SEWER WITH UNDERDRAIN UNDER ROADBED
CONCRETE & METAL PIPE
( FOR SHALLOW SEwers)

SEWER WITH UNDERDRAIN UNDER ROADBED
PLASTIC PIPE
( FOR SHALLOW SEwers)

NOTE: UNDERDRAIN TO BE PAID FOR SEPARATELY.

REPLACE SURFACE ACCORDING TO SPECIFICATIONS AND PLANS
EXISTING SURFACE
BACKFILL ACCORDING TO SPECIFICATIONS AND TYPICAL TRENCH SECTION
EXISTING CATCH BASIN DRAIN, SEWER OR OTHER UNDERGROUND UTILITY CROSSING NEW OPEN CUT CONSTRUCTION
APPROXIMATE SPRINGLINE (MIDPOINT)

SECTION A - A
NOTE: MINIMUM CLEARANCE BETWEEN UTILITIES SHALL BE 1'-0" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TYPICAL DETAIL AT CROSSING UNDER EXISTING UTILITIES
PAYMENT FOR THIS TRENCH DETAIL WILL BE INCLUDED WITH THE ADJACENT TRENCH DETAILS

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD Plan FOR
UTILITY TRENCHES

F.H.W.A. APPROVAL 2-8-2016 R-83-C SHEET 3 OF 5
WATER MAINS NOT UNDER ROADBED

EXISTING GROUND

SUITABLE MATERIAL EXCAVATED FROM SEWER TRENCH (OTHER THAN WET UNSTABLE CLAY)

GRANULAR MATERIAL CLASS IIIA

WATER MAIN

4" MIN. BEDDING GRANULAR MATERIAL CLASS IIIA

"w"

BACK OF CURB OR EDGE OF SHOULDER

SUBGRADE

SUITABLE MATERIAL EXCAVATED FROM SEWER TRENCH (OTHER THAN WET UNSTABLE CLAY)

GRANULAR MATERIAL CLASS III

GRANULAR MATERIAL CLASS IIIA

WATER MAIN

4" MIN. BEDDING GRANULAR MATERIAL CLASS IIIA

"w"

LIMITS OF PAVEMENT REMOVAL (6'-0" MINIMUM)

1'-0"

"W"

1'-0"

MIN.

MIN.

PAVEMENT

SUBBASE

HAS SPECIFIED ON PLANS

NOTE: WHEN WATER MAIN IS PLACED IN PROPOSED ROADBED AREA, IT SHALL BE BACKFILLED WITH SELECTED EXCAVATION MATERIAL ABOVE FUTURE SUBGRADE TO EXISTING GROUND LINE.

WATER MAINS UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED

WATER MAINS IN REINFORCED CONCRETE ENCASMENT

REQUIRED ENCAEASMENT SIZE FOR RESPECTIVE PIPE SIZES

<table>
<thead>
<tr>
<th>DIAMETER OF PIPE</th>
<th>ENCASMENT SIZE AND TRENCH WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; - 12&quot;</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>3'-6&quot;</td>
</tr>
<tr>
<td>24&quot;</td>
<td>4'-6&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>5'-0&quot;</td>
</tr>
<tr>
<td>36&quot;</td>
<td>5'-6&quot;</td>
</tr>
<tr>
<td>42&quot;</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>48&quot;</td>
<td>7'-0&quot;</td>
</tr>
<tr>
<td>54&quot;</td>
<td>7'-6&quot;</td>
</tr>
<tr>
<td>60&quot;</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>66&quot;</td>
<td>8'-6&quot;</td>
</tr>
<tr>
<td>72&quot;</td>
<td>9'-0&quot;</td>
</tr>
</tbody>
</table>

NOTE: REINFORCEMENT SHALL BE AS SPECIFIED ON PLANS.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

UTILITY TRENCHES

7-25-2017  2-4-2016  R-83-C  SHEET 4 OF 5
NOTES:

BACKFILLING SHALL BE ACCORDING TO THE STANDARD SPECIFICATION.

SUFFICIENT TRENCH WIDTH SHALL BE PROVIDED TO ALLOW FREE WORKING SPACE AND TO PERMIT COMPACTING THE BACKFILL AROUND THE PIPE.

THE FOLLOWING ARE MINIMUM TRENCH WIDTHS:

<table>
<thead>
<tr>
<th>I.D. PIPE SIZE (INCHES)</th>
<th>LESS THAN 18</th>
<th>21</th>
<th>24</th>
<th>30</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;W&quot; TRENCH WIDTH (FEET)</td>
<td>3.0</td>
<td>3.5</td>
<td>4.0</td>
<td>5.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

| I.D. PIPE SIZE (INCHES) | 42 | 48 | 54 | 60 | 66 | 72 |
| "W" TRENCH WIDTH (FEET) | 7.0| 8.0| 9.5|10.0|10.5|11.0|

| I.D. PIPE SIZE (INCHES) | 78 | 84 | 90 | 96 | 102| 108|
| "W" TRENCH WIDTH (FEET) | 11.5|12.0|12.5|13.0|13.5|14.0|

ESTIMATED PAVEMENT REMOVAL WIDTH IS TO BE TRENCH WIDTH "W" PLUS 1'-0" EACH SIDE OF THE TRENCH (6'-0" MINIMUM).