

BERGEN BYBANE – NOISE REDUCTION BY TRACK DESIGN

Arild Brekke

Brekke & Strand akustikk as
Postboks 1024, 0218 Oslo, Norway
Arild.Brekke@bs-akustikk.no

1. INTRODUCTION

The track form in the city roads for the new Bergen Bybane will be embedded rails on a concrete slab. The fundamental property of the embedded rail system is to insure electric isolation between the rail and the slab. In addition the stiffness of the rail support may influence on several factors as:

- Ground borne noise transmission
- Airborne noise transmission
- Growth of rail roughness
- Passenger and driver ride comfort

The paper is mainly concerned on the vibration isolation for the embedded rail system which is decisive for the airborne noise from the track and for the ground borne noise transmission.

Experiences from trams in Oslo is that there very often is a frequency maximum in the frequency region 100 – 125 Hz for both airborne and ground borne noise. The frequency is from the passing of the wheel on waves in the rail surface. Vibration is transmitted from the rail to the concrete slab, and airborne noise and ground borne noise is transmitted from the slab. The sound insulation for the windows in many cases have a weakness which coincides with the wheel passing frequency and the indoor noise levels become very high. In order to reduce the noise the resonance frequency for the embedded rail system should be as low as possible. However the maximum rail deflection cannot be too high in order to secure satisfactory condition for the sealing between the rail and the asphalt.

The paper gives a discussion on the factors which influences on the embedded rail system vibration isolation, and the requirements for the Bergen Bybane track is given