improve integration. Will screen traffic from within the Designed Landscape. Significant visual/physical severance of Designed Landscape and between Fochabers and the Estate.	XXX
G. Wall/barrier	In combination with planting, a wall with a natural finish would be in keeping with existing site elements. Provides required screening and integration. Will screen traffic from within the Designed Landscape. Inappropriate within the Designed Landscape. Visual/physical severance of the Designed Landscape and Fochabers from the Estate. Visually imposing from the carriageway.	XXX
H. "Natural" noise barrier	Willow wall will provide an attractive natural feature with immediate effect and landscape integration will improve over time. Will screen traffic from within the Designed Landscape. Visual/physical severance of the Designed Landscape and Fochabers from the Estate. Inappropriate within the Designed Landscape.	XXX
I. 1:2 slope from back of verge with 3m wall with 1m exposed to carriageway	A natural finish on visible surfaces and planting would provide definition of route, more attractive than Option G from the carriageway. Boundary wall currently a feature of the Designed Landscape. Will screen traffic from within the Designed Landscape. Visual/physical severance of the Designed Landscape and Fochabers from the Estate.	XXX
J. 3m wall – retaining wall at back of verge	With natural finish as above. Boundary wall currently a feature of the Designed Landscape. Will screen traffic from within the Designed Landscape. Visual/physical severance of the Designed Landscape and Fochabers from the Estate. Visually imposing within the carriageway.	XXX

K. Raised false crest with retaining wall and estate railing	Will screen traffic from within the Designed Landscape. Visual/physical severance of the Designed Landscape and Fochabers from the Estate.	XXX
L. False crest with 1.9m to 3m noise barrier at back of verge	Maintains a degree of visual continuity between Fochabers and the Estate while false crests screen traffic from within the Designed Landscape.	✓✓

Traffic Noise and Vibration

This sub-criterion considers the effectiveness of each option in reducing noise impact to receptors in Fochabers, in particular the Lake, properties in Castle Street and Duncan Avenue, including Gordon Chapel. This element of the assessment has been informed by post-PLI acoustic modelling undertaken by Hamilton Macgregor. The modelling compared four alternative mitigation options with the PLI Scheme. The options were initially chosen to give a reflection of the range of noise levels to be expected under the various mitigation strategies and to provide some context to the discussions and rating exercise at the Workshop. In terms of the current options, the PLI Scheme is considered to be equivalent to the current options A, B, C and D as open fences and hedges are deemed to offer no measurable noise protection.

The four alternatives were equivalent to:

- Options E & F: false crests with 3m wall/barrier
- Option I: 1:2 slopes with 3m retaining wall
- Option J: 3m wall at verge
- Options G & H: 3m wall at natural ground level.

All alternative options were assessed as performing better in reducing predicted noise levels than the PLI Scheme (i.e. Options A, B, C and D). Option J was the most effective, closely followed by Options E, F, G and H. Option I performed least well of the alternatives assessed. Results of the initial assessment are presented as noise contour maps in Appendix B.

In terms of scoring, the PLI Scheme is taken as the base case and scored as neutral with the alternatives scored as beneficial in comparison. Although Option J performed best, in terms of the impact on properties in Fochabers there is relatively little to choose between Options E, F, G, H and J hence all are scored as moderate beneficial in comparison to the PLI Scheme. Option I is less effective however it still performs better than the PLI Scheme and hence is scored slight beneficial.

At the Workshop, it was considered that the two new Options (K and L) would both perform better in reducing predicted noise levels than the PLI Scheme. It was considered that Option K could provide at least the same benefits as Options E, F, G, H and J and hence it was scored as moderate beneficial. The comparative benefits of Option L were less certain and hence at the Workshop it was conservatively scored as slight beneficial. The ratings, which were accepted by all parties at the workshop, are summarised below:

OPTION	RATING
A. False crest with estate railing	0
B. False crest with chain link fence	0
C. False crest with post and wire fence	0
D. False crest with hedge	0
E. False crest with wall	✓✓
F. False crest with "natural" noise barrier	✓✓
G. Wall/barrier	✓✓
H. "Natural" noise barrier	✓✓
I. 1:2 slope from back of verge with 3m wall with 1m exposed to carriageway	✓
J. 3m wall – retaining wall at back of verge	✓✓
K. Raised false crest, 3m retaining wall and railing	✓✓
L. False crest with 1.9m to 3m noise barrier	✓

Following the Workshop, some further preliminary modelling was undertaken of the new Option L. The interim results have been compared to the PLI Scheme and the best performing Option J. Whilst slightly less beneficial than Option J, initial modelling shows that Option L provides an improvement over the PLI Scheme. This is illustrated by the following table that shows indicative results at a typical location - the ground floor at 9 Castle Street.

Final results are subject to full detailing of the design of the mitigation measures. In particular at the workshop it was stressed that the noise barrier should be screened by the Scheme earthworks including the false crests. In some locations the configuration of the earthworks will mean that the barrier may only be 1.9m high to prevent it being visible from Castle Street, Duncan Avenue and the lakeside of the estate. This will lead to a slight reduction in the noise mitigation provided but will ensure that the optimum balance between noise reduction, prevention of access to the bypass and integration with the Designed Landscape is afforded.

	PLI Scheme Predicted Levels 2020 $L_{A10(18hr)}$ dB	Option J Predicted Levels 2020 $L_{A10(18hr)}$ dB	Option L Predicted Levels 2020 $L_{A10(18hr)}$ dB
9 Castle Street (Ground Floor)	55.5	48.6	49.8

Environment Summary

The Environmental sub-criteria ratings are summarised in the table below.

Environment	**OPTION**											
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
Impact on Designed Landscape	✓✓	✓	✓	XX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	✓✓
Traffic Noise	0	0	0	0	✓✓	✓✓	✓✓	✓✓	✓	✓✓	✓✓	✓

5 ASSESSMENT SUMMARY

The following table summarises the assessment results and relative performance of each option. In the assessment, no weighting has been given to any of the objectives.

Objective	OPTION											
	A	B	C	D	E	F	G	H	I	J	K	L
Safety	X	✓✓	X	0	✓✓✓	✓✓	✓✓✓	✓✓	✓✓✓	✓✓✓	XX	✓✓
Impact on Designed Landscape	✓✓	✓	✓	XX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	✓✓
Traffic Noise	0	0	0	0	✓✓	✓✓	✓✓	✓✓	✓	✓✓	✓✓	✓

6 SPECIFIC MITIGATION MEASURES

Sections 2 and 3 of this report made reference to three specific areas of localised mitigation, namely, Gordon Chapel, the Lake and the reconstructed wall adjacent to Castle Street. These three areas were previously identified in the scheme Environmental Statement and mitigation measures were proposed therein. All three areas of mitigation have been re-examined here and a narrative on the outcome of this assessment is presented below. It should be noted that none of these interventions on their own would provide full mitigation along the length of the bypass under consideration nor would they offer an "optimum balance". However it is recognised that each item offers specific and targeted mitigation to address localised impacts.

All three locations will also benefit from the mitigation strategy outlined in the foregoing sections.

6.1 Gordon Chapel

The Environmental Statement identified the following mitigation for the Chapel to protect its historic stained glass windows during construction and to offer additional noise mitigation once the bypass is in place. The proposal was to provide an "Isothermal" glazing system which would comprise of the existing stained glass windows being removed prior to construction and replaced with double glazed units. The stained glass windows would be refurbished and stored during the bypass construction and re-hung on completion beside the double glazing with a 100mm gap between the double glazed units and the stained glass windows.

On re-examination of this proposal and consultation with the Chapel, it is considered that this is still the best solution in terms of protection of the chapel during construction, conservation of the existing windows and long term noise mitigation, and will maintain the day to day operations of the Chapel during the construction phase.

6.2 The Lake

The Environmental Statement proposed the construction of a Lakeside wall to help protect the tranquillity of the area. There is no change to this proposal as a result of its re-examination.

Additionally, it was proposed that the Lake feed would be realigned as part of the mitigation set out in the Environmental Statement so as to ensure its continued operation. As a result of re-examination there is no change to this commitment, however the exact alignment of this lake feed may change depending on the outcome of the re-assessment of the realigned access to Gordon Castle Farm. This issue is considered in more detail in a separate report.

6.3 Reconstructed wall adjacent to Castle Street

The mitigation commitment within the Environmental Statement is to demolish and replace the existing wall with a new wall, approximately 2 metres in height, to match the section of original boundary wall which adjoins Gordon Chapel. A re-examination of this issue has considered the following issues:

- Economy - the proposal is affordable
- Environment - the proposal will provide some noise mitigation, although this will mainly be experienced at ground floor level. The proposal will screen views across the estate from Castle Street at ground floor level.
- Safety and accessibility - The proposal will not contribute to improving safety or restricting access to the bypass.
- Integration - the wall at this location has previously been reconstructed and is not an original part of the designed landscape. However, the wall which was originally on this alignment was approximately 1.8m high, matching the wall to the west of the Chapel and formed the original Estate boundary.

From this assessment it was concluded that the principal issues are those relating to noise and visual impact. It is considered that neither of these issues can be fully balanced without consultation with the residents of Castle Street who will be directly affected.

7 SUMMARY

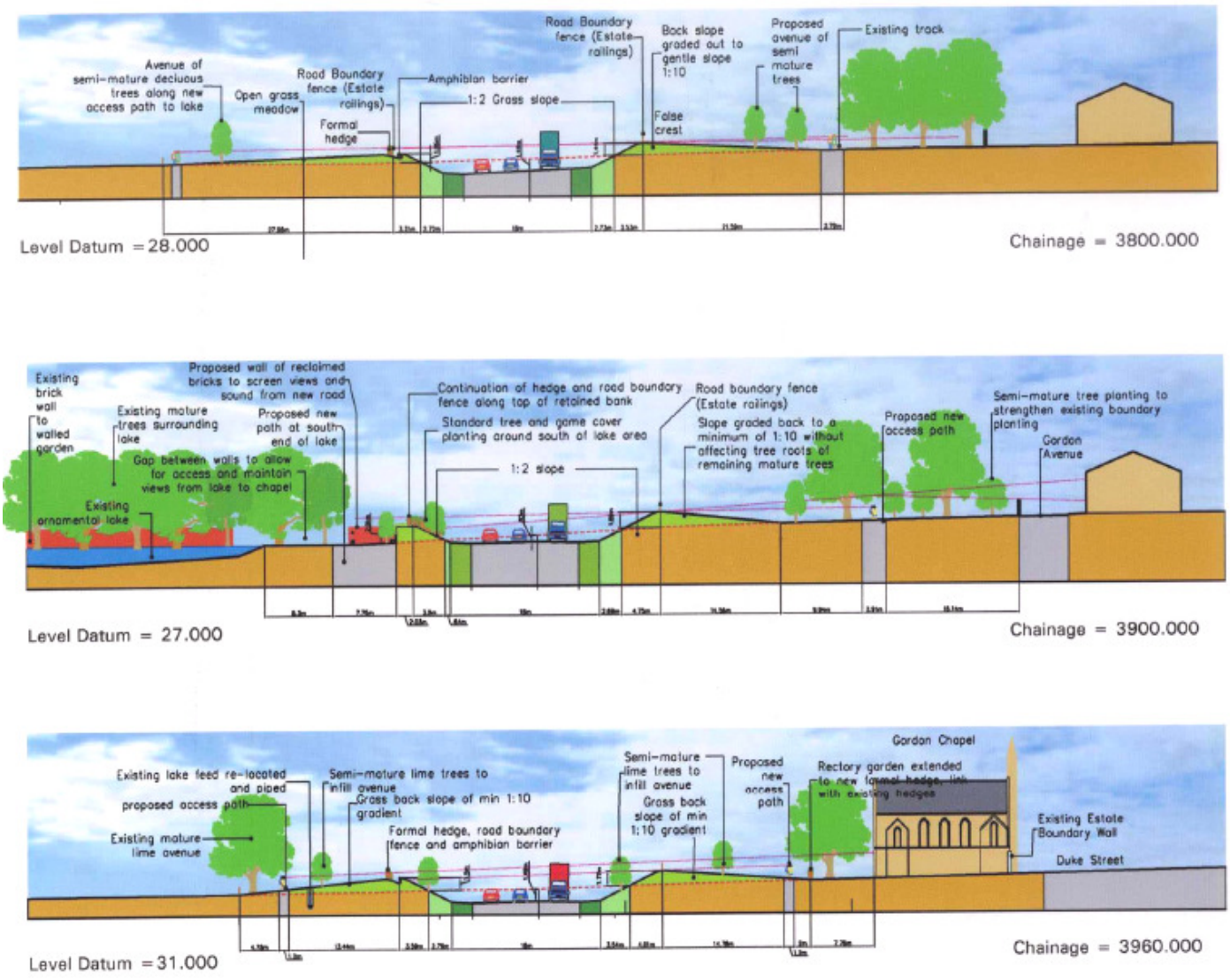
Twelve potential options have been derived for the Mitigation Strategy for the Bypass between the Gordon Castle Main Driveway and the realigned Gordon Castle Farm Road. Each option has been assessed against the government's five transport objectives and the results are summarised in section 5.

In terms of achieving an optimum balance between noise reduction, prevention of pedestrian access and integration with the Designed Landscape, from the assessment summary it appears that Option L provides the best overall balance of mitigation measures. In contrast to all other options, the summary for Option L shows beneficial impacts across the range of criteria.

Option L was developed at the statutory consultees' workshop as part of the re-examination process and it was the preferred option of the statutory consultees. However, Transport Scotland will also take account of your views expressed in this consultation exercise to complete its examination of the proposals. It will then publish the mitigation strategy to be adopted.

APPENDIX A

PLI Proposals



Extract from November 2002 Addendum to Environmental Statement

APPENDIX B

Noise Contour Maps

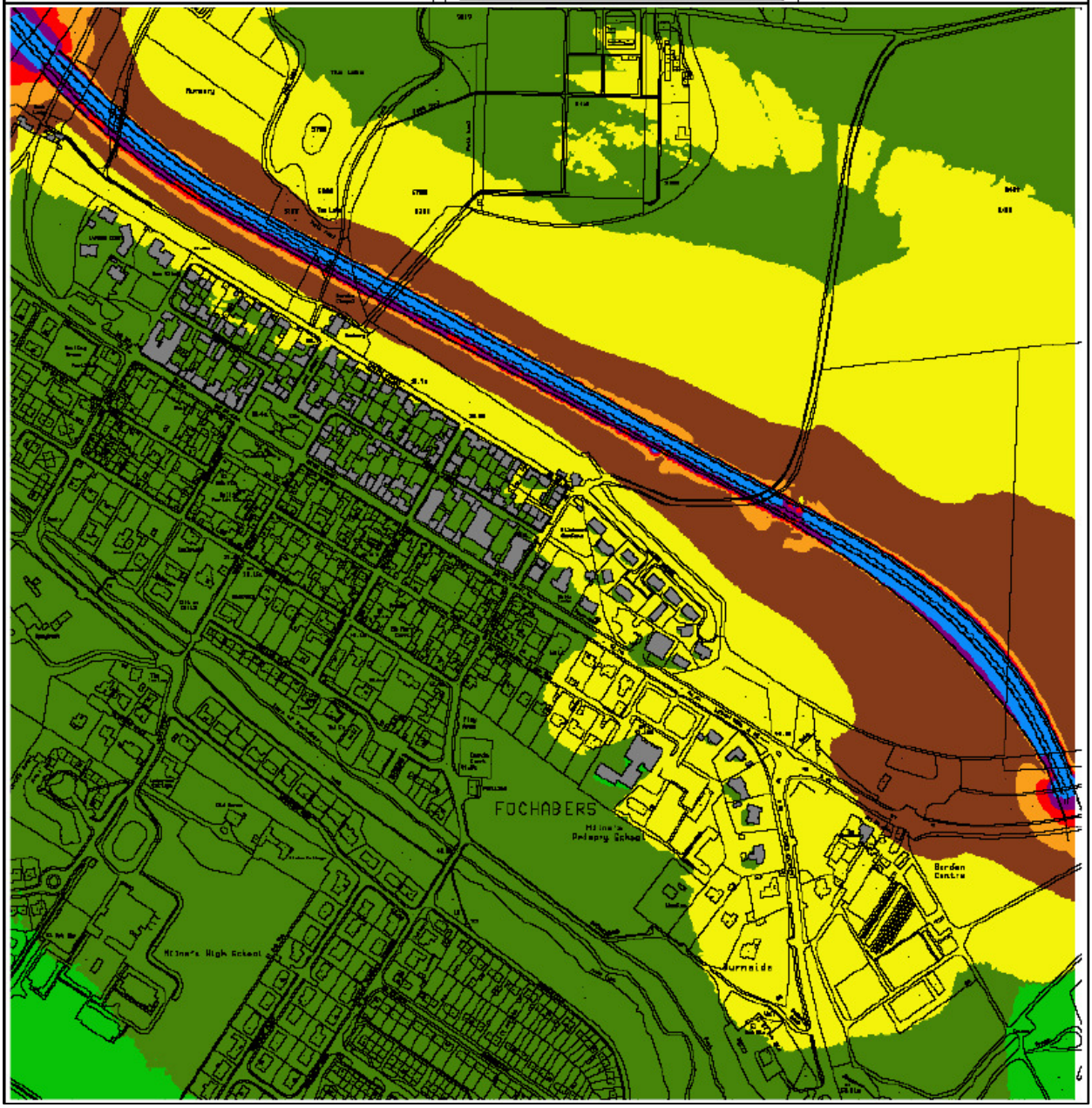
Hamilton & McGregor

Appendix 1
Evaluation of Noise Mitigation: Option 3
A96 Fochabers and Mosstodloch Bypass

areas of similar classes of noise levels

- <=35 dB(A)
- <=40 dB(A)
- <=45 dB(A)
- <=50 dB(A)
- <=55 dB(A)
- <=60 dB(A)
- <=65 dB(A)
- <=70 dB(A)
- <=75 dB(A)
- <=80 dB(A)
- > 80 dB(A)

Hamilton & McGregor
ACOUSTICS DIVISION

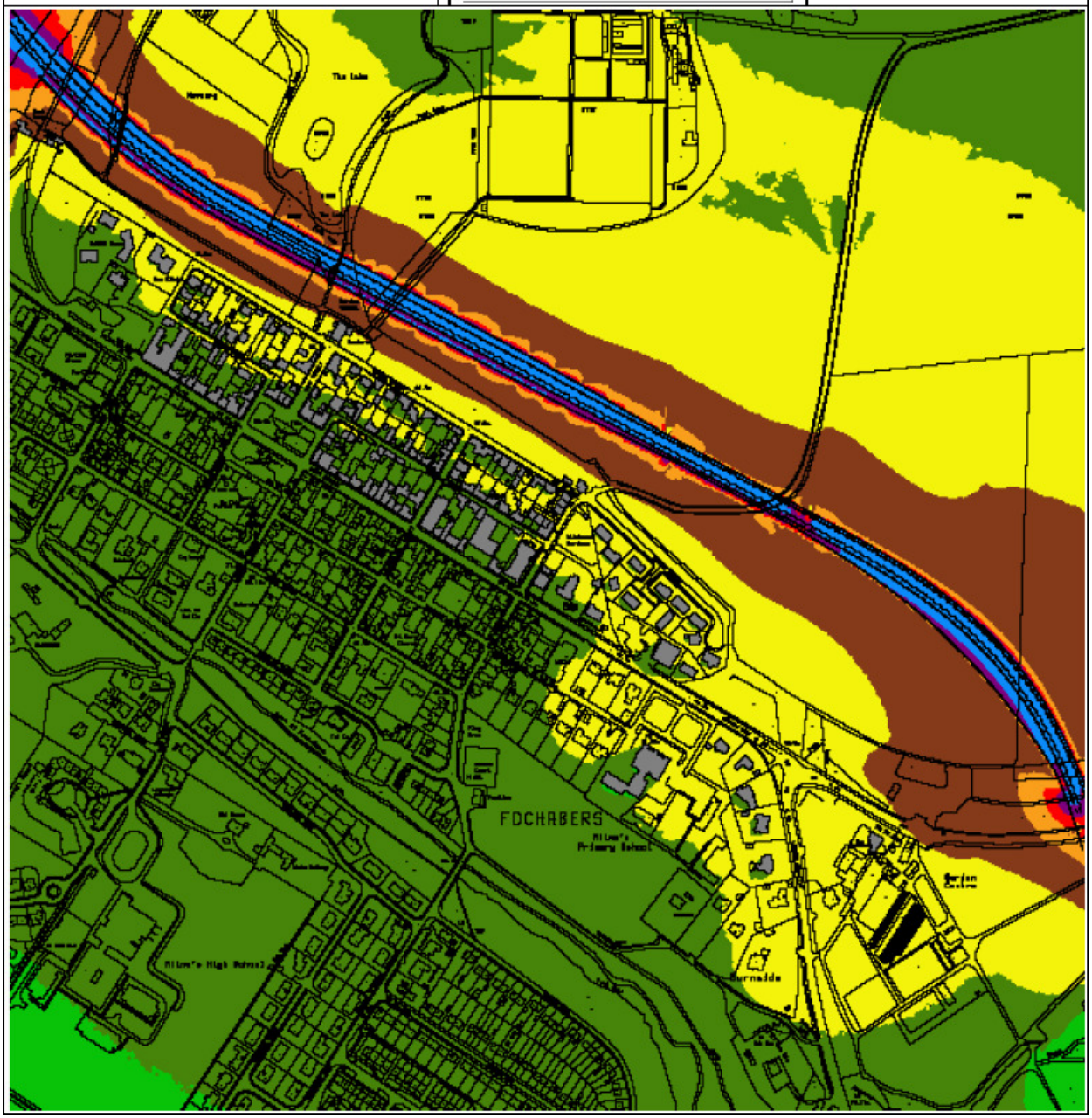


Appendix 2
Evaluation of Noise Mitigation:
Option 5
A96 Fochabers and Mosstodloch Bypass

areas of similar classes of noise levels

- <=35 dB(A)
- <=40 dB(A)
- <=45 dB(A)
- <=50 dB(A)
- <=55 dB(A)
- <=60 dB(A)
- <=65 dB(A)
- <=70 dB(A)
- <=75 dB(A)
- <=80 dB(A)
- > 80 dB(A)

Hamilton & McGregor
ACOUSTICS DIVISION

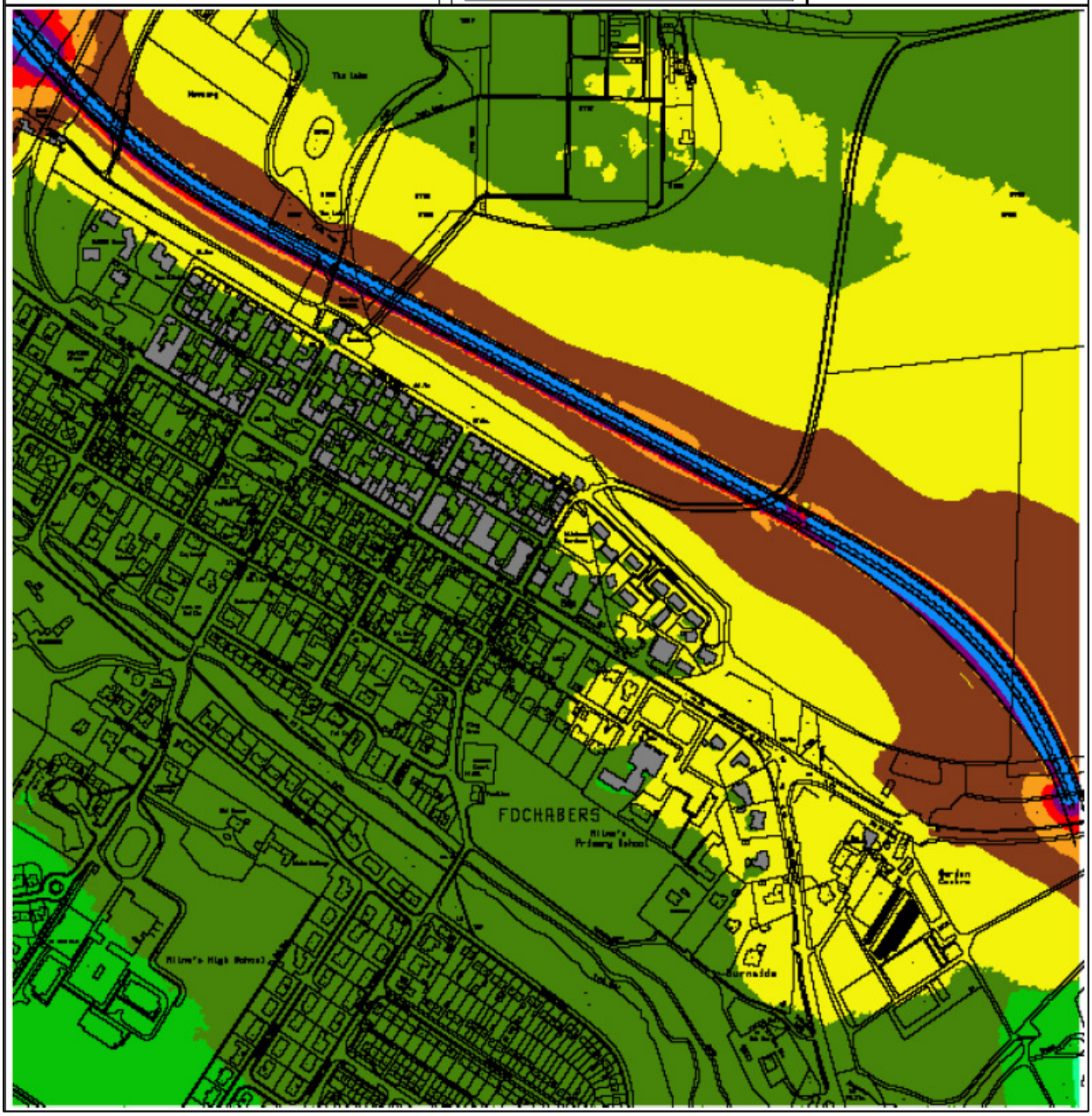


Appendix 3
Evaluation of Noise Mitigation:
Option 9
A96 Fochabers and Mosstodloch Bypass

areas of similar classes of noise levels

- <=35 dB(A)
- <=40 dB(A)
- <=45 dB(A)
- <=50 dB(A)
- <=55 dB(A)
- <=60 dB(A)
- <=65 dB(A)
- <=70 dB(A)
- <=75 dB(A)
- <=80 dB(A)
- > 80 dB(A)

Hamilton & McGregor
ACOUSTICS DIVISION



Appendix 4
Evaluation of Noise Mitigation:
Option 12
A96 Fochabers and Mosstodloch Bypass

areas of similar classes of noise levels

- <=35 dB(A)
- <=40 dB(A)
- <=45 dB(A)
- <=50 dB(A)
- <=55 dB(A)
- <=60 dB(A)
- <=65 dB(A)
- <=70 dB(A)
- <=75 dB(A)
- <=80 dB(A)
- > 80 dB(A)

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Appendix 5

Evaluation of Noise Mitigation:
Option 1 (ES Option)
A96 Fochabers and Mosstodloch Bypass

areas of similar classes of noise levels

- <=35 dB(A)
- <=40 dB(A)
- <=45 dB(A)
- <=50 dB(A)
- <=55 dB(A)
- <=60 dB(A)
- <=65 dB(A)
- <=70 dB(A)
- <=75 dB(A)
- <=80 dB(A)
- > 80 dB(A)

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