APPENDIX A

All detail drawings, forms, and documents as outlined in Appendix A are illustrative in nature only and should be used as a “guide” for all public works construction documents. Prior to acceptance of any contract, the City Engineer must approve all final proposals.

Appendix A is an abridged collection of detail drawings and forms covering most conditions anticipated. Contact the engineering department for a complete list of all documents on file.

Detail drawings, forms and documents outlined in Appendix A are as follows:

**UTILITY LOCATIONS**

<table>
<thead>
<tr>
<th>Detail Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDM-100</td>
<td>32’ Pavement on 60’ ROW</td>
</tr>
<tr>
<td>EDM-101</td>
<td>36’ Pavement on 66’ ROW</td>
</tr>
<tr>
<td>EDM-102</td>
<td>42’ Pavement on 80’ ROW</td>
</tr>
<tr>
<td>EDM-103</td>
<td>48’ Pavement on 80’ ROW</td>
</tr>
</tbody>
</table>

**EARTHWORK, GRADING AND GRAVELING**

<table>
<thead>
<tr>
<th>Detail Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>Typical Urban Section For 36' Curbs on 66' R.O.W.</td>
</tr>
<tr>
<td>302</td>
<td>Typical Urban Section For 42' Curbs on 80' R.O.W.</td>
</tr>
<tr>
<td>303</td>
<td>Typical Rural Section with 24' Pavement Width</td>
</tr>
<tr>
<td>304</td>
<td>Typical Driveway For Rural Pavement</td>
</tr>
</tbody>
</table>

**SEWER AND WATER CONSTRUCTION**

<table>
<thead>
<tr>
<th>Detail Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>401</td>
<td>Type ”1” Manhole - Standard Precast Manhole For Sanitary and Storm Sewers</td>
</tr>
<tr>
<td>402</td>
<td>Type ”7” Manhole – Non-Standard Precast or Block Manhole for Storm Sewers</td>
</tr>
<tr>
<td>403</td>
<td>Flat Top Detail for Type ”1” Sanitary or Storm Manholes</td>
</tr>
<tr>
<td>404</td>
<td>Type ”4” Combination Storm Manhole And Inlet Manhole</td>
</tr>
<tr>
<td>405</td>
<td>Type ”3” Standard Precast Inlet</td>
</tr>
<tr>
<td>406</td>
<td>Standard Trench Bedding and Backfilling Requirements</td>
</tr>
<tr>
<td>Detail Number</td>
<td>Title</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>501</td>
<td>Concrete Curb, Concrete Curb &amp; Gutter or Integral Curb and Pavement Ties</td>
</tr>
<tr>
<td>504</td>
<td>Sidewalk and Driveway Construction</td>
</tr>
<tr>
<td>505</td>
<td>Depressed Concrete Driveway</td>
</tr>
<tr>
<td>506</td>
<td>Standard Curb Ramps Types 1, 2, and 3</td>
</tr>
<tr>
<td>Detail Number</td>
<td>Title</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>506A</td>
<td>Standard Curb Ramps Type 1-A</td>
</tr>
<tr>
<td>507</td>
<td>Window Pane Concrete Sidewalk (special finish)</td>
</tr>
<tr>
<td>508</td>
<td>Sidewalk Construction Anchors</td>
</tr>
<tr>
<td>509</td>
<td>Sidewalk Final Measurement Guide – Sidewalk Assessments on Corner Lots</td>
</tr>
<tr>
<td>510</td>
<td>Root Barrier Installation</td>
</tr>
<tr>
<td>511</td>
<td>Concrete Pavement Sections – Joint Detail for Integral Curb</td>
</tr>
<tr>
<td>512</td>
<td>Concrete Pavement Sections – Joint Detail for Curb &amp; Gutter</td>
</tr>
<tr>
<td>513</td>
<td>Urban Doweled Concrete Pavement</td>
</tr>
<tr>
<td>514</td>
<td>Concrete Pavement – Typical Joint Layout</td>
</tr>
<tr>
<td>515</td>
<td>Concrete Pavement – Various Typical Joint Layouts</td>
</tr>
<tr>
<td>516</td>
<td>Concrete Pavement – Approach Slab at Bridge Abutments</td>
</tr>
<tr>
<td>517</td>
<td>Standard Cul-de-sac Joint Design (36' Face to Face)</td>
</tr>
<tr>
<td>518</td>
<td>Standard Cul-de-sac Joint Design (32' Face to Face)</td>
</tr>
<tr>
<td>519</td>
<td>Offset Cul-de-sac Joint Design (36' Face to Face)</td>
</tr>
<tr>
<td>520</td>
<td>Offset Cul-de-sac Joint Design (32' Face to Face)</td>
</tr>
<tr>
<td>524</td>
<td>Concrete Median Sloped and Blunt Nose Detail</td>
</tr>
<tr>
<td>525</td>
<td>Concrete Corrugated Median</td>
</tr>
<tr>
<td>527</td>
<td>Alteration To Existing Concrete Spillway</td>
</tr>
<tr>
<td>528</td>
<td>Blocking Up Existing Openings in Underground Vaults</td>
</tr>
<tr>
<td>529</td>
<td>Mooring Pile Detail</td>
</tr>
<tr>
<td>601</td>
<td><strong>ASPHALTIC CONCRETE CONSTRUCTION</strong></td>
</tr>
<tr>
<td>701</td>
<td>Tree Planting Detail</td>
</tr>
<tr>
<td>702</td>
<td>Shrub Planting Detail</td>
</tr>
</tbody>
</table>

**LANDSCAPING AND RESTORATION**

<table>
<thead>
<tr>
<th>Detail Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>701</td>
<td>Tree Planting Detail</td>
</tr>
<tr>
<td>702</td>
<td>Shrub Planting Detail</td>
</tr>
</tbody>
</table>
### Erosion Control and Stormwater Management

<table>
<thead>
<tr>
<th>Detail Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>801</td>
<td>Stabilized Construction Entrance (Tracking Pad)</td>
</tr>
<tr>
<td>802</td>
<td>Inlet Silt Sack Installation</td>
</tr>
<tr>
<td>803</td>
<td>Silt Fence Installation</td>
</tr>
<tr>
<td>804</td>
<td>Typical Installation of Erosion Bales and Temporary Ditch Checks</td>
</tr>
<tr>
<td>805</td>
<td>Inlet Protection Type A, B, and C</td>
</tr>
</tbody>
</table>

### Traffic Control

<table>
<thead>
<tr>
<th>Detail Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>901</td>
<td>Sign and Pavement Markings at Railroad Tracks</td>
</tr>
<tr>
<td>902</td>
<td>Pavement Marking Symbols</td>
</tr>
<tr>
<td>903</td>
<td>Pavement Marking (Mainline)</td>
</tr>
<tr>
<td>904</td>
<td>Pavement Marking (Island, Stop Line and Crosswalk)</td>
</tr>
<tr>
<td>905</td>
<td>Alternate Pavement Marking at Crosswalks</td>
</tr>
<tr>
<td>906</td>
<td>Tubular Steel Sign Posts</td>
</tr>
</tbody>
</table>

### Traffic Signals

<table>
<thead>
<tr>
<th>Detail Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>951</td>
<td>Signal Concrete Bases Types 1, 2 and 5</td>
</tr>
<tr>
<td>952</td>
<td>Signal Pull Box Detail</td>
</tr>
<tr>
<td>953</td>
<td>Signal Conduit Detail</td>
</tr>
<tr>
<td>954</td>
<td>Signal Loop Detector Placed in C.A.B.C.</td>
</tr>
<tr>
<td>955</td>
<td>Sawing in Loop Detectors</td>
</tr>
<tr>
<td>956</td>
<td>Signal Concrete Control Cabinet Bases</td>
</tr>
<tr>
<td>957</td>
<td>Signal Conduit Location Inside of Control Cabinet</td>
</tr>
<tr>
<td>958</td>
<td>Under Ground Electrical Service to Signal Control Cabinet</td>
</tr>
<tr>
<td>959</td>
<td>Electrical Service to Signal Control Cabinet from Power Pole</td>
</tr>
</tbody>
</table>
UTILITY LOCATION
(32' PAV'T on 60' ROW)
UTILITY LOCATION
(48' PAV'T on 80' ROW)

City of Manitowoc
ENGINEERING DEPARTMENT

FORM NO.
EDM-103

Rev. 9/05
Note: Street shall be graded to the Interim Section. C/L of interim Section shall be 3" below final pavement grade.
TYPICAL URBAN SECTION
FOR 42' CURBS ON 80' R.O.W

INTERIM SECTION

C/L

INTERIM
C/L = 10.00
(ELEV = 4" below ultimate)

23.8' @ 2.0%
40'

8' GRAVEL BASE
8' BREAKER RUN

R/W

1/3' PER FOOT
C/L ELEV. (10.00)

3:1

3:1

22.5' @ 2.0%

3.3'

14.2'

ULTIMATE
C/L = 10.33

21.0' @ 2.0%

R/W

4'-0" SWK

8'

8' CONC. PAV'T.

Note: Street shall be graded to the Interim Section. C/L of Interim Section shall be 4" below final pavement grade.
NOTES:
1. THE THICKNESS OF PAVEMENT AND BASE COURSE SHALL BE AS SPECIFIED IN THE SPECIAL PROVISIONS ON CITY CONTRACTS OR AS APPROVED BY THE CITY ENGINEER ON PRIVATE DEVELOPMENT PROJECTS.

2. THE STREET SIDE OF THE SIDEWALK SHALL BE AT LEAST 1 INCH BUT NOT MORE THAN 2 1/2 INCHES LOWER THAN THE SIDE AWAY FROM THE STREET.

3. THE STREET SIDE OF THE SIDEWALK SHALL BE AT LEAST 1/3 INCH ABOVE THE TOP OF THE FUTURE CURB FOR EACH FOOT OF DISTANCE FROM THE BACK OF THE FUTURE CURB.
SECTION A-A

A ≤ 25' MAX. FOR RESIDENTIAL
≤ 35' MAX. FOR COMMERCIAL AND RESIDENTIAL
DUPLEXES WITH ADJOINING DRIVEWAYS

B ≤ 3' FOR RESIDENTIAL PROPERTY
≤ 5' FOR COMMERCIAL PROPERTY

TYPICAL DRIVEWAY
FOR RURAL PAVEMENT

City of Manitowoc
ENGINEERING DEPARTMENT

FORM NO. 304
Rev. 4/05
TYPE 1
STANDARD PRECAST MANHOLE
FOR SANITARY OR STORM SEWERS

MONOLITHIC BASE REQUIRED FOR ALL SANITARY MANHOLES

CUT-OUT FOR SEWER PIPE
SEE NOTE 8

SEWER PIPE

FIELD JOINT (TYPICAL)
SEE NOTES 4 & 5

PRECasting step
SEE NOTE 7

REINFORCED CONCRETE RISER SECTION (BARREL)

REINFORCED CONCRETE ECCENTRIC CONE TOP SECTION (CORBEL) SEE NOTE 3

PRECasting REINFORCED CONCRETE BASE SECTION

PRECasting OR CAST-IN-PLACE CONCRETE
BENCH SEE WSWS FILE NO. 13 FOR STANDARD BENCH CHANNELIZATION.

BEDDING MATERIAL SEE NOTE 1

FINISHED GRADE

2'-3' MAX.

INVERT ELEV.

DIRECTION OF FLOW
SEWER PIPE
LADDER ACCESS OPENING IN CORBEL

LADDER & CORBEL ORIENTATION

MANHOLE FRAME & COVER

24" DIA

NO SCALE

City of Manitowoc
ENGINEERING DEPARTMENT

FORM NO. 401
Rev. 11/08
NOTES

1. MANHOLE BASE SECTIONS SHALL BE PLACED ON AT LEAST 8" OF BEDDING MATERIAL CONFORMING TO WSWS 8.43.2 FOR DRY SUBGRADE AND WSWS 8.43.6 FOR WET SUBGRADE.

2. CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO ASTM C-478 REQUIREMENTS.

3. PRECAST REINFORCED CONCRETE ECCENTRIC CONE TOPS (OFFSET CORBELS) MUST BE USED FOR MANHOLES OF DEPTHS GREATER THAN FIVE (5) FEET.

   IF THE MANHOLE DEPTH, AS MEASURED FROM THE TOP OF THE CASTING FRAME TO THE TOP OF THE MANHOLE BASE SLAB, IS LESS THAN 5 FEET, A FLAT PRECAST REINFORCED CONCRETE MANHOLE TOP SHALL BE USED INSTEAD OF A CORBEL SECTION. THE FLAT MANHOLE TOP SHALL BE PROVIDED WITH AN ECCENTRIC 24" DIAMETER OPENING FOR THE MANHOLE CASTING.

4. PRECAST REINFORCED CONCRETE RISER SECTIONS (BARRELS) MAY BE PLACED WITH TONGUE OR "D" JOINT ENDS EITHER UP OR DOWN.

5. ALL FIELD JOINTS AT MANHOLE PIECES SHALL BE WATERTIGHT AND SHALL BE MADE IN ACCORDANCE WITH WSWS 3.5.4(i).

6. PRECAST REINFORCED CONCRETE ADJUSTING RINGS SHALL BE USED TO ADJUST THE FRAME TO THE REQUIRED GRADE. A MINIMUM OF 4" AND A MAXIMUM OF 10" OF ADJUSTING RINGS AND MORTAR SHALL BE USED FOR THE ADJUSTMENT. MORTAR OR FLEXIBLE SEAL SHALL BE 3/8" MINIMUM THICKNESS BETWEEN EACH RING, RING AND STRUCTURE, AND RING AND FRAME. THE THICKNESS OF EACH GRADE RING SHALL RANGE FROM 2" MINIMUM TO 6" MAXIMUM.

   GRADE RINGS SHALL BE REINFORCED WITH AT LEAST ONE RING OF STEEL REBAR CENTERED WITHIN THE RING.

7. STEPS SHALL BE PRECAST INTO THE MANHOLE SECTIONS BY THE MANUFACTURER.

   THE STEPS SHALL MEET THE REQUIREMENTS OF WSWS 6.40.0. THE TOP STEP SHALL BE SET NO LESS THAN THREE (3) INCHES AND NO MORE THAN SIX (6) INCHES BELOW THE TOP OF THE CORBEL. THE STEPS SHALL BE EQUALLY SPACED VERTICALLY AT SIXTEEN (16) INCHES ON CENTER.

8. THE ENTIRE SPACE BETWEEN THE PIPE LEADS AND THE PRECAST MANHOLE WALL SHALL BE MORTARED OR CONCRETED IN PLACE BY THE CONTRACTOR.

   SOLID CONCRETE BRICKS MORTARED IN PLACE MAY BE USED AS A FILLER FOR STORM MANHOLES.

9. FOR DETAILS OF OUTSIDE DROP TYPE CONNECTIONS OF SEWER PIPE TO SANITARY MANHOLES SEE DETAIL WSWS FILE NO.19

10. ALL SANITARY MANHOLES SHALL HAVE A MONOLITHIC BASE.

TYPE 1

STANDARD PRECAST MANHOLE

FOR SANITARY OR STORM SEWERS

City of Manitowoc

ENGINEERING DEPARTMENT

Rev. 12/07 FORM NO. 401
NON-STANDARD MANHOLE

TYPE 7

DETAIL OF SHALLOW MANHOLE

PIPE DIA. > 30"

3" MINIMUM
TYPICAL

2'X3' OPENING FOR TYPE "H" INLET MANHOLES
24" DIA. OPENING FOR TYPE "J" MANHOLES
OFFSET OPENING TO MATCH STEPS

CASTING AND ADJUSTMENT RINGS

PRECAST REINFORCED
CONCRETE ECCENTRIC
CONE TOP SECTION

PRECAST STEPS

MINIMUM HEIGHT 36"

MINIMUM DIAMETER 36"

STAND-OFF DISTANCE 36"

INVERT ELEV

PIPE DIA. > 30"

PRECAST CONC. MANHOLE BOTTOM

DETAIL OF DEEP MANHOLE

TO FIND DISTANCE "X"

IF 5" < BC < 4'-6", USE 4'-6" FOR DIST. "X"
IF 6" < BC > 4'-6", USE 6" < BC FOR DIST. "X"

PRECAST MANHOLE BARREL SECTIONS GREATER THAN FOUR FEET IN DIAMETER SHALL MEET ASTM C-76 - 87 SPECIFICATIONS.
TOP SLABS TO BE REINFORCED CONCRETE, 8" THICK AS APPROVED BY CITY ENGINEER.
8" THICK PRECAST MANHOLE BOTTOMS FOR PIPE GREATER THAN 36".
FOR CAST IN PLACE WALL SECTIONS, ALL REINFORCING BARS SHALL BE 1/2" O.C. SPACED 12" ON CENTER, WITH MINIMUM OF 2" COVER PROVIDED.
FLAT TOP DETAIL FOR
TYPE 1
SANITARY & STORM MANHOLES

TOP VIEW SHOWN WITHOUT CASTING AND ADJUSTING RINGS

DOWN STREAM → MAINLINE SEWER

FINISHED GRADE

2'-3" MAX.

MANHOLE CASTING

PRECAST CONCRETE ADJUSTING RINGS
4" TO 10" OF ADJUSTMENT ONLY

PRECAST REINFORCED CONCRETE MANHOLE FLAT TOP WITH OFFSET OPENING

PRECAST STEP

4'-DIA.

REINFORCED CONCRETE RISER SECTION (BARREL)

SEE DETAIL 401 & 402 FOR ORIENTATION OF MANHOLE OPENING AND ADDITIONAL INFORMATION

NO SCALE
OPENING SHOWN IS FOR AN TYPE "H" CASTING.

PRECAST STEPS

PROVIDE 6" FUTURE LATERAL OPENING

1" MIN.

2' X 3'
OPENING

TOP VIEW

DOWN STREAM MAINLINE SEWER

PRECAST CONCRETE ADJUSTING RINGS.
4" TO 10" OF ADJUSTMENT ONLY.
2" UP TO 6" THICK RINGS ALLOWED.

INLET CASTING

FINISHED GRADE

PRECAST CONCRETE REINFORCED CONCRETE
MANHOLE FLAT TOP WITH 2' X 3'
OPENING

REINFORCED CONCRETE
RISER SECTION (BARREL)
TOTAL HEIGHT VARIABLE

SECTION VIEW

PRECAST CONC BOTTOM

PRECAST STEP

2'-3" MAX

1" MIN.

36"

3" MIN.

PROVIDE 6" FUTURE LATERAL OPENING

NO SCALE

TYPE 4
STORM MANHOLE

City of Manitowoc
ENGINEERING DEPARTMENT

Rev. 6/07
FORM NO. 404
NOTES
1. CATCH BASIN AND INLET STRUCTURES SHALL BE PLACED ON AT LEAST 8" OF BEDDING MATERIAL CONFORMING TO WSWS.8.43.2 FOR DRY SUBGRADE AND WSWS 8.43.6 FOR WET SUBGRADE.

2. CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO ASTM C-475 REQUIREMENTS.

3. PRECAST REINFORCED CONCRETE ADJUSTING RINGS SHALL BE USED TO ADJUST THE FRAME TO THE REQUIRED GRADE. A MINIMUM OF 4" THICKNESS BETWEEN EACH RING AND STRUCTURE. MORTAR SHALL BE USED FOR THE ADJUSTMENT. MORTAR OR FLEXIBLE SEAL SHALL BE 3/8" MINIMUM THICKNESS. THE THICKNESS OF EACH GRADE RING SHALL RANGE FROM 2" MINIMUM TO 6" MAXIMUM. USE NO MORE THAN TWO (2) OF THE 2" SIZE OF GRADE RINGS PER STRUCTURE. GRADE RINGS SHALL BE REINFORCED WITH AT LEAST ONE RING OF STEEL REBAR CENTERED WITHIN THE RING. SPLIT RINGS ARE NOT ALLOWED.


5. THE ENTIRE SPACE BETWEEN THE PIPE LEADS AND THE PRECAST CATCH BASIN OR INLET SHALL BE MORTARED OR CONCRETED IN PLACE BY THE CONTRACTOR. SOLID CONCRETE BRICKS MAY BE USED AS A FILLER.

6. THE FRAME OF THE CATCH BASIN (OR INLET) SHALL NOT EXTEND MORE THAN 1 1/2" BEYOND THE INNER OR OUTER EDGES OF THE CATCH BASIN (OR INLET) STRUCTURE.

NO. SCALE

TYPE 3
STANDARD PRECAST INLET
<table>
<thead>
<tr>
<th>FRAME</th>
<th>COVER</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-1550-A</td>
<td>TYPE &quot;B&quot;</td>
<td>23&quot;</td>
<td>1½&quot;</td>
<td>21&quot;</td>
<td>25½&quot;</td>
<td>36&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>R-2050</td>
<td>OPEN GRATE TYPE &quot;C&quot;</td>
<td>23&quot;</td>
<td>1½&quot;</td>
<td>21&quot;</td>
<td>25½&quot;</td>
<td>36&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>R-2560-E</td>
<td>BEE-HIVE GRATE</td>
<td>23&quot;</td>
<td>1½&quot;</td>
<td>21&quot;</td>
<td>25½&quot;</td>
<td>36&quot;</td>
<td>9&quot;</td>
</tr>
</tbody>
</table>

**STANDARD MANHOLE CASTINGS**

**R-1550-A**

NEENAH FOUNDRY CATALOG "R" 12TH EDITION (1999) OR APPROVED EQUAL.

SANITARY SEWER - MACHINED TO RECEIVE A 1/4" T-GASKET.

DETAIL PER NEENAH FOUNDRY DRAWING *45512.

TYPE "B" COVER WITH TWO CONCEALED PICK HOLES.

STORM SEWER

NON ROCKING DESIGN TYPE "B" COVER WITH TWO OPEN PICK HOLES.

OPEN GRATE DESIGN R-2050 SHALL BE A TYPE "C" COVER.

BEE-HIVE CASTING & GRATE SHALL BE R-2560-E.

A STANDARD CASTING SHALL BE USED FOR MANHOLES LARGER THAN FOUR FEET IN DIAMETER.

NO SCALE
STANDARD FRAME & COVER FOR SANITARY MANHOLE IN SUBAQUEOUS OR BURIED CONDITIONS

NEENAH R-1916-C WATERTIGHT MANHOLE FRAME WITH BOLTED COVER

BOLT HOLE (4 REQUIRED)

CONCEALED PICK HOLE (2 REQUIRED)

20 1/2"

25 1/2"

36"

23"

1-1/2"
1. NEENAH FRAME & GRATE R-3067-R (DIAGONAL) DIMENSIONED ABOVE SHALL BE USED UNLESS INDICATED OTHERWISE IN THE CONTRACT DOCUMENTS.
NEENAH R-3290-A FRAME & GRATE SHALL BE USED AT CATCH BASINS LOCATED WITHIN DRIVEWAY OPENINGS

STANDARD FRAME & GRATE FOR DRIVEWAY CATCH BASINS & INLETS

NO SCALE

City of Manitowoc
ENGINEERING DEPARTMENT

FORM NO.
410

Rev. 4/05
NOTES:
1. THE MAXIMUM DEPTH OF THE STRUCTURE SHALL BE THREE (3') FEET.
VERTICAL CENTER REINFORCEMENT BAR

OUTER FRAME
1/2" X 2" H.R. BAR STOCK

CROSS BARS
1" DIA. H.R. ROUND STOCK AT 5" O.C.

BOTTOM SECTION TO BE HINGED OUTWARD AND SHALL NOT EXCEED 1/2 PIPE DIAMETER

NOTES:

1. HINGED GRATES REQUIRED FOR PIPES OF 24" DIAMETER OR GREATER.

2. GRATE TO BE HELD IN PIPE WITH 4 1/2" GRADE 5 BOLTS.

3. ENTIRE UNIT TO BE PRIMER COATED WITH "RUSTOLEUM GRADE" RED PRIMER.

A VERTICAL HINGED LOCKABLE BAR SHALL BE PROVIDED. THIS LOCKABLE BAR SHALL BE IN ADDITION TO THE VERTICAL REINFORCING BAR REQUIRED FOR GRATES 24" IN DIAMETER OR GREATER. THE END OF THE LOCKABLE BAR SHALL HAVE A 1-1/2" RADIUS, TO PERMIT ITS USE TO RETAIN THE HINGED SECTION OF THE GRATE IN AN OPEN POSITION OF AT LEAST 110 DEGREES. THE LENGTH OF THE BAR SHALL BE BASED ON THE SIZE OF THE GRATE BEING FURNISHED.
NOTES:

1. 6" PERFORATED PIPE TO BE CONNECTED TO A DOWNSTREAM CATCH BASIN OR INLET.

2. SLOPE ON 6" PIPE TO BE A MINIMUM OF 0.5%.

3. PIPE TO BE 6" PVC OR 6" CORRUGATED HDPE.

4. SUMP PUMP LINES SHALL NOT BE CONNECTED TO UNDERDRAIN PERFORATED PIPE.

5. PROVIDE CLEANOUT RISERS EVERY 300' MAXIMUM SPACING AND AT UPSTREAM END OF PIPE.

6. THE PERFORATED PIPE COULD BE FURNISHED WITH AN FILTER FABRIC SOCK IN LIEU OF THE FILTER FABRIC WRAPPED TRENCH.
NOTES:

1. 6" PIPE TO BE CONNECTED TO A DOWNSTREAM CATCH BASIN OR INLET.

2. SLOPE ON 6" PIPE TO BE A MINIMUM OF 0.5%.

3. PIPE TO BE 6" PVC (SDR-35)

4. 6" INLINE WYES OR TEES REQUIRED FOR NEW CONSTRUCTION.

5. PROVIDE CLEANOUT RISERS EVERY 300' MAXIMUM SPACING AND AT UPSTREAM END OF PIPE.

6. INLET CONNECTION TO BE 12" ABOVE DISCHARGE PIPE.
STANDARD STORM LATERAL DETAIL

STORM RISER DETAIL

1. ALL STORM LATERALS TO BE 6" PVC (SDR-35)
2. ALL WYES OR TEES SHALL BE INLINE FOR NEW CONSTRUCTION. SADDLES CAN BE USED WHEN SEWER MAIN IS EXISTING.
3. ALL STORM LATERALS TO BE LAID AT 1.0% MINIMUM.
WHEN SAW CUTTING THE PAVEMENT FOR TRENCH RESTORATION, ALL SAW CUTS SHALL BE MADE PARALLEL OR PERPENDICULAR TO THE CENTERLINE OF THE TRENCH. PARALLEL CUTS SHALL BE A MINIMUM LENGTH OF 20 FEET AND PERPENDICULAR CUTS SHALL BE A MINIMUM OF 3 FEET IN LENGTH.
WHEN SAW CUTTING THE PAVEMENT FOR TRENCH RESTORATION, ALL SAW CUTS SHALL BE MADE PARALLEL OR PERPENDICULAR TO THE CENTERLINE OF THE TRENCH.

PARALLEL CUTS SHALL BE A MINIMUM LENGTH OF 20 FEET AND PERPENDICULAR CUTS SHALL BE A MINIMUM OF 3 FEET IN LENGTH. (SEE FORM 416)
PROPOSED BUILDING FOOTING

COMPACTED GRANULAR FILL
COMPACTATION 95%
MODIFIED PROTOR

TO BE DETERMINED
BY ENGINEER

FORMED WALL
(TYP.)

*5 REBAR AT 18"
ON CENTER

6 BAG CONCRETE

SEWER SPRING LINE

SOLID GROUND
OR STONE MATERIAL.
EXISTING BEDDING TO REMAIN.

6"
MIN.

6"
MIN.

EXTEND THE CAP A MINIMUM OF 10 FEET PAST THE OUTSIDE OF BUILDING WALLS.

TYPICAL CONCRETE CAP
OVER SEWER PIPE

City of Manitowoc
ENGINEERING DEPARTMENT

Rev. 4/05
FORM NO.
418
SECTION A-A'  ENDWALL LENGTH VARIES

SEWER PIPE

PIPE BEDDING STONE

PLACE RIP RAP LEVEL WITH FLOWLINE OF APRON

GEOTEXTILE FILTER FABRIC

MEDIUM/HEAVY RANDOM RIPRAP WITH FILTER FABRIC AT STORM OUTFALLS
(CONCRETE OR C.M.P. ENDWALL)

RIP RAP DETAIL
AT STORM OUTFALLS
SEWER PILING DETAIL

3/4" DIA. BOLTS
STAINLESS STEEL
w/WASHERS
& NUTS (TYP.)

2"X6" TREATED
LUMBER
(TYPICAL)

TREATED TIMBER
PILE
5 TON PER PILE
BEARING CAPACITY
PROBABLE MAXIMUM
LENGTH = 16'-20'

4'

6'

NO SCALE
**MANHOLE PIPE REPAIR**

6"  24"±  6"  6"

* 4 REBAR TIES DRILLED INTO EXISTING CONCRETE PIPE

1/8" STEEL PLATE ANCHORED AT 4 CORNERS

6 BAG MIX CONCRETE WITH 2 LAYERS OF PAVING MESH

EXISTING RCP

City of Manitowoc

No Scale
NOTES

1. CATCH BASIN AND INLET STRUCTURES SHALL BE PLACED ON AT LEAST 6" OF BEDDING MATERIAL CONFORMING TO WSWS.8.43.2 FOR DRY SUBGRADE AND WSWS.8.43.6 FOR WET SUBGRADE.

2. CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO ASTM C-478 REQUIREMENTS.

3. PRECAST REINFORCED CONCRETE ADJUSTING RINGS SHALL BE USED TO ADJUST THE FRAME TO THE REQUIRED GRADE. A MINIMUM OF 4" A MAXIMUM OF 10" OF ADJUSTING RINGS AND MORTAR SHALL BE USED FOR THE ADJUSTMENT. MORTAR OR FLEXIBLE SEAL SHALL BE 1/2" MINIMUM THICKNESS BETWEEN EACH RING, RING AND STRUCTURE, AND RING AND FRAME. THE THICKNESS OF EACH GRADE RING SHALL RANGE FROM 2" MINIMUM TO 6" MAXIMUM. USE NO MORE THAN TWO (2) OF THE 2" SIDE OF GRADE RINGS PER STRUCTURE. GRADE RINGS SHALL BE REINFORCED WITH AT LEAST ONE RING OF STEEL REBAR CENTERED WITHIN THE RING. SPLIT RINGS ARE NOT ALLOWED.


5. THE ENTIRE SPACE BETWEEN THE PIPE LEADS AND THE PRECAST CATCH BASIN OR INLET SHALL BE MORTARIZED OR CONCRETED IN PLACE BY THE CONTRACTOR. SOLID CONCRETE BRICKS MAY BE USED AS A FILLER.

6. THE FRAME OF THE CATCH BASIN (OR INLET) SHALL NOT EXTEND MORE THAN 1 1/2" BEYOND THE INNER OR OUTER EDGES OF THE CATCH BASIN (OR INLET) STRUCTURE.
1. TRACER WIRE SHALL BE 12 GAUGE (TYPE THWN OR THHN) SOLID COPPER WIRE WITH A PLASTIC CORROSION PROTECTIVE COATING.

2. WIRE COLORING SHALL BE BLUE FOR WATER, GREEN FOR SANITARY, AND BROWN FOR STORM.

3. TRACER WIRE SHALL BE STRAPPED TO THE TOP OF THE PIPE WALL BY MEANS OF A MINIMUM OF TWO COMPLETE WRAPS OF ELECTRICAL TAPE AT INTERVALS OF A MAXIMUM OF 14 FEET AND AT ALL BENDS. THE WIRES SHALL HAVE SOME SLACK TO ALLOW FOR BENDS IN LAYING OF THE PIPE.

4. IF SPLICING IS REQUIRED THE USE OF A DIRECT BURY WATERPROOF SPLICE KIT (3M SCOTCHLOK 562 WITH SCOTCHLOK TAPE 33 AND SCOTCH COAT, OR EQUIVALENT) IS REQUIRED. A WATERPROOF WIRE NUT, SIZED ACCORDING TO WIRE SIZE AND THE NUMBER OF CONDUCTORS (IDEAL TWISTER DB PLUS OR EQUIVALENT) IS ALSO ACCEPTABLE. THE CONTRACTOR SHALL SUBMIT PRODUCT TO ENGINEER FOR APPROVAL.

5. WHEN STORM AND SANITARY LATERALS ARE INSTALLED IN THE SAME TRENCH, INDIVIDUAL CORRESPONDING TRACING WIRES ARE REQUIRED.

6. TO PRESERVE CONTINUITY, IF A TRACER WIRE IS DAMAGED OR SEVERED, IT SHALL BE REPAIRED OR REPLACED IMMEDIATELY. SEE NOTE 4.

7. PROOF OF CONTINUITY SHALL BE REQUIRED UPON INSTALLATION, REPAIR OR REPLACEMENT OF TRACER WIRE.

8. FOR PROTECTION AGAINST DAMAGE, THE TRACER WIRE(S) SHALL EXTEND TO DAYLIGHT THROUGH A 1" PVC SCHEDULE 40 CONDUIT WITH ACCESS THROUGH A REMOVABLE THREADED GALVANIZED METAL CAP. SEE FORM 424 OR 425.
STANDARD TRACER WIRE DETAIL FOR STORM AND SANITARY LATERALS
WITHIN THE STREET R/W OR UTILITY EASEMENT, INSTALLED IN NEW
SUBDIVISIONS OR VACANT LOTS.

1. TRACER WIRE SHALL BE 12 GAUGE (TYPE THWN OR THHN) SOLID COPPER WIRE WITH A PLASTIC
CORROSION PROTECTIVE COATING.

2. WIRE COLORING SHALL BE BLUE FOR WATER, GREEN FOR SANITARY AND BROWN FOR STORM.

3. TRACER WIRE SHALL BE STRAPPED TO THE TOP OF THE PIPE WALL BY MEANS OF A MINIMUM OF TWO
COMPLETE WRAPS OF ELECTRICAL TAPE AT INTERVALS OF A MAXIMUM OF 14 FEET AND AT ALL BENDS.
THE WIRES SHALL HAVE SOME SLACK TO ALLOW FOR BENDS IN LAYING OF THE PIPING.

4. IF SPlicing IS REQUIRED THE USE OF A DIRECT BURY, WATERPROOF SPLICe KIT (3M SCOTCHLOK 562 WITH
SCOTCHLOK TAPE 33 AND SCOTCH COAT, OR EQUIVALENT) IS REQUIRED. A WATERPROOF WIRE NUT,
SIZED ACCORDING TO WIRE SIZE AND THE NUMBER OF CONDUCTORS (IDEAL TWISTER DB PLUS OR
EQUIVALENT) IS ALSO ACCEPTABLE. THE CONTRACTOR SHALL SUBMIT PRODUCT TO ENGINEER FOR APPROVAL.

5. WHEN STORM AND SANITARY LATERALS ARE INSTALLED IN THE SAME TRENCH, INDIVIDUAL CORRESPONDING
TRACING WIRES ARE REQUIRED.

6. TO PRESERVE CONTINUITY, IF A TRACER WIRE IS DAMAGED OR SEVERED, IT SHALL BE REPAIRED
OR REPLACED IMMEDIATELY. SEE NOTE 4.

7. PROOF OF CONTINUITY SHALL BE REQUIRED UPON INSTALLATION, REPAIR OR REPLACEMENT OF TRACER WIRE.

8. FOR PROTECTION AGAINST DAMAGE, THE TRACER WIRE(S), SHALL EXTEND TO DAYLIGHT THROUGH A 1" PVC
SCHEDULE 40 CONDUIT WITH ACCESS THROUGH A REMOVABLE THREADED GALVANIZED METAL CAP.

9. IF THE SEWER MAIN DOES HAVE A TRACER WIRE INSTALLED, SPlice LATERAL WIRE TO THE MAIN WIRE
USING A WATERPROOF SPLICe KIT OR WATERPROOF WIRE NUT. IF THE SEWER MAIN DOES NOT HAVE A
TRACER WIRE, TERMINATE LATERAL WIRE AT THE SEWER MAIN AND INSTALL A WATERPROOF END CAP/
WIRE NUT.
STANDARD TRACER WIRE DETAIL FOR RELAYING OF STORM AND SANITARY LATERALS WITHIN THE STREET R/W OR UTILITY EASEMENT.

1. TRACER WIRE SHALL BE 12 GAUGE (TYPE THWN OR THHN) SOLID COPPER WIRE WITH A PLASTIC CORROSION PROTECTIVE COATING.

2. WIRE COLORING SHALL BE BLUE FOR WATER, GREEN FOR SANITARY AND BROWN FOR STORM.

3. TRACER WIRE SHALL BE STRAPPED TO THE TOP OF THE PIPE WALL BY MEANS OF A MINIMUM OF TWO COMPLETE WRAPS OF ELECTRICAL TAPE AT INTERVALS OF A MAXIMUM OF 14 FEET AND AT ALL BENDS. THE WIRES SHALL HAVE SOME SLACK TO ALLOW FOR BENDS IN LAYING OF THE PIPE.

4. IF SPLICING IS REQUIRED THE USE OF A DIRECT BURY, WATERPROOF SPLICE KIT (3M SCOTCHLOK 562 WITH SCOTCHLOK TAPE 33 AND SCOTCH COAT, OR EQUIVALENT) IS REQUIRED. A WATERPROOF WIRE NUT, SIZED according to wire size and the number of conductors (IDEAL TWISTER DB PLUS OR EQUIVALENT) IS ALSO ACCEPTABLE. THE CONTRACTOR SHALL SUBMIT PRODUCT TO ENGINEER FOR APPROVAL.

5. WHEN STORM AND SANITARY LATERALS ARE INSTALLED IN THE SAME TRENCH, INDIVIDUAL CORRESPONDING TRACING WIRES ARE REQUIRED.

6. TO PRESERVE CONTINUITY, IF A TRACER WIRE IS DAMAGED OR SEVERED, IT SHALL BE REPAIRED OR REPLACED IMMEDIATELY. SEE NOTE 4.

7. PROOF OF CONTINUITY SHALL BE REQUIRED UPON INSTALLATION, REPAIR OR REPLACEMENT OF TRACER WIRE.

8. FOR PROTECTION AGAINST DAMAGE, THE TRACER WIRE(S) SHALL EXTEND TO DAYLIGHT THROUGH A 1" PVC SCHEDULE 40 CONDUIT WITH ACCESS THROUGH A REMOVABLE THREADED GALVANIZED METAL CAP.

9. IF THE SEWER MAIN DOES HAVE A TRACER WIRE INSTALLED, SPLICE LATERAL WIRE TO THE MAIN WIRE USING A WATERPROOF SPLICE KIT OR WATERPROOF WIRE NUT. IF THE SEWER MAIN DOES NOT HAVE A TRACER WIRE, TERMINATE LATERAL WIRE AT THE SEWER MAIN AND INSTALL A WATERPROOF END CAP/WIRE NUT.
NOTES
1. INSTALL 1/2" FELT EXPANSION JOINTS @ 50-FOOT INTERVALS (MIN.)
2. MATERIAL MUST BE DEPTH OF CONCRETE PLUS 2-INCHES
3. DRIVEWAY FLARES SHALL NOT EXCEED 3- FEET (RESIDENTIAL)
4. DRIVEWAY FLARES SHALL NOT EXCEED 5- FEET (COMMERCIAL)

SEE FORM 506 FOR RAMP AND DETECTABLE WARNING FIELD DETAIL

NOTE: IF EXISTING CURB HAS TO BE SAWED OUT FOR NEW APPROACH 1/2" EXPANSION JOINT IS REQUIRED AT EACH SIDE OF THE DRIVEWAY WHERE NEW CURB MEETS EXISTING CURB

SECTION A-A

SECTION B-B

Pavement or Curb & Gutter (Typical)

GRADE STAKES ARE MARKED "G" WITH NUMBER OF INCHES OR "F" WITH NUMBER OF INCHES "G" MEANS GUTTER OR CURB FROM TOP OF STAKE "F" MEANS FALL OR UP FROM TOP OF STAKE

SIDEWALK & DRIVEWAY CONSTRUCTION DETAIL

City of Manitowoc
ENGINEERING DEPARTMENT

NO SCALE

Rev. 12/07
Rev. 4/05

FORM NO. 504
STANDARD CURB RAMPS
TYPE 1, 2 AND 3

PLAN VIEW TYPE 1 RAMP
(CROSS SECTION SUBURBAN)

LEGEND

- 1/2" EXPANSION J oint-SIDewALK
- CONTRUCTION J oint FIELD LOCATED
- PAVEMENT WARNING CROSSWALK (WHITE)
- ALTERNATIVE LAYOUT

LOCATION OF JOINS MAY BE VARIES
FROM THOSE SHOWN TO BETTER FIT
THE CONCRETE AND/OR LOCAL
GOVERNMENT REQUIREMENTS.

PLAN VIEW TYPE 2 RAMP
(CROSS SECTION SUBURBAN)

GENERAL NOTES
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON
THIS DRAWING SHALL CONFORM TO THE SPECIFICATIONS OF THE
STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

RAMPS SHALL BE BUILT AT 1:21 OR FLATTER. WHEN NECESSARY, THE
SIDEWALK ELEVATION MAY BE LOWERED TO MEET THE HIGH POINT ON THE RAMP.
TYPES 1, 2 AND 3 RAMPS SHALL HAVE A NORMAL SIDEWALK, APPEAR, AND CURB
ON BOTH SIDES OF RAMP.

DETECTABLE WARNING FIELD SHALL BE MEASURED AND PAID BY THE SQUARE FOOT
AS "CURB RAMP DETECTABLE WARNING FIELD" THE CONCRETE PEDESTRIAN CURB.
IF NEEDED, SHALL BE MEASURED AND PAID BY THE LINEAL FOOT AS "CONCRETE
CURB PEDESTRIAN" CONCRETE SIDEWALK IN THE CURB RAMP AREA SHALL
BE MEASURED AND PAID BY THE SQUARE FOOT AS CONCRETE SIDEWALK,
INCLUDING THE AREA UNDER THE DETECTABLE WARNING FIELD.

SURFACE TEXTURE OF THE RAMP SHALL BE OBTAINED BY BROOMING TRANSVERSE
TO THE SLOPE OF THE RAMP.

USE THE TYPE 3 RAMP ONLY WHEN A TYPE 1 OR TYPE 2 CANNOT BE ACHIEVED
BECAUSE OF FIELD CONDITIONS.
STANDARD CURB RAMP

TYPE 1-A

PLAN VIEW

TYPE 1-A RAMP

INO TERRACE

CONCRETE SIDEWALK

DETECTABLE WARNING FIELD (TYPICAL)

PLAN VIEW

DETECTABLE WARNING FIELD

MIN. MAX.

A 1.5" 2.4"

B 0.65" 1.5"

C - -

D 0.9" 1.4"

THE D DIMENSION IS 50% TO 65% OF THE C DIMENSION.

TRUNCATED DOMES DETECTABLE WARNING PATTERN DETAIL

LEGEND

- 1/2 EXPANSION JOINT-SIDEWALK
- CONTRACTION JOINT FIELD LOCATED
- PAVEMENT MARKING CROSSWALK (WHITE)
- ALTERNATIVE LAYOUT

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKSMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

Ramps shall be built at 1:12:00 platter, when necessary, the sidewalk elevation may be lowered to meet the high point on the ramp.

DETECTABLE WARNING FIELD SHALL BE MEASURED AND PAID BY THE SQUARE FOOT AS "CURB RAMP DETECTABLE WARNING FIELD". THE CONCRETE PEDESTRIAN CURB, IF NEEDED, SHALL BE MEASURED AND PAID BY THE LINEAL FOOT AS "CONCRETE CURB PEDESTRIAN". CONCRETE SIDEWALK IN THE CURB RAMP AREA SHALL BE MEASURED AND PAID BY THE SQUARE FOOT AS CONCRETE SIDEWALK, INCLUDING THE AREA UNDER THE DETECTABLE WARNING FIELD.

SURFACE TEXTURE OF THE RAMP SHALL BE OBTAINED BY BROOMING TRANSVERSE TO THE SLOPE OF THE RAMP.
Special Finish Detail
Concrete Sidewalk

3" Troweled Edge
Medium Broom Finish (Typical)

Face of Building Varies
Contractor to Field Verify Building Masonry

1" Expansion Joint (Typical)

2'6" 2'6" 2'6" 2'6" 4'
Varies 14.5' to 15'
Bldg. to Back of Curb

1/2" Expansion Joint (Typical)

5' 2'6" 5' 2'6" 5' 2'6" 3" (Typical)
Face of Curb

No Scale
Existing Entrance Material to Buildings Remain
Troweled Contraction Joint
As Specified (Typical)

Bldg. To Back of Curb
R/W (Typical)
SIDEWALK ANCHORS ARE FOR USE ON SLOPES EXCEEDING 10%
NEW SIDEWALK FINAL MEASUREMENT FOR CORNER LOTS

SHOWING (2) DIFFERENT EXAMPLES OF R.W. LOCATIONS

ANYTHING UNDER 8" THE OWNER PAYS FOR (EXAMPLE, STANDARD SWK SETBACK IS 8" OFF THE PROPERTY LINE).

ANYTHING OVER THE STANDARD SETBACK OF 8" THE CITY PAYS FOR

NOTE A
THE OWNER WOULD NOT PAY ANY MORE THAN 100.67' AS SHOWN IN THIS EXAMPLE.

NOTE B
THE OWNER WOULD NOT PAY FOR 110.0' OF SWK ONLY THE LOT SIZE OF 100' THE CITY WOULD PAY FOR THE 10' OF SWK AS SHOWN.
DETAIL "A"

INSTALL ROOT BARRIER (DEEP ROOT LB12-2)

EXCAVATION & BACKFILL MATERIAL

NEW CONCRETE SIDEWALK

TOP OF ROOT BARRIER 3" BELOW FINISHED SIDEWALK GRADE

COMPACTED CRUSHED AGGREGATE BASE COURSE

DEEP ROOT LB12-2 (SUPPLIED BY CITY)

ROOT BARRIER INSTALLATION
GENERAL NOTES
Details of construction not shown on this drawing shall conform to the standard specifications and special provisions.

CONTRACTION JOINTS
Contraction joints shall be normal to the centerline. The location of contraction joints through intersections shall be shown on the plans or as directed by the engineer.

CONSTRUCTION JOINTS
Construction joints shall be a minimum of a feet from the nearest contraction joint and aligned with parallel to contraction joints or at 90° to the centerline.

Dowel bars shall be installed parallel to the pavement centerline and surface.

CONSTRUCTION JOINTS
Construction joints shall be a minimum of 4 feet from the nearest contraction joint and aligned with parallel to contraction joints or at 90° to the centerline.

Tie bars may be inserted through the header board after the concrete has been placed.

Alternative designs of the dowel assembly may be used when approved by the engineer. Mechanical dowel bar implanters may be used instead of dowel assemblies.

Dowel bars shall be anchored into drill holes with an approved epoxy grout.

The free end of dowel bars shall receive a thin uniform coating of bond breaking grease.

Dowel bars installed by drilling shall be spaced 1"-3" on center. The grouping of dowel bars shall be centered inside the slab based on all the following situations:

Between the edges of pavements without longitudinal joints or between the edge of pavement and nearest longitudinal joint or between two adjacent longitudinal joints.

The clear distance from the edge of pavement or longitudinal joint to the near edge of dowel bar nearest that edge or joint shall be a minimum of 6 inches and a maximum of 14 inches.

TRANSVERSE CONTRACTION JOINTS ABUTTING EXISTING PAVEMENT

Dowel bar detail

CONTRACTION JOINT LOCATIONS

1/8" CONCRETE PAVEMENT

1/8" X 18" DOWEL BARS
ANCHORED INTO EXISTING PAVEMENT

(SEE NOTE 2)

1 1/2" X 1/8" DOWEL BARS
ANCHORED INTO EXISTING PAVEMENT

(SEE NOTE 3)

Dowel Bar Detail

Example Joint Detail

See Table for Joint Spacing

CONSTRUCTION JOINT

DOWELED CONTRACTION JOINT

See joint detail

Pavement Depth, Dowel Bar Size
And Joint Spacing Table

<table>
<thead>
<tr>
<th>Pavement Depth (in)</th>
<th>Dowel Bar Diameter</th>
<th>Joint Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;-6 1/2&quot;</td>
<td>1/4&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>7&quot;-7 1/2&quot;</td>
<td>1/4&quot;</td>
<td>14&quot;</td>
</tr>
<tr>
<td>8&quot;-8 1/2&quot;</td>
<td>1/4&quot;</td>
<td>15&quot;</td>
</tr>
<tr>
<td>9&quot;-9 1/2&quot;</td>
<td>1/4&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>10&quot; &amp; Above</td>
<td>1/4&quot;</td>
<td>18&quot;</td>
</tr>
</tbody>
</table>
A 3/4" felt, beginning & end of curb radius & preformed joints at 100' centers (typ.)

"A", "D", or "H" joints (typ. - see plans)

Skewed joints (typ.)
- 4'-6" in 24.0'
- 4'-0" in 21.5'
- 3'-0" in 18.5'

All centerline MFs shall be constructed having a diamond shape. The min. dimension of concrete shall be 1'-0" from the MF casting to the construction joints. 4"x4" square 1/2" dia. 24" at 2'-6" centers. 2 bars per face of square.

Note: All joints shall have concrete joint sealer, hot poured elastic type ASTM designation D-3405.
CONCRETE PAVEMENT
TYPICAL JOINT DETAIL

DEFORMED EPOXY COATED TIE BAR
1/2" DIA 24" AT 36" O.C.
15" FROM TRANSVERSE JOINT

LONGITUDINAL JOIN (TYPE-B)

D/4
D/2

LONGITUDINAL CONSTRUCTION JOINT
AT EACH EDGE OF 24" SLAB (RURAL)

D/10

DETAIL "A"

TRANSVERSE JOINTS

SPACING 15" O.C.
(PLAIN PAV'T.)

1" EXPANSION
JOINT FILLER
W/JT. SEALER

D/8 DIA SMOOTH DOWEL
(LUBRICATED) 15" AT 12" O.C.
IN A D.O.T APPROVED BASKET

MINIMUM 2" SAW CUTS

ASPH OR GRAVEL

1" EXPANSION
JOINT FILLER
W/JT. SEALER

MIN 2" SAW CUTS

NO SCALE
STANDARD CUL-DE-SAC
JOINT DETAIL
(36' FACE TO FACE)

NOTE: TIE BARS SHALL BE INSTALLED IN ALL LONGITUDINAL JOINTS

NO SCALE

City of Manitowoc
ENGINEERING DEPARTMENT

Rev. 4/05
FORM NO. 517
STANDARD CUL-DE-SAC
JOINT DETAIL
(32' FACE TO FACE)

NOTE: TIE BARS SHALL BE INSTALLED IN ALL LONGITUDINAL JOINTS
CONCRETE MEDIAN SLOPED NOSE DETAIL

GENERAL NOTES

1. DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS AND THE STANDARD SPECIFICATIONS.

2. TIE BARS OR PAVEMENT TIES REQUIRED IN NEW CONCRETE PAVEMENT OR CONCRETE BASE COURSE. TIE BARS SHALL BE NO. N X 2-0' SPACED AT 2-0' C-C. PAVEMENT TIES ARE REQUIRED IN EXISTING CONCRETE BASE COURSE. TIE BARS SHALL BE NO. 8 X 1-0' SPACED AT 2-0' C-C INSTALLED ON A HORIZONTAL DECK OF 0-5. THE DIRECTION OF TIE BARS SHALL ALTERNATE AFTER EVERY ONE OR TWO BARS.

3. SURFACE TYPE AND DETAILS ARE SHOWN ELSEWHERE IN THE PLAN.

4. CONCRETE MEDIAN SLOPED NOSE DETAIL

5. CONCRETE MEDIAN BLUNT NOSE DETAIL

6. CONCRETE SIDEWALK OR ASPHALTIC CONCRETE SURFACE
ALERTATION TO EXIT
CONCRETE SPILLWAY

NEW 8" PVC STORM

PROVIDE OPENING IN CURB FOR 8" STORM PIPE

NEW 18" STANDUP CURB, TIE INTO REMAINING CONCRETE SPILLWAY

FUNNEL CURB TO 8" PIPE

14+00 AT EXISTING SPILLWAY

NO. 4 X 12" EPOXY BARS DRILLED & SPACED 2'-0" C-C (TYPICAL)

REMAINING CONC. SPILLWAY

56.47
56.88
55.93

NEW 8" PVC STEM

EXIST CURB

EXIST SPILLWAY

EXIST MOUNTABLE CURB SAW AT CURB FACE & REMOVE

EXIST CONC SPILLWAY

BACK OF NEW CURB

NO. 4 X 12" EPOXY BARS DRILLED & SPACED 2'-0" C-C (TYPICAL)

56.93

NEW 18" TYPE "A" STANDUP CURB TAPERED TO MATCH EXIST CURB

55.93

56.47

14+00
BLOCKING UP EXISTING OPENINGS IN UNDERGROUND VAULTS

SEAL THE STREET SIDE OF THE NEW & EXIST WALL IN VAULT AREA

EXIST WALL

3/4" DOWELS - 12" LONG DRILLED 6" INTO EXIST WALL

16"

12" CONCRETE BLOCK

EXIST CONCRETE FLOOR

NO SCALE
MOORING PILE DETAIL
TYPE 1

USE MIN. 3000 PSI CONCRETE

14" - 73# "H" PILE
40' LENGTH

3" DIAMETER WELDED TO "H" PILE
NOTES:

1.) ALL INFORMATION SHOWN ON THE UPPER SECTION IS TYPICAL FOR THE LOWER SECTION EXCEPT WHERE NOTED.

2.) THE STREET SIDE OF THE SIDEWALK SHALL BE AT LEAST 1/3 INCH ABOVE THE TOP OF THE CURB FOR EACH FOOT OF DISTANCE FROM THE FACE OF THE CURB.
WRAP BOTH ENDS OF FLEXIBLE 2" WIDE BLACK COTTON WEBBING SUPPORT FABRIC ONCE AROUND STAKE AND SECURE WITH A TIGHT DOUBLE KNOT. USING GALVANIZED SHINGLE NAILS OR GALVANIZED STAPLES, SECURE FABRIC TO BOTH SIDES OF THE STAKE.

2" X 2" PRESSURE TREATED PINE STAKES OR STEEL STAKES POSITIONED ON EAST/WEST AXIS IF POSSIBLE.

CUT AND REMOVE ALL WIRE AND ROPE FROM ROOT BALL.

CUT AND REMOVE BURLAP FROM TOP THIRD OF ROOT BALL.

HARDWOOD CHIPS-4" DEPTH KEEP CHIPS 3" AWAY FROM TRUNK

TOPSOIL-6" MIN. DEPTH

MIX OF PREVIOUSLY REMOVED TOPSOIL AND SUBSOIL

EXCAVATE AREA 3 TIMES THE DIAMETER OF THE ROOT BALL TO A 12" MINIMUM DEPTH

NOTES:
1) SET ROOT BALL ONTO MOUND OF UNDISTURBED SOIL. DO NOT EXCAVATE OR DISTURB THE SOIL DIRECTLY UNDER THE ROOT BALL. SET DEPTH OF HOLE SO THE ROOT COLLAR IS 2" ABOVE FINISHED GROUND GRADE.
2) SCARIFY SIDES OF EXCAVATED HOLE TO 1" MINIMUM DEPTH.
3) SCARIFY SIDES OF ROOT BALL BEFORE BACKFILLING TO RELEASE ROOTS.
SHRUB

HARDWOOD CHIPS
2" TO 3" DEPTH,
KEEP CHIPS 3"
AWAY FROM TRUNK

FINISHED
GRADE

TOPSOIL - 6"
MINIMUM DEPTH

ROOT BALL DIA.
2 TO 3 X ROOT BALL DIA.

SHRUB SHALL BEAR THE
SAME RELATIONSHIP TO
THE FINISHED GRADE AS
IT BORE TO THE PREVIOUS
FINISHED GRADE AS PER
SOIL MARK

SCARIFY BOWL-SHAPED
SIDES OF HOLE

MIX OF PREVIOUSLY REMOVED
TOPSOIL AND SUBSOIL

CUT AND REMOVE BURLAP FROM
THE TOP THIRD OF THE ROOT BALL

SOLID SUPPORT MOUND

STANDARD SHRUB PLANTING
DETAIL

City of Manitowoc
ENGINEERING DEPARTMENT

FORM NO. 702
Rev. 4/05
STABILIZED CONSTRUCTION ENTRANCE
(TRACKING PAD)
INLET SEDIMENT CONTROL DEVICE
(SILT SACK)
SILTSACK®
SPECIFICATIONS

NOTE: THE SILTSACK® WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS.

REGULAR FLOW SILTSACK®
(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th>TEST METHOD</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAB TENSILE STRENGTH</td>
<td>ASTM D-4632</td>
<td>300 LBS</td>
</tr>
<tr>
<td>GRAB TENSILE ELONGATION</td>
<td>ASTM D-4632</td>
<td>20 %</td>
</tr>
<tr>
<td>PUNCTURE</td>
<td>ASTM D-4833</td>
<td>120 LBS</td>
</tr>
<tr>
<td>MULLEN BURST</td>
<td>ASTM D-3786</td>
<td>800 PSI</td>
</tr>
<tr>
<td>TRAPEZOID TEAR</td>
<td>ASTM D-4533</td>
<td>120 LBS</td>
</tr>
<tr>
<td>UV RESISTENCE</td>
<td>ASTM D-4355</td>
<td>80 %</td>
</tr>
<tr>
<td>APPARENT OPENING SIZE</td>
<td>ASTM D-4751</td>
<td>40 US SIEVE</td>
</tr>
<tr>
<td>FLOW RATE</td>
<td>ASTM D-4491</td>
<td>40 GAL/MIN/SQ FT</td>
</tr>
<tr>
<td>PERMITTIVITY</td>
<td>ASTM D-4491</td>
<td>0.55 SEC -1</td>
</tr>
</tbody>
</table>

HI-FLOW SILTSACK®
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th>TEST METHOD</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAB TENSILE STRENGTH</td>
<td>ASTM D-4632</td>
<td>265 LBS</td>
</tr>
<tr>
<td>GRAB TENSILE ELONGATION</td>
<td>ASTM D-4632</td>
<td>20 %</td>
</tr>
<tr>
<td>PUNCTURE</td>
<td>ASTM D-4833</td>
<td>135 LBS</td>
</tr>
<tr>
<td>MULLEN BURST</td>
<td>ASTM D-3786</td>
<td>420 PSI</td>
</tr>
<tr>
<td>TRAPEZOID TEAR</td>
<td>ASTM D-4533</td>
<td>45 LBS</td>
</tr>
<tr>
<td>UV RESISTANCE</td>
<td>ASTM D-4355</td>
<td>90 %</td>
</tr>
<tr>
<td>APPARENT OPENING SIZE</td>
<td>ASTM D-4751</td>
<td>20 US SIEVE</td>
</tr>
<tr>
<td>FLOW RATE</td>
<td>ASTM D-4491</td>
<td>200 GAL/MIN/SQ FT</td>
</tr>
<tr>
<td>PERMITTIVITY</td>
<td>ASTM D-4491</td>
<td>1.5 SEC -1</td>
</tr>
</tbody>
</table>

OIL-ABSORBANT SILTSACK®
(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)

DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK® CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL-ABSORBANT PILLOW INSERT OR, MADE COMPLETELY FROM AN OIL-ABSORBANT SILTSACK®, WITH A WOVEN PILLOW INSERT.

INLET SEDIMENT CONTROL DEVICE
(SILT SACK)
GENERAL NOTES

1. HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.

2. BENCH SHALL BE A MINIMUM OF 4" HIGH & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC, FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.

3. WOOD POSTS SHALL BE A MINIMUM SIZE OF 3/4" X 3/4" OF OAK OR HICKORY.

4. SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.

NOTE: ADDITIONAL POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.

TRENCH DETAIL

SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)
INLET PROTECTION, TYPE A, B, AND C

GENERAL NOTES
INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

1. FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

2. FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.

INSTALLATION NOTES
TYPE B & C
TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HELD OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.
GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS, AND WORKSHIPS NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

A THREE-LANE ROADWAY SHOULD BE MARKED WITH A CENTERLINE FOR TWO-LANE APPROACH OPERATION OR THE APPROACH TO A CROSSING.

ON MULTI-LANE ROADS, THE TRANSVERSE BARS SHOULD EXTEND ACROSS ALL APPROACH LINES, AND INDIVIDUAL R X B SYMBOLS SHOULD BE USED IN EACH APPROACH LANE. ALL LETTERS AND SYMBOLS SHALL BE IN CONFORMANCE WITH THE STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS ADOPTED BY THE FEDERAL HIGHWAY ADMINISTRATION.

CENTER OR LANE LINES AND NO-PASSING ZONE MARKINGS SHOWN ON THIS DRAWING ARE REQUIRED AND PAVED FOR UNDER OTHER ITEMS IN THE CONTRACT.

2. MINIMUM R FROM ANY RAILROAD WARNING DEVICES (SIGNS, GATES, ETC.) OR 25' FROM THE NEAREST RAIL, WHICHVER DISTANCE IS GREATER.
3. REFLECTIVE WHITE.
4. REFLECTIVE YELLOW.
5. TABLE BASED ON 22-4 WISCONSIN SUPPLEMENT OF MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
6. FOR MULTIPLE TRACK CROSSINGS, THE BARRIER LINE SHALL EXTEND TO THE NEAR RAIL OF THE FURTHEST TRACK IN THE DIRECTION OF HIGHWAY TRAVEL.
7. MARKING LINES MAY BE EXTENDED AS DIRECTED BY THE ENGINEER TO MEET ADJACENT NO-PASSING ZONE MARKINGS.

<table>
<thead>
<tr>
<th>Posted Speed (MPH)</th>
<th>Variable Dimension (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>150</td>
</tr>
<tr>
<td>30</td>
<td>200</td>
</tr>
<tr>
<td>35</td>
<td>250</td>
</tr>
<tr>
<td>40</td>
<td>300</td>
</tr>
<tr>
<td>45</td>
<td>400</td>
</tr>
<tr>
<td>50</td>
<td>500</td>
</tr>
<tr>
<td>55</td>
<td>750</td>
</tr>
<tr>
<td>60</td>
<td>1000</td>
</tr>
<tr>
<td>65</td>
<td>1000</td>
</tr>
</tbody>
</table>
GENERAL NOTES

Details of installation, materials and workmanship not shown on the drawing shall conform to the pertinent requirements of the standard specifications and applicable special provisions.

All letters and symbols shall be in conformance with requirements included in "Standard Alphabets for Highway Signs and Pavement Marking" by the Federal Highway Administration. All letters, arrows and symbols shall be white and reflectorized.

A detailed drawing of the handicapped parking symbol is illustrated in the "Standard Highway Signs Manual" by the Federal Highway Administration.
GENERAL NOTES

Details of construction not shown on this drawing shall conform to standard specifications and special provisions.

1. Half-cycle lane markings (25") with 3" minimum stripe length shall be provided on roadways (including temporary traveled ways) with reverse curvature, curvatures of over 5 degrees or when directed by the engineer to make unusual alignment of the traveled way.

2. No-passing zone temporary pavement marking is required to be placed, where appropriate, along with centerline temporary pavement marking when a same day permanent pavement marking item is included in the contract.

NOTE

Arrow symbol ➔ shows direction of travel.
(ISLANDS, STOP LINE & CROSSWALK)

PAVEMENT MARKING

NOTE:
ARROW SYMBOL ➔
SHOWS DIRECTION OF TRAVEL

STOP LINE AND CROSSWALK

1. STOP LINE IS REQUIRED ONLY WHEN SPECIFIED IN THE CONTRACT.

LEFT TURN & MEDIAN ISLAND

MEDIAN ISLAND WITH SLOPED NOSE

RIGHT TURN ISLAND

NO SCALE
TABLE OF NOMINAL DIMENSIONS AND WEIGHS

<table>
<thead>
<tr>
<th>DIMENSION IN INCHES</th>
<th>TYPE OF PIPE</th>
<th>POLYETHYLENE SDR 32.5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CORRUGATED</td>
<td></td>
</tr>
<tr>
<td>PIPE DIAMETER (INSIDE)</td>
<td>A</td>
<td>12</td>
</tr>
<tr>
<td>PIPE LENGTH **</td>
<td>B</td>
<td>24</td>
</tr>
<tr>
<td>WALL THICKNESS</td>
<td>C</td>
<td>0.064</td>
</tr>
<tr>
<td>COVER</td>
<td>D</td>
<td>1 1/4</td>
</tr>
<tr>
<td>FRAME</td>
<td>E</td>
<td>14 1/2</td>
</tr>
<tr>
<td>FRAME</td>
<td>F</td>
<td>8 1/2</td>
</tr>
<tr>
<td>FRAME</td>
<td>G</td>
<td>11 1/2</td>
</tr>
</tbody>
</table>

WEIGHT IN POUNDS *

| FRAME AND COVER | 60 | 60 | 60 | 60 | 100 | 100 | 100 | 165 | 165 | 60 |

* THE ACTUAL WEIGHT OF THE MANHOLE FRAME AND COVER MAY VARY WITHIN 5 PERCENT PLUS OR MINUS OF THE WEIGHTS SHOWN.

** NORMALLY USED LENGTHS, THE PROJECT ENGINEER SHALL DETERMINE IF PIPE LENGTHS OTHER THAN THOSE SPECIFIED SHALL BE USED. TO A MAXIMUM OF 48-INCH CONTINUOUS LENGTH, NON-SPACED. THE ADDITIONAL LENGTH SHALL BE INCIDENTAL TO THE PULL BOX BID PRICE.

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND NOMINATIVELY NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

ALL FRAMES AND COVERS SHALL BE HEAVY DUTY TYPE, SUITABLE FOR VACUITY TRAFFIC LOADS.

PULL BOXES LOCATED IN THE ROADWAYS SHALL HAVE LOCKING COVERS.

ENTRANCE HOLES INTO PULL BOXES SHALL BE COVERED WITH A CIRCULAR HOLE DAP OR HYDRAULIC CONDUIT PUNCH. HOLE SIZE SHALL BE THE OUTSIDE DIAMETER OF THE CONDUIT THAT IS TO FIT IN THE OPENING PLUS NO MORE THAN 1/4 IN.

THE CONTRACTOR SHALL NOT INSTALL WIRE IN ANY PULL BOX UNTIL ITS INSTALLATION HAS BEEN INSPECTED AND ACCEPTED BY THE ENGINEER.

GROUNDING LUGS (MECHANICAL CONNECTORS) SHALL BE ALL LISTED AND APPROVED FOR USE WITH COPPER WIRE. THE MECHANICAL CONNECTION LUGS AND COVER EXTEND TO THE PULL BOX SHALL BE FULLY AND PERMANENTLY SEALED WITH A SEAL OR ALUMINUM CLAMPING COMPOUND AS APPROVED BY THE ENGINEER.

GROUNDING LUGS ARE NOT REQUIRED IN PULL BOXES WHEN VOLTAGES LESS THAN 600 VOLS AC ARE THE ONLY VOLTAGES ENCOUNTERED IN THE BOXES.

DRAIN DUCT SHALL BE MEASURED AND PAID FOR SEPARATELY.

RIGHTEOUS EAST SCREEN SHALL BE 1/6IN STAINLESS STEEL MESH AND BE INSTALLED WITH A STAINLESS STEEL HOE CLAMP OF SUITABLE SIZE.

ALL METALLIC CONNECTOR IN WHICH WIRE AND/or CABLE IS TO BE INSTALLED, SHALL BE BUSHED BEFORE INSTALLATION OF THE WIRE AND/cable.

5.00 603.0 "CONTRACT" APPLIES TO THIS DRAWING.

WHEN PULL BOXES ARE INSTALLED FOR FUTURE USE, DO NOT INSTALL THE EQUIPMENT GROUNDING LUGS. THE EQUIPMENT GROUNDING LUGS AND THE EQUIPMENT GROUNDING ELECTRODE AND THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED AND INSTALLED UNDER A FUTURE WORKING CONTRACT.

IF PULL BOX EQUIPMENT GROUNDING IS REQUIRED USING AN EQUIPMENT GROUNDING ELECTRODE IN EACH PULL BOX, THE ELECTRODE GROUNDING ELECTRODE SHALL BE 1/6 IN DIA, COMPTROL AND BE STAY TIGHTLY BURIED TO A 4- 1/2M, COPPER, STAINLESS STEEL WIRE ANCHOR OR GREEN IXID, THE 4- 1/2M WIRE SHALL BE 8 FEET IN LENGTH, NEARLY COILED, TAPPED AND AVAILABLE FOR USE WHEN REQUIRED.

INSTALL END BOLTS, NUTS AND LOCKNUTS REQUIRED.

EQUIPMENT GROUNDING WIRE FROM NEAREST CAST IRON STRUCTURAL MECHANICAL CONNECTOR, DRAINS OR OTHER EARTHED POINT TO ACCEPT MUG-10 TO # 00 COPPER STAINLESS WIRE.
GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the contract.

- Metallic standard specification 652.2.0 and nonmetallic standard specification 652.3.31. Conduit shall be furnished and placed as shown.

Depth of conduit installed below the traveled way shall be 24 inches minimum and 36 inches maximum.

Depth of conduit installed that is not below the traveled way shall be 18 inches minimum and 24 inches maximum.

Any exception to the maximum depth shall be only with the written approval of the Engineer.

The trench shall not be backfilled prior to inspection of the conduit.

- All metallic conduit runway ends shall be reamed and threaded.
- All metallic conduit in which wire or cable is to be installed shall be blushed with approved threaded bushings before installation of the wire or cable.
- All metallic conduits in which wire or cable is not to be installed shall be capped with threaded protective caps, as approved by the Engineer.
- All nonmetallic conduit shall be capped or plugged immediately after installation and shall remain capped or plugged until wire/cables are installed.
- Nonmetallic conduit in which wire or cable is not being installed shall remain capped or plugged.
- Bending of PVC electrical conduit shall be accomplished by using a blanket or expansion type tank designed for the purpose of bending PVC electrical conduit.
- All cut ends shall be trimmed inside and outside to remove all rough edges on nonmetallic conduit. (See NEC 347.81)

When required to connect nonmetallic conduit to metallic conduit, only UL listed adapter fittings shall be used.

- Prior to conduit acceptance, conduit caps or plugs shall be removed, and the caps, plugs and conduit ends shall be thoroughly cleaned and then the caps or plugs reinstalled to ensure that the caps or plugs can be easily removed in the future.
- All conduit being furnished and installed shall have the serial label firmly attached.
- Conduct runs shall be the same size of conduit from one end to the other from pull box to pull box or junction box to junction box or base to base, etc.
- Poly rope or a pull wire shall be installed as stated in the standard specification.
- Item 652.2.31.

All conduit runs shall be straight (without bends) from pull box to pull box, pull box to base and base to base as shown on the plans unless otherwise approved by the project Engineer.

DRIP TROWEL MASONRY FINISH DEPTH OF CONDUIT AND LENGTH OF FULL BOX VARIES WITH HEIGHT OF CURB USED. ALSO SEE FULL BOX 5.0.0.0. 984

SIDE ELEVATION
DETAIL FOR CONDUIT UNDER PAVED HIGHWAYS
GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the contract.

Loop size, location, number of turns of wire and associated signal phase shall be as shown on the plans.

PVC lead-out conduit to go roadside pull box.

Splices shall be installed by using cast in place splice kits such as 3m type box or approved equal. Non-insulated butt splices to fit 12" and stranded wire shall be used. Splices shall be soldered and insulated from each other as per instructions included in the splice kit.

The ground resistance readings of the loop shall read infinity to ground on an ohm meter using a multiple scale of 1000 ohms, and an input resistance of 10 megohms minimum before splicing the loop to the lead-in cable.

After splicing the loop wire to the loop lead-in cable, the contractor shall measure inductance, ground resistance and loop resistance at the cabinet end of the lead-in cable and furnish a copy of the readings to the project engineer for evaluation.

Anti-seize lubricating material shall be used on all threads of threaded assemblies before installation.

Loop detector leads shall be identified with their associated loop by use of waterproof tags at both ends of the cable. A listing of the cable identification per individual loop lead-in shall be placed in the cabinet.

The 12" and loop wire from the loop to the roadside pull box shall be hand twisted at least 2 twists per foot before installation.

Splices of loop wire to lead-in cable shall be made only in pull boxes at the side of the road.

The 12" and loop wire shall be installed from the roadside pull box through the loop duct, back to the roadside pull box, and be installed in one, non-spliced, continuous length.

Protection of the conduit, conduit and pull box shall be required after installation and before the new concrete pavement is placed.

12" pull box in pavement shall be corrugated steel only.

SECTION A-A
NO CURB & GUTTER
LOOP DETECTOR INSTALLATION DETAILS

Recess pull box so that the cover is 3" below grade in shoulder areas of crushed aggregate. Backfill over cover with the crushed aggregate to bring the area to grade level.

SECTION B-B
CURB & GUTTER
LOOP DETECTOR INSTALLATION DETAILS

TYPICAL PLAN OF LOOP DETECTOR WITH 12" PULLBOX
DETAIL

LOOP SAW CUT (TYP)

6'X20' EXTENSION LOOP (typ)

PAVEMENT JOINTS (TYP)

12' (typ)

6'X30' LOOP (typ)

12' (typ)

6'X30' LOOP (typ)

12' (typ)

SAW CUT ACROSS PAVEMENT

-------------------
LOOP DETECTOR SAW GROOVES 3/4" WIDE X 3" DEEP

6' WIDE BY REQUIRED LENGTH (SEE PLAN)

EXACT LOCATIONS TO BE DETERMINED BY THE FIELD ENGINEER.

NO SCALE

SIGNAL LOOP DETECTOR
SAWED IN EXISTING PAVEMENT
SIGNAL CONDUIT LOCATION
INSIDE OF CONTROL CABINET

2 - 3" CONDUITS
2" 2 - 2" CONDUITS
1 - 1" CONDUIT
1" ELECTRIC SERVICE CONDUIT

25"
2 - 3" CONDUITS
2" 2 - 2" CONDUITS
1 - 1" CONDUIT
1" ELECTRIC SERVICE CONDUIT

3" Flange
2.5" Flange

MANTAINANCE PLATFORM

DOOR

NO SCALE
UNDERGROUND ELEC. SERVICE
TO SIGNAL CONTROL CABINET
ELECTRICAL SERVICE
FROM POWER POLE TO CONTROL CABINET

FREE STANDING CABINET, MODEL EL 712

VERIFY HEIGHT OF SERVICE HEAD WITH ELECTRIC UTILITY

3 *6 CONDUCTORS IN 1" PVC SCHEDULE 40 CONDUIT

100A BYPASS TYPE METER SOCKET BY CONTRACTOR

METER BY ELECTRIC UTILITY

WOODEN ELECTRIC UTILITY POWER POLE

60 AMP CIRCUIT BREAKER SERVICE ENTRANCE DISCONNECT. INTERRUPTING RATING TO EXCEED AVAILABLE FAULT CURRENT FROM ELECTRICAL UTILITY

3 *6 & 1*6 GRD SINGLE PHASE IN 1" PVC SCHEDULE 80 COUNT

2 -5/8" X 8'0" COPPERCLAD GROUND RODS SPACED 6'0" APART

EXISTING GROUND

CONCRETE CABINET BASE TYPE 9

NO SCALE

ELECTRICAL SERVICE TO SIGNAL CONTROL CABINET (FROM A POWER POLE)