WATER AND SEWER STANDARD DETAILS

(UPDATED September 24, 2010)

These details apply to all projects in for construction drawing review as of April 19, 2010

PUBLIC WORKS DEPARTMENT: 3RD FLOOR OF CITY HALL
ADDRESS: 101 CITY HALL PLAZA DURHAM, NC 27701
TELEPHONE: (919) 560-4326 FAX: (919) 560-4316
HOMEPAGE: http://www.durhamnc.gov/departments/works/engineering.cfm
# City of Durham Water and Sewer Standard Details

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<td>W-8.0</td>
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<tr>
<td>W-8.1</td>
<td>Concrete thrust block</td>
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<td>ID Number</td>
<td>Description</td>
</tr>
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<td>-----------</td>
<td>-------------</td>
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<td>W-10.0</td>
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</tr>
<tr>
<td>SS-1.1</td>
<td>6&quot; sanitary sewer lateral</td>
</tr>
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<td>Sanitary sewer lateral at manhole</td>
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</tr>
<tr>
<td>SS-2.1</td>
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<td>Brick sanitary sewer manhole</td>
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<td>Concrete block sanitary sewer manhole</td>
</tr>
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</tr>
<tr>
<td>SS-2.5</td>
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<td>SS-2.7</td>
<td>Sanitary sewer drop manhole</td>
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<td>Sanitary sewer manhole vent</td>
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<td>SS-6.0</td>
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<td>SS-7.0</td>
<td>Double sewer line</td>
</tr>
<tr>
<td>SS-8.0</td>
<td>Trench cut installation</td>
</tr>
</tbody>
</table>
DESIGN EARTHWORK
FILL AREA = _____
CUT AREA = _____
VF = _____
VC = _____

SLOPE STAKE FOR
TYPICAL STREET CROSS-SECTION

CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS

DATE: 12/07/2009
SCALE: NTS
DETAIL NO. C-1.0
TYPICAL SECTION

(FOR TRENCH EXCAVATION SHOWING MAXIMUM SLOPE RELATIONSHIP FOR PARALLEL INSTALLATION)
NOTES:
1. NORMAL SPACING FOR SPIDERS IS 3 PER 18" LENGTH OF PIPE, ONE SUPPORT AT EACH END AND A SUPPORT AT 9" CENTER.
2. ENTIRE SPIDER ASSEMBLY TO BE BITUMINOUS COATED AFTER FABRICATION.
3. FIELD MODIFY AS REQUIRED TO PROVIDE DESIGN SLOPE IN CARRIER PIPE.
4. SIZING TABLE IN P-2.1

END ELEVATION

* SEE DETAIL P-2.1 FOR SIZING OF ENCASEMENT PIPES
# Sizing Table for Carrier Pipes and Casing Pipes

The following table summarizes the required sizes for steel pipe encasements:

<table>
<thead>
<tr>
<th>Nominal Carrier Pipe Size (Inches)</th>
<th>Steel Casing Pipe Size (Inches)</th>
<th>Railroad Crossing</th>
<th>Road Crossing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Outside Diameter)</td>
<td>(Wall Thickness)</td>
<td>(Outside Diameter)</td>
</tr>
<tr>
<td>3 and Under</td>
<td>12.75</td>
<td>0.188</td>
<td>6.625</td>
</tr>
<tr>
<td>4</td>
<td>12.75</td>
<td>0.188</td>
<td>8.625</td>
</tr>
<tr>
<td>6</td>
<td>12.75</td>
<td>0.188</td>
<td>12.75</td>
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<td>8</td>
<td>16</td>
<td>0.219</td>
<td>16</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>0.281</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>24</td>
<td>0.312</td>
<td>24</td>
</tr>
<tr>
<td>14</td>
<td>28</td>
<td>0.375</td>
<td>28</td>
</tr>
<tr>
<td>16</td>
<td>30</td>
<td>0.406</td>
<td>30</td>
</tr>
<tr>
<td>18</td>
<td>36</td>
<td>0.469</td>
<td>36</td>
</tr>
<tr>
<td>20</td>
<td>42</td>
<td>0.562</td>
<td>42</td>
</tr>
<tr>
<td>24</td>
<td>42</td>
<td>0.562</td>
<td>42</td>
</tr>
</tbody>
</table>

Note: NCDOT and the railroads may have different requirements.
STREAM CROSSING
BORE AND JACK

STREET CROSSING
BORE AND JACK

*DEPTH AS NECESSARY TO MEET MINIMUM COVER AND/OR MINIMUM UTILITY SEPARATION REQUIREMENTS
MANHOLE ADJUSTMENT IN PAVED STREET
CITY OF DURHAM, NORTH CAROLINA DEPARTMENT OF PUBLIC WORKS

REVISED DATE: 12/07/2009
SCALE: NTS
DETAIL NO. P-3.0
NOTES:

1. THE ARMOR FOR THE EASEMENT SHALL BE WIDE ENOUGH TO ENCOMPASS THE ENTIRE FLOW ACROSS THE EASEMENT.

2. PROVIDE MIRAFI X-SERIES WOVEN POLYPROPYLENE GEOTEXTILES (500X PRODUCT) ROAD FABRIC OR APPROVED EQUAL.

3. ARMOR FOR THE EASEMENT SHALL BE INSTALLED EVEN IF LEVEL SPREADERS ARE INSTALLED FOR THE STORM DRAINAGE DISCHARGE.
1. IN ALL MANHOLES, SEWER AND WATER, REGARDLESS OF LOCATION, ULTRA HDPE INSERTS, WITH POLYPROPYLENE HANDLES, ARE TO BE INSTALLED. ADDITIONALLY, ALL OC BOXES AT WATER VALVES, HDPE INSERTS ARE TO BE INSTALLED.

GENERAL NOTES:

1. 3000 P.S.I. SOLID CONCRETE BLOCKING BEHIND SLEEVE.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. 12" X 12" AND 16" X 16" TAPPING SLEEVE IS NOT ALLOWED.
GENERAL NOTES:

1. ALL CONCRETE BLOCKING SHALL BE 3000 P.S.I. MINIMUM.
2. ALL HYDRANT VALVES SHALL BE RODDED TO MAIN LINE.
3. CONCRETE PAD REQUIRED ON ALL VALVES. (DETAIL NO. W-6.0).
4. HYDRANT TO BE LOCATED 10' FROM P.T. OR P.C. AT INTERSECTIONS.
5. THE HYDRANT PUMPER NOZZLE SHALL BE OF ONE-PIECE DESIGN.
6. THE NOZZLE SHALL BE AN INTEGRAL PART OF THE FIRE HYDRANT AND MUST BE FURNISHED BY THE MANUFACTURER OR AUTHORIZED DISTRIBUTOR. ADAPTERS WILL NOT BE ACCEPTED.
7. ALL FIRE HYDRANTS ARE TO BE PAINTED NATIONAL STANDARD "SAFETY RED".
FIRE HYDRANT INSTALLATION
ROLL CURB AND GUTTER
CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS

GENERAL NOTES:

1. ALL CONCRETE BLOCKING SHALL BE 3000 P.S.I. MINIMUM.
2. ALL HYDRANT VALVES SHALL BE RODDED TO MAIN LINE.
3. CONCRETE PAD REQUIRED ON ALL VALVES (DETAIL NO. W–6.0).
4. HYDRANT TO BE LOCATED 10’ FROM P.T. OR P.C. AT INTERSECTIONS.
5. ALL FIRE HYDRANTS ARE TO BE PAINTED NATIONAL STANDARD "SAFETY RED".
NOTE:
THE METER BOX SHALL BE MID-STATES PLASTICS MSBCF1118–12, MSBCF1118–18XL, OR APPROVED EQUAL AS DIRECTED BY ENGINEER OR INSPECTOR.

NO. 33. T – DUCTILE IRON COVER
WITH DUCTILE IRON HINGE LID
WEIGHT 18LBS.

AS DIRECTED BY
ENGINEER OR
INSPECTOR.

BRASS HINGE PIN

FOR USE IN
RESIDENTIAL AREA.

FLANGE FRAME

NO. 33. H – PLASTIC COVER
WITH PLASTIC HINGE LID
WEIGHT 8LBS.

NO. 33. – PLASTIC BODY
WEIGHT 15LBS. OR 19.5LBS.
DEpending ON MODEL

12" OR 18"
DEpending ON
MODEL
NOTES:
1. FLARED FITTINGS REQUIRED. NO COMPRESSED OR PLASTIC FITTING ALLOWED.
2. YOKES WILL BE DISCONTINUED AS OF JULY 1, 2010

3/4" OR 1" WATER CONNECTION FOR
5/8" OR 1" WATER METERS (YOEK)
NO. 33. T — CAST IRON COVER WITH METAL HINGE LID WEIGHT 18 LBS.

AS DIRECTED BY ENGINEER OR INSPECTOR.

BRASS HINGE PIN

FOR USE IN RESIDENTIAL AREA.

6-GA. WELDED WIRE FRAME

NO. 33. H — CONCRETE COVER WITH METAL HINGE LID WEIGHT 30 LBS.

NO. 33. — CONCRETE BODY WEIGHT 72 LBS.

NOTE:
1. CONCRETE METER BOXES ARE TO BE DISCONTINUED AS OF JULY 1, 2010.
EXPLODED VIEW 2" TAP & 2" GATE VALVE

1 1/2" & 2" POSITIVE DISPLACEMENT WATER METER INSTALLATION

CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS

SCALE: NONE
DETAIL NO. W-4.0
GENERAL NOTES:

1. PIPES, BENDS, TEES, AND GATE VALVES ARE THE SAME SIZE AS THE METER SIZE. (I.E. 6" METER HAS 6" PIPE, 6" 90° BENDS, 6"x6" TEES AND 6" GATE VALVES.)

2. ALL DIMENSIONS ARE BASED UPON STANDARD SIZES FOR PIPES, BENDS, TEES, GATE VALVES AND METERS. STRAINER SIZES VARY DEPENDING ON MANUFACTURER. DIMENSION "G" IS BASED UPON NEPTUNE STRAINERS. IF ANOTHER MANUFACTURER IS BEING USED THIS DIMENSION WILL VARY AND THE METER INSTALLATION MAY NOT FIT INTO THE VAULT BOX SHOWN. THIS SHOULD BE CHECKED BEFORE ORDERING THE VAULT BOX. COORDINATE WITH CITY OF DURHAM WATER & SEWER MAINTENANCE DIVISION.

3. DIMENSION "H" IS FOR STANDARD METERS. DIMENSION "H(I)" IS FOR COMPOUND METERS.

4. USE APPROPRIATE SIZE PLATE FLANGE ON THE TEE WITH A 2" BRONZE TAPPING PLUG.

5. USE ONLY METERS, STRAINERS AND GATE VALVES APPROVED BY THE CITY OF DURHAM, SEE SPECIFICATIONS.

6. FOR 3" METER VAULTS USE THE STANDARD SINGLE HATCH-TYPE ALUMINIUM DOOR, CENTERED OVER THE METER. FOR 4", 6" AND 8" METER VAULTS USE 5'XS' STANDARD CITY OF DURHAM ACCESS DOORS. (SEE DETAIL NO. W-5.0 OR W-5.1).
STANDARD VALVE BOX

DUR-MV - 8
8" METER VAULT
CONCRETE: 4000 PSI @ 28 DAYS
REINFORCING: #4 @ 6" O.C.E.W.
CONCRETE WEIGHT:
BASE=15,000 LBS
TOP= 8,475 LBS

NEPTUNE E-CODER
R-9001 REGISTER

BILCO KD 60"X60"
ACCESS HATCH
300 LBS PER SQ. FT
316 STAINLESS STEEL
BOLTS AND NUTS

CONCRETE
BLOCKING
AS NEEDED

SIZE  A  B
4"  33"  22"
6"  45"  29"
8"  53"  34.25"
10" 68"  36.25"

FIRELINE METER AND METER VAULT
4", 6", 8", & 10" METERS
CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS

REVISION DATE:
12/07/2009

SCALE:
NONE

DETAIL NO.
W-4.3
NOTE:
1. DIAMOND PATTERN: 1/4" X 1/2"
2. UPPER CASTING SURFACE TO HAVE DIAMOND PATTERN RAISED 1/8".

NOTE:
1. FOR 1 1/2", 2", & 3" METERS.
2. 300 P.S.F. LOADING
NOTES:

1. ACCESS DOOR SHALL BE A TYPE KD-4 MANUFACTURED BY THE BILCO COMPANY, NEW HAVEN, CONN. OR APPROVED EQUAL.
2. FRAME SHALL BE 1/4" EXTRUDED ALUMINUM WITH BUILT-IN NEOPRENE CUSHION AND WITH STRAP ANCHORS BOLTED TO EXTERIOR.
3. DOOR LEAF SHALL BE 1/4" ALUMINUM DIAMOND PLATE REINFORCED WITH ALUMINUM STIFFENERS AS REQUIRED.
4. CAST STEEL HINGES SHALL BE BOLTED TO UNDERSIDE AND PIVOT ON TORSION BARS THAT COUNTERBALANCE THE DOOR FOR EASY OPERATION.
5. THE DOOR SHALL OPEN 90° AND LOCK AUTOMATICALLY IN THAT POSITION.
6. A VINYL GRIP HANDLE SHALL BE PROVIDED TO RELEASE AND CLOSE THE COVER WITH ONE HAND.
7. DOORS SHALL BE BUILT TO WITHSTAND A LIVE LOAD OF 150 POUNDS PER SQUARE FOOT, AND EQUIPPED WITH A SNAP LOCK AND REMOVABLE HANDLE.
8. FACTORY FINISH SHALL BE ALUMINUM LACQUER, AND BITUMINOUS COATING SHALL BE APPLIED TO THE EXTERIOR FRAME BY THE MANUFACTURER.

NOTE: FOR 4", 6", AND 8" METERS
WATER VALVE BOX INSTALLATION
FOR 4", 6", 8", AND 12" GATE VALVES

Provide HDPE inserts in all valve boxes based on specifications described in detail P-6.0
VALVE PREFERENCE TABLE

THE FOLLOWING TABLE SUMMARIZES VALVE TYPES AND ACCESS ALLOWED FOR DIFFERENT SIZED VALVES:

<table>
<thead>
<tr>
<th>VALVE SIZE (INCHES)</th>
<th>VALVE TYPE</th>
<th>TYPE OF ACCESS</th>
<th>SIZE OF ACCESS (FEET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 AND UNDER</td>
<td>RESILIENT WEDGE GATE</td>
<td>VALVE BOX, 2-PIECE SCREW TYPE</td>
<td>STANDARD</td>
</tr>
<tr>
<td>14</td>
<td>BUTTERFLY</td>
<td>MANHOLE</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>BUTTERFLY</td>
<td>MANHOLE</td>
<td>4</td>
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<tr>
<td>18</td>
<td>BUTTERFLY</td>
<td>MANHOLE</td>
<td>5</td>
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<td>BUTTERFLY</td>
<td>MANHOLE</td>
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</tr>
<tr>
<td>42</td>
<td>BUTTERFLY</td>
<td>MANHOLE</td>
<td>6</td>
</tr>
</tbody>
</table>

GATE VALVES MAY BE DEEMED NECESSARY BY THE ENGINEERING DIVISION.
NOTE: SOLID COVER MAY BE REQUIRED DUE TO SITE CONDITIONS.

MINIMUM AVERAGE WEIGHTS
RING  = 190lbs.
COVER = 120lbs.
TOTAL  = 310lbs.

PROVIDE HDPE INSERTS IN ALL MANHOLES BASED ON SPECIFICATIONS DESCRIBED IN DETAIL P-6.0
NOTES:
1. CONCRETE SHALL BE 2500 PSI.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO CITY OF DURHAM SPECIFICATIONS AND STANDARDS.
4. ALL BENDS AND TEES SHALL HAVE CONCRETE THRUST BLOCKING.
CONCRETE THRUST BLOCK

NOTES:
1. CONCRETE SHALL BE 3000 P.S.I
2. REINFORCING BARS SHALL BE DEFORMED, AND TIED TOGETHER.
3. BACKFILL TAMPED IN 6" LAYERS
4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK(S) INSTALLATION SHALL BE THE MINIMUM WIDTH AS DESCRIBED BY THE ENGINEER.
### General Notes:

1. Based on test pressure of 200 P.S.I., all areas given in square feet.
2. Reaction bearing areas are in square feet measured in a vertical plane in the trench side at an angle of 90° to the thrust vector.
3. Use 6°–90° bend value for hydrants for additional safety factors.
NOTE:
1. EZ hydrants can be required at the city's direction.

BLOW-OFF ASSEMBLY FOR
4", 6", 8", 12", AND 16" WATER MAINS

CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS
MAXIMUM TAP SIZES FOR DUCTILE IRON PIPES

THE FOLLOWING TABLE SUMMARIZES THE MAXIMUM TAP SIZES FOR VARIOUS CLASSES OF DUCTILE IRON PIPE:

<table>
<thead>
<tr>
<th>PIPE DIAMETER (INCHES)</th>
<th>MAXIMUM TAP SIZE FOR CLASS 50 /51 PIPE (INCHES)</th>
<th>MAXIMUM TAP SIZE FOR CLASS 250 /350 PIPE (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3/4</td>
<td>3/4</td>
</tr>
<tr>
<td>6</td>
<td>3/4</td>
<td>3/4</td>
</tr>
<tr>
<td>8</td>
<td>1-1/2</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>1-1/2</td>
<td>1-1/2</td>
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<td>1-1/2</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>2</td>
</tr>
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</table>

THIS TABLE IS BASED ON INFORMATION FROM TABLES 50.16 AND 50.5 OF ANSI / AWWA C150/A21.51-91 FOR CLASS 50 /50 AND CLASS 250 /350 PIPE, RESPECTIVELY; AND FROM TABLE A.2 OF APPENDIX A FROM ANSI / AWWA C151/A21.51-91 FOR TAPS WITH TWO THREADS USING STANDARD CORPORATION STOPS. IF TAP REQUIREMENTS EXCEED TWO THREADS, OR IF THE REQUIRED TAP SIZES EXCEED THE MAXIMUM TAP SIZES LISTED IN THIS TABLE, TAPPING SADDLES MAY BE USED TO MAKE THE TAP. TAPPING SADDLES SHALL BE AS MANUFACTURED BY AMERICAN PIPE COMPANY, OR EQUAL.

REVERSE TAPS REQUIRE PLAN APPROVAL FROM DEVELOPMENT REVIEW MANAGER.
STANDARD SEWER MAIN LATERAL STUB-OUT
PVC SEWER MAIN

CLEAN OUT DETAILS
INSTALLED BY PLUMBER

SANITARY SEWER LATERAL
4" SEWER LATERAL
CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS
NOTES:

1. The minimum spacing from the edge of a core for a lateral to the edge of the next core shall be 6 inches.
2. Sewer lateral shall not enter a manhole at an angle less than 90° to the effluent pipe.
3. All laterals to be installed at the top of the bench.
4. Provide brick or concrete for invert.
5. Inverts to be built from lateral to effluent pipe.
6. The maximum number of laterals for any one manhole is five (5).
7. All new laterals into manholes must be core drilled and installed with a flexible rubber boot.
MANHOLE RING AND COVER
(DETAIL NO. SS-2.4)

24" MAX.

2'-0"

MANHOLE STEP
(DETAIL NO. SS-2.5)

16" TYP.

4'-0"

(SEE NOTE 8 DETAIL NO. SS-2.1)

SEWER MAIN

1" PLASTER

FLOW

STEEL REINFORCEMENT (NOTE 3 DETAIL NO. SS-2.1)

FLEXIBLE RUBBER SLEEVE BOOT (NOTE 5 DETAIL NO. SS-2.1)
NOTES

1. ALL PRE CAST CONCRETE MANHOLES SHALL CONFORM TO THE LATEST REVISION OF ASTM C478.

2. CONCRETE SHALL BE 4000 PSI AT 28 DAYS MINIMUM.


4. STANDARD JOINTS SHALL BE; SEALED WITH PUTTY TYPE PLASTIC CEMENT PER FED. SPEC. SS-C-153 OR AN O-RING TYPE JOINT CONFORMING TO THE LATEST REVISION OF ASTM-C443.

5. MANHOLE INLETS AND OUTLETS SHALL BE CAST IN PLACE FLEXIBLE RUBBER SLEEVES BOOTS PER THE LATEST REVISION OF ASTM-C923.

6. INVERTS TO BE CONSTRUCTED OF BRICK WITH A CONCRETE BENCH (DETAIL NO. SS-2.2).

7. THE MAXIMUM SEPARATION OR INVERT IN TO INVERT OUT WITHIN A MANHOLE IS 0.50 FEET. WHEN THE SEPARATION IS GREATER THAN 0.5 FEET A DROP MANHOLE MUST BE USED.

8. MANHOLES GREATER THAN 18 FEET IN DEPTH SHALL HAVE AN INSIDE DIAMETER OR 5’-0” LONG FOR SANITARY SEWER MAINS GREATER THAN EIGHTEEN INCHES (18”) IN DIAMETER, MANHOLES SHALL BE A MINIMUM OF 5’-0” IN DIAMETER.

9. RIM ELEVATIONS SHALL BE AT GRADE IN STREETS & PARKING LOTS.


11. DEPENDING UPON THE HEIGHT OF THE MANHOLE, THE CITY OF DURHAM ENGINEERING DIVISION MAY REQUIRE FLAT MANHOLES, EXTERIOR STEPS AND SAFETY BARS ON TOP OF THE MANHOLE.
MANHOLE RING AND COVER
(DETAIL NO. SS-2.4)

RIM ELEVATIONS:
- AT GRADE IN STREETS AND PARKING LOTS
- 3.0 FEET ABOVE GROUND IN OUTFALLS
- 2.0 FEET ABOVE 100 YEAR FLOOD PLAIN

BRICK

2'-0"

2'-91/2"

1" CEMENT
MORTAR-PLASTER

WALL THICKNESS: MANHOLES 12' OR
LESS IN DEPTH SHALL HAVE WALLS
8" THICK. WHEN MANHOLES ARE
MORE THAN 12' DEEP, THE PORTION
OF THE MANHOLE DEEPER THAN 12'
SHALL HAVE WALLS 12" THICK.

BELL OF PIPE SHALL BE
FLUSH WITH OUTERMOST
WALL OF MANHOLE

POURED
CONCRETE SLAB

SECTION A-A

1" PLASTER

INVERT TO BE
CONSTRUCTED OF
BRICK WITH A
CONCRETE BENCH (7
BRICK MINIMUM)

SECTION B-B

*CITY OF DURHAM ENGINEERING INSPECTIONS APPROVAL IS
REQUIRED BEFORE THE USE OF THIS STRUCTURE.

BRICK
SANITARY SEWER MANHOLE
CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS

REVISION DATE:
12/07/2009

SCALE:
NTS

DETAIL NO.
SS-2.2
CONCRETE BLOCK
SANITARY SEWER MANHOLE
CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS

*CITY OF DURHAM ENGINEERING INSPECTIONS APPROVAL IS REQUIRED BEFORE THE USE OF THIS STRUCTURE.

REVISION DATE: 12/07/09

DETAIL NO. SS-2.3
SOLID COVER MAY BE REQUIRED DEPENDING ON FIELD CONDITIONS

MINIMUM AVERAGE WEIGHTS
RINg = 190 lbs.
COVER = 120 lbs.
TOTAL 310 lbs.

PROVIDE HDPE INSERTS IN ALL MANHOLES BASED ON SPECIFICATIONS DESCRIBED IN DETAIL P–6.0

SANITARY SEWER MANHOLE
RING AND COVER
CITY OF DURHAM, NORTH CAROLINA
DEPARTMENT OF PUBLIC WORKS

DETAIL NO. SS-2.4
DIMENSIONS OF STEPS MAY VARY DEPENDING ON MANHOLE WALL THICKNESS AND TYPE OF CONSTRUCTION.
NOTES:

1. INVERT MATERIAL SHALL BE CONCRETE CAST IN PLACE WITH A SMOOTH FINISH.
2. WIDTH OF INVERT SHALL MATCH INSIDE DIAMETER OF INCOMING AND OUTGOING PIPES.
3. BRICK INVERT SHALL BE FORMED AS SHOWN.
4. ALL INVERT ELEVATIONS SHALL BE AS SHOWN ON APPROVED CONSTRUCTION PLANS.
5. BENCHES TO BE BUILT OUT OF CONCRETE, MORTARED BLOCK OR BRICK. STONE IS NOT ACCEPTABLE.
WATER TIGHT SEAL AROUND EXISTING SEWER MAIN

ISOMETRIC VIEW

NOTES:
1. MANHOLE TO BE SET ON CONCRETE BASE AND BASE TO BE ONE POUR.
2. FOR VITRIFIED CLAY PIPE, CONCRETE SHALL BE POUR TO NEXT EXISTING
   JOINT (BOTH SIDES OF MANHOLE).
3. PIPE OPENING SHALL BE PRECAST BY MANUFACTURER.
4. FLOW SHALL BE MAINTAINED DURING CONSTRUCTION.
5. MINIMUM OF 4000 PSI CONCRETE REQUIRED.
6. THE CONTRACTOR SHALL PROVIDE A MINIMUM 6" COMPACTED #57 STONE BASE.
7. INVERT TO BE BUILT FROM PROPOSED PIPE TO EFFLUENT PIPE, ACCORDING TO
   DETAIL ON INVERTS.

CROSS-SECTION

FLOW

SAW CUT TO SPRINGLINE

GROUT

T.C. PIPE

CONCRETE BASE

MIN. 6" OR AS REQUIRED BY ENGINEER

#57 STONE
BACKFILL COMPACTED
IN 6" LIFTS TO
95% STD. PROCTOR

UNDISTURBED MATERIAL

2-3" ABOVE PIPE

#57 STONE

EDGE OF TRENCH

4" TO 6"
PVC PIPE

PIPE DIA.
VARIABLE

15" MIN.
PIPE DIA.
VARIABLE

15" MIN.
NOTE:
SEE CITY OF DURHAM STANDARD CONSTRUCTION DETAILS FOR TRENCHES AND PIPE BEDDING.

NEW ASPHALT (TYPE 1-2) 1'-0"
FEATHER TYPICAL 1'-0"

EXISTING SUB-BASE

BACKFILL COMPACTED IN 6" LIFTS TO 95% STD. PROCTOR, OR FLOWABLE FILL AS DIRECTED.

2 1/2" ASPHALT COMPACTED TO 100% STD. PROCTOR.

ABC STONE COMPACTED TO 100% STD. PROCTOR OR HB BASE COMPACTED TO 100% STD. PROCTOR, OR AS DIRECTED BY THE ENGINEER.

3' MIN. VARIES

FLOWABLE FILL TRENCH-CUT STREET, WATER, SEWER AND STORMWATER

VARIES PIPE

UNDISTURBED MATERIAL

#57 STONE ABOVE AND UNDER PIPE

4"-6" MIN.

PIPE DIA. VARIABLE 4"MIN.

4"MIN.