This mailing contains revisions to the English version of the Road Design Details effective for the 04-21-20 letting.

The green memos, describing the revisions made, should be retained in the "Revision Letters" section in the back of the manuals for future reference.

*Federal and state laws prohibit employment and/or public accommodation discrimination on the basis of age, color, creed, disability, gender identity, national origin, pregnancy, race, religion, sex, sexual orientation, or veteran’s status. If you believe you have been discriminated against, please contact the Iowa Civil Rights Commission at 800-457-4416 or Iowa Department of Transportation’s affirmative action officer. If you need accommodations because of a disability to access the Iowa Department of Transportation’s services, contact the agency’s affirmative action officer at 800-262-0003.*
INSTRUCTIONS: The attached Road Design Details have received approval and may be referred to in the plans by number. Questions concerning information contained on the Road Design Details should be directed to the Methods Section, Design Bureau, telephone (515) 239-1727 or email daniel.harness@iowadot.us.

**NOTE** The following revisions are effective with the 4/21/2020 letting. Projects let prior to this date may reference earlier versions of these Road Design Details.

<table>
<thead>
<tr>
<th>Design Detail</th>
<th>Description of Revision</th>
</tr>
</thead>
</table>

**TYPICAL COMPONENTS**

1L_P_ALT_
- Added 6% to right side shoulder.

1L_P_HMA_
- Added 6% to right side shoulder.

1R_Curb_
- Removed MODIFIED from the detail.

2_AL_Shldr_ALT_
- Removed MODIFIED from the detail.

2_AL_Shldr_C_
- Changed Subgrade Slope to 4%.

2_AL_Shldr_FullPCC
- Removed MODIFIED from the detail.

2_AL_Shldr_G_
- Changed Subgrade Slope to 4%.

2_AL_Shldr_HMA_
- Changed Subgrade Slope to 4%.

2_C_
- Changed Subgrade Slope to 4%.

2_C_FullPCC_
- Removed MODIFIED from the detail.

2_Curb_
- Removed MODIFIED from the detail.

2_E_
- Changed Subgrade Slope to 4%.
2_G_
   Changed Subgrade Slope to 4%.

2_G_SR_
   Changed Subgrade Slope to 4%.

2_P_ALT_
   Removed MODIFIED from the detail.

2_P_FullHMA
   Changed Subgrade Slope to 4%.

2_P_FullPCC_
   Removed MODIFIED from the detail.

2_P_Guard_
   Changed Subgrade Slope to 4%.

2_P_HMA_
   Changed Subgrade Slope to 4%.

2H_
   Removed MODIFIED from the detail.

2H_TWLTL_
   Removed MODIFIED from the detail.

2P_
   Removed MODIFIED from the detail.

2P_TWLTL_
   Removed MODIFIED from the detail.

2RH_
   Removed MODIFIED from the detail.

2RP_
   Removed MODIFIED from the detail.

4_AL_Shldr_ALT_
   Removed MODIFIED from the detail.

4_AL_Shldr_C_
   Changed Subgrade Slope to 4%.

4_AL_Shldr_FullPCC
   Removed MODIFIED from the detail.

4_AL_Shldr_G_
   Changed Subgrade Slope to 4%.

4_AL_Shldr_HMA_
   Changed Subgrade Slope to 4%.
4_C
  Changed Subgrade Slope to 4%.

4_C_FullPCC
  Removed MODIFIED from the detail.

4_P_ALT
  Removed MODIFIED from the detail.

4_P_FullHMA
  Changed Subgrade Slope to 4%.

4_P_FullPCC
  Removed MODIFIED from the detail.

4_P_Guard
  Changed Subgrade Slope to 4%.

4_P_HMA
  Changed Subgrade Slope to 4%.

4DH_Dprs
  Removed MODIFIED from the detail.

4DP
  Removed MODIFIED from the detail.

4DP_Raised_Crowned
  Removed MODIFIED from the detail.

4DP_Raised_Out
  Removed MODIFIED from the detail.

4UP
  Removed MODIFIED from the detail.

6D_Closed_P_FullPCC
  Removed MODIFIED from the detail.

6D_Dprs_P_FullPCC
  Removed MODIFIED from the detail.

6DP_Closed
  Removed MODIFIED from the detail.

6DP_Dprs
  Removed MODIFIED from the detail.

8DP_Closed
  Removed MODIFIED from the detail.

8DP_Dprs
  Removed MODIFIED from the detail.
G_2_Grade
    Removed MODIFIED from detail.

G_2_Grade_BR
    Removed MODIFIED from detail.

G_4D_Grade
    Removed MODIFIED from detail.

G_4D_Grade_Aux
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G_4D_Grade_Aux_Delayed
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G_4D_Grade_Delay
    Removed MODIFIED from the detail.

G_4D_Grade_Delay_S
    Removed MODIFIED from the detail.

Soils_1_
    Changed Subgrade Slope to 4%.

Soils_2_
    Changed Subgrade Slope to 4%.

100's Index

100-21
    Added Flooded Backfill.

110-12
    Modified paragraph I, D, 8.

110-12A
    Voided

113-10A
    New.

200's Index

231-02
    Modified paragraph 1,e

500's Index

500-19
    Void. Replaced by DR-504.

531-02
    Added reference to DR-502 for slotted drain. Replaced Section A-A and deleted Section B-B.
531-03
New.

533-01
Removed MODIFIED from the detail.

533-02
Removed MODIFIED from the detail.

533-03
Removed MODIFIED from the detail.

533-04
Removed MODIFIED from the detail

533-05
Removed MODIFIED from the detail.

560-05
Added YLW2.

570-7
Removed circle note 1 and modified general notes.

3000’s Index

3221
Modified inside shoulder slopes to 4%.

4000’s Index

4317
Added Designer Info button.

4318
Added Designer Info button.
## Typical Components - Backbones

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<tbody>
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<td>1 Lane HMA Loop</td>
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<td>2 Lane Existing Pavement</td>
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<tr>
<td>2H_</td>
<td>04-21-20</td>
<td>2 Lane HMA</td>
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## Typical Components - Backbones

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<td>2_P_Guard_</td>
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# Typical Components - Shoulders

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<td>4_P_Guard_</td>
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<td>Paved Shoulder at Guardrail</td>
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<td>Rural Full Depth PCC Shoulder</td>
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<td>Retrofit Combination Shoulder</td>
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<td>Soils_1_</td>
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<td>Granular Shoulder for Slide Repair</td>
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## Typical Components - Auxiliary Lanes

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# Typical Components - Auxiliary Lane Shoulders

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<td>Full Depth PCC Shoulder</td>
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<tr>
<td>2_AL_Shldr_G_</td>
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<td>Granular Shoulder</td>
</tr>
<tr>
<td>2_AL_Shldr_HMA_</td>
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<td>HMA Shoulder</td>
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<td>Paved Shoulder Alternates</td>
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<td>HMA Shoulder</td>
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Construction
Earth Shoulder
Backfill
Special
3'
1'
4'
2%
2%
10:1
4'

Normal Foreslope
Earth Shoulder Construction
Special Backfill

7" PCC OR 8" HMA SHOULDER

Subdrain

Longitudinal joint: B
HMA Shoulder Jointing:
Transverse joints: C at 17' spacing

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5

Paved Shoulder Alternates

<table>
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04-21-20
1L_P_ALT_
Curbed Shoulder

Shoulder jointing:
- Longitudinal joint not required when distance from back of curb to nearest joint is less than 16:
- Transverse: C at 17” spacing
- Single pour: L-2
- Staged: KT-2

Subdrain

Possible Joint

Earth Shoulder Finishing

Possible Joint

Earth Shoulder Finishing

Subdrain
Construction
Earth Shoulder
Backfill
Special
4%
10:1
Normal Foreslope
7" PCC OR 8" HMA SHOULDER

Paved Shoulder Alternates
PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 17' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_AL_Shldr_ALT_
04-21-20

Feet
Auxiliary Lane
Full Depth Shoulder
Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17' spacing

2_AL_Shldr_FullPCC_
04-21-20
Construction

Earth Shoulder

Granular

4%

10:1

Normal Foreslope

Granular Shoulder

4'

3'

4%

Granular Shoulder

4%

10:1

Normal Foreslope

Granular Shoulder

4'

4'

4%

Ear Shoulder Construction
Construction
Earth Shoulder
Backfill
Special
3'
P
Norma Foreslope
4%
10:1
4'
8" HMA SHOULDER
4%

Auxiliary Lane
HMA Shoulder
Shoulder Jointing:
Longitudinal joint: B

2_AL_Shldr_HMA_
04-21-20

Feet

P
Shoulder Jointing: Combination Shoulder

Auxiliary Lane
Combination Shoulder

Shoulder Jointing: B

Longitudinal joint: B

6" HMA SHOULDER

Granular Backfill

Special Backfill

Earth Shoulder Construction

Granular Shoulder

Normal Foreslope

4'

3'

10:1

4%
Combination Shoulder
Shoulder Jointing: Combination Shoulder
Longitudinal joint: B

STATION TO STATION

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<tr>
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2.C.
04-21-20
Curbed Shoulder

Shoulder Jointing:
Longitudinal joint not required when distance from back of curb to nearest joint is less than 15'.

Single pour: L-2
Staged: KT-2
Transverse: C at 17' spacing

STATION TO STATION

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2 Curb
04-21-20
Subdrain

Normal Foreslope

E 3'
4%
10:1

Shoulder Earth

4%
3'

Subdrain

STATION TO STATION

Earth Shoulder

2_E_
04-21-20

STATION TO STATION

E

Feet

<p>| | |</p>
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Granular Shoulder with Safety Edge

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<td>2_G_</td>
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### Normal Foreslope

- **1'**
- **3'**
- **Subdrain**
- **Special Construction**
- **Earth Shoulder**
- **10:1**
- **4'**
- **4%**
- **7" PCC OR 8" HMA SHOULDER**

### Paved Shoulder Alternates

**PCC Shoulder Jointing:**
- Longitudinal joint: BT-1 or BT-5
- Transverse joints: C at 17' spacing

**HMA Shoulder Jointing:**
- Longitudinal joint: B

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<th>Station to Station</th>
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<tr>
<td><strong>Paved Shoulder Alternates</strong></td>
<td>04-21-20</td>
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- **Special Backfill**
- **Subdrain**
- **4" PCC OR 8" HMA SHOULDER**
Full Depth HMA Shoulder
Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION

<p>| | |</p>
<table>
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</table>

04-21-20

2_P_FullHMA_
Normal Foreslope

Earth Shoulder

Construction

Subdrain

4% 3' 10:1

X" PCC SHOULD

X" PCC SHOULD

Subdrain

Full Depth PCC Shoulder

Shoulder Jointing:

Longitudinal joint: L-2 or KT-2

Transverse joints: C at 17' spacing

2_P_FullPCC_

04-21-20

STATION TO STATION

Feet
Normal Foreslope

Earth Shoulder Construction Special Backfill

X" HMA OR X" PCC SHOULDER

Subdrain

Normal Foreslope

Special Backfill

Earth Shoulder Construction

X" HMA OR X" PCC SHOULDER

Subdrain

Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION

Paved Shoulder at Guardrail

2021-04-21
P

<table>
<thead>
<tr>
<th>2_P_Guard_</th>
<th>04-21-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATION TO STATION</td>
<td>Feet</td>
</tr>
</tbody>
</table>
PROFILE GRADE XX" P.C. CONCRETE PAVEMENT
XX" GRANULAR SUBBASE
XX" P.C. CONCRETE PAVEMENT

Match Line
Match Line

12' 24'

PROFILE GRADE

2% 2% 2% 2%

L-2
Longitudinal joint: CD at 17' spacing
Transverse joints:
Mainline Jointing: L-2

2P_
04-21-20

STATION TO STATION
STATION TO STATION

<table>
<thead>
<tr>
<th>Feet</th>
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</thead>
<tbody>
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</tbody>
</table>

Mainline Jointing:
- Transverse joints: CD at 17' spacing
- Longitudinal joint: L-2
Section shown in the direction of traffic.

Match Line

24'

2% → PROFILE GRADE

2% →

6" MODIFIED SUBBASE

X" SURFACE COURSE

X" INTERMEDIATE COURSE

X" BASE COURSE

BEGIN STATION

END STATION

2RH_

04-21-20
PROFILE GRADE

XX" P.C. CONCRETE PAVEMENT

6" MODIFIED SUBBASE

Section shown in the direction of traffic.

Ramp Jointing:
- Transverse joints: CD at 17' spacing.
- Longitudinal joint: L-2

<table>
<thead>
<tr>
<th>BEGIN STATION</th>
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</tbody>
</table>

Match Line

Match Line

12'

24'

2% 2% 2%
Paved Shoulder Alternates

** Auxiliary Lane **

PCC Shoulder Jointing:
- Longitudinal joint: BT-1 or BT-5
- Transverse joints: C at 17' spacing

HMA Shoulder Jointing:
- Longitudinal joint: B

7" PCC OR 8" HMA SHOULDER

Earth Shoulder Construction
Special Backfill

Normal Foreslope

Longitudinal joint:  B
HMA Shoulder Jointing:
Transverse joints: C at 17' spacing
04-21-20

4_Al_Shldr_ALT_
Auxiliary Lane
Full Depth Shoulder
Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17' spacing

4_AL_Shldr_FullPCC_
04-21-20

Earth Shoulder Construction
Special Backfill

Normal Foreslope

X" PCC SHOULDER
Construction Earth Shoulder Backfill Special

Normal Foreslope 4% 10:1
8" HMA SHOULDER

4% Earth Shoulder Construction Special Backfill

3' 1' 3'

Auxiliary Lane
HMA Shoulder
Shoulder Jointing: Longitudinal joint: B

4_AL_Shldr_HMA_
04-21-20

4 Feet
**Combination Shoulder**

Shoulder Jointing:
Longitudinal joint: B

<table>
<thead>
<tr>
<th>Direction of Travel</th>
<th>BEGIN STATION</th>
<th>END STATION</th>
<th>P</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

4.C. 04-21-20
Full Depth PCC Combination Shoulder

Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17” spacing

Direction of Travel
<table>
<thead>
<tr>
<th>BEGIN STATION</th>
<th>END STATION</th>
<th>P Feet</th>
<th>G Feet</th>
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</thead>
<tbody>
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</tbody>
</table>
Paved Shoulder Alternates

PCC Shoulder Jointing:
- Longitudinal joint: BT-1 or BT-5
- Transverse joints: C at 17' spacing

HMA Shoulder Jointing:
- Longitudinal joint: B

<table>
<thead>
<tr>
<th>Direction</th>
<th>BEGIN STATION</th>
<th>END STATION</th>
<th>P</th>
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<tbody>
<tr>
<td>Travel</td>
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</tbody>
</table>

04-21-20

4_P_ALT_
Full Depth HMA Shoulder

Shoulder Jointing: Normal Fore slope
Longitudinal joint: B

<table>
<thead>
<tr>
<th>Direction of Travel</th>
<th>BEGIN STATION</th>
<th>END STATION</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
Full Depth PCC Shoulder

Shoulder Jointing:
- Longitudinal joint: L-2 or KT-2
- Transverse joints: C at 17' spacing

<table>
<thead>
<tr>
<th>Direction</th>
<th>BEGIN STATION</th>
<th>END STATION</th>
<th>P</th>
<th>Feet</th>
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</tbody>
</table>

4_P_FullPCC_04-21-20
Paved Shoulder at Guardrail

PCC Shoulder Jointing:
- Longitudinal joint: BT-1 or BT-5
- Transverse joints: C at mainline spacing

HMA Shoulder Jointing
- Longitudinal joint: B

<table>
<thead>
<tr>
<th>Direction of Travel</th>
<th>BEGIN STATION</th>
<th>END STATION</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
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04-21-20 4_P_Guard_
0% Construction Match Line MW/2 Match Line

Section shown in the direction of traffic.

<table>
<thead>
<tr>
<th>Direction of Travel</th>
<th>BEGIN STATION</th>
<th>END STATION</th>
<th>MW (Feet)</th>
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</tbody>
</table>
Section shown in the direction of traffic.

Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2

<table>
<thead>
<tr>
<th>Direction of Travel</th>
<th>BEGIN STATION</th>
<th>END STATION</th>
<th>MW Feet</th>
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</tbody>
</table>

4DP_00-21-20
Match Line

2% ← 2%

X" GRANULAR SUBBASE

XX" P.C. CONCRETE PAVEMENT

PROFILE GRADE

← 2.5%

← 2.5%

← 2%

← 2%

KT-2

12'

KT-3

2%

2%

KT-2

2.5% →

2.5% →

12'

12'

12'

12'

Mainline Jointing:
Transverse joints: CD at 17' spacing

4UP
04-21-20

STATION TO STATION
Subdrain ← 3% ← 3% Normal Foreslope

X" PCC SHOULDER

Earth Shoulder Construction

Subdrain 12' 3'

10:1 → 4'

Construction Earth Shoulder

3% → 3% Normal Foreslope

X" PCC SHOULDER

Subdrain 12' 3'

10:1 → 4'

Full Depth PCC Shoulder

Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17" spacing

Shoulder Jointing:

Transverse joints: C at 17" spacing

BEGIN STATION END STATION

6D_Closed_P_FullPCC_ 04-21-20
Full Depth PCC Shoulder

Shoulder Jointing:
- Longitudinal joint: L-2 or KT-2
- Transverse joints: C at 17' spacing

Construction
- Earth Shoulder
- Normal Foreslope
- Subdrain

Diagram:
- Earth Shoulder Construction
- Normal Foreslope
- Subdrain
- X" PCC SHOULDER
- 3% → 3% → 10:1 → Normal Foreslope
- 12' 13' 4' 3' 10:1
XX" P.C. CONCRETE PAVEMENT
12" SPECIAL BACKFILL
X" GRANULAR SUBBASE

KT-3
KT-3
KT-3
KT-3
KT-2
KT-2
KT-2
E
E
PROFILE GRADE
3% → 3% → 3% → 3% → 3%

Subrain

Match Line

12' 12' 12' 12' 12' 12' 12' 12'
12'
12' 12'
12' 12'
12' 12'
12' 12'
12' 12'
4'

Mainline Jointing:
Transverse joints: CD at 17' spacing

6DP_Closed_
04-21-20

BEGIN
STATION

END
STATION
Section shown in the direction of traffic.
Mainline Jointing: CD at 17' spacing

Match Line

Construction

XX" P.C. CONCRETE PAVEMENT

MATCH LINE

KT-3

12'

0%

2% →

2% →

2.5% →

MATCH LINE

KT-3

12'

12'

Profile Grade

← 2%

← 2%

← 2%

2.5% →

CD at 17' spacing

Transverse joints:

Mainline Jointing: CD at 17' spacing
## Grading Typicals

<table>
<thead>
<tr>
<th>NO.</th>
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<th>TITLE</th>
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<tr>
<td>G_1R_Grade</td>
<td>04-15-14</td>
<td>Ramp Grading</td>
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<tr>
<td>G_2_Grade</td>
<td>04-21-20</td>
<td>2 Lane Grading</td>
</tr>
<tr>
<td>G_2_Grade_BR</td>
<td>04-21-20</td>
<td>2 Lane Grading (Barnroof Section)</td>
</tr>
<tr>
<td>G_2_GradeGran</td>
<td>10-17-17</td>
<td>Grading and Granular Surfacing</td>
</tr>
<tr>
<td>G_4D_Grade</td>
<td>04-21-20</td>
<td>4 Lane Grading</td>
</tr>
<tr>
<td>G_4D_Grade_Aux</td>
<td>04-21-20</td>
<td>4 Lane Grading with Auxiliary Lanes</td>
</tr>
<tr>
<td>G_4D_Grade_Aux_Delayed</td>
<td>04-21-20</td>
<td>4 Lane Grading with Auxiliary Lanes (Delayed Paving)</td>
</tr>
<tr>
<td>G_4D_Grade_Delay</td>
<td>04-21-20</td>
<td>4 Lane Grading (Delayed Paving)</td>
</tr>
<tr>
<td>G_4D_Grade_Delay_S</td>
<td>04-21-20</td>
<td>4 Lane Grading with Optional Subgrade Treatment (Delayed Paving)</td>
</tr>
<tr>
<td>G_6_Grade_Closed</td>
<td>10-16-18</td>
<td>6 Lane Grading (Closed Median)</td>
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<tr>
<td>G_6_Grade_Depressed</td>
<td>10-16-18</td>
<td>6 Lane Grading (Depressed Median)</td>
</tr>
<tr>
<td>G_8_Grade_Closed</td>
<td>10-16-18</td>
<td>8 Lane Grading (Closed Median)</td>
</tr>
<tr>
<td>G_8_Grade_Depressed</td>
<td>10-16-18</td>
<td>8 Lane Grading (Depressed Median)</td>
</tr>
</tbody>
</table>
Normal section shown may be altered at the discretion of the Engineer. sweater areas specifically designated by the Engineer.

See plan & profile sheets and cross sections for additional details of ditch and back slopes.

2 LANE GRADING
Normal section shown may be modified appropriately in areas requiring drainage and other construction specifically designated by the Engineer.

See Plan & Profile sheets and cross sections for additional details of sections and backfills.

2 LANE GRADING
(Barnroof Section)
Refer to project plan and cross sections for specific location of foreslope change.

Ground Natural

Ditch Depth

4 LANE GRADING

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

See Plan & Profile sheets and cross sections for additional details of ditches and embankments.
FILL

PROFILE GRADE

X

6:1

MW

L

R

BW

4%

1%

Ground

Natural

Elevation

Profile Grade

ROAD IDENTIFICATION

STATION TO STATION

LOCATION

DIMENSIONS

Feet

Inches

Feet

Feet

3.5:1

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.

Activity: 4 Lane Grading

Profile Grade, Elevation

2 inch Change

Natural

2 inch Change

2 inch Change

GRADE

CUT

Ditch

Ditch

2' min

0%

3:1

CUT

0%

0%

9

0

10'

10'

Ditch

Ditch

2' min

0%

3:1

Normal section shown may be modified appropriately in areas of
locations specifically designated
by the Engineer.

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Auxiliary Lane Grading

Refer to project plan and cross sections
for specific location of foreslope change.

See Plan & Profile sheets
and other details of
sections and plan type.
Normal section shown may be modified appropriately to meet special conditions. Locations specifically designated by the Engineer.

Refer to project plans and cross sections for specific location of foreslope changes.
Normal section shown may be modified in accordance with the criteria established herein or other criteria specifically designated by the Engineer.

4 LANE GRADING (Delayed Paving)

ROAD IDENTIFICATION  STATION TO STATION  Feet  Feet  Inches  Feet  Feet

See Plan & Profiles sheets for additional details of ditches and swales.

Refer to project plans and cross sections for specific location of foreslope changes.

Table for dimensions:

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

04-21-20
G_4D_Grade_Delay
4 LANE GRADING
(Delayed Paving - Select Soil)

4 LANE GRADING
(Delayed Paving - Special Backfill)
(Optional)

**LOCATION**
- MILE IDENTIFICATION: STATION TO STATION

**DIMENSIONS**
- LOCATION
- MILE IDENTIFICATION
- STATION TO STATION

---

**PLAN VIEW**
- DETAIL 'A' - DRAIN FOR SPECIAL BACKFILL SUBGRADE TREATMENT

**PROFILE VIEW**
- DETAIL 'A' - DRAIN FOR SPECIAL BACKFILL SUBGRADE TREATMENT

---

- Refer to project plan and detail sections for specific location of roadway changes.
- See Detail 'A'.
- Drainage of subgrade as necessary to prevent damage to the subgrade. The additional excavation and special backfill for special sections will be paid for separately.
- Compaction with Moisture Control for gravel fill is required. Maintain moisture content within limits specified in Article 2107.03, H, 1 of the Standard Specifications.

---

- Special backfill is incidental to the construction of the roadway.
- Excavate a portion of subgrade as necessary to provide drainage for the subgrade. The additional excavation and special backfill for special sections is not included and will not be paid for separately.
- See Plan & Profiles sheets and other sections for additional details of special sections.
- Quantity calculations based on Section 'B'.
Granular Shoulder for Slide Repair

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Soils_1_
04-21-20
Combination Shoulder for Slide Repair

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<td>Temporary Sediment Control Basin</td>
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<td>Stormwater Drainage Basin and Storage</td>
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## Estimate of Quantities

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<td>Grate Intake Sediment Filter Bag</td>
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**FILL FOR CULVERTS USED IN BRIDGE REPLACEMENTS**  
Possible Details: 4317 and 4318

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<th>Location</th>
<th>Pavement</th>
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<th>Subdrain Outlet*</th>
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* Not a bid item
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<td>08-01-08</td>
<td>Curb Removal</td>
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<td>Salvage and Removal of Buildings</td>
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<td>Sanitary or Storm Sewer Abandonment or Removal</td>
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<td>Removal of Light Poles and Concrete Footings</td>
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<tr>
<td>110-17</td>
<td>04-18-17</td>
<td>Clearing and Grubbing</td>
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</table>
This project is regulated by the requirements of the Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) Individual Storm Water permit. The Contractor shall carry out the terms and conditions of this permit and the Pollution Prevention Plan (PPP). This Base PPP includes information on Rules and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection and Monitoring, and Mitigation Measures. It is based on the recognized practices required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.

I. ROLES AND RESPONSIBILITIES

A. Designer:
1. Prepares Base PPP included in the project plan.
2. Prepares Notice of Intent (NOI) submitted to Iowa DNR. The NOI shall be prepared by contract modification, and be readily available for review.

B. Contractor:
1. Signs a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
2. Designs a Water Pollution Control Manager (WPCM) who has the duties and responsibilities as defined in Section 2002 of the Standard Specifications.
3. Submits an Erosion Control Implementation Plan (ECIP) and ECIP updates according to Section 2002 of the Standard Specifications.

II. PROJECT SITE DESCRIPTION

A. This Pollution Prevention Plan (PPP) is for the construction of a *Describe Type of Facility*.

B. This PPP covers approximately *Provide # Of Acres* acres with an estimated *Provide # of Acres* acres being disturbed. The estimated weighted average runoff coefficient number for this PPP after completion will be *Provide runoff coefficient number*.

C. APPROVED STATE OR LOCAL PLANS

1. Prepares Base PPP whenever there is a change in design, construction, operation, or maintenance which has a significant effect on the discharge of pollutants from the project.
2. Maintains an up-to-date record that identifies contractors and subcontractors regarding storm water requirements.
3. Makes plans available to the DNR upon their request.
4. Conducts joint inspection of the site with the contractor/subcontractor.
5. Completes an inspection report after each inspection.

III. MAINTENANCE PROCEDURES

A. The Contractor is required to maintain all temporary erosion and sediment controls measures in proper working order, including cleaning, repairing, or replacing them throughout the construction period. This shall begin when the features have lost 50% of their capacity.

IV. MAINTENANCE PROCEDURES

A. The Contractor’s ECIP specified in Article 2002.05 of the Standard Specifications for specification of storm water controls should clearly describe the intended sequence of work activities, and for each activity define the control measure and the timing during the construction process that the measure will be implemented. This may include velocity dissipation devices at discharge structures, or sediment basins designed to receive sediment and storm water. If included with this project, these items are located in the storm water site map (when included), Estimated Project Quantities (100-8A, 100-1A, or 100-1C), and Reference Specification Information (100-4A) located in the C sheets. Additional information may be found in the Tabulations in the C or T Tabulation sheets, or in referenced in Section 2105 of the Standard Specifications.

B. Structural Practices

1. Structural practices shall be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Additionally, structural practices may include:  
   a. Stockpiles - Stockpiles shall be adequately and timely addressed and not allowed to adversely affect storm water or storm water quality. If included with this project, these items are located in the storm water site map (when included), Estimated Project Quantities (100-8A, 100-1A, or 100-1C), and Reference Specification Information (100-4A) located in the C sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on the project can be found on the B sheets or are referenced in the Standard Road Plans Tabulation (100-4) located in the C sheets.

2. Storm Water Management

1. Stormwater management practices shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. This may include velocity dissipation devices at discharge structures, or sediment basins designed to receive sediment and storm water. If included with this project, these items are located in the storm water site map (when included), Estimated Project Quantities (100-8A, 100-1A, or 100-1C), and Reference Specification Information (100-4A) located in the C sheets.

1. Stockpile Management - Implement controls to reduce or eliminate pollution of storm water from stockpiles of soil and storm water.
2. Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as specifically allowed by permit.
4. Concrete Residuals and Washout Wastes - Washout shall not be discharged to a surface water and is not allowed to adversely affect storm water water bodies. If included with this project, these items are located in the storm water site map (when included), Estimated Project Quantities (100-8A, 100-1A, or 100-1C), and Reference Specification Information (100-4A) located in the C sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on the project can be found on the B sheets or are referenced in the Standard Road Plans Tabulation (100-4) located in the C sheets.

2. OTHER STORM WATER MGMT.

A. Contractor disposal of unused construction materials and material construction waste shall comply with applicable state and local waste disposal laws, rules and regulations, or other regulations, laws, or regulations.

B. Stormwater Management Storage and Maintenance Areas - Perform on site fueling and maintenance in accordance with all state and local laws, rules and regulations, or other regulations.

C. Stockpile Management - Implement controls to reduce or eliminate pollution of storm water from stockpiles of soil and storm water.

D. Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as specifically allowed by permit.

E. Spill Prevention and Control - Implement chemical spill and leak prevention and response procedures to contain and control accidental spills.

F. Concrete Residuals and Washout Wastes - Washout shall not be discharged to a surface water and is not allowed to adversely affect storm water water bodies. If included with this project, these items are located in the storm water site map (when included), Estimated Project Quantities (100-8A, 100-1A, or 100-1C), and Reference Specification Information (100-4A) located in the C sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on the project can be found on the B sheets or are referenced in the Standard Road Plans Tabulation (100-4) located in the C sheets.

1. Stockpile Management - Implement controls to reduce or eliminate pollution of storm water from stockpiles of soil and storm water.
2. Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as specifically allowed by permit.

IV. MAINTENANCE PROCEDURES

A. The Contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.
V. INSPECTION REQUIREMENTS
   A. Inspections shall be made jointly by the Contractor and the Contracting Authority at least once every seven calendar days. Storm
      water monitoring inspections will include:
      1. Date of the inspection.
      2. Summary of the scope of the inspection.
      3. Name and qualifications of the personnel making the inspection.
      4. Review of erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving
         waters.
      5. Identification of corrective actions required to maintain or modify erosion and sediment control measures.
      6. Major observations related to the implementation of the PPP.
      7. Review of erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all
deficiencies found within 3 calendar days of the inspection and complete within 7 calendar days following the inspection. If it is determined
that making the corrections less than 72 hours after the inspection is impracticable, it should be documented why it is impracticable and indicate
an estimated date by which the corrections will be made.

   B. Include storm water monitoring inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control
measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found within 3 calendar days of the
inspection and complete within 7 calendar days following the inspection. If it is determined that making the corrections less than 72 hours after
the inspection is impracticable, it should be documented why it is impracticable and indicate an estimated date by which the corrections will be
made.

VI. NON-STORM WATER DISCHARGES
   This includes subsurface drains (i.e. longitudinal and standard subdrains) and slope drains. The velocity of the discharge from
these features may be controlled by the use of headwalls or blocks, Class A stone, erosion stone or other appropriate materials. This also
includes uncontaminated groundwater from dewatering operations, which will be controlled as discussed in Section III of the PPP.

VII. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION
   Silts, sediments, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event.
   Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be
   conveyed and controlled per this PPP.

VIII. DEFINITIONS
   A. Base PPP - Initial Pollution Prevention Plan.
   B. Amended PPP - May include Plan Revisions or Contract Modifications for new items, storm water monitoring inspection reports, and
      field book entries made by the inspector.
   C. IDR - Inspector’s Daily Report – this contains the inspector’s daily diary and bid item postings.
   D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize
      contaminants from other types of waste or materials. Also called Best Management Practices (BMPs).
   E. Signature Authority - Representative authorized to sign various storm water documents.

CERTIFICATION STATEMENT
   I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance
with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry
of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information
submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for
submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature

Printed or Typed Name

Signature
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<td>Pedestrian Channelizers</td>
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### SIDEWALK COMPLIANCE

See 5 Sheets

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<th>Elevation</th>
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1. Does not include curb
2. Staking required by Contracting Authority per Article 2511.03 of the Standard Specifications.
3. Refer to tabulation 113-03 for this quantity.

FOR INFORMATION ONLY:

VALUES USED TO DETERMINE DESIGNED SLOPES

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113-100

06-21-20
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<td>Erosion Control (Stabilizing Crop Seeding)</td>
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For all herbicide applications, the following provisions shall apply.

1. Follow all laws, rules and regulations related to the handling of pesticides, including but not limited to:
   a. Follow all herbicide label directions, restrictions, and precautions.
   b. The company responsible for the herbicide applicator must be licensed with Iowa Department of Agriculture and Land Stewardship (IDALS) as a commercial pesticide applicator company.
   c. The person applying the herbicide must be certified through IDALS as a pesticide applicator in Category 6, Right-of-Way. For herbicide applications that require an aquatic certification, the applicator must also be certified as a pesticide applicator in Category 5, Aquatics.
   d. Use herbicide and adjuvant products labeled for the application site:
      i. For applications on the primary highway right-of-way, use only products labeled for use on highway rights-of-way or roadsides.
      ii. For applications to or over water, use only products labeled for corresponding use in aquatic sites, unless intermittent pockets of standing water, such as tire ruts, and the product is labeled for such use.
      iii. For applications to areas in the water conveyance portion of the ditch that do not contain water at the time of application, use only products labeled for non-irrigation ditch banks or aquatic sites.
   e. Do not apply any herbicide to or over standing or flowing water unless required coverage is obtained under a National Pollutant Discharge and Elimination System (NPDES) Pesticide Discharge Permit through Iowa DNR. If standing or flowing water is encountered in areas when they need to be sprayed, notify Iowa DOT (Roadside Development) to determine required coverage.

2. Schedule work according to weather conditions and take measures to avoid off-target damage, such as runoff, leaching, drift and volatilization.
   a. Do not spray herbicide 24 hours prior to forecast precipitation that is expected to cause significant runoff conditions.
   b. For areas with saturated soil, such as ditch bottoms, do not spray herbicide 24 hours prior to forecast precipitation, unless using products labeled for aquatic sites.
   c. For conventional applications, avoid applications when wind speed exceeds 10 mph. For invert applications, avoid applications when wind speed exceeds 15 mph.
   d. For conventional foliar applications, use a drift retardant and maintain drift control throughout the application period by adding more to the tank as it breaks down from agitation.
   e. Avoid spraying volatile products when temperatures are forecast to exceed 85° F within 3 days.
   f. Check the IDALS Sensitive Crops Directory and do not spray adjacent to a listed operation when wind is blowing towards it.

3. Respond to allegations of any off-target damage attributed to handling and spraying of herbicide.

4. Provide the following documents to the Engineer for approval not less than 2 weeks prior to the application.
   a. A copy of the herbicide and adjuvant labels, including any applicable supplemental labels.
   b. A copy of the herbicide and adjuvant Material Safety Data Sheets (MSDS.)

5. Have copies of the herbicide and adjuvant labels and MSDSs on-hand and at locations of storage, transport, and application.

6. Schedule work to maximize efficiency of the herbicide application in relation to weather conditions and plant growth stage. Follow any label recommendations given as “for best results.”
   a. For weed applications:
      i. To determine if weeds are “actively growing,” use as a guideline that there needs to have been at least 1 hour of temperature above 65° F and 1 hour of sun in the day prior to, or forecast before a rain the day after the application.
      ii. For spring applications to thistles, apply after basal leaves of Canada thistles are fully extended, and after rosettes of musk thistle are at least 8 inches diameter, but before flower stage.
      iii. For fall applications to thistles, apply prior to the second hard freeze of 28° F, unless otherwise listed in the label directions.

b. For tree and brush applications:
   i. For foliar applications and cut stump/surface applications with water-soluble products, apply after leaves are fully opened in the spring and prior to leaf discoloration in the fall.
   ii. For cut stump applications with oil soluble products, do not apply during periods of heavy sap flow. Use as a guideline that heavy sap flow occurs in late winter to early spring when nighttime temperatures below 32° F are followed by daytime temperatures above 32° F with sunny conditions.
   iii. For cut stump and basin bark applications, add sufficient dye so that treated areas are visible to inspection 7 days after application.

7. Notify the Engineer prior to calibrating, mixing and applying herbicides, including incidental items.

8. Provide copies of daily spray logs to the RCE at the end of each week of spraying (form provided by Iowa DOT).

9. If Contractor does not complete spray item on schedule, the
### Drainage

<table>
<thead>
<tr>
<th>NO.</th>
<th>DATE</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>500-5</td>
<td>10-20-15</td>
<td>Precast Concrete Drain Extension</td>
</tr>
<tr>
<td>500-6</td>
<td>10-20-15</td>
<td>Median Culvert Extensions with Beveled Pipe and Guard</td>
</tr>
<tr>
<td>500-10</td>
<td>10-17-17</td>
<td>Outlets for Longitudinal, Transverse and Backslope Subdrains</td>
</tr>
</tbody>
</table>

### Fencing

<table>
<thead>
<tr>
<th>NO.</th>
<th>DATE</th>
<th>TITLE</th>
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</thead>
<tbody>
<tr>
<td>510-1</td>
<td>04-20-10</td>
<td>Chain Link Fence on Concrete Retaining Wall</td>
</tr>
<tr>
<td>510-2</td>
<td>03-28-95</td>
<td>Temporary Slope Drain</td>
</tr>
<tr>
<td>510-3</td>
<td>04-20-10</td>
<td>Supplemental Details of Field Fence (Small Animal Barrier)</td>
</tr>
<tr>
<td>510-4</td>
<td>04-21-15</td>
<td>Precast Stock Pass Extension</td>
</tr>
<tr>
<td>510-5</td>
<td>10-19-10</td>
<td>Small Animal Barrier for Gated Entrance</td>
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</table>
## SECTION 531

### ROADWAY PAVEMENT

<table>
<thead>
<tr>
<th>NO.</th>
<th>DATE</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>531-2</td>
<td>04-21-20</td>
<td>Median Crossover at Interchange (50' Median)</td>
</tr>
<tr>
<td>531-3</td>
<td>04-21-20</td>
<td>Median Crossover at Interchange (64' Median)</td>
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## SECTION 533

### ROADWAY PAVEMENT

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>533-1</td>
<td>04-21-20</td>
<td>Parallel Deceleration Taper for 16' Ramp (60MPH Design Speed)</td>
</tr>
<tr>
<td>533-2</td>
<td>04-21-20</td>
<td>Parallel Acceleration Taper for 16' Ramp (60MPH Design Speed)</td>
</tr>
<tr>
<td>533-3</td>
<td>04-21-20</td>
<td>Parallel Deceleration Taper for 18' Exit Loop (60MPH Design Speed)</td>
</tr>
<tr>
<td>533-4</td>
<td>04-21-20</td>
<td>Parallel Deceleration Taper for 24' Exit Loop (60MPH Design Speed)</td>
</tr>
<tr>
<td>533-5</td>
<td>04-21-20</td>
<td>Parallel Acceleration Taper for 24' Ramp (60MPH Design Speed)</td>
</tr>
</tbody>
</table>
The Engineer will determine the header location to accommodate the required staging activities.

Possible Contract Items:

- Special Backfill: 2140 Tons
- Detour Pavement: 4372*** Sq. Yds.
- 18 inch Unclassified Roadway Pipe: 335*** Linear Ft.

**Quantities are based on the assumption the existing median ditch is 4 feet deep and foreslopes are 4:1.

***Quantities are based on the assumption the median crossover is 300' in length.
The Engineer will determine the header location to accommodate the required staging activities.

1. Possible location of staging header
2. 8" PCC Detour Pavement or 10" HMA Detour Pavement. Refer to Section 2304 of the Standard Specifications.
3. "B" Joint.
4. Slotted drain for median crossover. See DR-502

Possible Contract Items:

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of Pavement*</td>
<td>Sq. Yds.</td>
<td>1729</td>
</tr>
<tr>
<td>Special Backfill</td>
<td>Tons</td>
<td>2287***</td>
</tr>
<tr>
<td>Detour Pavement</td>
<td>Sq. Yds.</td>
<td>4838***</td>
</tr>
<tr>
<td>18 inch Unclassified</td>
<td>Linear Ft.</td>
<td>332***</td>
</tr>
<tr>
<td>Roadway Pipe</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The removal of subbase material is incidental to the removal of pavement.

**Quantities are based on the assumption the existing median ditch is 4 feet deep and foreslopes are 4:1.

***Quantities are based on the assumption the median crossover is 300' in length.
NOTE: W is the width of the outside lane to the Edge of Pavement.
533-01
ROAD DESIGN DETAIL
SHEET 2 of 2
PARALLEL DECELERATION TAPER
FOR 16' RAMP
(60 MPH DESIGN SPEED)

100' min. (12' wide) Refer to plans for length of deceleration lane.

Transverse Joints Perpendicular to Mainline Pavement

Transverse Joints Perpendicular to Ramp Baseline

CD Joints at 15' Max. Spacing along Mainline

CD Joints at 15' Max. Spacing along Ramp

300' Taper

Reference Point for 15' Max. Joint Spacing

30' tapered

30' tapered

16' EXIT RAMP WITH PARALLEL DECELERATION LANE

① 'CO' Joints at 17' spacing.
② 'BT-2' or 'KT-2' Joint.
③ 'C' Joint.
④ 'B' Joint, 2' minimum, 4' maximum.
⑤ 'L-2' Joint.
⑥ 'C' Joint.
⑦ 'B' Joint, 2' minimum or equal to mainline shoulder width.
⑧ 'B' or 'C' Joint, 2' minimum, 4' maximum.

Refer to plans for length 1000' min. (12' wide).

CD Joints at 15' Max. Spacing along Mainline

CD Joints at 15' Max. Spacing along Ramp

Reference Point for 15' Max. Joint Spacing

300' tapered

300' tapered

Transverse Joints Perpendicular to Mainline Pavement

Transverse Joints Perpendicular to Ramp Baseline

CD Joints at 15' Max. Spacing along Mainline

CD Joints at 15' Max. Spacing along Ramp

Reference Point for 15' Max. Joint Spacing

300' tapered

300' tapered

Transverse Joints Perpendicular to Mainline Pavement

Transverse Joints Perpendicular to Ramp Baseline

CD Joints at 15' Max. Spacing along Mainline

CD Joints at 15' Max. Spacing along Ramp

Reference Point for 15' Max. Joint Spacing

300' tapered

300' tapered

Transverse Joints Perpendicular to Mainline Pavement

Transverse Joints Perpendicular to Ramp Baseline

CD Joints at 15' Max. Spacing along Mainline

CD Joints at 15' Max. Spacing along Ramp

Reference Point for 15' Max. Joint Spacing

300' tapered

300' tapered

Transverse Joints Perpendicular to Mainline Pavement

Transverse Joints Perpendicular to Ramp Baseline

CD Joints at 15' Max. Spacing along Mainline

CD Joints at 15' Max. Spacing along Ramp

Reference Point for 15' Max. Joint Spacing

300' tapered

300' tapered

Transverse Joints Perpendicular to Mainline Pavement

Transverse Joints Perpendicular to Ramp Baseline

CD Joints at 15' Max. Spacing along Mainline

CD Joints at 15' Max. Spacing along Ramp

Reference Point for 15' Max. Joint Spacing

300' tapered
For joint detail, see mainline pavement. Construct ramp exit pavement the same thickness as mainline subbase. For header construction detail at the end of taper, see Typical 7101 or Typical 7102.

For 16’ ramp taper:

<table>
<thead>
<tr>
<th>Distance from Point E to Pt. A’ Along Line A’ (Ft.)</th>
<th>100.10 300.25 500.50 700.75 900.10</th>
<th>A’1</th>
<th>A’2</th>
<th>A’3</th>
<th>A’4</th>
<th>A’5</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFFSET (Ft.) (A’1)</td>
<td>21.97 31.84 41.71 51.58 61.45</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SLOPE (%)</td>
<td>Constant 4.0% Slope</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>DROP (Ft.) (A’1)</td>
<td>0.62 0.76 0.90 1.04 1.18</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>OFFSET (Ft.) (A’2)</td>
<td>0.86 0.86 0.86 0.86 0.86</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SLOPE (%)</td>
<td>Constant 1% Offset</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>DROP (Ft.) (A’2)</td>
<td>1.16 1.16 1.16 1.16 1.16</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>OFFSET (Ft.) (A’5)</td>
<td>1.86 1.86 1.86 1.86 1.86</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>SLOPE (%)</td>
<td>Constant 3.0% Slope</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>DROP (Ft.) (A’5)</td>
<td>3.06 3.06 3.06 3.06 3.06</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

NOTE: The algebraic difference between ramp profile grade at point F and relative profile grade of mainline at point H is 0.62%.
Transverse Joints Perpendicular to Mainline Pavement

10'00' min (12' wide), Refer to plans for length of acceleration lane

CD' Joints at 15' Max Spacing along Mainline

Reference point for 15' joint spacing

Transaction Joints Perpendicular to Ramp Baseline

CD' Joints at 15' Max Spacing along Mainline

CD' Joints at 17' spacing. 'B'T-2' or 'KT-2' Joint. 'C' Joint parallel to mainline pavement. 'L-2' Joint.

CD' Joints at 17' spacing.

ROAD DESIGN DETAIL
FOR 16' RAMP
(60 MPH DESIGN SPEED)
TABLE OF OFFSETS AND DROPS FOR 18' RAMP TAPER

<table>
<thead>
<tr>
<th>OFFSET (Ft.)</th>
<th>SLOPE (%)</th>
<th>DROP (Ft.)</th>
<th>OFFSET (Ft.)</th>
<th>SLOPE (%)</th>
<th>DROP (Ft.)</th>
<th>OFFSET (Ft.)</th>
<th>SLOPE (%)</th>
<th>DROP (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>0.06</td>
<td>0.01</td>
<td>12.00</td>
<td>2.00</td>
<td>3.57</td>
<td>14.00</td>
<td>2.00</td>
<td>3.57</td>
</tr>
<tr>
<td>12.00</td>
<td>2.00</td>
<td>3.57</td>
<td>14.00</td>
<td>2.00</td>
<td>3.57</td>
<td>16.00</td>
<td>2.00</td>
<td>3.57</td>
</tr>
<tr>
<td>14.00</td>
<td>2.00</td>
<td>3.57</td>
<td>16.00</td>
<td>2.00</td>
<td>3.57</td>
<td>18.00</td>
<td>2.00</td>
<td>3.57</td>
</tr>
</tbody>
</table>

For joint details, see PV-101.

For header construction details at the beginning of taper, see Typical 7101 or Typical 7102.

Construct Loop exit pavement the same thickness as mainline pavement.

NOTE: The algebraic difference between profile grade for Loop Base Line at C and relative profile grade of Mainline at M is 1.2%.
"B" or "C" Joint. 2' minimum. 4' maximum. 10' minimum or equal to mainline shoulder width.

'B-2' Joint. 2' minimum, 4' maximum.

'L-2' Joint. 10' minimum or equal to mainline shoulder width.

'B' or 'C' Joint. 2' minimum. 4' maximum.
For joint detail, see PV-101.

For header construction detail at the end of taper, see Typical 7101 or Typical 7102.

Construct subbase for ramp exit pavement the same thickness as mainline subbase.

Construct ramp exit pavement the same thickness as mainline pavement.

For 24' ramp taper:

**PROFILE**

**TABLE OF OFFSETS AND DROPS FOR 24' RAMP TAPER**

<table>
<thead>
<tr>
<th>DISTANCE FROM POINT ALONG LINE A (FT)</th>
<th>360</th>
<th>350</th>
<th>340</th>
<th>322.5</th>
<th>300</th>
<th>275</th>
<th>250</th>
<th>225</th>
<th>200</th>
<th>175</th>
<th>150</th>
<th>125</th>
<th>100</th>
<th>75</th>
<th>50</th>
<th>25</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Line A To Line B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFFSET (P1)</td>
<td>2.0</td>
<td>4.0</td>
<td>6.0</td>
<td>8.0</td>
<td>10.0</td>
<td>12.0</td>
<td>14.0</td>
<td>16.0</td>
<td>18.0</td>
<td>20.0</td>
<td>22.0</td>
<td>24.0</td>
<td>26.0</td>
<td>28.0</td>
<td>30.0</td>
<td>32.0</td>
<td>34.0</td>
</tr>
<tr>
<td>SLOPE (%)</td>
<td>0.08</td>
<td>0.32</td>
<td>0.72</td>
<td>1.12</td>
<td>1.52</td>
<td>1.92</td>
<td>2.32</td>
<td>2.72</td>
<td>3.12</td>
<td>3.52</td>
<td>3.92</td>
<td>4.32</td>
<td>4.72</td>
<td>5.12</td>
<td>5.52</td>
<td>5.92</td>
<td>6.32</td>
</tr>
<tr>
<td>DROP (P1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| From Line B To Line C                |     |     |     |       |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| OFFSET (P1)                          | 24.0| 24.7| 26.0| 27.3 | 28.6| 30.0| 31.3| 32.6| 34.0| 35.3| 36.6| 38.0| 39.3| 40.6| 42.0| 43.3| 44.6|
| SLOPE (%)                            | 3.00| 3.00| 3.00| 3.00  | 3.00| 3.00| 3.00| 3.00| 3.00| 3.00| 3.00| 3.00| 3.00| 3.00| 3.00| 3.00| 3.00|
| DROP (P1)                            | 0.72| 0.72| 0.72| 0.72  | 0.72| 0.72| 0.72| 0.72| 0.72| 0.72| 0.72| 0.72| 0.72| 0.72| 0.72| 0.72| 0.72|

**DROP (Ft.)**

**OFFSET (Ft.)**

**SLOPE (%)**

Note: The algebraic difference between the profile grade for ramp base line at and relative profile grade of mainline at $\theta$ is 0.20%.

---

**SECTION A-A**

**SECTION B-B**

**SECTION C-C**

**SECTION D-D**

**SECTION E-E**

**SECTION F-F**

**TABLE OF SHOULDER TRANSITION LENGTHS WITH 6' SHOULDER ON RAMP**

<table>
<thead>
<tr>
<th>Shoulder Width beyond Edge of Mainline Pavement</th>
<th>8'</th>
<th>10'</th>
<th>12'</th>
</tr>
</thead>
<tbody>
<tr>
<td>12'</td>
<td>NA</td>
<td>100</td>
<td>150</td>
</tr>
</tbody>
</table>

**NOTE:** $W_o$ is the width of the outside lane to the Edge of Pavement.
Transverse Joints Perpendicular to Mainline Pavement

24' EXIT RAMP WITH PARALLEL DECELERATION LANE

1. 'CD' Joints at 17' spacing.
2. 'BT-2' or 'KT-2' Joint.
3. 'C' Joint.
4. 'B' Joint, 2' minimum, 4' maximum.
5. 'L-2' Joint.
6. Construct transverse joints on the exit ramp taper perpendicular to the ramp baseline where the gore area is 4 feet or greater.
7. 'C' Joint parallel to mainline pavement.
8. 10' minimum or equal to mainline shoulder width.
9. 'B' or 'C' Joint, 2' minimum, 4' maximum.

300' Taper

Transverse Joints Perpendicular to Ramp Baseline

400' min. (24' wide)

Refer to plans for length of deceleration lane.

360'

Refer to plans for length of deceleration lane.

1500' min. (12' wide)

Refer to plans for length of deceleration lane.

Transverse Joints Perpendicular to Mainline Pavement
PV-101

For joint detail, see mainline pavement.

Construct ramp entrance pavement the same thickness as mainline subbase.

For header construction detail at the end of taper see Typical T101 or Typical T102.

Construct subbase for ramp entrance pavement the same thickness as mainline subbase.

TABLE OF OFFSETS AND DROPS FOR 1/8 RAMP TAPER

<table>
<thead>
<tr>
<th>DISTANCE FROM POINT</th>
<th>ALONG LINE 'A' (Ft.)</th>
<th>OFFSET (Ft.)</th>
<th>SLOPE (%)</th>
<th>DROP (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Line 'A' To Line 'B'</td>
<td>310.8</td>
<td>23.36</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>29.50</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>275</td>
<td>35.45</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>250</td>
<td>41.30</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>225</td>
<td>47.15</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>53.00</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>175</td>
<td>58.85</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>64.70</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>126</td>
<td>70.55</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>106.4</td>
<td>76.40</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>82.25</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>88.10</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>93.95</td>
<td>5.40</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>100.00</td>
<td>5.40</td>
<td>2.90</td>
</tr>
</tbody>
</table>

TABLE OF SHOULDER TRANSITION LENGTHS WITH 6' SHOULDER ON RAMP

<table>
<thead>
<tr>
<th>ALONG LINE 'C' (Ft.)</th>
<th>308.93</th>
<th>272.78</th>
<th>227.63</th>
<th>182.48</th>
<th>137.33</th>
<th>92.18</th>
<th>46.93</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFFSET (Ft.)</td>
<td>25.55</td>
<td>20.41</td>
<td>15.26</td>
<td>11.12</td>
<td>6.97</td>
<td>2.83</td>
<td>0.79</td>
</tr>
<tr>
<td>SLOPE (%)</td>
<td>5.40</td>
<td>5.40</td>
<td>5.40</td>
<td>5.40</td>
<td>5.40</td>
<td>5.40</td>
<td>5.40</td>
</tr>
<tr>
<td>DROP (Ft.)</td>
<td>6.38</td>
<td>5.60</td>
<td>5.06</td>
<td>4.58</td>
<td>4.12</td>
<td>3.71</td>
<td>3.35</td>
</tr>
<tr>
<td>DISTANCE FROM POINT</td>
<td>200</td>
<td>300</td>
<td>500</td>
<td>700</td>
<td>900</td>
<td>1100</td>
<td>1300</td>
</tr>
</tbody>
</table>

NOTE: W is the width of the outside lane to the Edge of Pavement.
Transverse Joints Perpendicular to Mainline Pavement to Ramp Baseline

600' min. (24' wide) refer to plans for length of acceleration lane.

700' min. (12' wide) refer to plans for length of acceleration lane.

310.8' 600' Taper 300' Taper 500' Taper

Transverse Joints Perpendicular to Mainline Pavement

10' minimum or equal to mainline shoulder width.

Construct transverse joints through the gore perpendicular to mainline pavement.

'CD' Joints at 17' spacing.

'B' Joint, 2' minimum, 4' maximum.

'C' Joint parallel to mainline pavement.

'B' or 'C' Joint, 2' minimum, 4' maximum.

'BT-2' or 'KT-2' Joint.

'C' Joint.

'CD' Joints at 17' spacing.

'B' Joint, 2' minimum, 4' maximum.

'C' Joint parallel to mainline pavement.

'B' or 'C' Joint, 2' minimum, 4' maximum.
### MISCELLANEOUS

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<thead>
<tr>
<th>NO.</th>
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<tbody>
<tr>
<td>560-2</td>
<td>03-28-95</td>
<td>Mailbox Turnouts (Granular Surfaced)</td>
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<tr>
<td>560-3</td>
<td>10-16-12</td>
<td>Grading Blister at Light Pole Footing</td>
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<td>560-4</td>
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<td>HMA Wedge for Superelevation</td>
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<td>560-5</td>
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<td>Painted Islands</td>
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<td>560-6</td>
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<td>Shared-use Trail or Sidewalk Behind Steel Beam Guardrail at Bridge Approach</td>
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<td>560-7</td>
<td>10-15-19</td>
<td>Temporary Barrier Rail (Steel)</td>
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<td>560-8</td>
<td>10-15-19</td>
<td>Water Service Curb Stop Cover Located in Sidewalk</td>
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### EROSION CONTROL

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<tr>
<td>570-1</td>
<td>10-18-16</td>
<td>Slash Mulch Berm</td>
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<td>570-5</td>
<td>04-18-17</td>
<td>Erosion Control for Intake or Manhole Well</td>
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<tr>
<td>570-7</td>
<td>04-21-20</td>
<td>Grate Intake Sediment Filter Bag</td>
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<tr>
<td>570-8</td>
<td>10-17-17</td>
<td>Temporary Rock Berm for Sediment Control</td>
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<tr>
<td>570-11</td>
<td>10-15-19</td>
<td>Temporary Sediment Control for Culvert Extension with Exposed Soil</td>
</tr>
<tr>
<td>570-12</td>
<td>10-15-19</td>
<td>Temporary Sediment Control for Shoulder Widening with Exposed Soil</td>
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</tbody>
</table>
Possible Contract Item:
- Pavement Marking Line Items

Possible Tabulations:
- SLW2
- YLW2

For pavement marking line types, see PM-110.
For stop line information, see PM-120.
Use sediment filter bag consisting of woven material meeting the requirements of Table 4196-01-1 of the Standard Specifications, except a maximum apparent opening size of US Sieve No. 10 and a minimum flow rate of 145 gallons per minute per square foot. Sediment filter bags without steel grame and clamping bands will be allowed if overflow is provided.

Remove sediment filter bag upon stabilization of sediment sources.

Measurement for Grate Intake Sediment Filter Bag will be by count.

Basis of Payment for Grate Intake Sediment Filter Bag will be at the contract unit price for each device installed.

Payment is full compensation for furnishing all equipment, labor, and materials required to install the Grate Intake Sediment Filter Bag as shown.

Method of Measurement for Maintenance of Grate Intake Sediment Filter Bag will be by count.

Basis of Payment for Maintenance of Grate Intake Sediment Filter Bag will be at the contract unit price for each occurrence. Payment is full compensation for clean out and disposal of material when capacity reaches 50%, and for any other repair needed during the project.

Measurement for Removal of Grate Intake Sediment Filter Bag will be by count.

Basis of Payment for Removal of Grate Intake Sediment Filter Bag will be at the contract unit price for each device removed. Payment is full compensation for all labor and equipment required for removal.

Possible Contract Items:
Grate Intake Sediment Filter Bag
Maintenance of Grate Intake Sediment Filter Bag
Removal of Grate Intake Sediment Filter Bag

Possible Tabulation:
100-37
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<tbody>
<tr>
<td>3221</td>
<td>04-21-20</td>
<td>Typical Paving Cross Section Subgrade Adjustment to 1% Slope 4-Lane Divided Roadway</td>
</tr>
</tbody>
</table>
Subgrade adjustment is required on tangent sections of the roadway. Curved sections that require superelevation will not require subgrade adjustment once a 2% cross slope is attained across the entire subgrade.

1. Cut trenches in the subgrade shoulders to prevent water ponding in the trimmed area. The contractor may backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. The material used to backfill is incidental.

2. Excavate to drain the inside of pavement. Exercise extreme care in the trimming operation so that the stability of the subgrade is not impaired. If using trimmed material for shoulder construction, place the material in a windrow on either foreslope. Do not allow stored water, whatever the situation, to pond over winter. If placed over winter, it is included in the trimmed volume.

3. Trim the roadbed to within 0.05 feet of final subgrade elevation. Exercise extreme care in the trimming operation so that the stability of the subgrade is not impaired. If using trimmed material for shoulder construction, place the material in a windrow on either foreslope. Do not allow stored water, whatever the situation, to pond over winter. If placed over winter, it is included in the trimmed volume.

4. X is the distance between the Profile Grade and the bottom of the 1% grade line at the grade of pavement.
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<tr>
<td>4301</td>
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<td>VOID</td>
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<tr>
<td>4302</td>
<td>04-03-01</td>
<td>Typical Details for Obliteration Existing Roadbed</td>
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<tr>
<td>4309</td>
<td>10-20-09</td>
<td>Immediate Placement of Embankment at Culvert Extension</td>
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<td>4311</td>
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<td>Barnroof Foreslope at Drainage Structure</td>
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<td>4312</td>
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<td>Barnroof Foreslope at Skewed Drainage Structure</td>
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<tr>
<td>4315</td>
<td>04-15-08</td>
<td>Culvert Abandonment with Flowable Mortar (Rectangular structures less 8' in either height or width or circular structures less than 10' Dia. )</td>
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<tr>
<td>4316</td>
<td>04-15-08</td>
<td>Culvert Abandonment with Flowable Mortar (Rectangular structures at least 8' in both height and width or circular structures 10' Dia. or larger)</td>
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<tr>
<td>4317</td>
<td>04-21-20</td>
<td>Fill for Culverts used in Bridge Replacements</td>
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<tr>
<td>4318</td>
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<td>Fill for Culvert used in Bridge Replacements with Restricted Height</td>
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<tr>
<td>4320</td>
<td>10-18-11</td>
<td>Foreslope Benching for Slide Repair</td>
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04-21-20
Section along Centerline

- Drilled Holes
- Bridge Deck
- Existing Embankment
- Earthfill
- Flowable Mortar
- Floodable Backfill
- Proposed R.C.B or Concrete Pipe

Trench Layout

- Trench 1
- Trench 2
- Trench 3
- Trench 4

Remaining Deck Width

Detail B (Beam Bridge)

- Drilled Holes
- Bridge Deck
- Existing Embankment
- Flowable Mortar
- Floodable Backfill
- Proposed R.C.B or Concrete Pipe

Detail B (Slab Bridge)

- Drilled Holes
- Bridge Deck
- Existing Embankment
- Flowable Mortar
- Floodable Backfill
- Proposed R.C.B or Concrete Pipe

Detail A

- Flange Filler Material Area
- Existing Bridge Deck

- Drilled Holes
- Bridge Deck
- Earthfill
- Flowable Mortar
- Floodable Backfill
- Proposed R.C.B or Concrete Pipe

FILL FOR CULVERT USED IN BRIDGE REPLACEMENTS

- Denotes pay limits for flowable mortar
- Denotes pay limits for flooded backfill

1. 6" Subdrain at flowline elevation of culvert with 4" cover of porous backfill.
2. Place Flange Filler Material in fill pocket area between flanges to prevent flowable mortar from building up. Flange Filler Material is incidental to flowable mortar.
3. Fill void with the maximum amount of Floodable Backfill possible. Distance from Floodable Backfill to bridge beams (when present) or bridge deck shall not exceed 5'.
4. Cut trenches in the embankment to provide drainage for the backfill material. Backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. Backfill material is incidental to flowable mortar.
5. Place trenches at 20' spacing with a minimum of two trenches on each side of the roadway.
Cut trenches in the soil plug to provide drainage for the flowable mortar. Backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. Backfill material is incidental to flowable mortar.

Place trenches at 20' spacing with a minimum of two trenches on each side of the roadway.

Existing embankment.

4" Subdrain with 4" cover of porous backfill at flowline elevation of culvert.

Place Flange Filler Material to fill pocket area between flanges to prevent flowable mortar from building up.

Existing embankment.