Miscellaneous
## Miscellaneous

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<tr>
<th>NO.</th>
<th>DATE</th>
<th>TITLE</th>
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<tr>
<td>MI-101</td>
<td>10-20-15</td>
<td>Fencing Layout</td>
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<td>Chain Link Fence Construction</td>
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### Sidewalks and Driveways

<table>
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<th>DATE</th>
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<td>MI-210</td>
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<td>PCC Driveways and Alleys</td>
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<td>MI-220</td>
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<td>Detectable Warnings and Pedestrian Ramp</td>
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<td>Combined Retaining Wall - Sidewalk</td>
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</tbody>
</table>
Details shown illustrate typical situations and are not intended to cover specific cases. Refer to project plans for particular requirements at various locations.

Do not disturb or destroy any Right-of-Way markers.

Provide 12 inches to 15 inches of clear space between adjoining end post installations.

1. Review the exact location of the posts with the Engineer prior to construction.
2. Contractor has the option to install fence continuously beneath bridges when practical.
3. Contractor has the option to install fence over the top of the culvert if this dimension is a minimum of 50 feet.
4. Floodgate, Floodplain, or Channel Crossing Fence as specified on project plans. Review the exact location of the post with the Engineer prior to construction.
5. Construct corners with posts on the inside, unless wire is cut and wrapped.
Attach chain link fabric to braces, top rail, tension wire, and intermediate posts at intervals of 12 inches maximum.

Refer to MI-104 for fencing at Channel Crossings, Minor Ground Depressions, and Flood Plains.

1. Fabric width will be 8 feet unless specified otherwise.
2. Unless specified otherwise, install gates 18 feet in width. Double gate (shown) is required only for widths more than 16 feet. Exact details of gate design are subject to approval of the Engineer. Furnish gate with approved stop, latch and means for locking. Install as recommended by the manufacturer.
3. End Post used to terminate run of fence if no gate is proposed.
5. Connect bottom tension wire to end posts, angle posts, and pull posts. Install a turnbuckle or other approved tightening device on each continuous span of tension wire.
6. Refer to Post installation detail.

Possible Contract Items:
Chain Link Fence
Chain Link Gate Assembly

<table>
<thead>
<tr>
<th>ITEM</th>
<th>POST SIZE</th>
<th>CONCRETE ENCASEMENT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Nominal Pipe Dia.</td>
<td>Outside Diameter</td>
</tr>
<tr>
<td>Rail</td>
<td>1&quot;</td>
<td>1.963</td>
</tr>
<tr>
<td>Brace Post</td>
<td>1%</td>
<td>1.650</td>
</tr>
<tr>
<td>Line Post</td>
<td>3%</td>
<td>2.375</td>
</tr>
<tr>
<td>Angle, Corner, End, or Pull Post</td>
<td>2%</td>
<td>2.875</td>
</tr>
<tr>
<td>Gate Post for various gate widths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>up to 12 ft.</td>
<td>2%</td>
<td>2.875</td>
</tr>
<tr>
<td>over 12 ft. to 15 ft.</td>
<td>3%</td>
<td>4.000</td>
</tr>
<tr>
<td>over 15 ft. to 24 ft.</td>
<td>6%</td>
<td>6.025</td>
</tr>
</tbody>
</table>

APPROVED BY DESIGN METHODS ENGINEER

MI-104

CHAIN LINK FENCE CONSTRUCTION

STANDARD ROAD PLAN
1. Connect bottom tension wire to end posts, angle posts, corner posts, and pull posts. Install a turnbuckle or other approved tightening device on each continuous span of tension wire.

2. Refer to Post Installation detail.

3. Drive ground rod vertically until the top is 6 inches below the ground surface.

4. Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.

5. Connect bottom tension wire to end posts, angle posts, corner posts, and pull posts. Install a turnbuckle or other approved tightening device on each continuous span of tension wire.

6. Refer to Post Installation detail.

7. Drive ground rod vertically until the top is 6 inches below the ground surface.

8. Secure each end of each run of fabric using a stretcher bar inserted in the final links of the fabric. Use a bar that is as long as the fabric is wide.
Fence wire fabric may be placed on either the road side or the field side of posts, depending on local conditions; i.e., on curves, the wire should be placed on the side which would result in the least amount of tension on the staples. This will also apply where wind, drift, or other conditions would exert unusual pressure against the wire.

Refer to MI-104 for fencing at Channel Crossings, Minor Groud Depressions, and Flood Plains.

Possible Contract Items:
- Deer Fence
- Deer Fence Brace Panel
- Deer Fence Gate
- Field Fence
- Field Fence Brace Panel
- Field Fence Gate

Possible Tabulation:
100-7

Possible Contract Items:
- Deer Fence
- Deer Fence Brace Panel
- Deer Fence Gate
- Field Fence
- Field Fence Brace Panel
- Field Fence Gate

Possible Tabulation:
100-7
1. Brace Panel.

2. Brace Wire: 4 strands of No. 9 wire.

3. Details indicate placement of granular material for certain posts. The Contractor has the option to drive posts if method demonstrated is satisfactory to the Engineer. Granular material will not be required for driven posts.

4. Metal brace 8 feet long.

5. Wrap wire fabric around post.

6. Unless specified otherwise, install a 16 foot gate. Double gate is required only for widths more than 16 feet. Exact details of gate design are subject to the approval of the Engineer. Install as recommended by the manufacturer.
Spring loaded hinge allows tines to spread apart and return to original position.

Two 2 in. x 2 in. x 5/8 in. L top braces held by 1/2 inch diameter bolts.

Attach nut and washer to each bolt.

Support Plate 3 in. x 3/8 in. x 37 in.

2 in. x 2 in. x 54 in. structural steel tubing welded to Hinge Plate.

3/4 in. diameter x 8 in. bolt welded to Support Plate.

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**DEER GATE TOP**

**SUPPORT PLATE**

**HINGE**

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**DESIGNER:**

**APPROVED BY DESIGN METHODS ENGINEER**

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**STANDARD ROAD PLAN**

**DEER FENCE AND FIELD FENCE**

**CONSTRUCTION**

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**IOWA DOT**
FENCE TERMINATION AT BRIDGES

14. Fence termination at bridges, culverts, and other structures as detailed herein will not be paid for separately but will be considered incidental to the bid item "Deer Fence" or "Field Fence."

15. Place minimum of four (4) barbed wires fan shaped, connected to eye bolt on culvert wall or set 4 inch post when necessary.

FENCE TERMINATION AT STRUCTURES

See Detail "A"
CRIMP CONNECTION

Crimp Connectors that will develop a strength of at least 85% of the wire strength.

IN-LINE CONNECTION

Make a minimum of four tight wraps on the connecting wire. Ends of the wrap to be trimmed flush.

SELF-WRAP CONNECTION

Wrap wire around post, rod or other wire. Make a minimum of four tight wraps back around itself. Ends of the wrap to be trimmed flush.

APPROVED WIRE CONNECTIONS

Tension curve consists of a "U" shaped crimp in the fence wires and has the same effect as a spring. Stretch to 50% removal of the factory crimp.

 parenthesis: Crimp connection and in-line connection are also acceptable brace wire splices.

STRETCHING DETAILS

Fence assembly

Before Stretching

After Stretching

Tension Curve

SPLIT WITH ROD

Crimp Connection

Self-Wrap Connections

CRIMP SPLICE

FABRIC SPLICES

End of Stay Wires

In-Line Connection

Splicing Tool

OVERLAP SPLICE

STRETCHING DETAILS

FENCE ASSEMBLY

END POST CONNECTION
BRACE WIRE INSTALLATION

(Brace wire wrapped the same at the bottom of post.)

1. From Wire Roll

STEP 1

2. Brace Wire: 4 strands of No. 9 wire.

STEP 2

3. Metal brace 8 feet long.

STEP 3

4. Set staples cross-wise to the grain. Drive staples tight at pull posts. Drive all other staples firm, but loose enough to allow lateral movement of the wire.

STEP 4

5. Twist the two brace wires together to produce proper tension in the brace assembly.

STEP 5

6. Wrap around post

STEP 6

STAPLES

WIRE ASSEMBLY
Space line brace posts according to MI-103 where fencing is continuous and where end, corner, and line brace posts are not specified.

Double wrap barbed wire and tie off at end posts, corner posts, and line brace posts. Single wrap woven wire and tie off. Restart fence to be continued, in like manner.

Deer and field fence wire may be placed on either the road side or the field side of posts, depending on local conditions. For example, on curves the wire should be placed on the side which will result in the least amount of tension on the staples. This also applies where wind, drift, or other conditions will exert unusual pressure against the wire. Place wire on the upstream side of any stream.

Refer to MI-101, MI-102 and MI-103 for layout of General, Chain Link, Deer, and Fled Fence.

1. Floodgate is part of the Type B Channel Crossing Fence.

2. All extra length posts more than 8 feet long require a minimum embedment of 4 feet. For Flood Plain Fencing, install line posts of treated wood, 4 inches minimum diameter, 8 feet long and spaced at 10 foot centers. Maximum interval of Pull Posts Assembly is 600 feet.

3. For fence at minor ground depressions, additional wood line posts and up to two additional barbed wires will not be paid for directly but will be considered incidental to the price bid for Deer Fence or Field Fence.

4. Provide a minimum of 1/2 to 1 1/2 inches of clear space between adjoining end post installations.

5. Floodgate Panel built from Untreated Rough 1 in. x 8 in. (Nominal) Lumber. More than one Floodgate Panel if required by the contract documents.

6. Use screw-in anchor with twisted wire to hold barb wire at 6" spacing.

Possible Contract Items:
- Type A Channel Crossing Fence
- Type B Channel Crossing Fence
- Flood Plain Fencing

Possible Tabulation:
100-7
CHANNEL CROSSING FENCE - TYPE "A"

- Excavate as necessary to fan wires
- Clear stream bed or normal stream
- Surface approximately 6" to 12"
- 6" spacing

CHANNEL CROSSING FENCE - TYPE "B"

- Excavate as necessary to fan wires
- Clear stream bed or normal stream
- Surface approximately 6" to 12"
- 12" spacing max.

FLOODGATE HINGE AND BRACKET

- Extra Length Post
- Pipe Cap
- Washer
- Nut
- 8 3/8" x 1" min.
- Brackets (Nominal) Lumber
- More than one Floodgate Panel if required by the contract documents.

FLOOD PLAIN FENCE

- 2" Dia. Line Posts
- Measurement for Fence
- End Posts
- Normal Fencing
- Line
- Ground

BARBED WIRE ANCHOR

- 24" Long screw in anchor
- Twisted Wire
- Barbed Wire

FLOODGATE PANEL built from Untreated Rough 1 in. x 8 in. (Nominal) Lumber. More than one Floodgate Panel if required by the contract documents.

Measurement for Fence
- End Posts
- Normal Fencing
- Hinge
- Washer
- Nut
- 8 3/8" x 1" min.

Space line brace posts according to MI-102 where fencing is continuous and where end, corner, and line brace posts are not specified.

Double wrap barbed wire and tie off at posts. Attach chain link fence to braces, top rail, tension wire and posts at intervals of 12 inches. Restart fence to be continued, in like manner.

1. Floodgate is part of the Type B Channel Crossing Fence.
2. Provide a minimum of 12 to 15 inches of clear space between adjoining end post installations.
3. Floodgate Panel built from Untreated Rough 1 in. x 8 in. (Nominal) Lumber. More than one Floodgate Panel if required by the contract documents.
4. Use screw-in anchor with twisted wire to hold barb wire at 6" spacing.
5. All extra length posts more than 8 feet long require a minimum embedment of 4 feet. For Flood Plain Fencing, posts will be 8 feet long and spaced at 10 foot centers.
6. Maximum interval of Pull Posts Assembly is 600 feet.
Special details for entrances other than Cases 1 and 2 are included in the detail plans. The shape and surface of driveways and alleys will vary to fit individual conditions.

Use unreinforced concrete pavement mix with a minimum thickness of 6 inches, unless specified otherwise for driveways and alleys. If an alley drains toward the roadway, use a 2 inch inverted crown; otherwise, use flat surface for driveway pavement.

W is measured at the street side of sidewalk. If sidewalk is not present, W is to be measured at the end of the returns for Case 1 and 10 feet back of curb for Case 2.

1. Transverse Pavement Joints as per detail Project Plans.
2. 'C' Pavement Joint (Refer to PV-101) from end of radius to end of radius.
3. Line at the Back of Curb.
4. 'C' Joint on Centerline.
5. Refer to contract documents for sidewalk construction if the entrance is designed to accommodate sidewalk. Construct sidewalk using the same thickness as the driveway.
6. If the sidewalk is in place at the time of construction, place 'E' Joint along the front edge of the sidewalk. If the sidewalk is reconstructed with the driveway entrance, place 'E' Joint along the back edge of the sidewalk and a 'C' Joint sawed or formed along the front edge of the sidewalk. Refer to PV-101 for joint details.
7. Maximum cross slope is 2% unless specified otherwise in the contract documents.
8. If cross slope of the sidewalk panel exceeds 2%, remove and replace to transition from existing sidewalk to sidewalk through driveway. If elevation change requires a curb ramp, comply with MI-220; verify need for detectable warning panel with Engineer.

Possible Contract Items:
- Driveway, P.C. Concrete
- Driveway, Reinforced P.C. Concrete
- Removal of Paved Driveway
- Sidewalk, P.C. Concrete

Possible Tabulation:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>102-3</td>
<td></td>
</tr>
</tbody>
</table>
**SECTION A-A**
(Case 1 Entrance)

**SECTION B-B**
(Cases 2 Entrance)

**SECTION C-C**
(Standard Curb)

**SECTION C-C**
(Sloped Curb)

**DROPPED CURB**

- K Pavement Joint (Refer to PV-101) from end of radius to end of radius.
- Line at the Back of Curb.
- Taper to Pavement Thickness.
- Lip curb varies from either 4 1/2 inch or 3 inch at back of curb to 0 inch at front of sidewalk.
- Refer to Tabulation 102-3.
- Maximum cross slope is 2% unless specified otherwise in the contract documents.

**SHEET 2 of 2**
Unless curb ramp is aligned perpendicular to the street, provide an area of special shaping at the bottom of the ramp. This area allows the grade break at the bottom of the ramp to be perpendicular to the ramp and provides a smooth transition to gutterline for wheelchair access.

Use vertical curb adjacent to ramp unless flares are specified in the project plans. Install Detectable Warnings so that no gap is left between warning panel and base of curb.

Possible Contract Items:
- Detectable Warnings
- Sidewalk, P.C. Concrete, 6 in.
- Sidewalk, P.C. Concrete, 4 in.
- Removal of Sidewalk

Possible Tabulation:
- 113-1
Unless curb ramp is aligned perpendicular to the street, provide an area of special shaping at the bottom of the ramp. This area allows the grade break at the bottom of the ramp to be perpendicular to the ramp and provides a smooth transition to gutterline for wheelchair access.
LEGEND

- Ramp
- Landing
- Detectable Warnings
- Vegetation

If crossing gate conflicts with location of detectable warning, or if pedestrian crossing gate is provided, place detectable warning panel in advance of the crossing gate.

Detectable Warnings

RAILROAD CROSSING

24" wide (min.) detectable warning
Provide a minimum concrete cover to near reinforcement of 1 1/2 inches. Provide 3 inches minimum cover at the ends of bars.

Top bar parallel to top of wall. Lap 6 inch minimum as necessary. Tie securely.

Use 1" half-round beveled 1"x1" or other approved device.

Expansion Joints

TYPICAL RUSTICATION DETAIL

TYPICAL LONGITUDINAL SECTION OF RETAINING WALL

TYPE B WALL

TYPE A WALL
Provide a minimum concrete cover to near reinforcement of 1 1/2 inches. Provide 3 inches minimum cover at the ends of bars.

Excavate and place backfill material as necessary.

Provide 3 inch diameter weep holes at 8 foot intervals. Install rodent guards in weep holes. Align bottom of weep hole with top of subdrain.

Additional 12 inch width is adjacent to wall.