

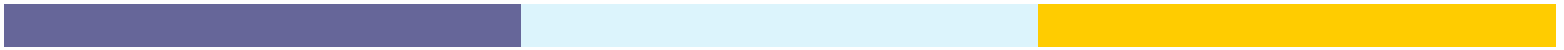
Estimating Residential Flows on Rooms instead of Bedrooms

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Eberhard Roeder¹, Ed Barranco¹, Jim Love²,
Johanna Whelan², Ed Williams¹

¹Florida Department of Health, Bureau of Onsite Sewage Programs

²Lee County Health Department



Outline

- Background
- Proposed Room Definition and Sizing
- Testing Room Definition: CHD Survey



Background

- Criteria for bedrooms (flow estimates) for onsite sewage design purposes that are:
 - Unambiguous
 - Reproducible
 - Lead to generally similar flow estimates as currently
 - Simple
 - Provides for flexibility of use conversion (e.g., den to bedroom) without impacting estimated sewage flow
 - Protective of public and environment
- Estimating Residential Flows using rooms instead of Bedrooms.



Background

- Why use rooms instead of bedrooms?
 - Consistent with the Census Definitions for bedrooms and rooms.
 - Census data correlated well for the conversion of rooms to bedrooms at 2:1 with an equivalent flow of 100 gpd/bedroom ~ 50 gpd/room and one occupant per room.
 - Eliminates the need for many distinctions between bedrooms and non-bedroom rooms
 - Definition may become simpler
 - Provides for flexibility of use conversion (den to bedroom) without impacting estimated sewage flow



Background

Checking out “Rooms”

- Initial working definition:
 - A room is a part of the building area (=enclosed habitable area).
 - Its floor area is determined by measurements of the interior wall dimensions.
 - minimum floor area of 70 square feet.



Background

Checking out “Rooms”

- **Initial Approach:**

- Review a sample of permits (60 Lee CHD Floor Plans).
- Review a sample 16 popular house plans – House of the Week – Online).
- Review a sample of 11 variances , where flow was at issue (very large homes).
- Review # of permits from NW Florida 1998-2007; Less than 1% of permits are >600 gpd.



Background

Checking out “Rooms”

- **Initial Approach:**
 - Review flow estimates:
 - Flow is variable, but correlated with # of people in house (origin of bedroom concept), size of house (socio-economic factors)
 - In Florida (2000 census):
 - 93.5 % of occupied housing units have 1.0 person or less per room (50 gpd/room; 100 gpd/bedroom)
 - 91% of households consist of 4 persons or less



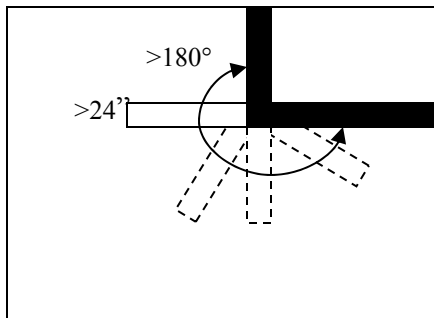
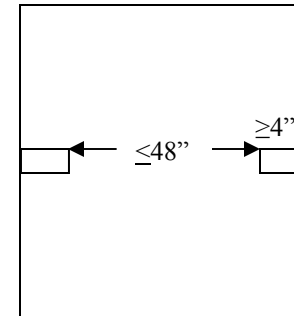
Proposed Definition of “Room”

- A room is a part of the building area (=enclosed habitable area). Its floor area is determined by measurements of the interior wall dimensions. In order to be considered for sewage flow determinations, a room shall have a minimum floor area of 70 square feet. A room is separated from other rooms by one or more of the following:
 1. a wall or a half wall (Half walls or bookcases count if built-in)
 2. a door
 3. two constrictions of at least 4” each on opposite sides of the room, and the distance between them is 4 feet or less
 4. a constriction of at least 2 feet if extending from an angle formed by other walls and half walls of more than 180 degrees
 5. a constriction of at least 2 feet if extending from an angle of 180 degree or less formed by other walls and half walls and the distance to the next wall is 4 feet or less
 6. several constrictions of a cumulative length of at least 2 ft defining the side of a room
 7. a stairway (four steps minimum, area is proportioned between levels)



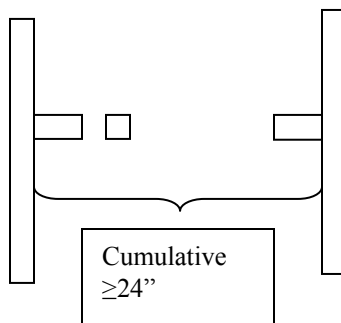
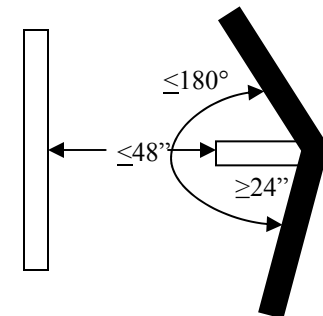
Details

3. two constrictions of at least 4" each on opposite sides of the room, and the distance between them is 4 feet or less

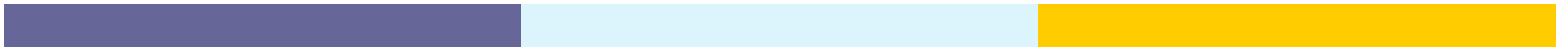


4.a constriction of at least 2 feet if extending from an angle formed by other walls and half walls of more than 180 degrees

5. a constriction of at least 2 feet if extending from an angle of 180 degrees or less formed by other walls and half walls and the distance to the next wall is 4 feet or less



6. several constrictions of a cumulative length of at least 2 ft defining the side of a room



Proposed TABLE I

For System Design ESTIMATED SEWAGE FLOWS

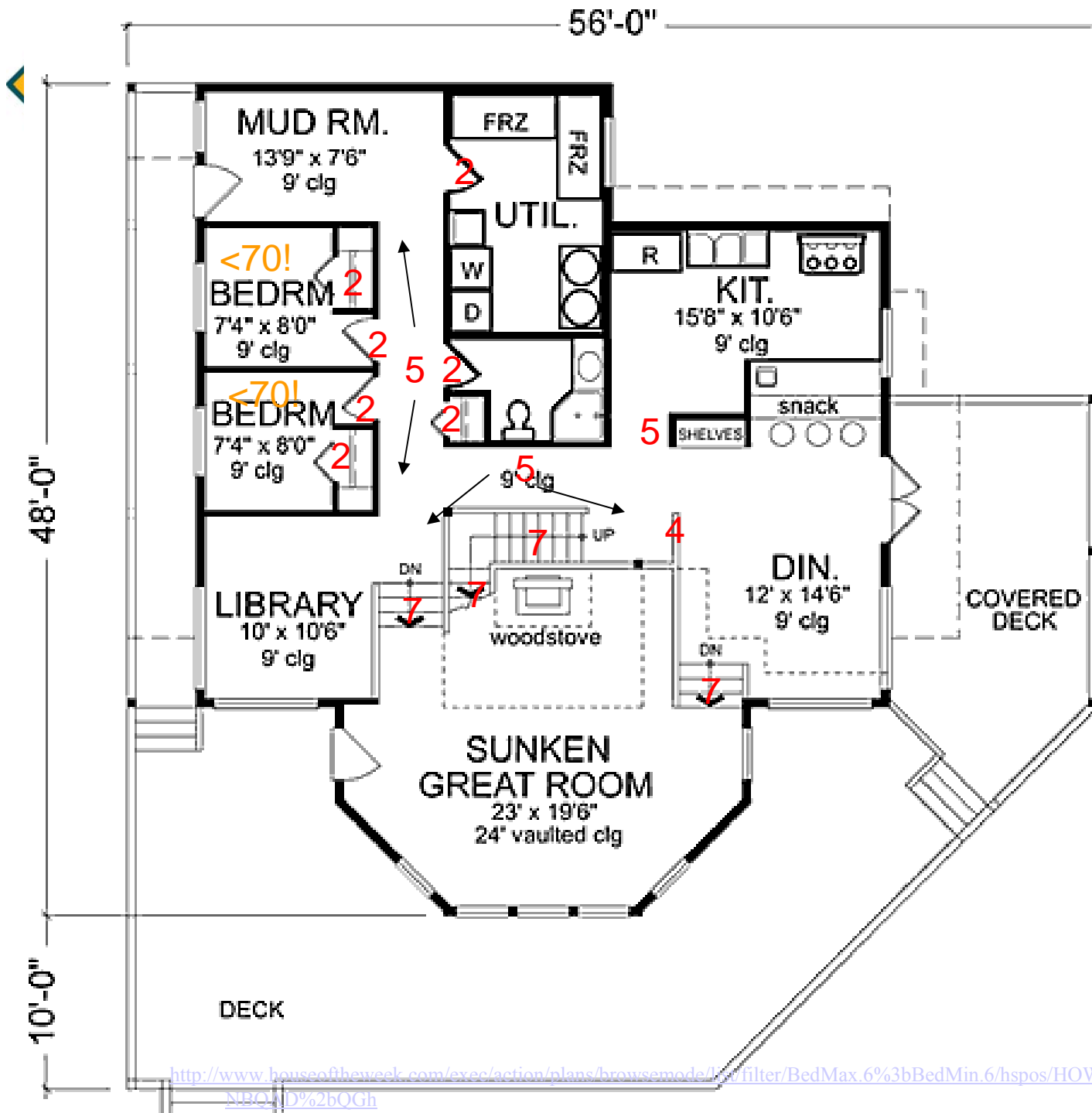
TYPE OF ESTABLISHMENT	GALLONS
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Residences

Single or multiple families - per dwelling unit:

For each of the first 8 rooms, add per room	50
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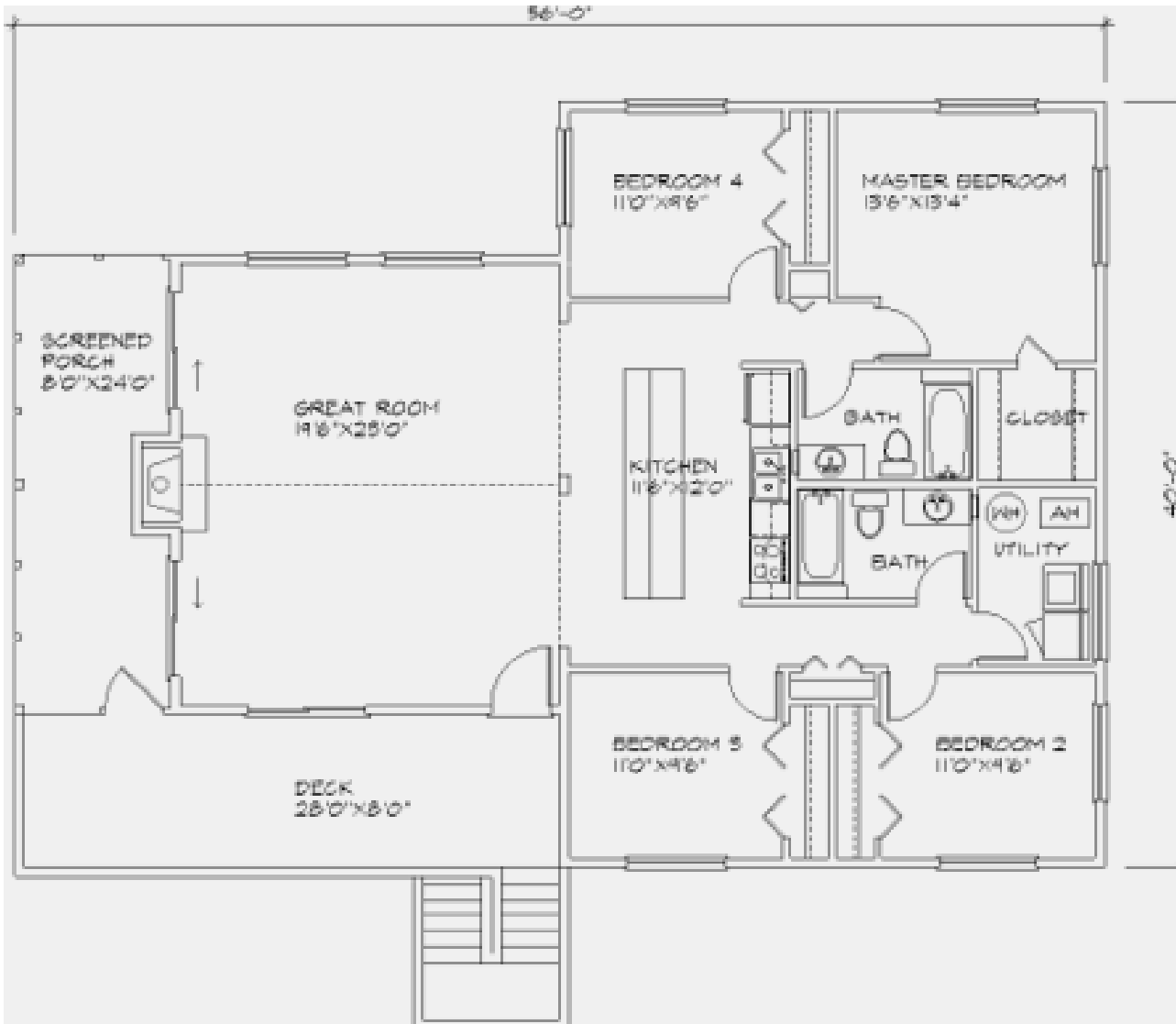
For each room after the first 8 rooms, add per room	32
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Example

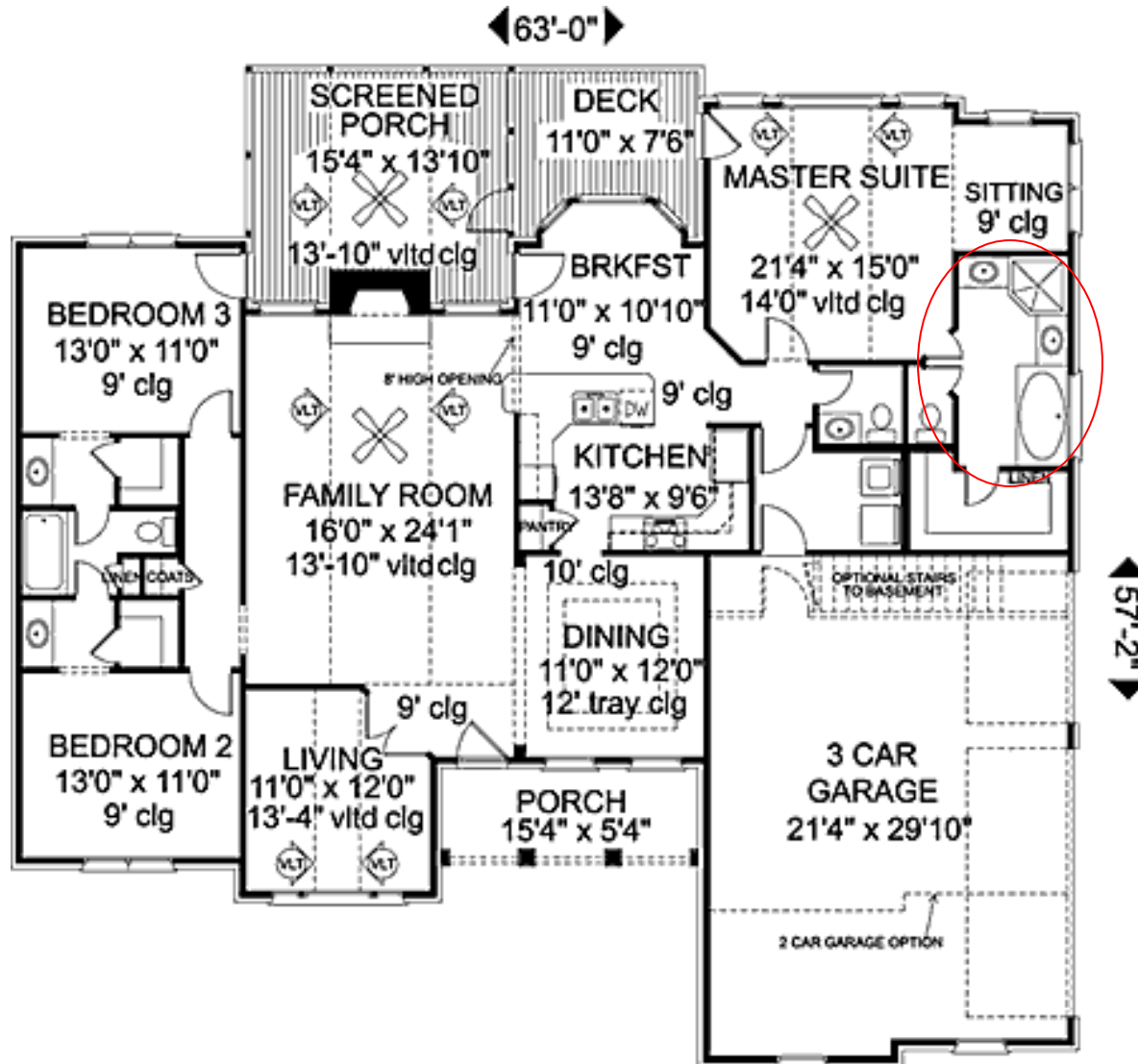


Example for flow reduction: 400->300 gpd





Example for flow increase: 300->432 gpd





Testing Room Definition

CHD Survey

- **Total of 22 responses representing 27% or 18 CHDs.**
(Bay, Brevard, Broward, Charlotte, Columbia, Collier, Duval, Flagler, Glades, Hendry, Hernando, Lee, Leon, Pinellas, Miami-Dade, Sumter, Okeechobee and Volusia)
- **Six large, seven medium and four small CHDs.**



Testing Room Definition

- CHD Survey
 - Six Floor Plans for CHD review:
 - **Plan 1** – Mobile home (3 bed/1280 ft²/5 rooms)
 - **Plan 2** – Duplex (3bed/1study/1325 ft²/5 rooms per side). Study counted as bedroom and room.
 - **Plan 3** – 3 story SFR (open ground floor w/storage/4 bed/1studio/2903 ft²/10 rooms). Storage area was counted as building area and the studio did not meet the criteria for either a bedroom or a room.



Testing Room Definition

- CHD Survey
 - Six Floor Plans for CHD review:
 - **Plan 4** – 2 story SFR (3 bed/1364 ft²/6 rooms)
 - **Plan 5** – 1 story SFR (3 bed/1085 ft²/6 rooms)
 - **Plan 6** – 3 story SFR (4 bed/1den/8,479 ft²/26 rooms). Den met criteria for both bedroom and room.



Testing Room Definition

CHD Survey Questions

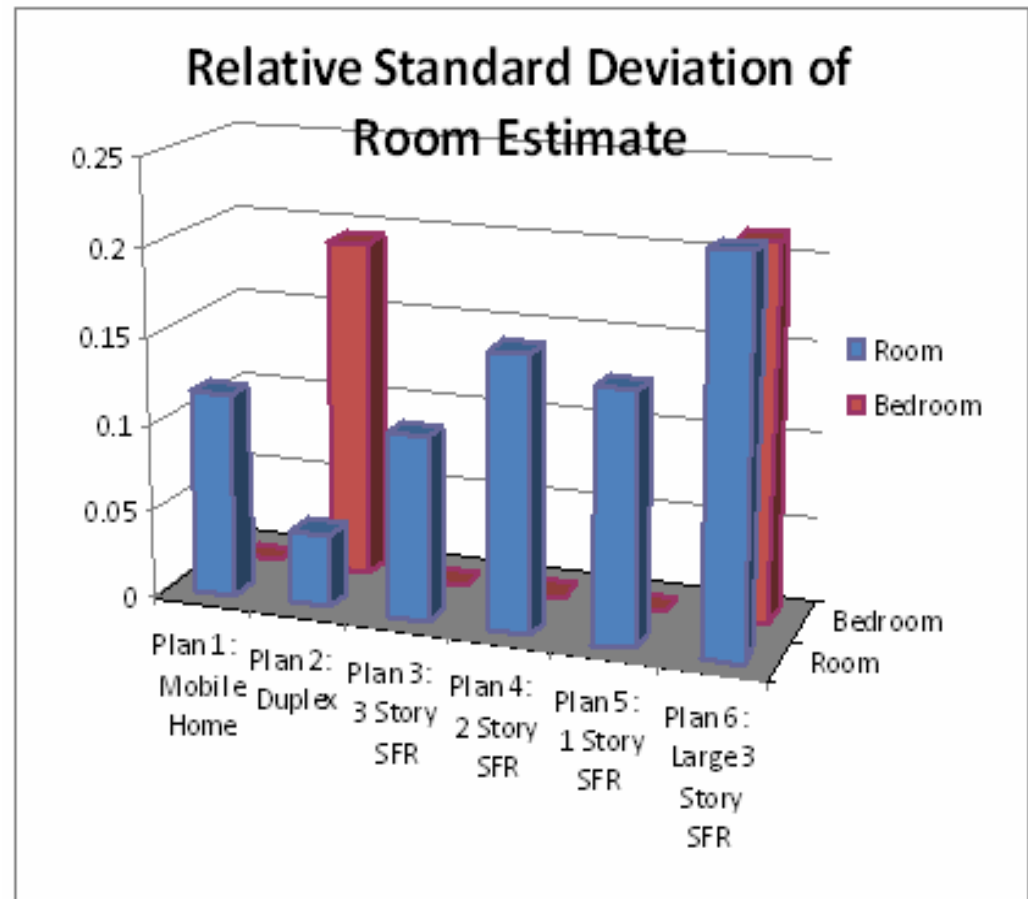
- Square feet of building area (current rule & interpretations)
- Number of bedrooms (current rule & interpretations)
- Sewage flow (current rule & interpretations)
- Number of rooms (proposed room definition)
- Sewage flow (proposed sizing criteria)



Testing Room Definition

Survey Results Bed/Rooms

- Generally, a greater deviation for room count.
- Less deviation for bedroom count.
- Plan 2 and 6 bedroom count showed greater deviation (3bed+study and large 8,000+ ft² SFR).

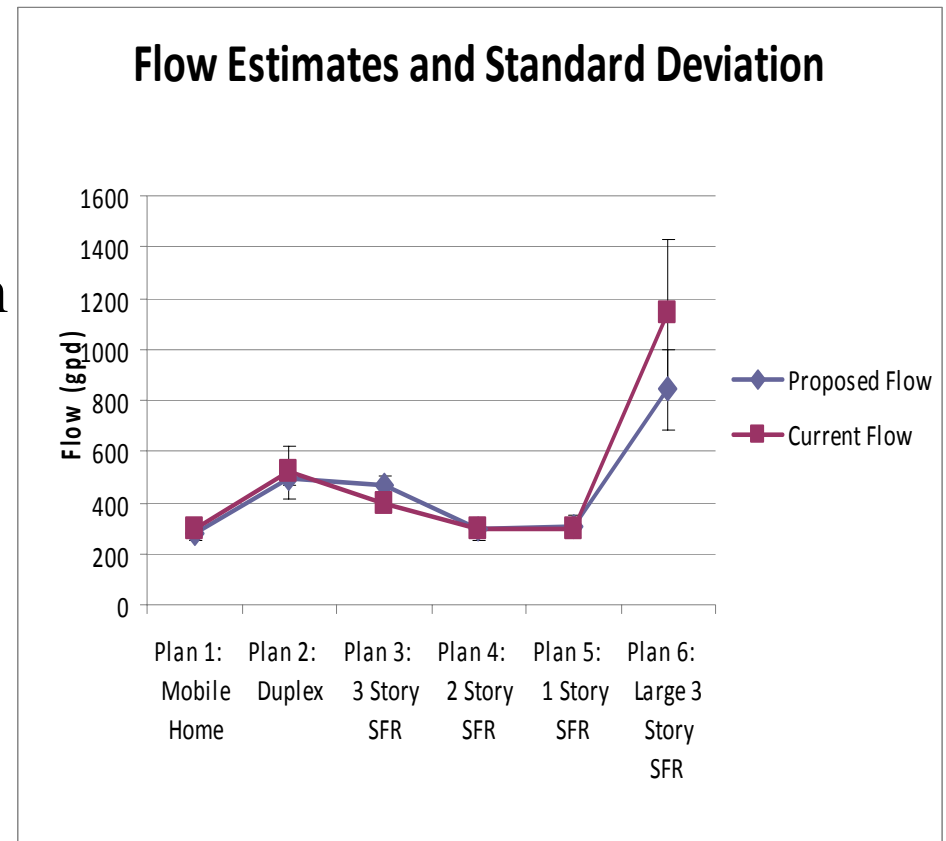




Testing Room Definition

Survey Results for Flow

- Consistent Flow calculations for Plans 1 – 5.
- Reduction in flow using room definition for the larger home (Plan 6).





Testing Room Definition

CHD Survey Comments

19 of 22 respondents provided comments

- 5 (26.3%) in support and 13 (68.4%) against the proposed room definition.
- 1 neither for nor against.
- 1 new proposal:
 - current rule be maintained for bedroom/den/office/computer room sizing and the "building area" calculation be changed back to "heated and cooled living area".



Testing Room Definition

CHD Survey Summary Comments

Support

- Eliminates the bedroom definition problem...counting rooms is much more efficient...leaves out the guessing game.
- Good for larger homes or homes in general to not be limited in size but in rooms.



Testing Room Definition

CHD Survey Summary Comments

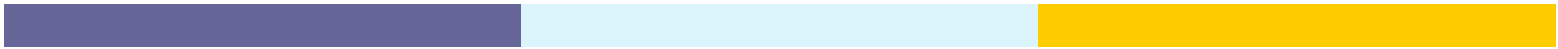
Against

- We have no problems with the current bedroom definition.
- Is confusing and subject to misinterpretation.
- Problems calculating large (10,000 plus) sq ft homes.
- Inconsistent results.
- Complicated floor plans require significantly longer review times.
- Variations in sizing and room configuration provide questionable determinations of when to count a room.
- Liability for the reviewing authority...open to argument in court
- Walk through "as built" will take on an entirely new meaning.



Options Initially Considered by The Florida Building Commission, Universal Bedroom Definition Workgroup

- Options 1 and 2 defined a bedroom as a room with
 - a minimum size of 70 ft²,
 - conditioning,
 - means of escape and rescue to the outside,
 - closet and door
 - Option 2 included many exclusions to distinguish non-bedrooms from bedrooms, needed many definitions
- Drawbacks:
 - Doors and closets can be changed similar to furniture and are not necessarily related to beds and occupancy
 - Conditioning does not relate to occupancy and beds, in particular in existing structures
- Option 3 proposed an occupancy/flow based on area. Similar to what is currently in code.
- DOH later introduced Option 4 – Sizing on rooms instead of bedrooms.



Discussion