# NCDOT Pipe Material Selection Guide

## Class II (Reinforced Concrete) AASHTO M170

<table>
<thead>
<tr>
<th>RCP</th>
<th>CSP (Corrugated Steel) AASHTO M36</th>
<th>CAAP (Corrugated Aluminum) AASHTO M764</th>
<th>HDPE AASHTO M294</th>
<th>ASTM P2764 or AAHSHTO M330</th>
<th>PVC ASTM 2694 or AASHTO M304</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50</td>
<td>12&quot;</td>
<td>12&quot;</td>
<td>12&quot;</td>
<td>12&quot;</td>
<td>1.0'</td>
</tr>
<tr>
<td>1.00</td>
<td>13&quot;</td>
<td>14&quot;</td>
<td>15&quot;</td>
<td>14&quot;</td>
<td>1.0'</td>
</tr>
<tr>
<td>2.00</td>
<td>18&quot;</td>
<td>19&quot;</td>
<td>20&quot;</td>
<td>20&quot;</td>
<td>1.0'</td>
</tr>
<tr>
<td>4.00</td>
<td>30&quot;</td>
<td>31&quot;</td>
<td>36&quot;</td>
<td>36&quot;</td>
<td>1.0'</td>
</tr>
</tbody>
</table>

### FILL TABLES

- **INTERSTATE**
  - Use only if pipe slope is greater than 10%.
  - Use only if pipe slope is greater than 10%.
  - Do not use.

- **PRIMARY**
  - Can be used.
  - Can be used.
  - Can be used.

- **SECONDARY**
  - Can be used.
  - Can be used.
  - Can be used.

| 0.50 | 12" | 12" | 12" | 12" | 1.0' |
| 1.00 | 13" | 14" | 15" | 14" | 1.0' |
| 2.00 | 18" | 19" | 20" | 20" | 1.0' |
| 4.00 | 30" | 31" | 36" | 36" | 1.0' |

### Definitions

- **Slope Drains**
  - Use only if pipe slope is greater than 10%.

- **Side Drains**
  - Use only if pipe slope is greater than 10%.

- **Transverse Median Pipes**
  - Use only if pipe slope is greater than 10%.

- **Storm Drain Systems**
  - Use only if system inlets & system outlet if pipe slope is greater than 10%.

- **Open End Cross Pipes**
  - Use only if system inlets & system outlet if pipe slope is greater than 10%.

### Notes

1. RCP is not allowed for grades > 10%.
2. For counties listed in Article 310-0 of the standard specifications CSP is not allowed. In other counties, CSP requires an acceptable coating in accordance with 1032-4.
3. For different corrugations and arch pipes refer to roadway design manual and manufacturers specifications.
4. Minimum fill height is measured from top of pipe to grade.
5. Increase pipe size one size for pipe runs with greater than 6% vertical drop to downstream structure.
6. Specify class V RCP.
7. Fill heights shown were calculated using AASHTO-LRF BRIDGE design specifications. Justify fill height or design deviations with structural design based on AASHTO-LRF BRIDGE design or ASTM standards. Submit design sealed by an PE for review & approval by NCDOT.

All pipe types are subject to the maximum and minimum fill height requirements as found in chapter 5 of the roadway design manual. The appropriate class of pipe for RCP and gauge thickness for CSP/CAAP should be selected.