

CULVERT MATERIAL COST COMPARISON

Prepared by: The New England Environmental Finance Center
For the Maine Department of Transportation Office of Environmental Planning

November 1, 2010

The following tables provide a detailed look at the role that culvert material and culvert diameter play in the overall cost of a culvert replacement project. Table 1 displays the cost per foot purchase price arranged by diameter size for the various culvert materials that are currently available. Table 2 displays the average additional culvert pipe material cost (increased cost to upsize minus original in-kind replacement cost) that would be incurred when upsizing a given diameter of culvert with a 50 foot length by factors of: 200%, 250% and 300%.

Notes: Table 1 displays cost information for Corrugated Metal Pipe (CMP) Culvert, Corrugated Metal Pipe (CMP) Elliptical Arch Culvert, Corrugated Metal Structural Plate (Bottomless) Culvert and Concrete Box Culvert. Table 2 uses a combined averaged cost of CMP Elliptical Arch Culvert and Corrugated Metal Bottomless Arch Culvert for diameters greater than 6 feet. Costs current as of August 2010.

| Cost/Lineal Foot | | | | | |
|------------------|---|--------------|---------------------|---|----------------------|
| DIAM/SPAN (feet) | CMP Culvert | HDPE Culvert | CMP Elliptical Arch | Corrugated Metal Bottomless Arch (incl. foundation) | Concrete Box Culvert |
| 2 | \$ 22 | \$ 22 | \$ - | \$ - | \$ - |
| 3 | \$ 45 | \$ 44 | \$ - | \$ - | \$ - |
| 4 | \$ 65 | \$ 68 | \$ - | \$ - | \$ - |
| 5 | \$ 115 | \$ 93 | \$ 120.00 | \$ - | \$ 200 |
| 6 | \$ 138 | \$ 92 | \$ 150 | \$ 182 | \$ 250 |
| 7 | \$ 162 | \$ - | \$ 213 | \$ 205 | \$ 375 |
| 8 | \$ 210 | \$ - | \$ 225 | \$ 248 | \$ 450 |
| 9 | \$ 240 | \$ - | \$ 267 | \$ 260 | \$ - |
| 10 | \$ 270 | \$ - | \$ 299 | \$ 291 | \$ 760 |
| 12 | \$ 330 | \$ - | \$ - | \$ 327 | \$ 900 |
| 14 | \$ - | \$ - | \$ - | \$ 430 | \$ 1,050 |
| 16 | \$ - | \$ - | \$ - | \$ 481 | \$ 1,200 |
| 18 | \$ - | \$ - | \$ - | \$ 506 | \$ 1,450 |
| LEGEND: | \$ - (blank) = material not available at this dimension | | | | |

| Average Material Upsize Additional Cost per 50 Foot Span | | | | | | | |
|--|-----------------------------|---------------------------|---------------------------|-----------------------------|-----------------------------|---------------------------|---------------------------|
| DIAM/SPAN (feet) | CMP CULVERT In-Kind Replace | 2X Upsize Additional Cost | 2X Upsize % Cost Increase | 2.5X Upsize Additional Cost | 2.5X Upsize % Cost Increase | 3X Upsize Additional Cost | 3X Upsize % Cost Increase |
| 2 | \$ 1,100 | \$ 2,300 | 309% | \$ 4,650 | 523% | \$ 6,400 | 682% |
| 3 | \$ 2,250 | \$ 4,773 | 312% | \$ 9,138 | 506% | \$ 10,524 | 568% |
| 4 | \$ 3,250 | \$ 8,138 | 350% | \$ 11,089 | 441% | \$ 13,178 | 505% |
| 5 | \$ 5,200 | \$ 14,339 | 376% | \$ 12,502 | 340% | \$ 17,310 | 433% |
| 6 | \$ 5,750 | \$ 10,678 | 286% | \$ 11,560 | 301% | \$ 19,556 | 440% |
| 7 | \$ 8,100 | \$ 13,410 | 266% | \$ 16,173 | 300% | \$ 28,553 | 453% |
| 8 | \$ 10,500 | \$ 13,543.33 | 229% | \$ 25,623.33 | 344% | \$ 29,783 | 384% |
| 9 | \$ 12,000 | \$ 13,305.83 | 211% | \$ 11,250 | 194% | \$ - | |
| 10 | \$ 13,500 | \$ - | | \$ - | | \$ - | |
| 12 | \$ 16,500 | \$ - | | \$ - | | \$ - | |
| 14 | \$ - | \$ - | | \$ - | | \$ - | |
| 16 | \$ - | \$ - | | \$ - | | \$ - | |
| 18 | \$ - | \$ - | | \$ - | | \$ - | |

Table displays additional cost (above and beyond in-kind replacement) for purchasing 50 lineal feet of pipe material in various typical diameters to meet potential upsize requirements.

% Cost Increase= [In-Kind Replace \$ + Upsize Additional Cost \$]/In-Kind Replace \$

Source: Contech Construction Products, Inc., WH Shurtleff & Co., and American Concrete Industries

Note: Concrete Box Culvert costs were not include in upsize average costs due to excessive costs