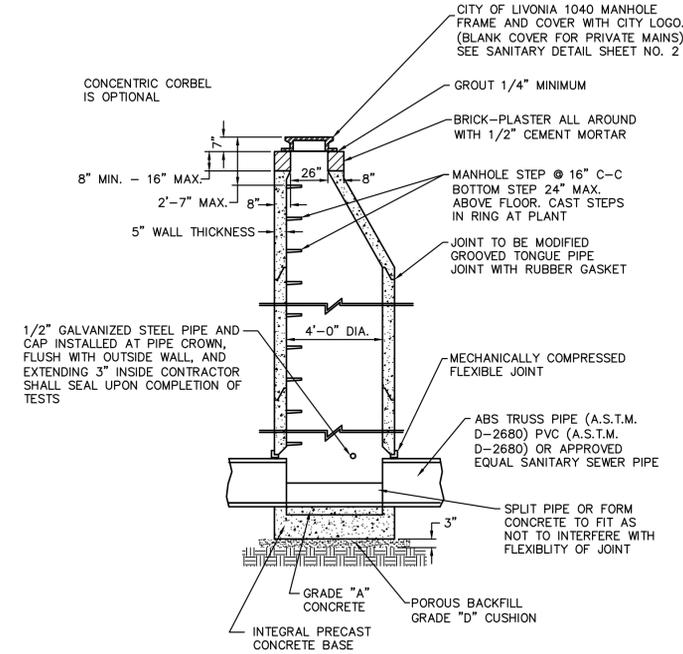


- No connections receiving storm water, surface water, or ground water shall be made to sanitary sewers.
- Infiltration for any sections of sewers between manholes shall not exceed 100 gals./inch dia./mile/24 hours including all manholes and appurtenances.
- No footing drains shall be connected to the building sewer.
- Differential of excavation around existing manholes shall not exceed 6'.
- All manholes and covers shall be in accordance with the current City of Livonia standards.
- Air testing methods in accordance with current C826-90 standards for VCP pipe and ASTM F-1417 standard for PVC/ABS truss pipe shall be required prior to approval by the City of Livonia.
- All sanitary sewer pipes shall be A.S.T.M. D2680 ABS or PVC composite (truss) pipe with cement solvent joints for ABS pipe or slip joints for the PVC Truss pipe.
- A 6" ABS, PVC Schedule 40 or SDR 23.5 house lead shall be installed from the sanitary sewer to a point 5' inside the property line at a minimum of 1.00% grade.
- Sanitary manholes shall be constructed in accordance with current City of Livonia standards.
- Leads:

- A 4" diameter service line will be allowed for a tap into an existing 10" sanitary sewer main.
- Materials:
  - ABS solid wall S.D.R. 23.5 conforming to ASTM D-2751 (SDR 23.5) Standard Specifications. Push on (ASTM D-3212) or solvent cemented (ASTM D-3034).
  - PVC solid wall S.D.R. 23.5 conforming to ASTM D-3034 (SDR 23.5) Standard Specifications. Push on (ASTM D-3212) or solvent cemented (ASTM D-3034).
  - ABS Schedule 40 pipe conforming to ASTM D-1527 Standard Specifications. Solvent Cemented joint (ASTM D-1527).
  - P.V.C. Schedule 40 pipe conforming to ASTM D-1785 Standard Specifications. Solvent cemented joint (ASTM D-1785).
- House connections shall not be tapped into manholes.
- Wyes shall be provided for each lot abutting sanitary sewers in easement.
- Risers shall be installed where necessary to have invert elevations of house connections at the property line 9' below the sidewalk, or property line grade.

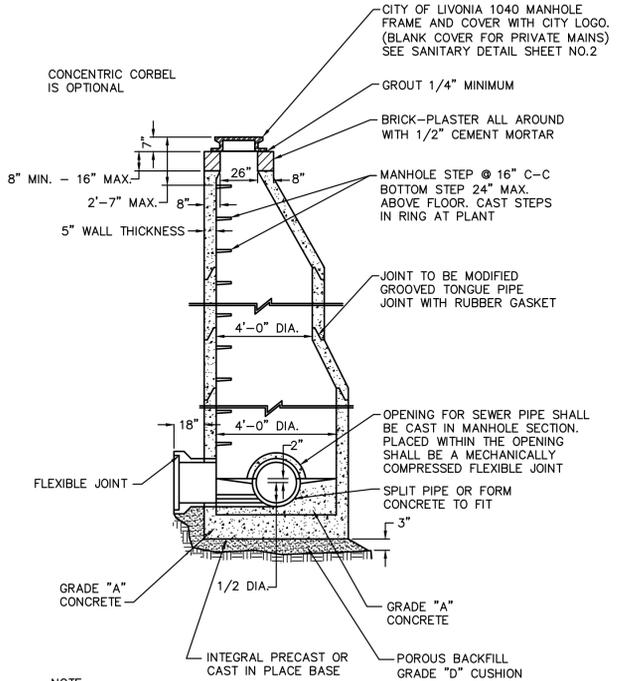
- Manholes are required at all dead ends, pipe intersections, and changes in pipe alignment, slope, and size.
- Cleanouts are required at all sanitary leads bends, changes in direction, and at 100' increments.
- Place a 6" service lead for each lot or parcel as shown on plan. For parcels in excess of 100' a wye must be placed every 100' unless otherwise noted.
- Prior to backfilling of a service lead. A 4" length of 1/4" diameter steel bar shall be placed from a point immediately in front of the service connection to 2' below the finish ground surface. Do not rest the marker on any portion of the service connection or stopper.
- All stubs shall have a water tight bulkhead.
- Pipe alignment must be set with a laser.
- All existing sanitary leads that are reused must be air tested or videotaped.
- Televising of pipes: video inspection shall be considered complete when all necessary construction repairs have been made and re-televised to verify that the repair is acceptable.
- All sanitary sewer mains 8" diameter and larger shall be tested not less than 30 days after the trench backfill and compaction has been completed including air testing and deflection.
- Testing shall be conducted on a manhole to manhole basis and shall be done after the line has been completely cleaned and flushed. Any portion of the sewer which fails to pass the test shall be excavated, repaired or realigned, and retested with TV, air, and deflection tests.
- If a sewer fails to pass any of the previously described tests, the contractor shall determine the location of the leak, repair and retest the sewer. The test shall be repeated until satisfactory results are obtained.
- Newly constructed, rehabilitated or adjusted sanitary manholes that are either public or private that touch or are in pavement areas such as sidewalks, roads, approaches, brick pavers, or stamped concrete shall have a manhole encapsulation installed to prevent water infiltration and providing support around the frame and block/concrete rings. The manhole encapsulation system shall be WrapidSeal or approved equal.

MANHOLE RISERS AND CONES SHALL MEET THE REQUIREMENTS OF A.S.T.M. SPEC. C-478 EXCEPT THAT A WALL THICKNESS OF 5" WILL BE REQUIRED. LENGTH OF EACH RISER SHALL BE A MULTIPLE OF 16". LENGTH OF CONE SHALL BE 2'-8" MIN. TWO LIFT HOLES WILL BE PERMITTED IN EACH UNIT. AND MUST BE FILLED WITH NON-SHRINK MORTAR AFTER SETTING MANHOLE.



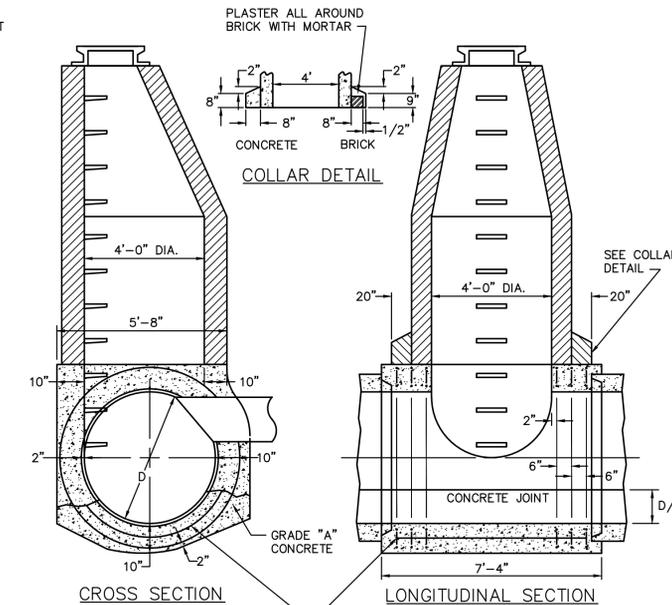
STANDARD MANHOLE FOR SEWERS 8" THROUGH 24"

MANHOLE RISERS AND CONES SHALL MEET THE REQUIREMENTS OF A.S.T.M. SPEC. C-478 EXCEPT THAT A WALL THICKNESS OF 5" WILL BE REQUIRED. LENGTH OF EACH RISER SHALL BE A MULTIPLE OF 16". LENGTH OF CONE SHALL BE 2'-8" MIN. TWO LIFT HOLES WILL BE PERMITTED IN EACH UNIT. AND MUST BE FILLED WITH NON-SHRINK MORTAR AFTER SETTING MANHOLE.



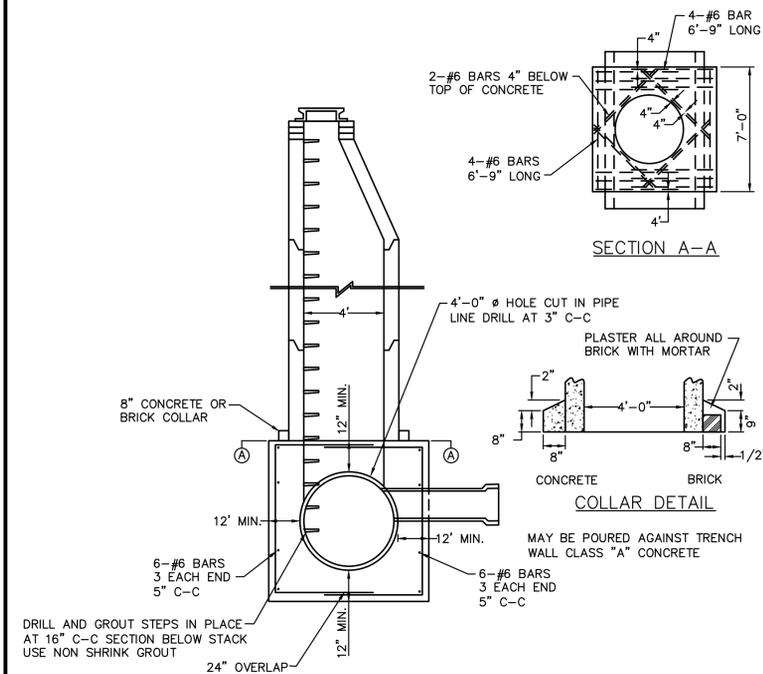
NOTE:  
EXCAVATION SHALL EXTEND AROUND ENTIRE PERIMETER OF MANHOLE, SO THAT THE DIFFERENTIAL OF EXCAVATION AND OPPOSITE SIDES DOES NOT EXCEED 6 FEET

STANDARD MANHOLE FOR SEWERS 27" THROUGH 42"

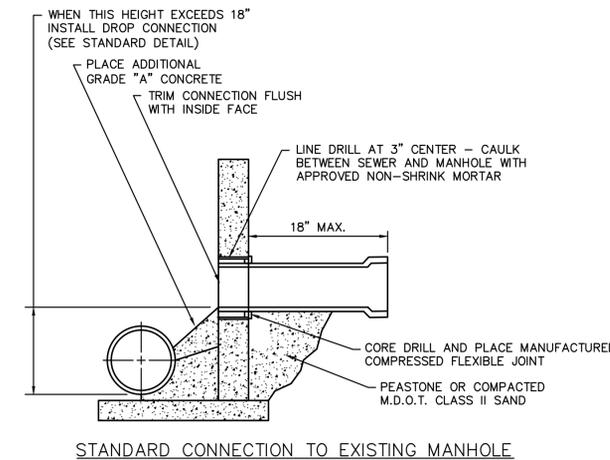


REINFORCEMENT		
DIA.	BAR DIA.	LAP AT SPLICES
48" - 60"	5/8"	20"
66" - 78"	3/4"	24"
84" - 96"	7/8"	28"
102" - 108"	1"	32"

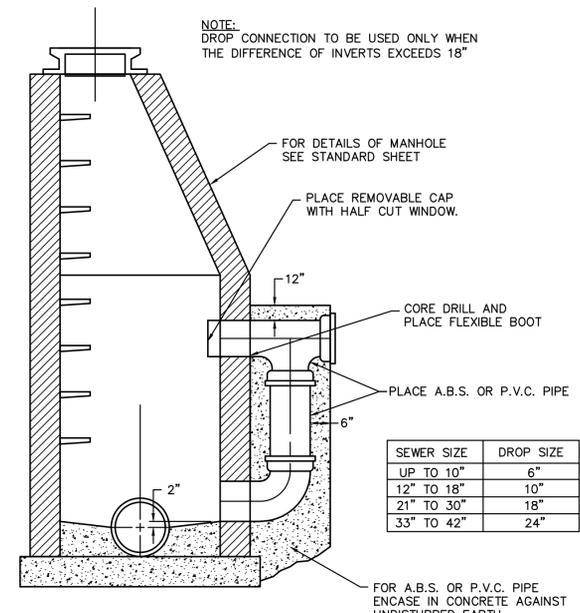
STANDARD MANHOLE FOR SEWERS 48" AND LARGER



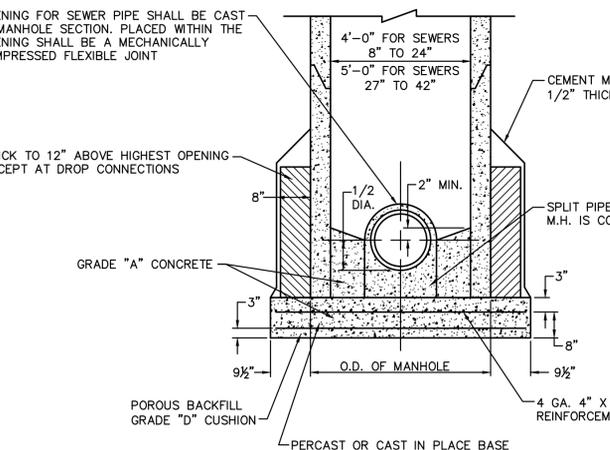
STANDARD MANHOLE FOR EXISTING SEWERS 48" AND LARGER



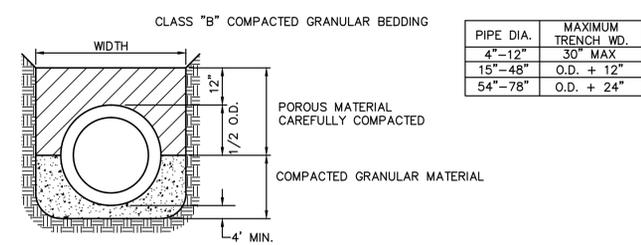
STANDARD CONNECTION TO EXISTING MANHOLE



STANDARD DROP CONNECTION AT MANHOLE



STANDARD MANHOLE FOR EXISTING SEWERS 8" THROUGH 42"



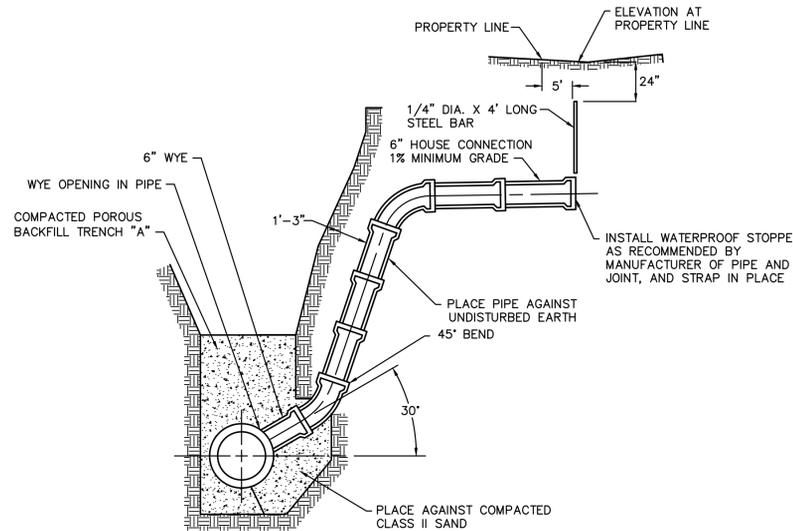
TRENCH BEDDING AND BACKFILL METHOD

Sanitary Sewer Standard Details			
JOB No.	REV. DATE	DATE	SHEET 1 OF 2
REVISIONS:		9/25/87	
Building Laterals & Misc. Updates	1/23/00		
WCD-3 Update	3/07/05		
1040 Frame & Cover Detail	4/08/09		
Misc. Notes Updated	2/19/13		
Standard Note #22	8/03/11		

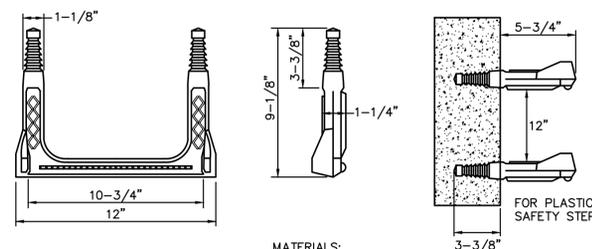
**CITY OF LIVONIA**  
 Department of Public Works - Engineering Division  
 33000 Civic Center Drive  
 Livonia, Michigan 48154  
 (734) 466-2570 Office, (734) 466-2195 Fax

RELEASED FOR :	DATE

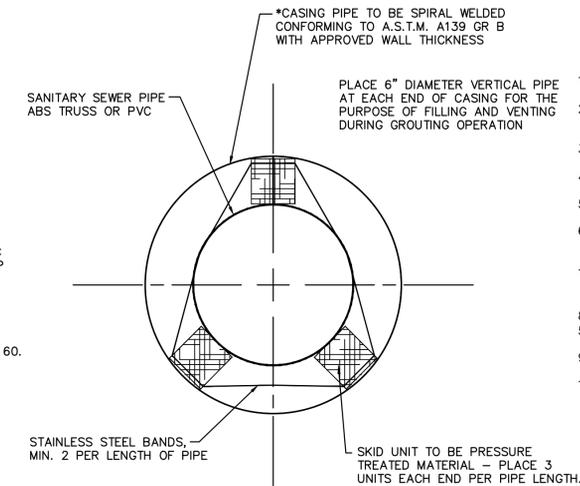
- No connections receiving storm water, surface water, or ground water shall be made to sanitary sewers.
- Infiltration for any sections of sewers between manholes shall not exceed 100 gals./inch dia./mile/24 hours including all manholes and appurtenances.
- No footing drains shall be connected to the building sewer.
- Differential of excavation around existing manholes shall not exceed 6'.
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- Air testing methods in accordance with current C826-90 standards for VCP pipe and ASTM F-1417 standard for PVC/ABS truss pipe shall be required prior to approval by the City of Livonia.
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- Sanitary manholes shall be constructed in accordance with current City of Livonia standards.
- Leads:
  - A 4" diameter service line will be allowed for a tap into an existing 10" sanitary sewer main.
  - Materials:
    - ABS solid wall S.D.R. 23.5 conforming to ASTM D-2751 (SDR 23.5) Standard Specifications. Push on (ASTM D-3212) or solvent cemented (ASTM D-3034).
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  - House connections shall not be tapped into manholes.
  - Wyes shall be provided for each lot abutting sanitary sewers in easement.
  - Risers shall be installed where necessary to have invert elevations of house connections at the property line 9' below the sidewalk, or property line grade.
- Manholes are required at all dead ends, pipe intersections, and changes in pipe alignment, slope, and size.
- Cleanouts are required at all sanitary leads bends, changes in direction, and at 100' increments.
- Place a 6" service lead for each lot or parcel as shown on plan. For parcels in excess of 100' a wye must be placed every 100' unless otherwise noted.
- Prior to backfilling of a service lead. A 4' length of 1/4" diameter steel bar shall be placed from a point immediately in front of the service connection to 2' below the finish ground surface. Do not rest the marker on any portion of the service connection or stopper.
- All stubs shall have a water tight bulkhead.
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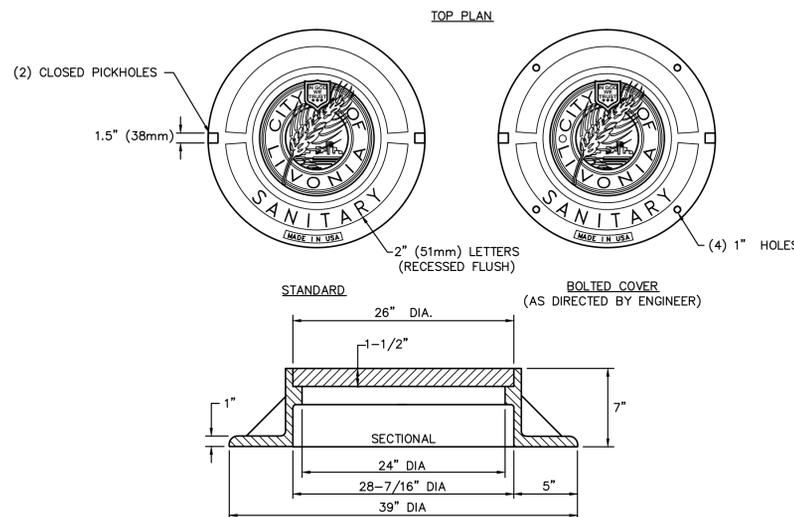
STANDARD BUILDING SEWER CONNECTION TO LATERAL OR TRUNK SEWERS



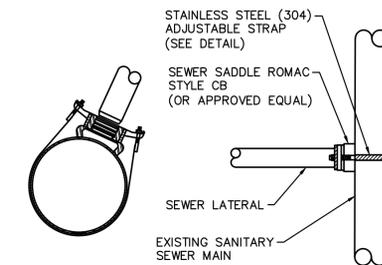
MANHOLE STEP DETAIL



SANITARY CASING PIPE DETAIL



1040 FRAME AND COVER DETAIL

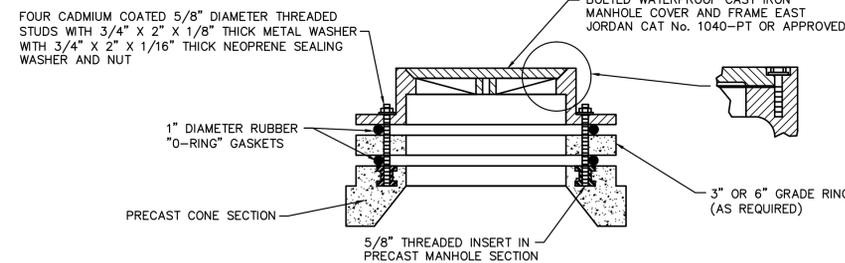


STAINLESS STEEL ADJUSTABLE STRAP

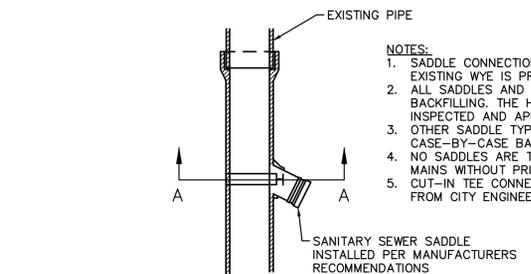
- NOTE:
- SANITARY MANHOLES WITHIN PRIMARY AND COLLECTOR ROADS, OR AS DIRECTED BY THE CITY ENGINEER, SHALL BE HINGED MANHOLE ASSEMBLY (24" ERGO, PRODUCT # 00104176L01)
  - MATERIAL SPECIFICATIONS COVER GRAY IRON, A.S.T.M. STD. SPEC. A-48, CL 35B BEARING SURFACE OF COVER AND FRAME SHALL BE GROUND TO PREVENT ROCKING. CASTING SHALL NOT BE COATED.
  - SANITARY MANHOLES ON PRIVATE MAINS SHALL HAVE COVERS THAT DO NOT INCLUDE ANY REFERENCE TO THE CITY OF LIVONIA.

- NOTE:
- PIPE TO BE TAPPED USING A CORE DRILL OR APPROVED EQUAL.
  - NO SIZE ON SIZE TAPS.
  - A 4" DIAMETER SERVICE LINE WILL BE ALLOWED FOR A TAP INTO AN EXISTING 10" SANITARY SEWER MAIN.

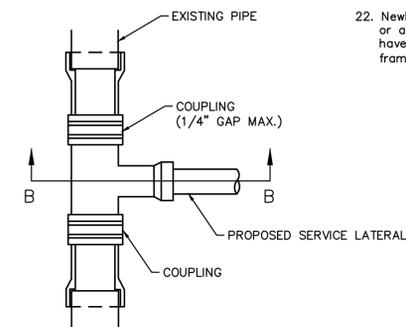
- NOTE:
- BOLTS, NUTS AND WASHERS SHALL BE, 1/2" UNC ROLLED THREAD AND TEFLON COATED.
  - 3-1/2" WIDE BAND FOR SPREADING OUT CLAMP FORCE ON PIPE.
  - STAINLESS STEEL WELDS SHALL BE FULLY PASSIVATED.
  - EXCESS STRAP TO BE LOCATED BETWEEN PIPE AND BAND.



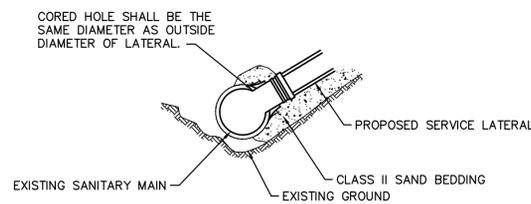
STANDARD PRESSURE M/H FRAME & COVER



SANITARY SEWER SADDLE



CUT-IN TEE



SANITARY SEWER TAP DETAILS

Sanitary Sewer Standard Details		
JOB No.	DATE: 9/25/87	2
REVISIONS:	SHEET 2 OF 2	
Building Laterals & Misc. Updates	1/23/00 CADD: dwl	
WCD-3 Update	3/07/05 ENG: dwl	
1040 Frame & Cover Detail	4/08/09 PM: tz	
Misc. Notes Updated	2/19/13 TECH: dwl	
Standard Note #22	8/03/11 Sanitary Sewer Detail Sheet	
 <b>CITY OF LIVONIA</b> Department of Public Works - Engineering Division 33000 Civic Center Drive Livonia, Michigan 48154 (734) 466-2570 Office, (734) 466-2195 Fax		
RELEASED FOR :	DATE	