

10. Isolation valves & bypass

- Isolation valves important upstream and downstream (ACV can't be serviced unless whole line is drained)
- Bypass – if using smaller bypass, service large valve in off-peak hours

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End Current Events



74

Break - 10 minutes



75

Main Event

Pipe for Water & Sewer

76

Pipe Materials

- Plastic
- Metal
- Wood
- Mineral



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Plastic Pipe

- PVC
- HDPE
- ABS



78

PVC Pipe



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Pipe Specifications

- Water Mains
- PVC Pipe: All PVC pipe shall conform to ASTM Specification D-2241 and shall be PVC 1120, SDR 26 with a 160 psi pressure rating or SDR 21 with a 200 psi pressure rating as shown on the drawings.

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Pipe Specifications

- Sewer Mains
- PVC Pipe: PVC sanitary sewer pipe shall conform to ASTM D-3034 SDR 35 including but not limited to the minimum wall thickness, minimum impact strength and minimum pipe stiffness required for each diameter of pipe installed. Filled PVC or styrene rubber pipe shall not be allowed.

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- What does all that mean?
- WATER
- ASTM D-2241
- PVC 1120
- SDR 26 (160 psi); SDR 21 (200 psi)
- SEWER
- ASTM D-3034
- SDR 35

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ASTM

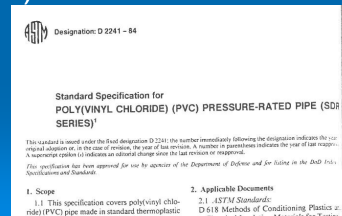


- Formerly know as “American Society for Testing and Materials” – now just ASTM International
- Develops international voluntary consensus standards
- Founded in 1898 by chemists and engineers from the Pennsylvania Railroad

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ASTM D-2241

- Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure Rate Pipe (SDR Series)



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SDR Series

- Standard Thermoplastic Pipe Dimension Ratio (SDR). Standard covers 7 SDRs:

- 13.5
- 17
- 21
- 26
- 32.5
- 41
- 64

85

SDR Definition

- Ratio of pipe diameter to wall thickness

$$\frac{OD}{Wt}$$

- OD is always the same
- Wt varies (or ID varies)

86

6-inch PVC SDR pipe

- OD = 6.625 inches
- SDR 26 -> wt = 0.255 inches (ID 6.115)
- SDR 21 -> wt = 0.316 inches (ID 5.993)



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What effect does Wt have?

- Strength – increases
- Weight – increases
- Cost – increases
- ID – reduces
- Headloss - increases

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Pressure Class

- 6-inch PVC SDR Series
 - SDR 26 – 160 psi
 - SDR 21 – 200 psi

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AWWA C900

- AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4in through 12 in. for water
- Three pressure classes 100, 150, 200 psi
- OD dimensions of IPS or CIP
- Wt dimension ratios 14, 18, 25

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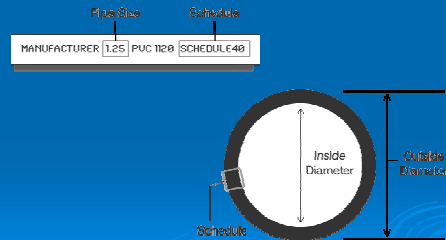
AWWA C900

- 6 inch diameter PVC pipe
 - IPS = 6.625 inches
 - CIP = 6.900 inches

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What about Schedule 40?

- Plumbing grade PVC pipe



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ASTM Standard D1785

- Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

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6-inch PVC

- OD = 6.625 inches
- SDR 26 -> wt = 0.255 inches (ID 6.115)
- SDR 21 -> wt = 0.316 inches (ID 5.993)
- SCH 40 -> wt = 0.289 inches (ID 6.047)
- SCH 80 -> wt = 0.432 inches (ID 5.761)

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Pressure Class

- 6-inch PVC SDR Series
 - SDR 26 – 160 psi
 - SDR 21 – 200 psi

Pressure Rating

- 6-inch PVC SCH
 - SDR SCH 40 – 180 psi
 - SDR SCH 80 – 280 psi

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ASTM D 3034

- Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

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PSM

- The term PSM is not an abbreviation, rather it is an arbitrary designation for a product having certain dimensions.
- Used for non-pressure drainage of sewage and surface water

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6-inch PVC

- OD = 6.625 inches
- SDR 26 -> wt = 0.255 inches (ID 6.115)
- SDR 21 -> wt = 0.316 inches (ID 5.993)
- SCH 40 -> wt = 0.289 inches (ID 6.047)
- SCH 80 -> wt = 0.432 inches (ID 5.761)
- **OD = 6.275 inches**
- **SDR 41 -> wt = 0.153 inches**
- **SDR 35 -> wt = 0.180 inches**

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ASTM D-2665

- Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
- OD = 6.625
- Wt = 0.280

99

Markings

3/4" Brandname PVC-1120 SCH.40 PR 480 PSI @ 73°F ASTM D-1785 NSF-pw

1 1/2" PVC 1120 SCH40 330 PSI NSF-pw ASTM D1785 JH90 02/FEB/02/2 R111111 754826200525 18MM 15V

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ABS?

- Acrylonitrile-Butadiene-Styrene Plastic
- Used for DWV only (non-commercial)
- ASTM D 2661



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HDPE



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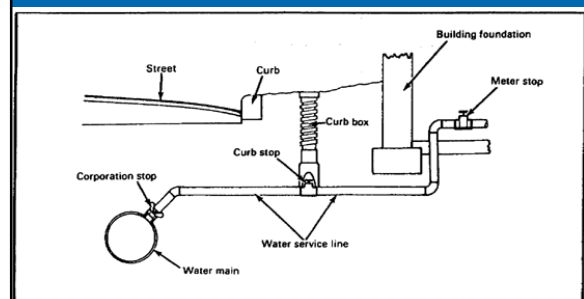
HDPE

- High Density Polyethylene
- More flexible than PVC/ABS
- Used in trenchless installations
 - No glue
 - Compression fitting
 - Butt fuse



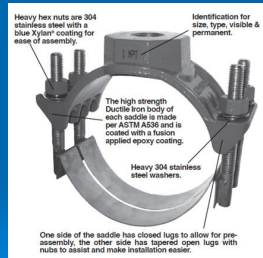
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Service Line



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Service line



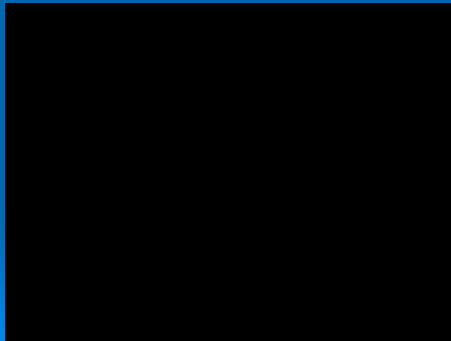
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Curb stop



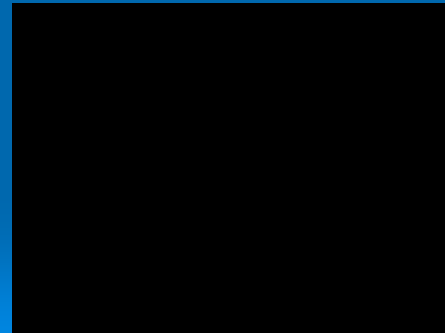
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Butt Fusion



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Butt Fusion Method



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Metals

- Copper
 - Soft, hard,...
- Steel
 - Galvanized
 - Black
- Iron
 - Cast iron
 - Ductile iron



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Steel / Iron

Black Steel



Galvanized Iron



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Iron

Cast Iron



Ductile Iron



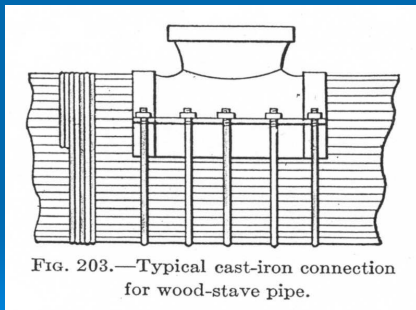
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Wood



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Wood



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Wood



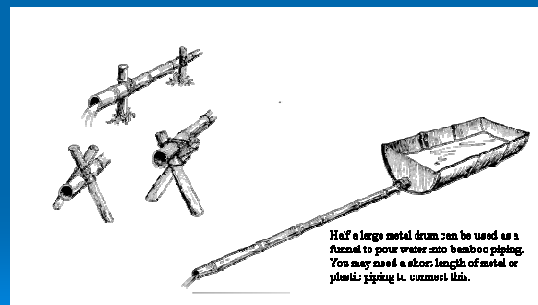
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Wood



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Wood (Bamboo)



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Mineral

- Clay
- Asbestos cement
- Concrete



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Concrete Pipe



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How do you choose?

- For repairs – know what is existing.
- Environment?
- Pressure requirements?
- Available?
- Compatible?

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Break - 10 minutes



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The Inside Scoop

CUC – Sewer Main Videos!

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Ice-Pigging

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End Training

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Association Business

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May Annual Meeting

- Next CEU training – May 2013
- Annual election of Board members (2)
 - Take nominations now
 - Derek up for re-election
 - Bernard up for re-election

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Board Member Terms

- Chair: Derek Chambers – May 2013
- Vice chair: Bernard Keremius – May 2013
- Secretary: Mariano Iglecias – May 2014
- Treas: Cecilio Raiukiulipiy – May 2015

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Contact Information

Mariana Islands Water Operator Association
P.O. Box 502512
Saipan, MP 96950

www.MarianasOperators.org

e-mail

info@MarianasOperators.org

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