NOTE: MANHOLE INVERTS OR CHANNELS TO BE PRECAST OR FORMED IN BASE, BY THE INSTALLATION OF CHANNEL PIPE AND FITTINGS, CHANGES IN SIZE, GRADE, AND DIRECTION TO BE MADE SMOOTHLY AND EVENLY WITH AS LARGE OF A RADIUS AS POSSIBLE.
NOTES:

1. MANHOLE FRAME SHALL BE SET USING INFRA-RISER, RISER RINGS AS MANUFACTURED BY GNR TECHNOLOGIES, INC. FRAME SHALL BE SET SO THAT THE TOP OF THE FRAME CONFORMS WITH THE SLOPE OF PAVED STREET SURFACES.

2. MANHOLE SECTIONS SHALL BE LAP JOINT WITH A DOUBLE BEAD FLEXIBLE BUTYL RUBBER SEALANT OR APPROVED EQUAL, ON BOTH INSIDE AND OUTSIDE FLAT SURFACE OF LAP JOINT.

3. EXTERIOR SURFACE TO BE COATED WITH KOPPERS 300-M BITUMINOUS COATING (20 MIL THICK MIN). INTERIOR SURFACE TO BE COATED WITH PENN-CHEM COATING #S4-W-23 BY PENNSBURY COATINGS OR APPROVED EQUAL. FIELD "TOUCH UP" AREAS AS REQUIRED BY WILLIAMS TOWNSHIP.

4. ALL MANHOLES TO INCLUDE HDPE INFILTRATION CAP INSERT.

5. STEPS SHALL BE POLYPROPYLENE.

6. ALL CONCRETE SHALL BE 4,000 PSI (MIN).

7. 4" DIA. MANHOLE - 8" TO 15" PIPES
   5" DIA. MANHOLE - 16" TO 27" PIPES
   6" DIA. MANHOLE - 30" TO 48" PIPES

8. MANHOLES THAT RECEIVE FORCE MAIN DISCHARGE SHALL BE CONSTRUCTED WITH A PVC LINER CAST INTO THE WALL.

5" MIN. THICKNESS

RUBBER GASKET SEAL (A-LOCK GASKET PER ASTM C923) CAST IN MANHOLE WALL.

STANDARD MANHOLE SECTION DETAIL
NO SCALE
Standard Drop Manhole Section

Notes:

1. Drop connections shall be installed when the pipe invert in are 2'-0" or more above the invert out of the manhole.

2. Manhole frame shall be set using infra-riser, riser rings as manufactured by GNR Technologies, Inc. Frame shall be set so that the top of the frame conforms with the slope of paved street surfaces.

3. Manhole sections shall be lap joint a double bead with flexible butyl, rubber sealant or approved equal, on both inside and outside flat surface of lap joint.

4. All manholes to include HDPE infiltration cap insert.

5. Exterior surface to be coated with Koppers 300-M bituminous coating (20 mil thick min). Interior surface to be coated with Penn-Chem coating 54-W-23 by Pennsberry Coatings or approved equal. Field "touch up" areas as required by Williams Township.

6. Polypropylene manhole steps by Mfg.

7. All concrete shall be 4,000 psi (min).

8. 4" dia manhole - 8" - 15" pipes
   5" dia manhole - 16" - 27" pipes
   6" dia manhole - 30" to 48" pipes

9. Manholes that receive force main discharge shall be constructed with a PVC liner cast into the wall.

5" min. thickness

RUBBER GASKET SEAL (A-LOK GASKET PER ASTM C923) CAST IN MANHOLE WALL

Additional Notes:

- Precast concrete drop assemblies may also be used.

- Channel:
  - Fully grouted pipe on inside wall only
  - Fully grouted pipe on outside wall only

- Note: Precast concrete drop assemblies may also be used.
STANDARD DETAIL

WILLIAMS TOWNSHIP
NORTHAMPTON COUNTY, PENNSYLVANIA

STANDARD METERING MANHOLE
PIPE SIZE 6" TO 12"

T&M ASSOCIATES
CONSULTING ENGINEERS

10/11 S-S-05
APP'D. DATE DRAWING NUMBER REV.

NOTES:
1. MANHOLE FRAME SHALL BE SET USING INFRA-RISER, RISER RINGS AS MANUFACTURED BY GNR TECHNOLOGIES, INC. FRAME SHALL BE SET SO THAT THE TOP OF THE FRAME CONFORMS WITH THE SLOPE OF PAVED STREET SURFACES.

2. MANHOLE SECTIONS SHALL BE LAP JOINT WITH A DOUBLE BEAD FLEXIBLE BUTYL RUBBER SEALANT OR APPROVED EQUAL, ON BOTH INSIDE AND OUTSIDE FLAT SURFACE LAP JOINT.

3. EXTERIOR SURFACE TO BE COATED WITH KOPPERS 300-M BITUMINOUS COATING (20 MIL THICK MIN). INTERIOR SURFACE TO BE COATED WITH PENN-CHEM COATING #54-W-23 BY PENNSBURY COATINGS OR APPROVED EQUAL. FIELD "TOUCH UP" AREAS AS REQUIRED BY WILLIAMS TOWNSHIP.

4. POLYPROPYLENE MANHOLE STEPS BY MFG.

5. CHART RECORDER UNIT TO BE LOCATED IN THE FIELD BY ENGINEER.

6. MAXIMUM SLOPE THROUGH MANHOLE WILL NOT EXCEED 2%.

7. SEE STANDARD MANHOLE SECTION DETAIL S-S-02 FOR ADDITIONAL REQUIREMENTS.

STANDARD METERING MANHOLE DETAIL
NO SCALE
NOTES:

1. EXISTING PIPE TO REMAIN UNTIL SATISFACTORY COMPLETION OF MANHOLE.

2. REMOVE CROWN OF EXISTING PIPE FLUSH WITH CONCRETE SHELF.

3. EXTERIOR SURFACE TO BE COATED WITH KOPPERS 300-M BITUMINOUS COATING (20 MIL THICK MIN). INTERIOR SURFACE TO BE COATED WITH PENN-CHEM COATING #54-W-23 BY PENNSBURY COATINGS OR APPROVED EQUAL. FIELD "TOUCH UP" AREAS AS REQUIRED BY WILLIAMS TOWNSHIP.

DOGHOUSE MANHOLE

NOT TO SCALE
18" W ALUM. MANHOLE
RUNGS @ 12" O.C.

PLAN BELOW ROOF

8" THK. TOP SLAB
DESIGNED TO MEET AASHTO
HS-20 LIVE LOAD CONDITIONS

30" Ø CLR.
OPNG.

CAST-IN
FLEXIBLE SLEEVE
(TYP.)

4" FLG. PLUG VALVE
W/BEVEL-GEAR OPERATOR
(2-TYP.)

12" CRUSHED STONE

5'-0" DIA.

STANDARD 80" PRECAST BASE

SECTION

FLUSHING MANHOLE NOTES:

1. EXTERIOR SURFACE TO BE COATED WITH KOPPERS 300-M BITUMINOUS COATING (20 MIL THICK MIN). INTERIOR SURFACE TO BE COATED WITH PENN-CHEM COATING #54-W-23 BY PENNSBURY COATINGS OR APPROVED EQUAL. FIELD "TOUCH UP" AREAS AS REQUIRED BY WILLIAMS TOWNSHIP.

2. THE CONTRACTOR SHALL PROVIDE BUOYANCY CALCULATIONS ASSUMING WATER AT GRADE ELEVATION. THE CALCULATIONS SHALL BE SIGNED & SEALED BY A LICENSED PENNSYLVANIA PROFESSIONAL ENGINEER AS PART OF THE SHOP DRAWING SUBMITTAL.

3. AREAS OF ALUMINUM IN CONTACT WITH CONCRETE SHALL BE PROVIDED WITH A BITUMASTIC COATING. AREAS IN WHICH DISSIMILAR METALS ARE IN CONTACT SHALL BE PROVIDED WITH NON-METALIC ISOLATORS.

FORCE MAIN FLUSHING MANHOLE

NOT TO SCALE
AIR RELEASE CHAMBER NOTES:

1. EXTERIOR SURFACE TO BE COATED WITH KOPPERS 300-M BITUMINOUS COATING (20 MIL THICK MIN). INTERIOR SURFACE TO BE COATED WITH PENN-CHM COATING #54-W-23 BY PENNSBURY COATINGS OR APPROVED EQUAL. FIELD "TOUCH UP" AREAS AS REQUIRED BY WILLIAMS TOWNSHIP.

2. THE CONTRACTOR SHALL PROVIDE BUOYANCY CALCULATIONS ASSUMING WATER AT GRADE ELEVATION. THE CALCULATIONS SHALL BE SIGNED & SEALED BY A LICENSED PENNSYLVANIA PROFESSIONAL ENGINEER AS PART OF THE SHOP DRAWING SUBMITTAL.

3. AREAS OF ALUMINUM IN CONTACT WITH CONCRETE SHALL BE PROVIDED WITH A BITUMASTIC COATING. AREAS IN WHICH DISSIMILAR METALS ARE IN CONTACT SHALL BE PROVIDED WITH NON-METALIC ISOLATORS.

FORCE MAIN AIR RELEASE CHAMBER
NO SCALE
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE NEENAH FOUNDRY COMPANY MODEL R-1642 WITH SELF SEALING GASKET TYPE COVER.
2. CASTING SHALL BE DESIGNED FOR AASHTO HIGHWAY LOADING CLASS HS - 25.
3. COVER SHALL HAVE THE WORD "SEWER" CAST THEREON.
5. PROVIDE FOUR (4) ANCHOR BOLTS IN FRAME TO ACCOMODATE 3/4" ANCHOR BOLTS.

STANDARD MANHOLE
FRAME & COVER
NO SCALE
NOTES:

1. MANHOLE FRAME AND COVER SHALL BE NEENAH FOUNDRY COMPANY MODEL R-1755 WITH SELF SEALING GASKET TYPE COVER.

2. CASTING SHALL BE DESIGNED FOR AASHTO HIGHWAY LOADING CLASS HS – 25.

3. COVER SHALL HAVE THE WORD "SEWER" CAST THEREON.


5. PROVIDE FOUR (4) ANCHOR BOLTS IN FRAME TO ACCOMODATE 3/4" ANCHOR BOLTS.
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY EXIST. CONDITIONS AND DIMENSIONS PRIOR TO ORDERING AND/OR FABRICATION OF ANY MATERIALS.

2. INSTALLATION SHALL CONFORM TO TOWNSHIP SPECIFICATIONS.

3. SCHEDULE 40 PVC PIPE SHALL BE GLUED AT ALL JOINTS.

4. 12" MINIMUM CUTBACK IN PAVED AREAS (SEE PAVING REQUIREMENTS).
NOTE: SURFACE RESTORATION TO ORIGINAL CONDITIONS. (AS REQUIRED)

BY PLUMBER

BY CONTRACTOR

HEAVY PVC MUSHROOM CAP 8" ABOVE FINISH GRADE

FIN. GRADE

CURB LINE

BUFFALO STYLE 55-S CAST IRON C.O. BOX WITH LID MARKED "SEWER"

3' APPROX.

MIN. SLOPE 1/4"/FT.

6" SDR 35 PVC

6" 22 1/2" ELBOW

4" CLEANOUT CAP

"INSPECTION PORT"

5' 0"

4" SDR 35 "ONE PIECE"

4" SDR 35 PVC MIN. SLOPE 1/4"/FT.

4" SDR 35 "P" TRAP

4" SDR 35 PVC

6" x 4" REDUCER 6" x 4" T WYE

8" SDR 35 PVC

8" SDR 35 MAIN

NOTE: CLEAN OUT SHALL BE PLUMB.

ELEVATION

RESTORATION TO ORIGINAL CONDITION

GRADE

2A (MODIFIED) IN PAVED AREAS, ALLEYS, SIDEWALKS, ETC. COMPACTED IN 12" LIFTS SELECT ON SITE MATERIALS IN LAWNS, YARDS, ETC. COMPACTED IN 12" LIFTS

2A STONE FROM INV. OF PIPE TO 12" ABOVE TOP OF PIPE

4" MIN.

4" OR 6" SDR 35 PVC

4" OF 2A STONE BEDDING

TRENCH DETAIL

NO SCALE

NOTE:

1. CONTRACTOR SHALL FIELD VERIFY EXIST. CONDITIONS AND DIMENSIONS PRIOR TO ORDERING AND/OR FABRICATION OF ANY MATERIALS.

2. INSTALLATION SHALL CONFORM TO TOWNSHIP SPECIFICATIONS.
SUBBASE (PAVED AREAS, SIDEWALKS, DRIVEWAYS, ETC.)
FINISHED GRADE (YARDS, LAWNS, UNPAVED AREAS)

UNDER PAVED AREAS, SIDEWALKS, DRIVEWAYS, ETC. 2A STONE COMPACTED IN 12" LIFTS

IN YARDS, LAWNS, UNPAVED AREAS, SUITABLE ON SITE BACKFILL MATERIAL COMPACTED IN 12" LIFTS

12" OF 2B STONE

1/4" TO 1' SLOPE

FROM HOUSE, BUILDING

4" SDR-35 PVC

4" OF 2B STONE

45° OR 22½° ELBOWS (AS REQUIRED)

TO MAIN

1/4" TO 1' SLOPE

4" SDR-35 PVC

BOTTOM OF TRENCH

GRADE ADJUSTMENT DETAIL
NO SCALE
SERVICE LATERAL RISER DETAIL
MULTIPLE SERVICE
NO SCALE
NOTES:

1. FRAME AND COVER SHALL BE NEENAH FOUNDRY COMPANY MODEL R-1976 OR APPROVED EQUAL

2. CLEAN-OUT PROTECTION SLEEVES ARE TO BE INSTALLED FOR CLEAN-OUTS LOCATED IN PAVED AREAS, OR LESS THAN 3 FEET FROM A PAVED AREA.

CLEAN-OUT PROTECTION SLEEVE

NO SCALE
SEWER SADDLE

NOTES:
1. SEALTITE SEWER PIPE SADDLE, MANUFACTURED BY GENEKO OR APPROVED EQUAL
2. PLACE SADDLE SO THAT LATERAL ConnectS TO TOP OF MAIN AT A 45° VERtical ANGLE

SEWER SADDLE
NOT TO SCALE
NOTES:
1. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMpressive STRENGTH OF 3300 PSI.
2. ALL REINFORCing STEEL SHALL BE DEFORMED BARS.
3. NO COUPLING OR JOINTS SHALL BE COVERED WITH CONCRETE.
4. REINFORCING BAR STRAPS TO BE SHAPED TO PIPE CURVATURE.
5. ALL EXPOSED STEEL TO BE COATED WITH CARBOLINE BITUMASTIC 50 APPLIED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS WITH A MINIMUM DRY FILM THICKNESS OF 30 MILS.
6. THRUST BLOCKING FOR TEES SHALL HAVE THE SAME BEARING AREA AS 90° BENDS OF THE PIPE SIZE OF THE OUTLET. DEAD ENDS SHALL HAVE THE SAME BEARING AREA AS 90° BENDS.

BEARING AREA REQUIRED, SQUARE FEET

<table>
<thead>
<tr>
<th>TYPE OF BEARING MATERIAL AND ALLOWABLE LOADS, PSF</th>
<th>4° AND LESS DEGREE BEND</th>
<th>6° AND 8° DEGREE BEND</th>
<th>10° AND 12° DEGREE BEND</th>
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<tbody>
<tr>
<td>LOOSE SAND OR MEDIUM CLAY - 2,000</td>
<td>1.0</td>
<td>2.0</td>
<td>2.7</td>
</tr>
<tr>
<td>PACKED GRAVEL AND SAND - 4,000</td>
<td>1.0</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>ROCK - 10,000</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
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BEARING AREA REQUIRED, SQUARE FEET

<table>
<thead>
<tr>
<th>TYPE OF BEARING MATERIAL AND ALLOWABLE LOADS</th>
<th>14° AND 16° DEGREE BEND OR DEFLECTION</th>
<th>18° AND 20° DEGREE BEND OR DEFLECTION</th>
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</thead>
<tbody>
<tr>
<td>LOOSE SAND OR MEDIUM CLAY - 2,000</td>
<td>11¼°</td>
<td>22½°</td>
</tr>
<tr>
<td>PACKED GRAVEL AND SAND - 4,000</td>
<td>6.0</td>
<td>12.0</td>
</tr>
<tr>
<td>ROCK - 10,000</td>
<td>3.0</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>2.4</td>
</tr>
</tbody>
</table>
PLAN VIEW

CLEAN FILL AS REQUIRED BETWEEN STONE FILTRATION DAM TO PROTECT THE BANKS AND THE TEMP. PIPE

SECTION A-A

ROCK FILTRATION DAM

SECTION B-B

STREAM CROSSING

NOT TO SCALE
NON-CONDUCTIVE CENTERED SPACERS

CARRYER PIPE

CASING CONDUIT

SELF MOLDING RUBBER END SEAL

END SECTION

NOTE - FOR CASING CONDUIT REQUIREMENTS, SEE SPECIFICATIONS

WATER OR FORCE MAIN

NO SCALE

NON-CENTERED, RESTRAINED, NON-CONDUCTIVE SPACERS

CARRIER PIPE

SELF MOLDING RUBBER END SEAL

END SECTION

NOTE - FOR CASING CONDUIT REQUIREMENTS, SEE SPECIFICATIONS

GRAVITY SEWER

NO SCALE

NOTE:
Contractor may use sand fill and brick and grout end seal if approved by Township.
REINFORCED CONCRETE SLOPE ANCHORS
(FOR UTILITY LINES)

ELEVATION

SECTION A-A

MAXIMUM SPACING

| 36' C/C | 20% TO 35% SLOPES |
| 24' C/C | 35% TO 50% SLOPES |
| 16' C/C | 50% OR GREATER SLOPES |

REINFORCED CONCRETE SLOPE ANCHORS
NO SCALE
GRAVITY SANITARY SEWERS AND FORCE MAINS

NOTE:
CONTRACTOR TO COMPLY WITH CURRENT OSHA STANDARD 29 CFR 1926 FOR TRENCH DIMENSIONS, SLOPING, BENCHING, SHORING AND INSPECTIONS.

BEDDING DETAILS
NO SCALE
NOTE:
1. CONTRACTOR TO COMPLY WITH CURRENT OSHA STANDARD 29 CFR 1926 FOR TRENCH DIMENSIONS, SLOPING, BENCHING, SHORING AND INSPECTIONS.
2. SANITARY SEWER PIPES MUST PASS UNDER POTABLE WATER PIPES.

TYPICAL CONCRETE ENCASEMENT DETAIL
NO SCALE
1" ID-2 WEARING COURSE OR 2" OF BITUMINOUS STOCKPILE PATCHING MATERIAL (WINTER ONLY)

2A STONE SUBBASE COMPACTED IN 12" LIFTS.

2A STONE FROM INV. OF PIPE TO 12" ABOVE TOP OF PIPE

6" MIN. OF 2A STONE BEDDING OR 1/4 OUTSIDE PIPE DIAMETER

PAVED STREET TEMPORARY RESTORATION
NO SCALE

2" - ID2 WEARING COURSE.

2A STONE SUBBASE COMPACTED IN 12" LIFTS.

2A STONE FROM INV. OF PIPE TO 12" ABOVE TOP OF PIPE

6" MIN. OF 2A STONE BEDDING OR 1/4 OUTSIDE PIPE DIAMETER

UNPAVED STREET OR SHOULDER TEMPORARY RESTORATION
NO SCALE

UNPAVED STREET OR SHOULDER PERMANENT RESTORATION
NO SCALE

STREET RESTORATION DETAIL
NO SCALE
STANDARD DETAIL

WILLIAMS TOWNSHIP
NORTHAMPTON COUNTY, PENNSYLVANIA

PERMANENT TOWNSHIP STREET RESTORATION

T&M ASSOCIATES
CONSULTING ENGINEERS

10/11 S-G-06

BITUMINOUS AND CONCRETE PAVING

12" WIDE BITUMINOUS SEAL

5" PADOT SUPERPAVE BASE

COURSE AND 1 1/2" SUPERPAVE WEARING COURSE

TRENCH WIDTH

1'-0"

1'-0"

2A STONE SUBBASE

2B STONE FROM INV. OF PIPE TO

12" ABOVE TOP OF PIPE

4" MIN. OR 1/4" OUTSIDE PIPE DIAMETER

4" MIN. OR 1/4" OUTSIDE PIPE DIAMETER OF 2B STONE BEDDING

PADOT SUPERPAVE – PERMANENT RESTORATION
NO SCALE

SUPERPAVE BINDER (MINIMUM DEPTH IS 1 1/2")
AND 1 1/2" SUPERPAVE WEARING COURSE,
MINIMUM 3" TOTAL DEPTH

12" WIDE BITUMINOUS SEAL

NEW CONCRETE TO BE 8" MINIMUM OR SAME
THICKNESS AS EXISTING PAVING

TRENCH WIDTH

1'-0"

1'-0"

4" MIN. OR 1/4"

OUTSIDE PIPE DIAMETER

TACK COAT OF TYPE E-1
BITUMINOUS MATERIAL

CONCRETE BASE WITH
SUPERPAVE WEARING SURFACE

FULL DEPTH CONCRETE
PAVEMENT RESTORATION

CONCRETE PAVING – PERMANENT RESTORATION
NO SCALE

FOR TEMPORARY PAVING SEE S-G-05
SUITABLE ON SITE BACKFILL MATERIALS IN LAWNS, YARDS, ETC. COMPACTED IN 12" LIFTS.

TOPSOIL AND SEED AS SPECIFIED.

2A STONE FROM INV. OF PIPE TO 12" ABOVE TOP OF PIPE

6" MIN. OF 2A STONE BEDDING OR 1/4 OUTSIDE PIPE DIAMETER

2. Surface texture as per Publication 408, Section 501.3(K).

3. For limits of concrete replacement see Dept. Reg. 459, Section 459.8(1)(4).

4. Cut back is not required beyond a transverse or longitudinal joint or curb.

PA–DOT ROADS — RIGID PAVEMENT RESTORATION
NO SCALE
NOTES:
1. ALL RESTORATION SHALL BE IN ACCORDANCE WITH PA DOT PUBLICATION 408 AND PA CODE TITLE 67 CHAPTER 459.
2. SPECIAL CONDITIONS OF OCCUPANCY PERMIT MAY SUPERSEDE THIS DETAIL.

PA–DOT ROADS – FLEXIBLE PAVEMENT RESTORATION
NO SCALE