



**Altoona Water  
Authority**

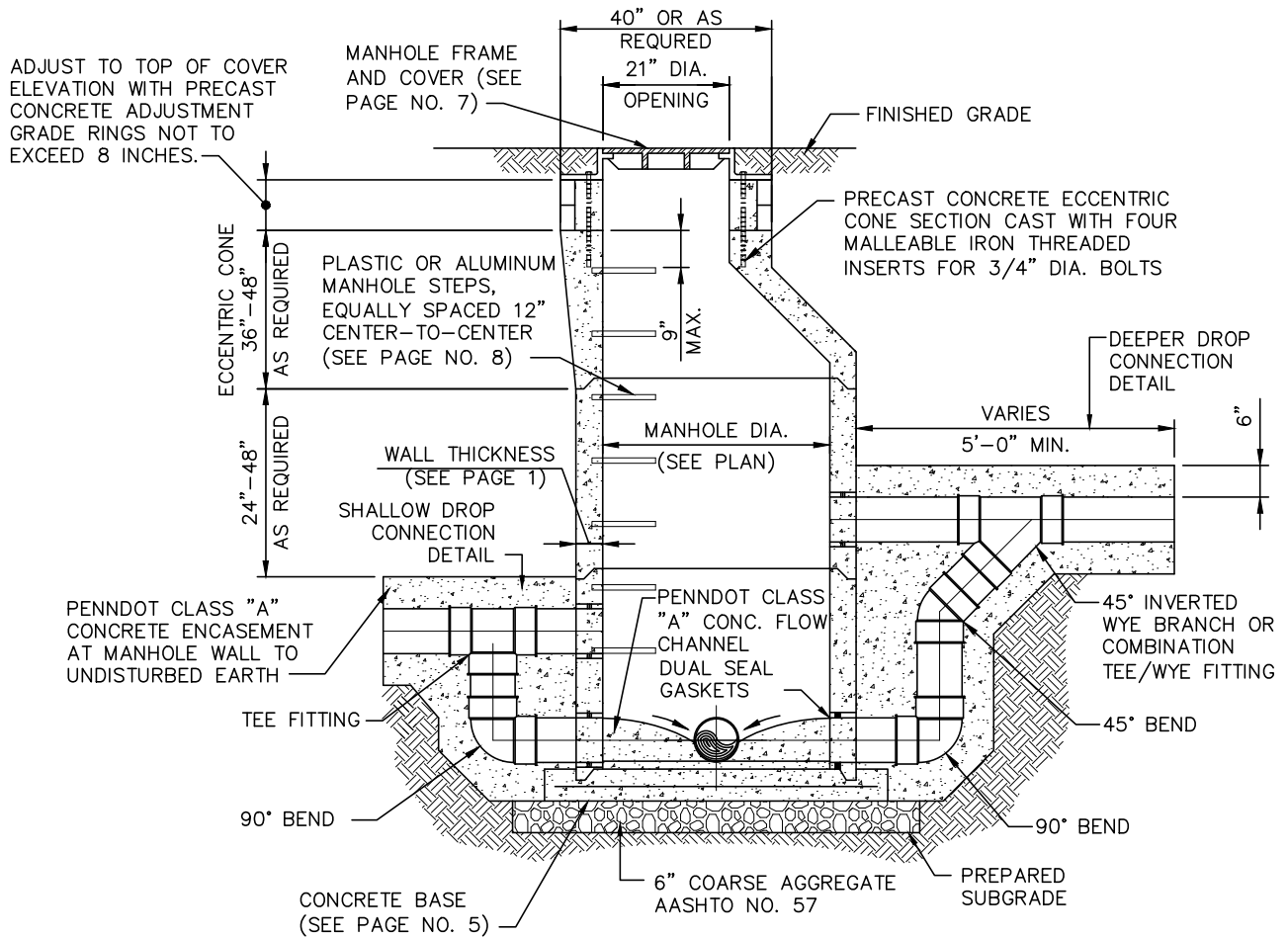
# **Waste Water Construction Details**

**Last Revised April 8, 2019**

## TABLE OF CONTENTS

PRECAST STANDARD MANHOLE BASE AND WALL DETAILS.....	1
PRECAST DROP MANHOLE BASE AND WALL DETAILS.....	2
PLAN VIEWS OF STANDARD AND DROP MANHOLE CHANNELS.....	3
STANDARD SHALLOW PRECAST MANHOLE SECTIONS.....	4
CAST-IN-PLACE MANHOLE BASE AND PRECAST WALL SECTIONS FOR EXISTING SEWER CONNECTIONS.....	5
MANHOLE REPLACEMENT DETAIL.....	6
PRECAST CONCRETE MANOLE FRAME AND COVER DETAILS.....	7
MANHOLE STEP DETAILS.....	8
SERVICE LATERAL CONNECTION TO EXISTING SEWER MAIN.....	9
SERVICE LATERAL CONNECTION ON NEW SEWER MAIN.....	10
BUILDING SEWER AND SERVICE LATERAL DETAILS.....	11





**DROP MANHOLE SECTION**  
(N.T.S.)

**NOTES:**

1. CONCRETE MANHOLES AND BASES SHALL CONFORM TO ASTM C-478.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A-185.
3. THE EXTERIOR SURFACE OF THE MANHOLE SHALL BE COATED WITH (2) TWO COATS OF A BITUMASTIC COATING SYSTEM AS APPROVED BY THE AUTHORITY. TOTAL DRY FILM THICKNESS SHALL BE 16 MILS. THE MANHOLE INTERIOR SHALL BE PROVIDED WITH A SIMILAR BITUMASTIC COATING. DRY FILM THICKNESS SHALL BE 8 MILS.
4. PROVIDE A BITUMINOUS COATING (CONFORMING TO AASHTO M-190) ON ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE.
5. DISTANCE FROM RIM OF MANHOLE TO TOP OF STEP SHALL NOT EXCEED 30".
6. DISTANCE FROM BOTTOM STEP TO FLOOR OF MANHOLE SHALL NOT BE GREATER THAN 24".
7. DO NOT LOCATE STEPS OVER FLOW CHANNELS. SEE PAGE NO. 3 FOR ORIENTATION.
8. A DROP CONNECTION SHALL BE INSTALLED WHEN INCOMING PIPE INVERTS ARE 2'-0" OR MORE ABOVE THE INVERT OF THE OUTGOING SEWER. THE ENTIRE OUTER SURFACE OF THE CONCRETE ENCASEMENT AROUND THE MANHOLE CONNECTIONS SHALL BE COATED WITH TWO COATS OF BITUMASTIC.
9. SEE PAGE NO. 7 FOR FRAME AND COVER DETAILS.
10. SEE PAGE NO. 3 FOR DETAILS OF FLOW CHANNELS, MANHOLE ACCESS OPENINGS AND MANHOLE STEPS.
11. REFER TO PAGE NO. 5 FOR PRECAST CONCRETE MANHOLE BASE DETAIL

ALTOONA WATER AUTHORITY  
STANDARD DETAIL

PRECAST DROP MANHOLE  
BASE AND WALL DETAILS

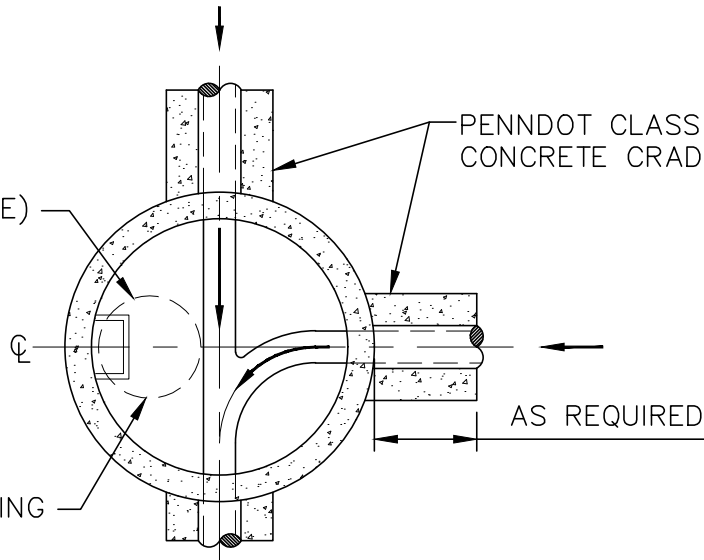
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DATE: 2-25-2019

PAGE 2

MANHOLE STEPS, FRAME AND COVER (CENTERED OVER FLOW CHANNEL LEDGE)

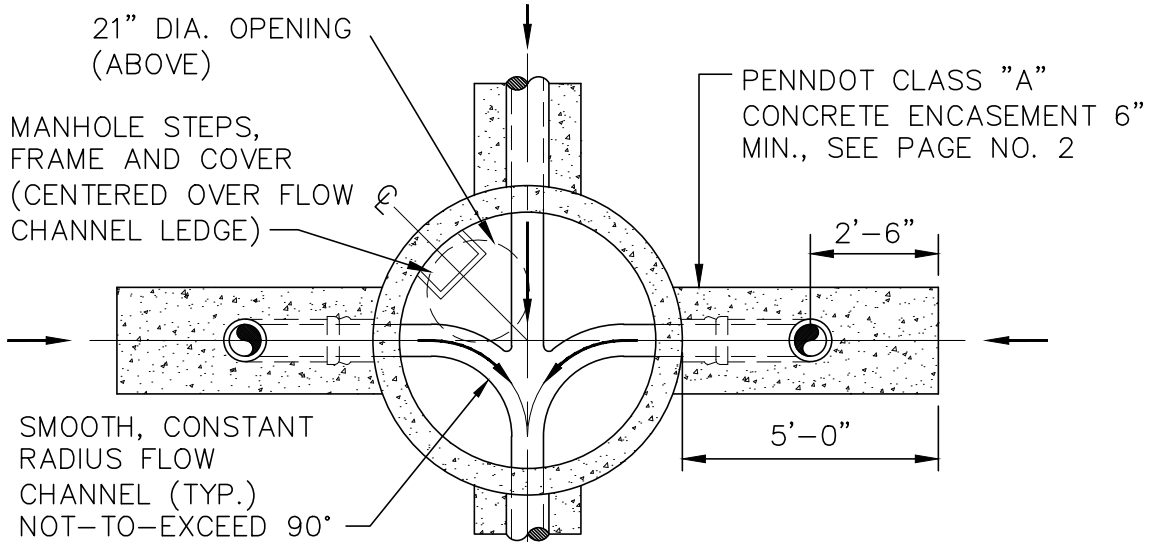
PENNDOT CLASS "A" CONCRETE CRADLES



21" DIA. OPENING (ABOVE)

AS REQUIRED

STANDARD MANHOLE  
(N.T.S.)



21" DIA. OPENING (ABOVE)

MANHOLE STEPS, FRAME AND COVER (CENTERED OVER FLOW CHANNEL LEDGE)

PENNDOT CLASS "A" CONCRETE ENCASEMENT 6" MIN., SEE PAGE NO. 2

SMOOTH, CONSTANT RADIUS FLOW CHANNEL (TYP.) NOT-TO-EXCEED 90°

2'-6"

5'-0"

STANDARD DROP MANHOLE  
(N.T.S.)

NOTES:

1. CONCRETE FOR FLOW CHANNELS SHALL BE PENNDOT CLASS "A" CONCRETE
2. GEOMETRY OF FLOW CHANNELS SHALL PRECISELY ALIGN WITH THE ORIENTATION OF THE INCOMING/OUTGOING DISCHARGING SEWERS AS SHOWN ON THE PLANS.
3. FLOW CHANNEL RADIUS SHALL NOT EXCEED 90°. ALL LEDGES SHALL BE POSITIVELY SLOPED FROM THE MANHOLE WALL TO THE FLOW CHANNELS.
4. FLOW CHANNELS SHALL BE NEATLY FORMED, POURED AND SMOOTHLY FINISHED TO THE SATISFACTION OF THE AUTHORITY.
5. INVERT ELEVATION OF SEWERS SHALL CONFORM WITH PLAN AND PROFILE ELEVATIONS WHICH ARE ASSUMED TO BE AT THE MANHOLE WALL. FLOW CHANNELS SHALL MAINTAIN A CONSTANTLY DESCENDING SLOPE TO THE INVERT ELEVATION OF THE OUTGOING SEWER.
6. MANHOLE ACCESS OPENINGS, PRECAST ECCENTRIC CONE SECTION AND STEPS SHALL ALIGN ON A FLOW CHANNEL LEDGE.

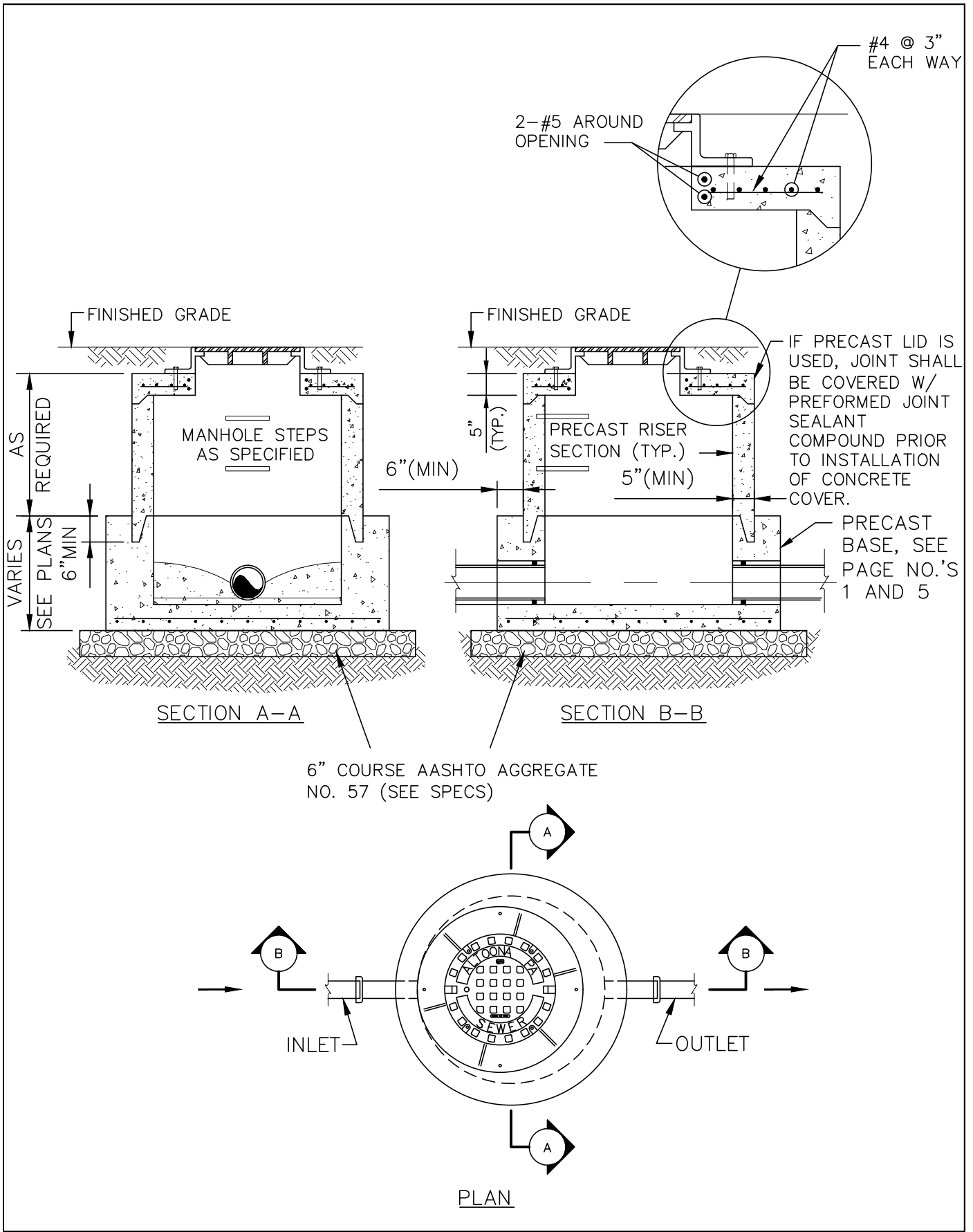
ALTOONA WATER AUTHORITY  
STANDARD DETAIL

PLAN VIEWS OF STANDARD AND  
DROP MANHOLE CHANNELS

SCALE: NONE

DATE: 2-25-2019

PAGE 3



ALTOONA WATER AUTHORITY  
STANDARD DETAIL

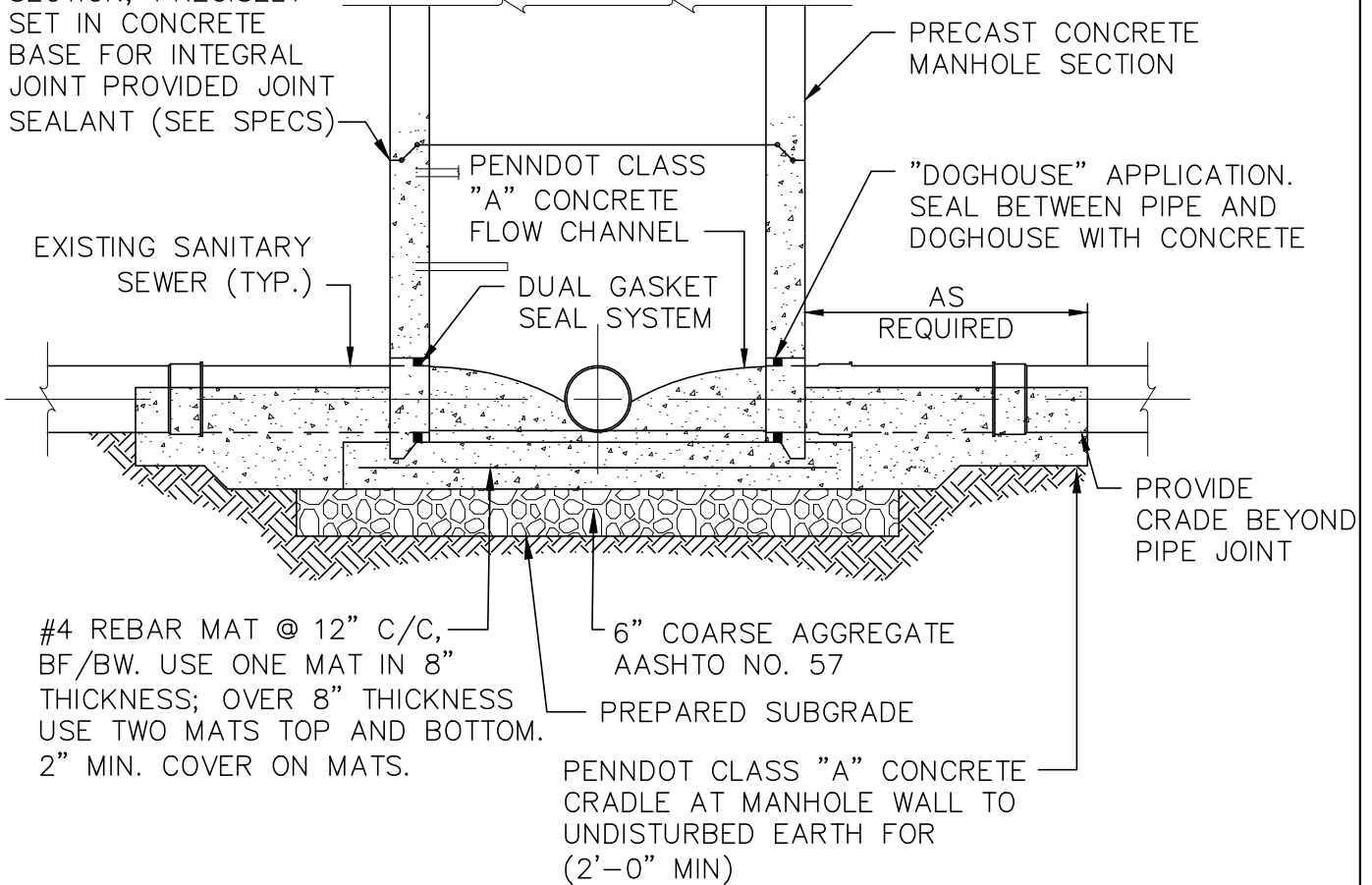
STANDARD SHALLOW  
PRECAST MANHOLE SECTIONS

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DATE: 2-25-2019

PAGE 4

PRECAST WALL SECTION; PRECISELY SET IN CONCRETE BASE FOR INTEGRAL JOINT PROVIDED JOINT SEALANT (SEE SPECS)



NOTES:

1. "DOGHOUSE" OPENINGS IN PRECAST CONCRETE MANHOLE SECTION SHALL BE SEALED WITH WATER PROOFING CEMENT MIXTURE (PER SPECS) ANNULAR SPACE TO BE COMPLETELY FILLED AND INTERIOR FINISH TO BE HAND TROWELED FLUSH AND SMOOTH.
2. WHERE CONDITIONS DICTATE AND AS DIRECTED BY THE AUTHORITY, MANUAL "BREAK-IN" OF EXISTING MANHOLE WALL SHALL REQUIRE A FULL-CIRCUMFERENCE RUBBER GASKET SEAL (A-LOCK OR EQUAL) FOR PROPOSED PIPE CONNECTION
3. REFER TO PAGE NO. 7 FOR DETAILS AND ORIENTATION OF FLOW CHANNELS, MANHOLE ACCESS OPENINGS, MANHOLE STEPS AND PRECAST ECCENTRIC CONE SECTION.
4. REFER TO PAGE NO.'S 1 AND 2 FOR SECTION AND DETAILS OF PRECAST CONCRETE MANHOLES
5. SEE PAGE NO. 7 FOR FLOW CHANNEL DETAIL.

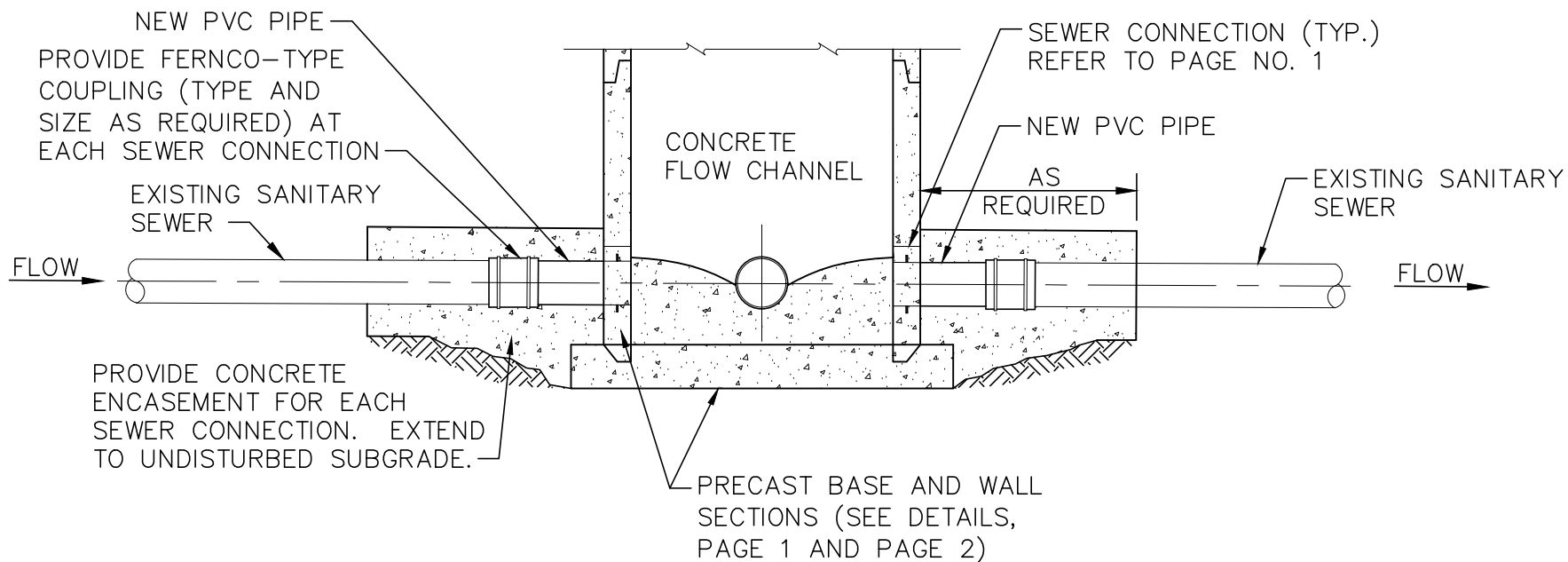
ALTOONA WATER AUTHORITY  
STANDARD DETAIL

CAST-IN-PLACE MANHOLE BASE  
AND PRECAST WALL SECTIONS FOR  
EXISTING SEWER CONNECTIONS

SCALE: NONE

DATE: 2-25-2019

PAGE 5



NOTES:

1. CONCRETE ENCASEMENT SHALL EXTEND TO UNDISTURBED EARTH AT ALL SEWER CONNECTIONS, 2'-0" MINIMUM IN ALL CASES
2. ANNULAR SPACE AND CONCRETE FLOW CHANNEL TO BE POURED MONOLITHICALLY

ALTOONA WATER AUTHORITY  
STANDARD DETAIL

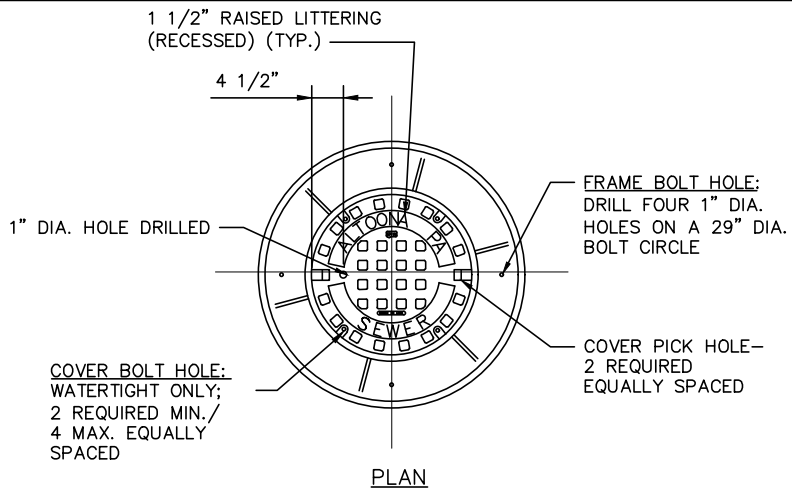
MANHOLE  
REPLACEMENT DETAIL

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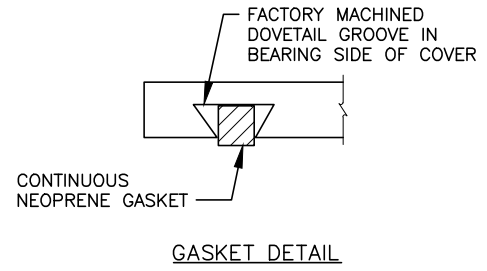
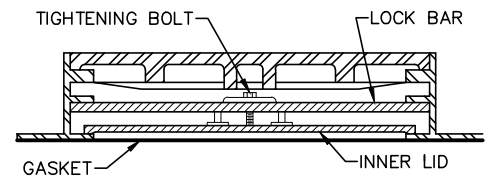
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PAGE 6





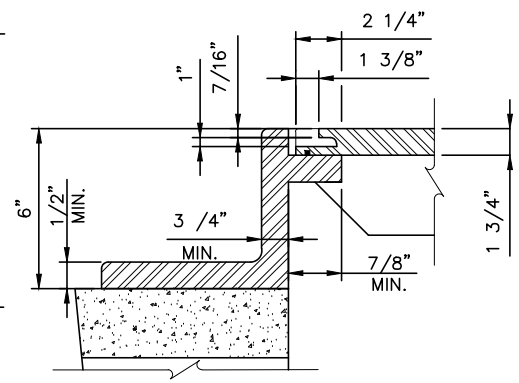
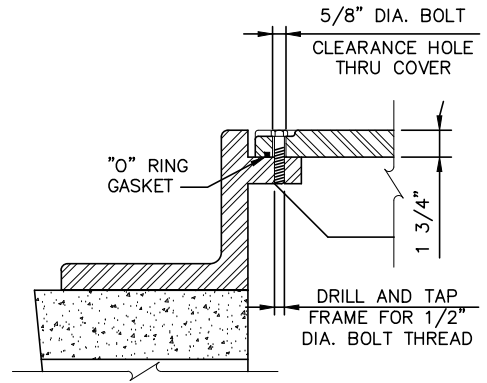
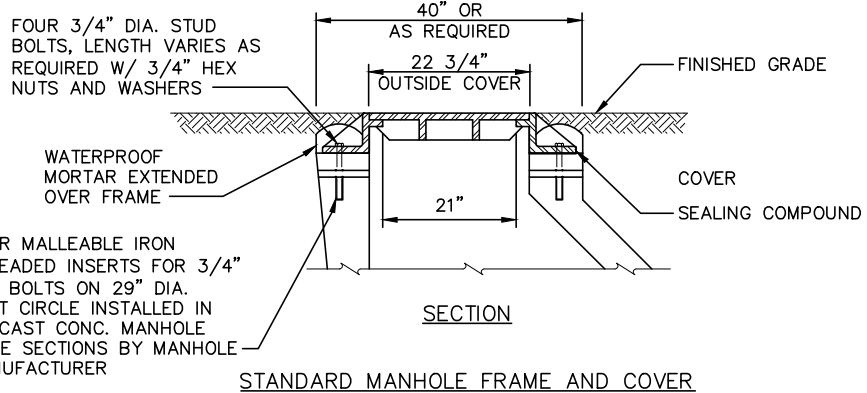
**NOTE:**  
 WATERTIGHT COVER SHALL HAVE MINIMUM OF TWO 1/2" DIA. STAINLESS STEEL BOLTS INSTALLED THROUGH THE COVER INTO THE FRAME



WATERTIGHT FRAME AND COVER

WATERTIGHT FRAME AND COVER NOTES:

1. MANHOLE COVER MUST BE MARKED "ALTOONA, PA-SEWER".
2. WATERTIGHT MANHOLE FRAME AND COVERS SHALL HAVE SELF SEALING LIDS WITH NEOPRENE RUBBER GASKETS.
3. WATERTIGHT FRAME AND COVERS SHALL BE FURNISHED WITH NEOPRENE RUBBER GASKETS, TIGHTENING BOLT AND LOCKING BAR. LIDS SHALL BE FURNISHED WITH CONCEALED WATERTIGHT PICKHOLE.



COVER BOLT HOLE - ELEVATION

COVER PICK HOLE - ELEVATION

WATERTIGHT MANHOLE FRAME AND COVER

NOTES:

1. MANHOLE COVER SHALL BE MARKED "ALTOONA, PA-SEWER" AS SHOWN ABOVE.
2. MANHOLE FRAMES AND COVERS SHALL BE DESIGNED FOR AASHTO CLASS HS-20
3. PRECAST CONCRETE RINGS ARE REQUIRED ONLY WHERE MANHOLE FRAME AND COVER MUST CONFORM TO GRADE OF STREET. MAXIMUM HEIGHT ADJUSTMENT W/ RINGS IS 8". PROVIDE 3/4" ANCHOR BOLT EXTENSION TO FRAME, FILL ANNULAR SPACE WITH WATERPROOF MORTAR
4. FOR COMBINED SEWER MANHOLES, PROVIDE 24" GRATE, H-20 HEAVY DUTY RATING, DUCTILE IRON, ASTM A536 GRADE 70-50-05 MINIMUM DRAIN AREA - 160 SQ. IN., NYLOPLAST AMERICAN INC., OR APPROVED EQUAL.
5. WATERTIGHT AND STANDARD FRAMES AND COVERS SHALL HAVE SELF-SEALING LIDS WITH NEOPRENE RUBBER GASKETS
6. MANHOLE FRAMES AND COVERS BY EAST JORDAN IRON WORKS OR OWNER SPECIFICATION

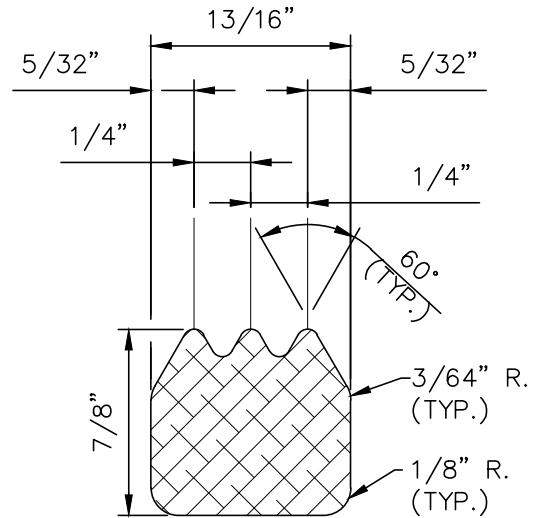
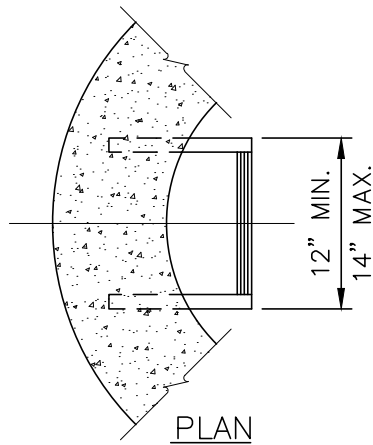
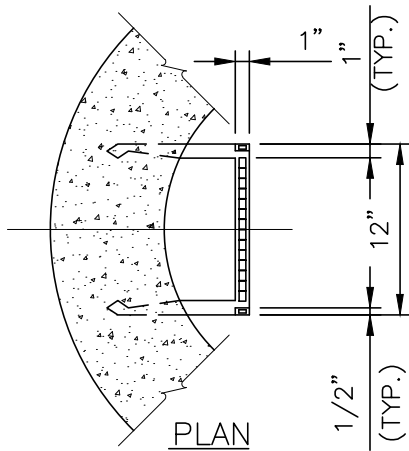
ALTOONA WATER AUTHORITY  
 STANDARD DETAIL

PRECAST CONCRETE MANHOLE  
 FRAME AND COVER DETAILS

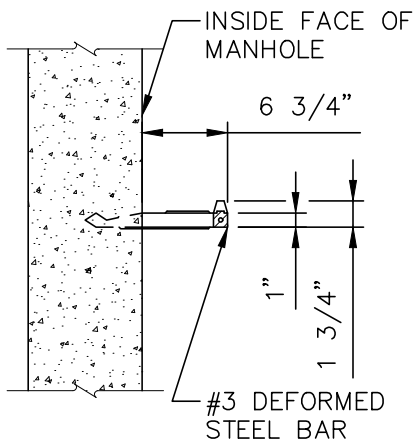
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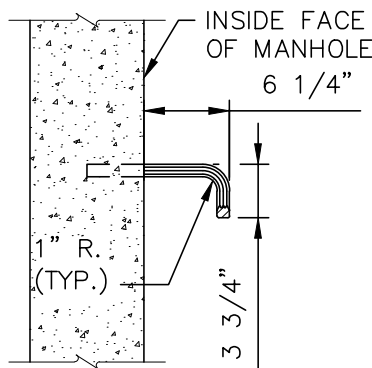
PAGE 7



TYPICAL SECTION THRU ALUMINUM MANHOLE STEP



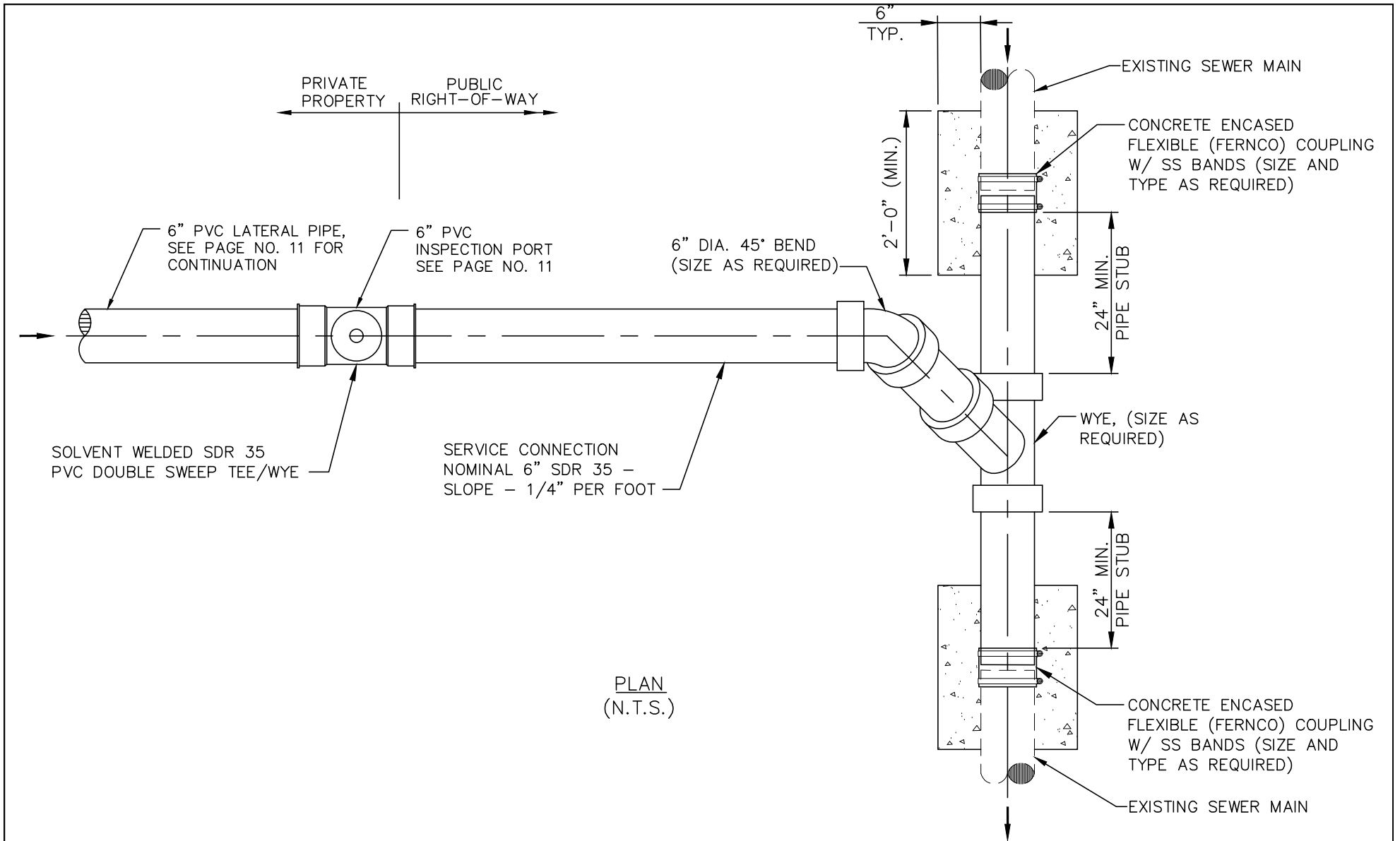
ELEVATION REINFORCED PLASTIC



ELEVATION ALUMINUM (ALLOY 6061-T6)

NOTES:

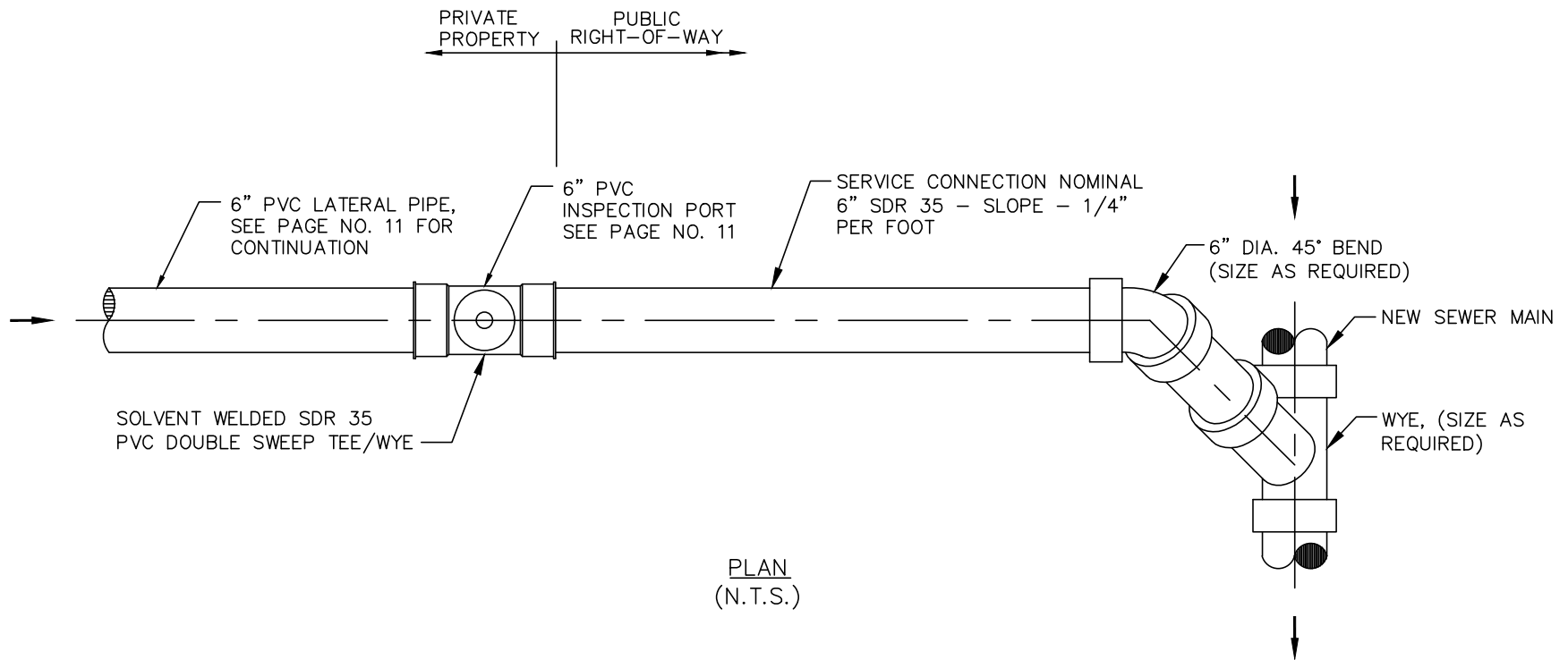
1. PROVIDE A BITUMINOUS COATING (CONFORMING TO AASHTO M-190) ON ALUMINUM SURFACES IN CONTACT WITH CONCRETE.
2. DISTANCE FROM RIM OF MANHOLE TO TOP OF STEP SHALL NOT EXCEED 30-IN.
3. DISTANCE FROM BOTTOM STEP TO FLOOR OF MANHOLE SHALL NOT BE GREATER THAN 24-IN.
4. DO NOT LOCATE STEPS OVER CHANNELS. (SEE PAGE NO. 3)



PLAN  
(N.T.S.)

ALTOONA WATER AUTHORITY  
STANDARD DETAIL

SERVICE LATERAL CONNECTION TO EXISTING SEWER MAIN		
SCALE: NONE	DATE: 2-25-2019	PAGE 9



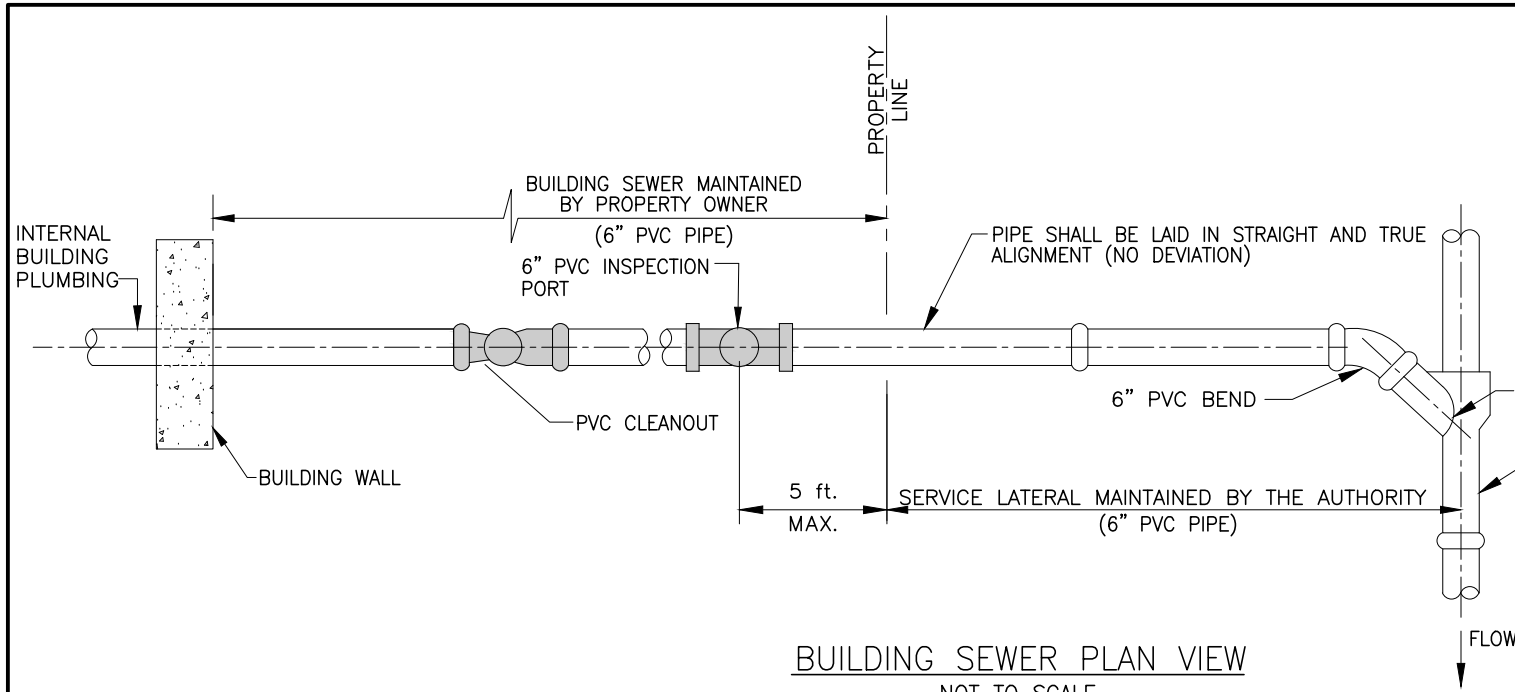
ALTOONA WATER AUTHORITY  
STANDARD DETAIL

SERVICE LATERAL CONNECTION  
ON NEW SEWER MAIN

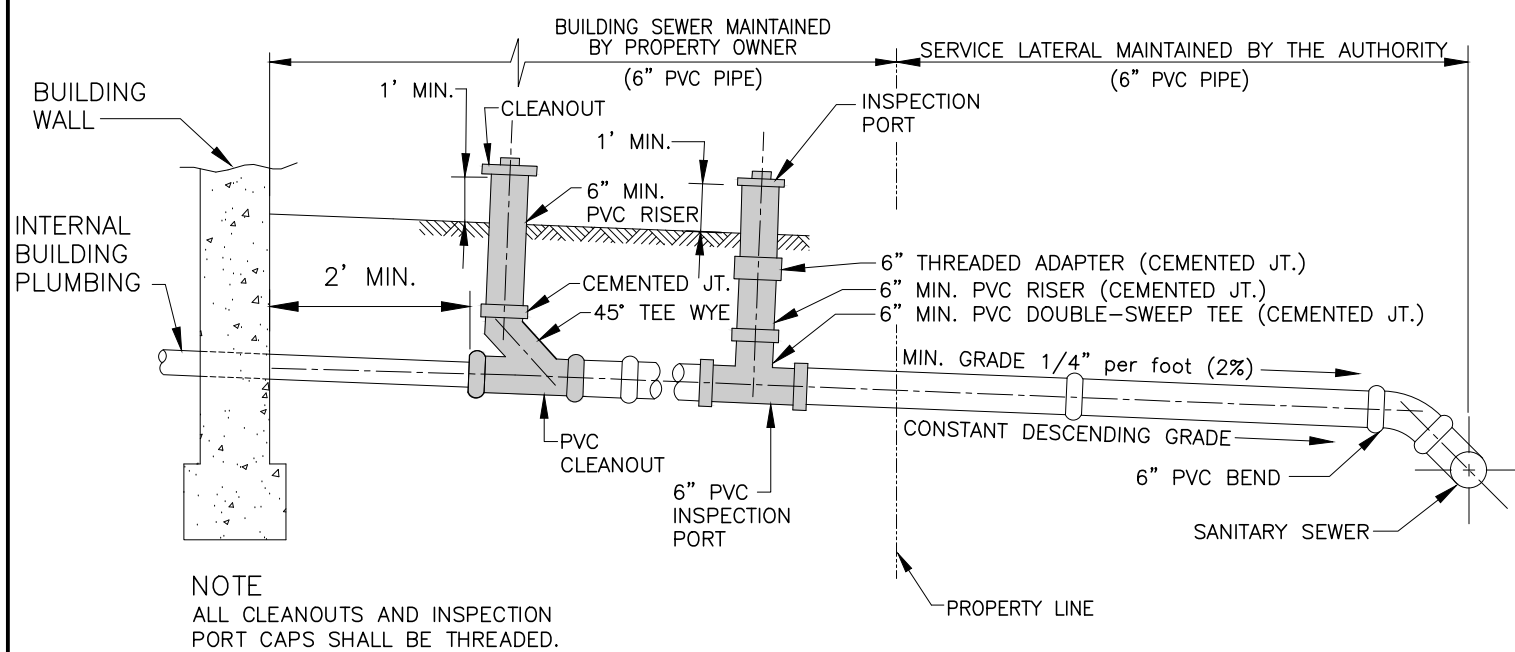
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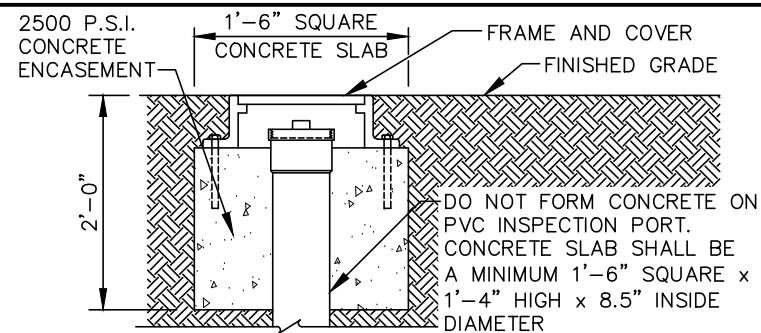
PAGE 10



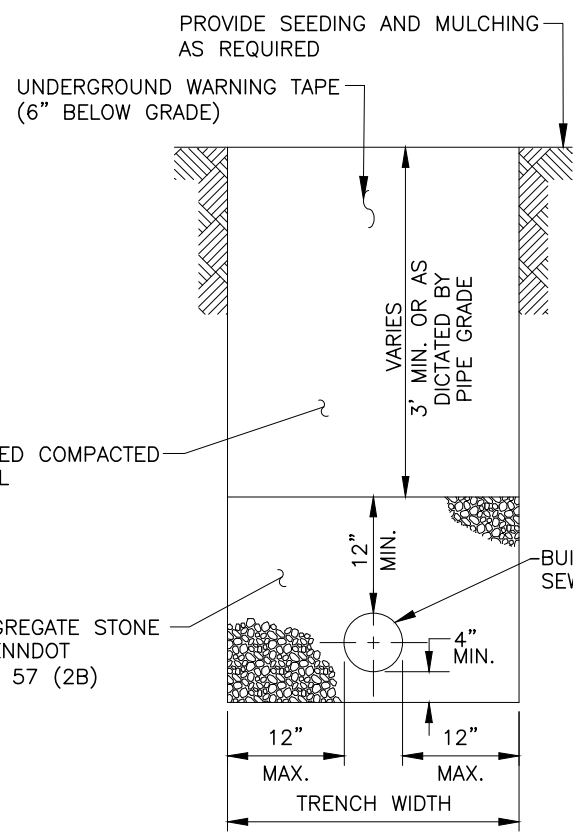
**BUILDING SEWER PLAN VIEW**  
NOT TO SCALE



**BUILDING SEWER ELEVATION VIEW**  
NOT TO SCALE



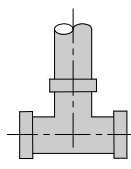
**NOTE: SEE NOTE 10  
FLUSH-MOUNTED  
INSPECTION PORT**  
NOT TO SCALE



**BUILDING SEWER BEDDING & BACKFILL DETAIL**  
NOT TO SCALE

**SPECIFICATIONS**

1. ALL DOMESTIC WASTEWATER MUST DISCHARGE TO THE BUILDING SEWER. NO ROOF DRAINS, BASEMENT DRAINS, SUMP DRAINS, FOUNDATION DRAINS OR OTHER EXTRANEIOUS WATER SHALL BE CONNECTED TO THE BUILDING SEWER AND ALL SUCH WATER IS STRICTLY PROHIBITED.
2. ACCEPTABLE BUILDING SEWER PIPE MATERIALS SHALL BE SDR35 PIPE (D3034), OR SCHEDULE 40 PVC PIPE; ALL WITH O-RING GASKETED JOINTS.
3. INSTALL 6" MIN. PVC BUILDING SEWER TO POINT OF CONNECTION AT A CONSTANT DESCENDING GRADE, MINIMUM SLOPE: 1/4" PER FOOT (2%).
4. ALL PIPE, REGARDLESS OF MATERIAL, SHALL BE BEDDED WITH 4" PENNDOT AASHTO NO. 57 (2B) COARSE AGGREGATE COMPACTED TO 12" MIN. OVER TOP OF PIPE (SEE DETAIL).
5. ALL BUILDING SEWERS SHALL BE PROVIDED WITH A CLEANOUT AND INSPECTION PORT WITH THREADED CAP. (SEE DETAIL).
6. PROPERTY OWNER TO NOTIFY THE AUTHORITY REPRESENTATIVE OF INTENT TO CONNECT TO SEWER SYSTEM 24 HOURS BEFORE CONNECTING, SO THAT THE AUTHORITY REPRESENTATIVE CAN BE PRESENT TO INSPECT AND APPROVE THE BUILDING SEWER CONNECTION AND INTERIOR PLUMBING SYSTEM.
7. AT THE TIME OF BUILDING SEWER CONNECTION, THE PROPERTY OWNER SHALL PERMIT THE AUTHORITY'S REPRESENTATIVE FULL AND COMPLETE ACCESS TO ALL INTERIOR SANITARY AND DRAINAGE PLUMBING IN EACH BUILDING ON THE PROPERTY. NO FINAL CONNECTION SHALL BE MADE TO THE SEWER SYSTEM UNTIL AFTER ALL BUILDING AND INTERIOR PLUMBING SYSTEMS HAVE BEEN INSPECTED AND APPROVED BY THE AUTHORITY REPRESENTATIVE.
8. ALL BUILDING SEWER PIPE SHALL BE VISUALLY INSPECTED FOR WATER TIGHTNESS. THE AUTHORITY'S REPRESENTATIVE RESERVES THE RIGHT FOR THE PROPERTY OWNER TO AIR OR WATER TEST THE BUILDING SEWER TO DOCUMENT WATERTIGHTNESS.
9. CLEANOUTS ARE REQUIRED AT a) EACH CHANGE OF ALIGNMENT, b) CHANGE IN GRADE OR c) AT 50' MIN. PIPE INTERVALS.
10. CLEANOUTS AND INSPECTION PORTS MAY BE INSTALLED FLUSH WITH GROUND IF PROVIDED WITH CAST IRON FRAME AND COVER (NEENAH NO. R-1975-A2 OR QUIRIN NO. MHR1140) AND CONCRETE PAD.
11. MINIMUM COVER FROM TOP OF PIPE TO FINISHED GRADE SHALL BE 4' MIN. OR AS DICTATED BY PIPE GRADE.
12. PROPERTY OWNER (OR SEWER INSTALLER/CONTRACTOR) MUST ADHERE TO ALL OSHA REGULATIONS AND PROVIDE TRENCH PROTECTION AS REQUIRED. THE AUTHORITY IS NOT RESPONSIBLE FOR SITE SAFETY.
13. FOR CONNECTION TO AN EXISTING AUTHORITY SEWER, PIPE SHALL BE NEATLY SAWCUT, AND SERVICE LATERAL WYE AND SPOOL PIECE INSTALLED, AND RECONNECTED USING GASKETED PVC COUPLINGS (HARCO). SIZE AND TYPE AS REQUIRED.
14. ALL MEANS, METHODS AND MATERIALS OF CONSTRUCTION FOR INSTALLATION OF BUILDING SEWERS SHALL CONFORM WITH THE RULES AND REGULATIONS OF THE AUTHORITY.
15. PROPERTY OWNER IS RESPONSIBLE TO ENSURE THAT ALL SANITARY PLUMBING LINES AND DRAINS ARE PROPERLY TRAPPED TO PREVENT SEWER GAS FROM ENTERING THE BUILDING PRIOR TO CONNECTION TO THE SEWER SYSTEM.



**LEGEND**

ALL VERTICAL PIPE SECTIONS INCLUDING FITTINGS MUST BE SOLVENT-WELD SDR35 OR SCH. 40 PVC.

ALTOONA WATER AUTHORITY  
STANDARD DETAIL

BUILDING SEWER AND SERVICE  
LATERAL DETAILS

SCALE: NONE	DATE: 2-25-2019	PAGE 11
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