CLAIMS

1. A method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal defined by length and width and a plurality of secondary canals that discharges to the primary canal comprising:
    a. identifying sections of the network that are prone to unwanted flooding;
    b. identifying corresponding sections of the network upstream to such identified flood prone sections suitable for installing of controllable flow control means;
    c. identifying sections of the network downstream to such flood prone sections that have capacity to receive more water when flooding occurs at the identified flood prone sections;
    d. identifying corresponding sections of the network downstream to such identified flood prone sections suitable for installing of flow improvement means;
    e. installing of controllable flow control means and flow improvement means at the respective identified sections
    f. installing controllable flow diverting means to channel water downstream to the identified flood prone sections away to the sections of the network identified that have capacity to receive more water.

2. The method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal according to claim 1 further comprising monitoring rain and flood parameters of the urban open drainage channel network and activating controllable flow diverting means to channel water downstream to the identified flood prone section away to the sections identified that have capacity to receive more water at a predetermined threshold.

3. The method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal according to claim 1 characterised in that the flow improvement means comprises teat bumps, crescent vanes, confluence channel dividers and channel dividers.

4. The method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal according to claim 1 characterised in that the controllable flow control means comprises at least one holding gate in the primary canal, the holding gate having an upper edge and a lower edge and movable along a vertical axis.

5. The method of claim 4, whereby the upper edge of the holding gate is profiled for water overflow.

6. The method of claim 5, whereby the lower edge of the holding gate is profiled with an opening gap.

7. The method of claim 6, whereby the holding gate is combined with a deflecting gate vane adjacent to the opening gap to streamline water flow existing from the opening gap.

8. The method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal according to any one of claims 4 to 7 characterised in that the controllable flow control means comprises a plurality of holding gates installed along a length of the canal upstream to such identified flood prone sections.

9. The method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal according to claim 6 characterised in that the opening gap is an inverted V notch and the upper edge of the holding gate is profiled with a V notch.

10. The method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal according to claim 6 characterised in that the opening gap is an inverted V notch and the upper edge of the holding gate is a concave curve spanning the width of the gate.

11. The method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal according to claim 4 further comprising monitoring rain and

flood parameters of the urban open drainage channel network and lowering of the at least one holding gate at a predetermined threshold, thereby increasing holding water level at sections of the network upstream to identified flood prone sections.

12. The method of improving water flow characteristics of an urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal according to any one of claims 4 to 11 characterised in that the at least one holding gate is moved upwards along the vertical axis through auto-floating adjustment relative to water level in the canal through power control or manual positioning.

13. The method of improving water flow characteristics of an urban open drainage channel network according to any one of claims 1 to 12 further comprising:

    a. assessing the water flow level and its corresponding flow pressure of the channel network after installation of combination of controllable flow control means, flow improvement means and controllable flow diverting means; and
    b. installing additional flow improvement means and/or controllable flow control means for additional water flow intervention.

14. An urban open drainage channel network system comprising:
    a. an existing urban open drainage channel network, the network comprising a primary canal and a plurality of secondary canals that discharges to the primary canal, the drainage channel network identified with sections that are prone to unwanted floods;
    b. one or more controllable flow control means adapted to variably impede flow of water installed in sections of the open drainage channel network upstream to the identified sections that are prone to floods; and
    c. one or more flow improvement means installed in the sections of the open drainage channel network downstream to the identified sections that are prone to floods to streamline water flow.

15. The urban open drainage channel network system according to claim 14 further comprising
    a. sensing means to remotely detect and monitor rain and flood related parameters; and

b. controlling means to activate the controllable flow control means upon a predetermined threshold of a monitored parameter.