U.S. 35/64 Interchange
Ramp 5 Lightweight Backfill for Embankment & MSE Walls

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WV DOT
### Soil Layers and Properties

- **0-10’** Lean Clay
- **10’-15’** Clayey Sand
- **15’-20’** Sand
- **20’-69’** Alluvial & Lakebed

### Material Properties

<table>
<thead>
<tr>
<th>Material</th>
<th>γ</th>
<th>φ</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat Clay</td>
<td>119</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Lean Clay</td>
<td>120</td>
<td>23</td>
<td>50</td>
</tr>
<tr>
<td>Silt Sand</td>
<td>124</td>
<td>28</td>
<td>0</td>
</tr>
</tbody>
</table>
Settlement Amounts (Calculated)

400-500 days 90% settlement without drains

90-120 days with drains

Conventional fill
22-30 inches at Abutment 2
OR 6-9 inches in body of MSE wall

Bottom Ash Fill
10-12 inches at Abutment 2
4-6 inches in body of MSE Wall
## Bottom Ash (Granular Backfill)

### Typical Properties

<table>
<thead>
<tr>
<th>Physical Properties</th>
<th>Mechanical Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Gravity</td>
<td>Maximum Dry Density 70-100 lbs/ft³</td>
</tr>
<tr>
<td>2.1-2.7</td>
<td>Optimum Moisture 12-24 %</td>
</tr>
<tr>
<td>Dry Unit Weight</td>
<td>LA Abrasion 30-50 %</td>
</tr>
<tr>
<td>45-100 lbs/ft³</td>
<td>Sodium Sulfate Soundness 1.5-10 %</td>
</tr>
<tr>
<td>Plasticity</td>
<td>Shear Strength 38-42 °</td>
</tr>
<tr>
<td>None</td>
<td>California Bearing Ratio 40-70 %</td>
</tr>
<tr>
<td>Absorption</td>
<td>Perm. Coefficient 10⁻² - 10⁻³ cm/sec</td>
</tr>
<tr>
<td>0.8-2.0 %</td>
<td></td>
</tr>
</tbody>
</table>
# Electrochemical Specifications

## Requirements
- Resistivity > 3000 ohm Centimeter
- Ph 5-10
- Chlorides < 100 parts per million
- Sulfates < 200 parts per million
- Organic Content: 1% Maximum

## Test Results
- 5710-7344 ohm Centimeter
- 5.5 to 6.5
- Test Waived
- Test Waived
- 1.8 to 2.8
Fill void with corrosion inhibiting mastic
Figure 31, Extension rod and coupler attached to inspection rod
Figure 34. Securing jack with vise grips on inspection element
Summary