Highway Noise Analysis
Design Considerations

Purdue Road School

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ODOT Design Experience

- Design parameters from preliminary development
- Locations shown in environmental document
ODOT Design Experience

- Design parameters from preliminary development
- Locations shown in environmental document
- Confirmed and/or warranted locations are advanced through detailed analysis and public approval and selection

Design Information

- Longitudinal location
- Offset location: cut/fill
Design Information

- Longitudinal location
- Offset location: cut/fill
- Height of need
- Material type, texture, color
- Geotechnical information for foundation design

Design Concerns

- Drainage
Design Concerns

- Drainage
- Clear Zone
- Structural attachment
- Aesthetics
Design Concerns
- Drainage
- Clear Zone
- Structural attachment
- Aesthetics
- Cost

ODOT Design Process
- Shown in plan view
ODOT Design Process

- Shown in plan view
- Typical cross section
- Height of need shown on the profile view; also depicted in cross section

Special details for structural attachments, etc.

- Plan insert sheets (standard details)
- Foundation design details and procedures
- Approved manufacturers
- Post spacing
- Some mounting details
ODOT Design Process

- Specify material type, color, texture
- Quantity calculations
- ODOT website: www.dot.state.oh.us (Documents & Publications) (Plan Insert Sheets)

Changes in noise barrier design

- 1. Aesthetics
  - Top of wall steps
Changes in noise barrier design

1. Aesthetics
   - Top of wall steps
   - Texture on highway or receiver side

Changes in noise barrier design

1. Aesthetics
   - Top of wall steps
   - Texture on highway or receiver side
   - Post type and texture
Changes in noise barrier design

1. Aesthetics
   - Top of wall steps
   - Texture on highway or receiver side
   - Post type and texture
   - Wall and post caps

2. Gaps not tolerated
   - Changing from cut to fill
   - Structure to ground
Changes in noise barrier design (lessons learned)

- 3. Sound absorption
  - Specify location to be used
  - Bid quantities

- 4. Design impact loads
  - Design for wind loading in the past
  - Impact load problem is alleviated if a separation can be provided (between noise barrier and roadway barrier)
  - Provide a crash worthy combination of noise barrier and roadway barrier
Changes in noise barrier design (lessons learned)

3. Sound absorption
   - Specify location to be used
   - Bid quantities

4. Design impact loads
   - Design for wind loading in the past
   - Impact load problem is alleviated if a separation can be provided (between noise barrier and roadway barrier)
   - Provide a crash worthy combination of noise barrier and roadway barrier
   - Ohio, Texas and Florida dealing with combined roadway barrier (parapet) and noise barrier
   - Impact loads with large trucks (NCHRP Report 350)

5. Noise barriers on bridge structures are being designed
   - A developing process
   - Construction cost vs. structural integrity is a primary concern
   - Reviewed on case-by-case basis
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