DISINTERGRATING HEADWALLS & WINGWALLS

To LINKFIELD ROAD

To MERRIAN LANE

Grating Drainage

DETERIORATING INVERT, SEPARATING PIPE SEGMENTS

STONE WALL

NORTHFIELD ROAD

PLAN VIEW

NTS

POTENTIAL SCOUR PROBLEM

FLOW

6'-0" Reinforced Concrete Pipe

SECTION LOOKING SOUTH

NTS

ELEVATION

NTS

Lenard Engineering, Inc.

CIVIL, ENVIRONMENTAL AND HYDROLOGICAL CONSULTANTS

2580 MAIN STREET
CLINTON, CT. 06615
0803 879-7100

18 MIDSTATE DRIVE
ALBURN, MA. 0100 797-0000

BRIDGE #153-002

PREPARED FOR

NORTHFIELD ROAD
OVER STEELE BROOK
WATERFORD, CONNECTICUT

DRAWING DATE
AUGUST 10, 2002

DESIGNED BY

DRAWING SHEET
3

CHECKED BY

PRINTED BY
### 3 - NORTHFIELD ROAD
**OVER STEELE BROOK**
*Bridge No. 153-002*
*Town of Watertown, Connecticut*

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>ITEM DESCRIPTION</th>
<th>CODE</th>
<th>ADDITIONAL CODE DIGITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Detour Length (in miles)</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Lanes on the Structure</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Average Daily Traffic (ADT)</td>
<td>420</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Approach Roadway Width</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Traffic Safety Features (0= not OK, 1= OK)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>36A</td>
<td>Bridge Railings</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>36B</td>
<td>Railing Transitions</td>
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<td></td>
</tr>
<tr>
<td>36C</td>
<td>Approach Guiderails</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>36D</td>
<td>Approach Guiderail Ends</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Structure Type, Main Span</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>51</td>
<td>Bridge Roadway Width, Curb-to-Curb</td>
<td>24</td>
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</tr>
<tr>
<td>53</td>
<td>Minimum Vertical Clearance over Bridge Roadway</td>
<td>9999</td>
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</tr>
<tr>
<td>58</td>
<td>Deck Condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Superstructure Condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Substructure Condition</td>
<td></td>
<td></td>
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<tr>
<td>61</td>
<td>Channel and Channel Protection</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Culverts (enter &quot;100&quot; if structure is not a culvert)</td>
<td>4</td>
<td></td>
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<tr>
<td>66</td>
<td>Inventory Rating</td>
<td>2</td>
<td>20</td>
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<td>67</td>
<td>Structural Evaluation</td>
<td>5</td>
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<td>68</td>
<td>Deck Geometry</td>
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<td>69</td>
<td>Underclearances</td>
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<td>71</td>
<td>Waterway Adequacy</td>
<td>5</td>
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<td>72</td>
<td>Approach Roadway Alignment</td>
<td>8</td>
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</tr>
<tr>
<td>100</td>
<td>Defense Highway Designation (0=no, 1=yes)</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

#### 1. STRUCTURAL ADEQUACY AND SAFETY (S1, 55 MAX., 0 MIN.)

1.a. Factors A through H

IF THE STRUCTURE IS A BRIDGE (#62 = 100), MIN (#59, #60) = 0

A= 0.0
B= 0.0
C= 0.0
D= 0.0

IF THE STRUCTURE IS A CULVERT (#62 IS BETWEEN 0 AND 9)

E= 0.0
F= 0.0
G= 25.0
H= 0.0

1.b. Reduction for Load Capacity (Factor I)

Adjusted Inventory Tonnage (AIT) = 20

I= 17.8

**S1 = 55-(A+B+C+D+E+F+G+H+I)** 12.22
### 2. SERVICEABILITY AND FUNCTIONAL OBSOLESCENCE (S2, 30 MAX., 0 MIN.)

**2.a. Rating Reductions (13 maximum)**

<table>
<thead>
<tr>
<th>Class</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
</tr>
</tbody>
</table>

\[ J = (A+B+C+D+E+F) \text{ (0 minimum, 13 maximum)} = 13 \]

**2.b. Width of Roadway Insufficiency (15 maximum)**

| X = (ADT / Lane) = #29 / #28 = | 210 |
| Y = (Curb-to-curb width / no. of lanes) = | 12 |
| G = If (#51+2ft)<#32 (applies if structure is not a culvert) | 0 |

\[ H = \begin{cases} 10 & \text{if } X \leq 50 \\ 0 & \text{if } 50 < X \leq 125 \\ 10 & \text{if } 125 < X \leq 375 \\ 0 & \text{if } 375 < X \leq 1350 \\ 0 & \text{if } 1350 < X \end{cases} \]

\[ G + H \text{ (15 maximum)} = 10 \]

**2.c. Vertical Clearance Insufficiency (2 maximum)**

| I = | 0 |

\[ S2 = 30-(J+(G+H)+I) = 7 \]
3 - NORTHFIELD ROAD
OVER STEELE BROOK
Bridge No. 153-002
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3. ESSENTIALITY FOR PUBLIC USE (15 MAXIMUM)

3.a. \[ K = \frac{(S1+S2)}{85} = \]
= 0.23

3.b. \[ A = \frac{(#29 \times #19 \times 15)}{(200,000 \times K)} = \]
\[ (0 \leq A \leq 15) \]
= 0.626859964

3.c. Based on Defense Highway designation \[ B = \]
= 0

\[ S3 = 15 - (A + B) = \text{(not less than 0 or more than 15)} = \]
= 14.37

4. SPECIAL REDUCTIONS (USE ONLY WHEN S1+S2+S3>=50)

4.a. and 4.b. do not apply to small municipal bridges

\[ A = \]
= 0

\[ B = \]
= 0

4.c. \[ C = \]
= 0

\[ S4 = A + B + C = \text{(use only if S1+S2+S3} \geq 50) \]
= 0

SUFFICIENCY RATING (SR) = S1 + S2 + S3 - S4 =
= 33.59

PRIORITY RATING (PR) =

For Bridges:
\[ PR = SR - 2 \left[ 1 - \frac{(#58 + #59 + #60)}{27} \right] - 4(1 - \frac{#66}{36}) \]

For Culverts and Arches:
\[ PR = SR - 2 \left( 1 - \frac{#62}{9} \right) - 4(1 - \frac{#66}{36}) \]