

AGREEMENT NO. CE 69/97
INVESTIGATION ASSIGNMENT FOR WIDENING AND
RECONSTRUCTION OF TAI PO ROAD (SHA TIN SECTION)
INVESTIGATION ASSIGNMENT

EXECUTIVE SUMMARY

CONTENTS

- 1.0 INTRODUCTION
- 2.0 IDENTIFICATION OF SENSITIVE RECEIVERS
- 3.0 CONSTRUCTION PHASE IMPACTS
- 4.0 OPERATIONAL IMPACTS
- 5.0 ENVIRONMENTAL MONITORING AND AUDIT (EM & A)
- 6.0 CONCLUSION

1.0 INTRODUCTION

1.1 Background

The project involves the reconstruction and widening of Tai Po Road (Shatin Section) to a dual 3-lane carriageway between the northern end of Shing Mun Tunnel Road and Fo Tan Road. The project road passes through the high-rise residential area in Shatin Tin Centre and has a total length of approximately 2200m. The project has been divided into two sections for the EIA. The first section about 1000m is the main part of the project where the road will be widened to carry additional traffic flow; this section of the project is a designated project under the Environmental Impact Assessment Ordinance. The second section of the project is divided into two parts, one at each end of the widened section. The road surface will be reconstructed along these two parts but this is not a designated project under the EIAO. The locations of the two sections of the project are shown on Drawing 1.

Babtie BMT Harris & Sutherland Hong Kong Limited, in association with Mouchel Asia Environmental, MVA and Team 73 Hong Kong were commissioned in February 1998 by Highways Department to provide professional services in respect to the Investigation Assignment for Widening and Reconstruction of Tai Po Road (Sha Tin Section), hereinafter referred to as the Project.

As recommended by the Sha Tin and Ma On Shan District Traffic Study, in order to avoid the Tai Po Road (Sha Tin Section) reaching its capacity and causing significant problems to the road users, it would be appropriate to implement the works as soon as possible. The current developed implementation programme has indicated that commissioning of the project should be attainable by mid 2006, depending upon the achievement of the interim programme milestones, with construction starting at the end of the year 2002. The construction period is about 36 months.

1.2 The Environmental Impact Assessment

The Environmental Impact Assessment (EIA) identifies sensitive receivers within the study area, defines environmental parameters and features likely to be affected by the proposed project and sets out the criteria and methodology on which noise, air quality and landscape and visual impact assessments have been based. The EIA has evaluated impacts during both the construction and operational phases.

Future year traffic flow predictions, developed by the traffic forecast and approved by the Transport Department, have been utilised in the assessment of operational air and noise impacts. Air quality and noise impact assessments have been based on the worst case scenario within 15 years of commissioning the Project.

The EIA has been carried out in accordance with the requirements of the Technical Memorandum on Environmental Impact Assessment Process (the TM) and the Environmental Impact Assessment Ordinance (the EIAO). The noise impact assessment of the EIA also incorporates mitigation resulting from recommendations of the Final Report of the study of the "Noise Impact Assessment for 24-Hour Opening of Border Crossings", completed in 1994.

Mitigation measures have been recommended for predicted environmental impacts arising from the proposed improvement works where these exceed the relevant standards and guidelines.

This Executive Summary presents a precis of the findings of the EIA.

2.0 IDENTIFICATION OF SENSITIVE RECEIVERS

2.1 Air and Noise Sensitive Receivers

Sensitive receivers have been identified. The study area accommodates mainly residential development and the majority of sensitive receivers are located alongside Tai Po Road (Sha Tin Section) itself, although representative locations on Sha Tin Rural Committee Road, Fo Tan Road and Sui Wo Road have also been selected. A future development at the Sha Tin Area 9 has also been included in the assessment. These areas can be seen on the project area plan in Drawing 1.

2.2 Landscape and Visual Sensitive Receivers

The landscape units and visual sensitive receivers were identified based on the overall topography and land uses within the visual envelope. The landscape towards the northwest of the Tai Po Road (Sha Tin Section) is characterized by the narrow fringes of the valley rising through the foothills of Shing Mun Country Park. Whereas, the topography towards the southeast comprises the flat reclaimed land upon which is located the large housing estates of Greater Shatin. The visual sensitive receivers located in close proximity to the Tai Po Road mainly comprise the low rise residential villages towards the northwest and the residential podium structures and shopping centres within Greater Shatin towards the southeast.

3.0 CONSTRUCTION PHASE IMPACTS

3.1 Environmental Monitoring and Audit

Construction phase impacts will be regulated by an Environmental Monitoring and Audit (EM&A) programme which will monitor noise and air quality impacts. An EM&A Manual has been included in the EIA Report and issued under separate cover and defines the monitoring requirements of the programme.

3.2 Noise Impacts

Seven broad construction activities have been identified as having the potential to generate noise impacts at nearby NSRs such as excavation, filling and construction. Due to the close proximity of the sensitive receivers and the confined nature of the works area, exceedances of the recommended daytime construction noise limit have been predicted from these operations.

Appropriate mitigation measures have been recommended in the EIA and include the incorporation of silencers on exhaust pipes, the use of mufflers and construction of temporary noise barriers and enclosures. For those receivers where impacts would still exceed the noise standard, further restrictions on the time of the uses of equipment would be implemented. The application of these measures has been shown to reduce noise impacts to acceptable levels and thus, predicted mitigated noise levels will meet the daytime construction noise criteria.

3.3 Construction Dust Impacts

With the adoption of general control measures both the predicted 1-hour and 24-hour dust concentrations at the representative sensitive receivers are predicted to be consistently within the required standards. The following general control measures will be applied to ensure that acceptable dust levels are maintained:

- watering of unpaved roads and dusty activities;
- watering of exposed areas every 1.5 hours;
- limit dropping heights for excavated materials during handling and loading/unloading operations;
- dampen or cover material during transportation;
- do not load material to a level higher than the side and tail boards during transportation; and
- all stockpiles of aggregate or spoil should be covered and watered.

3.4 Landscape Impacts

During the construction stage there will only be a slight adverse landscape impact as the road improvements are confined to the existing alignment of the Tai Po Road. There are no requirements for the creation of significant site formation works although the widening of the carriageway and the temporary works areas will require the felling and transplanting of a number of tree specimens.

3.5 Visual Impacts

During the construction stage of the road improvement works there will be a significant visual impact for the adjacent sensitive receivers due to the reconstruction of the road surface, the widening of the carriageway, installation of the noise barriers, and the reconstruction and widening of the Sha Tin Rural Committee Road/Tai Po Road Interchange.

4.0 OPERATIONAL IMPACTS

4.1 Noise Impacts

The traffic noise assessment was based upon predicted peak hour traffic flows at 15 years after the anticipated commissioning of the scheme.

The noise sensitive receivers are close to the proposed scheme and predicted noise levels during the operation of the scheme will exceed the criteria at the majority of representative sensitive receivers. Extensive mitigation measures are required.

Direct mitigation has been evaluated prior to assessing compliance in accordance with the TM requirements. The majority of direct mitigation will be along the southbound carriageway (Kowloon bound) of Tai Po Road, between Fo Tan Road and Lion Rock Tunnel Road.

The recommended mitigation scenario comprises a combination of top-bent barriers along the Kowloon bound carriageway. Most of the top-bent barriers are 11.0m in height with top-bent widths varying between 1.0m and 10.0m. Vertical barrier height varies between 2.0m and 6.0m. The total length of noise barriers proposed is about 3000m. These represent the maximum practicable direct mitigation measures that can be applied within the structural, traffic and safety constraints. The direct mitigation measures provide attenuation of the operational noise levels to within the acceptable standard at most dwellings. The locations of the noise mitigation structures are shown on Drawing 1 and cross-sections of the barriers

detailed in Drawings 2a, 2b and 2c.

In respect of dwellings that are predicted to be exposed to traffic noise levels exceeding the limits recommended in the TM even after all direct technical remedies have been applied, eligibility for indirect technical remedies in terms of acoustic insulation and air conditioners has been assessed. No dwelling is eligible for indirect technical remedies.

4.2 Air Quality Impacts

The worst case year for traffic flows and emission factors was determined to be 2021 for the air quality impact assessment. Determination of carbon monoxide, respirable particulates and nitrogen dioxide levels was undertaken to assess the operational air quality impacts resulting from the improvement works and the inclusion of the noise mitigation measures discussed above.

The predicted levels obtained showed that, both with and without the direct mitigation in place, levels of CO, RSP and NO₂ would be within their relevant Air Quality Objectives. Thus, no operational air quality mitigation is required.

4.3 Water Quality Impacts

The only sensitive receiver for water quality is the surface drainage system which drains into the Shing Mun River Channel.

The principal impact during construction and operation of the project will be increases in suspended solids which could be contaminated by other pollutants. Mitigation has been designed for the construction stage which will reduce these impacts to acceptable levels. No unacceptable impacts are anticipated during the operation stage of the project.

4.4 Landscape and Visual Impacts

The landscape impacts will be minimal as the proposed road improvements are confined to the existing alignment of the Tai Po Road. There will only be a low degree of change to the key component features within the existing landscape. The road improvement works, incorporating extensive landscape mitigation measures, will not have a direct impact upon specific landscape elements or any acknowledged special landscape interests. It will have a subtle effect upon the overall pattern of landscape elements. The road widening and addition of noise barriers will reduce the available open area for vegetation planting.

The road improvement works, incorporating extensive landscape mitigation measures, will be visually compatible with the existing topography and land uses within the visual target area. There will be a slight to medium adverse visual impact from the majority of sensitive receivers created by the extensive noise barriers and the increase in the spatial extent of the carriageway. Appropriate landscape design measures will be developed in order to mitigate the assessed impacts as far as possible, increase visual quality and help blend the road and its traffic into the surrounding landscape. The mitigation measures will include consideration of planting of engineered slopes, road verges, central dividers and around structures; screen noise barriers; and hard landscape treatment of the carriageway and roadside furniture. This includes the development of chromatic themes in the architectural treatment of engineering structures, and the consideration of landscape lighting and special landscape features.

4.5 Waste Management Impacts

Waste from the project will comprise:

- (a) excavated materials. There will be about 40,000 cu m of material to be excavated, some of which can be re-used on the site, but most will be disposed of at public fill sites
- (b) other waste during construction such as general construction waste, chemical waste, general refuse and sewage from site facilities.

All waste will be disposed of in accordance with the normal standards applicable to construction activities and no residual impacts are expected. There will be no waste during operation of the project.

4.6 Land Use Impacts

In respect to the land use zonings there are no short or long-term impact of any significance. The main reason for this is that the road improvement works incorporate only modifications of the existing alignment so therefore the effect on land uses will be confined to the land use zoning for the Tai Po Road (Shatin Section). There are no major engineering works or proposed new alignments and therefore the specific land use zoning for the road improvement works will not require any gazetted amendments. The development potential in respect to the land uses in the vicinity of the Shatin Section will improve considerably due to the installation of the extensive noise barriers and additional planting. There is only one major proposed development in the immediate vicinity of the Shatin Section. A 35-storey residential development in Fung Wo Lane will benefit from the proposed road improvements including the extensive noise barriers that will reduce the noise and aesthetic impact created by the existing carriageway.

5.0 ENVIRONMENTAL MONITORING AND AUDIT (EM&A)

Adverse impacts have been identified during the construction and operation phases of the project. The recommended measures will help to minimise the impacts. In order to ensure the mitigation measures are properly implemented and the works are conducted in an environmentally controlled manner, an environmental monitoring and audit programme has been developed. Noise and dust monitoring is recommended throughout the whole construction period. Regular site inspections shall be also conducted during the whole construction period to ensure the contractor's compliance with the relevant work specifications.

Baseline monitoring and impact monitoring for the above aspects will also be required to provide data on the initial ambient condition for the future assessment. The EM & A manual specifying the objectives and responsibilities of monitoring and audit, together with protocols for undertaking these activities has been prepared. The manual lists out the requirement for air, noise, water, waste, and ecology monitoring, site inspections, auditing and complaints handling procedures.

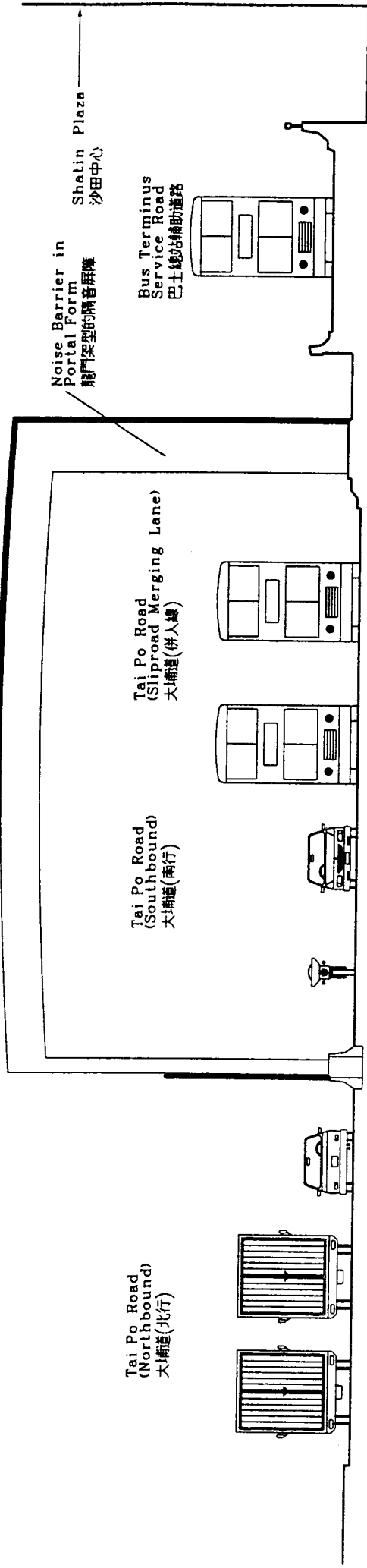
The environmental monitoring will ensure that the appropriate design measures will be developed to mitigate the assessed impacts of the road proposals as far as possible. The aspects subject to landscape and visual auditing in this Project are detailed specifications for trees to be retained, transplanted and felled and a 12-month maintenance schedule for the landscape works.

Monitoring and audit of noise during the first year of operation of the scheme is also recommended.

6.0 CONCLUSIONS

The project has been assessed in accordance with the requirements of the EIAO and mitigation has been developed to reduce any impacts to acceptable levels. There will be no residual impacts except for a few properties where traffic noise will be in excess of the standards required under the TM. These properties have been assessed for eligibility for indirect mitigation and it has been concluded that none are eligible.

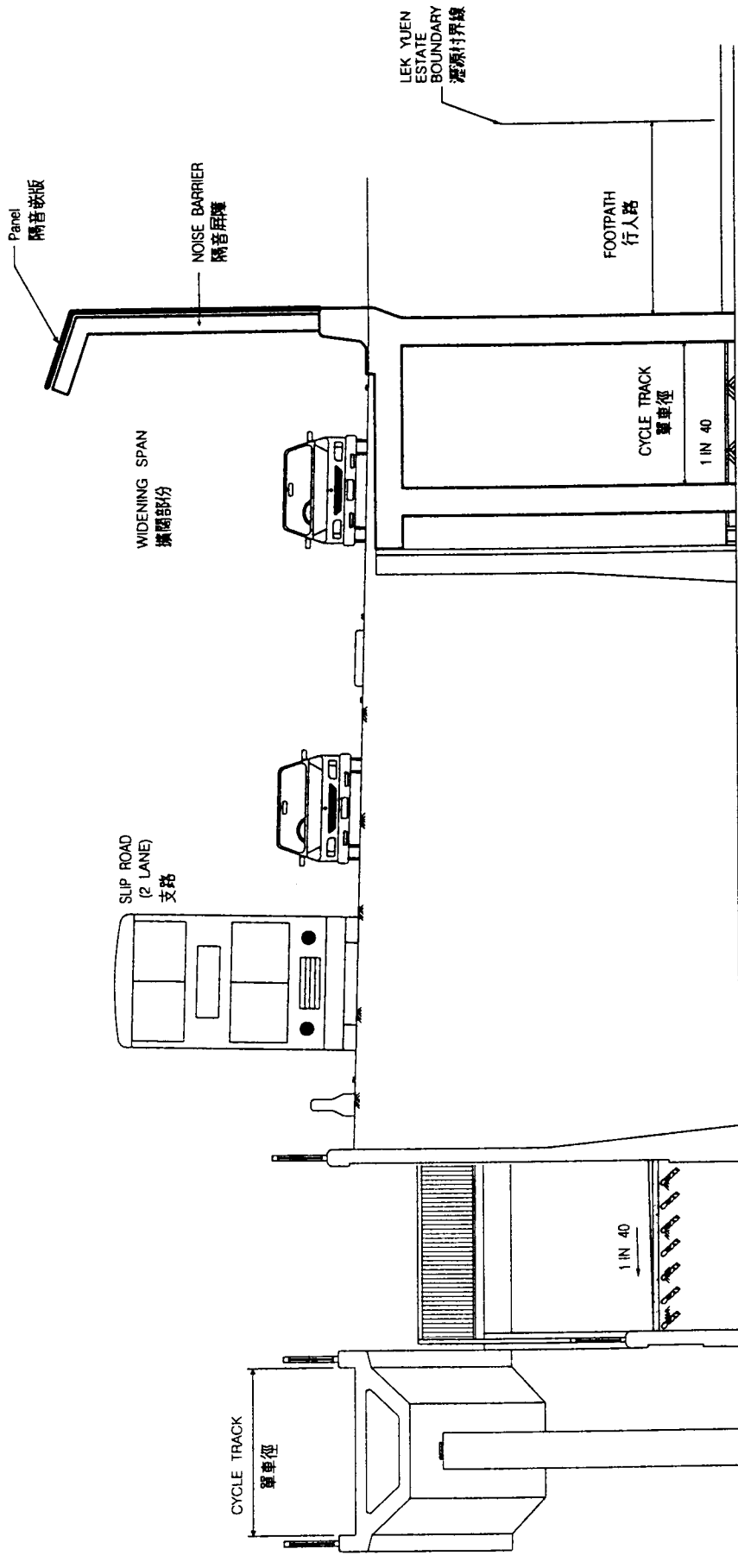
Panel
隔音板



Typical Carriageway Section with Noise Barrier at the frontage of Shatin Plaza

Drawing 2a

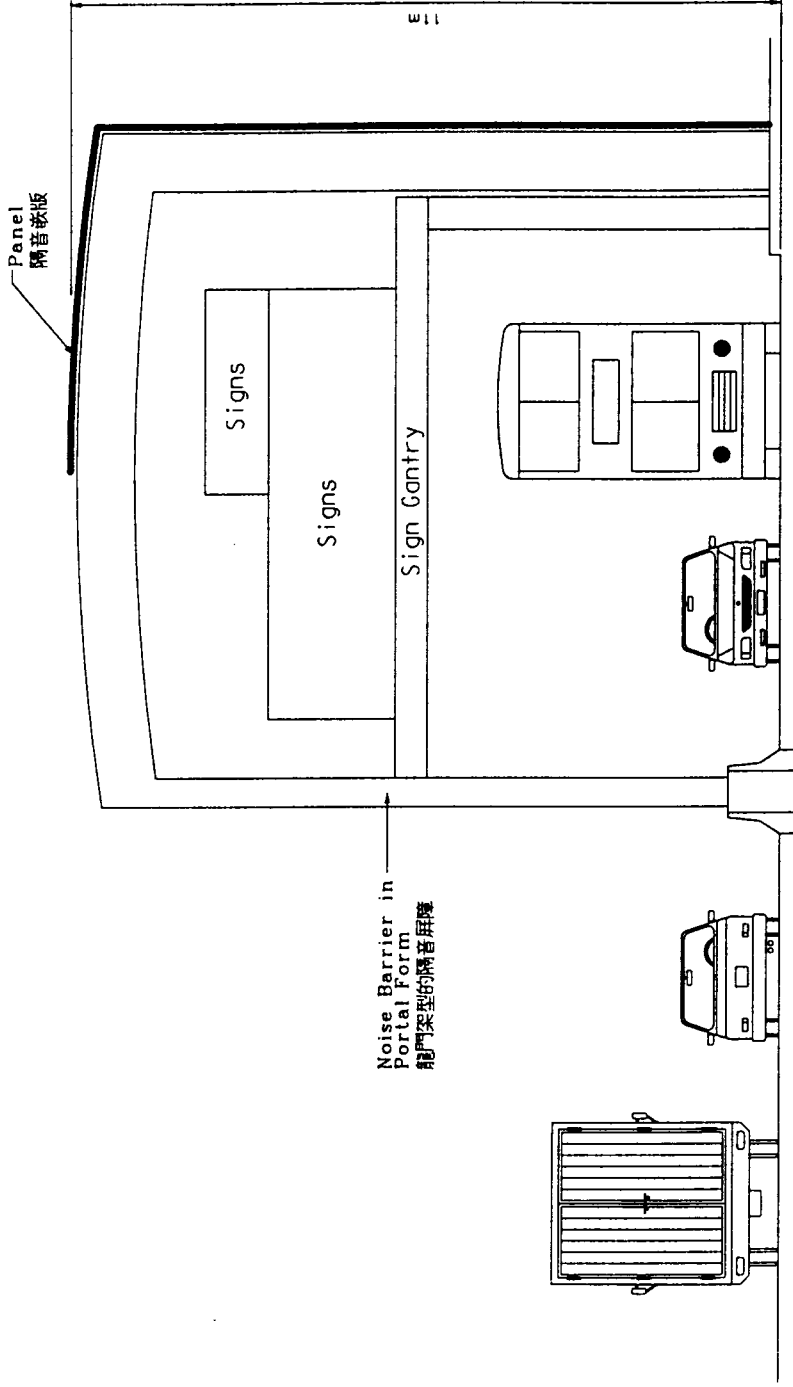
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Drawing 2b

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Typical Carriageway Section with Noise Barrier on the Slip Road at the frontage of Lek Yuen Estate



Typical Carriageway Section with Noise Barrier at the frontage of Wo Che Estate Near Fo Tan Road

Drawing 2c

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