USSC **FOUNDATION**

# Computation Equations

Sign Area
Viewer Reaction
Projection Control
Letter Height

USSCF ON-PREMISE SIGNS / RESEARCH SUMMARY

# Computation Equations / Area of Sign

Perpendicular (head-on) orientation to viewer approaching sign
10 degree lateral offset R/L of viewer

$$A_{sign} = \frac{(MPH)^2}{8}$$

Fixed Values:
- 30 Letters
- 10 second Viewer Reaction Time (VRT)
- Legibility Index (LI) of 30
- 40/60 ratio, letters/negative space

Variable Value:
- Miles Per Hour (MPH)

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$$A_{sign} = \frac{[(VRT)(MPH)]^2}{800}$$

Fixed Values:
- 30 Letters
- Legibility Index (LI) of 30
- 40/60 ratio, letters/negative space

Variable Values:
- Viewer Reaction Time (VRT)
- Miles Per Hour (MPH)

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$$A_{sign} = \frac{3n}{80}\left[\frac{(VRT)(MPH)}{LI}\right]^2$$

Fixed Value:
- 40/60 ratio, letters/negative space

Variable Values:
- Number of Letters (n)
- Viewer Reaction Time (VRT)
- Miles Per Hour (MPH)
- Legibility Index (LI)

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# Computation Equations / Viewer Reaction Time

Perpendicular (head-on) orientation to viewer approaching sign
10 degree lateral offset R/L of viewer

$$VRT = \frac{LI}{MPH}\sqrt{\frac{80}{3n}A_{sign}}$$

Fixed Value:
- 40/60 ratio, letters/negative space

Variable Values:
- Number of Letters (n)
- Miles Per Hour (MPH)
- Legibility Index (LI)
- Area of Sign

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$$VRT = \frac{\sqrt{800\,A_{sign}}}{MPH}$$

Fixed Values:
- 30 Letters
- Legibility Index (LI) of 30
- 40/60 ratio, letters/negative space

Variable Values:
- Miles Per Hour (MPH)
- Area of Sign

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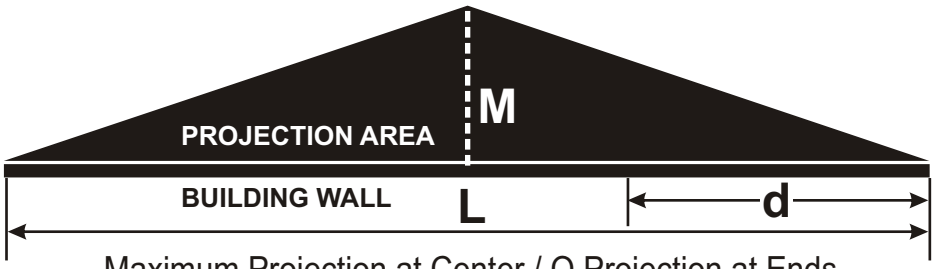
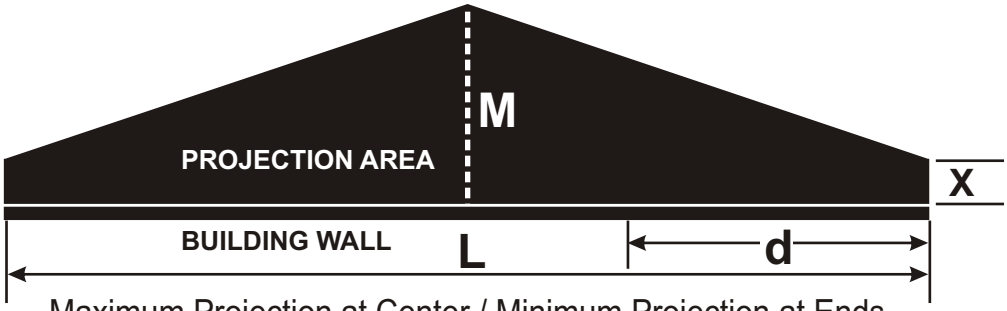
# Projecting Sign / Control Equations




Maximum Projection at Center / O Projection at Ends

$$P = \frac{2Md}{L}$$

P = Permitted Projection
M = Maximum Projection
d = Distance of Sign from Nearest End
L = Length of Building




Maximum Projection at Center / Minimum Projection at Ends

$$P = \left[ \frac{2\,(M-X)\,d}{L} + X \right]$$

P = Permitted Projection
M = Maximum Projection / X = Minimum Projection
d = Distance of Sign from Nearest End
L = Length of Building

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# Parallel Signs / Letter Height Equations

## Equation 1 - Legibility Index Unknown

$$LH = \frac{LN \times 10 + LO}{5}$$

LH = Letter Height in Inches
LN = Number of Lanes of Traffic
LO = Lateral Offset from Curb in Feet

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## Equation 2 - Legibility Index Known
See Table 1

$$LH = \frac{LN \times 10 + LO}{(LI / 6)}$$

LH = Letter Height in Inches
LN = Number of Lanes of Traffic
LO = Lateral Offset from Curb in Feet
LI = Legibility Index (Table 1)

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# USSC Legibility Index
## Table 1

| ILLUMINATION | LETTER STYLE | LETTER COLOR | Background COLOR | LEGIBILITY INDEX | |
|---|---|---|---|---|---|
| | | | | Upper & Lower Case | ALL CAPS |
| External | Helvetica | Black | White | **29** | **25** |
| External | Helvetica | Yellow | Green | **26** | **22** |
| External | Helvetica | White | Black | **26** | **22** |
| External | Clarendon | Black | White | **28** | **24** |
| External | Clarendon | Yellow | Green | **31** | **26** |
| External | Clarendon | White | Black | **24** | **20** |
| Internal Translucent | Helvetica | Black | White | **29** | **25** |
| Internal Translucent | Helvetica | Yellow | Green | **37** | **31** |
| Internal Translucent | Clarendon | Black | White | **31** | **26** |
| Internal Translucent | Clarendon | Yellow | Green | **37** | **31** |
| Internal Opaque | Helvetica | White | Black | **34** | **29** |
| Internal Opaque | Helvetica | Yellow | Green | **37** | **31** |
| Internal Opaque | Clarendon | White | Black | **36** | **30** |
| Internal Opaque | Clarendon | Yellow | Green | **37** | **28** |
| Neon | Helvetica | Red | Black | **29** | **25** |
| Neon | Helvetica | White | Black | **38** | **32** |

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