CLAIMS

1. An automatic flow control gate for installation close to or at a merging junction of an open drainage system, the drainage system having a major drain and a tributary that merges with the major drain at the merging junction, the major drain and tributary each having a bottom wall and side walls to define the passage of water flow, the discharge of fluid from the major drain and tributary forming a stagnation zone from the upstream merging point of the merging junction, the gate comprising:

    a first end securable to and rotatable in a horizontal orbit about a support;

    a second free-swinging end extending at least partially into the merging junction;

    a first side; and

    an opposing side;

    whereby said automatic flow control gate swings dynamically in response to upstream discharge of the major drain impinging on its first side and tributary discharge impinging on its opposing side into an optimal position that balances the inertial forces from the merging upstream discharge and tributary discharge, and the height and width of the gate is less than the depth and width of the tributary to prevent full closure of the tributary in any situation.

2. An automatic flow control gate according to claim 1 whereby the gate is rigid.

3. An automatic flow control gate according to claim 1 or 2 whereby the gate is planar.

4. An automatic flow control gate according to claim 1 or 2 whereby the gate has a curved profile.

5. An automatic flow control gate according to claim 1 whereby the gate is capable of flexing.

6. An automatic flow control gate according to claim 5, whereby the gate is formed from an array of rigid members interconnected by flexible membrane.

7. An automatic flow control gate according to claim 5, whereby the gate comprises a vertical series of unconnected rows of rigid members, the rigid members interconnected by flexible membrane.

8. An automatic flow control gate according to any one of claims 1-7, whereby rotation of the gate is about a fixed pivot.

9. An automatic flow control gate according to any one of claims 1-7, whereby rotation of the gate is through bending of a flexible member connected to the support.

10. An automatic flow control gate according to any one of claims 1-9, further comprising a flexing trailing member extending from said free-swinging end.

11. An automatic flow control gate according to any one of claims 1-10, further comprising at least a fluid diverting means to divert a portion of the upstream discharge of the major drain to combine with the tributary discharge.

12. An automatic flow control gate according to claim 11, whereby the fluid diverting means is one or more bleeding windows.

13. An automatic flow control gate according to claim 12, whereby the bleeding window has a curved profile to direct the diverted upstream discharge to impinge on tributary facing side of the gate.

14. An automatic flow control gate according to claim 9, whereby one or more bleeding windows are formed by cuts in the connecting flexible member.

15. An automatic flow control gate according to claim 11, whereby the fluid diverting means are unidirectional slits in the gate.

16. An automatic flow control gate according to any one of claims 1-15 further comprising an automatic activation mechanism.

17. An automatic flow control gate according to claim 16, whereby the automatic activation mechanism is activated at a pre-determined water level in the merging junction.

18. An automatic flow control gate according to claims 15 or 16, whereby the automatic activation mechanism comprises a swivel lock and float assembly.

19. An automatic flow control gate according to any of claims 1-18 whereby the support is where the side wall of the major drain first meets the side wall of the tributary.

20. An automatic flow control gate according to any of claims 1-18 whereby the support is an axial support extending vertically from the bottom wall of the merging junction.

21. The method of drainage flow improvement at a merging junction in water drainage systems by installing one or more automatic flow control gates according to any of claims 1-20 close to or at the merging junction.

22. The method of claim 21, whereby the one or more automatic flow control gates are installed at the stagnation zone of the merging junction, such that the formation of such stagnation zone is reduced.