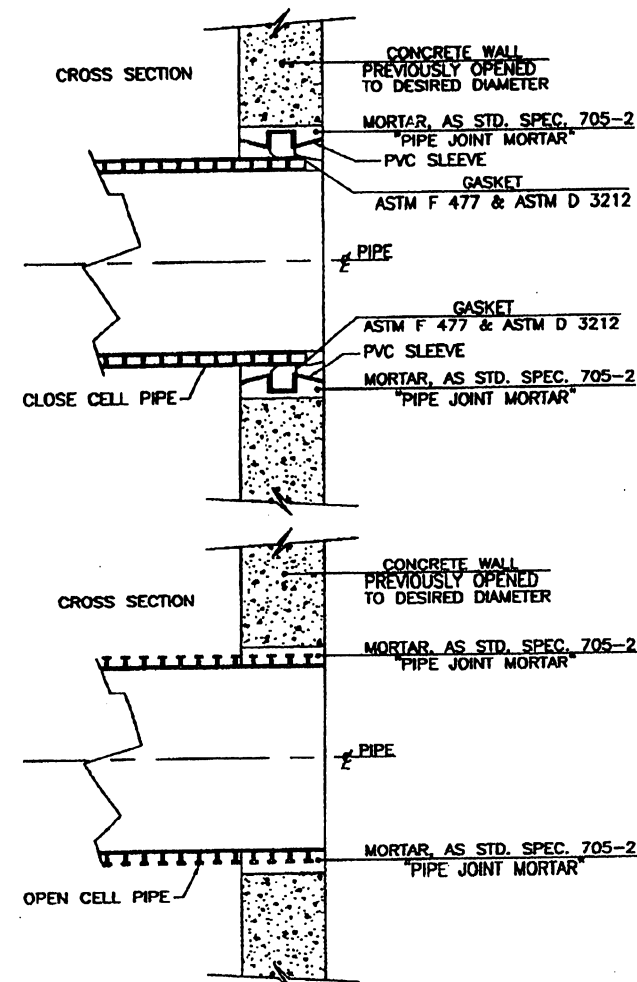
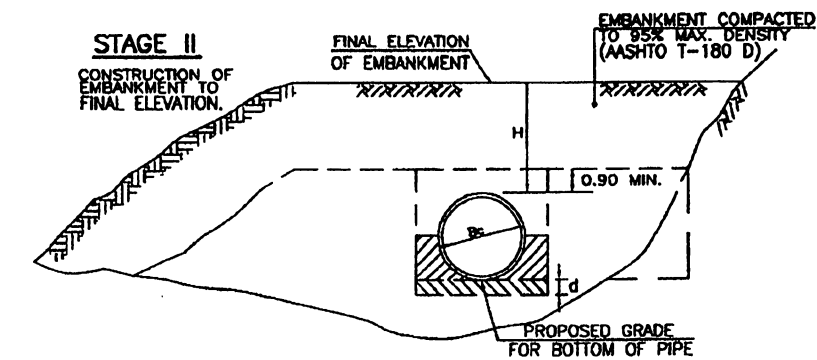
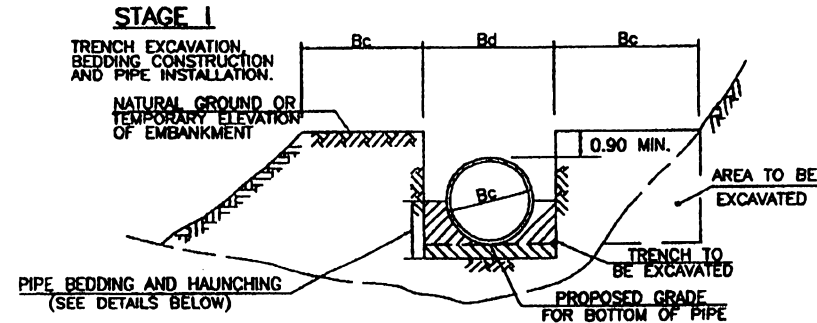


NEGATIVE PROJECTION METHOD



CONNECTION TO HEAD WALL, CATCH BASIN AND INLET DETAILS

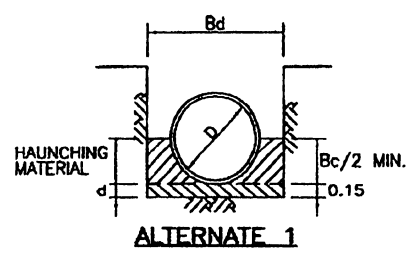
LEGEND:

- Bd - MAXIMUM TRENCH WIDTH
- Bc - OUTSIDE PIPE DIAMETER
- H - HEIGHT OF FILL ABOVE TOP OF PIPE
- d - INSIDE PIPE DIAMETER
- D - DEPTH OF BEDDING MATERIAL BELOW PIPE
- I.D. - INSIDE MANHOLE SLEEVE DIAMETER
- O.D. - OUTSIDE MANHOLE SLEEVE DIAMETER

NOTES:

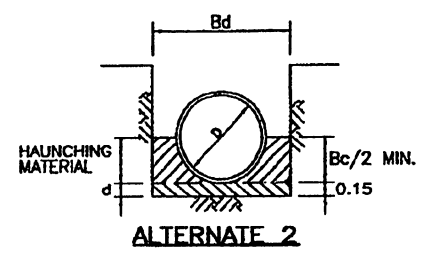
- 1- PVC PIPE SHALL CONFORM TO AASHTO M-304, STANDARD SPECIFICATION FOR PVC PIPE.
- 2- PIPE JOINTS SHALL BE WATERTIGHT AS PER AASHTO M-304 OR M-304M.
- 3- CONTRACTOR MAY CHOOSE OPEN OR CLOSE CELL PIPES.
- 4- PVC PIPES WILL NEVER BE INSTALLED IN THE POSITIVE PROJECTION OR INDUCED TRENCH METHOD.
- 5- MAXIMUM ALLOWABLE DEFLECTION OF PVC PIPE SHALL BE 5.0%. FOR PVC PIPES, WHICH SHOW QUESTIONABLE DEFLECTION, THE ENGINEER SHALL REQUIRE FROM THE CONTRACTOR A MANDREL TEST. THIS TEST WILL BE A SUBSIDIARY OBLIGATION.
- 6- MINIMUM COVER FOR H30 WHEEL LOADS SHALL BE 0.30 M, INCLUDING PAVEMENT SECTION. MINIMUM COVER OF FILL OVER THE CROWN OF THE PIPE OF 0.90 M SHALL BE PROVIDED BEFORE ANY HEAVY CONSTRUCTION EQUIPMENT IS PERMITTED ACROSS THE INSTALLATION.
- 7- TRENCH WIDTH INDICATED ASSUMES THE PIPE WILL BE INSTALLED IN COMPETENT NATIVE OR EMBANKMENT MATERIAL. IF POOR SOIL CONDITIONS ARE ENCOUNTERED, THE MAXIMUM WIDTHS INDICATED SHALL BE INCREASED AS DIRECTED BY THE ENGINEER.
- 8- HAUNCHING MATERIAL SHALL BE COMPACTED IN LAYERS NOT EXCEEDING 0.15 M IN COMPACTED THICKNESS.
- 9- ON PIPES WITH DIAMETER LESS THAN 30 INCHES, SLEEVE MAY BE OMITTED.
- 10- OTHER PROFILE PIPE CONFIGURATIONS WOULD BE PERMISSIBLE SUBJECT TO THE APPROVAL OF THE AUTHORITY.
- 11- BEDDING AND HAUNCHING MATERIALS, INCLUDING CONCRETE, SHALL BE CONSIDERED AS A SUBSIDIARY OBLIGATION OF THE PVC PIPE.
- 12- CLASS A BEDDING SHALL BE USED WHEN $H \leq 0.30$ M.

| PIPE (INSIDE) DIAMETER (D) | | MAXIMUM TRENCH WIDTH REQUIRED (Bd) | | MINIMUM CLEAR DISTANCE BETWEEN PIPES | | MAXIMUM COVER (H) | | MINIMUM PIPE STIFFNESS | |
|----------------------------|------|------------------------------------|------|--------------------------------------|-----|-------------------|----|------------------------|-----|
| IN. | MM | IN. | MM | IN. | MM | FT. | M | PSI | MPa |
| 18 | 460 | 36 | 915 | 12 | 300 | 50 | 15 | 32 | 220 |
| 21 | 535 | 42 | 1065 | 12 | 300 | 50 | 15 | 28 | 195 |
| 24 | 610 | 48 | 1220 | 14 | 350 | 50 | 15 | 24 | 165 |
| 27 | 690 | 51 | 1295 | 16 | 400 | 50 | 15 | 22 | 150 |
| 30 | 765 | 54 | 1375 | 18 | 450 | 50 | 15 | 19 | 130 |
| 36 | 915 | 60 | 1525 | 22 | 550 | 50 | 15 | 16 | 110 |
| 42 | 1070 | 66 | 1680 | 24 | 600 | 50 | 15 | 14 | 95 |
| 48 | 1220 | 72 | 1830 | 27 | 680 | 50 | 15 | 12 | 80 |



BEDDING AND HAUNCHING MATERIAL SHALL BE A-1, A-3, A-2-4 WHEN CLASSIFIED PER AASHTO M-145, AND COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DENSITY OBTAINED UNDER AASHTO T-180, METHOD D.

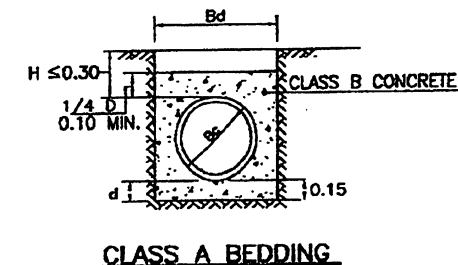
BACKFILL MATERIALS SHALL BE SOILS SUITABLE FOR EMBANKMENT CONSTRUCTION UNDER SPECIFICATION 203 AND COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DENSITY OBTAINED UNDER AASHTO T-180, METHOD D.



BEDDING AND HAUNCHING MATERIAL SHALL BE A WELL GRADED CRUSHED STONE WITH 100 PERCENT PASSING THE 1/4 INCH SIEVE AND NOT MORE THAN 10 PERCENT PASSING THE # 200 SIEVE.

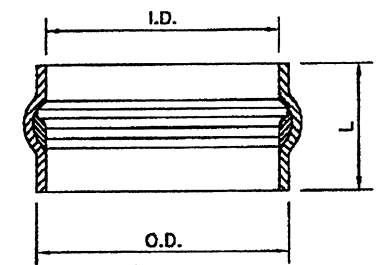
BACKFILL MATERIALS SHALL BE SOILS SUITABLE FOR EMBANKMENT CONSTRUCTION UNDER SPECIFICATION 203 AND COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DENSITY OBTAINED UNDER AASHTO T-180, METHOD D.

BEDDING CLASS C AND HAUNCHING DETAIL



NOTE:

CONTRACTOR MAY SUBSTITUTE THE NEXT LARGER DIAMETER PIPE IF THE PIPE SIZE CALLED FOR IN THE CONTRACT IS NOT MANUFACTURED. SUCH SUBSTITUTION AND FURNISHING REDUCTION AND EXPANSION COUPLERS SHALL BE A SUBSIDIARY OBLIGATION.



| PVC SLEEVE | | | |
|------------|---------|---------|---------|
| SIZE | L | O.D. | I.D. |
| 30" | 15.750" | 37.000" | 32.000" |
| 36" | 15.750" | 43.500" | 38.500" |
| 42" | 15.875" | 49.500" | 44.500" |
| 48" | 15.875" | 56.750" | 50.750" |

EFFECTIVE DATE: MAY 1998

COMMONWEALTH OF PUERTO RICO
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC WORKS
 HIGHWAY AND TRANSPORTATION AUTHORITY

PVC PIPE INSTALLATION METHOD
 NEGATIVE PROJECTION AND TRENCH METHOD

RECOMMENDED BY: [Signature]
 DESIGN AREA DIRECTOR
 DATE: [Date]

APPROVED BY: [Signature]
 EXECUTIVE DIRECTOR
 DATE: [Date]

APPROVED BY: [Signature]
 DIV. ADM. ENGR. DIVISION
 DATE: [Date]

| DATE | REVISION | BY |
|---------|------------------|-----|
| 5-12-88 | GENERAL REVISION | LV. |

STD. DWG. 1 OF 1