Resolution

Number 18-0585

Adopted Date April 03, 2018

AMEND STANDARD DETAILS FOR THE WARREN COUNTY WATER AND SEWER DEPARTMENT

WHEREAS, by Resolution #87-1103, the Board established Standard Details for water and sanitary sewer improvements to be constructed within Warren County; and

WHEREAS, by Resolution #12-0787, the Board amended said Standard Details; and

WHEREAS, it is necessary, at this time, to amend said Standard Details; and

NOW THEREFORE BE IT RESOLVED:

1. That the Standard Details for the Warren County Water and Sewer Department are hereby amended by the revisions to the following:

   STANDARD DRAWING INDEX
   WATER DETAIL W-1 (WATERMAIN LAYOUT AT CUL-DE-SAC)
   WATER DETAIL W-5 (WATERMAIN ENCASEMENT AT CREEK CROSSING)
   WATER DETAIL W-6 (WATERMAIN ENCASEMENT AT SEWER CROSSING)
   WATER DETAIL W-8 (HYDRANT SETTING)
   WATER DETAIL W-10A (METER BOX DETAIL FOR ¾” AND 1” METERS)
   WATER DETAIL W-10B (METER BOX DETAIL FOR 1 ½” AND 2” METERS)
   WATER DETAIL W-11 (MULTIPLE WATER SERVICE CONNECTIONS)
   WATER DETAIL W-12 (TYPICAL WATER SYSTEM DETAIL)
   WATER DETAIL W-13 (DITCH AND METER LOCATION)
   WATER DETAIL W-14 (LARGE DOMESTIC WATER METER PIT)
   WATER DETAIL W-15A (LARGE WATER METER PIT W/ FIRE LINE W/ FDC & DOMESTIC LINE)
   WATER DETAIL W-15B (LARGE WATER METER PIT W/ FIRE LINE, DOMESTIC LINE, & IRRIGATION LINE)
   WATER DETAIL W-15C (LARGE WATER METER PIT EQUIPMENT SCHEDULE)
   WATER DETAIL W-16 (VALVE PIT)
   WATER DETAIL W-17 (ANCHORS & BUTTRESSES FOR VERTICAL BENDS)
   WATER DETAIL W-18 (REQUIRED RESTRAINED JOINTS FOR BENDS)
WATER DETAIL W-19  (REQUIRED RESTRAINED JOINTS – DEAD END VALVES, PLUGS, CAPS, & TEES)
WATER DETAIL W-20  (ROAD PAVEMENT CUT AND RESTORATION AT ROADWAY CROSSING)
WATER DETAIL W-21  (METER TEST AT CREEK CROSSING)
WATER DETAIL WG-1A
WATER DETAIL WG-1B
WATER DETAIL WG-2  (PROCEDURE FOR CONNECTION TO EXISTING WATER SYSTEM)
WATER DETAIL WG-3  (PROCEDURE FOR RELOCATING AND LOWER SERVICE LATERAL AND RELOCATING OR BRINGING TO GRADE METER PITS)
SANITARY DETAIL S-1  (PRECAST MANHOLE)
SANITARY DETAIL S-2  (PRECAST MANHOLE INSIDE DROP CONNECTION)
SANITARY DETAIL S-3  (VENTED MANHOLE)
SANITARY DETAIL S-4  (MANHOLE CHANNELS)
SANITARY DETAIL S-5  (SANITARY MANHOLE INVERT TRANSITION BASE SECTIONS)
SANITARY DETAIL S-6  (SANITARY GRAVITY SEWER TRENCH DETAIL)
SANITARY DETAIL S-7  (ROAD PAVEMENT CUT AND RESTORATION AT ROADWAY CROSSING)
SANITARY DETAIL S-8  (SEWER IN CASING)
SANITARY DETAIL S-9  (CONCRETE ANCHOR)
SANITARY DETAIL S-10  (FULL CONCRETE ENCASEMENT)
SANITARY DETAIL S-11  (SANITARY SEWER CREEK CROSSING)
SANITARY DETAIL S-12  (AERIAL SANITARY SEWER CROSSING)
SANITARY DETAIL S-13  (DEEP HOUSE CONNECTIONS)
SANITARY DETAIL S-14A  (HOUSE CONNECTIONS)
SANITARY DETAIL S-14B  (HOUSE CONNECTIONS)
SANITARY DETAIL S-15  (FORCE MAIN CLEANOUT)
SANITARY DETAIL S-16  (AIR RELEASE VALVE ASSEMBLY)
SANITARY DETAIL S-17  (SANITARY CLEANOUT)
SANITARY DETAIL S-18  (REQUIRED RESTRAINED JOINTS FOR BENDS)
SANITARY DETAIL S-19  (REQUIRED RESTRAINED JOINTS – DEAD END VALVES, PLUGS, CAPS, & TEES)
SANITARY DETAIL S-20  (FORCE MAIN TRENCH DETAIL)
SANITARY DETAIL S-21  (IMPERVIOUS DAM DETAIL)
SANITARY DETAIL SG-1  (DETAILED PROCEDURES FOR SANITARY SEWER)
SANITARY DETAIL SG-2A
SANITARY DETAIL SG-2B
SANITARY DETAIL SG-4  (SEWER TESTING)
RESOLUTION #18-0585
APRIL 03, 2018
PAGE 3

2. That the Standard Details for the Warren County Water and Sewer Department are hereby amended by adding the following:

SANITARY DETAIL S-22 (LATERAL SADDLE INSTALLATION DETAIL FOR PVC PIPE)
SANITARY DETAIL S-23 (LATERAL SADDLE INSTALLATION DETAIL FOR VCP AND DUCTILE IRON PIPE)

3. That the Standard Details for the Warren County Water and Sewer Department are hereby amended by deleting the following:

WATER DETAIL W-16 (BLOWOFF DETAIL)
WATER DETAIL W-21 (BLOWOFF HYDRANT)
SANITARY DETAIL S-2 (DROP MANHOLE DETAIL)

4. That these modifications shall be effective immediately and a copy of the amended details are attached hereto be made a part hereof.

5. That all other provisions and requirements of the Standard Details shall remain unchanged.

Mr. Young moved for adoption of the foregoing resolution being seconded by Mr. Grossmann. Upon call of the roll, the following vote resulted:

Mrs. Jones – absent
Mr. Grossmann – yea
Mr. Young – yea

Resolution adopted this 3rd day of April 2018.

BOARD OF COUNTY COMMISSIONERS

Tina Osborne, Clerk

cc: Water/Sewer (file)
WARREN COUNTY WATER AND SEWER DEPARTMENT
STANDARD DRAWINGS INDEX
MARCH, 2018

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Watermain Layout at Cul-De-Sac W-1
Watermain Trench Detail W-2
Thrust Block Details W-3
Full Concrete Encasement W-4
Watermain Encasement at Creek Crossing W-5
Watermain Encasement at Sewer Crossing W-6
Watermain in Casing W-7
Hydrant Setting W-8
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Required Restrained Joints – Dead End Valves, Plugs, Caps, & Tees W-19
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Procedure for Connection to Existing Water System WG-2
Procedure for Relocating or Lowering Service Laterals and Relocating or Bringing to Grade Meter Pits WG-3
**SEWER**

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<td>Vented Manhole</td>
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<td>Sanitary Manhole Invert Transition Base Sections</td>
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<td>Road Pavement Cut and Restoration at Roadway Crossing</td>
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<td>Sewer in Casing</td>
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<td>Sanitary Sewer Creek Crossing</td>
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<td>Aerial Sanitary Sewer Crossing</td>
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<td>Deep House Connections</td>
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<td>Air Release Valve Assembly</td>
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<td>Impervious Dam Detail</td>
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<td>Saddled Wye Gasket Hub x Gasket Skirt w/ Stainless Steel Bands</td>
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**SEWER – GENERAL NOTES**

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<tr>
<td>Detailed Procedures for Sanitary Sewer</td>
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<td>Sewer</td>
<td>SG-2A</td>
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<td>Sewer (Continued)</td>
<td>SG-2B</td>
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<tr>
<td>Pipe Connection into Manholes</td>
<td>SG-3</td>
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<tr>
<td>Sewer Testing</td>
<td>SG-4</td>
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</table>
WATERMAIN SHALL BE INSTALLED IN A SEPARATE TRENCH FROM THE SANITARY SEWER AND SHALL BE A MINIMUM DISTANCE OF 10' MEASURED HORIZONTALLY FROM THE SANITARY SEWER.

BACKFILL AND RESTORATION OF PAVEMENT MUST CONFORM TO THE APPLICABLE WARREN COUNTY ENGINEER OR ODOT SPECIFICATION(S).

TRENCH SIDES SHALL BE IN CONFORMANCE WITH OSHA REQUIREMENTS

CLEAN COMMON FILL WITHIN RIGHT-OF-WAY, SELF COMPACTING GRANULAR FILL IN ROCK, AND CONTROLLED DENSITY FILL WITHIN 3' OF EDGE OF PAVEMENT

6" OR 1/2 D

EXCAVATE TO ACCOMMODATE BELL OF PIPE

ODOT #703 SIZES 6-8 GRANULAR MATERIAL (IF IN ROCK OR WITHIN 3' FROM EDGE OF PAVEMENT)

TRENCH SHALL HAVE FLAT BOTTOM SO THAT PIPE WILL BE SUPPORTED UNIFORMLY ALONG THE BARREL. NO SUPPORT BY BLOCKING IS PERMITTED.

WATERMAIN TRENCH DETAIL

APPROVED/REVISED
JUNE, 2012

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER W-2
NOTE:
BEARING AREA TO BE DETERMINED BASED ON SOIL TYPE & WORKING PRESSURE.
THRUST BLOCKS TO BE USED AT ALL BENDS 22.5° OR GREATER.
THRUST BLOCKS TO BE POURED AGAINST FIRM UNDISTURBED SOIL.
USE CLASS "C" CONCRETE.
90° BENDS SHALL NOT BE PERMITTED.
NOTES:
1) CONCRETE SHALL BE 3000 P.S.I. MINIMUM 28 DAYS STRENGTH (4" SLUMP).
2) SUPPORT PIPE AND REBAR CAGE ON CONCRETE BRICKS DURING CONCRETE PLACEMENT.
3) CONCRETE ENCASEMENT SHALL BE TERMINATED AT PIPE JOINTS ONLY.
NOTE:
ALL PIPE IN CREEK CROSSINGS TO BE RESTRAINED JOINT, PER STANDARD NUMBER W-18

WATERMAIN ENCASEMENT AT CREEK CROSSING

APPROVED/REVISED MARCH, 2018
WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER W-5
ALL PIPE IN SEWER CROSSINGS TO BE RESTRAINED JOINT, PER STANDARD NUMBER W-18

WATERMAIN ENCASEMENT AT SEWER CROSSING

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
W-6
WATER PIPE SIZE – CARRIER PIPE SIZE (O.D.) – THICKNESS

<table>
<thead>
<tr>
<th>Water Pipe Size</th>
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<tr>
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<td>24&quot;</td>
<td>36&quot;</td>
<td>1/2&quot;</td>
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SO THAT PIPE WILL BE CENTERED IN CARRIER PIPE, THE FOLLOWING INFORMATION IS NEEDED:

1. TYPE & O.D. OF PIPE
2. TYPE OF JOINT/RESTRAINT
3. TYPE & I.D. OF CASING
4. 2 SPACING PER LENGTH OF PIPE (18")
   (SEE STANDARD PLACEMENT BELOW)

NOTE:

1. RESTRAINED JOINT TO BE USED WITHIN LIMITS OF CASING
2. PACK END OF CASING W/ CONCRETE OR GRAVEL
3. CASING SPACERS TO BE USED THRU CARRIER PIPE.

RECOMMENDED STANDARD PLACEMENT
ALL FIRE HYDRANTS AND HYDRANT VALVES MUST OPEN LEFT.

ALL HYDRANTS TO BE 5 1/4" BRONZE TO BRONZE SEAT

MUELLER A-423 SUPER CENTURION
KENNEDY 81A
DARLING B62B
CLOW MEDALLION

SET TO BURY LINE ON HYDRANT

PROVIDE 6" AUXILIARY VALVE AND VALVE BOX

18"x9"x4" CONCRETE COLLAR

CRUSHED STONE OR COURSE GRAVEL MIN 1/2 CU.YD.

CONC. BLOCK

3/4" ROD (BOTH SIDES)

CONC. BLOCK AT BACK & BOTH SIDES TO HOLD HYDRANT SOLID & VERTICAL

1. ALL VALVES MUST BE RESILIENT SEATED.
2. APPROVED VALVE TYPES: CLOW, DRESSER & AMERICAN DARLING. MUST CONFORM TO AWWA C509.
3. RODDING SHALL NOT BE REQ'D IF ANCHOR FLANGES (SPOOLS) ARE USED.
4. HYDRANTS TO BE EQUIPPED WITH PRE-ATTACHED 4.5" NST PUMPER CONNECTION WITH A 5" STORTZ FITTING AND CAP.

HYDRANT SETTING

APPROVED/REVISED MARCH, 2018

WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER

STANDARD NUMBER W-8
NOTES:
1. HYDRANT, VALVE, BEND & TEE TO BE CLOSE COUPLED (USE RESTRAINED JOINTS).
2. HYDRANT AND VALVE MUST BE A MINIMUM OF 3' FROM ANY PAVED SURFACE.
3. ALL VALVES MUST BE RESILIENT SEATED.
4. APPROVED VALVE TYPES: CLOW, DRESSER & AMERICAN DARLING. MUST CONFORM TO AWWA C509.
5. RODDING SHALL NOT BE REQ'D IF ANCHOR FLANGES (SPOOL) ARE USED.
6. HYDRANTS TO BE EQUIPPED WITH PRE-ATTACHED 4.5" NST PUMPER CONNECTION WITH A 5" STORTZ FITTING AND CAP.
<table>
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<tr>
<th>METER SIZE</th>
<th>CHART A ANGLE VALVE</th>
<th>CHART B CHECK VALVE</th>
<th>CHART C METER PIT &amp; COVER</th>
<th>CHART D CORP STOP</th>
<th>CHART E COUPLINGS</th>
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<tr>
<td>3/4&quot; - 5/8&quot;</td>
<td>MUELLER P24258-1 FORD BA43-332W Mcdonald 46C2 B-22</td>
<td>MUELLER P 14269 FORD HA34 323 Mcdonald 02-342</td>
<td>METER PIT 20&quot;X30&quot; CARSON #0020213 STRAIGHT WALL METER PIT -OR- 20&quot;X30&quot; OLDCASTLE #0020-S COVER FORD C-3T OR EQUAL</td>
<td>MUELLER P 15008 FORD F-1000 Mcdonald MAC-PAK COMPRESSION</td>
<td>FORD C44-33 MUELLER P 15403 Mcdonald 4758-22</td>
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<td>1&quot;</td>
<td>FORD BA43-444W</td>
<td>FORD HA34-444</td>
<td>METER PIT 20&quot;X30&quot; CARSON #0020213 STRAIGHT WALL METER PIT -OR- 20&quot;X30&quot; OLDCASTLE #0020-S COVER FORD C-3T OR EQUAL</td>
<td>FORD F-1000</td>
<td>FORD C44-44 MUELLER P 15403 Mcdonald 4758-22</td>
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<td>DOUBLE 3/4&quot;</td>
<td>FORD UVB43-42W</td>
<td>FORD HA34-323</td>
<td>METER PIT 20&quot;X30&quot; CARSON #0020213 STRAIGHT WALL METER PIT -OR- 20&quot;X30&quot; OLDCASTLE #0020-S COVER FORD C-3T OR EQUAL</td>
<td>FORD F-1000</td>
<td>FORD C44-33 MUELLER P 15403 Mcdonald 4758-22</td>
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**NOTE:**
1. BACK FLOW PREVENTER TO BE INSTALLED AHEAD OF ANY SPRINKLER BUT NOT IN METER PIT.

**METER BOX DETAIL FOR 3/4" AND 1" METERS**

**APPROVED/REVISED**
March, 2018

**WARREN COUNTY STANDARD DETAILS**
DEPARTMENT OF WATER & SEWER

**STANDARD NUMBER**
W-10A
NOTE:
1. BACK FLOW PREVENTER TO BE INSTALLED AHEAD OF ANY SPRINKLER BUT NOT IN METER PIT.
NOTES:

1. PRIVATE MAIN APPLICATION MUST BE ACCOMPANIED BY MAINTENANCE AGREEMENT IN PROPER FORM.

2. MULTIPLE SERVICE LINES ON SINGLE TAPS SHALL BE APPROVED BY THE COUNTY ON A CASE-BY-CASE BASIS.

(MULTIPLE WATER SERVICE CONNECTIONS)

(WATER METER SEE W-10A, W-10B, W-14, W-15A AND W-15B)

(TYPICAL LAYOUT)
**NOTES:**

1) CORPORATION STOP TO BE CAST BRASS OR BRONZE. SEE W-10A OR W-10B.

2) ON THE SIDE OF THE ROAD WITH THE WATER MAIN PLASTIC TUBING SHALL BE 20'+/- LONG & EXTEND 23' BEHIND CURB TO CLEAR TELEPHONE & ELECTRIC EASEMENTS.

3) CONTRACTOR SHALL PLACE 2"X4" OR LARGER POSTS, PAINTED BLUE AT BOTH ENDS OF PLASTIC CONDUIT.

4) CONTRACTOR SHALL INSTALL A REBAR 5' LONG VERTICALLY AT ANGLE VALVES.

5) WATER MAIN WITHIN 3' OF BACK OF CURB MUST HAVE CDF BACKFILL.

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**TYPICAL WATER SYSTEM DETAIL**

**APPROVED/REVISED**  
MARCH, 2018

**WARREN COUNTY STANDARD DETAILS**  
DEPARTMENT OF WATER & SEWER

**STANDARD NUMBER**  
W-12
FROM COUNTY STANDARDS

5’  4’-6”  4’-8”
MIN  MIN  MIN

VARIES

11.5”  4”


OR

1 1/2” AND 2” SERVICE LINES, SEAMLESS COPPER TUBING TYPE “K”, FED. SPEC. W-T-799 OR SEAMLESS POLYETHYLENE 200 PSI WITH TRACER WIRE WITH 6’ LEAD INTO THE PIT.

NOTE:

1) CORPORATION STOP TO BE CAST BRASS OR BRONZE. SEE W-10A OR W-10B.

2) PLASTIC CONDUIT (2” ID) SHALL BE 20’+/- LONG AND EXTEND A MINIMUM OF 2’ INTO THE LOTS TO CLEAR UTILITY EASEMENTS.

3) CONTRACTOR SHALL PLACE 2”X 4” OR LARGER POSTS, PAINTED BLUE AT BOTH ENDS OF PLASTIC CONDUIT.

4) CONTRACTOR SHALL INSTALL A REBAR 5’ LONG VERTICALLY AT ANGLE VALVES.

5) WATER MAIN WITHIN 3’ OF BACK OF CURB MUST HAVE CDF BACKFILL.

DITCH AND METER LOCATION

APPROVED/REVISED  WARREN COUNTY STANDARD DETAILS  STANDARD NUMBER
MARCH, 2018  DEPARTMENT OF WATER & SEWER  W-13
**FDC - All shut off valves on fire line shall be electronically monitored per applicable Fire District and Warren County Building Dept.**

**PLAN**

**NOT TO SCALE**

**LARGE WATER METER PIT W/ FIRE LINE, DOMESTIC LINE & IRRIGATION LINE**

**APPROVED/REVISED**

MARCH, 2018

**WARREN COUNTY STANDARD DETAILS**

DEPARTMENT OF WATER & SEWER

**STANDARD NUMBER**

W-15B
Gate Valves - AWWA Resilient Seated with cast iron body, bronze mounted, flanged connections, nonrising stem, fusion epoxy coating, 400 PSI hydrostatic rated. Valve shall be Metro Seal 250 by US Pipe or equal.

Flanged Coupling Adaptors - Flanged adaptor connections for plain end pipe at fittings and valves shall be Dresser Style 127 or 128, or equal.

Vault Door - 60° x 60° double leaf aluminum diamond plate with hold open arm locks. Green space area hatches rated for 300 PSF. Traffic areas shall be AASHTO H-20. Doors shall be JD-4AL or JD-4AL H20 by Bilco or equal.

Strainer - Strainers 6" or smaller must be Badger Bronze Plate Strainers or equal. Screens must be made of non-corrosive 316 stainless steel with 3/16" or 1/4" perforations. Strainers 8" or larger must be Badger Model ML-MS Plate Strainers or equal. Screens must be made of non-corrosive stainless steel.

Sump Pump - Submersible pump with automatic level control, 115V single phase, discharge 25 - 30 gpm at 10 ft TDH. Sump pump operation and maintenance is the responsibility of the owner.

Piping - All piping 3" and larger shall be Class 52 ductile iron with flanged fittings. Piping smaller than 3" shall be threaded steel. Domestic and sprinkler lines shall be Type K Copper through the vault.

Backflow Preventer - FIRE: ASSE 1048 Double Check Detector or ASSE 1047 Reduced Pressure Principle Detector if additives in system. ASSE 1047 to be installed in the building.

DOMESTIC: ASSE 1013 Reduced Pressure Principle Backflow Prevention Assembly installed immediately upon entry of structure.

IRRIGATION: ASSE 1013 Reduced Pressure Principle Backflow Prevention Assembly installed immediately upon entry of structure and before any sprinklers.

The operation and maintenance of all backflow preventers is the responsibility of the property owner.
2 - #6 BARS ON BENDS

2" WIDE X 1/4" THICK STRAP

NOTE:
1. ALL CONCRETE 4200#
2. CARRY ALL BEARING SURFACES TO FIRM BEARING.

ANCHORS & BUTTRESSES FOR VERTICAL BENDS
APPROVED/REVISED MARCH, 2018
WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER
STANDARD NUMBER W-17
MINIMUM 54' OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL BENDS. REFER TO TABLE BELOW.

RESTRAINT OPTIONS:

MECHANICAL JOINT W/ MEGALUGS ~ ALL SIZES OF PIPE
MJ FIELD LOCKS ~ < 24" PIPE

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<td>56'</td>
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REQUIRED RESTRAINED JOINTS FOR BENDS

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
W-18
MINIMUM 54' OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL BENDS. REFER TO TABLE BELOW.

**TABLE**

REQUIRED LENGTH OF RESTRAINED JOINTS

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REQUIRED RESTRAINED JOINTS – DEAD END VALVES, PLUGS, CAPS & TEES

APPROVED/REVISED

MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

W-19
EXISTING PAVEMENT  
TACK COAT-MS-2, RS-1, RC-250  
1-1/2' ITEM 448

2-4" LIFTS  
ITEM 301

TRENCH DEPTH VARIES

GRANULAR BACKFILL  
95% COMPACTION

GRAVEL TO BE USED 6"  
BELOW AND 12" ABOVE PIPE.

CONTROLLED DENSITY FILL  
Saw cut both edges and seal with rubberized crack filler

"D"/2  
MAX. 12"

"D"  
MAX. 12"

6"

MAX. TRENCH WIDTH X

ALL DIMENSIONS ARE MINIMUM – ACTUAL TO BE PER COUNTY ENGINEER OR ODOT INSTRUCTIONS & PERMIT.

TRAFFIC MUST BE MAINTAINED AT ALL TIMES; LIGHTS, SIGNS, BARRICADES AND IF NECESSARY, FLAGMAN AND WATCHMEN TO BE ON JCB FOR PROTECTION OF THE PUBLIC. STREET PLATES MUST CONFORM TO COUNTY ENGINEER OR ODOT REQUIREMENTS.

FLASHFILL OR CONTROLLED DENSITY FILL TO A MINIMUM DISTANCE OF 5 FEET BEYOND THE EDGE OF PAVEMENT. TRENCH BACKFILL AND PAVEMENT RESTORATION MUST CONFORM TO THE APPLICABLE WARREN COUNTY ENGINEER OR ODOT SPECIFICATIONS.

EXISTING PAVEMENT EDGES SHALL BE NEATLY AND SQUARELY TRIMMED AND/OR MILLED. PAVEMENT MUST MATCH EXISTING ROAD THICKNESS OR AS SPECIFIED BY COUNTY ENGINEER OR ODOT.

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ROAD PAVEMENT CUT AND RESTORATION AT ROADWAY CROSSING

APPROVED/REVISED  
MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER  
W-20
NOTE:

CONNECT ON BOTH SIDES OF MAIN LINE GATE VALVE WITH 3/4" TYPE K COPPER CORP STOPS. INSTALL METER PIT & LID WITH 3/4" TYPE K COPPER LINES A MINIMUM OF 18" BELOW METER LID. ONE (1) ANGLE VALVE WITH METER BASE SHALL BE INSTALLED ON BOTH LINES.
WATER

1. ALL WATER MAINS SHALL HAVE A MINIMUM COVER OF 4’-6”.

2. ALL WATER SERVICE LATERALS SHALL HAVE A MINIMUM COVER OF 42”.

3. COMPACT FITTINGS ARE PERMITTED.

4. ALL WATER VALVES MUST OPEN LEFT. ALL VALVE BOX LIDS MUST BE CAST/STAMPED "WCWD" IN 1 1/2" LETTERS AND BE NEENAH NF-19130002 OR EQUAL. ALL VALVE EXTENSIONS TO HAVE SET SCREWS.

5. A CONCRETE SLAB MUST BE PROVIDED AT FINAL GRADE AROUND ALL MAIN VALVE BOXES. THE SLABS MUST BE EIGHTEEN INCHES (18") SQUARE /CIRCLE AND NINE INCHES (9") THICK. PRE-FABRICATED CONCRETE RINGS ARE ACCEPTABLE.

6. WATER AND SEWER LINES SHALL HAVE A MINIMUM OF TEN FEET (10') HORIZONTAL SEPARATION AND/ OR TWO FEET (2') VERTICAL SEPARATION.

7. NO GATE VALVE, METER PIT, BLOW OFF OR CORPORATION STOP SHALL BE LOCATED UNDER OR WITHIN THREE FEET (3') OF DRIVEWAYS, ROADWAYS OR SIDEWALKS.

8. NO DRIVEWAY SHALL BE INSTALLED WITHIN FIVE FEET (5') OF A FIRE HYDRANT.

9. A MINIMUM OF THREE FEET (3') IS REQUIRED BETWEEN CORPORATION STOPS. NO TAP SHALL BE MADE WITHIN THREE (3') OF A BELL.

10. THE LOCATION OF WATER SERVICE LATERALS MUST BE STAMPED IN THE CURB AT THE TIME THE CURB IS PLACED TO PERMANENTLY INDICATE THE LOCATION OF SAID LATERALS.

11. THE LOCATION OF ALL WATER SERVICE LATERALS, BENDS, TEES, ETC. MUST BE PROVIDED ON THE AS-BUILT PLANS. ALL OF THESE APPURTEANCES SHOULD BE SURVEYED IN STATE PLANE COORDINATES AND ELECTRONICALLY DELIVERED WITH AS-BUILTS.

12. CONTRACTOR SHALL SUBMIT AS-BUILT PLANS OF SANITARY AND WATER LATERALS TO THE OWNER.

13. ALL WATER MAINS CROSSING UNDER STORM DRAINS SHALL BE BACK-FILLED WITH GRANULAR MATERIAL, O.D.O.T. ITEM 310.02, BETWEEN MAINS AND DRAINS.
14. EACH SERVICE LATERAL MUST BE A CONTINUOUS PIECE OF PIPE FROM THE CORP STOP TO THE METER. COUPLINGS SHALL NOT BE ALLOWED. TYPE K COPPER SHALL BE USED FOR 3/4” AND 1” SERVICES. POLYETHYLENE 200 PSI (COPPER TUBE SIZE) MAY BE USED FOR 1 1/2” AND 2” SERVICES. TRACER WIRE MUST BE USED WITH POLY AND SDR 21.

15. SERVICE LINES 1” AND LARGER MUST BE EITHER TYPE K COPPER, POLY 200 PSI (ASTM D-2737) OR SDR 21 (SLIP JOINT) (ASTM-2241). TRACER WIRE MUST BE TAPE EVENLY EVERY 3’ ON POLY AND SDR 21 FROM THE METER PIT INTO THE STRUCTURE BEING SERVED (A 3’ LEAD IS REQUIRED INSIDE THE PIT).

16. 1 1/2” AND 2” SERVICE LINES FROM THE CORP STOP TO THE METER PIT MUST BE TYPE K COPPER OR POLYETHYLENE 200 PSI. POLY MUST HAVE A TRACER WIRE. SEE W-10B.

17. FIRE HYDRANTS MUST BE PROVIDED AT THE ENTRANCE TO ALL SUBDIVISIONS AND AT ALL STREET INTERSECTIONS.

18. AN APPROVED BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED ON ALL WATER SERVICE LATERALS BY THE PROPERTY OWNER PRIOR TO ANY POINT OF CONNECTION OR USAGE. THE FOLLOWING DEVICES AND LOCATIONS ARE REQUIRED.

   A) RESIDENTIAL DWELLING UNITS (3 FAMILY OR LESS): LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE. DUAL CHECK VALVE A.S.S.E. 1024.

   B) LANDSCAPE IRRIGATION SYSTEMS: REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY A.S.S.E. 1013. LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE.

   C) FIRE PROTECTION SYSTEMS: DOUBLE CHECK DETECTOR CHECK ASSEMBLY A.S.S.E. 1048 OR REDUCED PRESSURE PRINCIPLE DETECTOR CHECK A.S.S.E. 1047 IF SYSTEM CONTAINS ADDITIVES; A.S.S.E. 1048 LOCATED IN VAULT AND A.S.S.E. 1047 LOCATED IN BUILDING.

   D) NON-RESIDENTIAL SERVICES: REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY A.S.S.E. 1013, LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE.

19. SWAB PIPE WITH 50 PPM CHLORINE SOLUTION BEFORE INSTALLATION.

20. ALL NEW WATER MAINS SHALL BE PRESSURE TESTED FOR 2 HOURS AT 200 PSI, WHICHEVER IS GREATER. ALLOWABLE LEAKAGE SHALL BE PER TABLE 6A OF AWWA C-600.

21. DEDUCT METERS SHALL NOT BE ALLOWED.

22. NO IRRIGATION CONNECTIONS SHALL BE ALLOWED IN THE METER PIT.

23. BACK FLOW PREVENTER THAT COMPLIES WITH A.S.S.E. 1013 IS TO BE INSTALLED AHEAD OF ANY SPRINKLER BUT NOT IN METER PIT.

24. ALL MATERIALS USED SHALL BE DOMESTIC, MADE IN THE UNITED STATES OF AMERICA.
PROCEDURE FOR CONNECTION TO EXISTING WATER SYSTEM

1. MUST NOTIFY WARREN COUNTY WATER DEPARTMENT THREE (3) DAYS IN ADVANCE OF ANY SHUT DOWN. WARREN COUNTY WILL ISSUE THE SHUT DOWN NOTIFICATION AND/OR BOIL ADVISORY TO AFFECTED CUSTOMERS PER OHIO EPA REQUIREMENTS IF DETERMINED NECESSARY BY WARREN COUNTY.

2. EXPOSE EXISTING MAIN AT PROPOSED CONNECTION POINT. NO WET TAP SHALL BE MADE WITHIN THREE (3) FEET OF A BELL OR PIPE CONNECTION.

3. COUNTY PERSONNEL TO OPERATE CLOSING OF APPROPRIATE VALVES TO ISOLATE LINE TO BE TAPPED.

4. INSTALL PROPER TAPPING SLEEVE AND TAPPING VALVE. THE TAPPING SLEEVE AND VALVE SHALL BE TESTED AT 200 PSI FOR A PERIOD OF AT LEAST 5 MINUTES. THE PIPE SLUG MUST BE REMOVED AND INSPECTED BY COUNTY PERSONNEL.

5. IF THE TAPPING SLEEVE AND VALVE WILL BE UNDER FUTURE PAVEMENT, THE BURIED VALVE MUST BE LEFT OPEN AND A NEW VALVE SET OUT OF PAVEMENT.

6. FIELD CUT EXISTING MAIN AS NECESSARY TO ACCOMMODATE TEE AND CLOSE COUPLED VALVES AT EACH END OF TEE. CARE IS TO BE TAKEN SO AS NOT TO GET DIRT IN EXISTING MAIN.

7. THOROUGHLY CLEAN AND DISINFECT PIPE AND APPURTENANCES TO BE INSTALLED.

8. INSTALL TEE AND VALVES – DRESSER COUPLINGS CAN BE USED IF NECESSARY. PROPOSED MAIN VALVE IS TO BE CAPPED AND SHUT OFF. EXISTING MAIN IS THEN TO BE RETURNED TO SERVICE BY COUNTY PERSONNEL.

9. CONSTRUCTION OF PROPOSED MAIN IS TO BE COMPLETED WITHIN A JOINT OF CONNECTION TO TEE AND VALVES INSTALLED ABOVE.

10. ENTIRE LINE IS TO BE PRESSURE TESTED AND DISINFECTED TO COUNTY STANDARDS.

11. ENTIRE LENGTH OF PIPE IS TO BE THOROUGHLY CLEANED AND DISINFECTED PRIOR TO INSTALLATION. PERMATEX CHLORINE TABLETS TO BE USED FOR DISINFECTION. DOSAGE SHALL BE PER MANUFACTURER’S SPECIFICATIONS BASED ON PIPE MATERIAL.

12. NEW MAIN IS TO BE PUT INTO SERVICE BY COUNTY PERSONNEL.

13. TAPPING SLEEVES/SADDLES TO BE TWO–PIECE CAST IRON OR DUCTILE IRON (MUELLER H615). JCM412 OR FORD FTSS TAPPING SLEEVES PERMITTED ON C–900. SIZE ON SIZE TAPPING SLEEVES ARE NOT PERMITTED.

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<th>STANDARD NUMBER</th>
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<td>DEPARTMENT OF WATER &amp; SEWER</td>
<td>WG–2</td>
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</table>
PROCEDURE FOR RELOCATING OR LOWERING SERVICE LATERAL
AND RELOCATING OR BRINGING TO GRADE METER PITS

1. ALL AFFECTED USERS MUST BE NOTIFIED FORTY-EIGHT (48) HOURS IN
ADVANCE AS TO THE TIME AND DURATION OF THE SHUTOFF. ANY
DISCONTINUANCE OF SERVICE MUST BE COORDINATED THROUGH WARREN
COUNTY PRIOR TO ANY SHUT DOWN.

2. ALL WORK MUST BE PERFORMED ACCORDING TO ALL WARREN COUNTY

3. EACH SERVICE LATERAL MUST BE A CONTINUOUS PIECE OF PIPE FROM THE
CORP STOP TO THE METER. COUPLINGS SHALL NOT BE PERMITTED. TYPE K
COPPER SHALL BE USED FOR 3/4” AND 1” SERVICES. POLYETHYLENE 200
PSI MAY BE USED FOR 1 1/2” AND 2” SERVICES.

4. METER PITS MUST BE ADJUSTED TO GRADE USING RING RISERS OR PIT RISERS.
METERS MUST BE ADJUSTED WITH METER RESETTERS (FORD V42).

5. ALL PROCEDURES MUST BE DISCUSSED AT A PRECONSTRUCTION MEETING
PRIOR TO THE INITIATION OF CONSTRUCTION.
Manhole cover & frame to be NEENAH EJ. or APPROVED EQUAL. Cover to be lettered "SANITARY" or "SANITARY SEWER" EJ. Part Nos. 00160041B01
Neenah Part Nos. Water Tight R-1916-D
Solid Lid R-1776 & R-1767-2001-1 Casting

Adjust to finished grade with precast conc. collars, provide 12" maximum adjustment. (See notes 4 & 5 below)

For 12" & larger pipe start apron at elevation of inside crown of pipe and slope up to M.H. wall on minimum slope of 1/2" per ft.

NOTE:
Manhole invert shall be precast or cast in place.

Top of gravel (12" above pipe)

Refer to Warren County bedding specifications

NOTES:
1.) Minimum wall thickness and steel reinforcing to conform with A.S.T.M. designation C-478. Steel shall be cold drawn wire in accordance with A.S.T.M. designation A-82.
2.) Water tight gaskets are required at all joints (C-443 for rubber type joints).
3.) Except as otherwise noted on the sewer staking plan, where pipe sizes change at the manhole, the inside tops of pipes to be set at the same elevation.
4.) Top of casting shall be even with finished grade at paved locations (roadways and parking lots) and at developed lots. In undeveloped lots, top of casting to be a minimum of 12" above finished grade or as otherwise shown on plan.
5.) Within a new subdivision, temporary adjusting collar must be provided 1 foot above rough/finished grade. Risers (12" maximum) are permitted. Manholes shall be lowered to finished grade when subdivision improvements are completed and the lot is built on.
6.) No manhole, or any portion of a manhole, shall be located under a sidewalk or driveway. Manholes shall only be allowed in roadway pavement upon permission by the County Sanitary Engineer.
7.) A minimum drop of 0.20' must be maintained between inlet and outlet inverts.
NOTE: Top of casting shall be at finished grade at paved locations (roadways and parking lots) and at developed lots. In undeveloped lots, top of casting to be a minimum of 12” above finished grade or as shown on plan.

Manhole opening and steps must be aligned and opposite of the inside drop.

12” min.

36”

48” OR 60” DIA.

MANHOLE SHALL CONFORM TO A.S.T.M. SPECIFICATION C-478.

Adjust to finished grade with precast conc. collars, provide 12” maximum adjustment.

Note:
Except as otherwise noted on the sewer staking plan, where pipe sizes change at the MH, the inside tops of pipes to be at the same elevation.

Minimum wall thickness and steel reinforcing to conform with ASTM designation C-478. Steel shall be cold drawn wire in accordance with ASTM designation A-82.

No manhole, or any portion of a manhole, shall be located under a sidewalk or driveway. Manholes shall only be allowed in roadway pavement upon permission by the County Sanitary Engineer.

Within a new subdivision, temporary adjusting collar must be provided 1 foot above rough/finished grade. Risers (12” maximum) are permitted. Manholes shall be lowered to finished grade when subdivision improvements are completed and the lot is built on.

PRECAST MANHOLE INSIDE DROP CONNECTION

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
S-2
SECTION A-A

VENTED MANHOLE

Manhole cover & frame to be NEENAH, EJ. or APPROVED EQUAL
Cover to be lettered "SANITARY" or "SANITARY SEWER"
EJ. Part Nos. 00160041B01
Neenah Part Nos.
Water Tight R-1916-D
Solid Lid R-1776 &
R-1767-2001-1 Casting

3" I.D. STEEL PIPE
3" I.D. CU-FITTING
BACKFLOW PREVENTER
MUST USE ACTIVATED CARBON FILTER

HOLD STEEL PIPE WITH COLLAR & BOLT TO M.H. WALL

3" I.D. STEEL PIPE (SCH.40)

90° BEND (3" I.D. STEEL PIPE)

SEAL OPENING AROUND PIPE WITH WATERPROOF GROUT AS APPROVED BY COUNTY SANITARY ENGINEER

VENT HEIGHT VARIES SEE DETAILED PLANS FOR HEIGHT REQ'TS

STANDARD M.H.

standard manhole steps
ASTM D-4101
1st CONC. JOINT

12" MIN

ALL STEEL PIPE AND STEEL FITTINGS MUST BE STAINLESS STEEL.

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
S-3
A minimum drop of 0.20' must be maintained between inlet and outlet inverts.

NOTE: MODIFY MANHOLE CHANNEL ENTRANCE CONDITIONS SHOWN TO SUIT ENTRANCE NEEDS OF INDIVIDUAL CASES, MAINTAINING CHANNEL CONCEPT.

CHANNELS MUST BE SUITABLE FOR INSTALLATION & REMOVAL OF EXPANSION PLUG USED FOR FLUSHING.

ALL CONSTRUCTION DETAILS & DIMENSIONS ARE TO CONFORM TO THOSE SHOWN FOR STANDARD MANHOLES.

ALL CHANNELS MUST BE SMOOTH AND UNIFORM. TRANSITION MUST NOT CREATE OBSTRUCTION TO FLOW.
APRON IS TO BE CONSTRUCTED AT SPRING LINE OF HIGHEST SEWER

THREE PIPE TRANSITION

2' MAX.

CLASS A CONCRETE

PRECAST BASE SECTION

APRON IS TO BE CONSTRUCTED AT SPRING LINE OF HIGHEST SEWER

TWO PIPE TRANSITION

2' MAX.

CLASS A CONCRETE

PRECAST BASE SECTION

NOTE:
Drop manholes are to be used when the sewer entering the manhole is two (2) feet or greater above the manhole invert.
SANITARY SEWER SHALL BE INSTALLED IN A SEPARATE TRENCH FROM THE WATERMAIN AND SHALL BE A MINIMUM DISTANCE OF 10' MEASURED HORIZONTALLY FROM ANY WATERMAIN.

CLEAN COMMOM FILL WITHIN RIGHT-OF-WAY, SELF-COMPACTING GRANULAR FILL WITHIN ROCK, AND CONTROLLED DENSITY FILL WITHIN 3' OF EDGE OF PAVEMENT.

6" MIN. FOR PIPE UP TO 12" DIAMETER AND 1/2 DIA MAX. FOR PIPE LARGER THAN 12" DIAMETER.

Refer to Warren County bedding requirements per Standard Detail SG-1.

NOTES:
1. TRENCH SIDES SHALL MEET OSHA REQUIREMENTS.
2. TRENCH SHALL HAVE FLAT BOTTOM SO THAT PIPE WILL BE SUPPORTED UNIFORMLY ALONG THE BARREL.
3. NO SUPPORT BY BLOCKING IS PERMITTED.
EXISTING PAVEMENT
TACK COAT-MS-2, RS-1, RC-250
1-1/2" ITEM 448

2-4" LIFTS
ITEM 301

TRENCH DEPTH VARIES

GRANULAR BACKFILL
95% COMPACTION

Saw cut both edges and seal with rubberized crack filler

GRAVEL TO BE USED 6" BELOW AND 12" ABOVE PIPE.

"D"/2 MAX. 12"

"D" MAX. 12"

6"

12"

MAX. TRENCH WIDTH X

ALL DIMENSIONS ARE MINIMUM - ACTUAL TO BE PER COUNTY ENGINEER OR ODOT INSTRUCTIONS & PERMIT.

TRAFFIC MUST BE MAINTAINED AT ALL TIMES; LIGHTS, SIGNS, BARRICADES AND IF NECESSARY, FLAGMAN AND WATCHMEN TO BE ON JCB FOR PROTECTION OF THE PUBLIC. STREET PLATES MUST CONFORM TO COUNTY ENGINEER OR ODOT REQUIREMENTS.

FLASHFILL OR CONTROLLED DENSITY FILL TO A MINIMUM DISTANCE OF 3 FEET BEYOND THE EDGE OF PAVEMENT. TRENCH BACKFILL AND PAVEMENT RESTORATION MUST CONFORM TO THE APPLICABLE WARREN COUNTY ENGINEER OR ODOT SPECIFICATIONS.

EXISTING PAVEMENT EDGES SHALL BE NEATLY AND SQUARELY TRIMMED AND/OR MILLED. PAVEMENT MUST MATCH EXISTING ROAD THICKNESS OR AS SPECIFIED BY COUNTY ENGINEER OR ODOT.

ROAD PAVEMENT CUT AND RESTORATION
AT ROADWAY CROSSING

APPROVED/REVISED
MARCH, 2018
WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER
STANDARD NUMBER S-7
SEWER PIPE SIZE - CARRIER PIPE SIZE (O.D.) - THICKNESS

<table>
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<th>Sewer Pipe Size</th>
<th>Carrier Pipe Size (O.D.)</th>
<th>Thickness</th>
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<td>8&quot;</td>
<td>18&quot;</td>
<td>3/8&quot;</td>
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<td>10&quot;</td>
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<td>24&quot;</td>
<td>36&quot;</td>
<td>1/2&quot;</td>
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SO THAT PIPE WILL BE CENTERED IN CARRIER PIPE, THE FOLLOWING INFORMATION IS NEEDED:
1. TYPE & O.D. OF PIPE
2. TYPE OF JOINT/RESTRAINT
3. TYPE & I.D. OF CASING
4. 2 SPACERS PER LENGTH OF PIPE (18")
   (SEE STANDARD PLACEMENT BELOW)

NYLON AND STAINLESS STEEL CASCADE SPACERS AT 45°

NOTE:
1. RESTRAINED JOINT TO BE USED WITHIN LIMITS OF CASING.
2. SEAL END OF CASING WITH RUBBER BOOT OR BRICK AND MORTAR.
3. CASING SPACERS TO BE USED THRU CARRIER PIPE.

DUCTILE IRON PIPE CLASS 53

CASCADE SPACERS

RECOMMENDED STANDARD PLACEMENT

SEWER IN CASING

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
S-8
Sewers on 20 percent slope or greater shall be Class 53 Restrained Joint Ductile Iron anchored with concrete anchors spaced as follows:

1) Not over 36 feet center to center on grades 20 percent to 35 percent.
2) Not over 24 feet center to center on grades 35 percent to 50 percent.
3) Not over 16 feet center to center on grades 50 percent and over.

**CONCRETE ANCHOR**

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**STANDARD NUMBER**

S-9
NOTES:
1) CONCRETE SHALL BE 3000 P.S.I. MINIMUM 28 DAYS STRENGTH (4" SLUMP).
2) SUPPORT PIPE AND REBAR CAGE ON CONCRETE BRICKS DURING CONCRETE PLACEMENT.
3) CONCRETE ENCASEMENT SHALL BE TERMINATED AT PIPE JOINTS ONLY.
**SANITARY SEWER CREEK CROSSING**

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NOTES:
1. Structural design, calculations and drawing shall be prepared and stamped by an Ohio registered Professional Engineer and submitted to the County for review.

2. Submit complete drawings including, but not limited to:
   a. Complete details with structural section and material properties for all proposed sections (beams, columns, decking, etc.)
   c. Structural calculations, prepared and stamped by an Ohio registered Professional Engineer.
   d. Protective coatings.

AERIAL SANITARY SEWER CROSSING

APPROVED/REVISED MARCH, 2018
WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER
STANDARD NUMBER S-12
NOTES:

1. ALL JOINTS SHALL BE WATER TIGHT.

2. PIPE TO BE BEDDED SO THAT PIPE LOADS ARE NOT IMPOSED ON EXISTING WYES OR SADDLES.

3. EXCAVATION CLOSER THAN TWO FEET (2') FROM PIPE, WYES OR SADDLES SHALL BE DONE BY HAND.

4. DEEP HOUSE CONNECTION TO BE USED WHEN HOUSE CONNECTION IS MADE TO A SEWER DEEPER THAN 12'.

DEEP HOUSE CONNECTIONS

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INDICATES RESIDENCE OR OTHER BUILDING (FF ELEV = FIRST FLOOR ELEVATION)

PAINT WITH GREEN PAINT

R/W OR ESMT LINE

FINISH GRADE

MARK CURB "S" OVER LATERAL

1' LENGTH OF REINFORCING ROD
DRIVEN FLUSH WITH GRADE

#6 REBAR

2 X 4 OR LARGER TIMBER

45° BEND

1/4"/1' MIN SLOPE

FINISH GRADE

#6 REBAR & 2 X 4 OR LARGER TIMBER (LOCATE AS SHOWN ABOVE)

PLACE BEND A MIN OF 3' BELOW ELEV REQUIRED AT THE R/W LINE (SEE NOTE 6)

TYPE "A"

C/L SEWER MAIN

TYPE "B"

45° MAX

NOTE: HOUSE SERVICE IS TO RUN AT RIGHT ANGLE TO C/L OF SEWER MAIN.
#6 REBAR &
2 X 4 OR LARGER
TIMBER (LOCATE
AS SHOWN FOR
TYPE "A")

5' MIN
BACK OF CURB

45' MAX

1/4" / 1'
MIN SLOPE

FINISH GRADE

6"
1. 6" TEE OR WYE – ROTATE 45° FROM HORIZONTAL WHEN "5" DIMENSION IS ATTAINABLE.
2. 6” 1/8 BEND OR 1/16 BEND AS NEEDED.
3. CAP UNLESS JOINING EXISTING HOUSE LOCATION.
4. BED PIPE WITH 4” GRANULAR MATERIAL AND BACKFILL WITH GRANULAR MATERIAL TO 4” ABCVE PIPE.
5. 6’ FOR HOUSES ON SLAB.
   8’ FOR HOUSES WITH CRAWL SPACE.
   10’ FOR HOUSES WITH BASEMENT.

NOTE: USE TYPE "B" WHEN SEWER INVERT ELEVATION IS 5’ TO 10’ BELOW THE ELEVATION REQUIRED AT R/W LINE. USE DHC (S-13) WHEN SEWER INVERT ELEVATION IS 10’ OR MORE BELOW THE ELEVATION REQ’D AT R/W LINE. IN ALL OTHER CASES USE TYPE "A" OR TYPE "C".

HOUSE CONNECTIONS

S-14C
NOTE: Top of casting shall be at finished grade at paved locations (roadways and parking lots) and at developed lots. In undeveloped lots, top of casting to be a minimum of 12" above finished grade or as shown on plan.

Manhole cover & frame to be NEENAH, EJ, or APPROVED EQUAL
Cover to be lettered "SANITARY" or "SANITARY SEWER"
EJ Part Nos. C0160041B01
Neenah Part Nos.
Water Tight R-1916-D
Solid Lid R-1776 & R-1767-2001-1 Casting

ASTM D-4101

5' DIA.

1' CAULK WITH EXPANDING GROUT (TYP).

2'6" COMPANION FLANGE W/ 4"PLUG

CLASS "A" CONCRETE

FINISHED GRADE

ADJUST TO FINISHED GRADE PRECAST CONC. COLLARS OR HDPE (AS APPROVED BY COUNTY)
12" MAX. ADJUSTMENT.

MANHOLE SHALL CONFORM TO ASTM SPECIFICATION C-478

WATERTIGHT GASKETS ARE REQUIRED AT ALL JOINTS C-ASTM C-443 FOR RUBBER TYPE GASKET JOINTS.

2" HOSE CONNECTOR
2" PLUG VALVE
2" NIPPLE PLUG VALVES

FORCE MAIN

STRAIGHT COUPLING

FLANGED CROSS-RUN TO MATCH FORCE MAIN DIAMETER BRANCHES TO BE 4"

FORCEMAIN CLEANOUT

APPROVED/REVISED MARCH, 2018
WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER
STANDARD NUMBER S-15
NOTE: Top of casting shall be at finished grade at paved locations (roadways and parking lots) and at developed lots. In undeveloped lots, top of casting to be a minimum of 12" above finished grade or as shown on plan.

MANHOLE SHALL CONFORM TO ASTM SPECIFICATION C478

Manhole cover & frame to be NEENAH, EJ, or APPROVED EQUAL
Cover to be lettered "SANITARY" or "SANITARY SEWER"
EJ Part Nos. 00160041B01
Neenah Part Nos. Water Tight R-1916-D
Solid Lid R-1776 & R-1767-2001-1 Casting

FINISHED GRADE

PRECAST FLAT SLAB TOP

AIR RELEASE VALVE (Crispin Model SL 20 B or approved equal) *

GATE VALVE

PRESSURE MAIN

POURED IN PLACE FOOTER

WASHED GRAVEL

NOTE: IN WET AREAS SEAL BOTTOM WITH POURED CONCRETE BASE OR PRECAST MANHOLE BASF.

* Model no. may vary depending on application.

ADJUST TO FINISH GRADE PRECAST CONC COLLARS—12" MAX ADJUSTMENT

WATERTIGHT GASKETS ARE REQUIRED AT ALL JOINTS (ASTM C-443 FOR RUBBER TYPE GASKET JOINTS.)
NOTES:
CLEANOUTS SHALL BE INSTALLED AT ALL 45° BENDS.
ALL STRUCTURES MUST HAVE A CLEANOUT THAT IS ACCESSIBLE WITHIN TWO FEET (2') FROM THE POINT OF ENTRY INTO THE STRUCTURE.

SANITARY CLEAN-OUT

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
S-17
MINIMUM 54" OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL BENDS. REFER TO TABLE BELOW

RESTRAINT OPTIONS:
MECHANICAL JOINT W/ MEGALUGS OR FIELD LOC GASKETS.

<table>
<thead>
<tr>
<th>d</th>
<th>4&quot;</th>
<th>6&quot;</th>
<th>8&quot;</th>
<th>10&quot;</th>
<th>12&quot;</th>
<th>16&quot;</th>
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<td>54'</td>
<td>66'</td>
<td>98'</td>
<td>125'</td>
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MINIMUM 54" OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL BENDS. REFER TO TABLE BELOW.

**TABLE**

REQUIRED LENGTH OF RESTRAINED JOINTS

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<tr>
<th>d</th>
<th>4”</th>
<th>6”</th>
<th>8”</th>
<th>10”</th>
<th>12”</th>
<th>16”</th>
<th>20”</th>
<th>24”</th>
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<td>l</td>
<td>54’</td>
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<td>54’</td>
<td>54’</td>
<td>66’</td>
<td>98’</td>
<td>125’</td>
<td>145’</td>
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REQUIRED RESTRAINED JOINTS-DEAD END VALVES, PLUGS, CAPS & TEES

APPROVED/REVISED

MARCH, 2018

WARREN COUNTY STANDARD DETAILS

DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

S-19
FORCEMAIN SHALL BE INSTALLED IN A SEPARATE TRENCH FROM ANY WATERMAIN AND SHALL BE A MINIMUM DISTANCE OF 10' MEASURED HORIZONTALLY FROM THE WATERMAIN.

TRENCH SIDES SHALL BE IN CONFORMANCE WITH OSHA REQUIREMENTS.

FINISHED SURFACE

CLEAN COMMOM FILL WITHIN RIGHT-OF-WAY, SELF-COMPACTING GRANULAR FILL WITHIN ROCK, AND CONTROLLED DENSITY FILL WITHIN 3' OF EDGE OF PAVEMENT.

6" OR 1/2 D

EXCAVATE TO ACCOMODATE BELL OF PIPE

6"

AS NOTED ON PLANS

ODOT #703
SIZES 6 - 8
GRANULAR MATERIAL (IF IN ROCK OR WITHIN 3' FROM EDGE OF PAVEMENT)

TRENCH SHALL HAVE FLAT BOTTOM SO THAT PIPE WILL BE SUPPORTED UNIFORMLY ALONG THE BARREL. NO SUPPORT BY BLOCKING IS PERMITTED.

BACKFILL AND RESTORATION OF PAVEMENT MUST CONFORM TO THE APPLICABLE WARREN COUNTY ENGINEER OR ODOT SPECIFICATION.

FORCEMAIN TRENCH DETAIL

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
S-20
CONTRACTOR SHALL PROVIDE A 5' LONG SECTION OF IMPERVIOUS BACKFILL USING NATIVE CLAYS OR OTHER APPROVED MATERIAL.

IMPERVIOUS BACKFILL MAY BE REQUIRED BY THE COUNTY SANITARY ENGINEER TO PREVENT GROUNDWATER FROM FOLLOWING THE TRENCH. IMPERVIOUS DAMS SHALL BE REQUIRED WHERE EXCESSIVE GROUNDWATER MAY DETERIMENTALLY AFFECT THE PROPER INSTALLATION OF THE SANITARY SEWER.

THE CONTRACTOR SHALL PLACE CUTOFF TRENCH DAMS OF NATIVE CLAY OR IMPERVIOUS SOIL ACROSS AND ALONG THE TRENCH AS SPECIFIED BY THE COUNTY SANITARY ENGINEER.

THE TRENCH DAMS SHALL BE CAREFULLY COMPACTED AND SHALL BE 5 FEET IN LENGTH (MEASURED ALONG THE TRENCH CENTERLINE) AND SHALL BE BENCHED INTO THE UNDISTURBED TRENCH SIDES.

IMPERVIOUS DAM DETAIL

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
S-21
LATERAL SADDLE INSTALLATION DETAIL FOR PVC PIPE

APPROVED/REVISED
MARCH 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
S-22
# Detailed Procedures for Sanitary Sewer

1. Procedure for Making Sewer Lateral Connections to Existing Sewer:
   - A. If ABS Composite – Excavate to Point of Lateral on Main; Clean Existing Pipe; Align Saddle to Proper Position and Mark Area to Be Cut; Cut Hole in Pipe as Required Making Sure the Cut Out Doesn’t Enter the Main; Attach and Seal Saddle with Stainless Steel Straps and Mastic Sealer Between Saddle and Pipe. Inserta Tees Are Not Permitted.
   - B. If Clay or Concrete – Excavate to Point of Lateral on Main; Plug Outlet Pipe at Upstream Manhole – Pump to Downstream Manhole if Necessary; Remove Closest Length of Pipe and Replace with Tee. Lateral Section of Pipe or Core Existing Pipe in Place.

2. Procedure for Making Sewer Extensions from Existing Manholes:
   - Construct Line to Within One Joint of Existing Manhole; After Line Passes Leakage Test and Warren County Sanitary Engineer Gives Go Ahead – Connection Is to Be Made; Plug Outlet Pipe at Upstream Manhole – Pump to Downstream Manhole if Necessary; A Hole Is Cut at the Proposed Inlet Point and the Last Joint Is Laid; Existing Bench and Channel of Manhole Is Rebuilt and Shaped as Required; New Connection Is to Be Sealed as Required.

3. Procedure for Making New Manholes on Existing Sewer Mains:
   - Excavate and Expose Existing Sewer at Point of New Manhole; Build Manhole over Existing Line While Not Disturbing Existing Line; Build New Line(s) from New Manhole; After New Line(s) Pass(es) Leakage Test and Warren County Sanitary Engineer Gives Go Ahead – Plug Outlet Pipe at Existing Upstream Manhole (Pump to Existing Downstream Manhole if Necessary); Breakout Top of Existing sewer as Required and Form a Bench and Channel as Required.


5. All Sanitary Sewer Pipe Must Be Bedded with Number 57 Stone Extending from a Point Not Less Than 6" Below the Bottom of the Pipe to the Springline of the Pipe. Backfill with Number 9 Grits from the Springline to a Point Not Less Than 12" Above the Crown of the Pipe. Bedding Shall Provide a Uniform Support Along the Entire Pipe Barrel, Without Load Concentration at Joint Collars or Bells. Bedding Disturbed by Pipe Movement or by Removal of Shoring or Movement of the Trench Shield or Box Shall Be Reconsolidated Prior to Backfill. Bedding to Be Compacted to 95% Proctor.

<table>
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<th>Approved/Revised</th>
<th>Warren County Standard Details</th>
<th>Standard Number</th>
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<tr>
<td>March, 2018</td>
<td>Department of Water &amp; Sewer</td>
<td>SG-1</td>
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</table>
1. ALL SANITARY PIPE SHALL CONFORM TO ASTM D-2680 FOR ABS/PVC GASKETED COMPOSITE PIPE (TRUSS), ASTM D-3034 FOR SDR 26 GASKETED 4” – 15” DIAMETER OR ASTM F-679 FOR SDR 26 GASKETED 18” – 30” DIAMETER. PIPE LARGER THAN 15” SHALL CONFORM TO ASTM F-949 (A2000) OR ASTM F-1803. CERAMIC COATED CLASS 53 DUCTILE IRON PIPE OR EQUAL MUST BE USED WHERE SPECIFIED BY THE COUNTY SANITARY ENGINEER. JOINTS FOR PVC GRAVITY SEWER PIPE SHALL BE PUSH-ON TYPES WITH RUBBER GASKETS. PIPE ENDS SHALL NOT BE BEVELED. PIPE ENDS MUST BE SEALED.

2. ROOF DRAINS, FOUNDATION DRAINS AND OTHER STORM WATER CONNECTIONS TO THE SANITARY SYSTEM ARE PROHIBITED.

3. NO MANHOLE, OR ANY PORTION OF THE MANHOLE, SHALL BE LOCATED UNDER A SIDEWALK OR DRIVEWAY.

4. SANITARY SEWER LATERALS SHALL BE CONSTRUCTED OF THE FOLLOWING MATERIALS:
   A) ABS PIPE – ASTM D-2751 WITH SDR 23.5 (6” GLUE JOINT)
   B) PVC PIPE – ASTM D-3034 WITH SDR 23.5 (6” GLUE OR GASKET JOINT)
       ASTM D-2665 SCHEDULE 40
       ASTM D-3034 WITH SDR 35 (6” ONLY)
   C) DUCTILE IRON – CLASS 53 (6”)

5. SEWER LATERALS MUST BE EXTENDED TO THE HOUSE SIDE OF UTILITY EASEMENTS AND SHALL BE MARKED BY TWO INCHES (2”) BY FOUR INCHES (2” X 4”) OR LARGER POSTS. POSTS SHALL BE PAINTED GREEN. A SIX FOOT (6’) LENGTH OF #6 REINFORCED BAR SHALL BE INSTALLED AGAINST THE POST. END OF SEWER LATERAL SHALL NOT EXCEED 4’ IN DEPTH UNLESS APPROVED BY THE COUNTY SANITARY ENGINEER. SEE DETAIL S-14A.

6. ONLY SANITARY WYES WITH 45° BENDS SHALL BE USED FOR SANITARY LATERAL INSTALLATION. ALL WYES TO BE GLUE JOINTS ON TRUSS AND COMPOSITE PIPE. ALL SANITARY LATERALS MUST BE SIX INCHES (6”) IN DIAMETER WITHIN THE RIGHT-OF-WAY NO CONNECTION SHALL BE MADE TO THE CROWN OF THE SEWER MAIN.

7. ALL LATERALS TO BE NOT LESS THAN SIX INCHES (6”) INSIDE DIAMETER.

8. THE LOCATION OF SEWER LATERALS MUST BE STAMPED IN THE CURB AT THE TIME THE CURB IS PLACED TO PERMANENTLY INDICATE THE LOCATION OF SAID LATERALS.

9. THE LOCATION OF ALL SEWER LATERALS MUST BE PROVIDED ON THE AS-BUILT PLANS.

10. MANHOLE LATERALS SHALL HAVE AN INVERT TWO INCHES (2”) ABOVE MAIN-LINE INVERT.

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APPROVED/REVISED March, 2018
WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER SG-2A
11. EXISTING MANHOLE CASTINGS ARE TO BE RAISED BY EITHER A MANHOLE ADJUSTING RING OR A BARREL SECTION ADDED. IF THE HEIGHT OF NECESSARY ADJUSTMENT IS OVER ONE FOOT (1') OR THERE IS ALREADY AN EXISTING ADJUSTMENT RING BEING USED, THE CONTRACTOR IS TO USE A NEW BARREL SECTION ONLY. EXTRA CARE IS TO BE TAKEN TO INSURE A PROPER AND TIGHT SEAL AT ALL NEW JOINTS.

12. THE CONTRACTOR MUST INSTALL MECHANICAL PLUGS(S) AT THE POINT(S) OF CONNECTION TO THE EXISTING SEWER PRIOR TO INITIATING ANY CONSTRUCTION. THE BULK HEAD(S) OR MECHANICAL PLUG(S) SHALL REMAIN IN PLACE UNTIL THE NEW MAINS HAVE BEEN FLUSHED, CLEANED, TESTED, TELEVISUAL, AND APPROVED FOR USE BY WARREN COUNTY. THE MECHANICAL PLUG(S) CAN ONLY BE REMOVED IN THE PRESENCE OF A WARREN COUNTY SEWER INSPECTOR.

13. TRENCH SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR MUST INSURE THAT ALL APPLICABLE OSHA OPEN TRENCH SAFETY REQUIREMENTS ARE FOLLOWED. IT IS NOT WARREN COUNTY'S RESPONSIBILITY TO INSPECT EACH SITE FOR COMPLIANCE.

14. HDPE PIPE MAY BE USED FOR DIRECTIONAL BORING OF FORCE MAINS WITH APPROVAL FROM THE COUNTY SANITARY ENGINEER. ALL DIRECTIONAL DRILLING SHOULD BE ACCOMPANIED BY DRILLING LOGS AT 25' STATION INCREMENTS, PVC PIPE SHALL BE PERMITTED FOR FORCE MAINS SIX INCHES (6") OR SMALLER IN DIAMETER. FORCE MAINS EIGHT INCHES (8") OR LARGER MUST BE CLASS 53 DUCTILE IRON WITH AN INTERIOR LINING OF EPXY OR CERAMIC. PVC SHALL CONFORM TO AWWA C900 REQUIREMENTS AND HAVE AN EQUIVALENT OUTSIDE DIAMETER OF DR 14.

15. MINIMUM SLOPE SHALL BE AS FOLLOWS:

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>MINIMUM SLOPE (%)</th>
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<tr>
<td>6&quot;</td>
<td>2.00</td>
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16. ALL MATERIALS USED SHALL BE DOMESTIC, MADE IN THE UNITED STATES OF AMERICA.
PIPE CONNECTIONS INTO MANHOLES

SEWER PIPE TO MANHOLE CONNECTIONS ON ALL SANITARY SEWERS SHALL BE FLEXIBLE AND WATERTIGHT. SEWER PIPE SHALL BE SEALED IN THE MANHOLE SECTION PIPE OPENINGS WITH A RESILIENT CONNECTOR MEETING THE REQUIREMENTS OF ASTM C923. THE CONNECTION MAY BE ANY OF THE FOLLOWING TYPES:

1. RUBBER SLEEVE WITH STAINLESS STEEL BANDING
   A) KOR-N-SEAL AS MANUFACTURED BY POLLUTION CONTROL SYSTEMS, INC.
   B) LOCK JOINT FLEXIBLE MANHOLE SLEEVE AS MANUFACTURED BY INTERSPACE CORPORATION
   C) OR EQUAL

2. RUBBER GASKET COMPRESSION
   A) PRESS WEDGE II AS MANUFACTURED BY PRESS-SEAL GASKET CORPORATION
   B) DURA-SEAL MANUFACTURED BY DURA TECH, INC.
   C) OR EQUAL

RESILIENT CONNECTOR SHALL BE CAST INTEGRALLY INTO THE WALL OF THE MANHOLE SECTION AT TIME OF MANUFACTURE OR SHALL BE INSTALLED BY MECHANICAL MEANS IN OPENINGS CUT INTO MANHOLE WALL PER ASTM C923.

ANY CONNECTION TO AN EXISTING MANHOLE MUST BE MADE BY CORING THE MANHOLE. ANY CORE TO A MANHOLE MUST BE CENTERED IN THE BARREL SECTION. NO CORE SHALL BE MADE ALONG THE SEAM OF THE BARREL SECTION(S).
SEWER TESTING

1. THE CONTRACTOR MUST INSTALL MECHANICAL PLUG(S) AT THE POINT(S) OF CONNECTION TO THE EXISTING SEWER PRIOR TO INITIATING ANY CONSTRUCTION. THE MECHANICAL PLUG(S) SHALL REMAIN IN PLACE UNTIL THE NEW MAINS HAVE BEEN FLUSHED, CLEANED, TESTED, TELEVISIONED, AND APPROVED FOR USE BY WARREN COUNTY. THE MECHANICAL PLUG(S) CAN ONLY BE REMOVED IN THE PRESENCE OF A WARREN COUNTY SEWER INSPECTOR.

2. ALL NEW MANHOLES SHALL BE VACUUM TESTED. A VACUUM OF 10" OF MERCURY SHALL BE DRAWN ON THE MANHOLE. FOR A 4' MANHOLE LESS THAN 20' DEEP, MANHOLE SHALL HOLD 9" OF MERCURY FOR AT LEAST 1 MINUTE.

3. ALL SANITARY SEWER MAINS MUST BE AIR TESTED. THE STANDARD TEST IS AN AIR PRESSURE TEST OF 5.0 PSI FOR A FIVE (5) MINUTE PERIOD WITH A MAXIMUM OF 1.0 PSI LOSS.

4. ALL NON-TRUSS PIPE SHALL BE TESTED FOR DEFLECTION AFTER BACKFILLING IS COMPLETED (30 DAY MINIMUM REQUIRED). A DEFLECTION TEST WITH A NINE POINT MANDREL WILL BE REQUIRED. NO MECHANICAL PULLING DEVICE SHALL BE USED. A VERTICAL RING DEFLECTION GREATER THAN FIVE PERCENT (5%) WILL NOT BE ALLOWED. THIS DEFLECTION IS DEFINED AS A FIVE PERCENT REDUCTION IN THE VERTICAL BASE OR AVERAGE INSIDE DIAMETER.

5. AT THE TIME THE SANITARY SEWER IS TESTED, THE SEWER MUST BE CLEANED AND TELEVISIONED WITH VIDEO DOCUMENTATION (DVD) PROVIDED TO WARREN COUNTY. THE VIDEO MUST INCLUDE AUDIO IDENTIFICATION OF PIPE SPANS FROM MANHOLE TO MANHOLE, FLOW DIRECTION, TILT AND PAN OF ALL LATERALS AND CALL OUT ANY SUSPECT PROBLEMS IN THE SYSTEM. ALL PROBLEMS MUST BE IDENTIFIED BY THE CONTRACTOR. THE NECESSARY REPAIRS MUST BE MADE AND THE SEWER MUST THEN BE RE-CLEANED, RE-TESTED AND RE-TELEVISIONED.

6. A SECOND VIDEO INSPECTION IS REQUIRED ONE YEAR AFTER INSTALLATION AND/OR PRIOR TO THE RELEASE OF THE MAINTENANCE BOND. IF A DEFICIENCY IS IDENTIFIED DURING THIS TELEVISIONED INSPECTION, THE FAILED SEWER PIPE MUST BE TESTED AND REPAIRED TO THE SATISFACTION OF THE COUNTY SANITARY ENGINEER.

7. THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE TELEVISIONING, TESTING AND REPAIRS OF THE SANITARY SEWER.

APPROVED/REVISED
MARCH, 2018

WARREN COUNTY STANDARD DETAILS
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER
SG-4