EAST CLAYTON DEVELOPMENT

Low Impact Development Techniques and Facilities

Presenters: Jim Dumont

October 28, 2010

Stormwater

GOALS

- Sustainability
- Stream Health

STORMWATER CONTROL

- Runoff Volume (downstream pond controls rate)

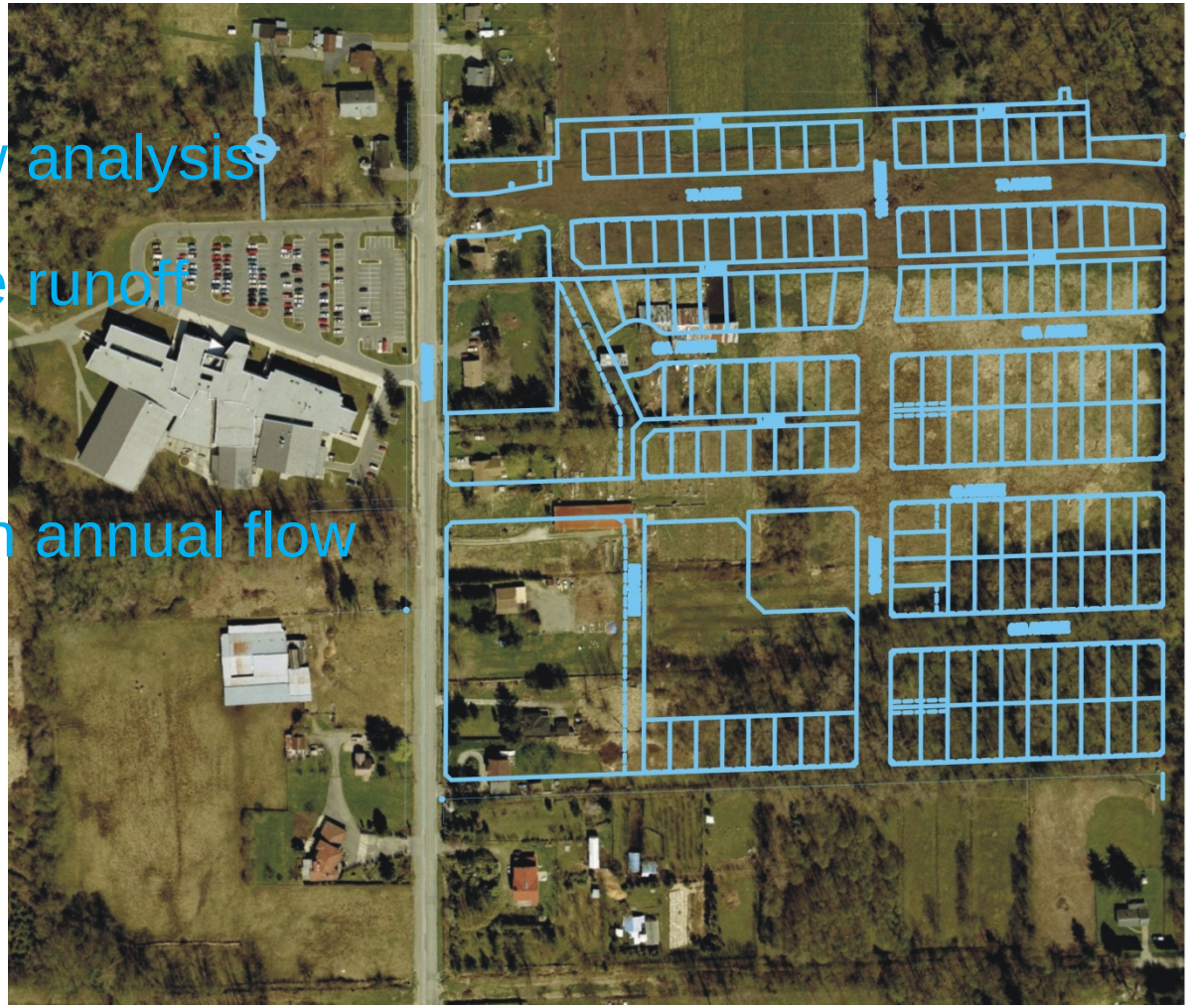
GUIDEBOOK CRITERIA

- Retain 90% of all rainfall
- Retain ½ MAS

East Clayton - Then

Phase 1

- Regional streamflow analysis
- 30% rainfall became runoff
- Runoff >base flow
- Base flow <2X mean annual flow



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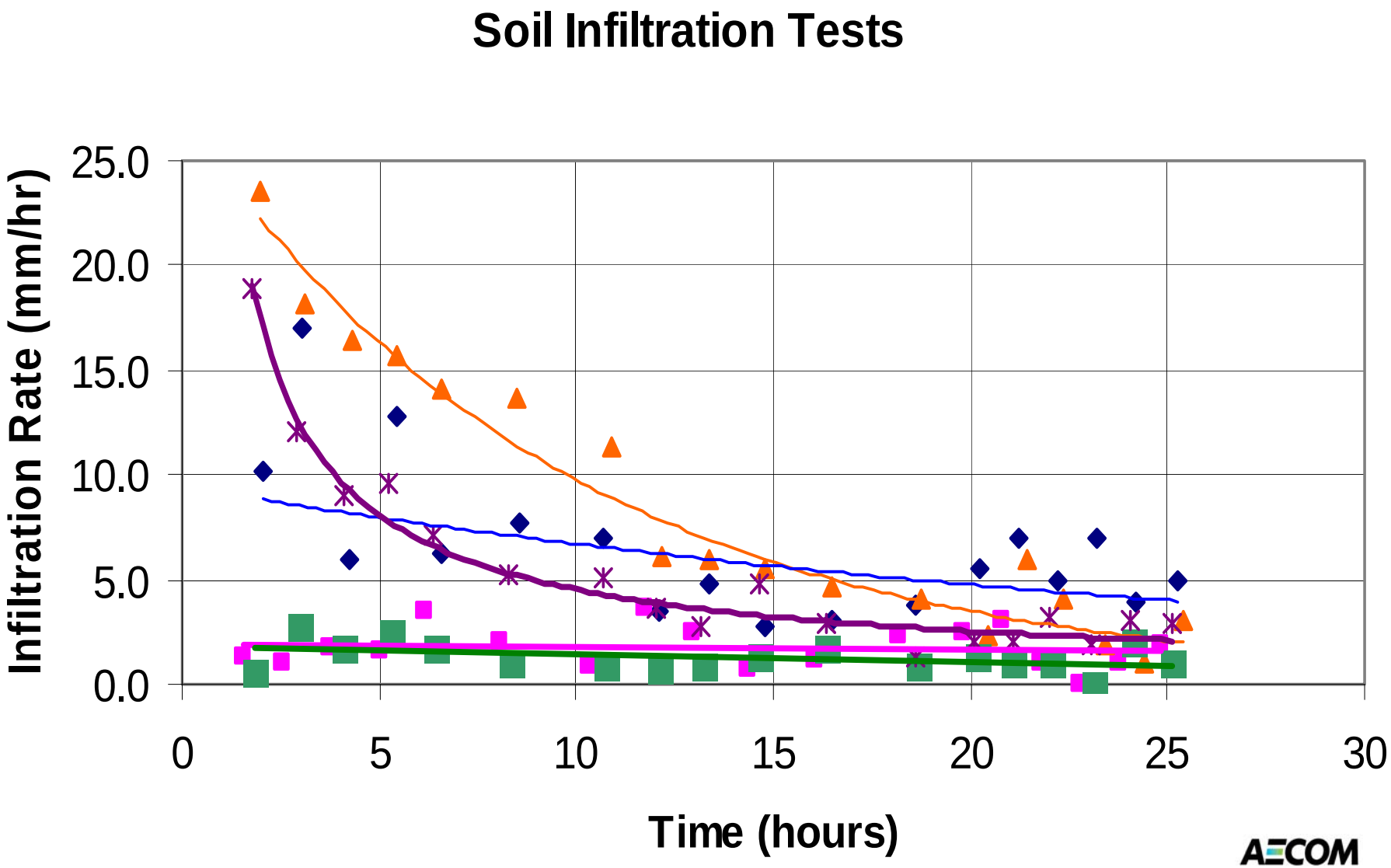
East Clayton - Now

Phase 1

- Pilot to test ideas
- Establish design criteria
- Establish design standards

Typical Subsurface Infiltration Rates



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Retained Volume and Infiltration Areas

Event	Depth	Volume for 60% Impervious	Infiltration Area Required
MAS (24 hours)	60 mm	11.5 m^3	240 m^2
½ MAS (24 hours)	30 mm	5.8 m^3	120 m^2

Assumptions:

- 320 square meter lot
- 8 UPA
- Actual impervious values
- Volume for Impervious areas only
- infiltration rate of 2 mm/hr

Design criteria:

Rainwater **retained** and **infiltrated** within **1 day** to allow for multi-day storm events

Conclusion:

½ MAS needs 40% of lot area for infiltration

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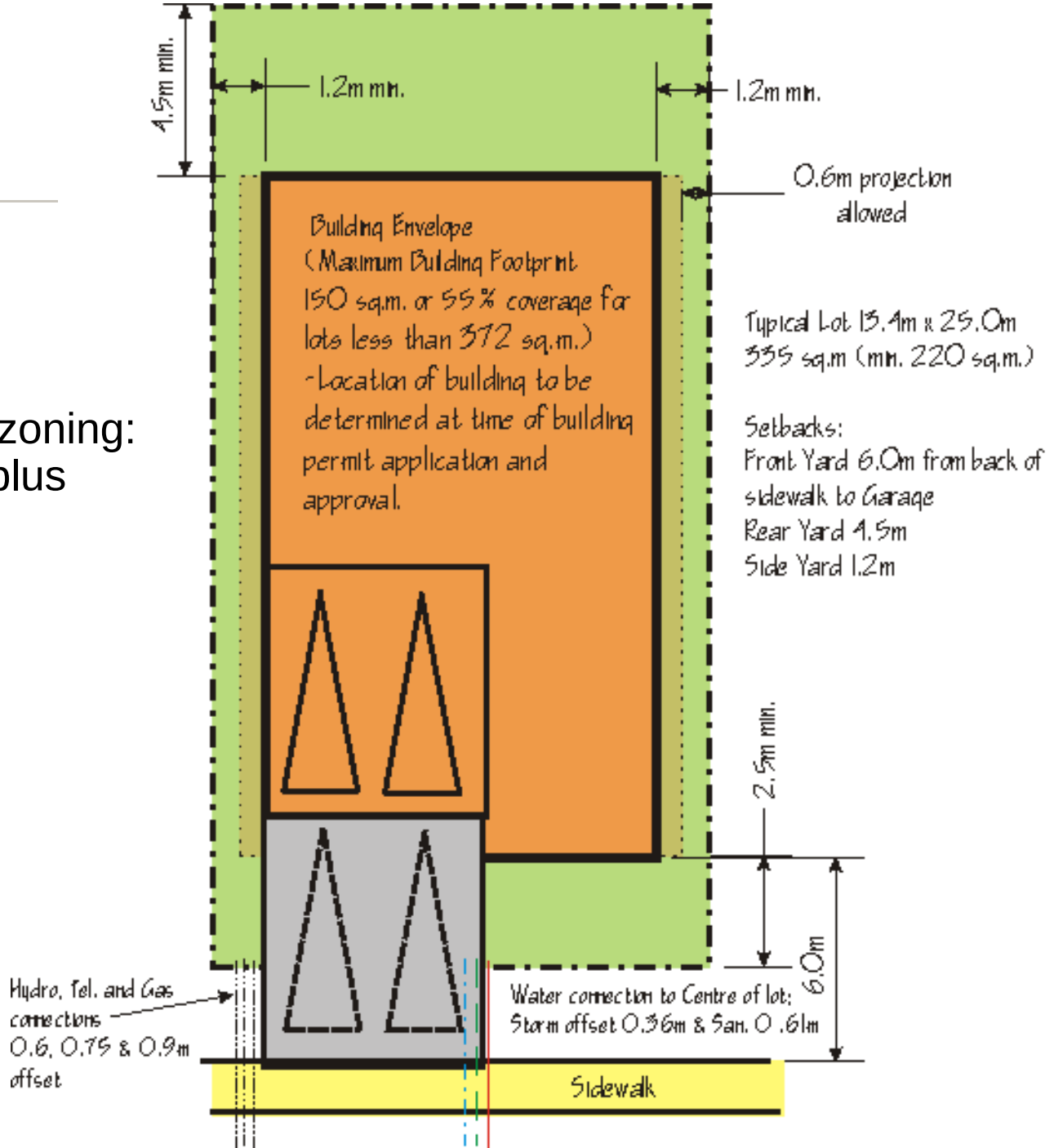
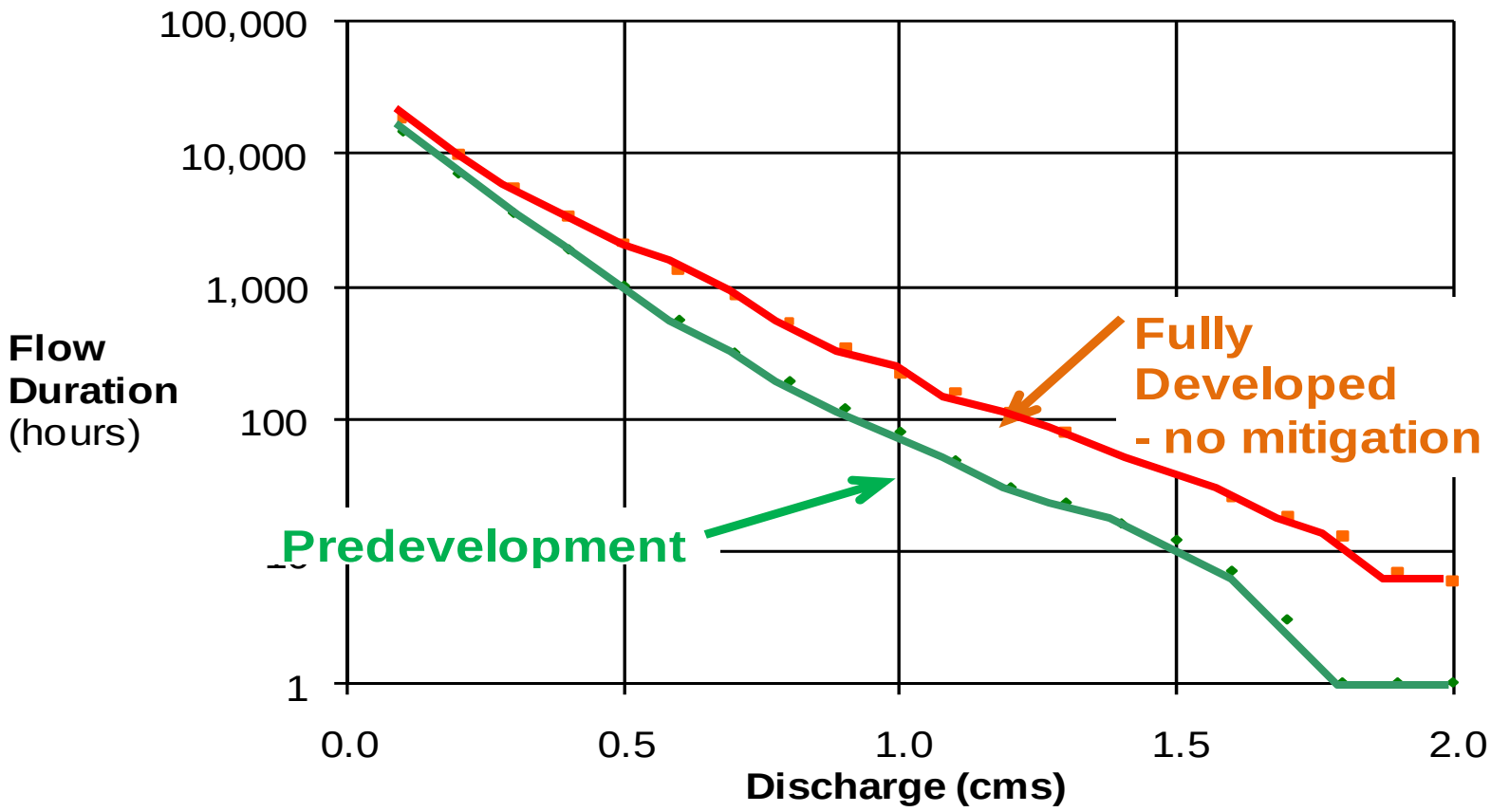
Typical Single Family Lot

Site Cover allowed by zoning:
- 55% of lot (building), plus
- Overhang, plus
- Driveway, plus
- Patios, plus
- On-lot sidewalks, plus
- ……



Flow Duration

Streamflow records show natural runoff is 30% of rainfall
(flow in excess of baseflow)



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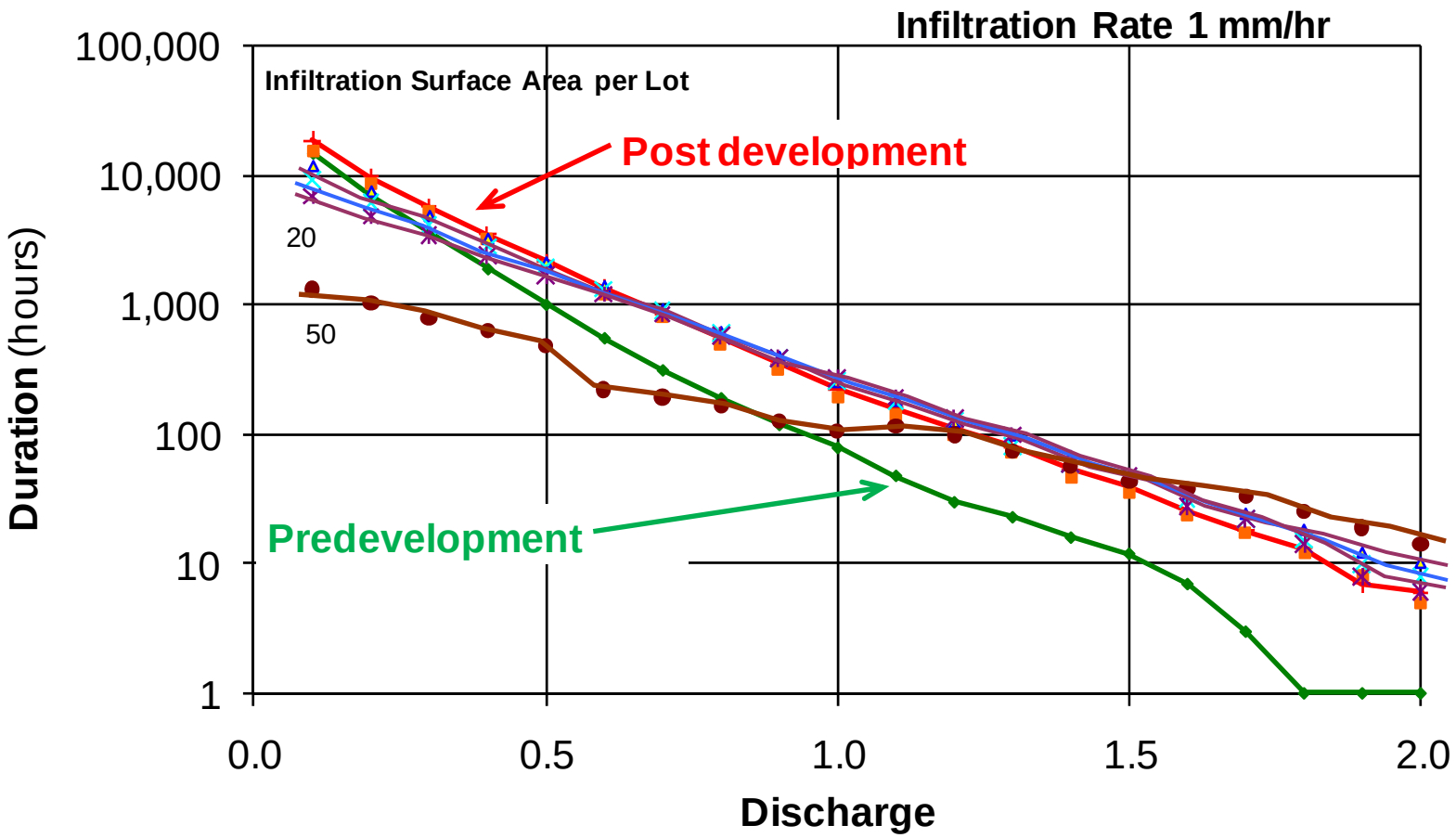
Flow Duration - Design



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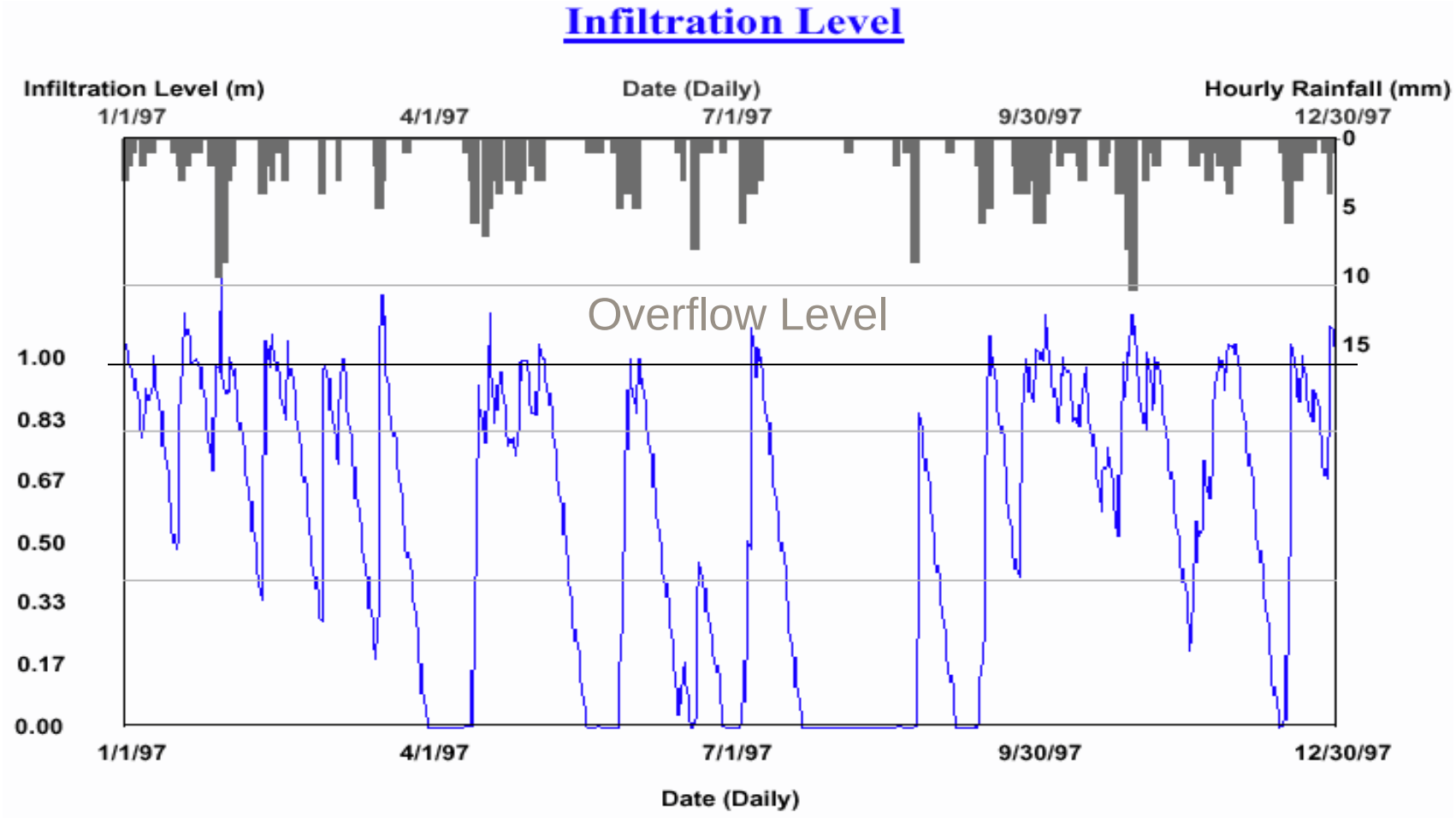
Depth Duration



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Solution

Complete Systems

- Topsoil over entire disturbed pervious area – 300 to 450 mm depth
- Infiltration system capturing surface runoff

Allow base flows out of infiltration systems

- Augment reported low summer flows
- Allow systems to drain down and refil
- Avoids:
  - Saturated surface areas
  - Potential anoxic conditions in rooting zones

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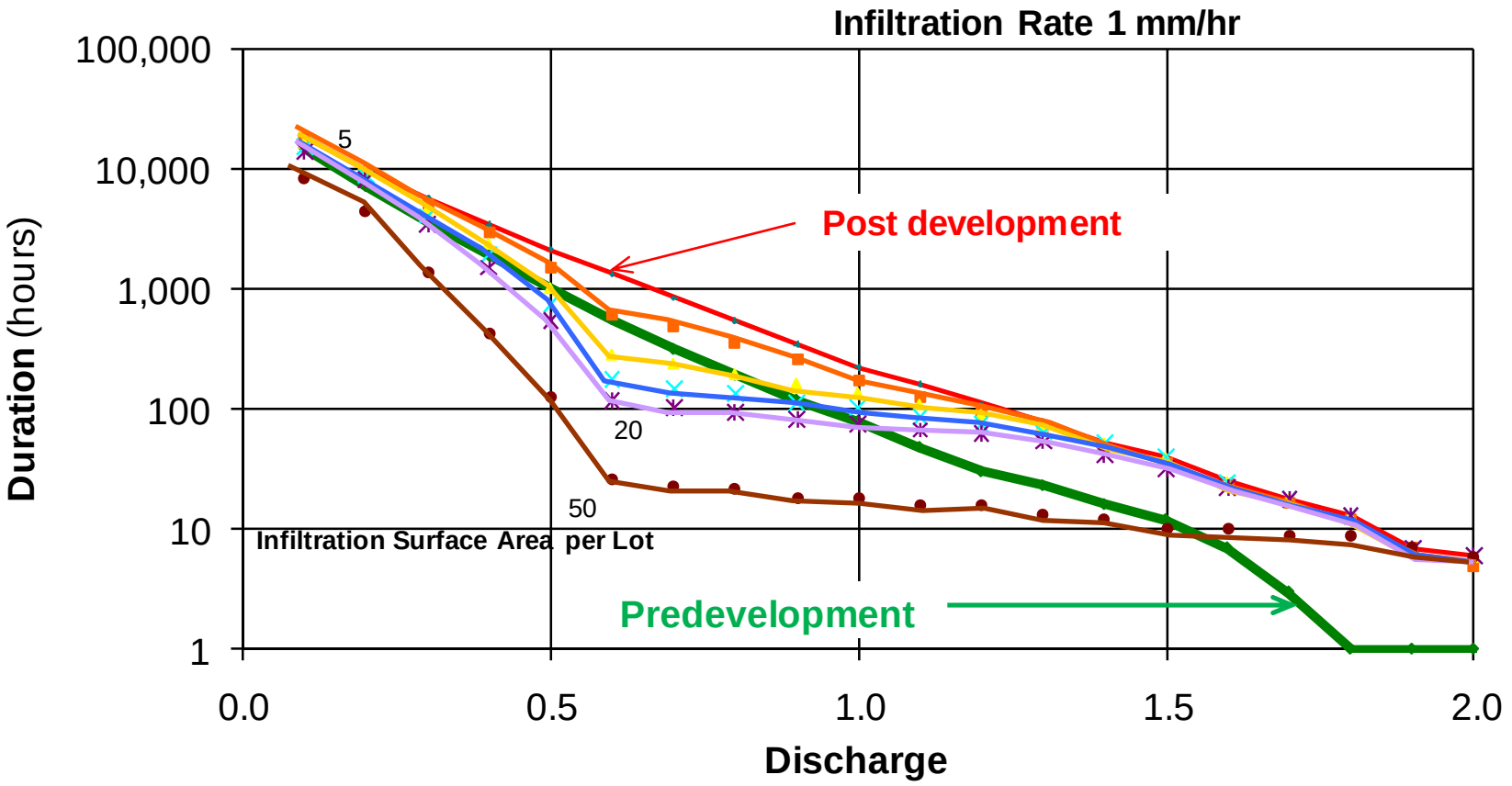
Enhanced Duration



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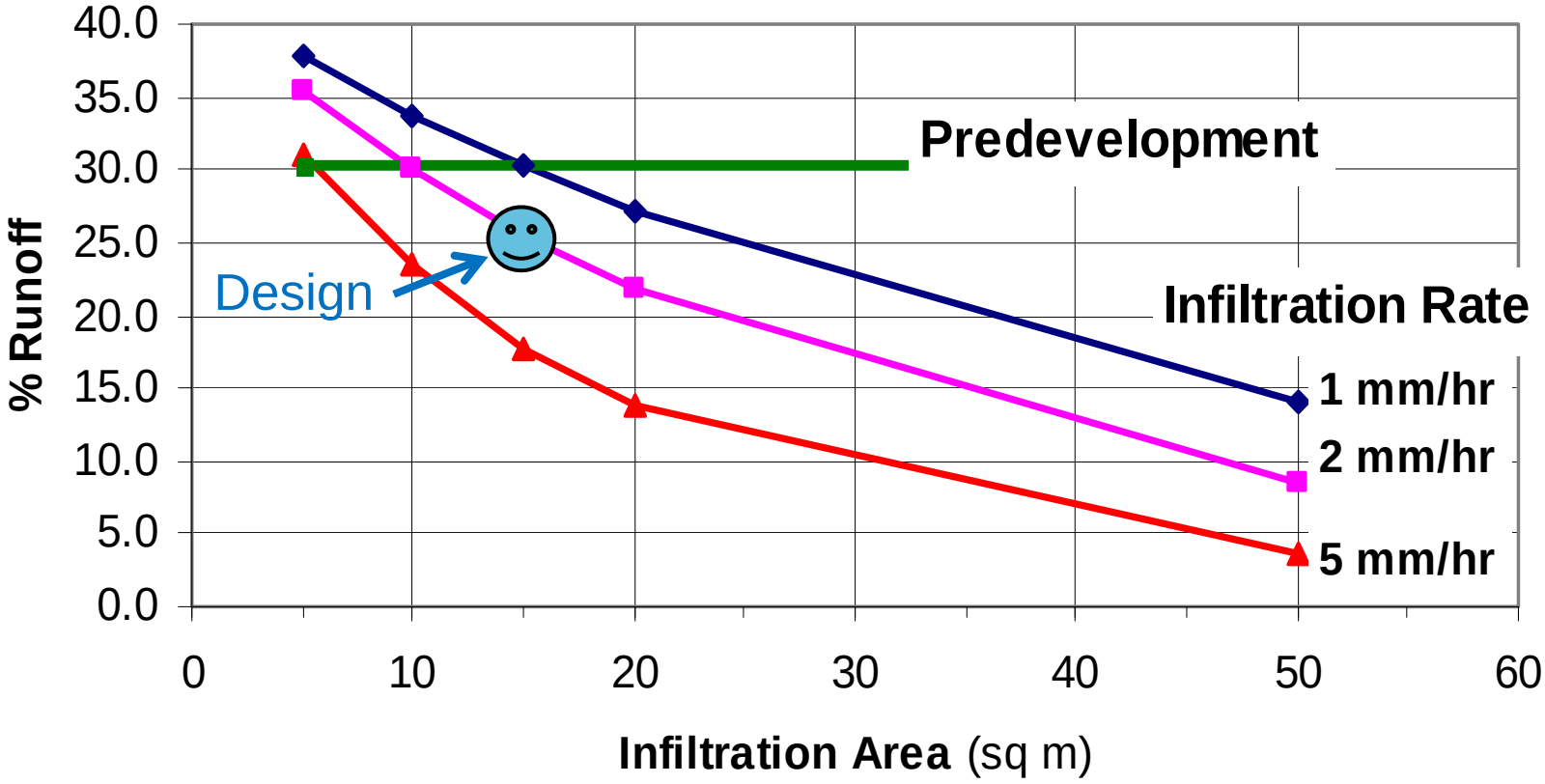
Runoff of Volume



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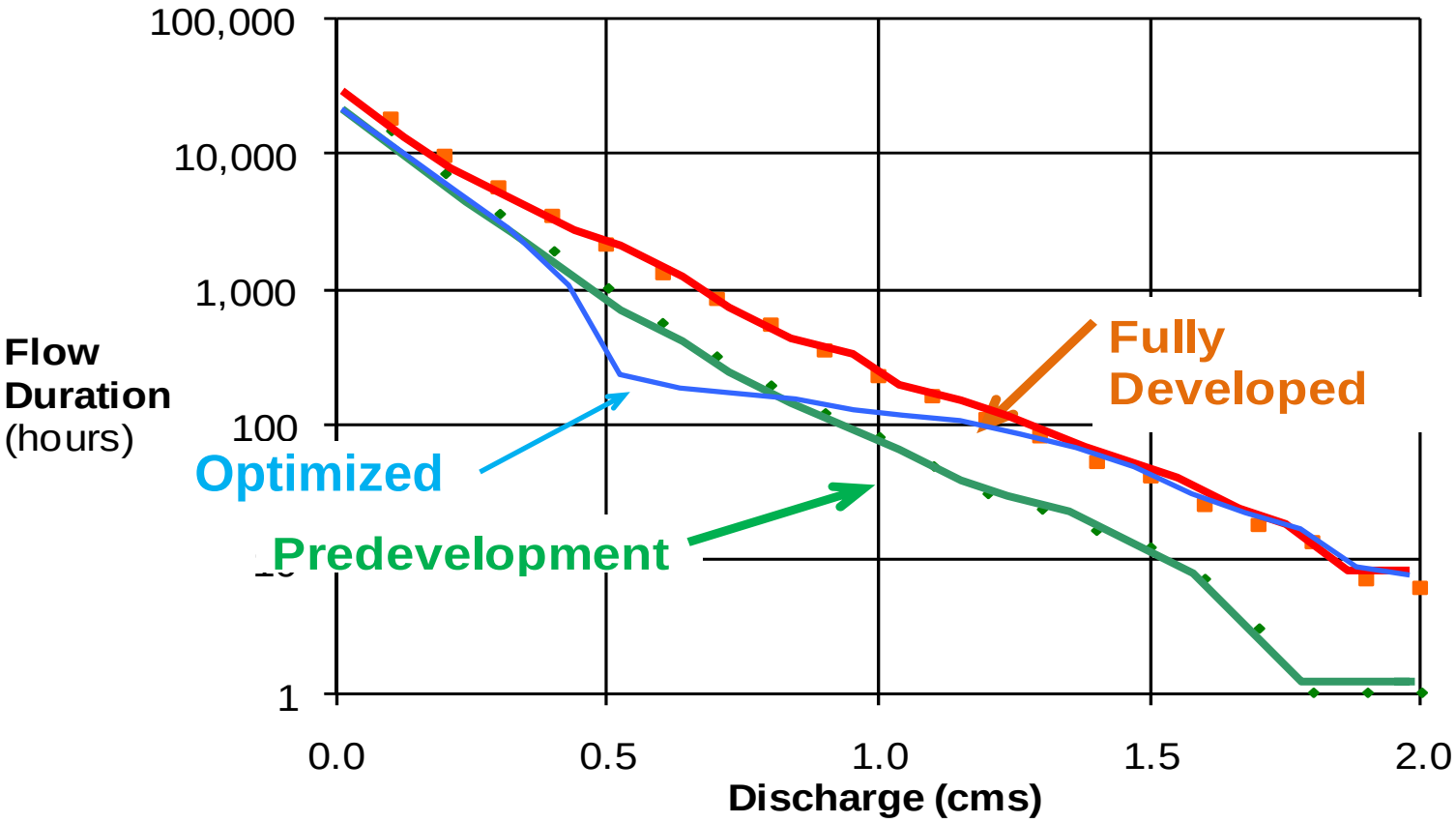
Flow Duration

Optimized system includes:
- Roof leader disconnection,
- Top soil, and
- Infiltration system of 15 square meters (5% of lot)



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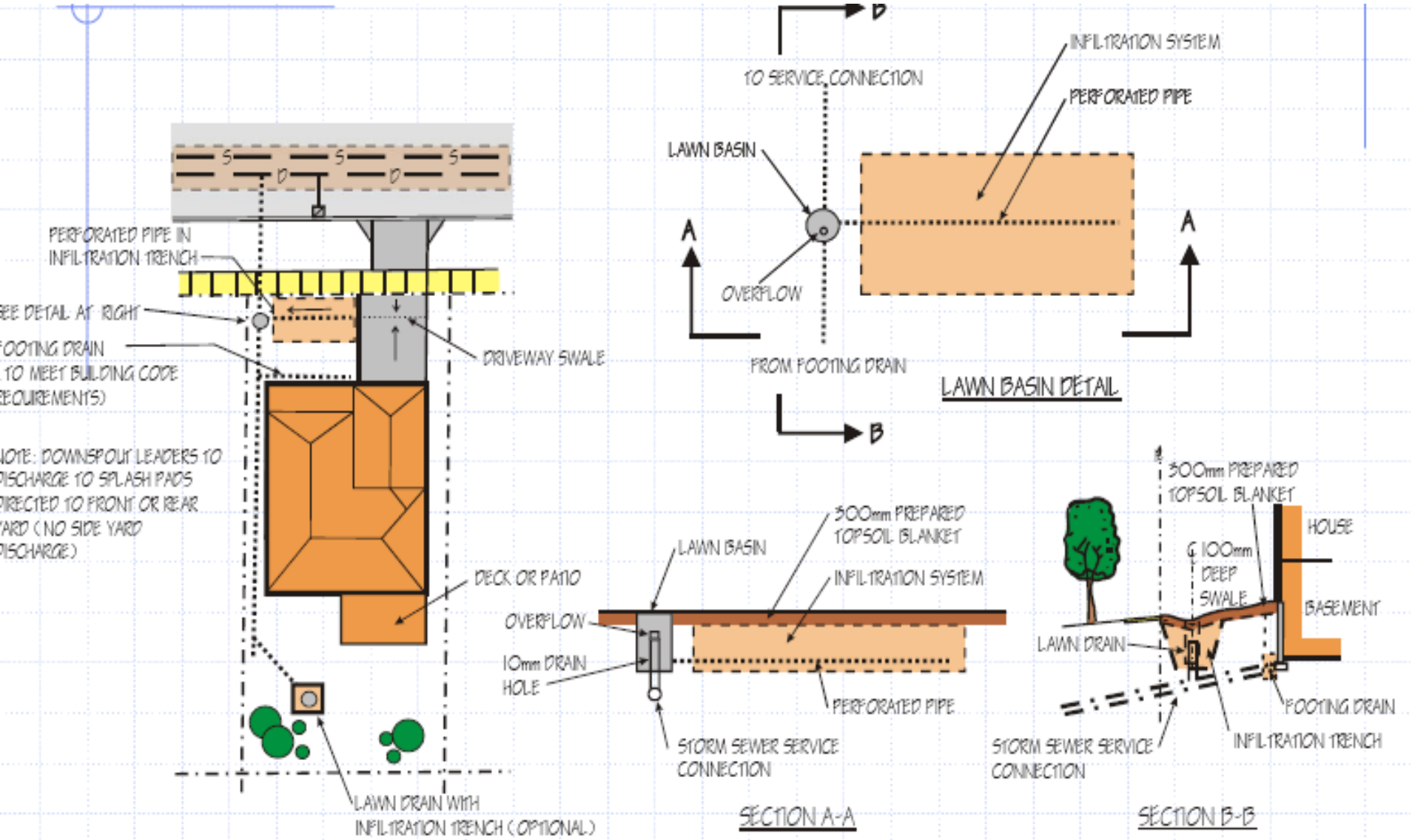
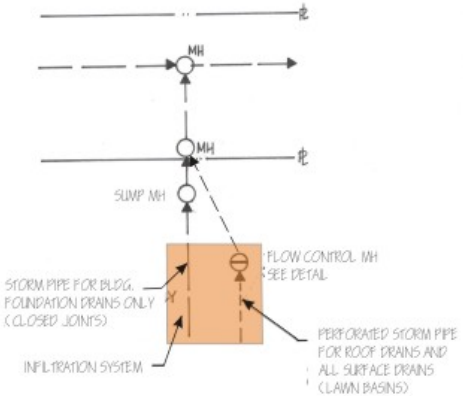
On Lot Systems



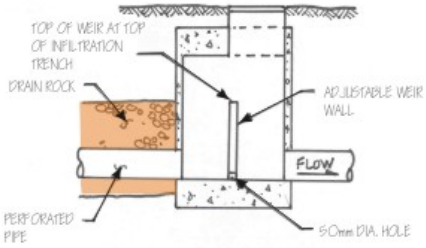
Note: CONCEPT ONLY. Final configuration to be confirmed during detailed design.

Multi Family Lot

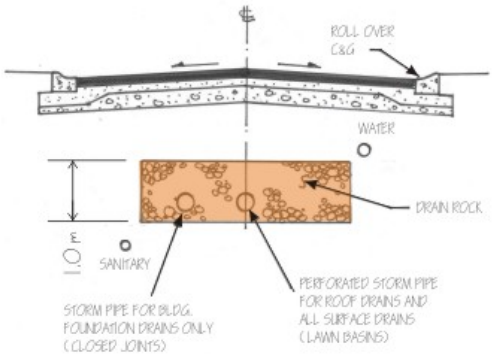
TYPICAL PLAN



PLAN DETAIL



FLOW CONTROL MANHOLE



TYPICAL SECTION

Typical surface area of the infiltration system will be 5% of the total site area.

Conclusions

1. Modified the Guidebook criteria
2. Predevelopment Runoff 30%
3. Post development Runoff 25%
4. Baseflows extended
5. Single and Multi-family sites
6. LID Systems include:
   - Disconnected roof leaders
   - Enhanced top soil
   - Infiltration facilities
7. Led to “Beyond the Guidebook”

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