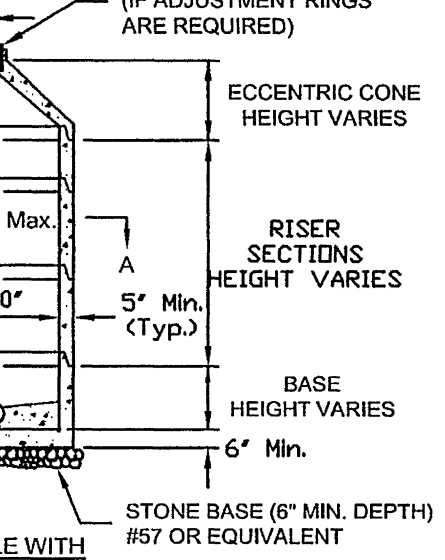


- 
- Diagram illustrating the cross-section (SECTION A-A) of a manhole assembly. The assembly includes a PRECAST HOLE (TYP.) at the top, a GROUT ANNULAR SPACE (TYP. INLET & OUTLET) surrounding the manhole, and a FLEXIBLE BOOT WITH STAINLESS STEEL BAND (TYP.) at the bottom. The diameter of the manhole is indicated as 4'-0".



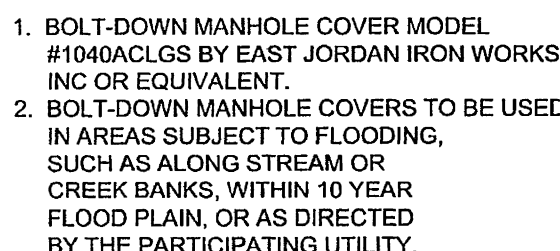
01/01/12

- 
- Technical drawing of a 12-inch diameter manhole assembly. The drawing shows a cross-section of the assembly with various components and dimensions labeled.
- Dimensions:**
- Overall diameter: 12" MIN.
  - Top section height: 7" MIN.
  - Bottom section height: 6" MIN. STONE BASE #57 OR EQUIVALENT
  - Internal diameter: 10" MIN.
  - Internal diameter at top: 10" MIN.
  - Internal diameter at bottom: 10" MIN.
  - Internal diameter at top: 10" MIN.
  - Internal diameter at bottom: 10" MIN.
- Components and Labels:**
- 3/4" Ø SS THREADED ROD (IF ADJUSTMENT RINGS ARE REQUIRED)
  - 2" Ø CONE ECCENTRIC RISER
  - BUTYL MASTIC JOINT SEALER OR GASKETS MEETING ASTM C143 AND ASTM C1244 TESTING STANDARD (NO MORTAR)
  - CUT OUT
  - THREADED END CAP WITH PLUG
  - 1" STAINLESS STEEL BAND @ 24" O.C. WITH 5/8" S.S. ANCHOR BOLTS
  - SCH 40 PVC
  - 1" 1/4" Mbx.
  - SCH 40
  - FLEXIBLE BOOT WITH STAINLESS STEEL BAND

100

- 
- The image contains three technical drawings:
- Top Drawing:** A plan view of a circular frame. It features a central hole with a diameter of 2.50 inches. The outer edge has a diameter of 27 1/2 inches. There are eight adjustment rings around the perimeter, each with a diameter of 28 1/4 inches. The distance between the centers of adjacent rings is 24 inches. The frame has a thickness of 1 1/2 inches. The drawing is labeled "2.50 IN. DIA. HOLE" and "27 1/2\" DIA.".
  - Middle Drawing:** A cross-section of the frame. It shows a trapezoidal shape with a top width of 24 inches and a bottom width of 36 inches. The height is 5/8 inch. The drawing is labeled "FRAME SECTION".
  - Bottom Drawing:** A detailed cross-section of the frame. It shows the frame section with a 3/4 inch stainless steel threaded rod and nut (4 TYP.) passing through it. The rod is secured with a nut. The drawing is labeled "3/4\" STAINLESS STEEL THREADED ROD AND NUTS (4 TYP.)" and "SECURE NUT". It also shows a 12 inch maximum distance between the rods and a 4 inch minimum distance between the rods.

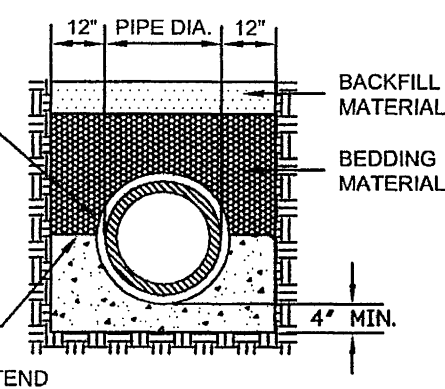
100



100

- 
- PRIVATE PROPERTY
- RIGHT OF WAY OR LIMITS OF EASEMENT
- SOLID GLUE CAP
- ROUGH GRADE
- FINISHED GRADE
- CLEAN-OUT BOX AND LID (SET TO FINISHED GRADE)
- CLEAN-OUT TO EXTEND ABOVE GROUND A MIN. OF 3 FEET DURING INSTALLATION OF MAIN LINE. PLUMBER SHALL CUT STACK TO FINISHED GRADE AS SHOWN WHEN BUILDING SEWER IS CONNECTED TO LATERAL
- 45° WYE
- TEE NOT ACCEPTABLE
- SDR 35
- 45° MAX.
- SEWER MAIN
- 1/4" PER 1'-0" MINIMUM GRADE
- HORIZONTAL SECTION SHALL EXTEND A MINIMUM OF 5' OR AS DIRECTED BY THE PARTICIPATING UTILITY
- SCHEDULE 40/SDR 35
- 4" MINIMUM GRAVEL BEDDING #57 OR EQUIVALENT
- 45° MAX.
- TEE, WYE, TEE/WYE OR COMBINATION OF WYE & 45° BEND FITTINGS SHALL BE SIZED AS REQUIRED
- 2'-0" MIN.
- 2'-0" MIN.
- 45° MAX.
- 11.25° OR 22.5° BEND
- SDR 35 (TYP.)
- SANITARY SEWER LATERAL FOR DEEP SEWER
- SAME AS ABOVE

100



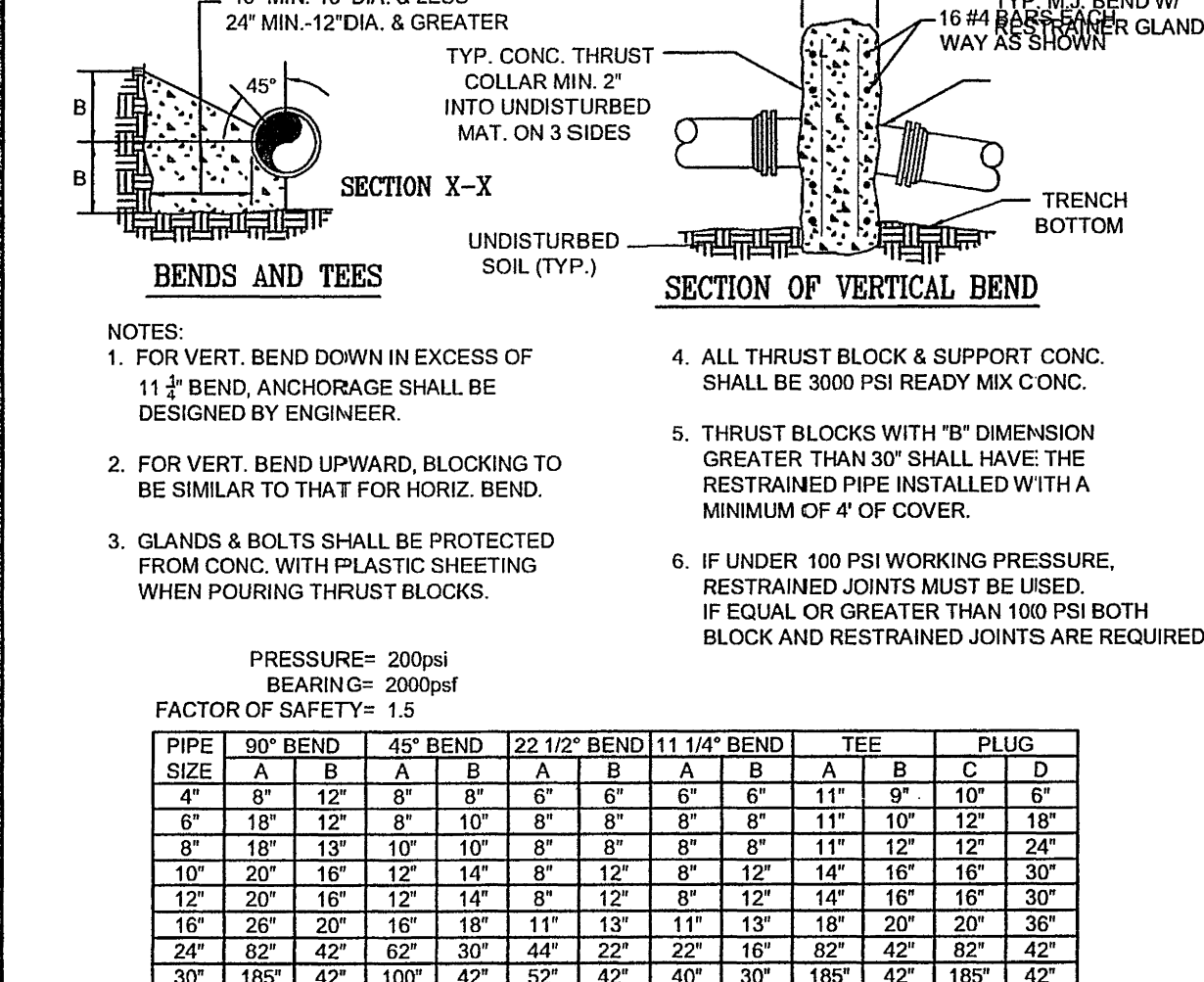
01/01/12

- 
- Diagram illustrating the procedure for disconnecting a pipe from an existing manhole structure:
- EXISTING MANHOLE TO REMAIN:** The top structure of the manhole.
  - EXISTING PIPE TO MANHOLE CONNECTION TO REMAIN:** The section of pipe connected to the manhole.
  - 2" MINIMUM THICKNESS:** The thickness of the concrete seal at the manhole connection.
  - 20" MINIMUM:** The length of the concrete seal at the manhole connection.
  - PIPE TO BE ABANDONED:** The section of pipe to be removed.
  - MECHANICAL PLUG:** A plug used to seal the end of the pipe to be abandoned.
  - DISCONNECT PIPE:** The section of pipe to be removed.
  - (REMOVE A MINIMUM OF TWO FEET OF EXISTING PIPE):** The section of pipe to be removed.
  - READY MIX CONCRETE 3000 PSI IN 28 DAYS:** The concrete used for the seal.
  - 20" MINIMUM:** The length of the concrete seal at the pipe end.
  - PIPE TO REMAIN:** The section of pipe that remains after the disconnect.

01/01/12

- 

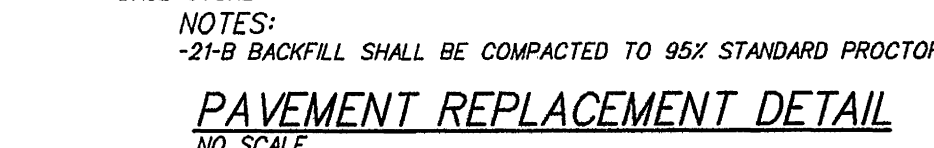
100




100

- 
- EXISTING PAYMENT SECTION
- LIMITS OF OPEN CUT
- SM-9.5A SURFACE  
BM-25.0 BASE
- 21B SUBBASE
- PIPE DIA.  
+ 12" EACH SIDE
- BACKFILL ONLY WITH APPROVED MATERIAL PER APPLICABLE LOCALITY OR VDOT STANDARDS
- PIPELINE SIZE & MATERIAL AS SHOWN ON PLAN
- SEE BEDDING NOTE BELOW
- NON-DETECTABLE WARNING TAPE, 3 TO 5 MILS IN THICKNESS, TO BE INSTALLED APPROX. 24" ABOVE AND AT A MINIMUM OF 6" BELOW GRADE (ALL PIPE)
- DEPTH VARIES
- (6" IN ROCK CONDITIONS) 4"
- WIDTH OF TRENCH EXCAVATION
- LOCATION OF TRACE WIRE WITH NON-METALLIC PRESSURE PIPE. TRACER WIRE NOT REQUIRED FOR TYPICAL GRAVITY SANITARY SEWER. SEE DETAIL G-4
- BEDDING:** FOR WATERLINES, INSTALL BEDDING STONE TO SPRING LINE OF PIPE AT A MINIMUM, OR PER

100



Designed: \_\_\_\_\_  
 Drawn: \_\_\_\_\_  
 Checked: \_\_\_\_\_  
 Date: \_\_\_\_\_ 01/26/10  
 Revised: \_\_\_\_\_ 03/12/13  
 Tax Parcel: \_\_\_\_\_ As Shown  
 N.B. No.: \_\_\_\_\_ Carilion #11  
 W.O. No.: \_\_\_\_\_ 09-0070

 **CWA**

---

**CALDWELL WHITE ASSOCIATES**

---

**ENGINEERS / SURVEYORS / PLANNERS**

---

**4203 MELROSE AVENUE, N.W.**  
**P.O. BOX 6260**  
**ROANOKE, VIRGINIA 24017**  
**(540) 366-3400**  
**FAX: (540) 366-8702**