

Flooding

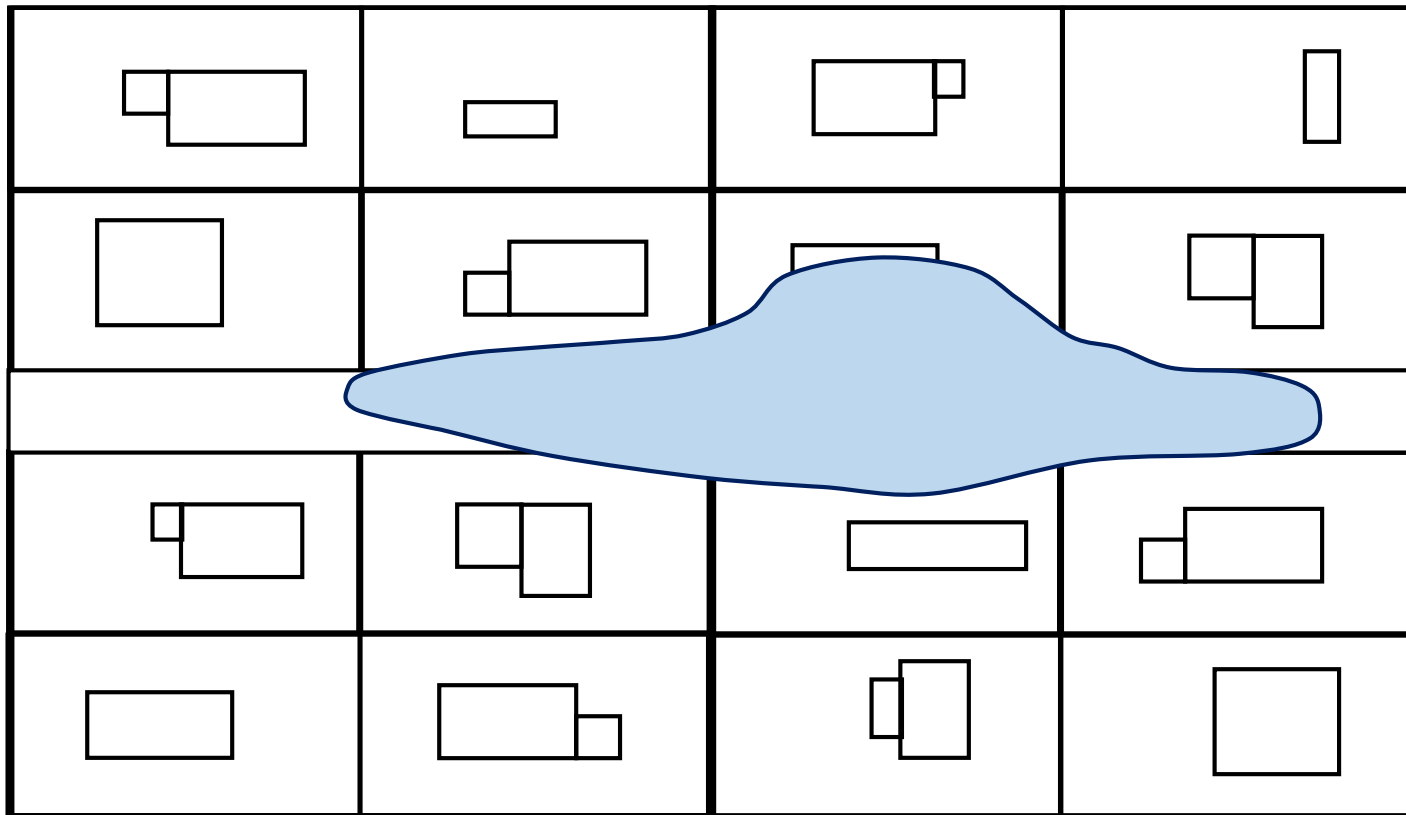
Guam Department of Public Works
Guam Environmental Protection Agency
Guam Department of Land Management



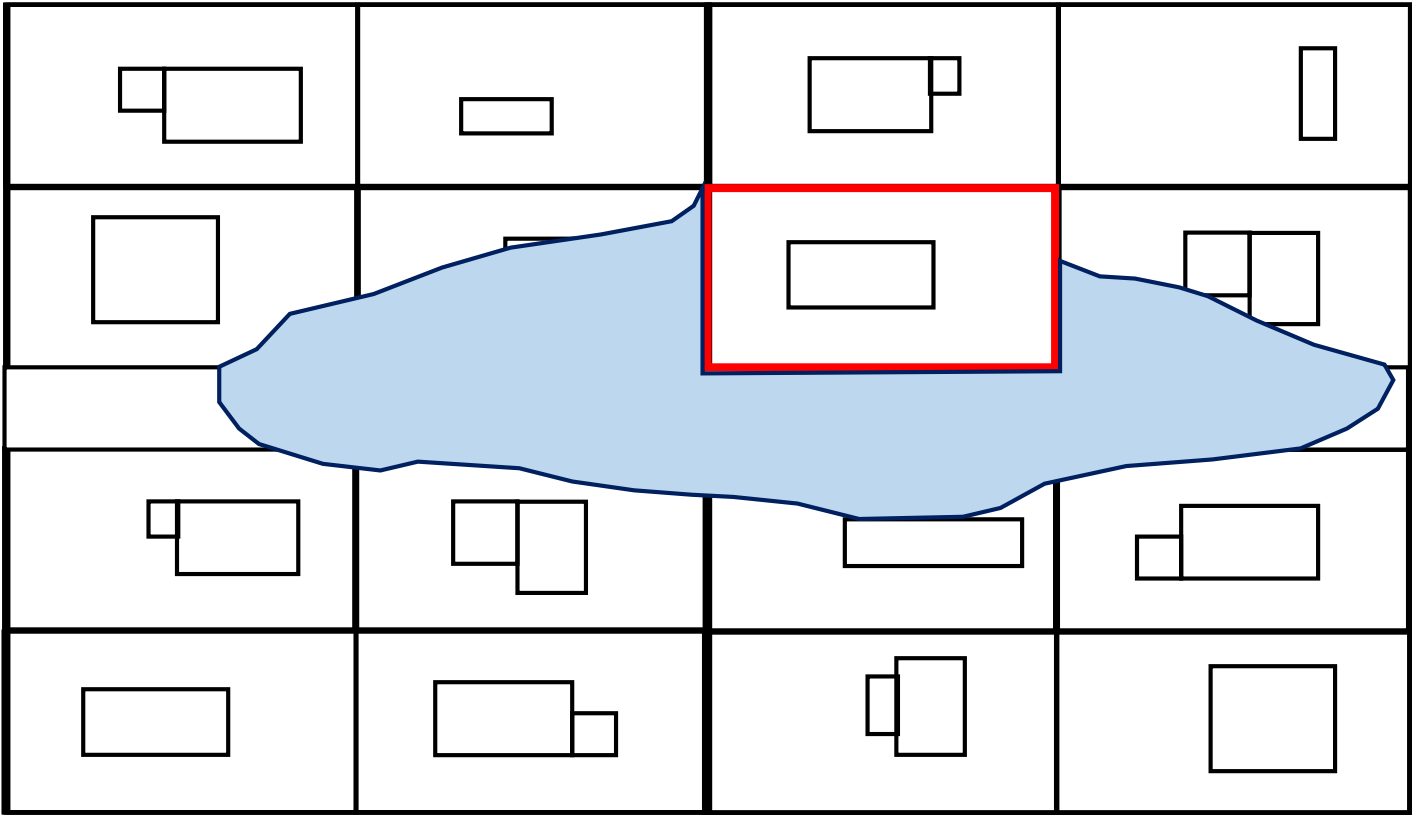
A typical scenario

Subsequent properties

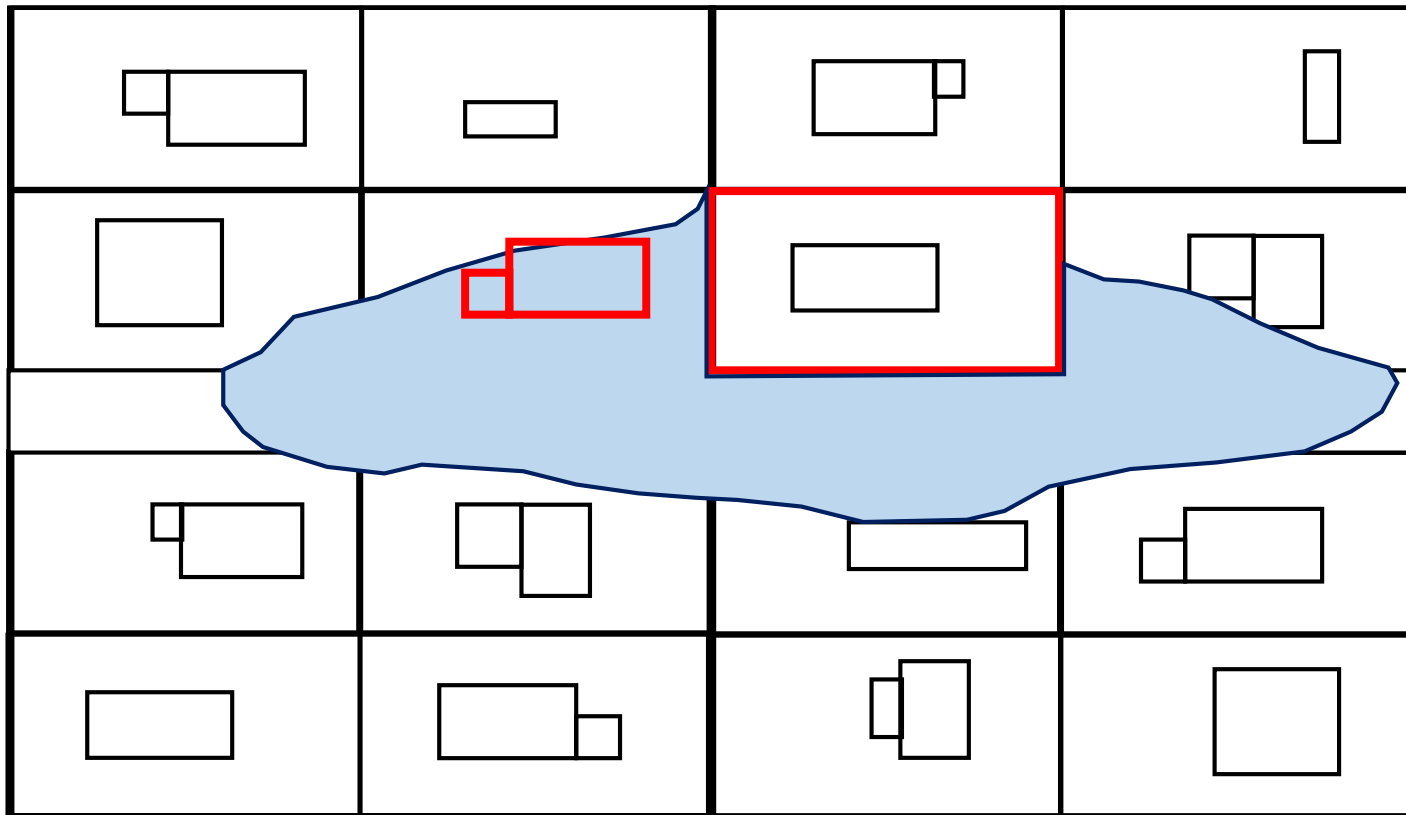
Piecemeal development



First (private) attempt at flood control



Issues!



What can each agency do?

DPW: Authorities

- Primarily preventative
- Flood prevention and controls established **prior** to subdivision development (*GCA Title 21 Chapter 62, The Subdivision Law*)
- GovGuam agencies to vet subdivision plans to ensure sufficient infrastructure for the development, including storm drainage

DPW: Gaps and misconceptions

- Infrastructure requirements and stringent plan review do not apply to lot parcelings that create five (5) or less parcels
- Building permits not required for fence construction; concrete fence can disrupt natural storm water flow >> flooding (*GCA Title 21 Chapter 26, 66105*)
- DPW does not have the authority to force private property owners to do post-construction remediation

DPW: Solutions

- Prevent by promoting:
 - Low impact development and green infrastructure
 - Less impervious surfaces
- Post-construction
 - Open additional ponding / percolation basin
 - Install additional flood controls in right-of-way
 - *Currently no \$ for disposal system construction*
- Develop stormwater utility

GEPA: Authorities 1

- Statutes and regulations focus on pollution control, not flood control

GEPA: Authorities 2

- Soil Erosion and Sediment Control Regulations contain some provisions that reduce flood impacts
 - Post-construction drainage system plan required
 - Stormwater BMP standards (*CNMI-Guam Manual*)

HOWEVER:

Applies during permitting and construction only
Broad exemptions for single-family homes

GEPA: Gaps and misconceptions 1

- Smaller divisions of land plots can go unnoticed
 - 5 lot definition of “subdivision”
- Residential exemptions → cumulative impacts
 - Single and two-family residences typically not required to address post-construction run-off

GEPA: Gaps and misconceptions 2

- Rules do not apply post-permitting, construction
 - Cumulative impacts from prior development
 - No requirement to maintain or replace failed systems
- Rules apply strictly to erosion control
 - Flooding provisions added in *CNMI-Guam Manual*
 - NO requirement to contain all runoff on-site

GEPA: Solutions

- Permitting and construction
 - Might be able to catch potential for flooding in review of retaining wall permit application – not always easy to I.D. in field
 - BUT - GEPA regulations do not directly address
- After permitting and construction
 - No “developer” to cite – not even a subdivision plan
 - Regulations do not apply retroactively to existing development

DLM: Authorities 1

- Statutes and regulations focus on land use

Through the subdivision or parceling process:

“General requirements for subdivisions are to provide for sufficient drainage of the land to provide reasonable protection against flooding.”

DLM: Authorities 2

- Regarding Public Rights of Ways

“The sub-divider shall retain no special property rights that would allow him to grade, change water courses upon, modify the topography and roadway elevation of the public right of way without the prior written authorization from the Department of Public Works.”

DLM: Authorities 3

- “In a Guam Land Use Commission approved subdivision, Storm drainage facilities shall be provided in all subdivisions in accordance with plan prepared by the sub-divider conforming to criteria established by the Commission. These facilities shall be designed to dispose of normal storm waters falling on the subdivision without hazard of flooding, inconvenience of ponding, and the erosion of public or private lands.”

DLM: Gaps and misconceptions

- DPW Building Permits section has enforcement authority of the Zoning Law
- When the use type follows what is permitted for each respective zone – DLM has no enforcement authority

DLM: Gaps and misconceptions

- Issues similar to GEPA
 - Parental subdivisions not required to make improvements for storm drainage
 - Residential exemptions for single family and duplexes not required to address post-construction run-off
 - Impacts from prior development and new construction

DLM: Solutions

- During permitting and construction
 - Review contour maps to identify flooding potential
 - Inform of any historical flooding issues in area
- After permitting and construction
 - No enforcement authorities

Summary: Major gaps

- Subdivision requirements do not apply to piecemeal parceling
- Minimal development requirements for individual homeowners
- Little to no ability to address post-construction problems
- Flooding not explicitly addressed by any agency

Flood prevention: Some policy options

- Decrease development density
- Set an impervious surface percentage per lot
- Incentivize low impact development standards
- Establish design criteria for retaining walls / fences to allow flow-through

Flood prevention: Some policy options

- Clearly designate flood control agency (DPW?)
- Use mapping to indicate potential drainage problems/areas
- After DLM review, DPW does tech review on all parcels to include:
 - Percolation rate
 - Topography

Addressing floods post-development: Some policy options

- Change rules to apply retroactively to existing development
 - Maintenance or replacement
 - Installation if none
- Develop stormwater utility
 - Capital funding mechanism for drainage infrastructure, maintenance