Highway Noise Analysis
Design Considerations

Purdue Road School

Michael F. Johnston, P.E.

ms consultants
engineers
architects
planners

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

**ODOT Design Process**

- 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](http://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
  - 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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