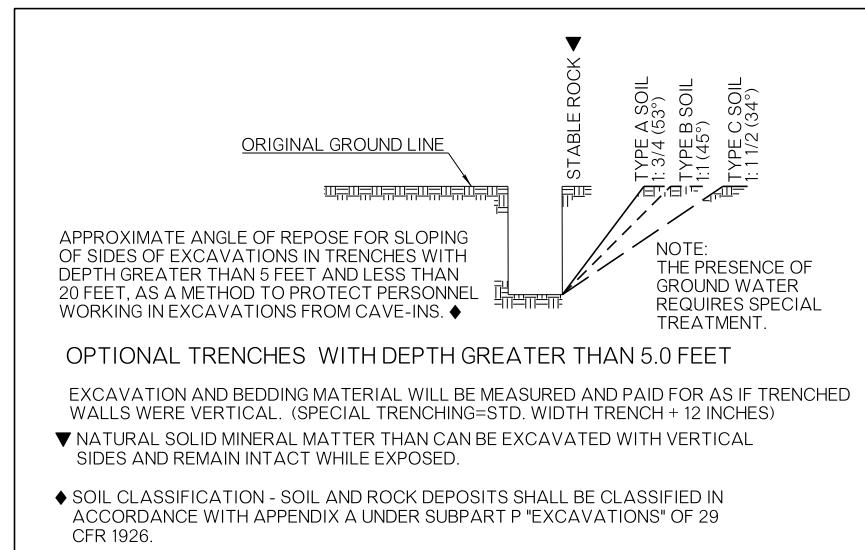


| LEGEND | |
|---|---|
| D | = DIAMETER |
|  | STANDARD BEDDING MATERIAL COMPAKTED IN 6" LAYERS 95% MAXIMUM DENSITY |
|  | SUITABLE FOUNDATION, FREE OF DEBRIS OR LOOSE SOIL |
|  | MIDDLE BEDDING, LOOSELY PLACED, UNCOMPACTED |
|  | OUTER BEDDING COMPACTED TO 95% MAXIMUM DENSITY |



| STANDARD BEDDING MATERIAL QUANTITIES | | | | | | | | | |
|--------------------------------------|--------------------|-------------|-----------------------------|-------------|-----------------------------|-------------|-----------------------------|-----------------------------|------------------------------------|
| PIPE DIAM. (D) | H STD. BED. MAT. □ | SINGLE PIPE | | DOUBLE PIPE | | TRIPLE PIPE | | CLEAR SPACE BETWEEN PIPES ▲ | SPACE BETWEEN PIPE AND TRENCH WALL |
| | | W WIDTH | STANDARD BEDDING MATERIAL ■ | W WIDTH | STANDARD BEDDING MATERIAL ■ | W WIDTH | STANDARD BEDDING MATERIAL ■ | | |
| IN. | FT. | FT. | CY/LF | FT. | CY/LF | FT. | CY/LF | FEET | FEET |
| 12 | 2.33 | 2.50 | 0.19 | 5.00 | 0.37 | 7.00 | 0.52 | 1.00 | 1.00 |
| 15 | 2.58 | 2.88 | 0.23 | 5.50 | 0.44 | 7.75 | 0.61 | 1.00 | 1.00 |
| 18 | 2.83 | 3.25 | 0.28 | 6.00 | 0.50 | 8.50 | 0.70 | 1.00 | 1.00 |
| 24 | 3.33 | 4.00 | 0.38 | 7.00 | 0.63 | 10.00 | 0.89 | 1.00 | 1.00 |
| 30 | 3.83 | 4.75 | 0.49 | 8.25 | 0.81 | 12.00 | 1.16 | 1.25 | 1.00 |
| 36 | 4.33 | 5.50 | 0.62 | 9.50 | 1.00 | 14.00 | 1.46 | 1.50 | 1.00 |
| 42 | 4.83 | 6.25 | 0.76 | 10.75 | 1.21 | 16.00 | 1.80 | 1.75 | 1.00 |
| 48 | 5.33 | 7.00 | 0.92 | 12.00 | 1.44 | 18.00 | 2.16 | 2.00 | 1.00 |
| 60 | 6.33 | 8.50 | 1.27 | 15.00 | 2.06 | 22.50 | 3.10 | 2.50 | 1.25 |

■ HEIGHT OF STD BEDDING MATERIAL INCLUDES THE BEDDING UNDER PIPE, THE NOMINAL DIAMETER OF THE PIPE, AND 12 INCHES ABOVE TOP OF PIPE

- FOR PIPES UNDER PAVEMENT, THE H DIMENSION AND THE STANDARD BEDDING MATERIAL QUANTITY SHALL BE INCREASED TO GO TO THE PAVEMENT. SEE ROADWAY STANDARD PBB-1.

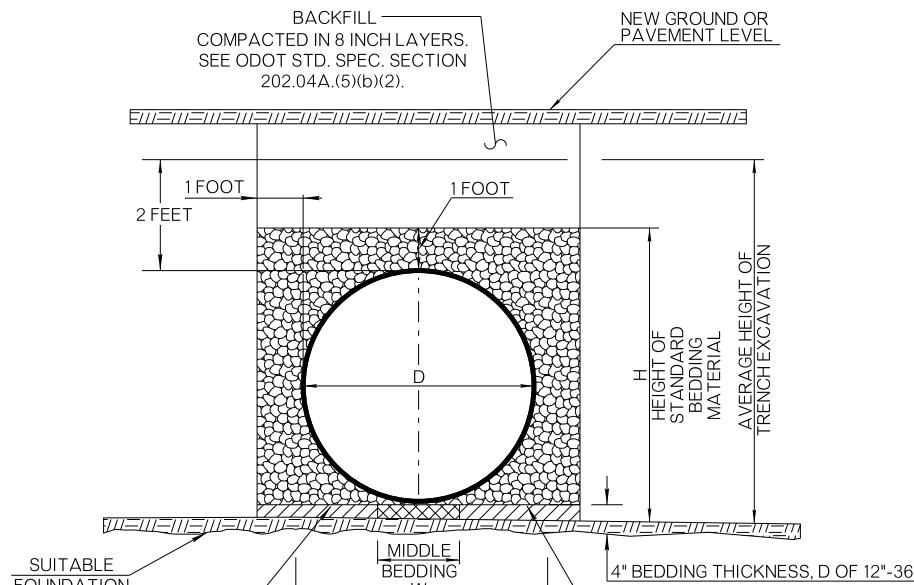
▲ SEE MULTIPLE INSTALLATIONS TABLE

| ALLOWABLE PIPE SIZES | |
|--|---|
| CORRUGATED HIGH DENSITY POLYETHYLENE PIPE, TYPE S (HDPE) <input checked="" type="checkbox"/> | CORRUGATED POLYPROPYLENE PIPE, TYPE S (PP) <input checked="" type="checkbox"/> |
| AASHTO M 294 | AASHTO M 330 |
| ASTM F2306 | ASTM F2881 |
| DIAMETER (INCHES) | DIAMETER (INCHES) |
| 12 | 12 |
| 15 | 15 |
| 18 | 18 |
| 24 | 24 |
| 30 | 30 |
| 36 | 36 |
| 42 | 42 |
| 48 | 48 |
| 60 | 60 |

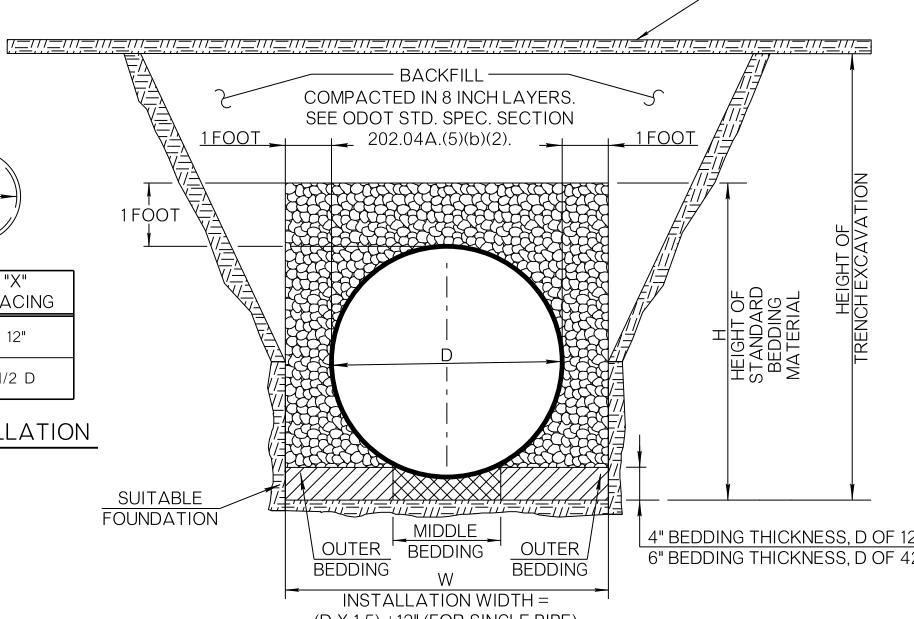
SEE "DUAL WALL" TYPE S
CONFIGURATION DETAIL

| MINIMUM AND MAXIMUM HEIGHT OF COVER FOR CORR. HIGH DENSITY POLYETHYLENE (HDPE) AND CORR. POLYPROPYLENE (PP) PIPES ● | | | | |
|---|-------------------|------|-------------------|------|
| PIPE DIAMETER | MIN. HT. OF COVER | | MAX. HT. OF COVER | |
| | HDPE | PP | HDPE | PP |
| INCHES | FEET | FEET | FEET | FEET |
| 12 | 1 | 1 | 29 | 32 |
| 15 | 1 | 1 | 26 | 30 |
| 18 | 1 | 1 | 26 | 25 |
| 24 | 1 | 1 | 24 | 25 |
| 30 | 1 | 1 | 24 | 25 |
| 36 | 1 | 1 | 24 | 24 |
| 42 | 1 | 1 | 23 | 23 |
| 48 | 1 | 2 | 23 | 21 |
| 60 | 1 | 2 | 23 | 21 |

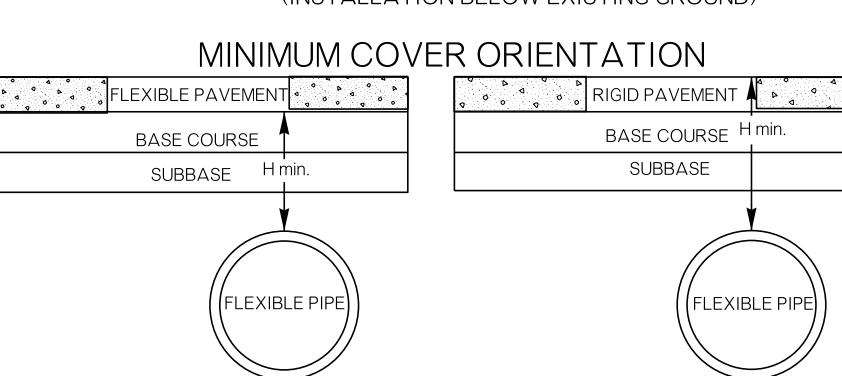
- MINIMUM COVER DEPTH IS TAKEN FROM AASHTO LRFD BRIDGE DESIGN SPEC. 12.6.6.3, AND THE MAXIMUM COVER DEPTH IS TAKEN FROM PLASTIC PIPE INSTITUTE'S HANDBOOK, CHAPTER 7.



EMBANKMENT INSTALLATION (INSTALLATION ON OR ABOVE EXISTING GROUND) NEW GROUND PAVEMENT L

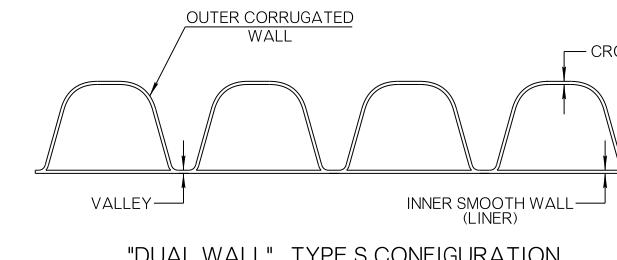


TRENCH INSTALLATION



H min. = MINIMUM ALLOWABLE COVER DIMENSION

NOTE: THE MINIMUM COVER DIMENSION IS NOT TO BE CONFUSED WITH THE FILL HEIGHT USED FOR CALCULATION PURPOSES, WHICH SHALL BE FROM THE TOP OF THE PIPE TO THE TOP OF THE SURFACE, REGARDLESS OF THE PIPE TYPE OR PAVEMENT TYPE.



FOR CORRUGATED HIGH-DENSITY POLYETHYLENE (HDPE) AND CORRUGATED POLYPROPYLENE (PP) PIPES

GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
 2. BOTH THE CORRUGATED POLYPROPYLENE (PP) AND CORRUGATED POLYETHYLENE (HDPE) PIPES' COVER HEIGHT VALUES ARE BASED ON A HL-93 LIVE LOADING, NO HYDROSTATIC PRESSURE, AND 120 LBS/CF SOIL WEIGHT.
 3. TRENCHING REQUIREMENTS FOR DEPTHS OVER 5 FEET SHALL BE IN ACCORDANCE WITH AND DEFINED BY, O.S.H.A. REGULATIONS, TITLE 29 CFR, PART 1926, SUBPART P - 'EXCAVATIONS', STANDARDS 1926.650, 1926.651 AND 1926.652.
 4. IN THE EVENT LOADS IN EXCESS OF HL-93 ARE TO BE OPERATED OVER OR ADJACENT TO THE PIPE INSTALLATION DURING THE CONSTRUCTION PHASE, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN A MINIMUM OF 4 FEET OF COVER OVER THE PIPE AT WHEEL OR TRACK PATHS.
 5. PROPER INSTALLATION PRACTICE MUST BE ADHERED TO AS SHOWN ON ROADWAY STANDARD PBB-1 AND AS DESIGNATED IN ASTM D2321. THE PAY ITEMS OF TRENCH EXCAVATION AND STANDARD BEDDING WILL BE REQUIRED FOR THESE PIPES WHEN THEY ARE INSTALLED AS CROSS DRAINS.
 6. IN NO CASE SHALL A PIPE INSTALLATION, SUBJECT TO SUDDEN FLOW DEVELOPMENT, BE LEFT WITHOUT SUFFICIENT BACKFILL TO RESTRAIN THE CONDUIT AND PREVENT JOINT SEPARATION AND/OR PIPING SCOUR. PHYSICALLY RESTRAINING THE CONDUIT MAY BE USED TO AUGMENT OR REPLACE THIS IMMEDIATE BACKFILL REQUIREMENT.
 7. ANY EXCESS EXCAVATION NOT USED FOR BACKFILL WILL BECOME THE PROPERTY OF THE CONTRACTOR AND DISPOSED OF BY THE CONTRACTOR IN A MANNER APPROVED BY THE ENGINEER.
 8. JOINTS IN THERMOPLASTIC PIPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM D3212. SPIGOTS SHALL HAVE WATER TIGHT GASKETS MEETING THE REQUIREMENTS OF ASTM F477.
 9. FOUNDATION SHALL BE MADE OF STABLE IN-SITU SOIL. IF THE FOUNDATION AREA IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER.
 10. CORRUGATED HIGH DENSITY POLYETHYLENE PIPE (HDPE) SHALL HAVE A MINIMUM COVER OVER PIPE OF 1 FOOT. THE MINIMUM COVER OVER POLYPROPYLENE PIPE (PP) IS 1 FOOT. SEE ROADWAY STANDARD PBB-1 FOR MORE DETAILS OF BOTH PIPES.
 11. SEGMENTS OF NON-FLAMMABLE PIPE ARE NO LONGER REQUIRED. HOWEVER, METAL OR CONCRETE END TREATMENTS SHALL BE PROVIDED AND PAID FOR AS A SEPARATE PAY ITEM.

| BASIS OF PAYMENT | | |
|------------------|------------------------------------|------|
| ITEM NO. | ITEM | UNIT |
| 613 (E) | CORRUGATED POLYETHYLENE PIPE | LF |
| 613 (EE) | CORRUGATED POLYPROPYLENE PIPE | LF |
| 613 (S) | STANDARD BEDDING MATERIAL, CLASS B | CY |
| 613 (T) | STANDARD BEDDING MATERIAL, CLASS C | CY |
| 613 (V) | TRENCH EXCAVATION | CY |

ROADWAY DESIGN DIVISION STANDARD
THERMOPLASTIC
CULVERT INSTALLATION

