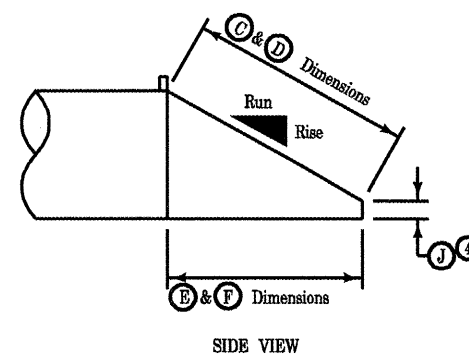
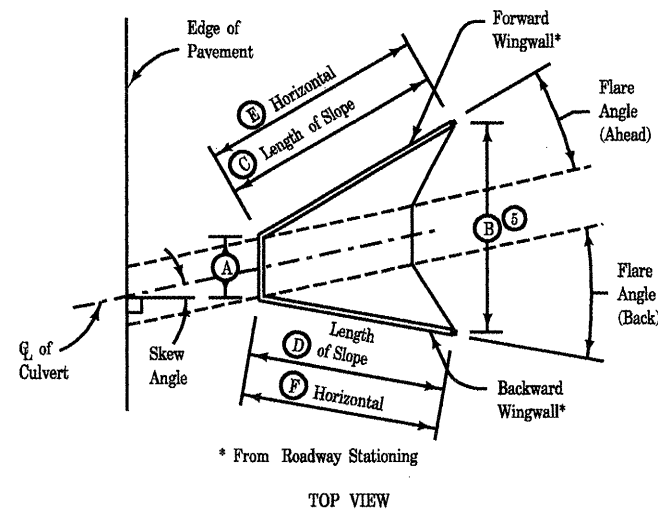
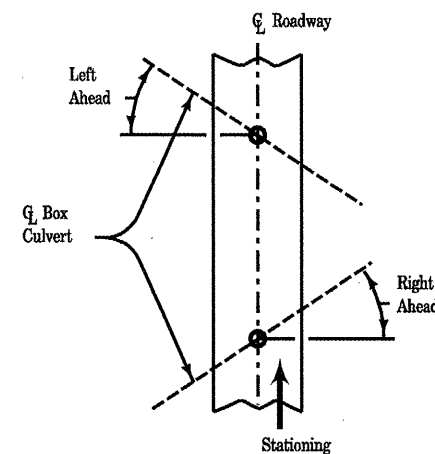


INSTALLATION TYPES

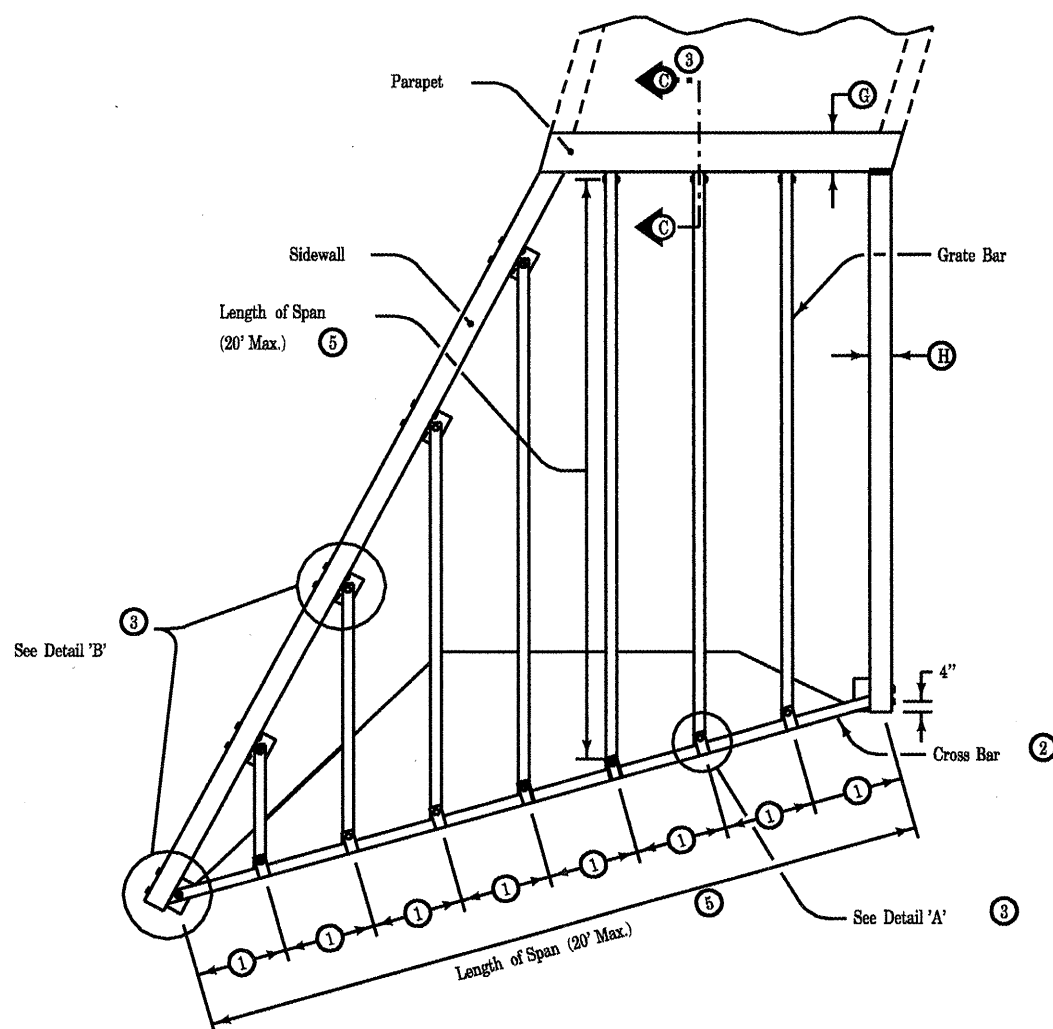
Grate bars to be perpendicular to direction of traffic flow.



DETAILS OF DIMENSIONS



SKEW ANGLE DETERMINATION



TYPICAL INSTALLATION PLAN

GRATE & CROSS BAR SIZE REQUIREMENTS		
Length of Span	Nominal Pipe Size ②	O.D. Size
0'-12'	3.0"	3.5"
12'-16'	3.5"	4.0"
16'-20'	4.0"	4.5"

See Detail Sheets 3 & 4 when midspan support is required.

For additional information, see Detail Sheet 2 for Safety Grate Treatment and Fabrication.

GENERAL NOTES:

The dimensions shown shall be verified at the site by the Contractor before fabrication of the components. The Contractor is responsible for using the correct pipe diameter, correct dimensions, and proper fit of the safety grate into the headwall opening.

Bolts, lock nuts, washers, and plates shall be installed at all locations as shown.

The bolts, nuts, and washers shall conform to the requirements of Articles 1006.09 and 1006.27(f) of the Standard Specifications. All fabrications shall be complete and ready for assembly prior to galvanizing.

Structural Steel Shapes and Plates shall be in accordance with Article 1006.04 Standard Specifications. Galvanized Steel Pipe shall be in accordance with Article 1006.27(b) of the Standard Specifications.

Gas Metal-Arc and Flux-Cored Arc welding may be used for welding incidental items as indicated on this sheet, provided that the fabricator furnishes certifications for the gas, uses approved filler metal and qualified welders.

Pipe furnished shall meet the requirements of ASTM A-53, Schedule 40, Grade B, including galvanizing.

The Contractor may encounter reinforcing steel when drilling holes through the existing structure walls

Holes drilled in the Concrete End Section shall be cored to the diameter noted. If cone-out on the other end of the hole occurs, the hole shall be filled with grout to correct the diameter of the hole.

Price bid for GRATING FOR BOX CULVERT WITH WING WALLS shall be considered full compensation for furnishing all materials and work necessary to fabricate and install the grate system as required for each headwall opening.

Anchor bolts shall be installed in accordance with Article 509.06 of the Standard Specifications.

- ① Equal spaces 24" minimum, 30" maximum edge of sidewall to center of bracket or center to center of bracket.
- ② Cross Bar diameter equal to or greater than Grate Bar diameter.
- ③ See Detail Sheet 2.
- ④ 2' maximum.
- ⑤ If more than 20', a midspan support is required. See Detail Sheets 3 and 4.