
www.dot.state.oh.us/construction/oca/
or
www.dot.state.oh.us/geotechnical/
Background

- $11 million of subgrade stabilization change orders in 2000
- $10 million of subgrade stabilization change orders in 2001
  - Senior Leadership asked OGE and Construction to reduce subgrade related change orders

- 2001 FHWA review of ODOT Geotechnical Engineering Program
  - All 12 Districts claim soft subgrades are the typical construction problem

- Contingency quantities skew bids and are not acceptable for subgrade stabilization plan notes

- Subgrade stabilization, or treatment, is currently performed for constructability purposes only → the improved subgrade strength is not currently considered in the pavement design

- Limits and quantities of partial stabilization are verified and adjusted in the field based on proof rolling and visual observation
Interim Guidelines for Plan Subgrade Treatments (November 2001)

- Design Procedure to predict areas of anticipated instability and plan vertical and horizontal limits of subgrade treatment and treatment type
- Based on procedures used for years in construction
- Predict areas of anticipated instability
  - Natural moisture content > optimum moisture +3%
  - Optimum moisture content based on Atterberg limits for cohesive soils
- Identify depth, type, and % area of treatment
  - Based on average lowest standard penetration blow count (N) recorded in top 5.0 feet of proposed subgrade
- Type and location of project affects stabilization options (new vs. rehabilitation, urban vs. rural)
- Rubblize and Roll not a rehabilitation option when average N < 15 bpf
- Reference to 2002 CMS
- Only consider lime if PI>20, otherwise use cement
- When average N is less than 5 bpf, only consider undercut
GB1: Plan Subgrades (July 11, 2003)

- Refined optimum moisture content estimate (establish a minimum value)
- Maximum N = 30 bpf for averaging
- Eliminate N>20 bpf stabilization procedure
- Eliminate % area to be treated - to much like a contingency
- Establish minimum laboratory testing requirements (lab classify [including hydrometer] 2 samples within top 5.0 feet of proposed subgrade)
- Establish boring locations based on type of rehabilitation
- Establish global treatment threshold - consider when >30%
- Eliminate Average Lower N – 1 standard deviation
Future Modifications Being Considered

- Treatment required where average lower N < 10 bpf, regardless of moisture content
- Exclude bedrock subgrade when averaging N
- Average N should always be rounded to nearest whole number
- Explore considering lime for PI > 16
Subgrade Investigation
Recommendations

• Must clearly present methods, locations and dimensions (including depth) of treatment - see SSI 5.3.2.1
• Never visually classify A-4b, A-7-5, A-2-5 soils present in top 3.0 feet of proposed subgrade
• No need to regurgitate the specifications
• Segregate and analyze alignment appropriately (by station, left and right, pavement/widened portion, etc.)
• Always present calculations (see SSI 5.3.2). Interpretation column is the most important
• Always consider construction: partial rubblize and roll, piecemeal chemical stabilization, etc. may not be practical
• Design CBR = Average or 50th percentile CBR (optimum conditions)
• Never design pavement unless scoped