APPENDIX F FLOW SPLITTER DESIGN SPECIFICATIONS

Flow splitters must be provided for off-line facilities to divert the water quality design flow to the BMP and bypass higher flows. In most cases, it is a designer's choice whether storm water treatment BMPs described in this manual are designed as on-line or off-line; exceptions are vegetated strip filters, permeable pavement, and building BMPs which are designed on-line.

A crucial factor in designing flow splitters is to ensure that low flows are delivered to the treatment facility up to the water quality design flow rate. Above this rate, additional flows remain in the storm drain or are diverted to a bypass drain with minimal increase in head at the flow splitter structure to avoid surcharging the water quality facility under high flow conditions.

Flow splitters are typically manholes or vaults with baffles. In place of baffles, the splitter mechanism may be a half tee section with a solid top and an orifice in the bottom of the tee section. A full tee option may also be used (see "Design Criteria" below). Two possible design options for flow splitters are shown in Figures F1 and F2. Other equivalent designs that achieve the result of splitting low flows, up to the WQ design flow, into the WQ treatment facility and divert higher flows around the facility are also acceptable.

Flow splitters may be modeled using standard level pool routing techniques, as described in the Handbook of Applied Hydrology (Ven te Chow; 1964) and elsewhere. The stage/discharge relationship of the outflow pipes shall be determined using backwater analysis techniques. Orifices, if used, may be designed using the approach outlined in “Outlet Structure and Drawdown Time” in the Dry Extended Detention Basin Section 6.10.3. Weirs shall be analyzed as sharp-crested weirs.

Design Criteria

A flow splitter shall be designed to deliver the required water quality design flow rate to the storm water treatment facility.

The top of the weir shall be located at the water surface for the design flow. Remaining flows enter the bypass line.

The maximum head shall be minimized for flow in excess of the water quality design flow. Specifically, flow to the treatment facility at the capital storm water surface shall not increase the design water quality design flow by more than 10%.

Example designs are shown in Figure F1 and Figure F2. Equivalent designs are also acceptable.

Special applications, such as roads, may require the use of a modified flow splitter. The baffle wall may be fitted with a notch and adjustable weir plate to proportion runoff volumes other than high flows.

For ponding facilities, backwater effects must be included in designing the height of the standpipe in the manhole.

Ladder or step and handhold access shall be provided. If the weir wall is higher than 36 inches, two ladders, on the either side of the wall, are required.

Material Requirements

The splitter baffle shall be installed in a standard manhole or vault. The baffle wall shall be made of material resistant to corrosion (minimum 4-inch thick reinforced concrete, Type 302 or Type 316 stainless steel plate, or equivalent).

The minimum clearance between the top of the baffle wall and the bottom of the manhole or vault cover shall be 4 feet; otherwise, dual access points shall be provided.

All metal parts shall be corrosion resistant. Examples of preferred materials include aluminum, stainless steel, and plastic. Zinc and galvanized materials are not permitted because of aquatic toxicity. Painting metal parts shall not be allowed because of poor longevity.

Figure F-10: Flow Splitter - Option A

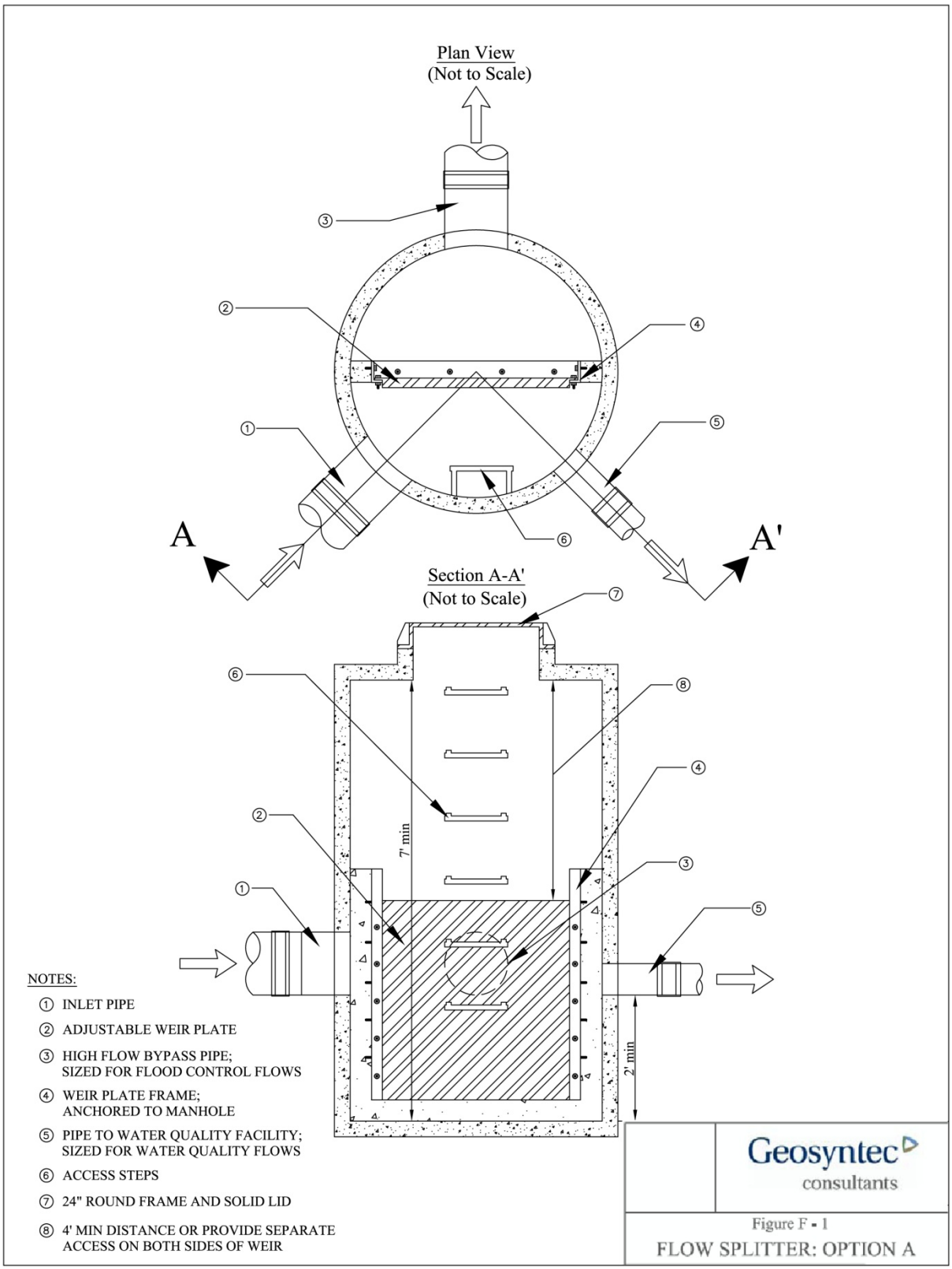

Figure F-11: Flow Splitter - Option B