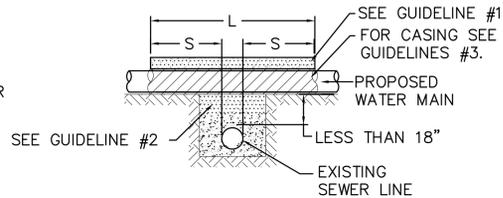


FILE NAME: S:\PT\Northwest\Main\Permanen\01\_PRR2 - FEED\02\_PRR21 - PAVE\Technical\CADD\_Standards\_Details\_and\_Sheet\_Borders\CADD\_Details\Chiller & Sewer\_Separation\_Details.dwg LAYOUT NAME: WTS\_SEWER\_SEP\_REQUIREMENTS\_PLOTTED: Wednesday, December 08, 2010 - 8:29am USER: danjell.juliano

**GUIDELINES**

1. OMIT SELECT GRANULAR EMBEDMENT AND GRANULAR BACKFILL TO ONE (1) FOOT OVER TOP OF WATER MAIN AND USE SELECT EXCAVATED MATERIAL AND COMPACT THE LENGTH OF "L".
2. IF SELECT GRANULAR BACKFILL EXISTS, REMOVE WITHIN WIDTH OF EXISTING SEWER LINE TRENCH AND REPLACE WITH SELECT EXCAVATED MATERIAL AND COMPACT.
3. USE "L" FEET OF WATER MAIN MATERIAL FOR CASING OF PROPOSED WATER MAIN AND SEAL ENDS OF CASING.
4. POINT LOADS SHALL NOT BE ALLOWED BETWEEN WATER MAIN CASING AND SEWER.

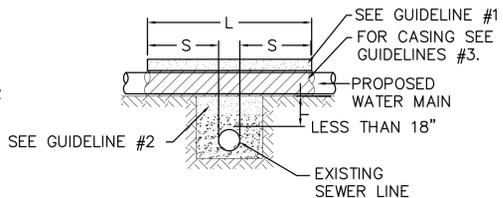
**NOTE:** COMPACTION REQUIREMENTS REFER TO 10--2.20B



① PROPOSED WATER MAIN ABOVE EXISTING SEWER LINE WITH LESS THAN 18" VERTICAL SEPARATION NOT TO SCALE

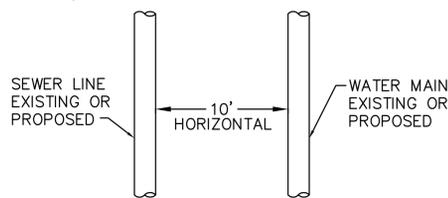
**GUIDELINES**

1. OMIT SELECT GRANULAR EMBEDMENT AND GRANULAR BACKFILL TO ONE (1) FOOT OVER TOP OF WATER MAIN AND USE SELECT EXCAVATED MATERIAL AND COMPACT THE LENGTH OF "L".
2. IF SELECT GRANULAR BACKFILL EXISTS, REMOVE WITHIN WIDTH OF EXISTING SEWER LINE TRENCH AND REPLACE WITH SELECT EXCAVATED MATERIAL AND COMPACT.
3. USE "L" FEET OF WATER MAIN MATERIAL FOR CASING OF PROPOSED WATER MAIN AND SEAL ENDS OF CASING.
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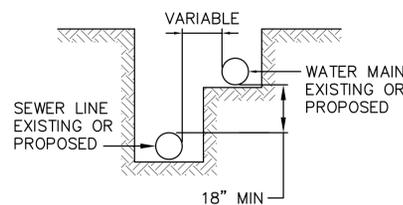
③ PROPOSED WATER MAIN ABOVE EXISTING SEWER LINE WITH LESS THAN 18" VERTICAL SEPARATION NOT TO SCALE

WHEN PROPOSED SEWER (OR WATER) IS LOCATED 10 FEET OR MORE FROM EXISTING WATER (OR SEWER), NO SPECIAL CONSTRUCTION REQUIRED.



⑤ WATER/SEWER LOCATED 10ft OR MORE NOT TO SCALE

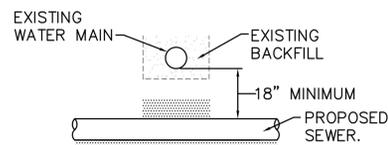
WHEN PROPOSED SEWER (OR WATER) IS LOCATED LESS THAN 10 FEET FROM EXISTING WATER (OR SEWER), DETAILS SHOWN BELOW SHALL APPLY.



⑦ WATER/SEWER LOCATED WITHIN 10ft NOT TO SCALE

**GUIDELINES**

1. PROVIDE ADEQUATE SUPPORT FOR EXISTING WATER MAIN TO PREVENT DAMAGE DUE TO SETTLING OF SEWER TRENCH.

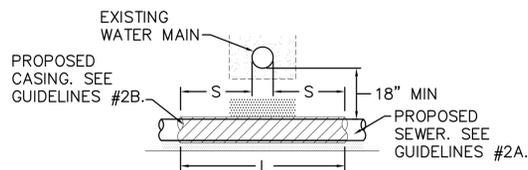


② PROPOSED SEWER LINE BELOW EXISTING WATER MAIN WITH 18" MINIMUM VERTICAL SEPARATION NOT TO SCALE

**GUIDELINES:**

1. OMIT SELECT GRANULAR EMBEDMENT AND GRANULAR BACKFILL TO ONE (1) FOOT OVER TOP OF SEWER AND USE SELECT EXCAVATED MATERIAL AND COMPACT FOR "S" FEET ON EACH SIDE OF WATER MAIN.
2. CONSTRUCT OR USE:
  - A. CONSTRUCT "L" FEET OF PROPOSED SEWER OR WATER MAIN MATERIAL AND PRESSURE TEST; OR,
  - B. USE "L" FEET OF WATER MAIN MATERIAL FOR CASING OF PROPOSED SEWER AND SEAL ENDS OF CASING.
3. PROVIDE ADEQUATE SUPPORT FOR EXISTING WATER MAIN TO PREVENT DAMAGE DUE TO SETTLEMENT OF SEWER TRENCH.

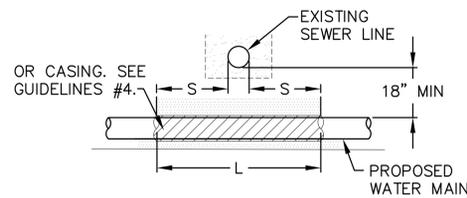
**NOTE:** "s" THE LENGTH NECESSARY TO PROVIDE 10 FEET OF SEPARATION AS MEASURED PERPENDICULAR TO EXISTING WATER MAIN..



④ PROPOSED SEWER LINE BELOW EXISTING WATER MAIN WITH LESS THAN 18" VERTICAL SEPARATION NOT TO SCALE

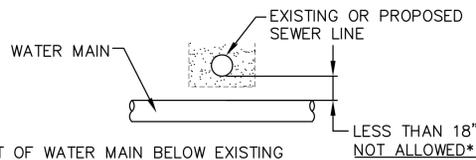
**GUIDELINES**

1. OMIT SELECT GRANULAR EMBEDMENT AND GRANULAR BACKFILL TO ONE (1) FOOT OVER TOP OF WATER MAIN AND USE SELECT EXCAVATED MATERIAL AND COMPACT THE LENGTH OF "L".
2. IF SELECT GRANULAR BACKFILL EXISTS, REMOVE WITHIN WIDTH OF EXISTING SEWER LINE TRENCH AND REPLACE WITH SELECT EXCAVATED MATERIAL AND COMPACT.
3. PROVIDE ADEQUATE SUPPORT FOR EXISTING SEWER LINE TO PREVENT DAMAGE DUE TO SETTLEMENT.
4. USE "L" FEET OF WATER MAIN MATERIAL FOR CASING OF PROPOSED WATER MAIN AND SEAL ENDS OF CASING.



**NOTE:** "s" THE LENGTH NECESSARY TO PROVIDE 10 FEET OF SEPARATION AND MEASURED PERPENDICULAR TO EXISTING SEWER LINE.

⑥ PROPOSED SEWER MAIN ABOVE EXISTING WATER LINE WITH LESS THAN 18" VERTICAL SEPARATION NOT TO SCALE



\*PLACEMENT OF WATER MAIN BELOW EXISTING OR PROPOSED SEWER LINE WITH LESS THAN 18" MINIMUM VERTICAL SEPARATION NOT ALLOWED.

⑧ WATER MAIN BELOW EXISTING OR PROPOSED SEWER LINE WITH LESS THAN 18" MINIMUM VERTICAL SEPARATION NOT TO SCALE

1. THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A DRINKING WATER SUPPLY LINE AND A SEWER OR SEWER APPURTENANCE.
2. WATER LINES SHALL BE LAID AT LEAST TEN (10) FEET HORIZONTALLY FROM A SEWER OR SEWER MANHOLE WHENEVER POSSIBLE; THE DISTANCE MEASURED FROM EDGE TO EDGE. WHEN LOCAL CONDITIONS PREVENT A HORIZONTAL SEPARATION OF TEN (10) FEET, THE WATER LINE MAY BE LAID CLOSER TO A SEWER OR SEWER MANHOLE PROVIDED THAT:
  - A. THE BOTTOM (INVERT) OF THE WATER MAIN SHALL BE EIGHTEEN (18) INCHES ABOVE THE TOP OF THE SEWER AND THE EDGE TO EDGE DISTANCE SHALL BE NO LESS THAN FIVE (5) FEET.
  - B. WHERE THIS VERTICAL/HORIZONTAL SEPARATION CANNOT BE OBTAINED, THE SEWER SHALL BE CONSTRUCTED OF AWWA APPROVED DUCTILE IRON WATER PIPE, PRESSURE TESTED WITHOUT LEAKAGE PRIOR TO BACKFILLING.
3. WATER LINES CROSSING SEWERS SHALL BE LAID TO PROVIDE A SEPARATION OF AT LEAST EIGHTEEN (18) INCHES BETWEEN THE BOTTOM OF THE WATER LINE AND THE TOP OF THE SEWER, WHENEVER POSSIBLE. WHEN LOCAL CONDITIONS PREVENT THIS VERTICAL SEPARATION, THE FOLLOWING CONSTRUCTION SHALL BE USED:
  - A. SEWERS PASSING OVER OR UNDER WATER LINES SHALL BE CONSTRUCTED OF AWWA APPROVED DUCTILE IRON WATER PIPE.
  - B. WATER LINES PASSING UNDER SEWERS SHALL, IN ADDITION, BE PROTECTED BY THE FOLLOWING:
    - 1) A VERTICAL SEPARATION OF AT LEAST EIGHTEEN (18) INCHES BETWEEN THE BOTTOM OF THE SEWER AND THE TOP OF THE WATER LINE.
    - 2) ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS TO PREVENT EXCESSIVE DEFLECTION OF THE JOINTS AND THE SETTING ON AND BREAKING OF THE WATER LINE.
    - 3) ONE FULL LENGTH OF WATERLINE BE CENTERED AT THE POINT OF THE CROSSING SO THAT THE JOINTS SHALL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
4. THE FOLLOWING MINIMUM SEPARATIONS FROM WATER MAINS SHALL BE OBSERVED AT ALL TIMES UNLESS OTHERWISE DIRECTED BY CONTRACTING OFFICER.
 

**HORIZONTAL SEPARATION**

  - A. SANITARY SEWERS - REFER TO REQUIREMENTS IN THIS SECTION NOTED ABOVE.
  - B. STORM DRAINS - THREE (3) FEET FACE TO FACE FOR MAINS; TWELVE (12) INCHES AT CONTACT POINTS FOR CBs AND DMHs.
  - C. GAS MAINS - SIX (6) FEET FACE TO FACE.
  - D. UNDERGROUND ELECTRIC AND TELEPHONE - SIX (6) FEET FACE TO FACE.
  - E. UTILITY POLES - SIX (6) FEET FACE TO FACE

**VERTICAL SEPARATION**

  - A. SANITARY SEWERS - TWELVE (12) INCHES OVER AND UNDER
  - B. STORM DRAINS - SIX (6) INCHES OVER AND UNDER
  - C. ALL OTHER CROSSINGS - TWELVE (12) INCHES MINIMUM
5. THE FOLLOWING MINIMUM SEPARATIONS FROM WATER SERVICES SHALL BE OBSERVED AT ALL TIMES UNLESS OTHERWISE DIRECTED BY CONTRACTING OFFICER.
 

**HORIZONTAL SEPARATION**

  - A. STORM DRAINS - THREE (3) INCHES FACE TO FACE FOR MAINS; TWO (2) INCHES AT CONTACT POINTS FOR CBs AND DMHs.
  - B. GAS MAINS - SIX (6) INCHES FACE TO FACE
  - C. UNDERGROUND ELECTRIC AND TELEPHONE - SIX (6) INCHES FACE TO FACE
  - D. PROPERTY LINES - TEN (10) FEET
  - E. SANITARY SEWER - FIVE (5) FEET; IF SANITARY SEWER SERVICE IS LAID EIGHTEEN (18) INCHES BELOW WATER SERVICE, THEN EIGHTEEN (18) INCHES HORIZONTAL SEPARATION IS ALLOWED.
  - F. CURB STOPS FOR MULTIPLE SERVICES - EIGHTEEN (18) INCHES.
  - G. UTILITY POLES - SIX (6) FEET.
6. THE FOLLOWING MINIMUM SEPARATIONS FROM HYDRANTS SHALL BE OBSERVED AT ALL TIMES UNLESS OTHERWISE DIRECTED BY CONTRACTING OFFICER.
 

**HORIZONTAL SEPARATION**

  - A. GAS MAINS - THREE (3) FEET FACE TO FACE FOR HYDRANT BRANCHES
  - B. UNDERGROUND ELECTRIC AND TELEPHONE - THREE (3) FEET BEHIND HYDRANT (NOT ALLOWED OVER HYDRANT BRANCH)
7. INSTALLED UTILITIES SHALL BE LOCATED A MINIMUM OF TEN (10) FEET HORIZONTALLY FROM STRUCTURES.

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| ACTIVITY   |          |
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| DES CAE   DRW   CHK   JFH  |          |
| PIU/DW   |          |
| BRANCH MANAGER   |          |
| PHONE  |          |
| DEPARTMENT OF THE NAVY<br>NAVAL FACILITIES ENGINEERING COMMAND<br>NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC<br>PORTSMOUTH NAVAL SHIPYARD - KITTERY, ME |          |
| <b>WATER AND SEWER SEPARATION REQUIREMENTS</b>   |          |
| DETAILS AND NOTES  |          |
| SCALE  | AS NOTED |
| E/PROJECT NO.  |          |
| CONSTR. CONTR. NO.   |          |
| NAVFAC DRAWING NO.   |          |
| SHEET  | 1 OF 1   |
| DRAWING REVISION: 10 MARCH 2009  |          |