GENERAL: This drawing shows alternate types of curb that may be used on various types of pavement. The typical section of the project shows the type to be used, as well as the thickness of the edge of the pavement or the edge of the curb and gutter section.

JOINTS: Expansion joints shall extend up to the top of the curb and shall be constructed in the curb and gutter section in such a manner that the joint seal will extend the full width of the gutter and into the curb face a sufficient distance to seal the joint to an elevation of a least 2" above the flow line of the gutter. Dowel bars shall be used in the curb and gutter section of expansion joints and to the surface of the pavement.

Transverse expansion joint material shall meet the requirements of Item 705.03.

GUTTER PLATE THICKNESS: Thickness of gutter plate "T" shall be 9" unless otherwise shown on the plans.

TOLERANCES: Dimensional tolerances are as follows:

- Curbs: ±1/4"
- Gutters: 0 to +1/2"
- Curb and gutter: ±1/2"

NOTE: Expansion joint material and joint sealer are not required for the portion of the curb that is adjacent to a flexible pavement type. Both materials are required, as detailed, for the full height of rigid pavement and concrete bases.

Butt joints shall be provided between combined curb-and-gutter and new or existing rigid pavements, with tie bars or hook bolts provided at intervals of 5'. See SCD BP-2.1 for details of tie bars and hook bolts.

If the combined curb-and-gutter adjoins a new rigid base or existing rigid pavement, a butt joint shall also be provided. However, tie bars or hook bolts shall be omitted when the vertical overlap "V" in detail below between the curb-and-gutter and rigid pavement is less than 1/2."
NOTES

GENERAL: This drawing shows curb ramp types details and placement examples for curb ramp construction, including the installation of detectable warnings.

Curb ramp types are shown on Sheet 2 and include Perpendicular, Parallel, and Combined types as specified to be constructed in the locations shown on the project plans.

Curb ramps added to an existing intersection or walk should be individually detailed on the project plans to ensure that the design is appropriate for the constraints and all items can be constructed to ADA standards. The contractor may adjust the placement of curb ramps if existing field conditions warrant with the approval of the Engineer.

PAYMENT: Measure and pay for the ramp area within the shaded limits of this drawing only where curbs exist. This includes the cost of any curb or curb and gutter, detectable warning, landing area, and all additional materials, installation, grading, forming, and finishing required within the shaded area.

Work beyond the shaded ramp/landing area is paid for as curb (609) and walk (608). The work to cast the tiles in place will also achieve ADA compliance, measure and pay for the strip of detectable warnings as item 608 Curb Ramp, Square Foot. The work to cast the tiles is paid for as item 608 Detectable Warning, Square Foot.

For at-grade crossing locations where only detectable warnings are required in order to achieve ADA compliance, measure and pay for the strip of detectable warnings as item 608 Detectable Warning, Square Foot. The work to cast the tiles is paid for as item 608 Detectable Warning, Square Foot. The work to cast the tiles is paid for as item 608 Detectable Warning, Square Foot.

Acceptable design for retrofits only where utilities prevent using a preferred layout.

Acceptable design on corners with wide turning radius when user is able to maneuver within crosswalk limits so as not to encroach into adjacent traveled lanes.

Use this design only for existing walks, and when site constraints prohibit other designs. The diagonal Type D ramp may be constructed as either a Perpendicular, Parallel or Combination curb ramp type. Avoid using where curb radii are less than 20'-0".

Curb ramp placement where streets have wide turning radius and sufficient sidewalks width.

Use curb ramps with flared sides at locations with wide sidewalks.

Use curb ramps with returned curbs where buffer is wide enough to accommodate ramp slope.

Place curb ramps along wide turning radius and where sidewalks are narrow.

Perpendicular Curb Ramps

Preferred Construction Placement

Parallel Curb Ramps

Combination Curb Ramps

Acceptable Construction Placement

Diagonal Ramp (Type D)
The running slope of the curb ramp shall be a 13:1 maximum or flatter. In existing sidewalks, where the maximum ramp slope is not feasible due to site constraints (e.g., utility poles or vaults, right-of-way limits) it may be reduced as follows:

A) 10:1 for a max. rise of 6".
B) 6:1 for a max. rise of 3".
C) 4:1 for a max. run of 1' for historic areas where a flatter slope is not feasible.

To prevent chasing the grade indefinitely, the transition from existing sidewalk to the shaded curb ramp area is not required to exceed 1' feet in length.

While ramps may be skewed to the crosswalk, the entire lower landing area must fall within the cross walk that the ramp serves and cannot be located in the traveled lane of opposing traffic.

The counter slope of the gutter or street at the foot of a curb ramp, landing, or blended transitions shall be 4:1 or flatter.

The bottom edge of the ramp shall change planes perpendicular to the landing. The edge of the curb shall be flush with the edge of the adjacent pavement and gutter and surface slopes that meet grade breaks shall also be flush.

Ramp landings shall be 4' min. x 4' min. with a 64:1 or flatter cross slope and running slope.

**NOTES CONTINUED**

**DETECTABLE WARNINGS:** Install detectable warnings on curb ramps with approved materials, as shown on Sheet 3. Install these proprietary products as per manufacturer's written instructions.

**DRAINAGE:** Contractor is to ensure the base of each constructed curb ramp allows for proper drainage, without exceeding allowable cross slope or ramp slopes. Vertical change in level exceeding 6" between the pavement and gutter, and 2) gutter and ramp, are not allowed.

**SURFACE TEXTURE:** Texture concrete surfaces by coarse brooming transversely to the ramp slopes to be rougher than the adjacent walk.

**JOINTS:** Provide expansion joints in the curb ramp as extensions of walk joints and consistent with the 600.03 requirements for a new concrete walk. Provide a 9" x 15 ½" expansion joint every 10' across the edge of ramps built in historic areas where a flatter slope is not feasible.

While ramps may be skewed to the crosswalk, the entire lower landing area must fall within the cross walk that the ramp serves and cannot be located in the traveled lane of opposing traffic.

In existing sidewalks, where the maximum ramp slope is not feasible due to site constraints (e.g., utility poles or vaults, right-of-way limits) it may be reduced as follows:

A) 10:1 for a max. rise of 6".
B) 6:1 for a max. rise of 3".
C) 4:1 for a max. run of 1' for historic areas where a flatter slope is not feasible.

To prevent chasing the grade indefinitely, the transition from existing sidewalk to the shaded curb ramp area is not required to exceed 1' feet in length.

While ramps may be skewed to the crosswalk, the entire lower landing area must fall within the cross walk that the ramp serves and cannot be located in the traveled lane of opposing traffic.

The counter slope of the gutter or street at the foot of a curb ramp, landing, or blended transitions shall be 4:1 or flatter.

The bottom edge of the ramp shall change planes perpendicular to the landing. The edge of the curb shall be flush with the edge of the adjacent pavement and gutter and surface slopes that meet grade breaks shall also be flush.

Ramp landings shall be 4' min. x 4' min. with a 64:1 or flatter cross slope and running slope.

See Sheet 3 for Sections.
PLAN OF CATCH BASIN AND PAVEMENT JOINTS

CATCH BASIN No. 3

The bottom may be precast separately and the outlet pipe placed on top of it with the bottom shaped to drain curb & gutter.

Location of grate, elev., station and offset

Normal gutter elevation

Depressed gutter elevation

Depressed pavement

Reinf. steel per SCD BP-1.1

Steel Beam S6x12.5x6'`1"

Steel Beam S6x12.5x6'`1"

1" Dowel

1" Dowel

1'-0"

2'-(5")

2'-(5")

9"

8"

6"

3"

8"

4'-9"

8"

2'-(3")

2'-(3")

9" (Typ.)

9" (Typ.)

1" Dowel

1" Dowel

1" exp. joint

1" exp. joint

Top of curb

Top of curb

Pavement block out for straight transverse slope

Combination curb & gutter blockout

Gutter blockout

Butt joint

Outside of conc. basin

Location of grate, elev., station and offset

Direction of flow for grate as shown

The arrow points to the location of grate, station and offset.

SECTION A-A

SECTION B-B WITH CURB (2° DEPRESSION)

SECTION B-B WITH CURB & GUTTER (0° DEPRESSION)

See Sht. 2/2 for NOTES
### Notes

**Grates:** Two required. For details, see SCD CB-2.1. Provide Grate "V" unless the plans specifically require the diagonal grate. The diagonal grate is specified, place it so that the diagonal bars direct drainage flow toward the curb.

**Castings:** Provide a design essentially the same and equally as strong as the one shown. Minimum weight:
- Curb Casting: 305 lbs.
- Two Grates: 254 lbs.
- Frame: 590 lbs.

Lighter weight frames and grates that meet the requirements of CMS 711.14 may also be provided. Provide grate openings and dimensions as shown here unless otherwise shown in the plans.

Cast the following text into the top of the curb casting:

"DUMP NO WASTE" and "DRAINS TO WATERWAY"

Print text in bold, capital letters at least 1" high. See example on Plan & Section. "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

**Bearing Areas:** Fit and finish the frame and grate to provide a firm and even seat. No projections are permitted on bearing areas, and the grate must seat in its frame without rocking.

**Walls:** When used in place of concrete, construct brick side walls with 8" nominal thickness.

**Precast Construction:** Permitted, except for the apron. Meet CMS 706.3 concrete requirements. Provide prestressed walls of least 8" thick with sufficient reinforcing to permit shipping and placement without damage. Reduce the wall thickness from the outside.

**Minimum Depth:** The minimum depth is per the cover requirements for that pipe type.

**Opening:** Ensure pipe openings are the O.D. of the pipe being supplied plus 2" when fabricated or field cut. Fill any voids per CMS 611.

**Dowels:** Furnish four 1" x 18" dowels for concrete pavement or gutter blockout. See SCD BP-2.1 for dowel details.

**Blockout:** Nine blockouts with 4000 psi compressive strength concrete in PCC pavement or gutter. Blockouts must be made in curb quantities. All materials and labor, including excavation and backfilling, are paid for under Item 611 - Catch Basin, No. 3.

**Payment:** See SCD BP-2.1 for full details.
PLAN OF CATCH BASIN AND PAVEMENT JOINTS

For SECTIONS C-C and D-D, see SHT. 2/2

SECTION A-A

Location of grate, elev., station and offset

Location of grate, elev., station and offset

Note of grate, elev., station and offset

SECTION B-B

Location of grate elevation, station and offset

Location of grate elevation, station and offset

Location of grate, elev., station and offset

SECTION B-B

With Curb (2" DEPRESSION)
NOTES

GRATE AND FRAME: Provide a design essentially the same and equally as strong as the one shown in the plans. Be sure to meet the requirements of CMS 711.4. Provide grate openings and dimensions as shown here unless otherwise shown in the plans.

Cost the following text into the top of the grate:

"DUMP NO DUMP" and "DRAIN TO WATERWAY"

Print test in bold, capital letters at least 1½" high. "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

BEARING AREAS: Fit and finish frame and grate to provide a firm and even seat for all portions of the grate in the frame, no projections are permitted on bearing areas of either casting, all grate must fit and finish frame and grate before delivery to the project.

WALLS: Construct brick or cast-in-place walls with a nominal thickness of 8". Provide precast walls at least 6" thick with sufficient reinforcing to permit shipping and handling without damage.

CONCRETE: Use 4000 psi for cast-in-place concrete. Meet the requirements of CMS 706.13 for precast concrete and mark with the catch basin number. Reduce the wall thickness from the outside.

MINIMUM DEPTH: The minimum depth is the outside diameter of the outlet pipe plus 1½".

OPENINGS: Ensure pipe openings are the O.D. of the pipe being supplied plus 2" when fabricated or field cut. Fill any voids per CMS 611.

DOWELS: Furnish four 1" dowels for pavement and curb. See CMS 607-2.1 for dowel detail.

BLOCKOUT APRONS: Use 4000 psi compressive strength concrete. Cost of apron is not included in catch basin price when located in PCC pavement, and do not deduct from normal pavement quantity. This is per CMS 607-2.2.

BACK OF CURB: Edge of concrete apron is included in the catch basin bid price. Cost of curb, if any, is included in CMS 608.

PAYMENT: All materials and labor, including excavation and backfilling, are paid for under Item 51 - Catch Basin, No. 6.

CAST-INK DRAWING

REVISIONS

ENGINEERING

HYDRAULICS

OFFICE OF

ENGINER

ROADWAY HYDRAULIC

JEFFREY E. SYAR

TRANSPORTATION HYDRAULIC ENGINEER

STATE OF OHIO DEPARTMENT OF

M. COZZO LI

OPENINGS:

SCD BP-2.2

for Sections

See Sht. 2/2

CONSTRUCTION INFORMATION

Minimum weight of grate, 225 lbs.

Minimum weight of frame, 265 lbs.
CAST-IN-PLACE CONCRETE

REINFORCED PRECAST CONCRETE

SECTION A-A
(See Sht. 1/2.)

CATCH BASIN No. 6
(See Sht. 1/2.)

SHOWN WITH BRICK WALLS
SECTION B-B
(See Sht. 1/2.)
GENERAL NOTE:

1. THE STANDARDS SHOWN HEREIN ARE TO BE CONSIDERED THE MINIMUM REQUIREMENTS. MODIFICATIONS TO THESE STANDARDS TO BE ONLY AS DIRECTED BY THE ENGINEER.

2. THE UNDERGROUND REQUIREMENT IS TO BE CONSIDERED THE STANDARDS FOR NEW CONSTRUCTION. HOWEVER, THIS REQUIREMENT MAY BE WAIVED BY THE CITY ENGINEER IF SUPPLEMENTARY EVIDENCE IS PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER DOCUMENTING SPECIFIC CONDITIONS THAT WOULD SUPPORT THE ELIMINATION OF THE UNDERGROUND.

NOTES FOR SIDEWALKS, DRIVE APRONS, CURBS & GUTTER:

1. FLEXIBLE FORMS SHALL BE USED ON ALL CURVES HAVING A RADIUS OF 275' OR LESS UNLESS SUP FORM METHOD IS USED.

2. CONCRETE SHALL BE CIVIL CLASS "C11". AN APPROVED CURING AGENT SHALL BE APPLIED IMMEDIATELY AFTER FINISHING.

3. ALL JOINTS SHALL BE VERTICAL AND EITHER PERPENDICULAR OR RACIAL TO THE BACK OF CURB.

4. EMBANKMENT BEHIND THE CURB SHALL BE PLACED BEFORE PAVEMENT WORK IS BEGUN.

5. DOWELS AND EXPANSION JOINT MATERIAL SHALL BE PLACED AT CATCH BASINS AND COLD JOINTS WHERE NEW CURB MEETS EXISTING CURB. DOWELS "1/2" X 3/4" DIAMETER RESIN INSERTED 9" INTO A 3/4" DIAMETER HOLE DRILLED INTO THE EXISTING CURB.

6. WIRE MESH IS NOT PERMITTED IN APRONS OR SIDEWALK WITHIN THE RIGHT OF WAY.

7. FOR NEW DRIVE APRONS WITH EXISTING CURB, SAMPLING OF THE EXISTING CURB MAY BE PERMITTED UNDER SPECIFIC RESTRICTIONS WITH PRIOR APPROVAL FROM THE ENGINEER.

![Diagram of Driveway Standard Section](image-url)

**DRIVEWAY DETAIL ISOMETRIC-NO SCALE**

LETTERS TO BE IMPRINTED INTO THE FRESH CONCRETE A DEPTH OF 1/2" DIRECTLY ABOVE POINT WHERE SERVICES CROSS THE CURB.

**UTILITY LOCATION DESIGNATION**

**PERMANENT REPAIR**

1. ITEM 441 = 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG 64-22
2. ITEM 301 = ASPHALT CONCRETE BASE, PG 64-22 (MATCH EXISTING BASE COURSE OR MINIMUM 4.5" THICKNESS)
3. ITEM 304 = 4" AGGREGATE BASE
4. COLD PATCH = 4" THICKNESS (SEE NOTE BELOW)
5. ITEM 304 = 10" AGGREGATE BASE

NOTE: WHEN CONDITIONS PROHIBIT PROPER PLACEMENT OF HOT MIX MATERIAL, COLD PATCH SHALL BE USED AND MAINTAINED AS DIRECTED BY THE ENGINEER UNTIL PERMANENT REPAIR CAN BE MADE. ALL PERMANENT REPAIRS SHALL BE MADE PRIOR TO THE FOLLOWING JUNE 1ST.

**PAVEMENT PATCH DETAIL**

**LOCAL STREET PAVEMENT SECTION**

**ARTERIAL/COLLECTOR STREET PAVEMENT SECTION**
GENERAL NOTES FOR ALL MANHOLES

2. Manhole basks that are buried in place shall be constructed of concrete and shall extend 4' beyond the manhole walls. The manhole base is to be reinforced if manhole depth exceeds 14'.
3. Manhole frame to be set in bed of mortar.
4. Slab top manhole to be used when the distance from top of the outlet pipe to finished grade is less than 6'-6".
5. The depth of a manhole is measured from the top of casting to the flow line of the sewer.
6. Sanitary sewer manholes to be precast concrete only.
7. All parts of precast concrete manholes, i.e. base section, barrel section, cone, and slab tops) shall meet the requirements of ASTM C-443.
8. Sanitary sewer manhole joints for precast concrete sections shall be 0-90° type gaskets meeting the specifications of ASTM C-443.
9. All masonry construction of manholes shall have 1/2" cement mortar plastered on exterior walls.
10. Notch R-1767 frame and lid or approved equal, lettering on lid to be similar to that shown on Notch R-1804-L, with words "SEWER," "WATER," or "STORM.
11. The flow channel straight through a manhole should be made to conform as closely as possible in shape and slope to that of the connecting sewers. The channel walls should be formed or shaped to the full height of the crown of the outlet sewer in such a manner as to not obstruct maintenance, inspection, or flow in the sewer. When curved flow channels are specified in manholes, including branch inlets, the minimum slopes should be increased to maintain acceptable velocities.
12. Each manhole shall be provided on each side of any manhole channel where the pipe diameter(s) are less than the manhole diameter. The bench should be sloped no less than 3 inch per foot (4 percent). No lateral, sewer, service connection, or drop manhole pipe shall discharge onto the surface of the bench.

NOTES FOR OUTSIDE DROP MANHOLE

1. Drop to be installed in sanitary sewers where the difference in grade in elevations between the pipe inverts exceeds 2 feet.
2. The service drop shall be constructed in one of following manners:
   a) Formed class "C" concrete
   b) Approved precast drop sections and base.
3. The concrete base poured in place shall extend a minimum of 4' beyond the extremities of the drop section.
4. Hole for cleanout pipe entrance shall be made with a core type drill.

SECTION E-E
SEWER DROP OUTSIDE MANHOLE

SECTION A-A
SEWER DROP INSIDE MANHOLE

INTERIM CONTRACTOR

CITY OF DENVER
DIVISION OF ENGINEERING
ROBERT E. NOELKE, P.E.

SANITARY AND STORM SEWER STANDARDS

PIPE CONNECTION DETAILS

PRECAST CONCRETE MANHOLE

SECTION B-B
GENERAL NOTES FOR STORM SEWERS:
1. Bottom of catch basin to have 6" minimum thickness and to be constructed of dot class "C" concrete.
2. Brick, concrete block, or cast-in-place walls shall have a minimum thickness of 6 inches. Pre-cast walls shall have a minimum thickness of 6", and reinforcement shall be sufficient to permit shifting and placement without damage.
3. Basin foundation in stable soil shall consist of a concrete slab set to grade under each corner. Poured in-place slab shall be supported by a concrete slab set to grade, extending 4" beyond all outside walls.
4. Basin foundation in unstable soil shall consist of a 6" thick slab of dot class "C" concrete slab set to grade, extending 4" beyond all outside walls.
5. Non-reinforced slab tops are permitted on type "A"—special catch basins with conduit up to 24" in diameter (see notes for repair placement in larger sizes). All slab tops to be constructed of dot class "C" concrete with a minimum thickness of 8 inches.
6. Specify neecheap grade type R-3668-40(5) or R-3665-80(5), or approved equal grade and grate.
7. Slope shall be provided where shown in the standard manhole detail when the catch basin depth exceeds 60".
8. Maximum catch basin depth is 84 inches.
9. The following note shall be on each catch basin grate:
   "NO DUMPING — DRAINS TO RIVER"
   The place of drainage shall be specified in the plans by the engineer.

AS OF JUNE 2008, THIS DRAWING TO BE USED FOR INFORMATIONAL USE OR RETROFIT PROJECTS ONLY. ODOT STANDARD BASINS TO BE SPECIFIED FOR NEW CONSTRUCTION AND RETROFITS WHERE FEASIBLE.
**GENERAL NOTES FOR WATER MAINS**

**Ductile Iron Water Mains**
1. Ductile iron pipe shall be designed in accordance with the latest revision of ANSI/AWWA C150/ A21.30 for a minimum 100 PSI Type 2 Laying Condition and a depth of cover of 4 feet.
2. Ductile iron pipe shall be manufactured in accordance with the latest revision of ANSI/AWWA C151/ A21.1.
3. Pipe shall have non-asphaltic coating on the exterior. Pipe shall also have a cement mortar lining on the interior in accordance with ANSI/AWWA C104/A21.4 of latest revision.
4. The pressure class or nominal thickness, net weight without lining, and casting density shall be clearly marked on each length of pipe. Additionally, the manufacturer's mark, year in which the pipe was produced, and the letters “DI” or “Ductile Iron” shall be cast or stamped on the pipe.
5. All pipe shall be furnished with push-on type joints, such as “Rivet” or “Rustite.” Joints shall be in accordance with ANSI/AWWA C111/A21.11, of latest revision, and be furnished complete with all necessary accessories.
6. Fittings shall be either ductile iron or gray iron. Ductile iron fittings shall conform to the latest revision of either ANSI/AWWA C106/A21.10 or ANSI/AWWA C153/A21.33. Gray iron fittings shall be in accordance with ANSI/AWWA C106/A21.1, of latest revision. Fittings shall have a standard asphaltic coating on the exterior. Fittings shall also have a cement mortar lining on the interior in accordance with ANSI/AWWA C104/A21.4 of latest revision.
7. Fittings and accessories shall be furnished with either mechanical or push-on type joints in accordance with ANSI/AWWA C112/A21.11, of latest revision.
8. Cost of all restrained joints, including the cost of restraints restrained joints on existing mains as necessary for new bends, valves, etc. and the cost of all thrust blocks, is to be included in the unit price of the water main.

**Hydrostatic Testing**
All work, including installation of all taps and purging test stations, must be completed prior to hydrostatic testing. Operation of all valves shall be made by city personnel only.
2. All pipe, fittings, and accessories shall be installed and tested in accordance with the latest revision of AWWA Standard C150. Newly installed ductile iron and plastic water main shall be disinfected in accordance with the City of Middletown water and sewer rules and regulations.

**Maximum Pipe Deflections**
Maximum pipe deflections shall be per manufacturer’s recommendations.

**Curb Stops**
Curb stops shall be cast brass or bronze fitted to receive copper tubing. They shall be of the inverted key type with the following features:
1. (1) Ground way
2. (2) Ground key stops set for quarter turn to give full opening.
3. (3) Ground key stops for curb stop at 45° to horizontal.

**Water Service Box**
1. Water service boxes shall be of the best quality gray cast iron, bituminous coated, and bored in the pattern with 2-1/2" diameter shafts, adjustable from 3' to 6' covers. The lid shall be marked with the width and secured to the shaft with a brass or bronze bolt. The footplate shall fit over the curb stop. Water service boxes of the type shall be Mueller Type H-15000, Size 0-50, or approved equal.

**Roadway Valve Box**
Roadway valve boxes shall be of the best quality gray cast iron, bituminous coated and furnished with a 3-1/4" diameter shaft, adjustable from 4' to 5'. The cover shall be of the drop type as shown in the top. Roadway valve boxes shall be clear type F-2450 or approved equal with the basic sections as follows:
1. 6" and 8" valves.................Clow Type F-2450
2. 10" and larger valves.............Clow Type F-2454
3. 4" and smaller valves............Clow Type F-2480

**Corporation Stop**
Corporation stops shall be cast brass or bronze with Mueller thread inserted into the water main. The outlet shall be fitted to receive copper tubing. Corporation stops shall be Mueller Type H-15000 or approved equal for sizes ranging from 3'/4" to 2'.

**Water Meter Box (Replacement of Existing Only)**
Water meter boxes shall be of the best quality gray cast iron, bituminous coated, and provided with a double lid to protect against freezing. Water meter boxes shall be Mueller Model H-1500, or approved equal.

**Meter Setting Yokes (Replacement of Existing Only)**
Meter setting yokes shall be copper with vertical, left and right connections as Mueller Model H-14002, or approved equal.

**Temporary Fire Hydrant**
A temporary fire hydrant will be required at the end of any water main to be extended in the future.

**Piping Saddle**
Piping saddles shall be Clow F-1280 or approved equal. Service cones larger than 2" shall require tapping saddle and saddle, Clow F-5093 or approved equal.

**Fire Hydrant**
All fire hydrants shall be National Standard.

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**NOTES:**
1. Water service line shall be located a minimum horizontal distance of 10' from the sanitary service line.
2. Service box shall be plumbed and centered over curb cut.
3. If a utility equipment exists beyond the right-of-way line, the service box shall be extended to the equipment and the end capped.

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**Water Service Box in Sidewalk**

**Water Service Installation Detail**

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**Purity Testing**

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**Air Release Valve**

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**Precast Concrete Structure**

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