

Meeting Minutes: Plumbing Board

Date: October 15, 2024
Time: 9:30 a.m.
Minutes by: Lyndy Logan
Location: Minnesota Room, DLI, 443 Lafayette Rd. No., St. Paul, MN 55155

Members

1. Karl Abrahamson (Secretary)
 2. Sam Arnold
 3. Kent Erickson (Vice Chair)
 4. Jonathan Lemke
 5. Justin Parizek – joined via phone at 10 a.m.
 6. Scott Stewart
 7. Rick Wahlen – WebEx
 8. Mike Westemeier (DLI CO’s Designee)
 9. Shane Willis – WebEx
 10. Philip Wood
- David Weum (MDH CO’s Designee) (non-voting)

Members Absent

Richard Becker (Chair)
Adam Johnson
Bruce Pylkas

DLI Staff & Visitors

Adam Case (Board. Counsel, DLI)
Krystle Conley (DLI) – WebEx
Allison Eastman (DLI) – WebEx

DLI Staff & Visitors continued...

Thomas Eisert (DLI)
Todd Green (DLI) – WebEx
Brad Jensen
Lyndy Logan (DLI)
Hannah Mardaus (DLI) – WebEx
Steve Nuebel (DLI) – WebEx
Chuck Olson (DLI)
Sean O’Neil (DLI)
John Roehl (DLI)
Jon Boesche (MN ABC)
Nick Erickson (Housing First)
Jeff Hill (MWQA)
Mike Johnson (J-Berd Mechanical)
David Nickelson (Uponor) – WebEx
Tom Pakkala (Local 15)
Angie Peterson (METC) – WebEx
Jim Peterson (MN PHCC)
Jarrett Purdue (DNR) – WebEx
David Radziej (MN PHCC)
Scott Thompson (My Plumbing Training)

1. Call to Order, Chair

- A. The meeting was called to order by Chair Becker at 9:37 AM. Roll call was taken by the Secretary and a quorum was declared with 9 of 13 voting members present; Justin Parizek joined via phone at 10 a.m., resulting in 10 voting members present in person or via WebEx.
- B. Announcements – Introductions (members and attendees) – Chair Becker
 - Everyone present in person and remotely can hear all discussions.
 - All votes will be taken by roll call if any member attends remotely.
 - All handouts discussed and WebEx instructions are posted on the Board’s website.
 - WebEx instructions/procedures can be found on the board’s website at:
<https://www.dli.mn.gov/about-department/boards-and-councils/plumbing-board>

2. Approval of meeting agenda

A motion was made by Arnold, seconded by Wood, to approve the agenda. The roll call vote was unanimous with 9 votes in favor; the motion carried.

3. Approval of previous meeting minutes

A motion was made by Abrahamson, seconded by Lemke, to approve the Jul. 16, 2024, meeting minutes. The roll call vote was unanimous with 9 votes in favor; the motion carried.

4. Regular Business

Expense reports were approved.

5. Special Business

A. Enforcement & Licensing update

- Plumbing enforcement actions are updated monthly and can be found here: <https://www.dli.mn.gov/business/plumbing-contractors/plumbing-enforcement-actions>.

- Contractors who have been fined due to unlicensed activity can be viewed in the [CCLD Review Newsletter](#).

• **Licensing Unit/License & Registrations**

○ Plumbing contractors	1,776
○ Registered employers	56
○ Master plumbers	3,663
○ Journeyworker plumbers	3,260
○ Registered unlicensed plumbers	5,637
○ Water conditioning contractors	62
○ WC masters	129
○ WC journey workers	185
○ Registered unlicensed WC	178
○ Backflow prevention testers	716
○ Backflow prevention rebuilders	900
○ Exams administered in CY 2024 (to date/all trades)	7,048
○ Exams administered PLB-specific in CY 2024	395

- Master (102), Journeyworker (293)

• **Enforcement Unit**

○ Active plumbing investigations	90
○ Orders issued to date (CY)	62
○ Investigations closed	96

B. Department update – Mike Westemeier

C. CCLD Division update – Todd Green (see Attachment A)

Justin Parizek joined the meeting at 10 a.m. via phone resulting in 10 voting members present in person or remotely.

A motion was made by Wahlen, seconded by Abrahamson, to take a 10-minute recess from 10:10 to 10:20 a.m. The roll call vote was unanimous with 10 votes in favor of the motion; the motion passed.

- D. RFI PB0183, Section 706 – Jim Peterson, Minnesota PHCC – see **Attachment B (RFI) and C (Plumbing fittings and direction of flow)**

This question was withdrawn by Peterson and will be submitted as an RFA to the 2024 UPC ad hoc Rulemaking Committee: *Is the use of Plastic ¼ bend, and Tapped Short ¼ bend fittings (for no hub) at the end of a trap arm for connection to the trap adapter allowed?*

A motion was made by Abrahamson, seconded by Westemeier, to provide the following interpretation to RFI PB0183 as shown below. The roll call vote was unanimous with 10 votes in favor of the motion; the motion passed.

Question: For both horizontal to horizontal, and vertical to horizontal runs when long pattern plastic or long sweep for cast iron systems are not made, are short sweep 1/4 bends for cast iron systems, and plastic 1/4 bends considered to be fittings of equivalent sweep?

Answer: In drainage systems with piping over 6 inches, a quarter bend LS, SS, or any fitting listed by the manufacturer as a long pattern or long sweep fitting can be used in the horizontal to horizontal or vertical to horizontal installations. Equivalent sweep includes any combination of 45-degree 1/8 bends or 22-degree 1/16th bends.

Analysis: Any combination of fittings would include street fittings. In most cases, the call is to require the use of two, 45-degree elbows for a 90-degree change of direction, thinking that the chapter requires a combination Wye and 1/8 bend (or two 45-degree changes) some will also allow the use of “Long sweep or long pattern ¼ bends,” but when the manufacturer does not list a product as a long pattern or long sweep fittings over 6 inches, one must revert to the two, 45 interpretation.

6. Committee Reports

- A. 2024 UPC ad hoc Rulemaking Committee update – Secretary Abrahamson
- Abrahamson reported that the Committee continues to meet monthly and has just finished Chapter 11. At future meetings, the Committee will proceed with outstanding RFAs and tabled items.
- B. Construction Codes Advisory Council (CCAC) – Abrahamson (rep) / Lemke (alt)
- Abrahamson gave a brief recap from the last CCAC meeting held on July 30, 2024 – see [presentation](#).

7. Complaints and Correspondence

None

8. Open Forum

None

9. Board Discussion

None

10. Announcements

Next regular quarterly meeting – 9:30 a.m., 3rd Tuesday of each quarter – DLI / WebEx

- Jan. 21, 2025
- April 15, 2025
- July 15, 2025 (annual meeting – election of officers)
- Oct. 21, 2024

11. Adjournment

A motion was made by Abrahamson, seconded by Lemke, to adjourn the meeting at 11:19 a.m. The roll call vote was unanimous with 10 votes in favor of the motion; the motion passed.

Respectfully submitted,

Karl Abrahamson

Karl Abrahamson
Secretary

Green meeting practices

The State of Minnesota is committed to minimizing in-person environmental impacts by following green meeting practices. DLI is minimizing the environmental impact of its events by following green meeting practices. DLI encourages you to use electronic copies of handouts or to print them on 100% post-consumer processed chlorine-free paper, double-sided.

CCLD Fee Change Proposals

Attachment A

CCLD proposes increasing fees for the following programs to align with the costs of each program's services.

Unit	Year of last fee change
Electrical Inspections	2007
Plumbing Inspections	2013
Boiler & Pressure Vessel Registrations	2005
Plumbing Plan Review	2007
Manufactured Structures	2008
Elevator Operating Permits	2007

Proposed plumbing fees comparison

Project Type	Drainage Fixture Units	Interceptors, Separators, Drains	Valuation	Existing Plan Review Fee	Proposed Plan Review Fee	Existing Permit Fee	Proposed Permit Fee
Senior care center	60	1	\$100,000	\$450	\$2,901	\$1,626	\$2,931
School dishwasher replacement	4	0	\$2,500	\$250	\$191	\$201	\$221
Minor restroom remodel	5	0	\$7,000	\$0	\$0	\$226	\$467
Medium sized Clinic	81	0	\$387,122	\$350	\$2,533	\$2,126	\$4294
Medical office addition	94	43	\$882,500	\$1,576	\$2,950	\$3,526	\$7,190
Fitness Center	44	2	\$65,950	\$250	\$1,797	\$1,251	\$2,790
School renovation	187	3	\$800,000	\$1,901	\$2,909	\$4,851	\$5,117
Convenience store	40	2	\$115,000	\$420	\$1,571	\$1,151	\$3,025
Small office & shop building	10	1	\$28,692	\$320	\$1,100	\$376	\$1,625
Restaurant	27	9	\$14,000	\$250	\$613	\$1,001	\$838
Medium apartment building	138	2	\$98,776	\$1,459	\$2,901	\$3,776	\$2,931

Plumbing Board
 c/o Department of Labor and Industry
 443 Lafayette Road North
 St. Paul, MN 55155-4344
 www.dli.mn.gov

Plumbing Board Request for Interpretation Attachment B

PRINT IN INK or TYPE

NAME OF SUBMITTER Minnesota PHCC	Rule(s) to be interpreted (e.g., 4714.0330) 706, 3 & 4
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The Minnesota Plumbing Code (MN Rules, Chapter 4714) is available at www.dli.mn.gov/CCLD/PlumbingCode.asp

Has a request for interpretation been submitted to Department of Labor and Industry (DLI) staff, either as a verbal request or a written request? Yes No

If "No," contact DLI staff at 651-284-5898. The DLI is responsible for administration and interpretation of the Minnesota Plumbing Code, and all requests must be processed and provided a DLI interpretation before being referred to the Plumbing Board. This form is intended to be used to request an interpretation from the Plumbing Board only as a resolution of dispute with DLI interpretation.

Code/Rule to be interpreted: 706.3 & 4	Name of DLI employee gave interpretation: DOLI Staff	Date interpretation originally requested: July 10, 2024 Resubmitted 10/4/2024
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Provide a copy of the DLI interpretation with this request (a copy must be provided as reference).

Is there a local dispute with an Inspector of other official? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, state the name or type of official Various locations, various inspectors
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State the circumstances of the initial dispute:

Contractors we represent have been getting conflicting interpretations of chapter 706 Change of direction :

There are instances in various locations and projects where the Inspection Department is having difficulties interpreting the requirements of Chapter 706 Change of direction. In both vertical and horizontal applications. Also questioning the use of ¼ bends on the end of a trap arm connecting to the trap adapter. The problem comes in interpreting " drainage lines shall enter through 45 degree (0.79 rad) wye branches, combination wye and one-eighth bend branches, or " other approved fittings of equivalent sweep ". In most cases the call is to require the use of 2, 45 degree elbows for a 90 degree change of direction, thinking that the chapter requires a combination Wye and 1/8 bend (or 2. 45 degree changes) some will also allow the use of " Long sweep or long pattern ¼ bends ", but when the manufactures do not list produce long pattern or long sweep fittings in 6 inch or over, and revert to the 2, 45 interpretation.

The questions at hand are:

- 1 Is the use of Plastic ¼ bend, and Tapped Short ¼ bend fittings (for no hub)at the end of a trap arm for connection to the trap adapter?
2. For both horizontal to horizontal, and vertical to horizontal runs when long pattern plastic or long sweep for cast iron systems, are not made, are short sweep ¼ bends for cast iron systems, and plastic ¼ bends considered to be fittings of equivalent sweep?

Explain what you disagree with the interpretation given to you by DLI staff:

The DOLI opinion did not appear to allow the use of 1/4 bends at the end of the trap arm, Short Sweep cast iron fittings, or provide guidance of the dimensions (end to center) to make what would be considered fitting of equivalent sweep.

What is your interpretation of the language:

1 Is the use of Plastic ¼ bend, and Tapped Short ¼ bend fittings (for no hub)at the end of a trap arm for connection to the trap adapter

A. The use of plastic 1/4 bend the Tapped 1/4 bend fot No-Hub, and the bblack Cast Iron Drainage 90 at the end of the trap arm would and as past practice allowed at the end of the trap arm.

2. For both horizontal to horizontal, and vertical to horizontal runs when long pattern plastic or long sweep for cast iron systems, are not made, are short sweep ¼ bends for cast iron systems, and plastic ¼ bends considered to be fittings of equivalent sweep?

A. Long Sweep fittings above 6 " are not listed in the Cast Iron Standard A-888 or ASTM D 4311 for Plastic. When comparing the dimensions, (end to center) of Short Sweep No-Hub ¼ bends, to plastic Long Sweep ¼ Bends. The plastic ¼ bends in all cases are shorter end to end, (tighter radius) but due to the internal smoothness of plastic pipe and fittings the flow rates are higher allowing the shorter radius fittings achieving the 2 ft/sec flow rates required by code. Therefore We are asking the Board to consider, in the larger diameters the use of (above 6 ") plastic 1/4 bends, and Short Sweep Cast Iron, as fittings of equivalent sweep.

List any other information you would like the Board to consider:

Information regarding submitting this form:

- Submit any supporting documentation to be considered electronically to DLI.CCLDBOARDS@state.mn.us. Once your Request For Interpretation form has been received, it will be assigned a file number. Please reference this file number on any correspondence and supplemental submissions.

Information for presentation to the Committee:

- You will be notified with the date of the Committee Meeting in which your Request For Interpretation will be heard.
- Limit presentations to 5 minutes or less.
- Be prepared to answer questions regarding the Code, the circumstances that led to the dispute and please bring copies of any documentation.

What you can do if you disagree with the Board's determination:

- You may appeal the Board's determination pursuant to Minn. Stat. Chapter 14.

Submitted by:

NAME Jim Peterson		FIRM NAME MN PHCC	
ADDRESS Email address: klempner1@juno.com		CITY	STATE ZIP CODE
PHONE	SIGNATURE (original or electronic)	DATE	

Office Use Only

RFI File No. PB0183	Date Received by DLI Resubmitted 10/4/2024	Dated Received by Board 10/4/2024	Date of Board Meeting 10/4/2024
Title of RFI PB0183.RFA.Jim Peterson.Section 706	By:		

This material can be made available in different forms, such as large print, Braille or on a tape. To request, call 1-800-342-5354 (DIAL-DLI).

For assistance or questions on completing this form, please call 651-284-5898 or 651-284-5889.

Mailing address:

**Plumbing Board
c/o Department of Labor and Industry
443 Lafayette Road North
St. Paul, MN 55155-4344**

*** Please remember to attach all necessary explanations and supporting documentation***

Phone (651)-284-5889

Fax (651)-284-5748

Visit our web site at:

<http://www.doll.state.mn.us/plumbing.html>

From: Al Kivisto [mailto:akivisto@DuluthMN.gov]

Sent: Monday, July 25, 2016 8:31 AM

To: Peterson, Jim (DLI)

Subject: New Code Clarifications

Hi Jim,

We have a few questions regarding rules in the new code and are hoping you could let us know how the state inspectors are calling these items.

First question is regarding 704.4 locations of cleanouts.

Specifically, on a branch off of the building drain to a bathroom, but more than 5ft from it, is a cleanout fitting needed on the end of that branch or can a toilet serve as the required cleanout?

? Second, is regarding section 706.

In 706.3, and 706.4 the code requires 45 degree branches or " approved fittings of equivalent sweep".

When using pvc, can a " long sweep" 90 be used going from horizontal to horizontal, or from vertical to horizontal, as opposed to two 45 degree fittings

Last, regarding single wall heat exchangers Section 603.5.4.1 (2) .

This mentions " fluids having a toxicity rating or Class of 1 " .

Does propylene glycol meet this requirement?

Thank you,

Al Kivisto

If this fails let me know and we will run it up the ladder. I would like to get this cleared up b-4 the construction season gets in full swing.

Jim Peterson

From: "klempner1@juno.com" <klempner1@juno.com>

To: swilliams@bisbeeph.com, david@mnphcc.com

Sent: Mon, Apr 22, 2024 03:46 PM

Subject: sweep fittings

Scott: After digging around in my old flash drives from my time at DOLI I found an email response to the City of Duluth about this when we went to the UPC in 2016

.Jim,

Thanks for the quick answers.

Both John and I would like to be on your email code chain.

Al

From: Peterson, Jim (DLI) [mailto:jim.peterson@state.mn.us]

Sent: Tuesday, July 26, 2016 8:09 AM

To: Al Kivisto

Cc: Tran, Cathy (DLI); Olson, Charles (DLI); Jensen, Brad (DLI); Topp, Gary (DLI); Roehl, John (DLI); Freiderich, Michael (DLI); Royer, Bruce (DLI); Parizek, John (jparizek@dunwoody.edu); Jacobs, Rick (CI-StPaul) (rick.jacobs@ci.stpaul.mn.us); Eggen, Scott (Scott.Eggen@ci.minneapolis.mn.us); Brian Kirby (bjkirby@umn.edu)

Subject: RE: New Code Clarifications

Al: Thanks for the questions: Im real busy so, here are some short answers, and when I get some time I will answer more in depth.

1. First question is regarding 704.4 locations of cleanouts.

Specifically, on a branch off of the building drain to a bathroom, but more than 5ft from it , is a cleanout fitting needed on the end of that branch or can a toilet serve as the required cleanout?

It would appears that the toilet cannot be used for the cleanout, either fixture branch or end of run. (I cannot find a prohibition, but from information in the illustrated book it would appear that you cannot, a good future question for the plumbing board)

2. Second, is regarding section 706.

In 706.3, and 706.4 the code requires 45 degree branches or " approved fittings of equivalent sweep".

When using pvc, can a " long sweep" 90 be used going from horizontal to horizontal, or from vertical to horizontal, as opposed to two 45 degree fittings

There was a Plumbing Inspectors meeting last week here with The State (Me , Cathy Tran, and Chuck Olson), St Paul, Minneapolis, The University of MN, and the President of the Plumbing Board

The consensus was that the use of long sweep (pattern) fittings listed in either standard for plastic or cast iron (long or short) sweep fittings would if "equivalent sweep" allowed in 706.1

3. Last, regarding single wall heat exchangers Section 603.5.4.1 (2) .

This mentions " fluids having a toxicity rating or Class of 1 "

Does propylene glycol meet this requirement?

You would have to get that information from the manufacturer, some may, and moist probably not.

There is a Plumbing Official group starting to address some of these issues here, if you would like to be included, I can you to the e-mail list, I know we would like to get more input from outstate people.

There will most likely be some articles coming out in the CCLD newsletter in the future on the subject.

James H Peterson

Const Codes Licensing Supervisor
Plumbing Plan Review and Inspections
Minnesota Department of Labor and Industry
443 Lafayette Road North
St Paul, MN 55155-4343

From: Mike @DOLI <michael.westemeier@state.mn.us>

To: "klempner1@juno.com" <klempner1@juno.com>, "david@mnphcc.com" <david@mnphcc.com>, "anastasis@loretel.net" <anastasis@loretel.net>

Cc: "Jensen, Brad (DLI)" <brad.jensen@state.mn.us>

Sent: Wed, Jul 10, 2024 04:48 PM

Subject: RE: Chapter 706 Change of direction

Jim,

I believe this was brought up in the ad-hoc committee meeting and it was mentioned that this is really about education of the BO/plumbing inspectors. Specifically what the "Equivalent Sweep" would be and when a long sweep elbow could be utilized in lieu of two 1/8 bends. Since the type of fittings is dependent on what the manufacturers make there may be installations that there is no long sweep ell made so two 1/8 bends will need to be installed. I am not sure if an interpretation by the plumbing board will be the best way to educate the Building Officials as there is not a one size solution fits every installation.

As you are aware the intent of the code is to allow fittings that create efficient operation of the waste system and limit the disruption of the flow as the piping system makes changes in direction. From my education and research there are times that a 1/4 bend may be allowed for certain materials for horizontal to vertical connections, but it would not be allowed for horizontal to horizontal or vertical to horizontal connections. The use of short pattern fittings versus long pattern fittings does impact the carrying capacity of the system and thus the use of long pattern fittings would provide a better/more efficient system so they should be encouraged to be used.

I hope this answers your question.

Mike

Mike Westemeier, P.E.
Engineering Administrative Plumbing Plan Review | Construction Codes and Licensing
Minnesota Department of Labor and Industry
443 Lafayette Road N., St. Paul, MN 55155
Phone: 651-284-5898 | Web: www.dli.mn.gov

-----Original Message-----

From: klempner1@juno.com <klempner1@juno.com>

Sent: Tuesday, July 9, 2024 7:38 AM

To: Westemeier, Michael (DLI) <michael.westemeier@state.mn.us>; david@mnphcc.com; anastasis@loretel.net

Subject: Chapter 706 Change of direction

This message may be from an external email source.
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Mike:

Contractors we represent have been getting conflicting interpretations of chapter 706 Change of direction :

There are instances in various locations and projects where the Inspection Department is having difficulties interpreting the requirements of Chapter 706 Change of direction. In both vertical and horizontal applications. Also questioning the use of 1/4 bends on the end of a trap or trap adapter to the trap adapter. The problem comes in interpreting

"drainage lines shall enter through 45 degree (0.79 rad) wye branches, combination wye and one-eighth bend branches, or other approved fittings of equivalent sweep". In most cases the call is to require the use of two, 45-degree elbows for a 90 degree change of direction, thinking that the chapter requires a combination Wye and 1/8 bend (or two, 45-degree changes) some will also allow the use of "Long sweep or long pattern 1/4 bends", but when the manufactures do not list produce long pattern or long sweep fittings in 6 inch or over, they revert to the, two 45 interpretation.

The questions at hand are:

- 1 Is the use of Plastic 1/4 bend, and Tapped Short 1/4 bend fittings (for no hub) at the end of a trap arm for connection to the trap adapter?
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4715.2370 FIXTURE CONNECTIONS TO AN OFFSET OF MORE THAN 45 DEGREES OR AT BASE OF STACK.

When stacks in buildings of five or more stories in height receive the discharge of fixtures four or more stories above the offset, no fixtures on the floor at which the offset occurs shall be connected to the stack within eight feet of the base of the offset measured vertically or horizontally. Said fixtures may also be connected into vertical section of the stack more than two feet below the offset. Fixture connections to horizontal piping at the bases of such stacks shall be made in the same manner, or at a point acceptable to the administrative authority.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
 HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2400 PITCH ON HORIZONTAL DRAINAGE PIPING.

Horizontal drainage piping shall be installed in uniform alignment at uniform slopes in accordance with the following requirements and in no case at a slope which will produce a computed velocity of less than two feet per second, unless otherwise permitted by the administrative authority, based on hydraulic analysis of the piping system.

Size of Piping	Minimum Slope
Less than 3 inches	1/4 inch per foot
3 inches to 6 inches	1/8 inch per foot
8 inches and over	1/16 inch per foot

STAT AUTH: MS s 16B.59; 16B.61; 16B.64; 326.37; 326.40; 326B.101; 326B.106; 326B.13; 326B.43; 326B.46
 HIST: 28 SR 146; L 2007 c 140 art 4 s 61; art 6 s 15; art 13 s 4

4715.2410 CHANGE IN DIRECTION.

Changes in direction in drainage piping shall be made by the appropriate use of 45 degree wyes, long or short sweep quarter bends, sixth, eighth, or sixteenth bends, or by combination of these or equivalent fittings. Single and double sanitary tees, quarter bends, and long turn ells may be used in drainage lines only where the direction of the flow is from the horizontal to the vertical. Short sweep bends or long turn ells

three inch or larger in diameter may be used in soil or waste lines where the change in direction of flow is from either the horizontal to the vertical or from the vertical to the horizontal.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
 HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2420 PROHIBITED FITTINGS AND CONNECTIONS.

Subpart 1. **General prohibitions.** No fittings having a hub in the direction opposite to flow, or straight tee branch shall be used as a drainage fitting. No fitting or connection which has an enlargement chamber or recess with a ledge or shoulder, or reduction in pipe area shall be used. No manhole shall be used to join drainage piping within a building. No drainage or vent piping shall be drilled, tapped, or welded unless otherwise permitted by the administrative authority. Fittings used for back-to-back, wall outlet, blowout type water closet bowls shall have a baffle plate or other device to prevent the waste water from one water closet from entering the opposite water closet. No fixture or cleanout connection shall be made to a closet bend. No running threads, bands, or saddles shall be used. The short pattern fitting in a horizontal position is prohibited in underground work.

Subp. 2. **Heel or side-inlet bends.** A heel or side-inlet quarter bend shall not be used as a vent when the inlet is placed in a horizontal position or any similar arrangement of pipe or fittings producing a similar effect.

Subp. 3. **Obstruction to flow.** No fitting, connection, device, or method of installation which obstructs or retards the flow of water, wastes, sewage, or air in the drainage or venting system in an amount greater than the normal frictional resistance to flow shall be used unless it is indicated as acceptable to this code by having a desirable and acceptable function and as of ultimate benefit to the proper and continuing functioning of the plumbing system. The enlargement of a three-inch closet bend or stub to four inches shall not be considered an obstruction, provided the horizontal flow line or insert is continuous without forming a ledge.

CHARLOTTE
PIPE AND FOUNDRY COMPANY

DIMENSIONAL CATALOG

No-Hub Pipe and Fittings

Service Pipe and Fittings

Extra Heavy Pipe and Fittings

Plugs

[Updated June 12, 2024]

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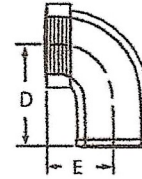
© 1977-2024 Charlotte Pipe and Foundry Company

DC-CI

PART NO. NH 4A

Tapped Quarter Bend

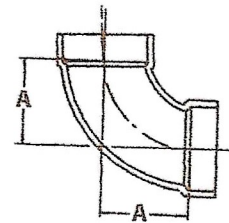
Size	D	E	Weight
1½ x 1½	3	2	1.9
2 x 1¼	3¼	2¼	2.1
2 x 1½	3¼	2¼	1.8
2 x 2	3¼	2¼	2.8



PART NO. 300

¼ Bend
(Sanitary 90° Ell)
ALL HUB

SIZE	A
1¼ (PVC)	1 ⁹ / ₁₆
1½	1¾
2 (PVC)	2 ⁵ / ₁₆
2 (ABS)	2¼



RECESSED DRAINAGE FITTINGS

DIMENSION-A-INCHES. CENTER TO END

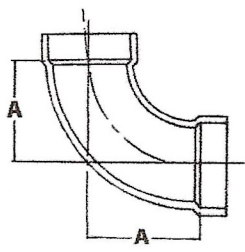
FIG.	1	2	3	4	5
	5-5/8°	11-1/4°	22-1/2°	45° S.T.	45° L.T.
1-1/4	1-3/16	1-1/16	1-1/8	1-5/16	1-3/4
1-1/2	1-5/16	1-1/4	1-1/4	1-7/16	1-7/8
2	1-1/2	1-3/8	1-7/16	1-11/16	2-1/4
2-1/2	1-5/8	1-5/8	1-3/4	1-15/16	2-5/8
3	1-3/4	1-13/16	2	2-3/16	2-15/16
4	1-7/8	2	2-5/16	2-5/8	3-1/2
5	2	2-1/4	2-5/8	3-1/16	4-1/8
6	2-1/4	2-3/8	2-15/16	3-7/16	4-7/8
8	2-1/2	2-3/4	3-9/16	4-1/4	6
FIG.	6	7	8	9	10
	60°	90°	90°	90°	90°
1-1/4	1-9/16	1-3/4	2-1/4	2-5/16	3-1/8
1-1/2	1-3/4	1-15/16	2-1/2	2-11/16	3-7/16
2	2-1/16	2-1/4	3-1/16	3-1/2	3-7/8
2-1/2	2-1/2	2-11/16	3-11/16	4-1/4	4-3/4
3	2-7/8	3-1/16	4-1/4		5-1/4
4	3-3/8	3-13/16	5-3/16	SEE	6-1/8

#10
Long Sweep

PART NO. 304

Long Sweep 1/4 Bend

SIZE	HUB X HUB
	A
1½	2¾
2	3¼
3 (PVC)	4¼ ₁₆
3 (ABS)	4
4	4 ¹⁵ / ₁₆
6 (PVC)	9

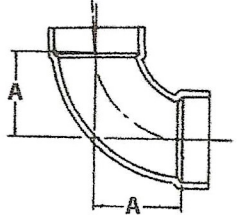


PVC & ABS DWV FITTINGS

PART NO. 300

1/4 Bend
(Sanitary 90° Ell)
ALL HUB

SIZE	A
1¼ (PVC)	1 ⁹ / ₁₆
1½	1¾
2 (PVC)	2 ⁵ / ₁₆
2 (ABS)	2¼
3	3 ¹ / ₁₆
4	3 ⁷ / ₈
6	5
8 (PVC)	6
10 (PVC)	9 ⁹ / ₃₂
12 (PVC)	11
14 ^(F) (PVC)	16 ³ / ₄
16 ^(F) (PVC)	20 ⁹ / ₁₆



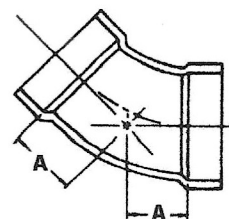
(C1) Inserts into pipe
(C2) Inserts over pipe
(F) Fabricated

Note: If PVC or ABS is not listed for a specific size, that size fitting is available in PVC and ABS materials, and the dimensions listed are the same for both materials.

PART NO. 321

**1/8 Bend
(45° Ell)
HUB X HUB**

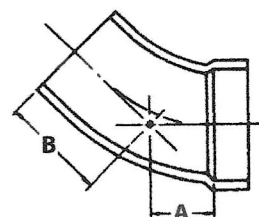
SIZE	A
1 1/4 (PVC)	1
1 1/2	1 1/8
2	1 1/2
3	1 3/4
4	2 3/16
6	2 1/16
8 (PVC)	2 1/16
10 (PVC)	3 1/8
12 (PVC)	3 31/64
14 ^(F) (PVC)	8 1/4
16 ^(F) (PVC)	10 5/16



PART NO. 323

**1/8 Bend, Street
(45° Street Ell)
SPIGOT X HUB**

SIZE	A	B
1 1/4 (PVC)	1	1 3/4
1 1/2 (PVC)	1 1/8	1 7/8
1 1/2 (ABS)	1 1/16	1 7/8
2 (PVC)	1 1/2	2 3/8
2 (ABS)	1 15/32	2 1/8
3	1 3/4	3 1/4
4	2 3/16	3 15/16
6 (PVC)	2 1/16	5 5/64
6 (ABS)	2 1/16	5
8 (PVC)	2	6 3/32
10 (PVC)	3 1/8	8 5/32
12 (PVC)	3 31/64	9 1/2
14 ^(F) (PVC)	9 3/8	15 9/16
16 ^(F) (PVC)	10 5/16	18 1/2



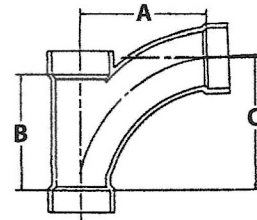
^(F) Fabricated

Note: If PVC or ABS is not listed for a specific size, that size fitting is available in PVC and ABS materials, and the dimensions listed are the same for both materials.

PART NO. 502

**Combination Wye & 1/8 Bend,
Reducing
(One Piece)
ALL HUB**

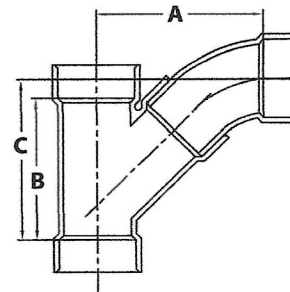
SIZE	A	B	C
2 x 1½ x 1½ (PVC)	4 ³ / ₁₆	3½	3 ¹⁵ / ₁₆
2 x 1½ x 1½ (ABS)	4 ¹ / ₈	3 ¹⁷ / ₃₂	3¾
2 x 2 x 1½ (PVC)	4 ³ / ₁₆	3½	3 ¹⁵ / ₁₆
2 x 2 x 1½ (ABS)	4 ¹ / ₈	3 ⁷ / ₁₆	3 ⁷ / ₈
3 x 3 x 1½	4 ³ / ₄	3½	3 ¹⁵ / ₁₆
3 x 3 x 2	5 ¹¹ / ₁₆	4 ⁷ / ₁₆	5 ¹ / ₈
4 x 4 x 2	6 ¹ / ₁₆	4 ⁷ / ₁₆	5 ¹ / ₁₆
4 x 4 x 3 (PVC)	8 ¹ / ₁₆	6½	7 ⁹ / ₁₆
4 x 4 x 3 (ABS)	7 ²⁹ / ₃₂	6 ¹³ / ₃₂	7 ⁵ / ₁₆
6 x 6 x 4 (PVC)	*	*	*



PART NO. PVC 503

**Combination Wye & 1/8 Bend
(Two Pieces)
ALL HUB**

SIZE	A	B	C
6 [∞] (PVC)	11 ¹⁵ / ₃₂	10 ¹ / ₈	11 ⁹ / ₆₄
8 [∞] (PVC)	14 ¹⁹ / ₃₂	14 ¹ / ₈	14 ²³ / ₃₂
10 [∞] (PVC)	18½	16½	18¼
12 [∞] (PVC)	21½	19½	21½
14 ^{(F)∞} (PVC)	36 ⁷ / ₈	32½	37 ³ / ₁₆
16 ^{(F)∞} (PVC)	39½	35½	39 ¹³ / ₁₆



* Refer to PVC 504 for dimensional data

^(F) Fabricated

[∞] Fitting shipped with street bend strapped to fitting.

Note: If PVC or ABS is not listed for a specific size, that size fitting is available in PVC and ABS materials, and the dimensions listed are the same for both materials.

PART NO. HD 1

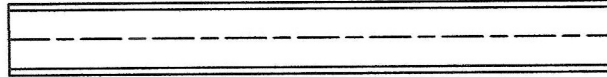
Heavy Duty Coupling



Size	Shield Width	Number of Clamps
12	5.50"	6
15	5.50"	6

N O - H U B

PART NO. NH 2



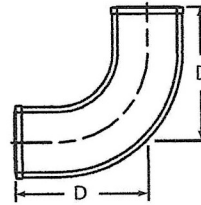
No-Hub Pipe - Ten Feet Laying Length

Size	Weight
1 1/2" x 10'	28.5
2" x 10'	35.0
3" x 10'	54.0
4" x 10'	76.0
5" x 10'	97.6
6" x 10'	117.8
8" x 10'	170.9
10" x 10'	254.6
12" x 10'	318.1
15" x 10'	492.6

PART NO. NH 4

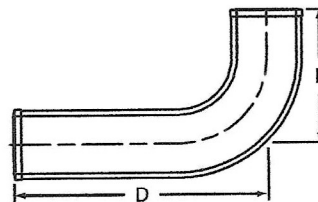
**Quarter Bend
(90° EII)**

Size	D	Weight
1 1/2	4 1/4	1.6
2	4 1/2	2.3
3	5	4.4
4	5 1/2	7.3
5	6 1/2	9.9
6	7	13.7
8	8 1/2	20.6
4 x 3	5 1/2	5.4



Long Quarter Bend

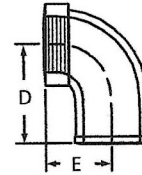
Size	D	E	Weight
2 x 12	12	4 1/2	5.4
2 x 18	18	4 1/2	8.6
2 x 24	24	4 1/2	10.6
3 x 12	12	5	7.5
4 x 12	12	5 1/2	11.3



PART NO. NH 4A

Tapped Quarter Bend

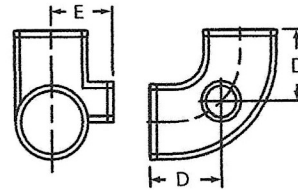
Size	D	E	Weight
1½ x 1½	3	2	1.9
2 x 1¼	3¼	2¼	2.1
2 x 1½	3¼	2¼	1.8
2 x 2	3¼	2¼	2.8



PART NO. NH 6

Quarter Bend with Side Opening

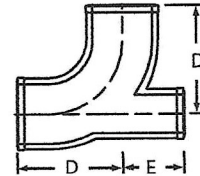
Size	E	D	Weight
3 x 2	3¼	4	5.1
4 x 2	3¾	4 ⁵ / ₁₆	7.5



PART NO. NH 8

Quarter Bend with Heel Opening

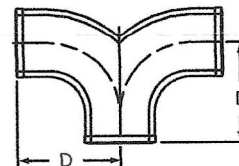
Size	D	E	Weight
3 x 2	5	2 ⁷ / ₈	5.5
4 x 2	5½	3¼	7.1



PART NO. NH 8A

Double Quarter Bend

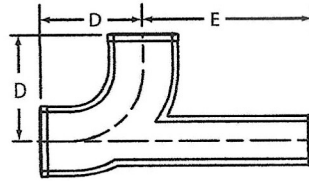
Size	D	Weight
2	4½	4.4
3	5	6.9
4	5½	9.3



PART NO. NH 8B

**Quarter Bend with
Extended Low Heel Outlet**

Size	D	E	Weight
3 x 2	5	10 1/2	8.0

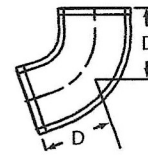


N O - H U B

PART NO. NH 9

**Fifth Bend
(72° EII)**

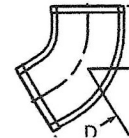
Size	D	Weight
2	3 11/16	2.3
3	4 1/16	3.7
4	4 7/16	5.7



PART NO. NH 10

**Sixth Bend
(60° EII)**

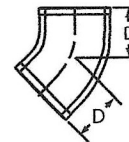
Size	D	Weight
2	3 1/4	2.2
3	3 1/2	3.0
4	3 13/16	5.4



PART NO. NH 12

**Eighth Bend
(45° EII)**

Size	D	Weight
1 1/2	2 5/8	1.5
2	2 3/4	1.8
3	3	3.0
4	3 1/8	3.7
5	3 7/8	7.2
6	4 1/16	8.6
8	5	14.9
10	5 15/16	30.8
12	6 9/16	42.0
15	7 13/16	63.4

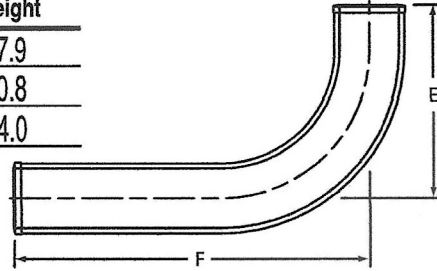


8

PART NO. EZS 14

Extended Short Sweep

Size	E	F	Weight
2 x 18	6½	18	7.9
2 x 24	6½	24	10.8
2 x 34	6½	34	14.0

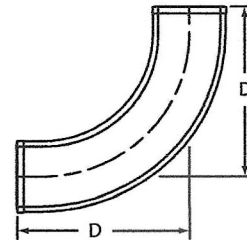


NO-HUB

PART NO. NH 18

Long Sweep

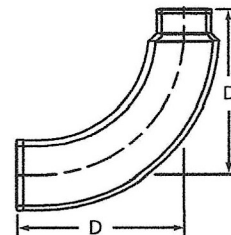
Size	D	Weight
1½	9¼	4.6
2	9½	5.7
3	10	9.3
4	10½	11.8
5	11½	18.2
6	12	23.2



PART NO. NH 18

Reducing Long Sweep

Size	D	Weight
4 x 3	10½	12.4

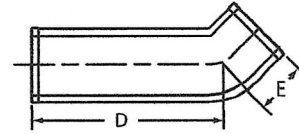


9

PART NO. NH 12

Long Eighth Bend

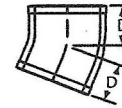
Size	D	E	Weight
2 x 6	6	2 ³ / ₄	2.4
2 x 12	12	2 ³ / ₄	4.5
2 x 18	18	2 ³ / ₄	7.3
3 x 12	12	3	7.4
3 x 18	18	3	10.2
4 x 12	12	3 ¹ / ₈	9.6



PART NO. NH 14

**Sixteenth Bend
(22 1/2° Ell)**

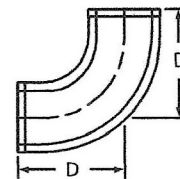
Size	D	Weight
1 1/2	2 1/8	1.2
2	2 1/8	1.4
3	2 1/4	2.2
4	2 5/16	3.3
5	2 7/8	5.1
6	3	6.5
8	3 3/4	11.4



PART NO. NH 16

Short Sweep

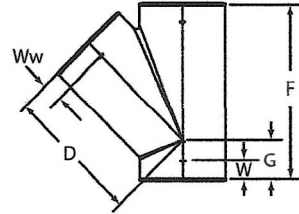
Size	D	Weight
2	6 1/2	3.8
3	7	6.5
4	7 1/2	8.5
5	8 1/2	12.7
6	9	16.7
8	10 1/2	27.4
10	12	50.9
12	13 1/4	61.3
15	14 3/4	105.6



PART NO. NH 20

Wye

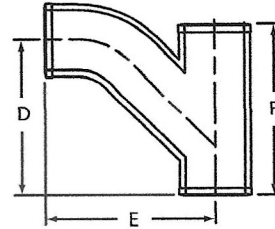
Size	D	F	G	W	Ww	Weight
1½ x 1½	4	6	2	1⅛	1⅛	2.5
2 x 2	4⅝	6⅝	2	1⅛	1⅛	3.3
3 x 1½	4⅝	6⅞	1⅝ ¹⁵ / ₁₆	1⅛	1⅛	4.4
3 x 2	5⅝ ¹⁶	6⅝	1½	1⅛	1⅛	4.4
3	5¾	8	2¼	1⅛	1⅛	4.4
4 x 2	6	6⅝	1	1⅛	1⅛	4.7
4 x 3	6½	8	1⅞ ¹¹ / ₁₆	1⅛	1⅛	7.5
4	7⅛ ¹⁶	9½	2⅞ ¹⁶	1⅛	1⅛	9.4
5 x 2	7½	8⅞ ¹⁶	1⅝ ¹⁵ / ₁₆	1½	1⅛	8.6
5 x 3	8	9⅞ ¹⁶	1⅞ ¹¹ / ₁₆	1½	1⅛	10.3
5 x 4	8½	11⅞ ¹⁶	2⅞ ¹⁶	1½	1⅛	12.5
5	9½	12⅝ ⁸	3⅞	1½	1½	14.8
6 x 2	8¼	8⅞ ¹⁶	½	1½	1⅛	9.4
6 x 3	8¾	9¾	1¼	1½	1⅛	12.1
6 x 4	9¼	11⅞ ¹⁶	1⅝ ¹⁵ / ₁₆	1½	1⅛	13.9
6 x 5	10¼	12½	2⅞ ¹⁶	1½	1½	17.1
6	10¾	14⅞ ¹⁶	3⅝ ¹⁶	1½	1½	19.0
8 x 3	9⅞ ¹⁶	9⅝ ¹⁶	⅞	2	1⅛	17.2
8 x 4	10⅞ ⁸	11⅞ ¹⁶	1⅝ ¹⁵ / ₁₆	2	1⅛	21.3
8 x 5	11⅞ ⁸	12⅞ ¹⁶	1⅝ ¹⁵ / ₈	2	1½	23.5
8 x 6	11⅞ ¹⁶	14⅞ ¹⁶	2⅝ ¹⁶	2	1½	28.1
8	13⅞ ⁸	17⅞	3¾	2	2	33.3
10 x 4	11⅞ ¹⁶	12⅝ ⁸	¾	2	1⅛	33.1
10 x 6	13⅞ ⁸	15⅞ ¹⁶	2⅞ ¹⁶	2	1½	42.3
10 x 8	14⅞ ¹⁶	18⅞ ⁸	3⅝ ⁸	2	2	56.8
10	16½	21½	5⅞ ¹⁶	2	2	75.4
12	19¾	25½	5¾	2¾	2¾	97.0
15	23¼	30	6¾	2¾	2¾	189.5



PART NO. NH 22

Combination

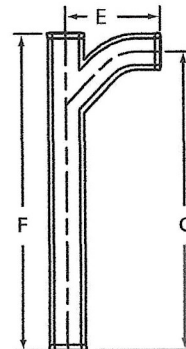
Size	D	E	F	Weight
1 1/2	4 3/4	5 3/8	6	3.1
2 x 1 1/2	5	5 7/8	6	3.5
2	5 3/8	6 1/8	6 5/8	4.1
3 x 1 1/2	5 1/2	6 3/4	6 5/8	5.2
3 x 2	5 1/2	6 3/4	6 5/8	5.5
3	7 5/16	8	8	8.1
4 x 2	5 1/2	7 1/4	6 5/8	6.8
4 x 3	7 1/4	8 1/2	8	9.4
4	9 1/4	10	9 1/2	14.2
5 x 2	5 15/16	7 3/4	8 1/16	8.6
5 x 3	7 3/4	9	9 11/16	12.6
5 x 4	9 3/4	10 1/2	11 3/16	16.7
5	11 3/4	12 1/2	12 5/8	19.5
6 x 2	6	8 1/4	8 5/16	10.9
6 x 3	7 13/16	9 1/2	9 3/4	14.8
6 x 4	9 3/4	11	11 3/16	18.3
6 x 5	11 11/16	13	12 1/2	22.4
6	13 5/8	14 3/8	14 1/16	29.7
8 x 4	9 7/16	11 5/16	11 3/16	24.9
8 x 6	12	13 3/8	13 15/16	34.2
8	14 3/4	15 9/16	16 15/16	42.6

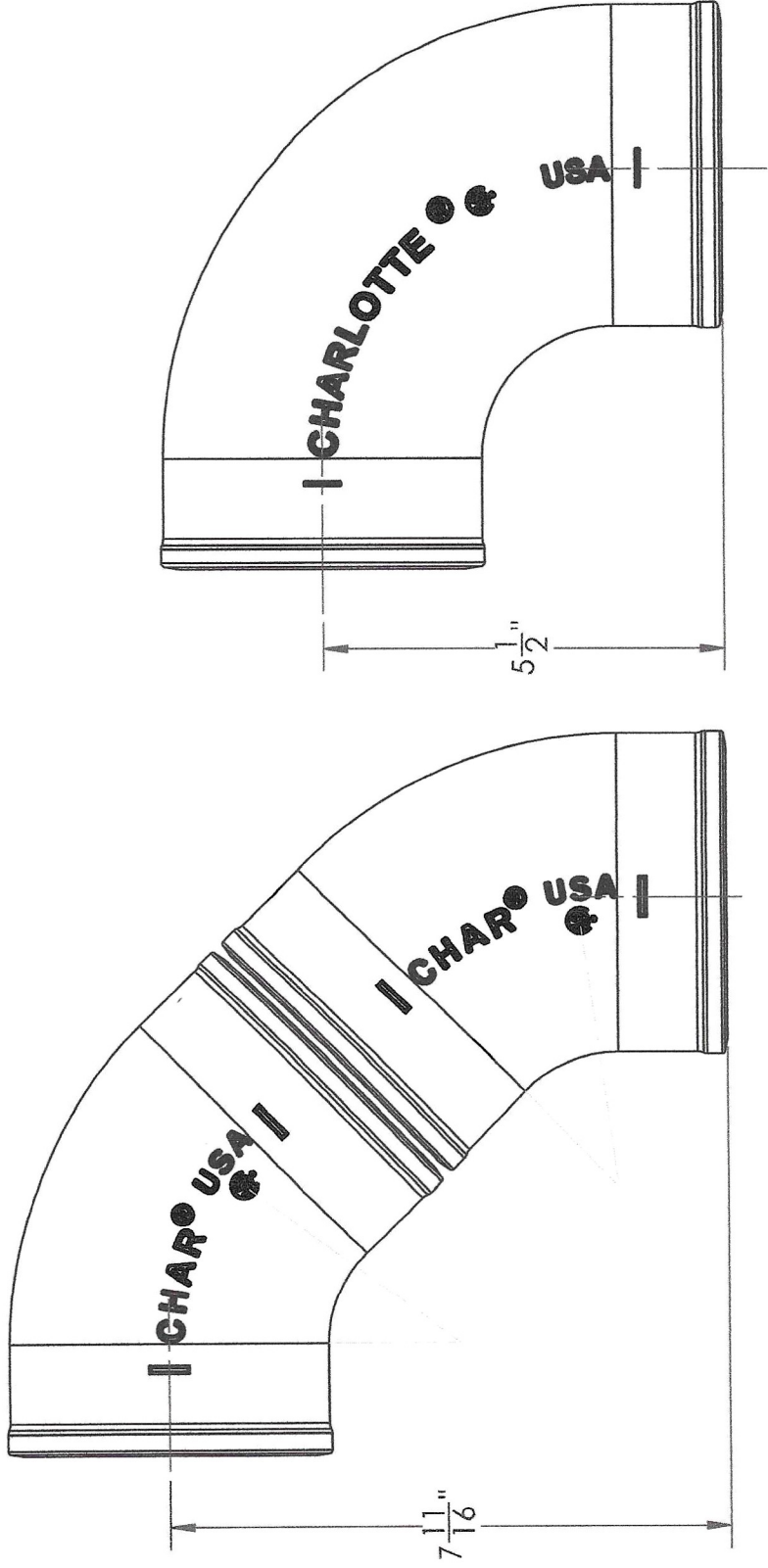


PART NO. EZS 15

Extended Combination

Size	E	F	G	Weight
2 x 24	6 3/16	25 3/8	24	11.9
2 x 36	6 3/16	36	34 3/4	15.3





CHARLOTTE PIPE AND FOUNDRY CO.		CAST IRON
1335 SOUTH CLARKSON STREET		
CHARLOTTE, NORTH CAROLINA 28208		
TITLE: 4" NH 1/8's BD. COMP. TO 4" NH 1/4 BD.		
SCALE: 1:2.5	DR BY: D.E.E.	DWG #:
DATE: 7/19/2024	PART #:	SHEET: 1 OF 1

REV	X	DESCRIPTION
		LIMITS UNLESS OTHERWISE SPECIFIED
		FRACTIONS ± DEC. FRACTIONS ± .01 ANGLES ± 30'
		DECIMALS ± .005 SURFACE FINISH 125 R.M.S.

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From: John Mullen <john.mullen@iapmo.org>

To: "klempner1@juno.com" <klempner1@juno.com>

Cc: "Flores, Carlos - HPC-HPW" <carlos.flores@houstontx.gov>, DJ Nunez Nunez <DJ.Nunez@iapmo.org>

Sent: Wed, Aug 21, 2024 01:07 PM

Subject: Request for clarification

Hello,

This is the response to your request for clarification on the Uniform Plumbing Code. The question(s) considered was (were):

1. Is the use of a PVC sanitary quarter bend, or a No Hub Tapped quarter bend approved at the end of a trap arm for connection to the trap adapter?

Comment #1: 706.4 horizontal change: Some inspectors even in the same jurisdictions require a long sweep fitting either plastic or with no-hub, with no-hub making it difficult at beat to make everything fit properly, or in the case of fire rated wills the fire collars to fit tight against the wall.

2. Is a cast iron short sweep or in cases over 6" plastic a PVC quarter bend considered to be fittings of equivalent sweep in vertical to horizontal applications?

Comment #2: 706.5 Cast Iron short sweep 1/4 bends are available up and including 15", and plastic up to 6" and after that only 1/4 bends are listed. The question always boils down to what is equivalent to a combo wye and 1/8th bend, is it the radius at the back of the 1/4 bend or the end to center dimension of the combo?

General Comment: There are instances in various locations and projects where the Inspection Department is having difficulties interpreting the requirements of Chapter 706 Change of direction, for both vertical and horizontal applications. Also questioning the use of 1/4 bends on the end of a trap arm connecting to the trap adapter. The problem comes in interpreting "drainage lines shall enter through 45-degree (0.79 rad) wye branches, combination wye and one-eighth bend branches, or " other approved fittings of equivalent sweep". In most cases the call is to require the use of 2, 45 degree elbows for a 90 degree change of direction, thinking that the chapter requires a combination Wye and 1/8 bend (or 2. 45 degree changes) some will also allow the use of "Long sweep or long pattern 1/4 bends", but when the manufactures do not list produce long pattern or long sweep fittings in 6 inch or over, and revert to the 2, 45 interpretation.

The UPC Answers & Analysis Committee answered as follows:

1. No, horizontal to horizontal as per 706.3. "Connecting with other horizontal drainage lines shall enter through 45-degree wye branches, combination wye and one-eighth bend branches or other approved fittings of equivalent sweep." Any interruption to the flow by short or abrupt changes of direction will cause turbulence and reduce the velocity of that flow.
2. Yes, if the manufacturer can confirm sweep equivalency. In most cases the call is to require the use of 2, 45 degree elbows for a 90 degree change of direction, thinking that the chapter requires a combination Wye and 1/8 bend (or 2. 45 degree changes) some will also allow the use of "Long sweep or long pattern 1/4 bends", but when the manufacture does not list product as long pattern or long sweep fittings in 6 inch or over, one must revert to the 2, 45 interpretation.

Answers provided by the Answers and Analysis Committee are informal interpretations of the Codes and do not represent the official position of the Technical Committee or IAPMO. Official code interpretations can be obtained only by submission of a written request for a formal Interpretation to the Technical Committee.

Formal interpretation request can be submitted to the Technical Committee at https://forms.iapmo.org/iapmo/interpretations/formal_request.aspx

Procedures for requesting a formal interpretation can be found at <https://www.iapmo.org/hidden/procedures-for-requesting-formal-interpretation/>

Please allow a minimum of 90 days for a response.







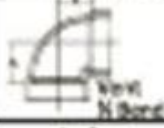


The Authority Having Jurisdiction is the ultimate authority in interpreting the code in your jurisdiction.

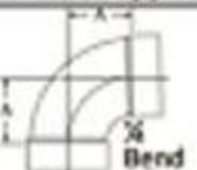



Sincerely,
Carlos Flores, III
Chairman UPC Answers & Analysis Committee

Request processed by,

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Hubless Cast Iron	1-1/2"	2"	3"	4"	5"	6"	Uses
	4-1/4"	4-1/2"	5"	5-1/2"	6-1/2"	7"	Minimum fitting for H to V Not for H to H or V to H
	*	6-1/2"	7"	7-1/2"	8-1/2"	9"	Minimum fitting for H to H Minimum fitting for V to H May be used anywhere
	9-1/4"	9-1/2"	10"	10-1/2"	11-1/2"	12"	Not required in UPC May be used anywhere
Service Cast Iron		2"	3"	4"	5"	6"	Minimum fitting for H to V Not for H to H or V to H
	X=	3-1/4"	4"	4-1/2"	5"	5-1/2"	
	D=	6"	7"	8"	8-1/2"	9"	Minimum fitting for H to H Minimum fitting for V to H May be used anywhere
	X=	5-1/4"	6"	6-1/2"	7"	7-1/2"	
	D=	8"	9"	10"	10-1/2"	11"	Not required in UPC May be used anywhere
	X=	8-1/4"	9"	9-1/2"	10"	10-1/2"	
	D=	11"	12"	13"	13-1/2"	14"	
PVC/ABS	1-1/2"	2"	3"	4"			
	1-3/16"	1-1/2"	1-7/8"				DWW Vents only
	1-3/4"	2-15/16"	3-1/16"	3-7/8"	Minimum fitting for H to V Not for H to H or V to H		
	2-3/4"	3-1/4"	4-1/16"	4-15/16"	Minimum fitting for H to H Minimum fitting for V to H May be used anywhere		

DWV Copper	1-1/2"	2"	3"	4"	
 1/4 Bend					Minimum fitting for H to V Not for H to H or V to H
	1-7/16"	1-15/16"	2-25/32"	3-25/32"	
 Long Swoop					Minimum fitting for H to H Minimum fitting for V to H May be used anywhere
	2-5/16"	2-3/4"	3-1/16"	3-7/8"	
Recessed Drainage Fitting	1-1/2"	2"	3"	4"	
 Short Turn Elbow	2"	2-5/8"	3-3/8"	3-15/16"	DWV Vents only
 Long Turn Elbow	2-11/16"	2-7/16"	5-7/8"	6-3/4"	Minimum fitting for H to V Not for H to H or V to H

**FIGURE 706.1B
DIMENSIONAL DRAWINGS OF FITTING PATTERNS**