PLUMBING…
PASS OR FAIL?

by John Williams, Jr.
Supervisor, Onondaga County Plumbing Control

PLUMBING CAN THREATEN THE HEALTH AND SAFETY OF US ALL

- Even as we sit here today!

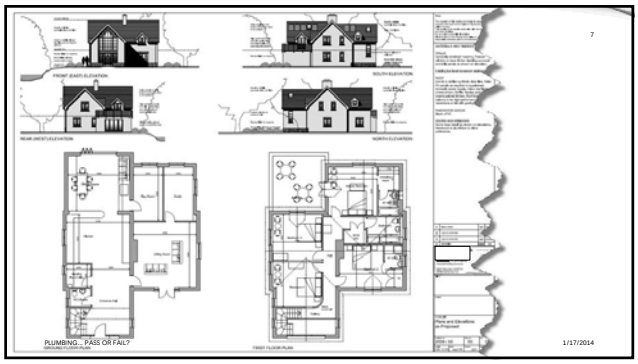
SO WHO IS RESPONSIBLE FOR PLUMBING AND INSPECTIONS?

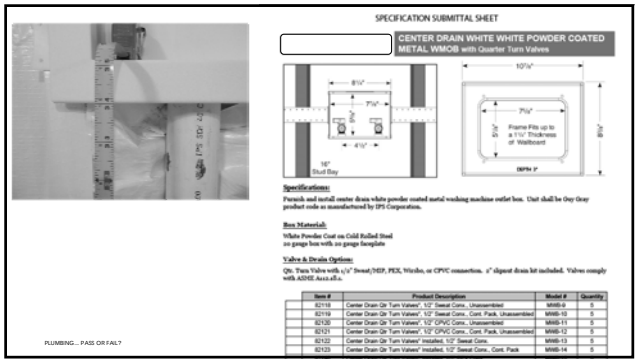
KEY PLUMBING CONCERNS

1. Building plans
2. Building construction
3. Building materials
4. Potable water supply
5. Drainage
6. Venting
7. Inspections

CONCERN #1
Building plans

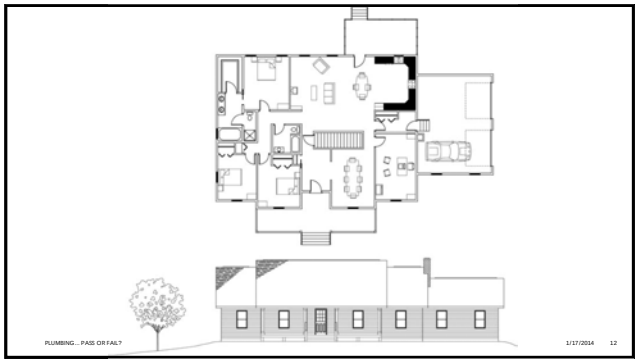
COMMON ISSUES WITH RESIDENTIAL BUILDING PLANS



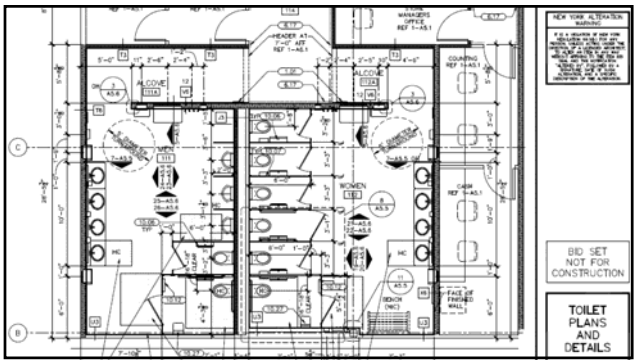


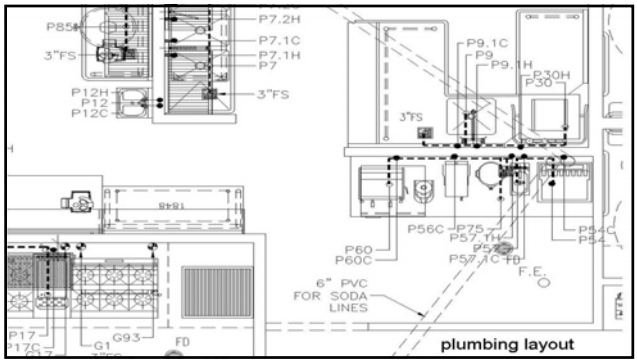
SPECIFICATION SUBMITTAL SHEET

CENTER DRAIN WHITE POWDER COATED METAL WMOB with Quarter Turn Valves

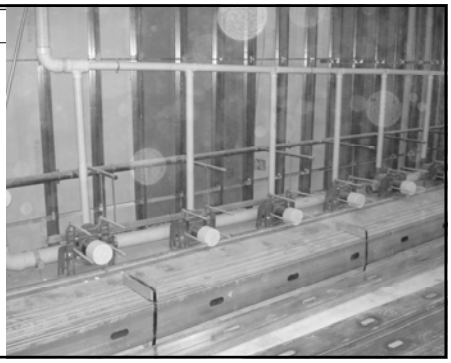


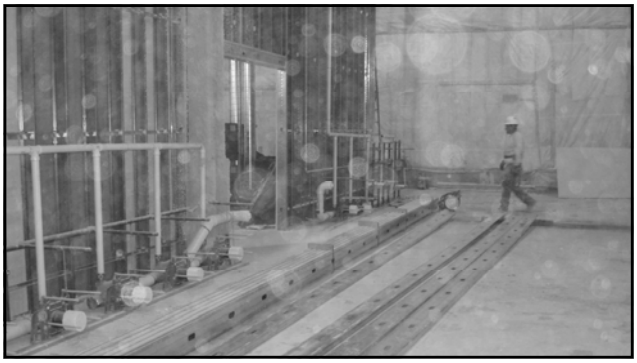
COMMERCIAL
BUILDING PLANS

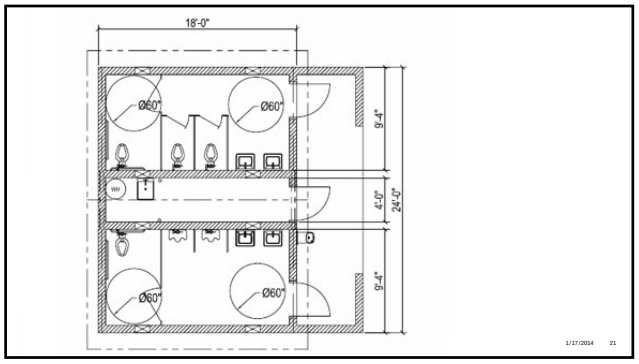




WASHROOM/
TOILET
REQUIREMENTS

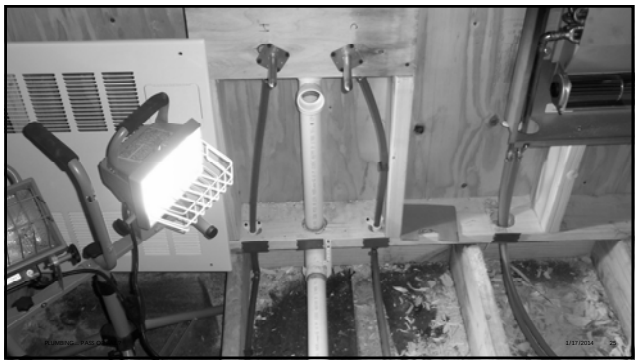




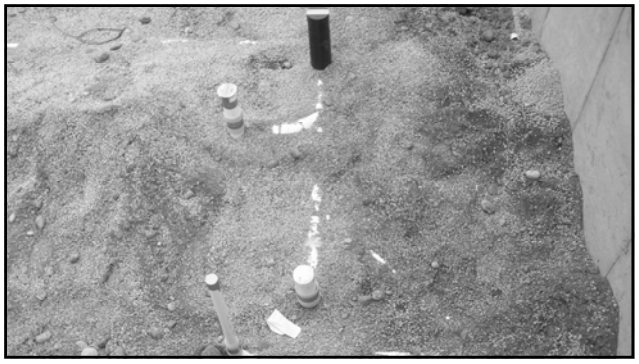


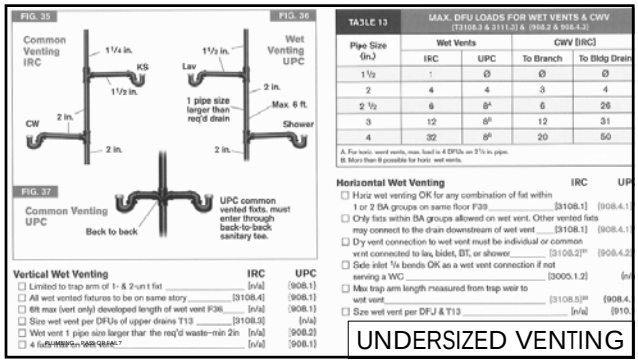
UNHEATED SPACES

PLUMBING IN OUTSIDE WALLS



BACKWATER PROTECTION





31

TERMINATION OF VENTS

33

WATER CLOSET SPACE

SIZING OF SEWERS

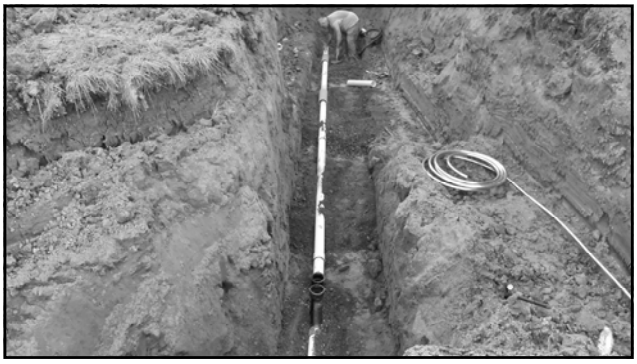
709

	1-1/2 bathroom home	2-1/2 bathroom home
• Clothes washer	2	2
• Bathroom group	5	10
• Dishwasher	2	2
• Kitchen sink	2	2
• Laundry tray	2	2
• Lavatory	1	1
• Water closet	4	4
	18	23

710

- 3" 1/8 = (36 F.U.)
- 3" 1/4 = (42 F.U.)
- 4" 1/8 = (180 F.U.)
- 4" 1/4 = (216 F.U.)

WATER SERVICE MATERIALS



COMMON ISSUES WITH COMMERCIAL BUILDING PLANS

BATHROOM COUNT

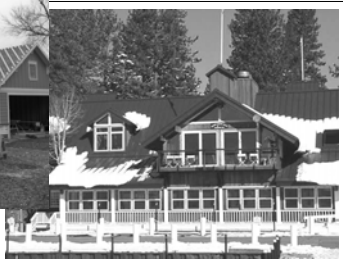
- Business use
  - 100 occupants 100/2 = 50 occupants each gender
  - 50 x 1/25 = 2 (2)
  - 50 x 1/40 = 1.2 (2)
  - 1 drinking fountain
  - 1 service sink
  - Floor drains each bathroom

FLOOR DRAINS

SERVICE SINKS

CONCERN #2
Building Construction

FREQUENT
BUILDING CONSTRUCTION ISSUES



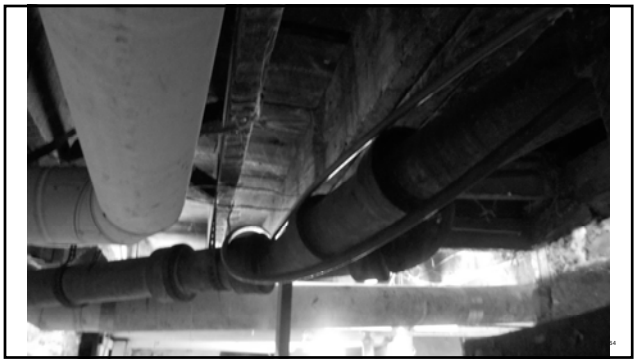
ROOFS

SIDEWALLS

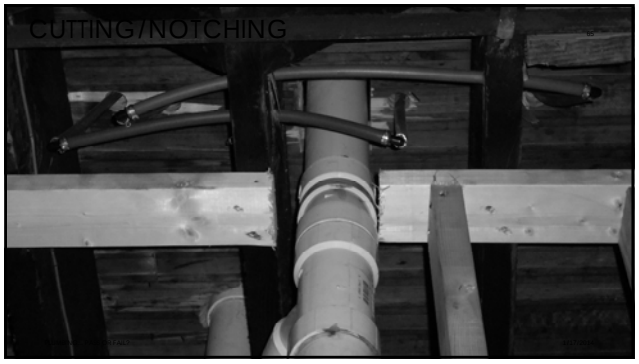
VENT TERMINATION

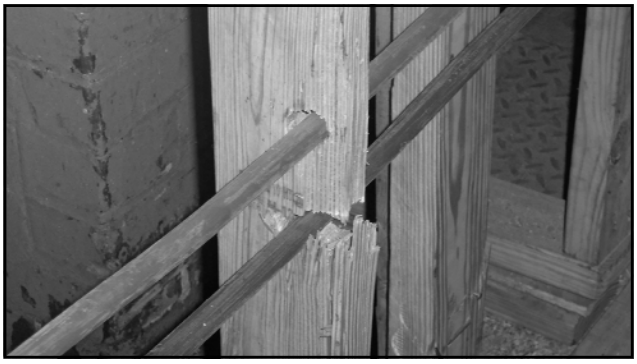
SLAB
-ON-
GRADE

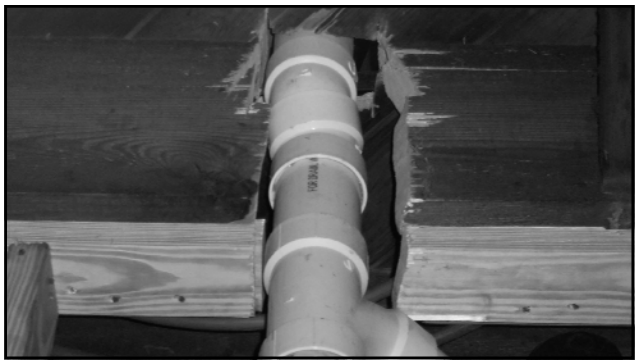
BASEMENT

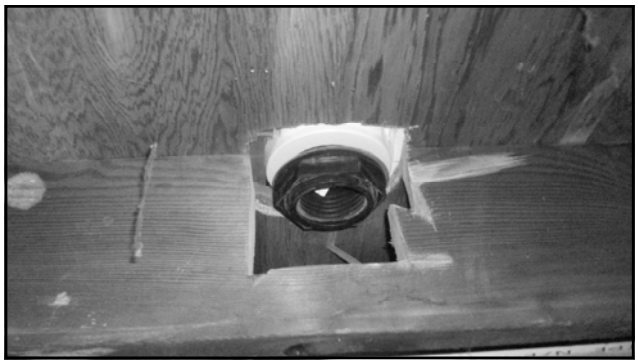


CUTTING/NOTCHING





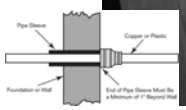




FOUNDATIONS

Relief arches

Sleeves

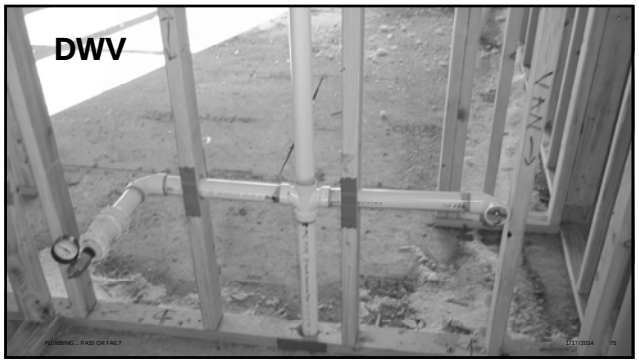


TESTING

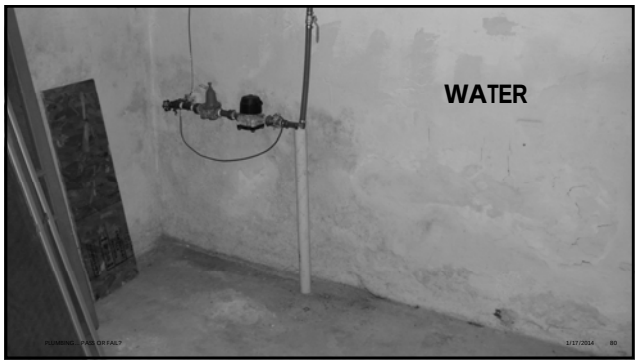
4 psi air

Maximum 10' head pressure of water

CONCERN #3
Building Materials



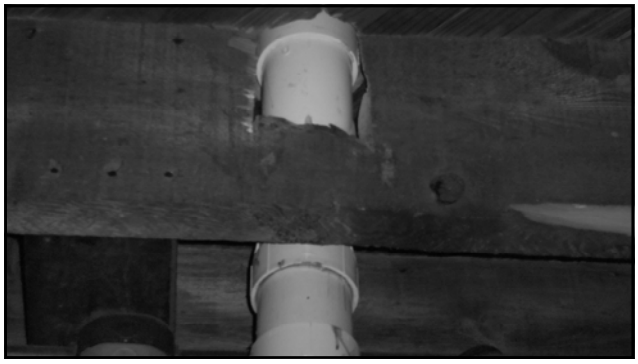
SEWER/SEPTIC



WATER

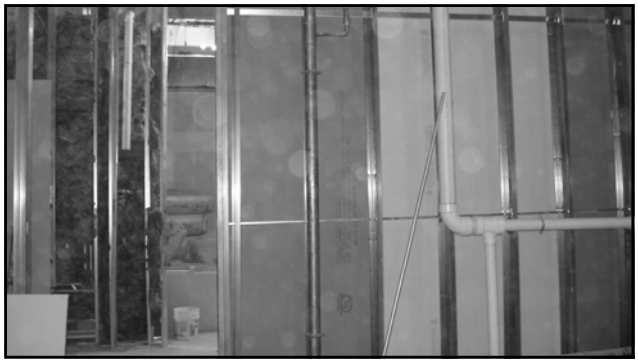
84

WOOD



88

STEEL



90

MASONRY

FLOOD HAZARD

CONCERN #4

Potable water

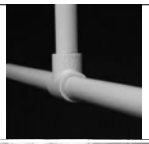
WATER SUPPLY

- PUBLIC
- LAKE
- WELL

WATER SYSTEM HAS TO CONVEY POTABLE TO ALL OCCUPANTS

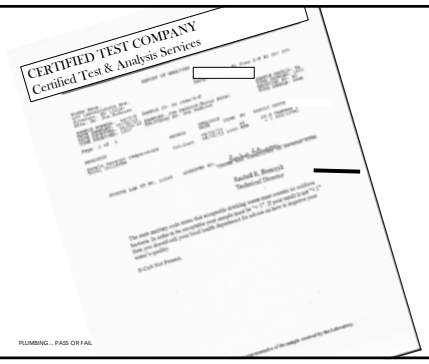
- Public/private
- Adequate supply
- Minimum PSI
- Maximum PSI

MATERIALS



WATER SAMPLE – TEST

- Test to no less than 50 psi
- NSF 61
- Potable water source shall be used to test water piping


CERTIFIED TEST COMPANY
Certified Test & Analysis Services


Report on Test and Maintenance of Backflow Prevention Device

MINIMUM TEMERATURE

MAXIUMUM TEMPERATURE

- NYS RESIDENTIAL CODE
  - P2708.3 SHOWER 120º F
  - P2721 BIDET 110º F
  - P2802.2 WATER-SPACE HEATER

FOR SPACE HEATING SHALL HAVE A MASTER THREMOSTATIC MIXING VALVE TO TEMPER THE WATER TO A TEMPERATURE OF 140º 0R LESS FOR DOMESTIC USES

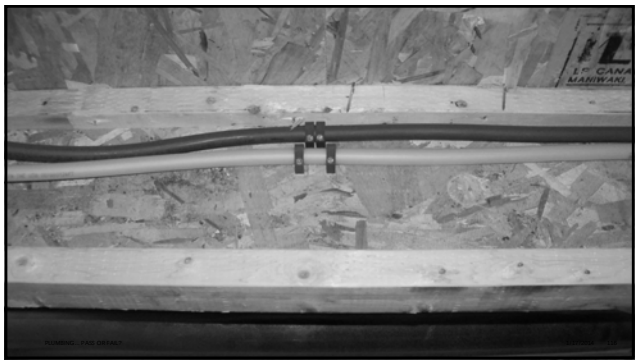
MAXIUMUM TEMPERATURE

- NYS SANITARY CODE
  - P2713.3 BATHTUB/WHIRLPOOL 120º F
- NYS PROPERTY MAINTENANCE CODE
  - 505.3 WATER HEATING FACILITIES 110º F
- NYS ENERGY CODE
  - 504.3 PUBLIC LAVATORIES 110º F
- NYS PLUMBING CODE
  - 607.1 WATER HEATING FACILITIES 110º F
- FOOD SERVICE ESTABLISHMENTS
  - 14-1.112 170º F

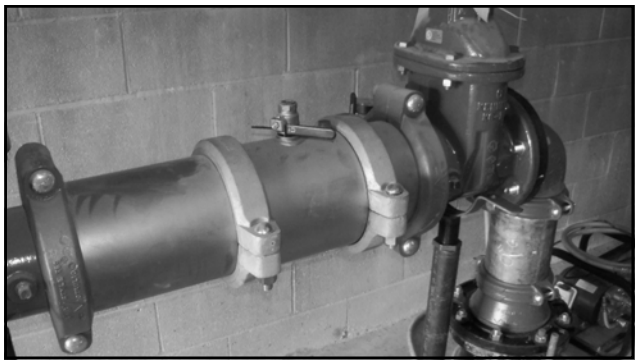
BACKFLOW

Test
Certification
Approved

PIPE SUPPORT



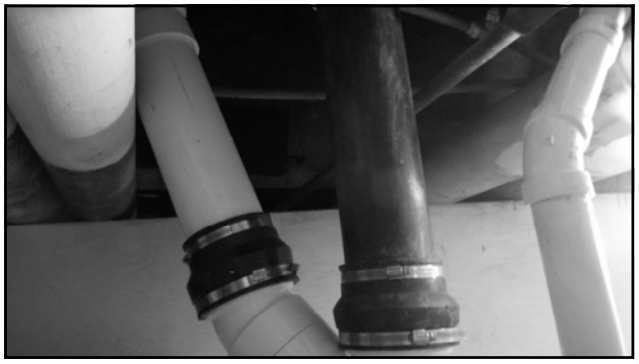
PROTECTION OF POTABLE WATER SUPPY



CONCERN #5
Drainage

WASTE HAS TO CONVEY TO PUBLIC/PRIVATE DISPOSAL SYSTEM

DRAINAGE CHALLENGES



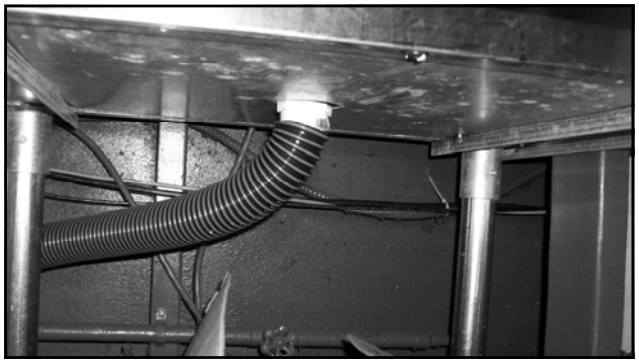
DWV SYSTEMS SHALL NOT COMPROMISE BUILDING ELEMENTS:

- Structure
- Walls
- Penetrations
- Nuisance to others
- Weather
- Systems have to breathe – flow of air thru system

MATERIALS APPROVED

- ABS
- COPPER - DWV
- PVC
- SDR

MATERIALS NON-APPROVED



SIZING

TABLE 710.1(1)
BUILDING DRAINS AND SEWERS

DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS CONNECTED TO ANY PORTION OF THE BUILDING DRAIN OR THE BUILDING SEWER, INCLUDING BRANCHES OF THE BUILDING DRAIN[a]			
	Slope per foot			
	1/16 inch	1/8 inch	1/4 inch	1/2 inch
1 1/4	—	—	1	1
1 1/2	—	—	3	3
2	—	—	21	26
2 1/2	—	—	24	31
3	—	36	42	50
4	—	180	216	250
5	—	390	480	575
6	—	700	840	1,000
8	1,400	1,600	1,920	2,300
10	2,500	2,900	3,500	4,200
12	3,900	4,600	5,600	6,700
15	7,000	8,300	10,000	12,000

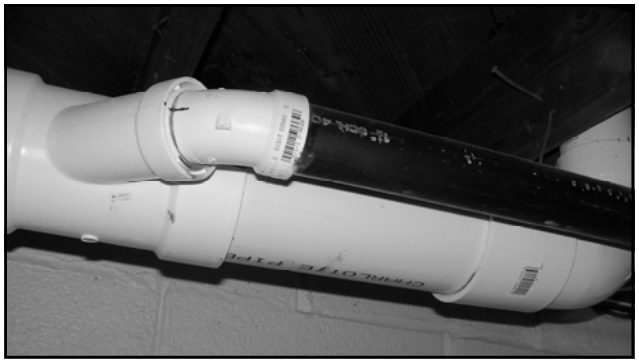
For SI: 1 inch = 25.4 mm, 1 inch per foot = 83.3 mm/m.
a. The minimum size of any building drain serving a water closet shall be 3 inches.

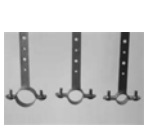
TABLE 710.1(2)
HORIZONTAL FIXTURE BRANCHES AND STACKS *

DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)			
		Stacks[b]		
	Total for horizontal branch	Total discharge into one branch interval	Total for stack of three branch intervals or less	Total for stack greater than three branch intervals
1 1/2	3	2	4	8
2	6	6	10	24
2 1/2	12	9	20	42
3	20	20	48	72
4	160	90	240	500
5	360	200	540	1,100
6	620	350	960	1,900
8	1,400	600	2,200	3,600
10	2,500	1,000	3,800	5,600
12	3,900	1,500	6,000	8,400
15	7,000	Note c	Note c	Note c

For SI: 1 inch = 25.4 mm.
a. Does not include branches of the building drain. Refer to Table 710.1(1).
b. Stacks shall be sized based on the total accumulated connected load at each story or branch interval. As the total accumulated connected load decreases, stacks are permitted to be reduced in size. Stack diameters shall not be reduced to less than one-half of the diameter of the largest stack size required.
c. Sizing load based on design criteria.

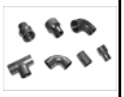
GLUE/CONNECTIONS



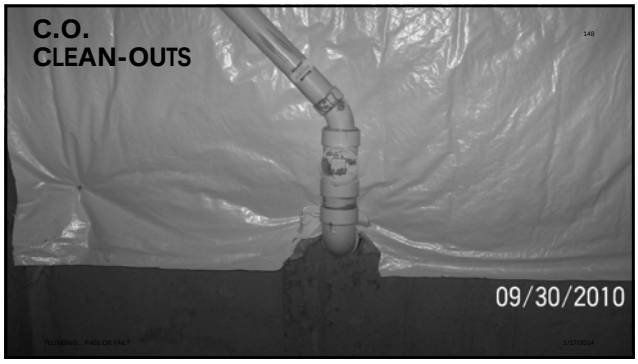


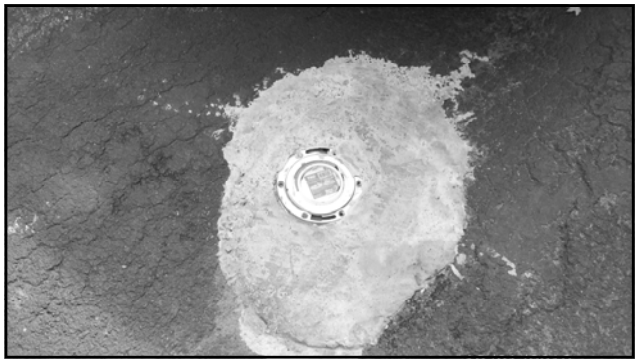
HANGERS

APPROVED FITTINGS



C.O.
CLEAN-OUTS





CHANGE OF DIRECTION

SEWAGE BACKUPS

Health

Safety

Sanitation

RESIDENTIAL CLEANUP

- Loss of service
- Mold
- Sanitary conditions

COMMERCIAL CLEANUP

Interconnection

Food/food

Waste/waste

ITEMS ADDED TO SEWER

Wipes and Papers, etc.

Rags

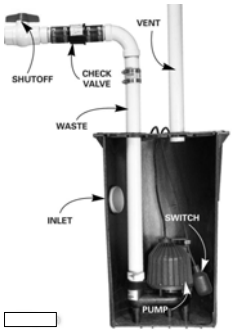
Non-flushables

Drugs

Chemicals

Grease

SEWAGE EJECTOR



CHEMICAL WASTE

SUMP

CONCERN #6

Venting

MATERIALS

902

VENT PIPE SIZE

MINIMUM SIZE

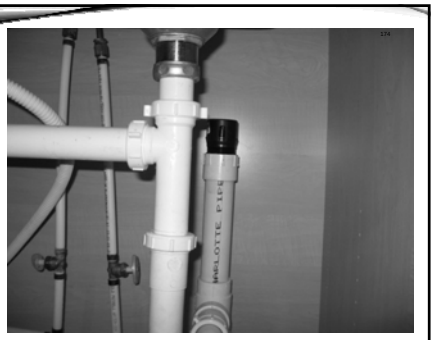
916

RESIDENTIAL OR COMMERCIAL

3” thru roof

AAV

917



1/17/2014 176

177

LOOP CIRCUIT

Wet
Waste stack

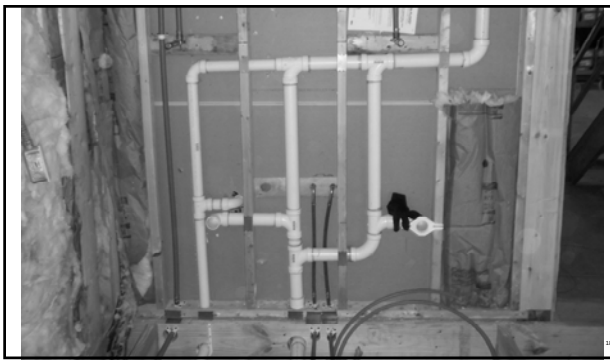
PLUMBING... PASS OR FAIL? 1/17/2014

180

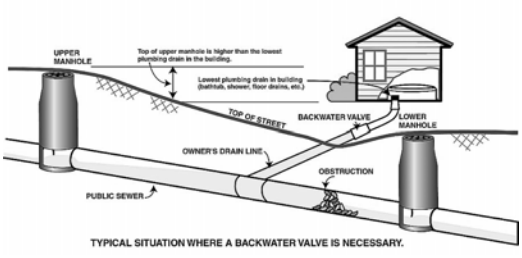
LENGTH
OF TRAP ARMS

906.1

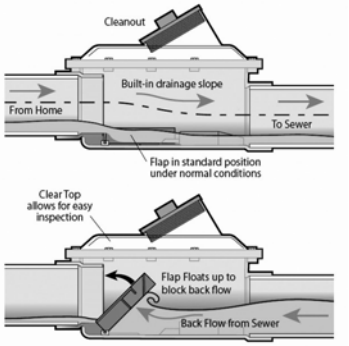
PLUMBING... PASS OR FAIL? 1/17/2014



BACKWATER



TYPICAL SITUATION WHERE A BACKWATER VALVE IS NECESSARY.



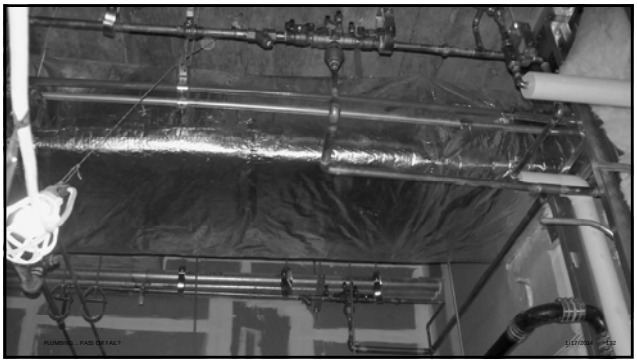
CLEAR WATER WASTE DISPOSAL

CONCERN #7

Inspections

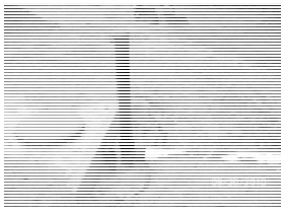
PLUMBING INSPECTIONS

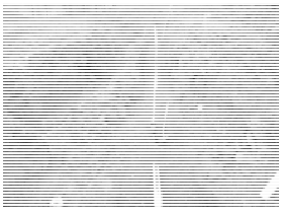
- LET'S PERFORM AN INSPECTION!



193

SEWER/ WATER





UNDERGROUND

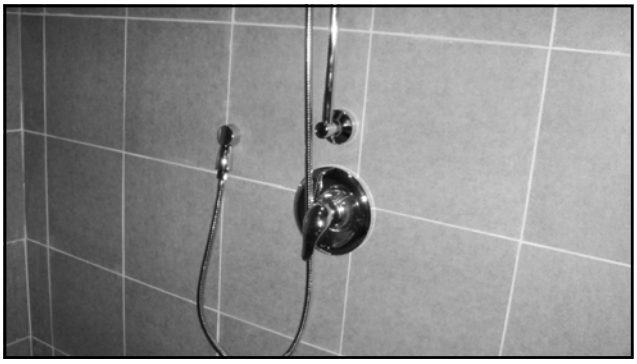
194

196

ROUGH-IN

201

FINAL



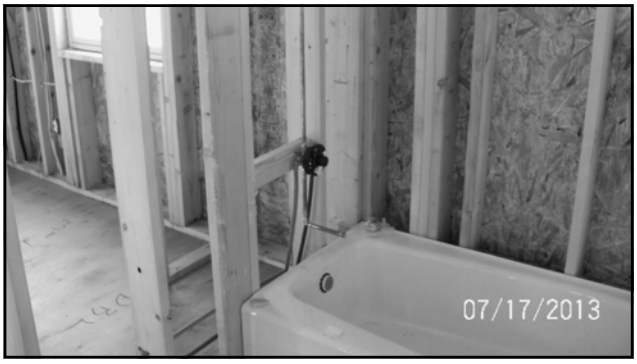

205


1/17/2014 206

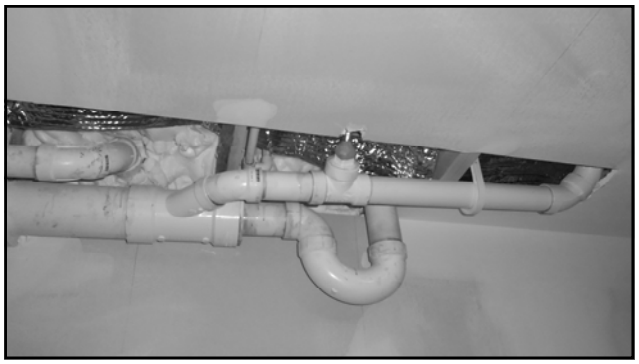

PLUMBING - PASS OR FAIL?
1/17/2014 207


PLUMBING - PASS OR FAIL?
1/17/2014 208

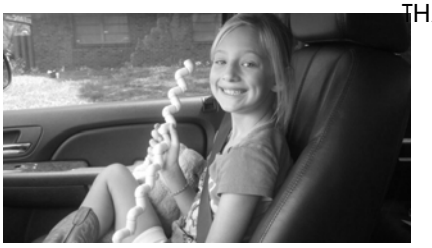

209


07/17/2013


07/03/2012



THANK YOU!



QUESTIONS?