

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?



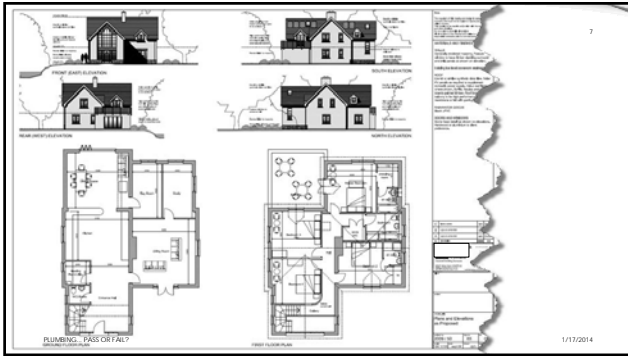
KEY PLUMBING CONCERNS

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

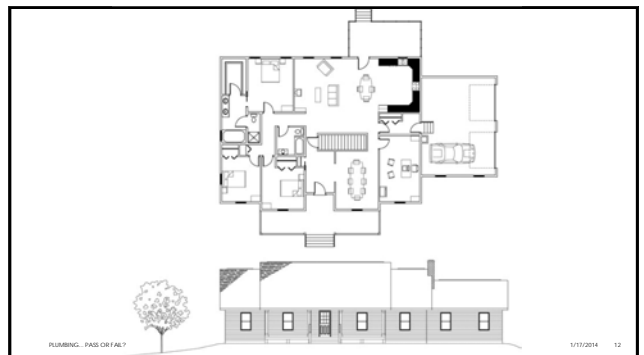
Specifications:
 Porcelain and enamel drain basin white powder coated enamel washing machine outlet box. That shall be Day Dray product code as manufactured by DRY Corporation.

Finish Materials:
 White Powder Coat on Cold Rolled Steel as per spec with no gauge change.

Valves & Drain Options:
 QTY: Three Valves with 1/2" Sweat/NEP, PEX, Nylon, or CPVC connections. 1" diameter drain kit included. Valves comply with ASSE A106.4.

Item #	Product Description	Model #	Quantity
82110	Center Drain Qtr Turn Valve, 1/2" Sweat Conn. Unthreaded	WMB-8	5
82111	Center Drain Qtr Turn Valve, 1/2" Sweat Conn. Gasketed, Unthreaded	WMB-9	5
82120	Center Drain Qtr Turn Valve, 1/2" CPVC Conn. Unthreaded	WMB-11	5
82121	Center Drain Qtr Turn Valve, 1/2" CPVC Conn. Gasketed, Unthreaded	WMB-12	5
82122	Center Drain Qtr Turn Valve, Insulated, 1/2" Sweat Conn.	WMB-13	5
82123	Center Drain Qtr Turn Valve, Insulated, 1/2" Sweat Conn. Gasketed	WMB-14	5

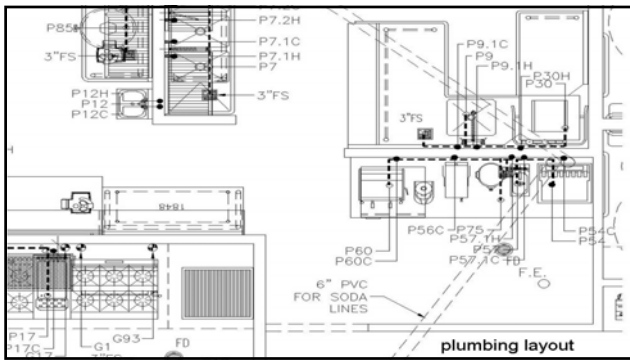
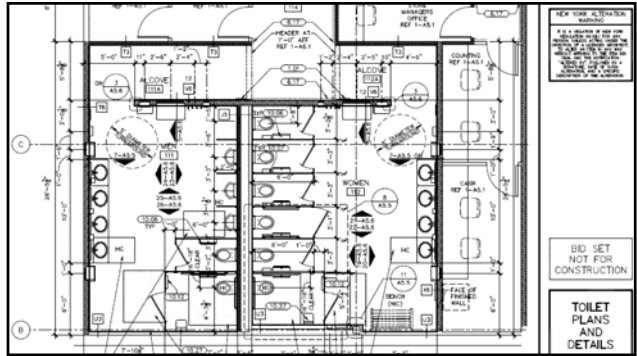
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COMMERCIAL BUILDING PLANS

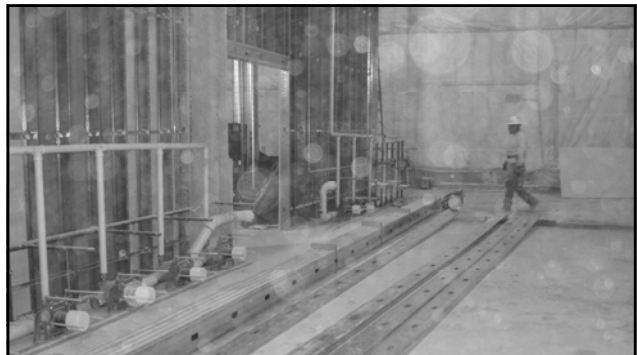
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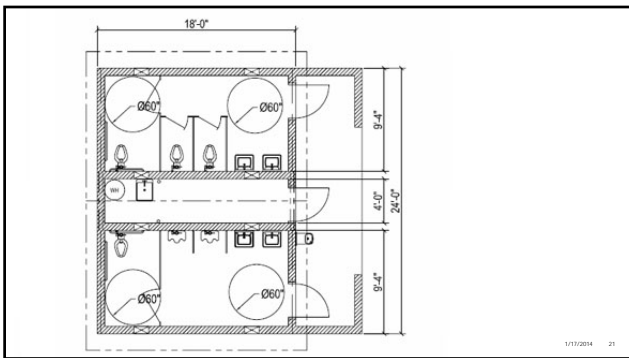
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WASHROOM/ TOILET REQUIREMENTS

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UNHEATED SPACES

PLUMBING... PASS OR FAIL?

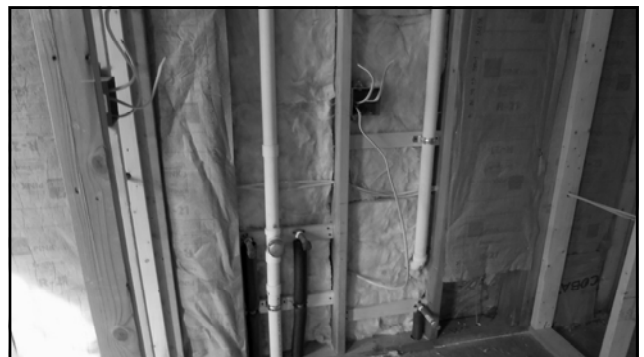
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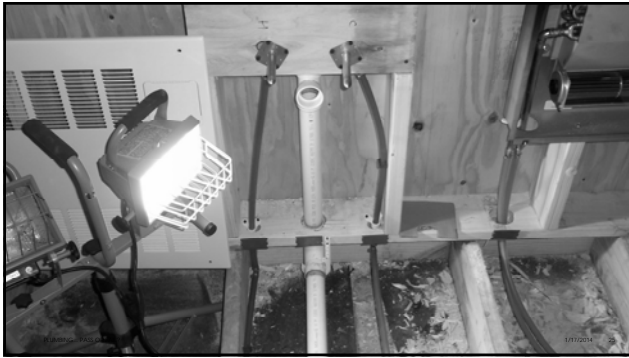
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PLUMBING IN OUTSIDE WALLS

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BACKWATER PROTECTION

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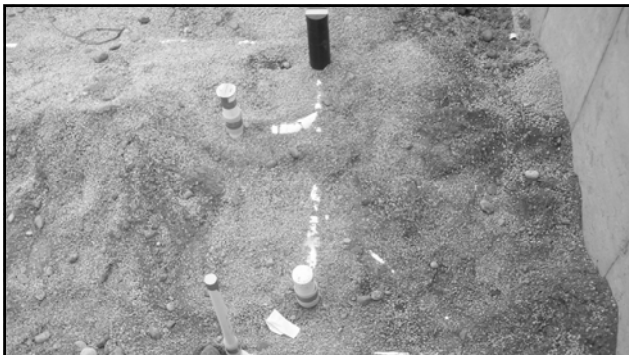
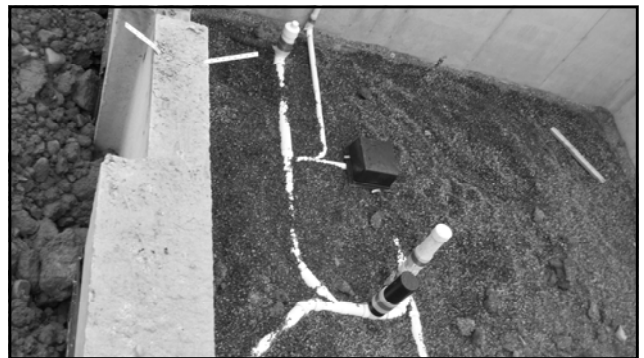


FIG. 35

FIG. 36

FIG. 37

TABLE 13 MAX. DFU LOADS FOR WET VENTS & CWV
(TABLES 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5 & 9.11.6)

Pipe Size (in.)	Wet Vents		CWV (IRC)	
	IRC	UPC	To Branch	To Bkg Drain
1 1/2	1	0	0	0
2	4	4	3	4
2 1/2	6	8 ^A	6	26
3	12	8 ^B	12	31
4	32	8 ^B	20	50

A. For back-siphon vents, max. load is 4 DFUs on 2 1/2-in. pipe.
B. More than 8 possible for horiz. wet vents.

Horizontal Wet Venting IRC UP

- Horiz wet venting OK for any combination of fit within [908.4.1]
- For 2 DA groups on same floor F3P [908.4.1]
- Only fits within DA groups allowed on wet vent. Other vented fits may connect to the drain downstream of wet vent [908.4.1]
- Dry vent connection to wet vent must be individual or common-wirt connected to lav, bidet, DT, or shower [908.4.2]^{UP}
- Side-sit 1/4 bends OK as a wet vent connection if not serving a WC [908.4.2]
- Max trap-arm length measured from trap weir to wet vent [908.5]^{UP}
- Size wet vent per DFUs of upper drains T13 [910]
- Size wet vent per DFUs & T13 [910]

UNDERSIZED VENTING

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TERMINATION OF VENTS

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WATER CLOSET SPACE

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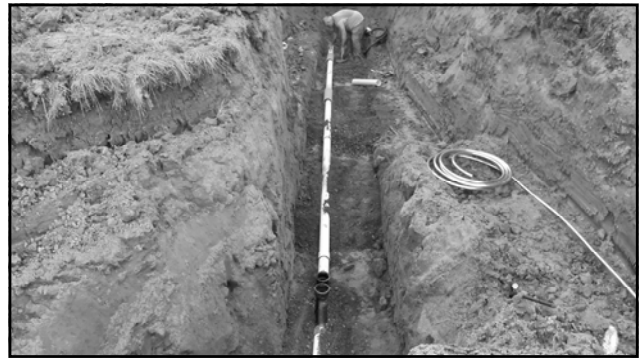
SIZING OF SEWERS

<p>709</p> <p>1-1/2 bathroom home</p> <ul style="list-style-type: none"> • Clothes washer 2 • Bathroom group 5 • Dishwasher 2 • Kitchen sink 2 • Laundry tray 2 • Lavatory 1 • Water closet <u>4</u> <li style="text-align: right;">18 	<p>2-1/2 bathroom home</p> <ul style="list-style-type: none"> 2 10 2 2 2 1 <u>4</u> 23 	<p style="text-align: right;">710</p> <ul style="list-style-type: none"> • 3" 1/8 = (36 F.U.) • 3" 1/4 = (42 F.U.) • 4" 1/8 = (180 F.U.) • 4" 1/4 = (216 F.U.)
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WATER SERVICE MATERIALS

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COMMON ISSUES WITH COMMERCIAL BUILDING PLANS

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BATHROOM COUNT

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

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FLOOR DRAINS

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DRINKING FOUNTAINS

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SERVICE SINKS

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CONCERN #2

Building Construction



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FREQUENT BUILDING CONSTRUCTION ISSUES

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ROOFS

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SIDEWALLS

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VENT TERMINATION

1/18/2013

PLUMBING... PASS OR FAIL?

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SLAB-ON-GRADE

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BASEMENT

08/05/2013

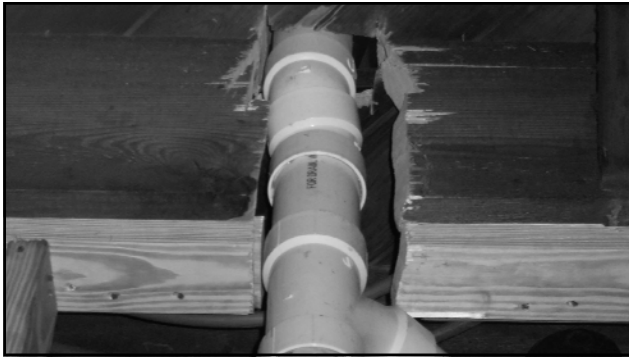
08/05/2013

08/05/2013

08/05/2013

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FOUNDATIONS

Relief arches
Sleeves

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TESTING

4 psi air

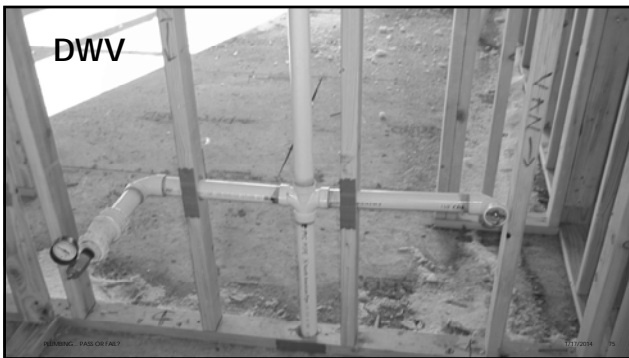
Maximum
10' head
pressure of
water

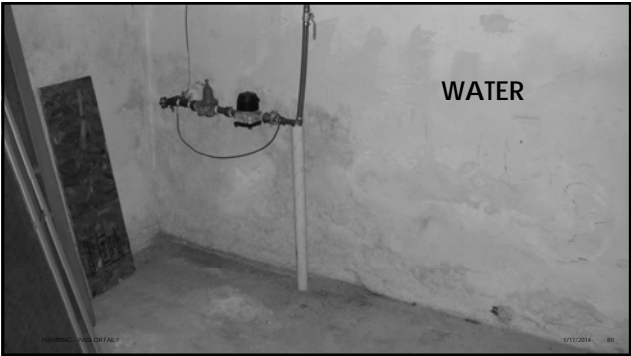
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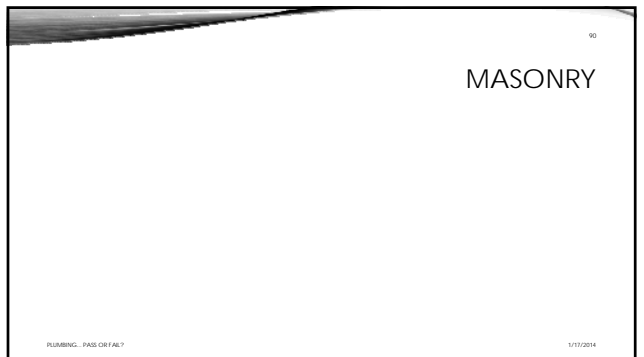
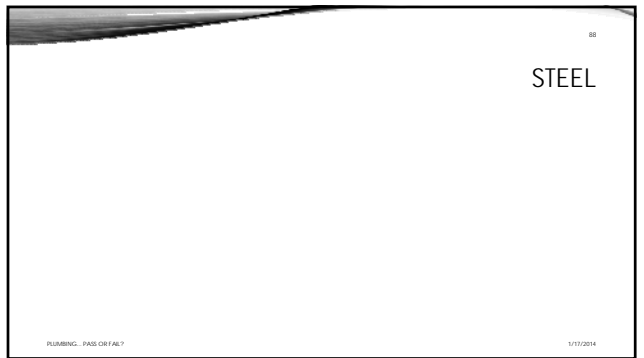
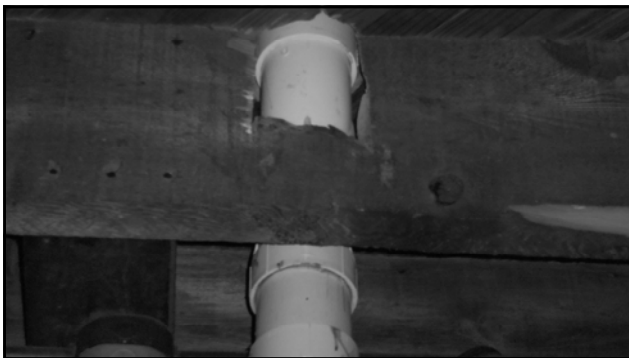


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CONCERN #3 Building Materials












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WATER SUPPLY

- PUBLIC
- LAKE
- WELL



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WATER SYSTEM HAS TO CONVEY POTABLE TO ALL OCCUPANTS

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

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MATERIALS

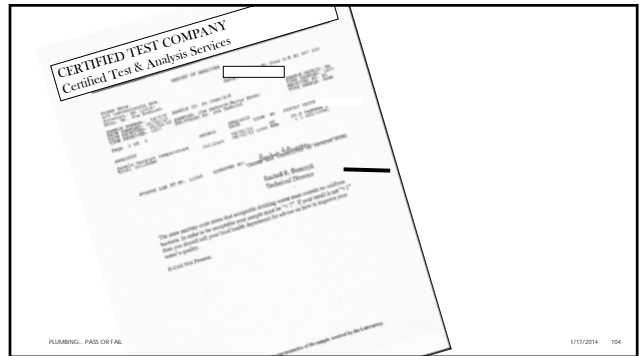






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WATER SAMPLE – TEST

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



MINIMUM TEMPERATURE



MAXIMUM TEMPERATURE

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

FOR SPACE HEATING SHALL HAVE A MASTER THERMOSTATIC MIXING VALVE TO TEMPER THE WATER TO A TEMPERATURE OF 140° OR LESS FOR DOMESTIC USES

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MAXIMUM TEMPERATURE

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

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BACKFLOW

Test
Certification
Approved

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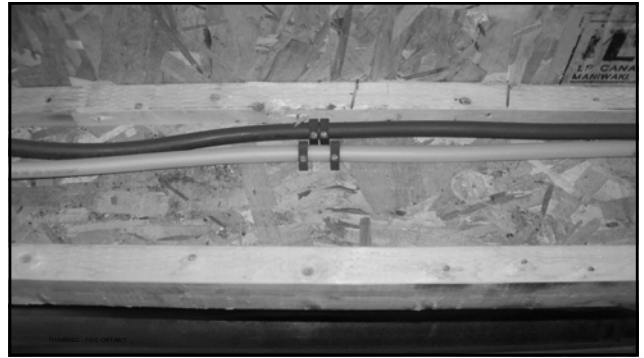


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PIPE SUPPORT

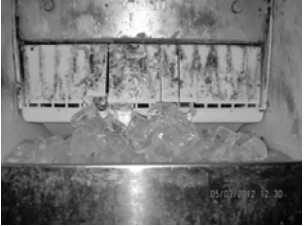

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PROTECTION OF POTABLE WATER SUPPLY

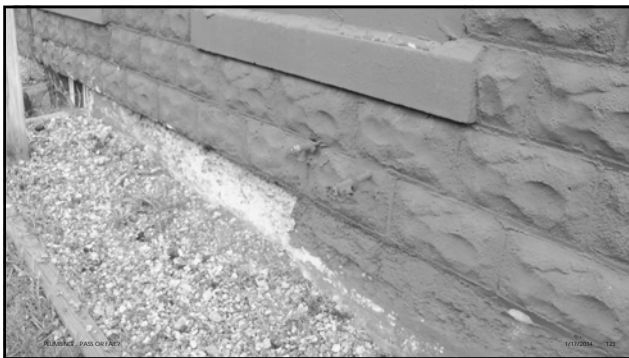
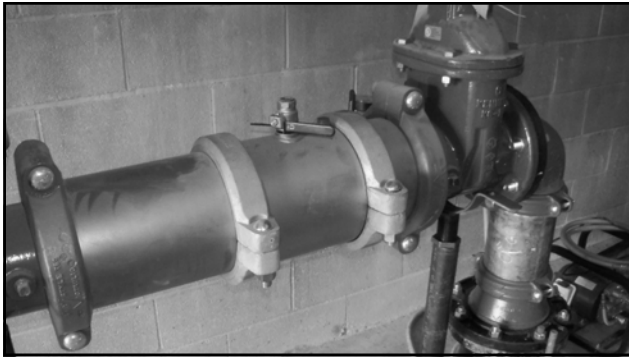
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CONCERN #5 Drainage



WASTE HAS TO CONVEY TO PUBLIC/PRIVATE DISPOSAL SYSTEM

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DRAINAGE CHALLENGES

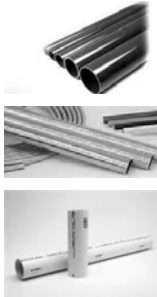
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DWV SYSTEMS SHALL NOT
COMPROMISE BUILDING ELEMENTS:


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

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MATERIALS APPROVED

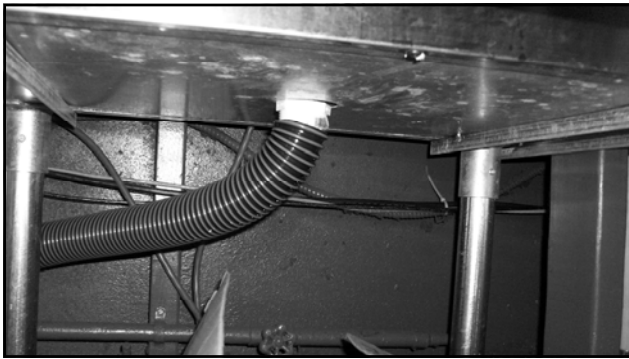
- ABS
- COPPER - DWV
- PVC
- SDR



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MATERIALS NON-APPROVED

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SIZING

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**TABLE 710.1(1)
BUILDING DRAINS AND SEWERS**

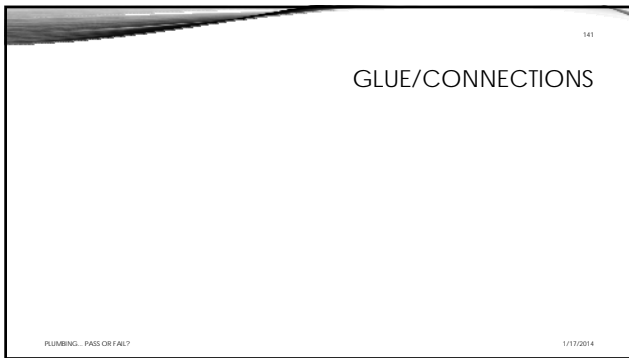
DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS CONNECTED TO ANY PORTION OF THE BUILDING DRAIN OR THE BUILDING SEWER, INCLUDING BRANCHES OF THE BUILDING DRAIN ^a			
	Slope per foot			
	1/8 inch	1/4 inch	1/2 inch	3/4 inch
1 1/2	—	—	1	1
1 1/2	—	—	3	3
2	—	—	21	26
2 1/2	—	—	24	31
3	—	36	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

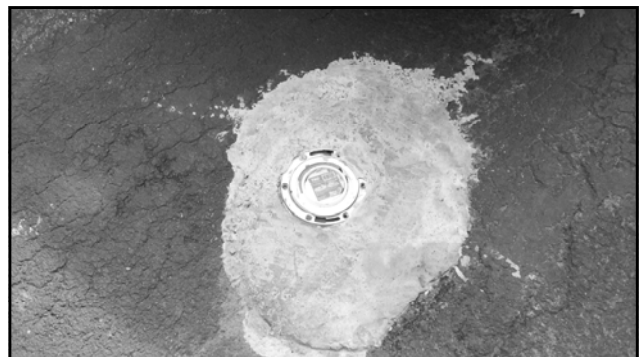
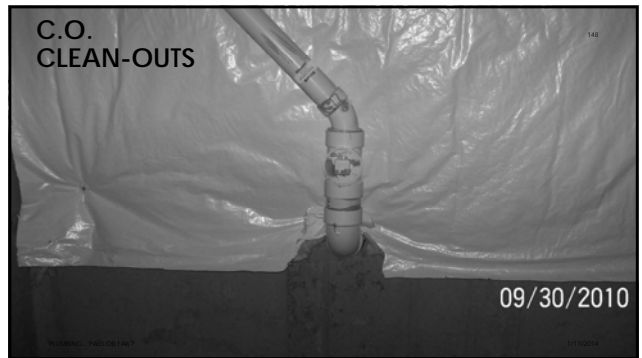
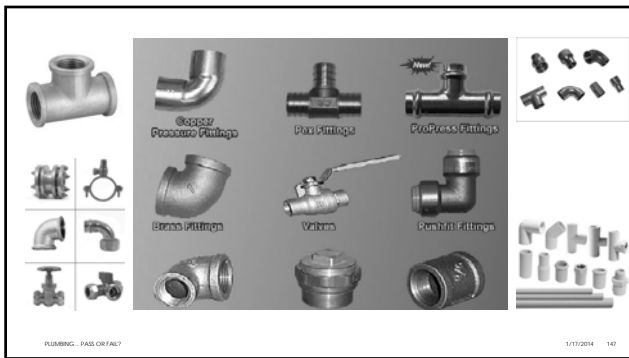
For SI: 1 inch = 25.4 mm, 1 inch per foot = 83.3 mm/m.
a. The minimum size of any building drain serving a water closet shall be 3 inches.

**TABLE 710.1(2)
HORIZONTAL FIXTURE BRANCHES AND STACKS^a**

DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)			
	Total for horizontal branch	Stacks ^b		
		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. Stacks shall be sized based on the total accumulated connected load.





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CHANGE OF DIRECTION



09/30/2010


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SEWAGE BACKUPS

Health
Safety
Sanitation



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RESIDENTIAL CLEANUP

- Loss of service
- Mold
- Sanitary conditions



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COMMERCIAL CLEANUP

Interconnection
Food/food
Waste/waste



STREET CLOSED

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ITEMS ADDED TO SEWER

Wipes and Papers, etc.

Rags




It's a Toilet, Not a Trashcan!

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Non-flushables

Drugs

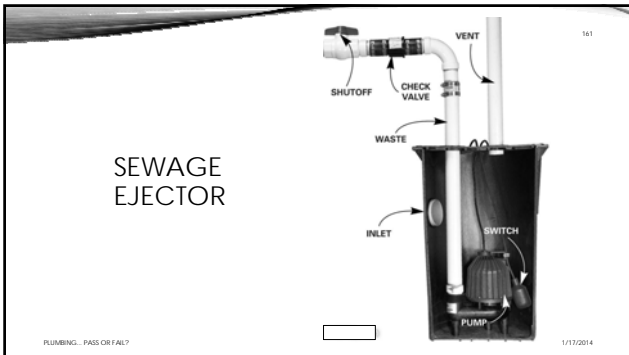
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Chemicals

Grease

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CHEMICAL WASTE

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SUMP

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CONCERN #6
Venting

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MATERIALS

902

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VENT PIPE SIZE
MINIMUM SIZE

916

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RESIDENTIAL OR
COMMERCIAL


3" thru roof

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AAV

917



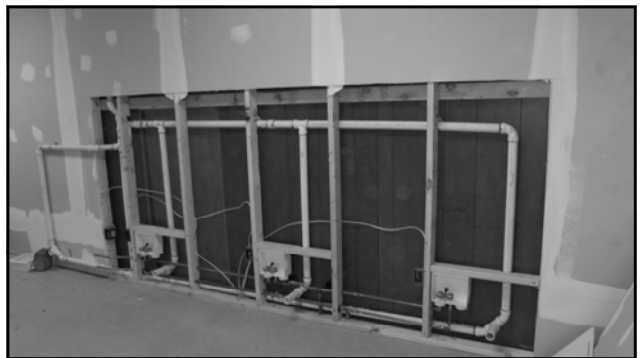
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LOOP CIRCUIT

Wet
Waste stack

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LENGTH
OF TRAP ARMS

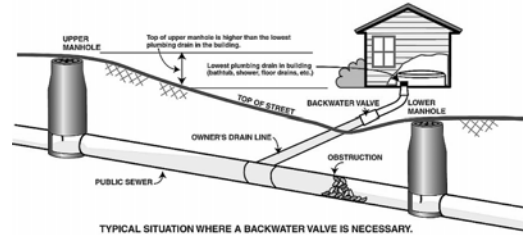
906.1



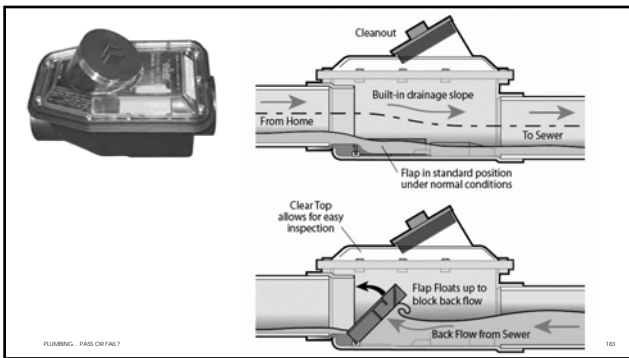
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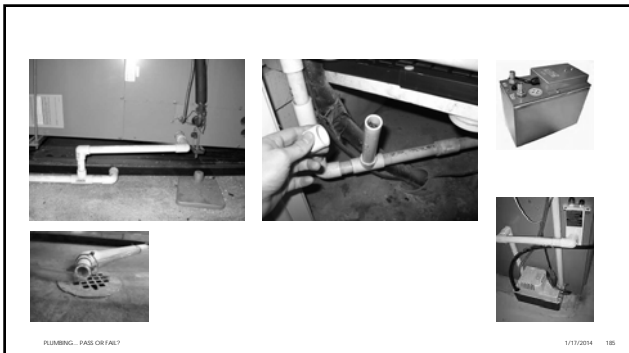
BACKWATER



TYPICAL SITUATION WHERE A BACKWATER VALVE IS NECESSARY.



CLEAR WATER WASTE DISPOSAL



CONCERN #7 Inspections

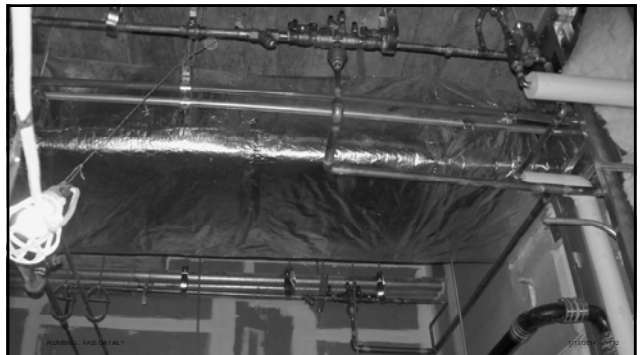


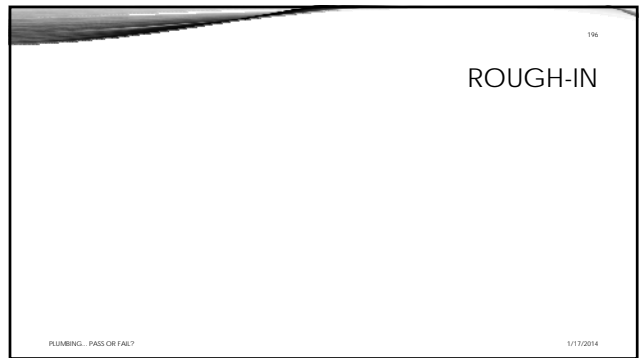
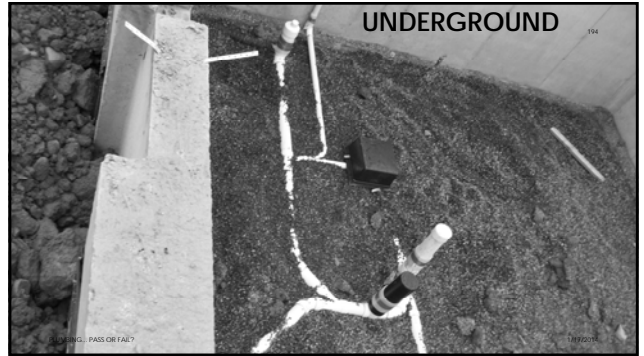
PLUMBING INSPECTIONS

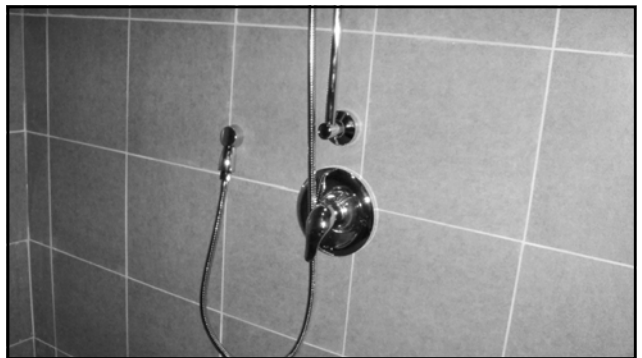
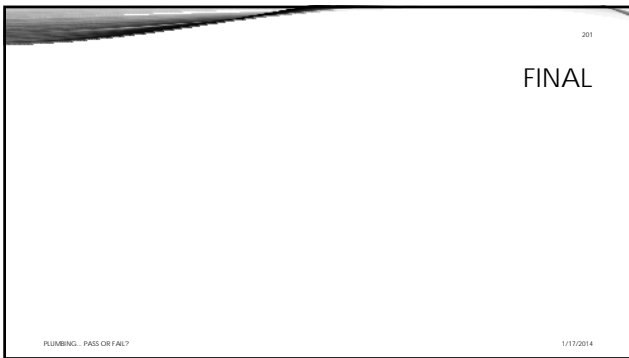
- LET'S PERFORM AN INSPECTION!

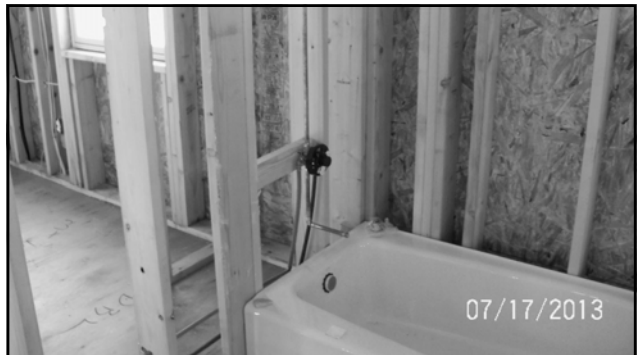


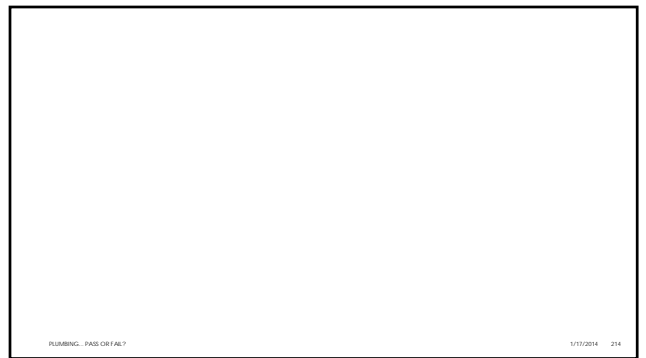
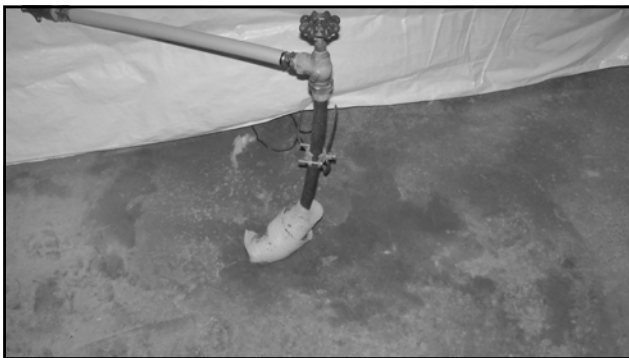
... and you expect me to pass that plumbing? #REALLY













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THANK YOU!



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QUESTIONS?